Comprehensive Study on Riverine Inputs and Direct Discharges (RID):

Overview of the RID 2005 Data and an Analysis of the Reliability, Accuracy, Comparability and Completeness of the Data

OSPAR Commission
2007

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 Community 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 la Communauté européenne et l'Espagne.

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OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic

NIVA

Norwegian Institute for Water Research

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Annexes :

Addenda:

Executive Summary

This report presents the results of monitoring undertaken by OSPAR Contracting Parties for the Comprehensive Study of Riverine Inputs and Direct Discharges (RID) during 2005. Under the RID Principles, Contracting Parties are committed to monitor, on a mandatory basis, the loads of a range of heavy metals, organic contaminants, suspended particulate matter and nutrient species which are directly discharged or transported by rivers into the OSPAR maritime area.

In the series of OSPAR's annual reports publishing the monitoring results reported by Contracting Parties under the RID Principles, the present report is the first to assess in more detail the compliance by Contracting Parties with the requirements of the RID Principles relating to monitoring and reporting and provides an initial step towards presenting the annual RID data in a more accessible way. While the national data and explanatory text reports are reported in two addenda, the main report focuses on analysing the reliability, accuracy, comparability and completeness of national data reported under RID for 2005.

The report shows that there are a number of factors that may influence the accuracy, reliability and comparability of RID data reported by Contracting Parties. This includes for example the sampling method applied (frequency, distance from river mouth, site in river); the coverage and way of reporting (direct monitoring, estimation and/or modelling) of losses from land areas/sources; calculation methods used; etc. The two major issues identified by this report requiring further attention by the OSPAR Working Group on Inputs to the Marine Environment (INPUT) which oversees the implementation of the RID Study are:

a. quality assurance procedures;

b. transparency in the use by Contracting Parties of limits of detection (LODs) and limits of quantification (LOQs), and the way estimates are reported in cases where measurements are below those limits.

Chapter 4 especially illustrates the impact on the RID 2005 data of the differences in LODs/LOQs achieved by Contracting Parties and the way "less-than" values are reported. The reader of this report should be aware that a direct comparison of the inputs of one Contracting Party with another is difficult due to the differences in national reporting practices. The main reason for presenting the charts and tables on the individual determinands in this report is to demonstrate the factors interfering with comparability. The purpose is to highlight the importance of the way in which national data are reported and that they are supplemented by information which allows their interpretation. The charts shown in chapter 4 are intended to raise awareness for the kind of information that is needed to accompany RID data with a view to improving their utility in assessments. The charts must not be used on their own but must be seen in the context of the specific analysis and its purpose presented in this report.

Récapitulatif

Le présent rapport comporte les résultats de la surveillance entreprise par les Parties contractantes OSPAR pour l'étude exhaustive des apports fluviaux et des rejets directs (RID) en 2005. Dans le cadre des Principes du RID, les Parties contractantes sont tenues de surveiller, obligatoirement, les charges d'une gamme de métaux lourds, de contaminants organiques, de matière en suspension et d'espèces de nutriments qui sont directement rejetées ou transportées par les fleuves dans la zone maritime OSPAR.

Le présent rapport fait partie de la série des rapports annuels OSPAR qui publient les résultats notifiés par les Parties contractantes dans le cadre des Principes du RID. Il est le seul qui évalue de manière plus détaillée la conformité des Parties contractantes aux exigences des Principes du RID relatives à la surveillance et à la notification et qui fournisse une étape initiale dans le sens d'une présentation plus accessible des données annuelles RID. Le corps du rapport se concentre sur l'analyse de la fiabilité, de la justesse, de la comparabilité et de l'état complet des données nationales notifiées dans le cadre du RID pour 2005, alors que les deux addenda comportent les données nationales et les rapports explicatifs.

Le rapport montre qu'un certain nombre de facteurs risquent d'influencer la justesse, la fiabilité et la comparabilité des données RID notifiées par les Parties contractantes. Il s'agit par exemple de la méthode d'échantillonnage utilisée (fréquence, distance à partir de l'embouchure du fleuve, emplacement dans le fleuve), de la couverture et du mode de notification (surveillance directe, estimation et/ou modélisation) des pertes provenant de zones/sources à terre, des méthodes de calcul utilisées, etc. Le présent rapport détermine deux questions importantes sur lesquelles le Groupe de travail apports au milieu marin (INPUT), qui surveille la mise en œuvre de l'étude RID, devra se pencher plus avant. Il s'agit :

a. des procédures d'assurance de qualité;

b. de la transparence avec laquelle les Parties contractantes utilisent les limites de détection (LOD) et les limites de quantification (LOQ), et de la manière dont les évaluations sont notifiées lorsque les résultats des analyses sont inférieurs à ces limites.

Le chapitre 4 en particulier illustre l'impact qu'ont sur les données RID de 2005 les différences dans les LOD/LOQ auxquelles sont parvenues les Parties contractantes et le mode de notification des valeurs « inférieures à ». Le lecteur doit être conscient qu'il est difficile de comparer directement les apports d'une Partie contractante avec ceux d'une autre car les méthodes nationales de notification varient. La présentation de graphiques et de tableaux sur les déterminands individuels dans ce rapport vise essentiellement à montrer les facteurs qui entravent la comparabilité. Il s'agit de mettre en évidence l'importance des modes de notification des données nationales et le fait que des informations complémentaires permettent d'interpréter ces données. Les graphiques qui figurent dans le chapitre 4 ont pour but d'attirer l'attention sur le type d'informations qu'il y a lieu de fournir à l'appui des données RID afin d'améliorer leur utilisation dans les évaluations. Les graphiques ne doivent pas être utilisées indépendamment, mais étudiés dans le contexte de l'analyse spécifique et de son objectif qui figurent dans le présent rapport.

1. Introduction

This report describes the results of the national RID studies carried out by Contracting Parties across the OSPAR Convention area (see Figure 1) under the Comprehensive Study on Riverine Inputs and Direct Discharges (agreement 1998-5, update 2005).[1]

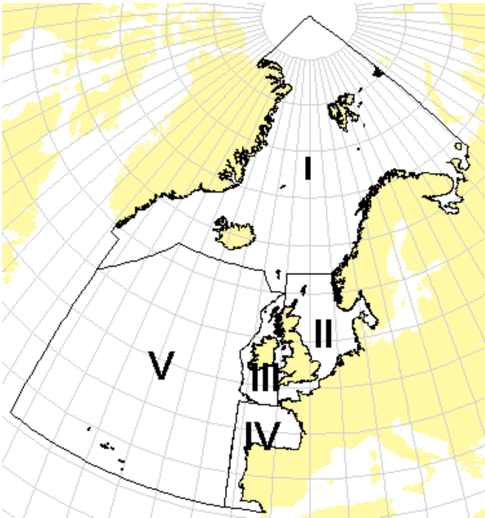

Figure 1. OSPAR maritime area and regions. I: Arctic waters, II: Greater North Sea, III: Celtic Seas, IV: Bay of Biscay, V: Wider Atlantic

The RID Study forms one element within the wider Joint Assessment and Monitoring Programme of OSPAR. The purpose of the RID Study is to assess, as accurately as possible, all riverborne and direct inputs of selected pollutants to Convention waters on an annual basis. The RID Principles set out the monitoring regime to be employed for generating and reporting input data and to this end describes for example the relevant substances and river systems covered; sampling approach, locations and frequency; detection limits; calculation methodologies; and quality assurance.

Under the RID Principles, Contracting Parties should aim to monitor, on a regular basis, 90 % of the inputs of each selected parameter.

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)

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]."

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1 At its Tenth Meeting (Lisbon, 1988) the Paris Commission (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. The RID Principles were reviewed in 1998 and 2005.

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. (* Secretariat note: DIFF was discontinued

Contracting Parties are requested to report the relevant data annually (by 30 September, and 30 November for Denmark) and to provide, for a selection of their main rivers, information on the annual mean/median concentration of selected pollutant.

Sources for monitoring and reporting of direct discharges under the RID Principles include sewage effluents, industrial effluents and mariculture. As far as practicable, estimate inputs from unmonitored areas (including diffuse sources, and minor direct sources and rivers) should complement the percentage monitored to 100 %.

Contracting Parties are requested to report their annual RID data together with an explanatory text report using the reporting format appended to the RID Principles. The results of annual RID data reporting are published by OSPAR each year on the OSPAR web site.

RID data 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. Such an assessment of data collected under RID in 1990 – 2002 was carried out by the Environmental Assessment and Monitoring Committee (ASMO) in 2005 (publication number: 2005/233). A further assessment is being prepared for 2009.

In the course of the regular review of the RID Principles, ASMO 2005 endorsed arrangements for a review of the limits of detection and the procedures for quality assurance set out in the RID Principles with a view to determining whether a revision is needed. To assist this further review of the RID Principles and to provide an example how annual RID data reports could be improved, Norway had offered to prepare in a one-off exercise this report on RID 2005 data.

In addition to the presentation of the RID data reported for 2005, Norway prepared an analysis of the reliability, accuracy, comparability and completeness of the reported data. The analysis is based on information submitted by Contracting Parties as part of their RID data reports and in response to a questionnaire, circulated by Norway, to specially collect information on data generation and reporting for the purposes of this report.

The purpose of this report is to pinpoint some of the challenges which need to be faced in order to improve the usefulness of the results of the RID Programmes. These challenges include: uncertainties, knowledge gaps, and lack of documentation on harmonised practises, approaches and methodologies among Contracting Parties.

This report provides an overview of compliance by Contracting Parties with their reporting requirement for RID 2005 data and its completeness (chapter 2), an analysis of the generation and reporting of RID 2005 data by Contracting Parties (chapter 3) and, in the light of this analysis, an overview of the riverine inputs and direct discharges reported for 2005 (chapter 4). A summary with conclusions and recommendations is given in chapter 5.

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by OSPAR 2000. The work formerly undertaken by DIFF has been carried out by SPDS until 2004/2005 and, since then, by HSC.)

2. RID data reporting for 2005

For the 2005 RID study, RID data reports were submitted by Belgium, Denmark, France, Germany, Ireland, Netherlands, Norway, Spain, Sweden and the UK. Portugal did not report 2005 data. All national RID data reports are presented in Addendum 1 to this report.

Iceland reported for the first time under the RID Principles. The reported data for 1997 – 2005 are mainly data on riverine inputs of NH4-N, NO3-N, PO4-P, total N and total P for the two Icelandic main rivers Þjórsá and Ölfusá. The Icelandic data and text report is presented in Addendum 2 to this report.

The national data reported by Contracting Parties have been summarised in the overview tables at Annex 1. The data have in many cases 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. Statistical information on river catchment areas covered by the national RID 2005 data reports is presented in the Appendix to Annex 1.

Table 1a at Annex 1 gives an overview of data reported by Contracting Parties in 2005 for the categories direct discharges (sewage effluents, industrial effluents), riverine inputs (main and tributary rivers) and coastal areas. This information is summarised in Table 2.1 below. The table only shows if information has been reported, and not if the RID Principles regarding sampling frequency have been followed. The general coverage of the OSPAR maritime area by RID 2005 data reported by Contracting Parties shows significant gaps for the Atlantic (Regions IV and V). For a number of regions, Contracting Parties reported "no information" (NI) on coastal areas, i.e. from areas downstream of river sampling points (see section 3.5 for discussion).

Table 2.1 Overview of information for 2005 reported by Contracting Parties on inputs to the OSPAR maritime area (based on overview table 1a at Annex 1) (green = data reported; red = no information)

OSPAR regions	Country	Sewage effluents	Industrial effluents	Coastal areas	Main rivers	Tributary rivers
North Sea main body	Belgium	NA	NA	*		
	Denmark			*		***
	Germany			*		
	Netherlands			*		
	Norway			**		
	UK East coast					***
Kattegatt	Denmark			*		***
	Sweden			*		
Skagerrak	Denmark			*		***
	Norway			**		
	Sweden			*		
Channel	France[1]					
	UK					***
Irish Sea	Ireland	**	**			
	UK					***
Celtic Sea	Ireland	**	**			
	UK					***
Norwegian Sea	Norway			**		
Barents Sea	Norway			**		
Atlantic	France[1]					
	Ireland	**	**			
	Portugal[2]					
	Spain					
	UK					***

1 France's report is provisional. France reported no totals for inputs where input data were incomplete.
2 Portugal has not submitted any data for 2005 or updated table 1a at Annex 1. This is reflected here as "no information" status.
* included in other data sets
** 1990 data since the basis for calculation remained unchanged. At ASMO 2004, Ireland stated that they planned to update its data on direct discharges in time for the next reporting cycle.
*** Reported as main rivers

The determinands reported by Contracting Parties are detailed in Table 1b at Annex 1 which also indicates the precision of the estimate where the relevant data was provided. The coverage of mandatory determinands in the OSPAR maritime area by the RID 2005 data reports differs for riverine inputs and direct discharges and shows some important gaps (Table 2.2 below).

Table 2.2 Overview of mandatory determinands reported by Contracting Parties in 2005 for riverine inputs and direct discharges (red: no information; yellow: data for riverine inputs but not for direct discharges; green: data fully reported), based on overview table 1b at Annex 1

Country	Cd	Hg	Cu	Pb	Zn	µ-HCH	NH4 -N	NO3 -N	PO4 -P	total N	total P	SPM	% completion RID reporting (parameters)*
Belgium[1]	green	green	green	green	green	green	green	green	green	green	green	green	100 %
Denmark	red	red	red	red	red	red	green	green	green	green	green	red	42 %
France[2]	red	red	red	red	red	red	yellow	yellow	yellow	red	yellow	yellow	21 %
Germany	green	green	green	green	green	green	green	green	green	green	green	green	100 %
Ireland	green	yellow	green	green	green	red	yellow	yellow	yellow	green	green	green	75 %
Netherlands	green	green	green	green	green	yellow	yellow	green	yellow	green	green	green	88 %
Norway	green	green	green	green	green	yellow	green	green	green	green	green	green	96 %
Portugal	red	red	red	red	red	red	red	red	red	red	red	red	0 %
Spain	green	green	green	green	green	green	green	green	green	green	green	green	100 %
Sweden	green	green	green	green	green	red	green	yellow	yellow	green	green	red	75 %
United Kingdom	green	green	green	green	green	green	green	green	green	green	green	green	100 %

* % of data reported in relation to 12 substances for each riverine inputs and direct discharges (24 = 100%), based on overview table 1b at Annex 1.

1 Belgium does not report direct discharges as this is not applicable.

2 France's report is provisional. France reported riverine data on metals and lindane for some main and tributary rivers. In the absence of complete information (e.g. concentration or flow), no total inputs were reported for those determinands. France reported no direct discharges for any determinand.

Table 2.2, therefore, gives an overview of the parameters measured by each CP, but as for Table 2.1, it does not show the frequency with which each parameter has been sampled and analysed, nor the number of rivers for which each determinand is measured.

In summary:

- only three countries, Germany, Spain and United Kingdom, are reporting all mandatory determinands for both rivers and direct discharges;
- Belgium reports all mandatory determinands for rivers, but does not report direct discharges as this is not applicable;
- the Netherlands and Norway report all determinands for rivers, but for direct discharges neither country reports lindane, and the Netherlands does not report ammonia and orthophosphate;
- Sweden does not report lindane or SPM at all, and does not report nitrate or orthophosphate in direct discharges;
- Ireland does not report lindane at all, and does not cover mercury and three nutrient species in direct discharges. Mercury in direct discharges is not reported since all samples were below the detection limit of 0.15 µg/l;
- Denmark only reports nutrients in rivers and direct discharges, and no metals or SPM are reported neither in direct nor in riverine inputs.

On voluntary parameters, Belgium, Germany, Spain and the UK reported data for PCBs as well as France for some of their main and tributary rivers. No other voluntary parameter has been reported.

A number of additional parameters (Cr, Ni, As, TOC) not covered by the RID Principles were reported by Norway. These parameters are not included in the overview tables at Annex 1.

In general, determinands in direct discharges (especially for nutrients parameters) are less well reported than those in riverine inputs. France, for example, has not reported any direct discharges. There are significant gaps in the reporting of metals for both riverine inputs and direct discharges, especially for mercury in direct discharges for which one third of Contracting Parties did not report (36 %). Significant gaps exist for lindane with only 6 Contracting Parties reporting riverine inputs of lindane (55%); direct discharges are only reported by one third of Contracting Parties, leaving a gap in data coverage of 64%. A number of CPs did not report direct discharges of nutrient parameters.

In terms of geographic coverage, the OSPAR Region II (Greater North Sea), especially the main body of the North Sea, is the maritime area that is covered best, although even here gaps still exist. There are substantial gaps for Region IV (Bay of Biscay/Iberian coast), especially for metals and lindane and for all parameters in Region V.

3. Assessment of the data

3.1 Overview of the information obtained

The following analysis of RID data reported by Contracting Parties for 2005 is based on information submitted by Contracting Parties in their text report supplementing their national RID data (presented in Addendum 1) and in response to a questionnaire prepared by Norway to collect information on the generation and reporting of RID data (Table 3.1). This information is not only relevant for RID 2005 data but reflects, in more general terms, the national practice of Contracting Parties in monitoring and reporting under the RID Principles.

Table 3.1 Overview of information submitted by Contracting Parties on their RID data for 2005

Country	RID data text report	Questionnaire filled in
Belgium	Yes	Yes
Denmark	Yes*	No
France	Yes	No
Germany	Yes	No
Iceland	Yes	Yes
Ireland	Yes	Yes
Netherlands	Yes	Yes
Norway	Yes	Yes
Portugal	No	No
Spain	Yes	Yes
Sweden	Yes	Yes
United Kingdom	Yes	Yes

** Report came in too late to be fully taken into account in this document. The data are included in the tables and charts.*

Tables 3.2 and 3.3 summarise the information submitted by Contracting Parties and supplement the information received on inputs to the OSPAR maritime area in 2005 (overview table 1a and statistical information on river catchments (Appendix 1) at Annex 1). The information in tables 3.2 and 3.3 address the following issues:

Table 3.2:

- Number of rivers monitored
- Number of maritime areas per country
- Size of convention area for the country
- Whether one or more laboratories have been involved in the analyses of the water samples
- Whether monitoring has been carried out by one or many institutes

Table 3.3:

- The number of samples per year in the main rivers
- The number of samples per year in the tributary rivers
- What is measured and/or calculated downstream of the riverine sampling points
- Which strategy is taken to include direct discharges to the maritime areas
- And whether or not all parameters have been analysed, in compliance with the RID principles.

Table 3.2: Compilation of submitted information on data quality - A

Country	Number of rivers	Number of areas	Size of Convention Area (for the country)	One or many labs	Monitoring carried out by many or one institute
Belgium	2 main rivers, 9 tributaries	1 (North Sea) (Again divided into Scheldt estuary and Belgian Coastal zone; again divided into 5 sub-areas)	Surface area covered by RID river's catchment: 15.392 km^2 100% of the Belgian area drains into Convention Area. 50% drains directly into it through the Scheldt estuary and the coastal basins and is represented by the RID reportings. The other 50% drains indirectly into the Area through the Meuse and Rhine basins and contributes to the Netherland's inputs.	Source of data for all analyses: Vlaamse Milieumaatschappij (VMM), A. Van De Maelestraat 96, B-9320 Erembodegem.	One and the same organisation (VMM – Vlaamse Milieu Maatschappij) A. Van De Maelestraat 96, B-9320 Erembodegem co-ordinates the sampling and does the analyses for all rivers.
Denmark	25 rivers	3 (North Sea, Kattegat, and Skagerrak.)	Total catchment area in Denmark to OSPAR is 27.500 km2, which constitutes 64% of the Danish land area.	NI	NI
France	9 main rivers, 29 tributaries and 13 unmonitored areas.	2 (Channel/North Sea and Atlantic, again divided into four sub-regions.	382.162 km^2, hence 70% of the total land area of France with 319.822 km^2 monitored	Several labs but all have to be registered by the French Ministry of the Environment	Different river basin districts: Loire-Bretagne, Seine-Normandie, Artois-Picardie, Adour-Garonne
Germany	4 main rivers	1 (North Sea)	NI	NI	NI
Iceland	2	1 (Atlantic)	100% Monitored area: 13.000 km^2 of total 103.000 km^2	One lab for nutrients. Change from 1998 for total P. After 1998, P = ICP-MS (SGAP). Some discrepancies were observed at the transition period.	One University
Ireland	17 main rivers; of which 4 to the Irish Sea, 10 to the Celtic Sea and 3 to the Atlantic. . Several tributaries.	3 (Irish Sea, Celtic Sea and the Atlantic	98 %	All samples are analysed in the EPA's regional laboratory in Richview, Clonskeagh, Dublin.	Sampling is organized and carried out by Environmental Protection Agency staff.
Netherlands	4 main rivers (Rhine, Ems, Schelde, Maas)	1 (North Sea).	100%	Samples from main rivers analysed by RIZA, from tributary rivers by other laboratories.	In main rivers sampling is organised by RIZA, in tributaries by other water administrations.
Norway	10 main rivers and 36 tributaries	4 (Skagerrak, North Sea, Norwegian Sea, Barents Sea)	The river basin register system has classified the Norwegian river basins into 20.000 units, or 252 main catchments areas. According to this system, 247 of the 252 Norwegian rivers are draining into coastal areas. 100% drain into Convention areas.	Same laboratory for all analyses	One institute responsible for the monitoring, but many people are sampling.
Spain	43 main rivers and 9	1	61,56% of the surface of Spain	Each River Basin District	Different River Basin Districts. CH Norte, CH

Country	Number of rivers	Number of areas	Size of Convention Area (for the country)	One or many labs	Monitoring carried out by many or one institute
	tributaries	(Atlantic. Again divided into 8 areas: País Vasco and Norte III; Norte II, Galicia costa; Norte I, Guadiana and Guadalquivir are controlled by Spain;Duero and Tajo controlled by Portugal.	drains into the Convention Area, but 34,96% is controlled by Spain and 26,61% (Duero and Tajo) by Portugal	has its own laboratory or laboratories. In some cases monitoring is carried out by contracts with private laboratories	Guadiana, CH Guadalquivir, País Vasco, Galicia Costa, Junta de Andalucía
Sweden	12 rivers; (10 major and 7 minor) No tributaries.	2 (Kattegat and Skagerrak) Divided into 10 coastal areas.	72 700 km^2 , corresponding to 15 % of the total land area of Sweden. Of this, 88.7 % is monitored, the rest is estimated.	One laboratory except for Hg analyses, which are performed by a sub-contractor.	One institute responsible for the monitoring within the National programme. Several persons perform the actual sampling (generally made by local/regional authorities). Some smaller rivers are monitored by regional authorities.
UK	233 rivers aggregated into 29 sampling regions	6 (North Sea North, North Sea South, North Sea Channel, Celtic Sea, Irish Sea, Atlantic.)	100% of the UK, as all rivers drain into Convention Waters. Riverine inputs: 80 % of the land mass Direct discharges: 10 %. The remaining 10 % is not estimated (in order to assure comparability with former years)	9 different laboratories	3 regions which do the sampling. The same sampling protocols are used by all regional offices *within a particular region.*

Table 3.3: Compilation of submitted information on data quality -B

Country	Number of samples/ year main rivers	Number of samples/ year tributary rivers	Downstream sampling points – what is measured/ calculated?	Direct discharges	All parameters included?
Belgium	24 for Scheldt; 12 for Ijzer	12	The only areas that could be qualified as "unmonitored" in Belgium are situated in a very narrow (no more than a few hundred metres and mostly less) fringe along the coast. In those areas a seepage and diffuse runoff go straight into the sea. These are not materially measurable, of very little impact and do not have to be covered in the RID reporting. All other downstream areas and polders are covered by monitoring and thus quantified in RID.	Since 1996 there are no longer direct inputs in convention waters under Belgian jurisdiction. No industrial effluents are discharged directly to Belgium's convention waters. No urban run-off or storm water overflows discharge to Convention Waters under Belgian jurisdiction.	All parameters are monitored
Denmark	Varies from 9-27(34) times a year. On average for all 25 main rivers: 16 times a year.	None		Wastewater treatment plant outflow are sampled from 2-24 times a year. All point sources larger than 30 PE are monitored, even if they are situated in an unmonitored part of the river.	Metals and PCBs not included, except Gudenå and Skjernå (for metals).
France	12 measures per year – at least.	Main tributary rivers: 12/yr. Others, at least 4/yr.	For main rivers, the part of the river downstream the monitoring station is considered as an OSPAR coast.	No reporting of direct discharges, either for sewage effluents, industry or fish farming.	All mandatory and some voluntary parameters are monitored but no totals for inputs were reported where input data were incomplete
Germany	Elbe and Eider: 25-26/yr Eider 13/yr for other parameters than nutrients. Weser and Ems: 12/yr.	For Elbe tributaries 2 to 13/yr (heavy metals, nutrients and SPM). Weser and Ems: No measurements in the tributaries. Eider: 26/yr for nutrients and 13/yr for all other parameters. Sampling based on representative random samples.	Within the Eider catchment area the loads of the unmonitored part were determined by extrapolating the loads of the monitored parts of the catchment area.	Sewage & industry: Elbe, direct discharges of sewage effluents determined downstream of the measurement site. Weser and Jade: estimates based on population equivalents & industry. Ems: partly measured (major discharges), partly estimated. Eider: included in the riverine inputs.	In the river Elbe and its tributaries as well as in the river Eider no measurements for PCBs (in water) were carried out, because the concentrations are mostly below the detection limit. This is also the case for γ-HCH measurements in water in the Elbe tributaries.
Iceland	7 samples/yr in 2005.	None	Nothing is calculated downstream of sampling points.	Seems as if direct discharges are not included at all. Only discharges in the two monitored rivers are included. No discharges from industrial plants along the coast.	NI
Ireland	In general between 6-7 sampling runs are made for each river in the January to March and October to December periods. Sampling also	NA	Loads for unmonitored areas are estimated by extrapolation from those calculated for relevant main rivers on the basis of catchment areas.	NI	Mercury not measured (all concentrations have been less than the detection limit of 0.15 ug/l). It should be noted that this value is used to give an upper estimate of loading to the receiving water. Lindane is not being measured due to lack of

Country	Number of samples/ year main rivers	Number of samples/ year tributary rivers	Downstream sampling points – what is measured/ calculated?	Direct discharges	All parameters included?
	takes place in May. Sampling frequency is less than 12 times per annum but is concentrated in the period of expected higher river flows (October to May). The reason for the non-compliance is the lack of resources.				resources.
The Netherlands	For Noordzeekanaal, IJsselmeer and Haringvlietsluizen 12-13 samples per year. For Maassluis 24-25 samples per year. Loads calculated following each flow weighed concentration method. Calculations for PCBs not included due to lack of measurements.	Monthly or bimonthly (at Maassluis).	Generally sampling sites are so far downstream that this is not necessary. Except for Maassluis, where some direct discharge are reported downstream of sampling point,	Information is collected from • Environmental annual reports of (larger) industries in which discharges are reported • Annual questionnaire to administrators of rivers on annual direct and indirect loads from smaller industries • An annual questionnaire send out by the Netherlands Central Bureau of Statistics to the administrators of Sewage treatment plants for annual loads Used methodology is : product of annual flow and flow weighted concentrations.	No PCBs and lindane in sewage effluents; instead an estimate of total national load in all sewage effluents available. No SPM in industrial effluents in 2005, but usually this is included.
Norway	12 / yr, two large rivers in Southern Norway 16 /yr	Four times a year in 36 tributaries	See details in 3.7. The calculation model TEOTIL is used for estimating losses of nutrients, direct discharges are monitored.	Industry Sewage treatment plants Fish farming	All, except lindane which is not monitored in tributaries or direct discharges.
Spain	Basically 12 a year, but it differs for each discharge area and parameter.	Basically 12 a year.	Loads for unmonitored areas not calculated	Industrial effluents based on industries' discharge declarations, regional discharge registries, direct control measurements, discharge permits, concentration values from previous years when effluents were similar and data were not available, and fixed values when measurements were below detection limits. The number of samples varies among different discharge sites. Fish farming is included	All mandatory parameters are monitored and some voluntary parameters in some areas
Sweden	Rivers: Generally 12/yr. Point sources: Tot-N, Tot-P, BOD7 and CODCr are sampled (in proportion to flow) 12 – 52 times annually. Metals are sampled 1 – 12 times annually, on the largest plant even 52 times.	No samples.	Quantified by the area specific loss from the monitored parts and the loads are included in the amounts given for the monitored areas. Generally, the monitored parts of the rivers cover some 95-100% of the total areas. Two exceptions: Rivers Enningdalsälven and Rönneån cover only 80 and 51 %, respectively, of the total areas.	Annual reporting is restricted to municipal treatment plants designed for more than 2000 "population equivalents" and "the most important" industrial point sources Industries: Varies. Emissions generally reported above certain threshold values, mostly well below those applied in the EPER register. Water flows are often not reported. A few facilities discharge very large (unreported) water amounts, mostly cooling water	Rivers: Lindane and Suspended particulate matter are not measured. Metals are not measured in all rivers (will be measured in all rivers within the National monitoring program from 2007 and onwards).

Country	Number of samples/ year main rivers	Number of samples/ year tributary rivers	Downstream sampling points – what is measured/ calculated?	Direct discharges	All parameters included?
United Kingdom	Generally 12 samples are collected per year at approximately monthly intervals from sampling points at the various rivers in a designated sampling region.	NA	Riverine inputs cover some 80% of the landmass. When adding monitoring of direct inputs downstream the stations, it is considered that the 90% coverage target has been met.	Direct discharges downstream monitoring points measured	Yes, but where previous monitoring has shown that levels are consistently below the detection limit (e.g. PCBs) monitoring may be discontinued or reduced.

3.2 Coverage of monitored areas

It proved difficult to provide an overview of the extent of the area covered by the RID programme in each Contracting Party, as compared to the total land area of that country draining into the OSPAR maritime area. This is due to lack of clarity of the understanding and practice of Contracting Parties relating to the concept of “unmonitored areas”:

- What is understood by the concept “unmonitored areas”?
- How are the inputs from these areas treated by the different countries (e.g. ignored, estimated, or modelled)?
- If the inputs from the unmonitored areas are estimated or modelled, are these areas then covered or not by the RID programme?

Instead of attempting a comprehensive answer to these questions, this report focussed on clarifying the definitions of those concepts (see section 3.5). For some Contracting Parties, preliminary answers to the question of area coverage by the RID Programme are recorded in Table 3.2.

In addition to the above, some countries have made an effort to evaluate the distance from the RID sampling points to the coast. This is useful information as it indicates the area of unmonitored land between the RID sampling point and the sea. An example from the Belgian rivers is included in Table 3.4 below, for demonstration purposes.

Table 3.4 Example of distance between river sampling points and coast reported by Belgium

River sampling point	**Distance to coast**	**Comments**
Scheldt (main river):	60 km	(=distance along streamline to sea mouth of the estuary). Note that the sampling point is situated in tidal brackish convention waters
Gent-Terneuzen canal (tributary)	12 km	distance along canal (fresh water reach) to sluices giving into the Scheldt estuary
Yzer (main river)	4 km	situated in fresh water reach; distance to sluice complex at the receiving Yzer estuary
Langeleed (tributary)	9 km	situated in fresh water reach; distance to receiving Yzer estuary sluice complex
Beverdijk (tributary)	3 km	situated in fresh water reach; distance to receiving Yzer estuary sluice complex
Vladslovaart (tributary)	6 km	situated in fresh water reach; distance to receiving Yzer estuary sluice complex
Gent-Oostende canal (tributary)	500m	situated in fresh water reach, distance to sluices of the receiving harbour canal open to the sea
Noordede (tributary)	1 km	situated in fresh water reach, distance to sluices of the receiving open harbour canal open to the sea
Blankenbergse vaart (tributary)	1 km	situated in fresh water reach, distance to receiving harbour canal open to the sea
Leopold canal (tributary)	1 km	situated in fresh water reach, distance to receiving harbour canal open to the sea
Schipdonk canal (tributary)	10 km	situated in fresh water reach, distance to receiving harbour canal open to the sea

This example shows that there are quite large differences in the distance from the riverine RID sampling points to the coastline within one and the same country. It should also be noted that some rivers are sampled at the border to the next Contracting Party, and not at the coast.

3.3 Sampling, laboratory analyses and detection limits

3.3.1 Sampling

It is not clear whether all Contracting Parties have standard procedures for sampling and whether these are used consistently within each country. Since, in general, several persons are involved in the sampling of rivers, such standards should be considered important by the Contracting Parties. In the UK, three different regions are responsible for the sampling, and the same sampling protocols are used by all regional offices within a particular region. In Norway, local observers are carrying out the sampling based on a common sampling protocol; they represent a network of fieldworkers and professional staff administered by the Norwegian Water Resources and Energy Directorate (NVE). Norway also states that it is an advantage to use local observers and samplers, since they were familiar with their local rivers and were aware of anomalies or special events. In Spain, the monitoring and calculations are carried out by different River Basin Districts and Autonomous Communities, and methodologies may vary. In Belgium, one and the same organisation co-ordinates the sampling and does the analyses for all rivers. In the Netherlands, the sampling in the main rivers is organised by RIZA (Ministry of Waterways and Public Works); whereas the tributaries are sampled by other water administrations.

Sampling of point sources by Contracting Parties is usually administered by the owners, i.e. sampling of effluents from industry is carried out by employees at the plant. The same is true for sewage treatment plants and fish farming plants. This also means that methodologies for sampling may differ significantly from point-source to point-source.

3.3.2 Laboratory analyses and detection limits

For chemical analysis of samples, several countries use different laboratories both for riverine inputs and direct discharges. However, Belgium, Iceland, Ireland, Norway, and Sweden (except for mercury) use the same laboratory for all rivers monitored.

Concerning detection limits, Contracting Parties had been invited to report with their RID 2005 data the limits of detection (LODs) or limits of quantification (LOQs) achieved to clarify what approach (LOD or LOQ) they used and which values they achieved, with a view to supporting a review by INPUT of the LOD examples in the RID Principles.

For the purpose of the present report, LODs and LOQs and their role for chemical analysis is understood as follows, based on a description prepared by Germany for INPUT 2007:

> *"According to the definitions (IUPAC, IS/TR 13530), the limit of detection (LOD) is, in broad terms, the smallest amount or concentration of an analyte in the test sample that can be reliably distinguished from zero. The limit of quantification (LOQ) is the smallest amount or concentration of analyte in the test sample which can be determined with a fixed precision, e.g. relative standard deviation s_{rel} = 33,3 %. This means in other words, that a substance can only be correctly qualified from LODs, while it only can be quantified from LOQs."*

> *"Usually the LOQ is understood to be a fixed multiple of the LOD (LOQ = LOD x 3). The factor of 3 corresponds to the relative standard deviation s_{rel} = 33.3 %. On this basis, the LOQ can be calculated from the LOD. In terms of quantification, concentrations above the LOQ can be considered to produce reliable load results. Concentrations below the LOQ tend to loose reliability the closer they get to the LOD. As a consequence, compliance with the LOQ adds reliability to the input figures established for OSPAR."*

The information of LODs/LOQs achieved by Contracting Parties, as far as reported by them, is presented in Tables 3.5 and 3.6 below, drawing on a compilation prepared by Germany for INPUT 2007. Not all Contracting Parties submitted information: information on LODs/LOQs is missing from Portugal entirely and from Belgium, Denmark, France, Norway and Sweden for analysis of direct discharge samples. Information submitted by some Contracting Parties is incomplete. For Icelandic data, see detailed information in Addendum 2 to this report.

It is not always clear from the information submitted by Contracting Parties to which extent the values in Tables 3.5 and 3.6 reflect LODs or LOQs. In some cases, the national values may include both. For instance, Spain has submitted an overview showing that LOD is used in País Vasco and Guadalquivir, whereas LOQs are used in Galicia, Guadiana and the North region. Spain has earlier informed ASMO 2005 that they propose to replace detection limits (LOD) with quantification limits (LOQ) for loads as a more suitable approach, in particular for the measurement of heavy metals in riverine inputs. However, other countries prefer for various reasons to use LODs.

Most Contracting Parties who submitted information on LODs/LOQs reported a range. The reason for this is in most cases that different detection limits are achieved by the laboratories involved in national data generation and reporting in different regions. It is noted that detection limits for analysis of riverine inputs will be lower and more challenging than those used for direct discharges, as these can be handled in different ways by different laboratories. Most countries have good overviews of the regional laboratories and the detection limits achieved by them. For instance, the different detection limits for Spanish laboratories are reflected in table 8 of the national Spanish RID data report at Addendum 1 to this report. The national RID data report of the UK specifies that the detection limits are different in Scotland, England and Wales, and Northern Ireland, but that the limits achieved within each of the three regions are consistent. The situation is different in Belgium: there had been no change in laboratories since 1993, and the span in detection limits reported reflects the span within this same laboratory.

As Tables 3.5 and 3.6 show, some countries have rather high LODs/LOQs for some substances, and especially for substances that are found in small quantities, such as the metals cadmium and mercury. For instance, the recommended detection limit of cadmium is 0,01 µg/l, but there are examples of detection limits of 1, 4.9, 20 and even in one case 100 µg/l in the tables. This leads to striking differences in RID data results for some substances when either upper or lower estimates are used. This is exemplified on the data submitted by Contracting Parties for 2005 in Chapter 4.

According to the RID Principles, it is necessary to choose an analytical method which gives at least 70 % of positive findings (i.e. no more than 30% of the samples below the detection limit). It has not been possible to produce a table showing the results for all Contracting Parties, but Table 3.7 shows the results for Norway in 2005, where thirteen parameters analysed had more than 30% of the samples below the detection limit. Most of these parameters belong to the PCB compounds and Lindane. The rest of these parameters were three metals (Cd, Cr and Hg) and two nutrients (Orthophosphate and Ammonia). Since the detection limit of the analytical method used is within the acceptable limits of the RID Principles, this reflects that the concentrations of these parameters were relatively low in river waters. Table 3.7 also shows the analytical method applied for each parameter. Evidently, many of these methods have national standard references, and can therefore not be readily compared between the Contracting Parties.

Table 3.5 Limits of Detection or Quantification achieved by Contracting Parties, as far as reported, for river sample analysis

Parameter	Recommended		Belgium	Denmark*	France	Germany	Ireland**	Netherlands	Norway	Spain	Sweden	UK
Cd	**0.01**	**(µg/l)**	0.06 - 0.6	NI	0.1 - 4.9	0.02 - 0.05	0.1	0.01 - 0.2	0.005	0.2 - 20	0.003	0.008 - 0.11
Hg	**0.005**	**(µg/l)**	0.01 - 0.03	NI	0.02 - 0.5	0.001- 0.005	0.15	0.001- 0.02	0.001	0.005 - 6.8	0.0001	0.002 - 0.02
Cu	**0.1**	**(µg/l)**	0.6 - 5	NI	2.0 - 6.6	0.1 - 0.5	1	0.1 - 5.0	0.01	0.4 - 20	0.004	0.05 - 0.6
Pb	**0.01**	**(µg/l)**	0.35 - 11	NI	4.4 - 5.8	0.2 - 0.5	1	0.1 - 5.0	0.005	3.0 - 20	0.02	0.03 - 0.2
Zn	**0.1**	**(µg/l)**	2 - 13	NI	1.5 - 20	0.1 - 1.0	1	0.05 - 10	0.05	0.01 - 50	0.2	0.79 - 4.0
γ-HCH	**0.5**	**(ng/l)**	2 - 6	NI	1.0 - 2190	0.08 - 0.5	NI	1.0 - 50	0.2	0.7 - 10	--	0.1 - 1.0
PCB	**--**	**(ng/l)**	1 - 12	NI	5.0	1.8	NI	--	0.2	0.7 - 40	--	1.0
NH4-N	**0.01**	**(mg/l)**	0.06 - 0.5	>0.01	0.007 - 0.077	0.01 - 0.05	NI	0.01 - 0.2	0.005	0.004 - 0.06	0.001	0.003 - 0.03
NO3-N	**0.05**	**(mg/l)**	0.1 - 0.77	>0.02	0.14 - 0.68	0.05 - 0.5	0.01	0.01 - 0.05	0.001	0.023 - 0.11	0.001	0.0014 - 0.1
PO4-P	**0.005**	**(mg/l)**	0.1	>0.005	0.003 - 0.038	0.005 - 0.03	0.005	0.005 - 0.05	0.001	0.001 - 0.26	0.001	0.0012 - 0.008
Total N	**0.05**	**(mg/l)**	--	>0.06	1.4 - 8.6	0.05 - 1.0	0.01	0.1	0.01	0.02 - 1.46	0.05	0.021 - 0.1
Total P	**0.005**	**(mg/l)**	0.07 - 1	>0.01	0.02 - 0.07	0.01 - 0.1	NI	0.02 - 0.1	0.001	0.01 - 0.1	0.005	0.003 - 4.0
SPM	**2.0**	**(mg/l)**	2.4 - 4.7	>2.0	2.0	1.0 - 20	10	5.0 - 8.0	0.1	0.5 - 3.0	--	2.0

* Derived from the Danish RID Data Report
** Reported by Ireland in response to the questionnaire.
NI: no information

Table 3.6 Limits of Detection or Quantification achieved by Contracting Parties, as far as reported, for analysis of direct discharge samples

Para-meter	Recommended		Germany	Netherlands	Spain	UK
Cd	**0.5**	**(µg/l)**	0.1 - 0.5	1.0	1.0 - 100	0.02 - 0.11
Hg	**0.5**	**(µg/l)**	0.1 - 0.5	0.1	0.1 - 5.0	0.005 - 0.02
Cu	**10.0**	**(µg/l)**	1.0 - 30	1.0	1.0 - 100	0.05 - 20
Pb	**1.0**	**(µg/l)**	1.0	30	1.0 - 200	0.03 - 10
Zn	**5.0**	**(µg/l)**	10	1.0	1.0 - 100	0.31 - 40
γ-HCH	**--**	**(ng/l)**	--	50	50	0.1 - 10
PCB	**--**	**(ng/l)**	1.0	--	50	1.0
NH4-N	**0.05**	**(mg/l)**	0.05	0.1	0.02 - 1.0	0.003 - 0.04
NO3-N	**0.1**	**(mg/l)**	0.1	0.01	0.1 - 6.0	0.0014 - 0.15
PO4-P	**0.1**	**(mg/l)**	0.01	0.01	0.02 - 0.20	0.0012 - 0.08
Total N	**1.0**	**(mg/l)**	1.0	0.1	0.5 - 10	0.021 - 0.1
Total P	**0.05**	**(mg/l)**	0.02 - 0.05	0.2	0.05 - 0.5	0.003 - 4.0
SPM	**--**	**(mg/l)**	--	10	1.0 - 2.5	2.0

Table 3.7 A Norwegian Example of Analytical Methods Applied and Proportion of analyses below detection limits. Norwegian RID Report 2005, all parameters included in the sampling programme

Parameter	Analytical Method Applied	% samples below detection limit	Total no. of samples	No. of samples below detection limit
pH	NS[5] 4720	0	272	0
Conductivity (mS/m)	NS-ISO 7888	0	271	0
Suspended particulate matter (S.P.M.) (mg/L)	NS 4733 modified	0,4	272	1
Total Organic Carbon (TOC) (mg C/L)	EPA number 415.1 and 9060A STD.	0	272	0
Total phosphorus (µg P/L)	NS 4725 – Peroxidisulphate oxidation method	1,8	272	5
Orthophosphate (PO4-P) (µg P/L)	NS 4724 – Automated molybdate method	51,1	272	139
Total nitrogen (µg N/L)	NS 4743 – Peroxidisulphate oxidation method	0	272	0
Nitrate (µg N/L)	NS-EN ISO 10304-1	0,7	272	2
Ammonia (NH_4) (µg N/L)	NS-EN ISO 14911	33,1	272	90
Silicate (SiO_2) (Si/ICD; mg/L)	ICP-AES and ISO 11885 + NIVA's accredited method E9-5	0	272	0
Lead (Pb) (µg Pb/L)	ICP-MS; NIVA's accredited method E8-3	2,6	272	7
Cadmium (Cd) (µg Cd/L)	ICP-MS; NIVA's accredited method E8-3	30,5	272	83
Copper (Cu) (µg Cu/L)	ICP-MS; NIVA's accredited method E8-3	0	272	0
Zinc (Zn) (µg Zn/L)	ICP-MS; NIVA's accredited method E8-3	0	272	0
Arsenic (As) (µg As/L)	ICP-MS; NIVA's accredited method E8-3	15,1	272	41
Mercury (Hg) (ng Hg/L)	ICP-MS; NIVA's accredited method E8-3	71	272	193
Chromium (Cr) (µg Cr/L)	ICP-MS; NIVA's accredited method E8-3	52,2	272	142
Nickel (Ni) (µg Ni/L)	NS-EN 1483 and NIVA's accredited method E4-3	1,5	272	4
Lindane (ng/L)	NIVA's accredited method H3-2 (PCB)	72,5	40	29
PCB (CB28) (ng/L)	NIVA's accredited method H3-2 (PCB)	100	40	40
PCB (CB52) (ng/L)	NIVA's accredited method H3-2 (PCB)	100	30	30
PCB (CB101) (ng/L)	NIVA's accredited method H3-2 (PCB)	100	40	40
PCB (CB118) (ng/L)	NIVA's accredited method H3-2 (PCB)	100	39	39
PCB (CB138) (ng/L)	NIVA's accredited method H3-2 (PCB)	100	40	40
PCB (CB153) (ng/L)	NIVA's accredited method H3-2 (PCB)	100	40	40
PCB (CB180) (ng/L)	NIVA's accredited method H3-2 (PCB)	100	40	40

3.4 Number of samples per year

The frequency of river sampling required by the RID Principles differs for main and tributary rivers. The RID Principles define "main river" as a river to be monitored at least once a month (12 datasets) every year in accordance with the objectives of the RID Study as set out in its paragraph 1.4. Main rivers should be major load bearing rivers. "Tributary river" is defined as a river with separate catchment from a main river and with an outlet directly to the maritime area or to a main river downstream of a river monitoring point. A tributary river should be a minor load bearing river and can be sampled at a frequency determined by each Contracting Party.

The data and supplementary information reported by Contracting Parties for 2005 suggest that different approaches are used by Contracting Parties in classifying rivers as main or tributary rivers and in reporting related inputs.

3.4.1 Main rivers

Contracting Parties have very different river patterns. Whereas some countries report on a few, large rivers (such as Germany), others have a large set of smaller rivers draining into the coastal areas (e.g. UK, Ireland, Norway, Denmark and Sweden). This necessarily also reflects the number of samples annually collected from each river. However, most countries sample a minimum of 12 samples a year from the main rivers, but

[5] NS: Norwegian Standard

there are exceptions (e.g. Ireland and Iceland). Whereas most Contracting Parties report that these samples are distributed as once per month (e.g. Norway, UK) or more often (e.g. Belgium, the Netherlands), Germany reported that the sampling is based on “representative random sampling”. It is not clear what this ‘representativeness’ is based on. No country seems to report that event-based sampling is carried out (e.g. sampling during flood events).

3.4.2 Tributary rivers

It follows from the information submitted by Contracting Parties that their interpretation of what is meant by ‘tributary rivers’ varies widely. Some countries (e.g. Germany, the Netherlands) seem to define “tributaries” true to the word – i.e. rivers which are tributaries to the main rivers entering the sea. In countries such as Norway, where altogether 247 rivers are entering the sea, rivers directly discharging into the OSPAR maritime area are treated as “tributary rivers” either because they are smaller rivers or because these rivers carry less pollutant loads to the sea. Thus, in order to monitor this large number of rivers within reasonable costs, Norway had identified under the RID Principles 10 rivers as “main rivers” and 36 rivers as ”tributaries”. In Iceland, where population is scarce, only two rivers are monitored and none is a tributary. Some countries do not report on tributary rivers at all (e.g. Iceland, the Netherlands), and others, like the UK and Ireland, report all rivers without any distinction of type.

For those countries reporting ‘tributaries’, the sampling frequency varies. Germany samples their tributaries up to 26 times a year (e.g. Elbe tributaries), whereas in France the frequency for sampling tributaries varies between 4 and 12 times a year. In Spain and Belgium the tributaries are mainly sampled 12 times a year. In Norway, “tributary rivers” entering the sea are sampled 4 times a year, but an effort is made to sample during different climatic conditions (such as snow melt season, summer low flow, autumn rains).

INPUT 2007 considered a proposal for arriving at a more common understanding of tributary rivers by using the sampling frequency rather than riverine channel patterns as determining feature. A possible definition could be that main rivers are those monitored frequently (at least monthly) and tributaries are rivers monitored less frequently than monthly. The proposed definition is attached to this report (Annex 2). It should be noted that a change of definition of main and tributary rivers as suggested in Annex 2 would have implications for the current classification of national rivers under the RID Principles and that some Contracting Parties would have to change the status of some rivers from tributaries to main rivers, and *vice versa*.

3.5 Sources included downstream sampling points

Monitoring downstream of river sampling points is covered by the RID Principles relating to:

a. “direct discharges” defined by the RID Principles as the mass of a determinand discharged to the maritime area from point sources (sewage effluents, industrial effluents or other) per unit of time at a point on a coast or to an estuary downstream of the point at which the riverine estimate of input is made, and;

b. “unmonitored area” defined by the RID Principles as any sub-catchment(s) located downstream of the riverine monitoring points within catchments and any areas between catchments. The unmonitored areas may contribute to the losses/discharges of substances downstream of the monitoring point or directly to the sea (OSPAR Maritime Area).

The data and supplementary information reported by Contracting Parties for 2005 suggest that the concept of “unmonitored areas” is treated differently by Contracting Parties and that different approaches are taken to report direct discharges.

3.5.1 Unmonitored areas

Practice of Contracting Parties seems to vary considerably concerning the calculation or measurement, downstream of the river sampling point, of inputs from unmonitored areas, and their reporting to OSPAR.

In France, the area downstream of the river sampling points is regarded as “OSPAR Coast” for main rivers only. All other areas downstream of the sampling points are included as tributaries or unmonitored areas. Only direct discharges along the OSPAR coast are not monitored under RID. In Iceland, pollution sources downstream of the two monitored rivers are not included in the reporting. The same is true for the Netherlands, where, with one exception, losses from unmonitored areas are generally not reported as most sampling points are at sluices and river mouths. The exception is Maassluis, where some direct discharges downstream of the sampling points are reported. In Germany calculations are done for the Eider catchment; here, the loads of the unmonitored parts are determined by extrapolating the loads of the monitored parts of the catchment area. Similar extrapolation exercises are done in Sweden and Ireland for the unmonitored areas. In Norway, modelling is used to determine the inputs from the unmonitored areas; the model is based on estimated inputs from diffuse sources (natural background values; agricultural land; sewage from scattered dwellings) and point sources (industry; water treatment plants; fish farming).

INPUT 2007 considered the proposal, included and illustrated at Annex 2, for a definition to promote a common understanding of “unmonitored area”. It is suggested that the concept of unmonitored areas should include all areas that are not upstream a RID sampling point, i.e. including:

- areas downstream the sampling point in monitored rivers;
- coastal unmonitored areas;
- catchment area of all unmonitored rivers (rivers without a RID sampling station).

3.5.2 Direct discharges

A number of Contracting Parties has reported data from such point sources as industries, sewage treatment plants and fish farming. Some countries, however, do not seem to include such data at all in their reporting. This includes e.g. France and Iceland. In Sweden, annual reporting of direct discharges is restricted to municipal treatment plants designed for more than 2000 “population equivalents” and the most important industrial point sources. In Spain, the industrial effluents reported are based on industries’ discharge declarations, regional discharge registries, direct control measurements, discharge permits, concentration values from previous years when effluents were similar and data were not available, and fixed values when measurements were below detection limits. Belgium reported that no point sources exist outside the monitored rivers. This area is estimated to be around 30 km^2 and mainly discharges inputs through seepage.

53. For all point sources it is believed that the number of samples varies among the different discharge sites, but no specific information has been made available.

3.6 Calculation practices

The RID Principles require that the load of a specific determinand transported by a river should be estimated by taking the product of the mean flow-weighted concentration and the total flow, expressed by the following formula:

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

where
Ci = measured concentration in sample i
Qi = corresponding flow for sample i
Qr = mean flow rate for each sampling period (i.e., annual flow)
N = number of samples taken in the sampling period

It seems that most countries use this formula. There are, however, variations for some rivers and countries, due to e.g. lack of flow data for the sampling date. Thus, for some rivers, annual average concentration calculated with annual average flow is used. Other Contracting Parties reported that they used linear interpolation. An overview and details of different formula used by Contracting Parties are given in Annex 2. The use of different calculation practices may give significant differences in the resulting calculated loads.

3.7 Quality Assurance

Most Contracting Parties reported that the quality assurance procedures were available only in national languages and not in English, making their assessment more difficult. To support a review of the QA arrangements under the RID Principles in the light of national practice, Norway prepared proposals for possible QA steps based on their QA procedures for the Norwegian RID Report. This covers some main aspects of QA relating to sampling strategies, analytical methods, detection limits, technical and historical quality assessment, load calculation and some general considerations. INPUT 2007 agreed that the proposal at Annex 4 should be used as a starting point for the review of section 10 of the RID Principles by INPUT 2008.

3.8 Conclusions from the RID 2005 data

It follows from the foregoing analysis that there is a whole host of possible sources of errors that are attached to RID data and might influence their accuracy, reliability and comparability. This includes for example different practices in:

- sampling methodology (frequency, distance from river mouth, site in river);
- pollutant losses covered by direct monitoring, by estimation and/or modelling, as well as land areas/sources not covered at all;
- direct discharges and how they are accounted for;
- the parameters which are analysed;
- calculation practices;
- quality assurance procedures; and
- the number of institutions involved per country in the various parts of the programme.

Therefore, RID data reported by Contracting Parties must be seen and assessed against this background.

4. Total inputs to OSPAR maritime area in 2005

This chapter summarises and visualises national RID data reported for 2005. Ideally, charts like those shown in this chapter should reflect actual differences in inputs between Contracting Parties, both in terms of the compounds measured and in terms of the two different sources (riverine inputs and direct discharges). The inputs should, furthermore, properly reflect the anthropogenic and natural sources in each country, and thereby give indications and guidance as to how to reduce the inputs in the future. For the reasons set out in Chapter 3, this is, however, not always the case.

4.1 Difficulties in comparing the inputs reported by Contracting Parties

In the following, the national RID data are presented to illustrate the findings of Chapter 3 relating to uncertainties attached to RID data. This chapter intends to specially exemplify how differences in achieved limits of detection and the reporting of upper and lower estimates can influence the results of the RID Study and data comparability.

The reader of this report should be aware that a direct comparison of the inputs of one Contracting Party with another is difficult due to the differences in national reporting practices. The main reason for presenting the charts and tables in the following sections on the individual determinands is to demonstrate the factors interfering with comparability. The purpose is to highlight the importance of the way in which national data are reported and are supplemented by information which allows their interpretation. The charts shown in this chapter are intended to raise awareness for the kind of information that is needed to accompany RID data with a view to improving their utility in assessments.

A key issue arises from the fact that in many cases, the concentration values of the various samples taken over the year by Contracting Parties are below the detection limit. To account for this, an upper and a lower value are reported for the annual input value. The RID Principles state that in those cases where the results recorded are less than the limits of detection, two load estimates should be supplied, one assuming that the true concentration is zero and the other assuming that the true concentration is the limit of detection. This will provide minimum and maximum concentrations within which the true estimate will fall. However, it is not clear from the national RID reports that this is followed by all Contracting Parties.

This chapter is intended to help identifying issues that need to be given attention in future RID data reporting. For example, when considering the data for direct discharges there are significant differences in national RID data which indicate different reporting practices of Contracting Parties:

a. Why, for example, are the direct inputs reported by Spain so much higher than those reported by other Contracting Parties?

b. Are there Contracting Parties other than Norway with extensive discharges from fish farming industry that might have high direct discharges of copper and include these in their RID data?

c. Are urban discharges from large cities located close to the coast included in data reported for direct discharges?

d. If direct discharges are covered differently by Contracting Parties' RID data, may the data still be compared?

4.2 Overview of RID 2005 data

The national RID data reported by Contracting Parties are presented in Addendum 1 to this report. They are aggregated in the overview tables at Annex 1. This does not include the data reported by Iceland for riverine inputs of nutrient species for two main rivers (see Addendum 2). Based on the overview tables at Annex 1, Tables 4.1 and 4.2 have been compiled to give the total inputs to the OSPAR maritime area of five metals, lindane, PCBs, five nutrient species and suspended particulate matter. The total inputs reported by Contracting Parties are presented as upper estimates in Table 4.1 and lower estimates in Table 4.2. The reason for this differentiation is discrepancies in the way Contracting Parties report upper and lower values. The concept of upper and lower values derives from the detection limits of each parameter and the reported data should be read in the light of the LODs/LOQs reported in section 3.3. The general idea is that for the *lower* estimates, the analytical results below the detection limit will be reported as *zero*; whereas for the *upper* estimates, the analytical results below the detection limit may either be reported as *equal to* the detection limit, or *as half the value of* the detection limit.

It should also be noted that whereas most Contracting Parties report their values in upper and lower estimates, some countries do not. To make the charts on total loads presented here more readable, they have been organised so that *all* countries are listed both for upper and lower values. This means that the same values are reported for upper and lower values for Denmark and Sweden in the diagrams.

In the following, charts have been prepared to visualise the RID data reported on cadmium, lead, mercury, copper, zinc, total nitrogen, total phosphorus and suspended particulate matter. The charts are based on Tables 4.1 and 4.2. When considering those data and related charts, it should be noted that data reported by Contracting Parties were not always complete and the totals reported may not reflect the true totals (see Tables 2.1 and 2.2). The following information on national RID data needs to be noted:

- Denmark has only reported their data as lower values. The reported nutrient data seem to be very low as compared to the amount of agriculture in the country. There is, therefore a risk that the reported numbers are of an order of magnitude too low. Since this report was finalised before Denmark had verified their data, no comments are given below on the Danish datasets.
- Sweden's data are only shown as upper estimates, since they only reported the upper limit of LOQ for metals. For nutrients, Sweden reported the result of the laboratory analyses, regardless of whether or not this result is above or below the detection limit. For this reason, Sweden is only listed with its upper values, although the definition of upper values (=the detection limit) is not quite true.
- France has reported upper and lower values. The values are often identical for macropollutants but not for micropollutants. The data reported by France for 2005 were provisional at the time when this analysis was finalised, because not all data were available in time. No total inputs have been reported where data was incomplete. Sums may be underestimated. The nutrient input to Region IV (the Atlantic part of France) is reported to be zero. For these reasons no comments are given below on the French datasets.
- Spain reported upper and lower estimates. Some regions (Galicia, Costa, Norte and Guadiana) work with LOQs. The limits reported for those regions assume LOQ values and so do the upper estimates. The LOQs are higher (approximately x3) than LODs. This explains that upper estimates reported by Spain for heavy metals are so high compared to estimates from other Contracting Parties.

Table 4.1 Upper estimates of the sum of Direct and Riverine Inputs to the OSPAR Maritime Area reported by Contracting Parties in 2005.

Country	Cd tons	Hg tons	Cu tons	Pb tons	Zn tons	g-HCH kg	PCBs kg	NH4-N kt	NO3-N kt	PO4-P kt	Total N kt	Total P kt	SPM kt
Belgium	3	0.3	46	42	249	32	77	3.9	30	1.4	42	3.1	323
France	-	-	-	-	-	-	-	15.5	63	2.2	0	2.5	217
Germany	5.4	2.7	227	137	1061	23	32	8.9	146	2.4	189	9	1701
Ireland	4.88	7.03	94	65	372	-	-	1.76	83	2.14	124	5.8	746
Netherlands	5.4	1.4	205	109	825	82	-	7	176	5.1	240	10	1192
Norway	2.74	0.48	461	37.5	629	0	-	33	37	5.4	100	8.7	1291
Spain	82	5	162	187	521	76	238	18	32	4.1	66	5.1	789
Sweden	0.62	0.07	44.9	12.6	161.5	-	-	2.49	14.4	0.31	29.1	0.87	*
UK	8	1.4	397	304	1639	162	157	48	211	20	290	24	2249

* not determined

Table 4.2. Lower estimates of the sum of Direct and Riverine Inputs to the OSPAR Maritime Area reported by Contracting Parties in 2005.

Country	Cd tons	Hg tons	Cu tons	Pb tons	Zn tons	g-HCH kg	PCBs kg	NH4-N kt	NO3-N kt	PO4-P kt	Total N kt	Total P kt	SPM kt
Belgium	0.8	0.3	31	21	193	4.5	0.32	3.2	25	1.2	31	1.3	250
Denmark	-	-	-	-	-	-	-	0.08	0.19	0.37	0.39	0.43	0
France	-	-	-	-	-	-	-	15.5	63	2.2	0.0	2.50	217
Germany	5.1	2.6	226	136	1056	23	4.3	8.8	146	2.3	189	9	1655
Ireland	0.26	0.06	67	23	368	-	-	1.68	83	2.09	124	5.8	745
Netherlands	3.8	1.3	204	105	815	14	-	6	176	5.1	231	10	1190
Norway	2.44	0.38	461	37.50	629	0.00	-	32.93	36.83	5.31	99.9	8.68	1291
Spain	1.6	0.2	15	7	280	2.6	0.0	15	18	2.7	60	4.2	701
UK	4.9	0.60	388	272	1611	19.6	0.7	47	210	20.0	281	24	2212

4.3 *Cadmium Inputs*

Total cadmium inputs to the OSPAR maritime area reported by Contracting Parties for 2005 ranged from 0 to 8 tons, except for Spain.

Spain reported 82 tons using the upper (LOQ based) estimates (c.f. Figure 4.1). A check on former years confirms that the Spanish loads were of similar magnitude in 2003 and 2004. Figure 4.1 is a very explicit example how the use of upper and lower estimates and related national reporting practices can distort RID results and make comparison between Contracting Parties impossible. Inputs reported as lower estimates would suggest that inputs are highest from Germany, the UK and the Netherlands with a contribution of 27%, 25% and 19 % to total inputs, respectively. In this scenario, the contribution of Spain to total inputs would be 8% whilst it would be 73% if the upper estimates were used.

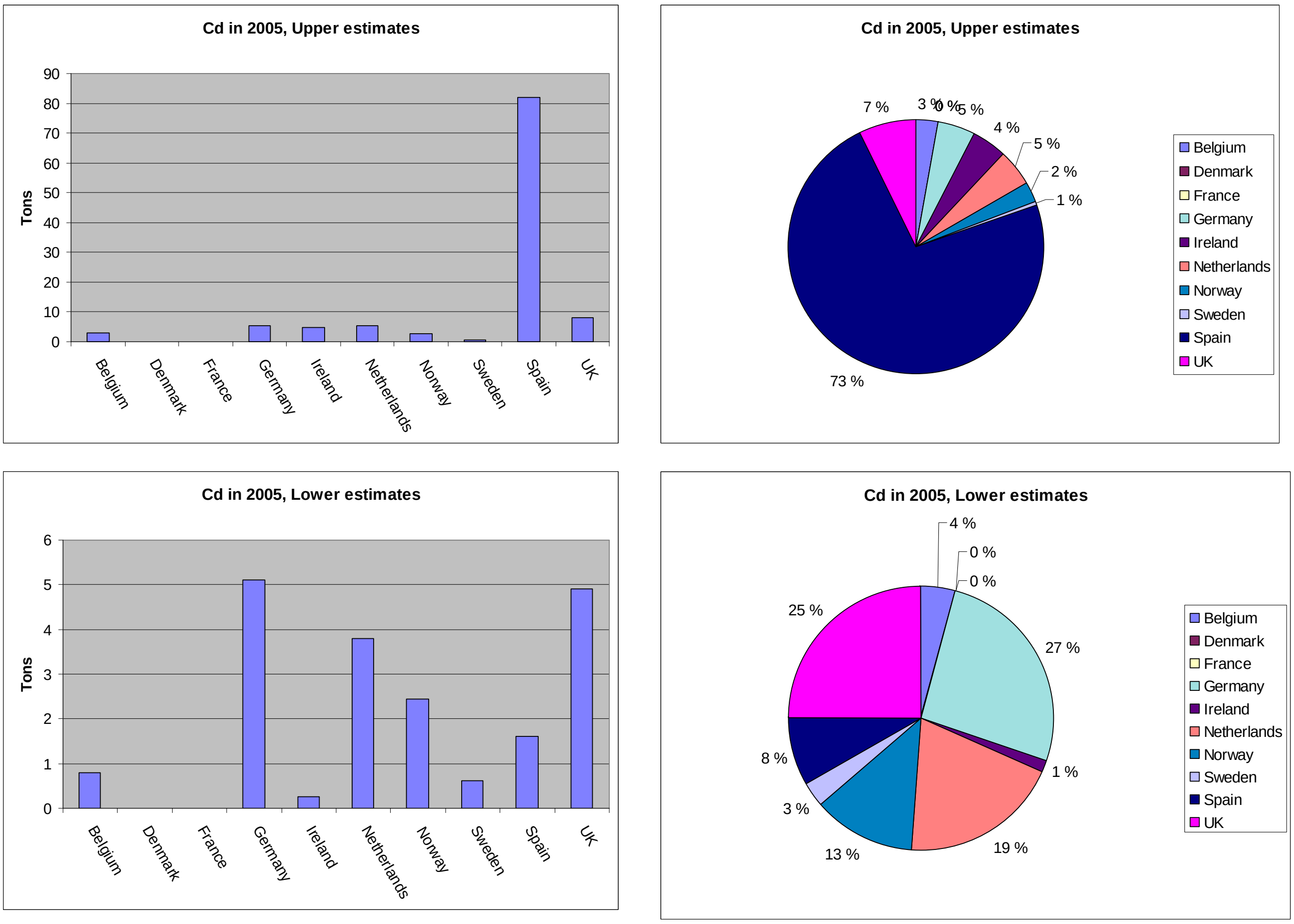

Figure 4.1: Illustration of cadmium inputs (in tons) reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability and relative contributions (%). No data reported by Denmark, France and Portugal.

When segregating the data by input sources (Figure 4.2), riverine inputs are significantly larger than the direct discharges when using upper estimates. The difference between the two sources is less explicit when using lower estimates.

The inputs reported by Spain are highest for both riverine and direct discharges when using the upper estimates. This is not the case for riverine inputs when using lower estimates.

The inputs reported by Germany and the UK are highest for riverine inputs when measured with the method of lower estimates.

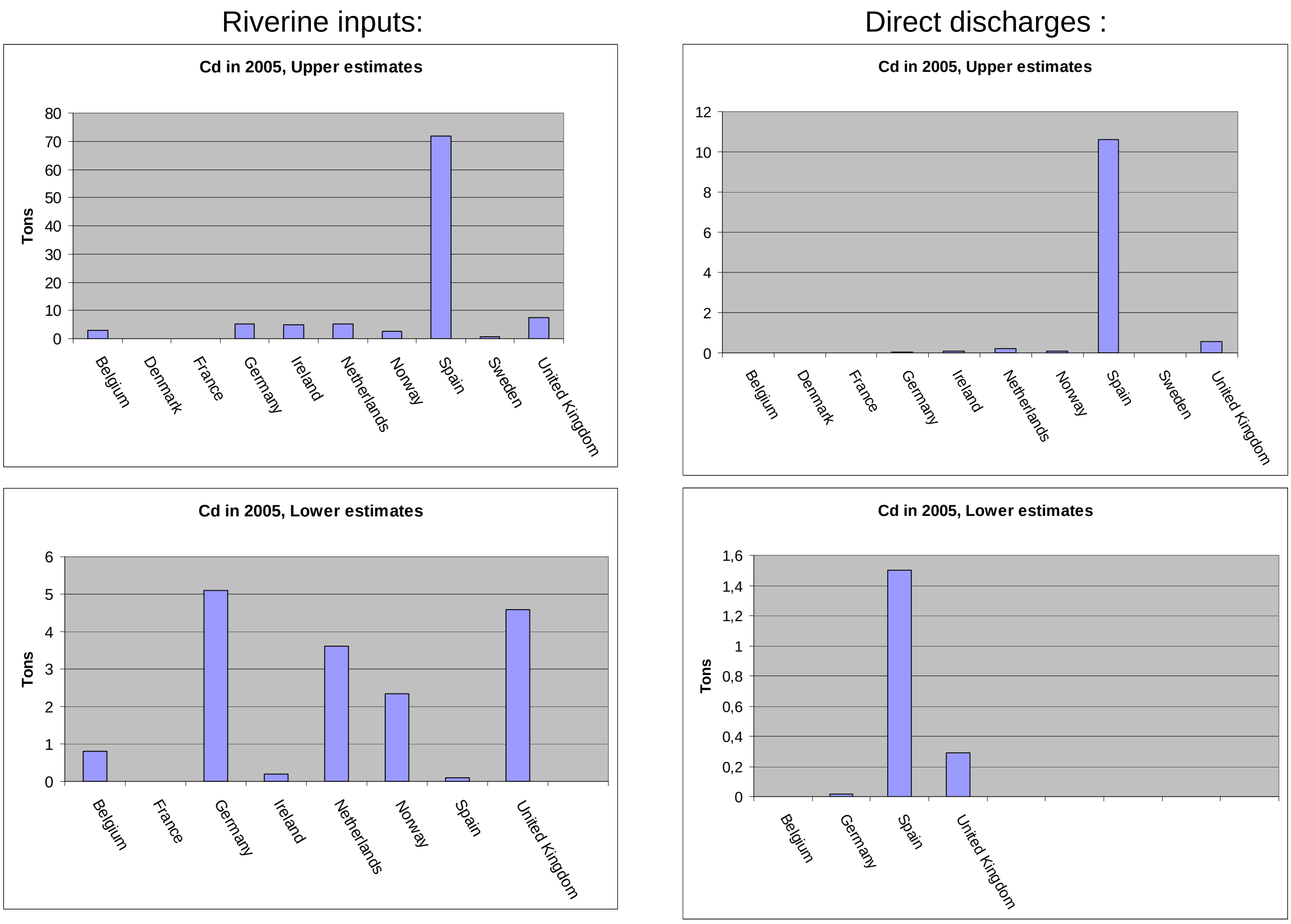

Figure 4.2: Illustration of riverine inputs (in tons) and direct discharges (in tons) reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability. No data reported by Denmark, France and Portugal. Direct discharges are not applicable for Belgium. Swedish data are too small to show in chart.

4.4 Mercury Inputs

Total mercury inputs reported by Contracting Parties range in general from 0.07 to 2.5 tons (c.f. Figure 4.3).

The input data for mercury reported by Contracting Parties provide another striking example of different RID results depending on the use of lower or upper estimate. If lower estimates are used, Germany and the Netherlands would have reported the highest inputs of mercury to the OSPAR maritime area in 2005, representing 47% and 24% of the total, respectively. When the upper estimates are used, Ireland and Spain would be the Contracting Party with the highest proportion of reported inputs (37% and 27%, respectively) referring German and Netherlands' contributions to 15% and 8%, respectively. Ireland reported a detection limit for mercury at 0.15 µg/l, which is rather high and may explain the difference in Irish data.

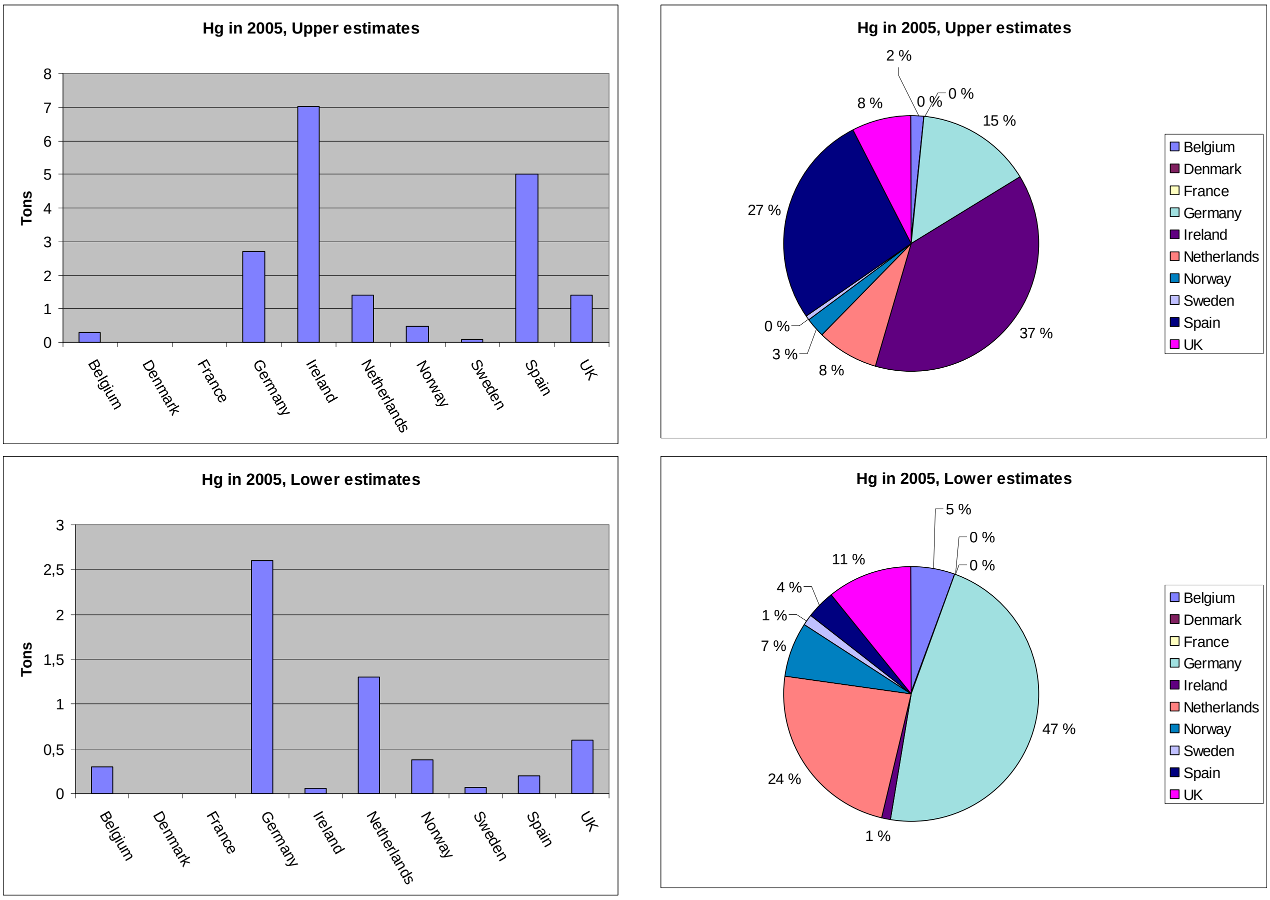

Figure 4.3: Illustration of mercury inputs (in tons) reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability and relative contributions (%). No data reported by Denmark, France and Portugal.

When comparing the data reported by Contracting Parties for riverine inputs and direct discharges, loads carried by rivers are significantly larger than those from direct discharges (Figure 4.4).

Figures reported for Ireland (upper estimates) and Germany (lower estimates) are highest for riverine inputs. The detection limit of less than 0.15 µg/l for mercury reported by Ireland may explain their high riverine inputs in the upper estimates.

Direct discharges reported by Spain are highest irrespective of the estimate used. This could be explained by the high detection limit for mercury for these analyses, ranging from 0.1-5 µg/l.

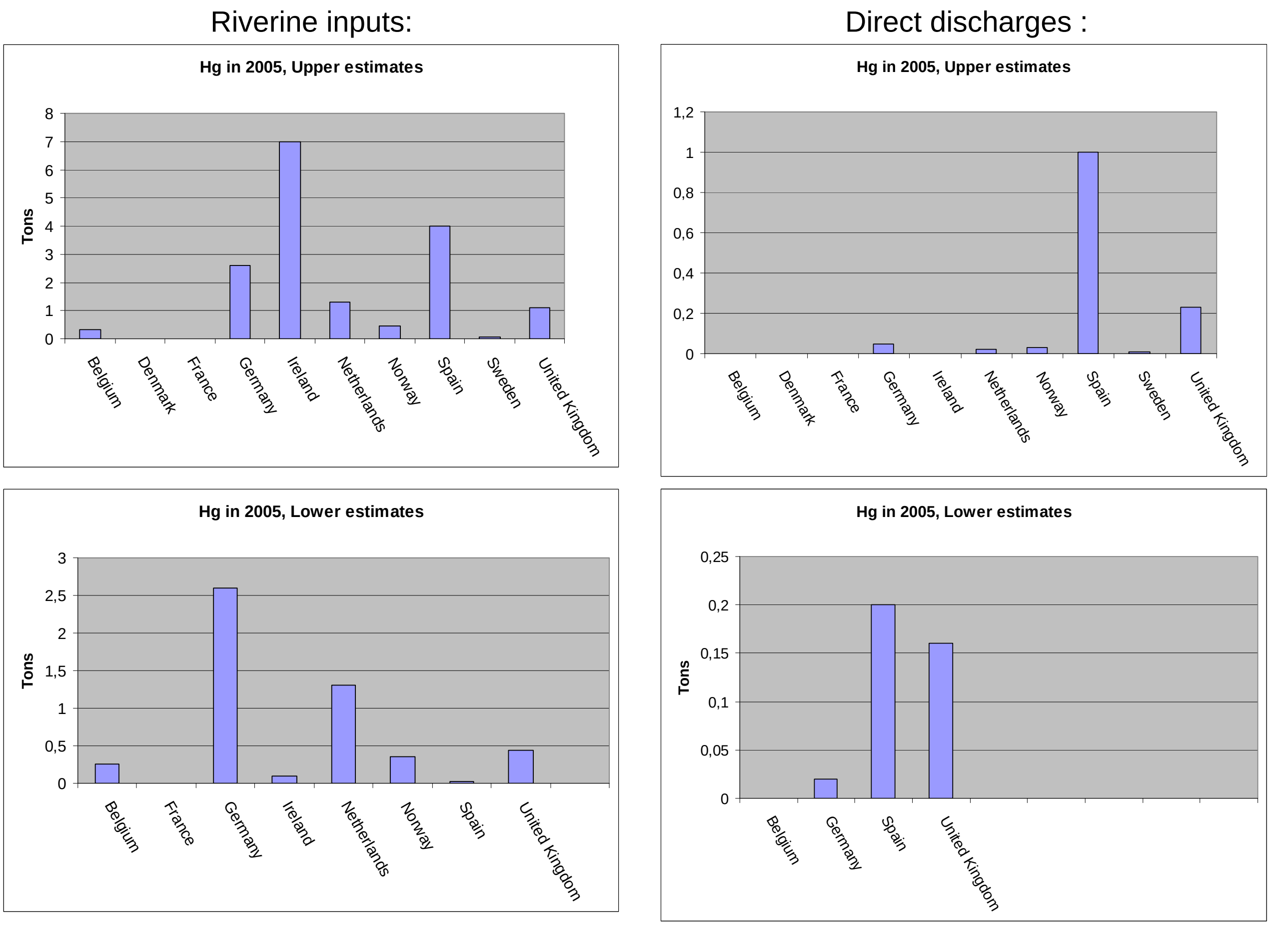

Figure 4.4: Illustration of riverine inputs (in tons) and direct discharges (in tons) of mercury reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability. No data reported by Denmark, France and Portugal. No direct discharges reported by Ireland. Direct discharges are not applicable for Belgium.

4.5 Lead Inputs

The total inputs of lead to Convention Waters in 2005 reported by Contracting Parties vary from 7 tons to around 300 tons (c.f. Figure 4.5).

Also here the picture depends on whether the lower or upper estimates are used. The differences in results are however less explicit than for cadmium and mercury. The reason for the comparably more “stable” situation is probably that the concentrations of lead, compared to cadmium and mercury, are found in much higher concentrations. This reduces the uncertainty linked to detection limits.

The inputs reported by the United Kingdom seem to represent the largest contribution to total inputs of lead to Convention Waters at a magnitude ranging between 35% (upper estimate) and 45% (lower estimates). For contributions of other Contracting Parties, the picture differs when using lower estimates (Germany and the Netherlands would follow the UK with 22% and 17% respectively) and upper estimates (Spain and Germany would follow the UK with 21 % and 15%, respectively). Again, these differences in scenarios are probably due to differences in detection limits.

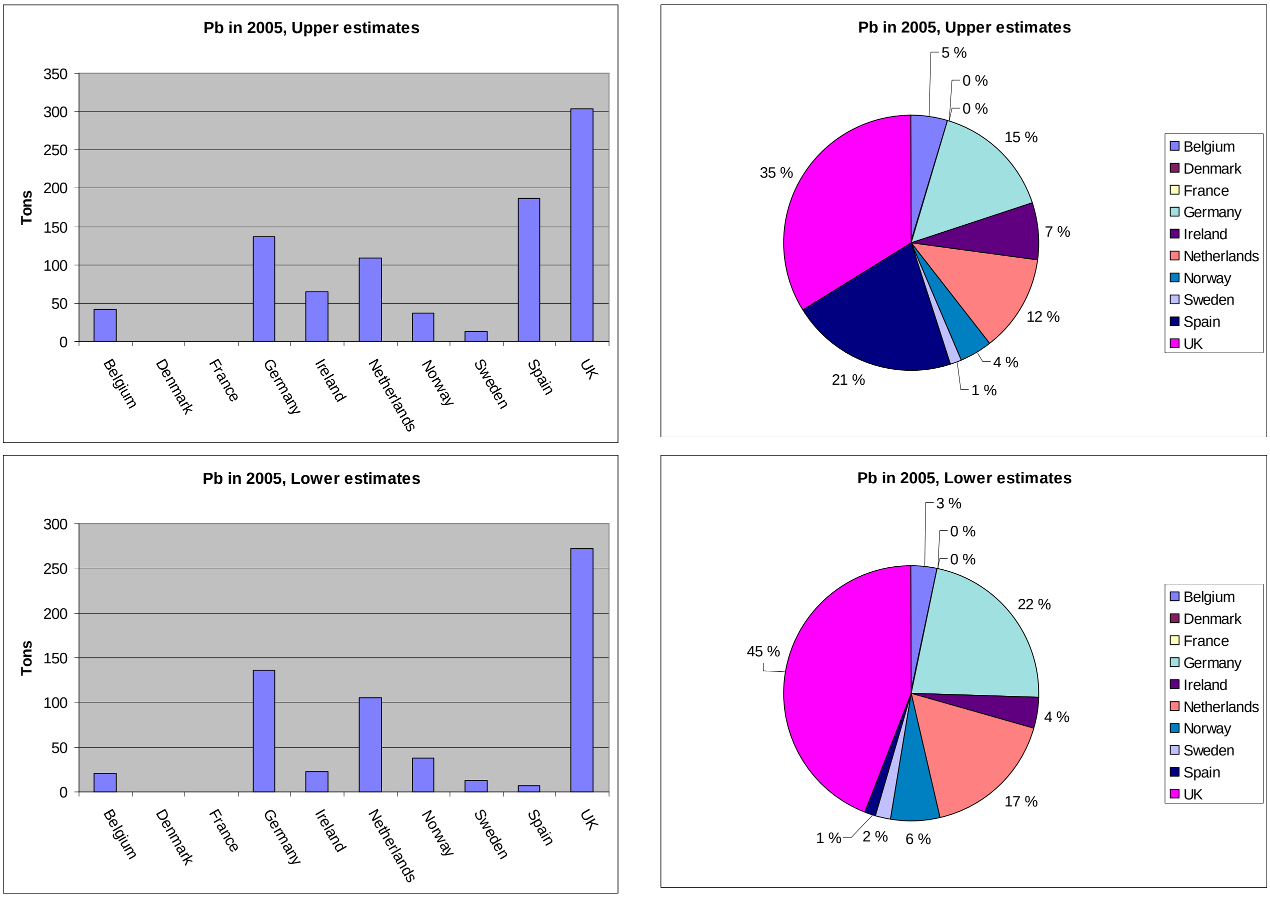

Figure 4.5: Illustration of lead inputs (in tons) reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability and relative contributions (%). No data reported by Denmark, France and Portugal.

The highest inputs derive from the rivers, with direct discharges being significantly lower (Figure 4.6).

Regardless of the estimate method used, the riverine inputs reported by the United Kingdom were highest. For direct discharges, the UK reported fairly consistent upper and lower estimates. The differences in upper and lower estimates reported by Spain for direct discharges are considerable, suggesting that Spain would be the biggest contributor to direct discharges if upper (LOQ based) estimates were used. Under lower estimates, the direct discharges reported by the UK would be the highest to the OSPAR maritime area.

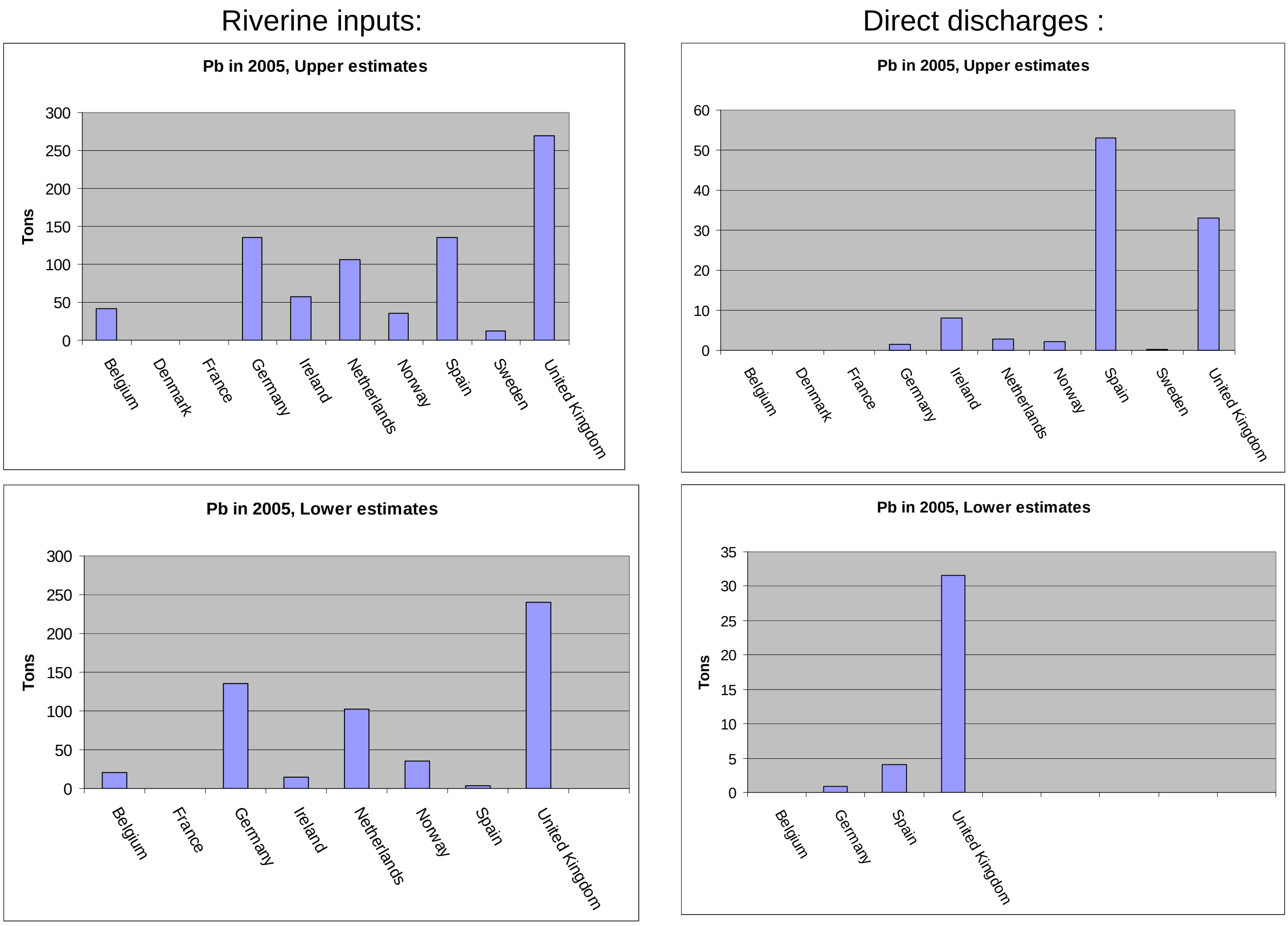

Figure 4.6: Illustration of riverine inputs (in tons) and direct discharges (in tons) of lead reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability. No data reported by Denmark, France and Portugal. Direct discharges are not applicable for Belgium. Direct discharges reported by Sweden are too small to show in the chart.

4.6 Copper Inputs

The total inputs of copper into the OSPAR maritime area in 2005 reported by Contracting Parties range from 15 tons to more than 450 tons in Norway (Figure 4.7).

The difference between upper and lower estimates is less explicit that for other metals. Regardless of the estimation method used, Norway reported the largest inputs of copper. The relative contribution of inputs from Contracting Parties is lower when upper estimates are used because the LOQ-based estimates reported by Spain are higher, representing 10% of total inputs, than the lower estimate (1%).

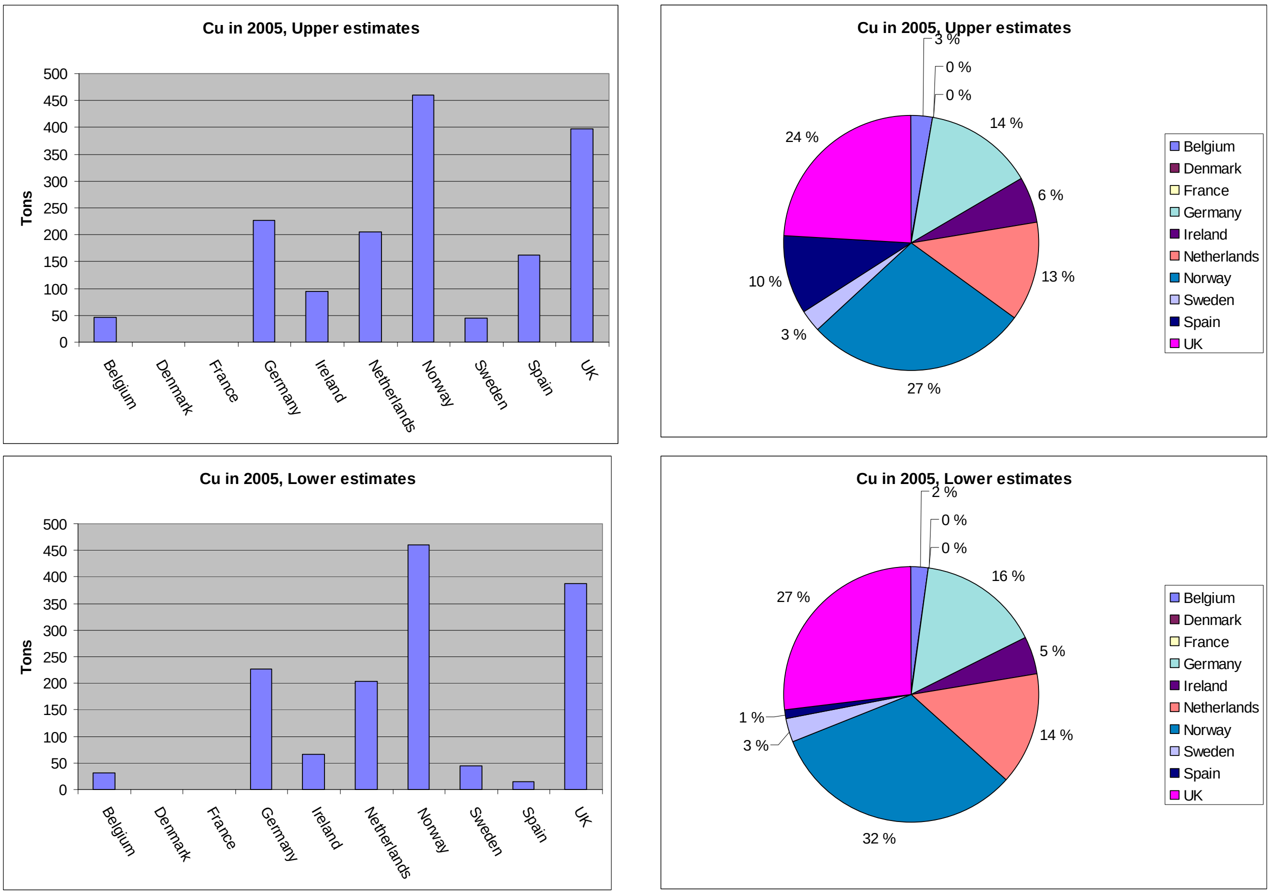

Figure 4.7: Illustration of copper inputs (in tons) reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability and relative contributions (%). No data reported by Denmark, France and Portugal.

Direct discharges form the smaller part of the total inputs (Figure 4.8).

Under both estimates used, the riverine inputs reported by the UK are highest, followed by Germany, Norway and the Netherlands.

For direct discharges, Norway reported highest inputs which are also higher than riverine inputs reported by Norway. This is due to the fact that Norway is reporting discharges of copper from the cleaning of fish cages in the fish farming industry. These cages are impregnated with a substance containing copper in order to prevent algae growth. The discharges reported by Norway are uncertain: they are only estimates and not monitored data and therefore only upper estimates for direct discharges are given.

Riverine inputs: Direct discharges :

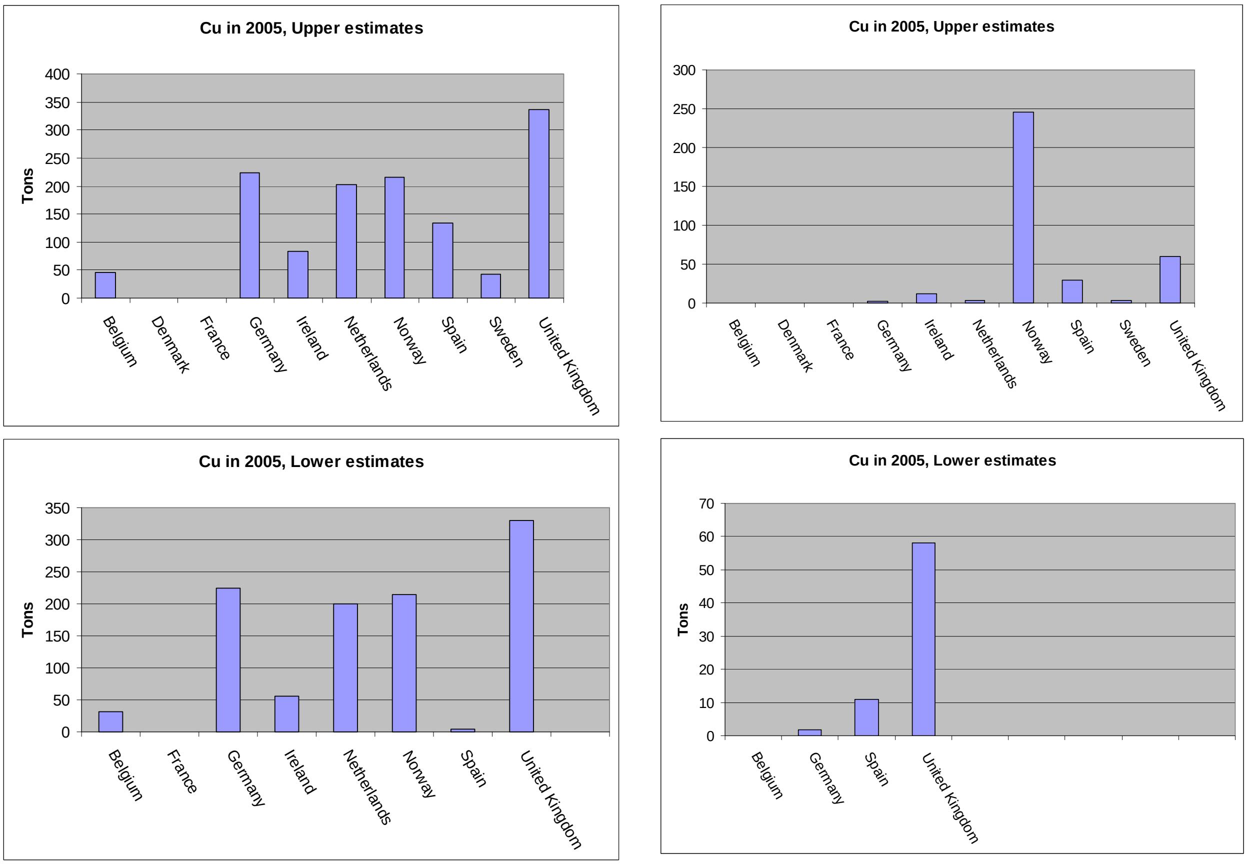

Figure 4.8: Illustration of riverine inputs (in tons) and direct discharges (in tons) of copper reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability. No data reported by Denmark, France and Portugal. Direct discharges are not applicable for Belgium.

4.7 *Zinc Inputs*

The total inputs of zinc into Convention Waters in 2005 by Contracting Parties range from 160 in Sweden to 1639 tons in UK (Figure 4.9).

The upper and lower estimates reported by Contracting Parties are more consistent than for other metals. This may reflect the relative high concentrations of zinc. In this case, detection limits are a less distorting factor. Only the figures reported by Spain show an almost 50% discrepancy between the LOQ based upper estimate and the lower estimate.

Regardless of estimation method, the UK reported the highest inputs of zinc, followed by Germany the Netherlands and Norway with relative contributions to inputs at a magnitude of 29-32% (UK), 19-21% (Germany), 15-16% (Netherlands) and 12% (Norway).

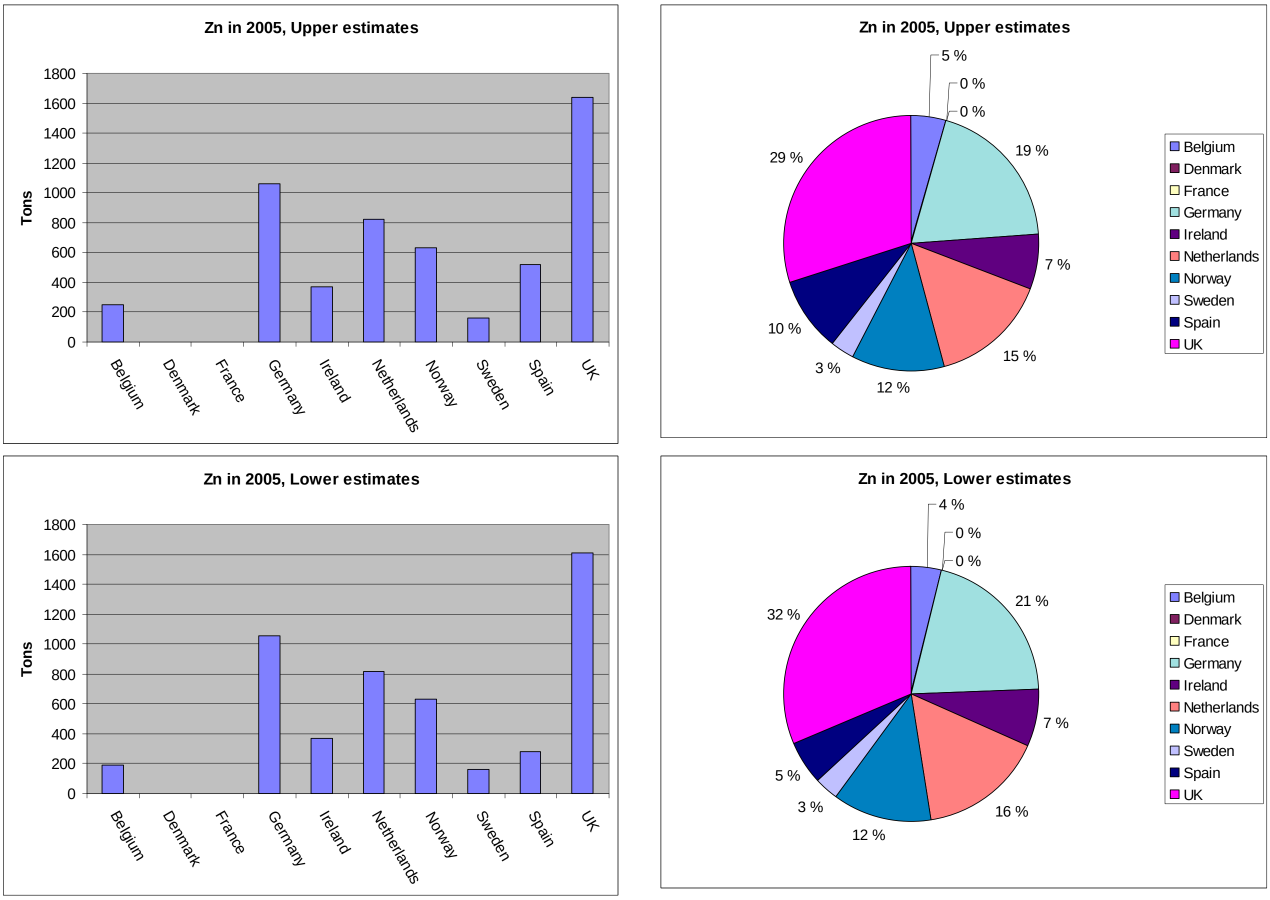

Figure 4.9: Illustration of zinc inputs (in tons) reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability and relative contributions (%). No data reported by Denmark, France and Portugal.

The riverine inputs are an order of magnitude higher than direct discharges (Figure 4.10).

Highest inputs were reported for both riverine and direct discharges by the UK. Germany and the Netherlands reported important contributions to riverine inputs. Spain and partly Ireland reported high contributions to direct discharges.

The discrepancy between upper and lower estimates in Spanish data is mainly reflected in riverine inputs.

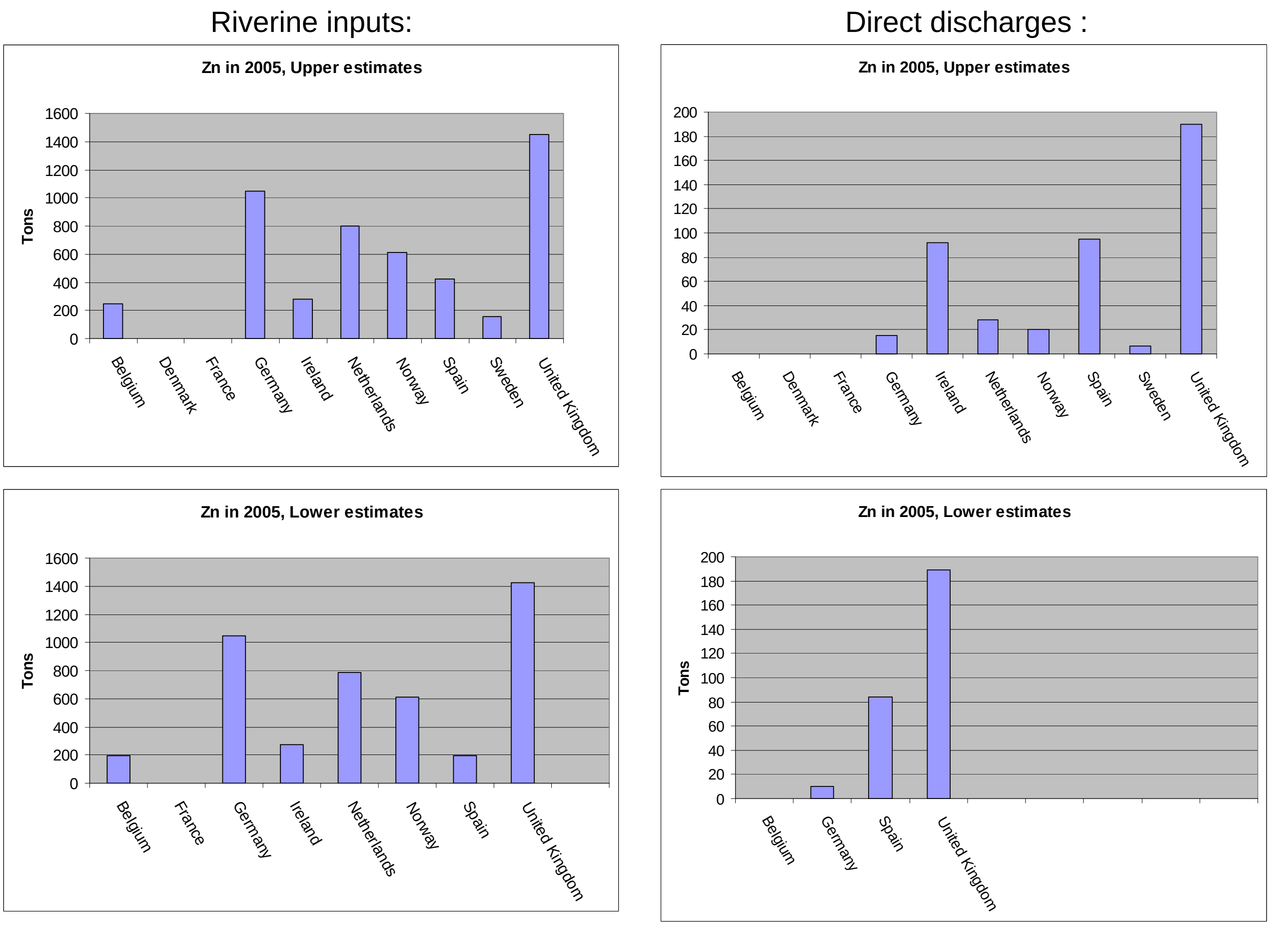

Figure 4.10: Illustration of riverine inputs (in tons) and direct discharges (in tons) of zinc reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability. No data reported by Denmark, France and Portugal. Direct discharges are not applicable for Belgium.

4.8 Inputs of Total Nitrogen

The total inputs of nitrogen to the OSPAR maritime area in 2005 reported by Contracting Parties range from 29 tons (Sweden) to almost 300 tons (UK) (cf. Figure 4.11).

In general, the reported total nitrogen inputs show less differences between the upper and lower estimates than the inputs reported for metals. For both estimate methods, the inputs reported by the UK, the Netherlands and Germany were highest representing a relative contribution at a magnitude of 26-28%, 22% and 17-18% respectively.

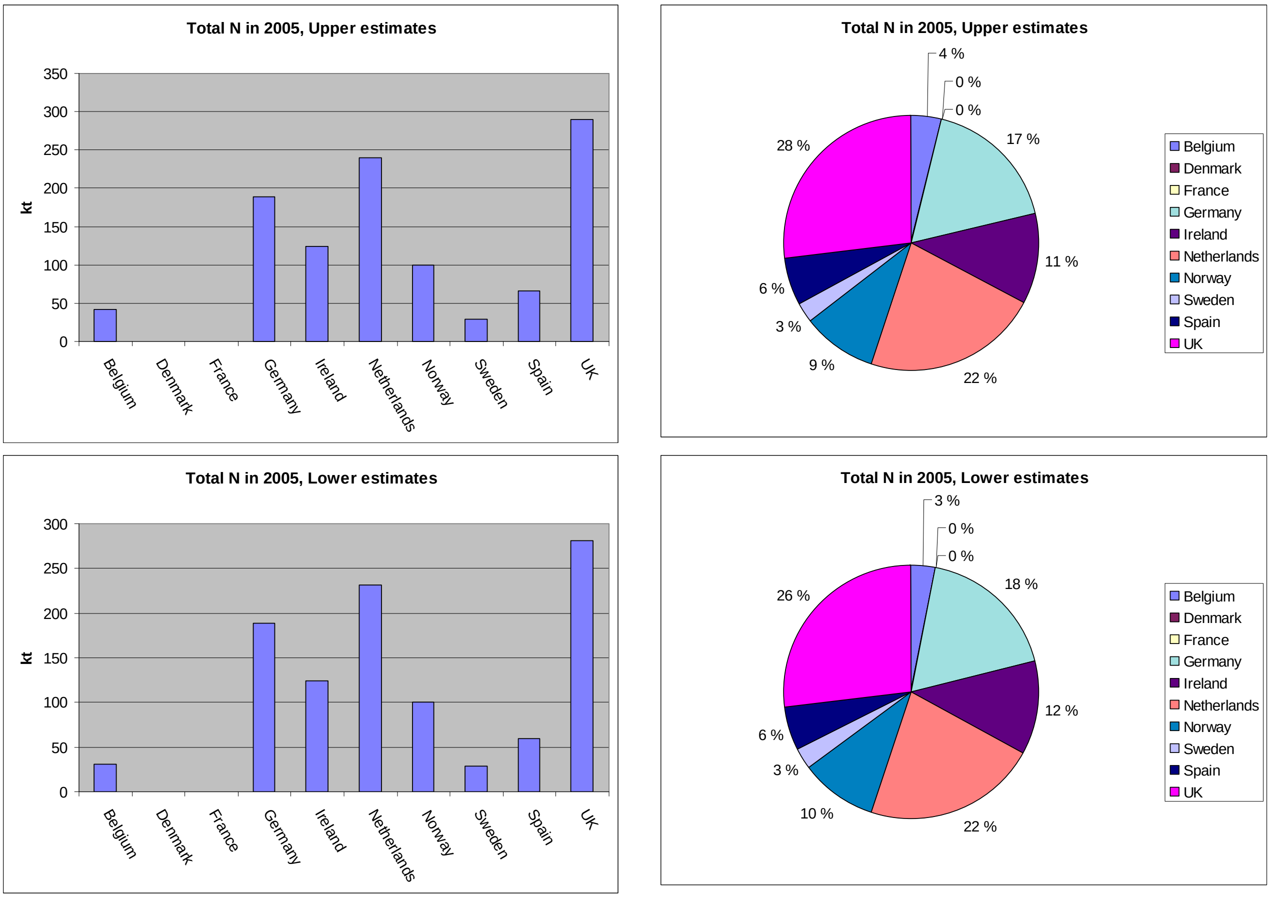

Figure 4.11: Illustration of total nitrogen inputs (in tons) reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability and relative contributions (%). No data reported by France and Portugal.

Riverine inputs form the larger part of inputs of total nitrogen (Figure 4.12).

The highest contributions to riverine inputs of total nitrogen were reported by the Netherlands, with the UK and Germany at close range.

For direct discharges, the UK and Norway reported the highest inputs. Norwegian direct discharges are strongly connected to fish farming.

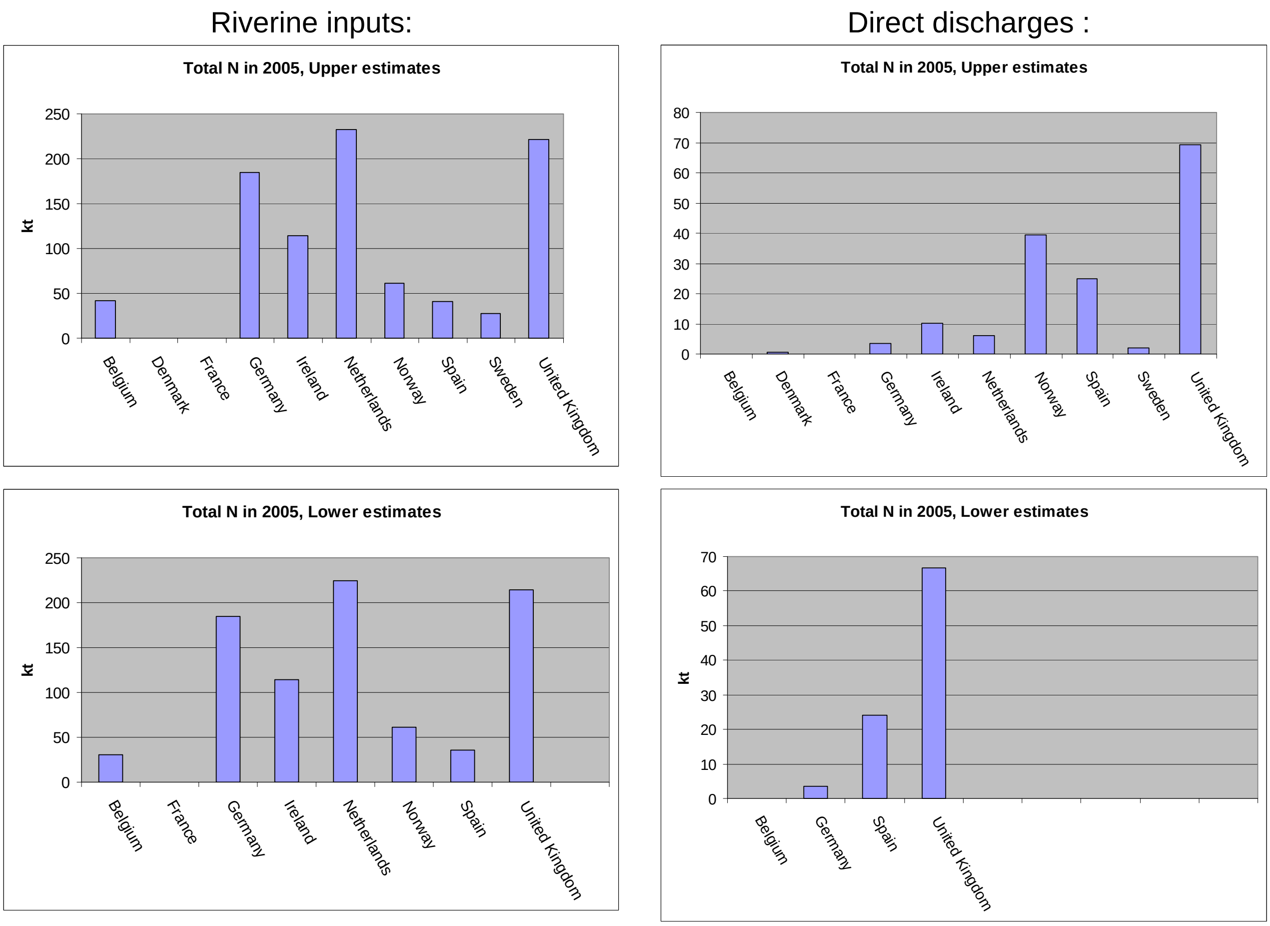

Figure 4.12: Illustration of riverine inputs (in tons) and direct discharges (in tons) of total nitrogen reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability. No data reported by France and Portugal. Direct discharges are not applicable for Belgium. Riverine inputs reported by Denmark are too small to show in the chart.

4.9 Inputs of Total Phosphorus

The total inputs of phosphorus to the OSPAR maritime area in 2005 reported by Contracting Parties range from less than 1 to 24 tons (Figure 4.13).

As for total nitrogen, the differences between the upper and lower estimates are less explicit than for metals, possibly because of lower detection limits and higher concentrations.

The United Kingdom reported the highest inputs (36%) of phosphorus followed by the Netherlands (14-15%) and Germany (13%).

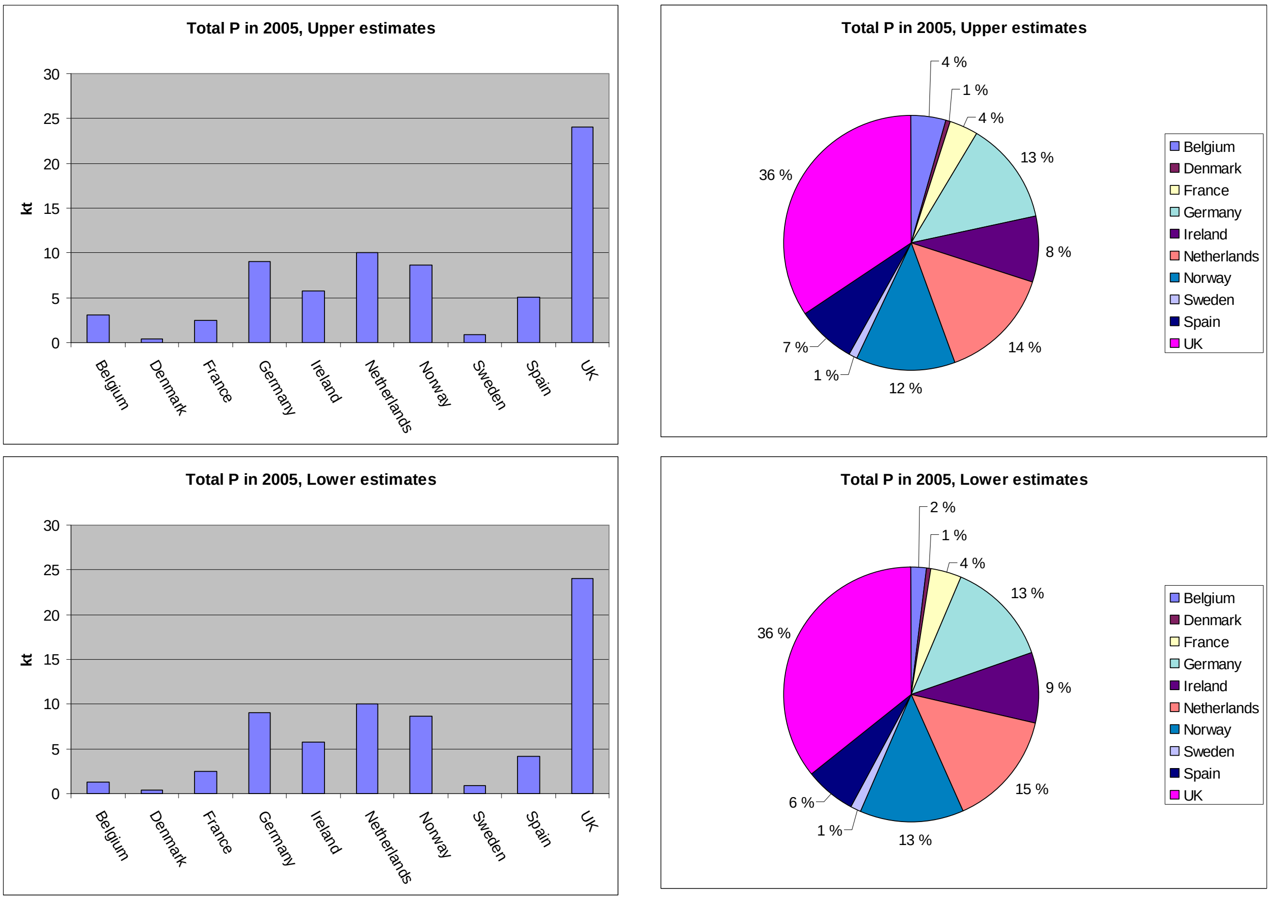

Figure 4.13: Illustration of total phosphorus inputs (in tons) reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability and relative contributions (%). No data reported by Portugal.

The total riverine inputs are higher than direct discharges. Single discharges reported are of the same magnitude as single riverine contributions (Figure 4.14).

The United Kingdom reported the highest inputs of phosphorus for both riverine inputs and direct discharges.

Like for nitrogen, the Netherlands and Germany also reported high riverine loads of total phosphorus. Norway reported high direct discharges due to fish farming.

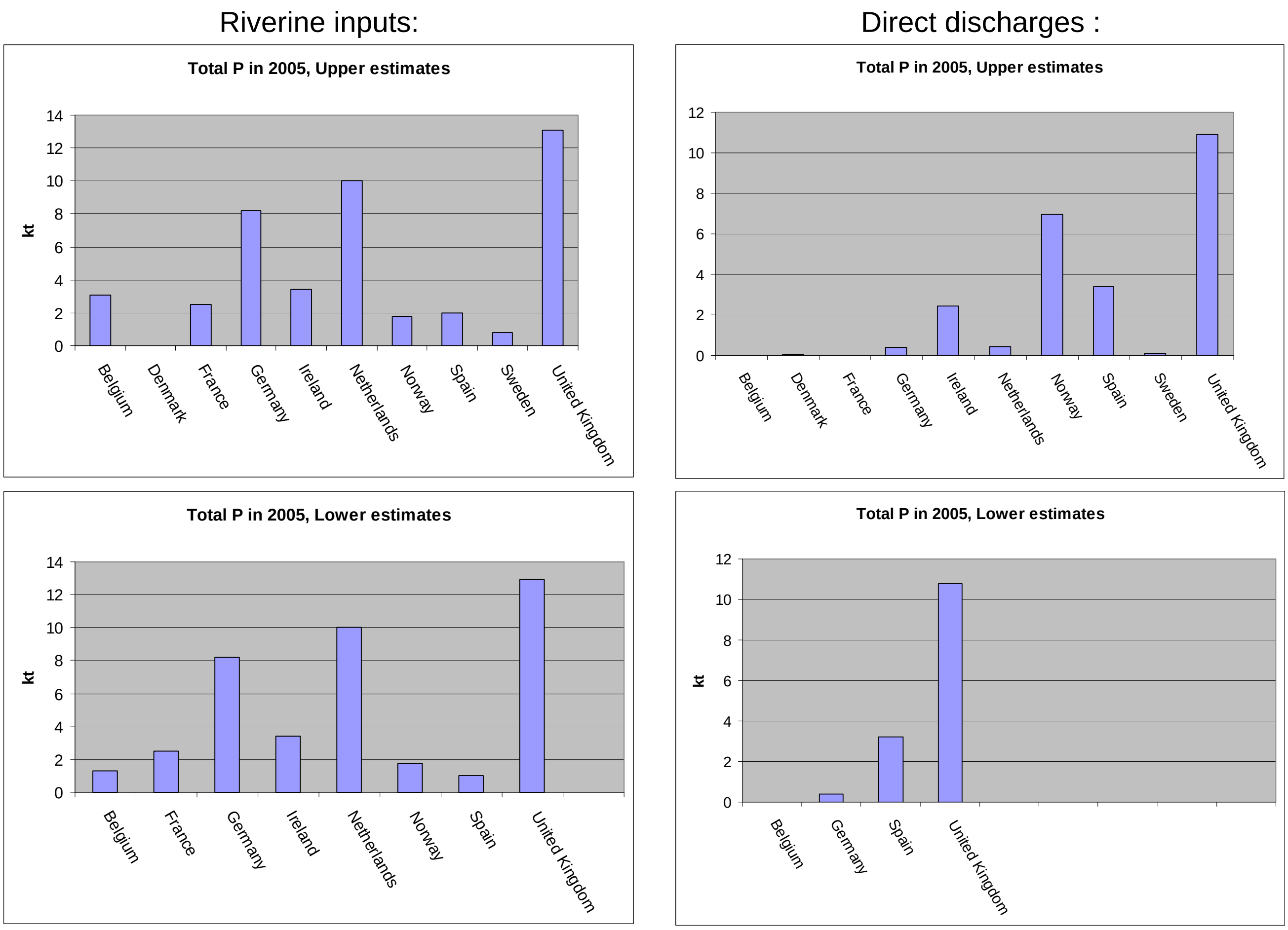

Figure 4.14: Illustration of riverine inputs (in tons) and direct discharges (in tons) of total phosphorus reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability. No data reported by Portugal. No direct discharges reported by France. Direct discharges are not applicable for Belgium. Data reported by Denmark are too small to show in the chart.

4.10 Inputs of Suspended Particulate Matter (SPM)

Suspended particulate matter (SPM) is the determinand for which most Contracting Parties reported similar values for the upper and lower estimates (c.f. Figure 4.15). The consistency between upper and lower limits for this determinand does not necessarily reflect that the estimates are correct. It only reflects the results of the laboratory analyses but not the reliability of the monitoring methodology.

Highest inputs were reported from the UK (26-27%), Germany (20%), Norway (15-16%) and the Netherlands (14%).

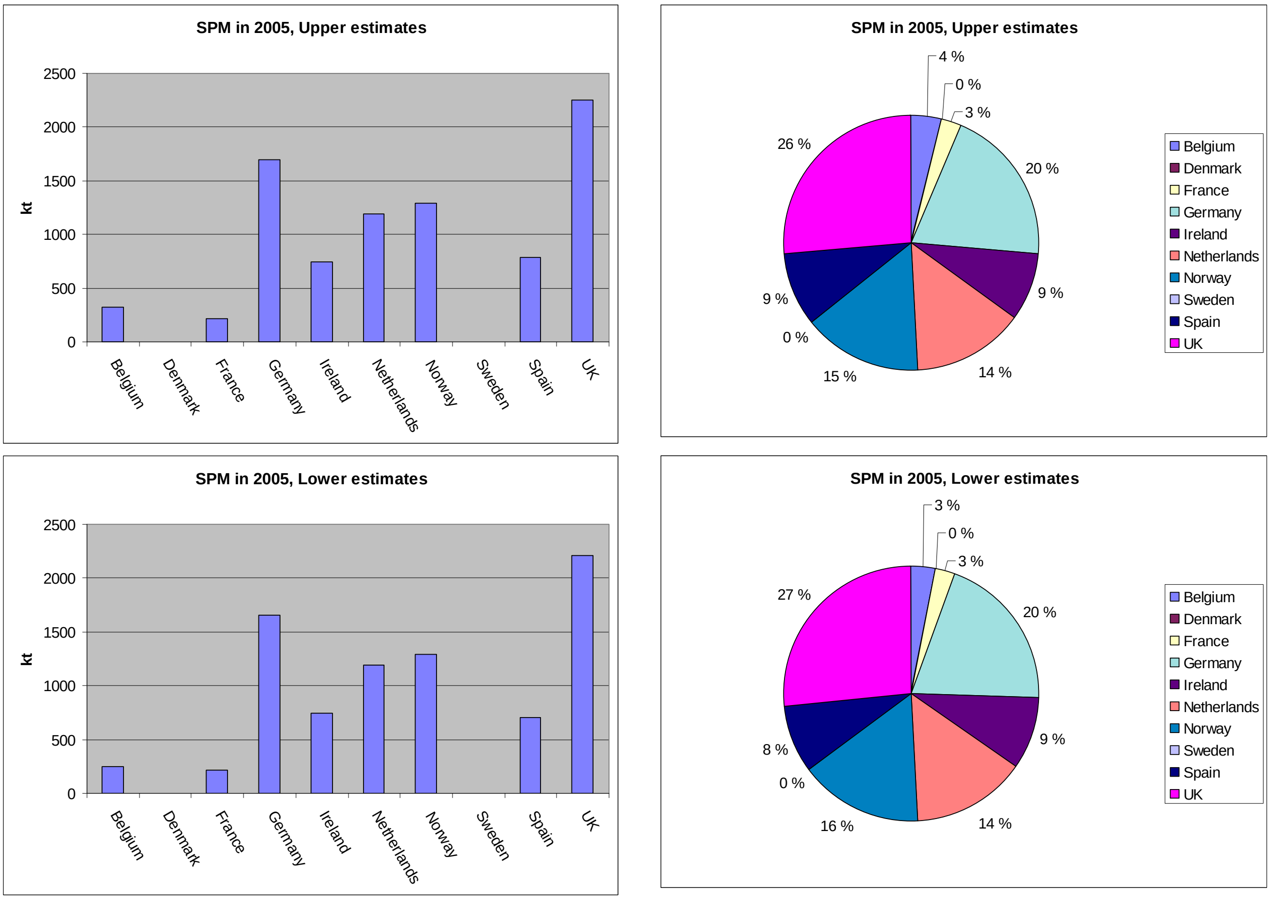

Figure 4.15: Illustration of total inputs of suspended particulate matter (in tons) reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability and relative contributions (%). No data reported by Denmark, Portugal and Sweden.

Riverine inputs of SPM are significantly higher than direct discharges (Figure 4.16).

Germany, United Kingdom, the Netherlands, Norway and Ireland reported relatively high loads of suspended particulate matter in rivers. For direct discharges, the main contributions were reported by the UK, Norway and Spain.

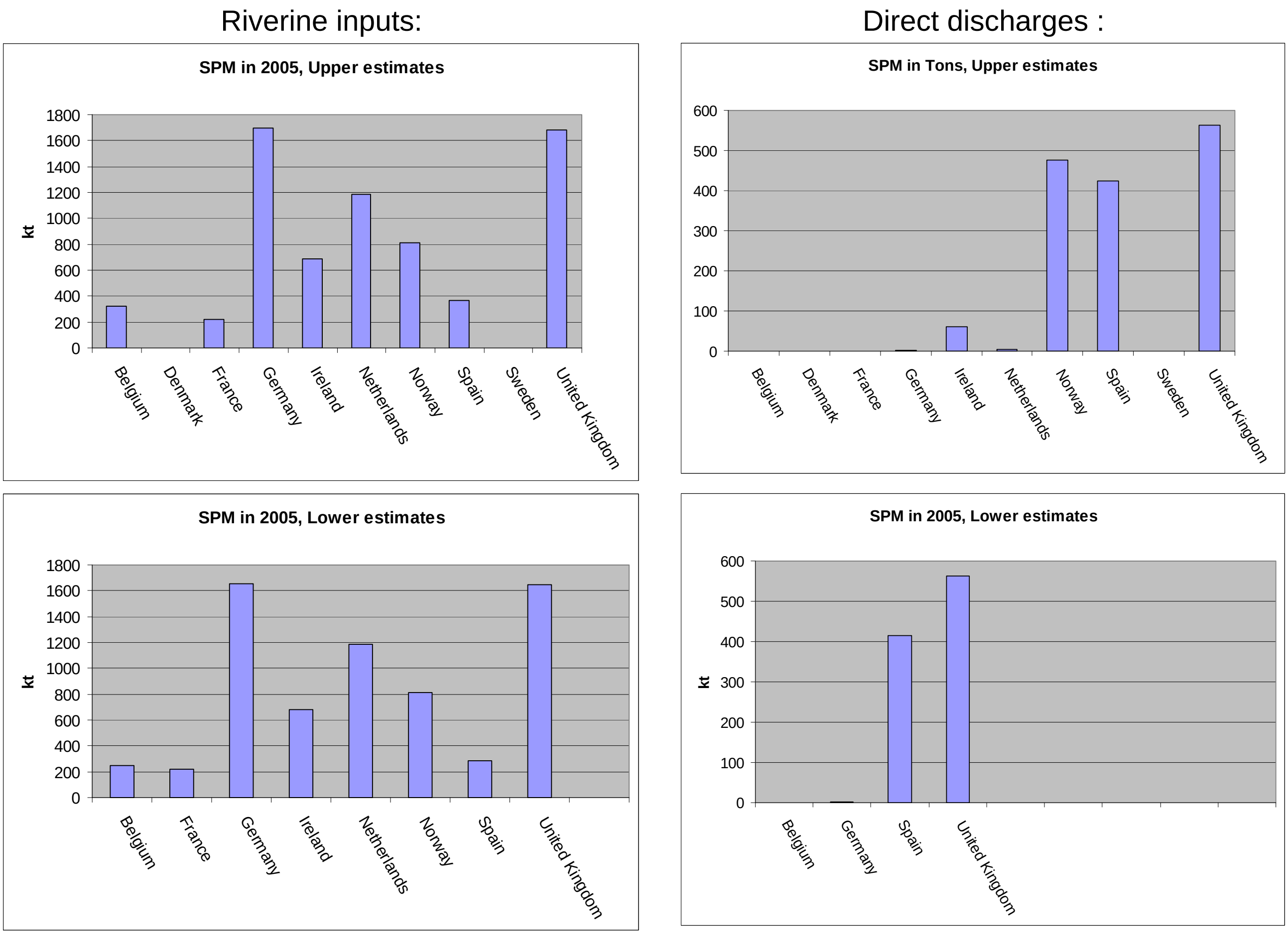

Figure 4.16: Illustration of riverine inputs (in tons) and direct discharges (in tons) of total suspended particulate matter reported by Contracting Parties in 2005 as upper and lower estimates and their implications on data comparability. No data reported by Denmark, Portugal and Sweden. No direct discharges reported by France. Direct discharges are not applicable for Belgium.

5. General conclusions and recommendations

The ”visualising” of the reported RID 2005 data in figures and charts presented in Chapter 4 revealed important features of the 2005 data and their reliability. In particular, the differences between upper and lower estimates reported for some substances were rather striking, as were some of the differences between riverine and direct discharges both for different countries and substances. A closer look at the detection limits (section 3.3), showed that these vary significantly, not just between the countries but also within the same country, depending on the laboratory used. It may therefore be concluded that:

- the higher estimates may give too high input values when the detection limits are high; and
- with similarly high detection limits, the lower estimates may give too low input values, and often equal zero if all samples analysed are below the detection limit.

In short, neither the higher nor the lower estimates can be trusted when the detection limits are too high.

The question on whether to use LOD (limit of detection) or LOQ (limit of quantification) is therefore a valid one. Since the different Contracting Parties have such differences in detection limits, and since different laboratories use different practices relating to LODs and LOQs, it is difficult to give advice on the correct choice. It can only be concluded that it is of vital importance that Contracting Parties report which detection method is used in which laboratory.

The fact that many Contracting Parties use different laboratories, or that laboratories change over time, is a challenge. It means that the detection limits (and analytical methods) also change. It is therefore important that Contracting Parties have a good overview of which samples are analysed in which laboratory, and with which detection limits. Changes in laboratories and detection limits over time should be duly registered – preferably in a common database, since this will influence the trends significantly; perhaps more than factual variations. This is also very important for the forthcoming 2009 RID Assessment.

This report also revealed that several concepts within the RID programme are differently understood by Contracting Parties. It is recommended that the proposed definitions in Annex 2 on concepts such as “tributary rivers” and “unmonitored areas” are further developed and agreed upon by Contracting Parties. Such definitions could become part of a RID quality assessment document. A first rough outline of quality assurance aspects is given in Annex 4. It is suggested that Contracting Parties could further develop this into a common RID QA Document. One of the factors that may need clarification in such a quality assessment document is the sampling procedures, as many countries use different institutions for the sampling. Another such factor is the load calculation practices, which seem to vary between Contracting Parties, partly according to available hydrological data.

One factor that was only lightly treated in this report is that Contracting Parties report very different sampling frequencies, although monthly sampling seems to be the most usual. There is a risk of underestimating particulate and particle associated loads with regular monthly sampling, especially if event sampling is not carried out. It should be of concern that few of the Contracting Parties reported that they did extra sampling during floods. For this reason it is not improbable that the annual inputs reported by Contracting Parties are underestimated for SPM and substances that are mainly transported in the sediment phase.

It should also be noted that there are large variations in the way that direct discharges are included in the Contracting Parties’ annual RID data reports. Some Contracting Parties report on sewage treatment plants, industries and fish farming, others do not report any direct discharges at all. In many Contracting Parties, large cities are located along the shores of the marine coastline. It is, perhaps, interesting to notice how relatively less important the direct discharges are compared to the riverine inputs (cf. Chapter 4). This may be reasonable for areas where large cities are located upstream and along major rivers, especially in central Europe, but it might nevertheless be a valid question to ask if the inputs of coastal urban areas are sufficiently accounted for.

It is hoped that one important outcome from this report may be related to how confident we can be that the figures to be created in the forthcoming 2009 RID Assessment, i.e. the follow-up of the 1990-2002 RID Assessment, are reasonably reliable, accurate and comparable between Contracting Parties. It is also hoped that some of the conclusions of the present report can help in the preparation of this 2009 RID Assessment. It must be noted that since the practices of the different Contracting Parties vary as much as is demonstrated in this assessment, it might be very difficult to produce meaningful comparative trend analyses between countries.

Annex 1: RID Data Overview Tables 2005

Table 1a	Information Received on Inputs to the Maritime Area of the OSPAR Convention in 2005
Table 1b	Determinands Reported by Contracting Parties in 2005
Table 2	Direct Inputs to the Maritime Area of the OSPAR Convention in 2005 by Country
Table 3	Riverine Inputs to the Maritime Area of the OSPAR Convention in 2005 by Country
Table 4a	Summary of Direct (Table 2) and Riverine (Table 3) Inputs to the Maritime Area of the OSPAR Convention in 2005 by Country
Table 4b	Summary of Direct and Riverine Inputs to the Maritime Area of the OSPAR Convention by Sea Area

Statistical information on river catchment areas

Table 1a. Information Received on Inputs to the Maritime Area of the OSPAR Convention in 2005

Country	Direct Discharges			Riverine Inputs	
	Sewage Effluents	Industrial Effluents	Coastal Areas (1)	Main Rivers	Tributary Rivers (2)
Belgium	NA	NA	(3)	+	+
Denmark					
- Kattegat	+	+	(4)	+	(5)
- Skagerrak	+	+	(4)	+	(5)
- North Sea	+	+	(4)	+	(5)
France*					
- Channel/North Sea	NI	NI		+	+
- Atlantic	NI	NI		NI	NI
Germany	+	+	(6)	+	+
Iceland (7)					
Ireland					
- Irish Sea	(8)	(8)	NI	+	+
- Celtic Sea	(8)	(8)	NI	+	+
- Atlantic	(8)	(8)	NI	+	+
Netherlands	+	+	(3)	+	+
Norway					
- Skagerrak	+	+	+ (8)	+	+
- North Sea	+	+	+ (8)	+	+
- Norwegian Sea	+	+	+ (8)	+	+
- Barents Sea	+	+	+ (8)	+	+
Portugal					
Spain	+	+	NI	+	+
Sweden					
- Kattegat	+	+	(3)	+	+
- Skagerrak	+	+	(3)	+	+
United Kingdom					
- East Coast (11)	+	+	NI	+	+ (10)
- Channel	+	+	NI	+	+ (10)
- Celtic Sea	+	+	NI	+	+ (10)
- Irish Sea	+	+	NI	+	+ (10)
- Atlantic	+	+	NI	+	+ (10)

+ = Information available
NI = No information
NA = Not applicable
(1) 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 of a river.
(2) Tributary Rivers: - any tributary river flowing into (the estuary of) a main river, downstream from the sampling point;
- any minor river which was not deemed to be a main river.
(3) Included in data on riverine inputs ("tributary rivers")
(4) Included in the totals for Danish inputs to the North Sea, the Skagerrak and the Kattegat
(5) All 25 rivers are reported as main rivers
(6) Included in data on direct inputs
(7) 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
(8) 1990 data since the basis for calculation remained unchanged. At ASMO 2004, Ireland stated that it planned to update its data on direct discharges in time for the next reporting cycle.
(9) cf. category "run-off" (i.e. estimated values for diffuse contributions) in Table 6b. for Norway
(10) Reported as main rivers
(11) Split into East Coast (North) and East Coast (South)
* Provisional data (France does not submit totals for inputs if any input values are lacking in the total)

Table 1b. Determinands Reported by Contracting Parties in 2005

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 (4)	R (4)	R (4)	R (3)	R (3)	R (3)	R (4)	R (3)	
Denmark														
- direct inputs	NI	NI	NI	NI	NI	NI	NI	+	+	+	+	+	NI	
- riverine inputs	NI	NI	NI	NI	NI	NI	NI	+	+	+	+	+	NI	
France*														
- direct inputs	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
- riverine inputs	NI	NI	NI	NI	NI	NI	NI	+	+	+	NI	+	+	
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)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (4)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)(4)	
*) Elbe **) Other main rivers														
Iceland														
Ireland														
- direct inputs	9	NI	9	9	9	NI	NI	NI	NI	NI	9	9	9	
- main riv. inputs	R (3)(4)	NI	R (3)(4)	R (3)(4)	R (3)(4)	NI	NI	R (3)(4)	+(3)(10)	3	+	+	3	
- tributary rivers	R	NI	R	R	R	NI	NI	R	+	+	+	+	+	
Netherlands														
- direct inputs	+	+	+	+	+	NI	NI	NI	+	NI	+	+	+	
- main riv. inputs	+ (3)(4)	+ (3)	+ (3)	+ (3)	+ (3)(4)	+ (3)	NI	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	
- tributary rivers	+	+	+	+	+	+	NI	+	+	+	+	+	+	
Norway														
- direct inputs	+	+	+	+	+	NI	NI	+	+	+	+	+	+	Cr, Ni
- main riv. inputs	+ (3)(4)	+(4) (3)	+	+ (3)	+ (3)	+ (3)(4)	NI	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	As, TOC
- tributary rivers	`+	`+	+	+	+	E (11)	NI	+(5)	+ (5)	+(5)	+ (5)	+ (5)	+ (5)	As, TOC
Portugal														
- direct inputs														
- main riv. Inputs (7)														
- tributary rivers														
Spain														
- direct inputs	+	+	+	+	+	+	+	+	+	+	+	+	+	
- riverine inputs	+ (3)(4)	+(4)	+ (3)(4)	+ (3)(4)	+ (3)(4)	+(4)	+(4)	+ (3)(4)	+ (3)(4)	+ (3)(4)	+ (3)(4)	+ (3)(4)	+ (3)(4)	
Sweden														
- sewage effluents	+	+	+	+	+	NI	NI	+	NI	NI	+	+	NI	
- industrial effluents	+	+	+	+	+	NI	NI	+	NI	NI	+	+	NI	
- main riv. inputs	+	+	+	+	+	NI	NI	+	+	+	+	+	NI	
United Kingdom														
- direct inputs	R	R	R	R	R	R	R	R	R	R	R(8)	R(8)	R	
- riverine inputs	R	R	R	R	R	R	R	R	R	R	R(8)	R(8)	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', i.e. estimated values for diffuse contributions.
(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) In England and Wales, Total-N and Total-P were not measured. To avoid anomalies, values equal to (i) the sum of the inorganic forms of N and (ii) orthophosphate-P respectively have been used.
(9) 1990 data since the basis for calculation remained unchanged. At ASMO 2004, Ireland stated that it planned to update its data on direct discharges in time for the next reporting cycle.
(10) Total oxidised nitrogen measured and not nitrate per se.
* Provisional data

Table 2^. Direct Discharges to the Maritime Area of the OSPAR Convention in 2005 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	(lower 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	0.01	0.09	0.00	0.10	0.01	NI
	Skagerrak		NI	NI	NI	NI	NI	NI	NI	0.00	0.01	0.00	0.01	0.00	NI
	Kattegat		NI	NI	NI	NI	NI	NI	NI	0.04	0.36	0.02	0.41	0.04	NI
France	Channel/North Sea Atlantic		Direct discharges data is not available.												
Germany	North Sea	(lower estimate)	0.02	0.02	1.9	0.9	10	0.02	0.04	1.7	1.7	0.08	3.6	0.4	1.9
		(upper estimate)	0.05	0.05	2.5	1.5	15	0.3	2.9	1.7	1.7	0.08	3.6	0.4	1.9
Iceland	Atlantic														
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	0.65	19
	Atlantic		0.01	NI	0.83	0.39	7.7	NI	NI	NI	NI	NI	0.70	0.21	4.3
Netherlands	North Sea	(upper estimate)	0.20	0.02	3.3	2.9	28	NI	NI	NI	1.3	NI	6	0.42	5
Norway (3)	Skagerrak		0.04	0.01	12	0.72	12			3.3	0.22	0.11	4.4	0.19	3.8
	North Sea		0.01	0.02	82	0	6			10	1.3	1.61	13	2.4	15
	Norwegian Sea		0.04	0.00	136	1	2			16	2.2	2.8	20	4.1	457
	Barents Sea		NI	NI	16	NI	NI			1.3	0.18	0.22	1.6	0.32	NI
Portugal	Atlantic	(lower estimate)	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Spain	Atlantic	(lower estimate)	1.5	0.20	11	4	84	2.6	0	13	1.9	2.2	24	3.2	415
		(upper estimate)	10.6	1.0	29	53	95	12	13	14	2.1	2.3	25	3.4	424
Sweden	Kattegat		0.02	0.01	2.0	0.12	5.8	NI	NI	1.05	NI	NI	1.7	0.1	NI
	Skagerrak		0.00	0.00	0.74	0.02	0.7	NI	NI	0.14	NI	NI	0.31	0.01	NI
United Kingdom	North Sea North	(lower estimate)	0.10	0.02	26	17	32	2	0	10	3	1.8	15	2.3	326
		(upper estimate)	0.11	0.02	26	17	32	5	3	10	3	1.8	15	2.3	326
	North Sea South	(lower estimate)	0.09	0.10	17	6	69	1	0	6	8	3.3	21	3.3	170
		(upper estimate)	0.17	0.10	17	6	69	10	1.5	6	8	3.3	21	3.3	170
	North Sea (Channel)	(lower estimate)	0.01	0.01	6	1.1	12	0.3	0	8.4	2.5	1.3	10	1.3	20
		(upper estimate)	0.02	0.01	6	1.2	12	3.3	6.6	8.5	2.6	1.3	11	1.3	20
	Total North Sea	*(lower estimate)*	*0.20*	*0.13*	*48*	*24*	*113*	*2.6*	*0*	*25*	*14*	*6.4*	*45*	*6.9*	*516*
		(upper estimate)	*0.30*	*0.13*	*48*	*25*	*113*	*18*	*11*	*25*	*14*	*6.4*	*47*	*7*	*516*
	Celtic Sea	(lower estimate)	0.03	0	2	1	23	0	0.2	3.1	0.94	0.64	3.4	0.64	7
		(upper estimate)	0.04	0.01	2	2	23	0.90	1.1	3.1	0.98	0.65	4.5	0.65	7
	Irish Sea	(lower estimate)	0.03	0.02	3	5	26	0.85	0	6.2	1.7	0.9	8	1	10
		(upper estimate)	0.12	0.07	4	6	26	4.2	2.5	6.2	1.7	1.0	9	1.1	11
	Atlantic	(lower estimate)	0.03	0.01	5	1.4	27	0.10	0	5.0	2.4	1.5	9.3	2.2	30
		(upper estimate)	0.09	0.02	6	1.5	27	0.88	0.01	5.0	2.4	1.5	9.4	2.2	30
	Total Non-North Sea	*(lower estimate)*	*0.09*	*0.03*	*10*	*7.9*	*76*	*1*	*0.23*	*14*	*5*	*3.1*	*21*	*3.9*	*47*
		(upper estimate)	*0.25*	*0.10*	*11*	*8.6*	*76*	*5.9*	*3.7*	*14*	*5*	*3.1*	*23*	*4*	*48*

^ 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

(3) Includes data on fish farming effluents

* Denmark's data have not been validated

Table 3^. Riverine Inputs to the Maritime Area of the OSPAR Convention in 2005 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)	0.8	0.26	31	21	193	4	0.32	3.2	25	1.2	31	1.3	250
		(upper estimate)	2.8	0.32	46	42	249	32	77	3.9	30	1.4	42	3.1	323
Denmark	North Sea		NI	NI	NI	NI	NI	NI	NI	0.00	0.00	0.00	0.02	0.01	NI
	Skagerrak		NI	NI	NI	NI	NI	NI	NI	0.00	0.00	0.00	0.01	0.00	NI
	Kattegat		NI	NI	NI	NI	NI	NI	NI	0.02	0.05	0.00	0.23	0.01	NI
France	Channel/North Sea	(lower estimate)	NI	NI	NI	NI	NI	NI	NI	15	63	2.2	NI	2.5	217
		(upper estimate)	NI	NI	NI	NI	NI	NI	NI	16	63	2.2	NI	2.5	217
	Atlantic	(lower estimate)	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
		(upper estimate)	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Germany	North Sea	(lower estimate)	5.1	2.6	224	135	1046	23	4.3	7.1	144	2.2	185	8.2	1653
		(upper estimate)	5.3	2.6	224	135	1046	23	29	7.2	144	2.3	185	8.2	1699
Iceland	Atlantic														
Ireland	Irish Sea	(lower estimate)	0.1	0.1	11	2	57	NI	NI	0.3	16	0.3	21	0.5	68
		(upper estimate)	0.5	0.7	13	6	57	NI	NI	0.3	16	0.3	21	0.5	68
	Celtic Sea	(lower estimate)	0.0	0.0	32	13	164	NI	NI	0.8	51	1.4	68	2.1	423
		(upper estimate)	2.3	3.4	43	31	164	NI	NI	0.9	51	1.4	68	2.1	423
	Atlantic	(lower estimate)	0.1	0.0	12	0	54	NI	NI	0.6	16	0.4	25	0.8	194
		(upper estimate)	2.0	2.9	27	19	59	NI	NI	0.6	16	0.4	25	0.8	194
Netherlands	North Sea	(lower estimate)	3.6	1.3	200	103	787	14		6	174	5.1	225	10	1186
		(upper estimate)	5.2	1.3	202	106	797	82		7	174	5.1	233	10	1188
Norway	Skagerrak	(lower estimate)	1	0.04	76	14	225			0.9	16	0.24	26	0.66	293
		(upper estimate)	1	0.07	76	14	225			0.9	16	0.26	26	0.66	293
	North Sea	(lower estimate)	0.74	0.13	36	14	158			0.54	12	0.18	18	0.50	241
		(upper estimate)	0.81	0.15	36	14	158			0.61	12	0.21	18	0.50	241
	Norwegian Sea	(lower estimate)	0.49	0.14	72	5	206			0.4	5	0.14	13	0.41	236
		(upper estimate)	0.67	0.18	72	5	206			0.5	5	0.17	13	0.41	236
	Barents Sea	(lower estimate)	0.17	0.04	32	1.5	20			0.19	0.35	0.03	4	0.17	45
		(upper estimate)	0.22	0.05	32	1.5	20			0.22	0.36	0.04	4	0.17	45
Portugal	Atlantic	(lower estimate)													
		(upper estimate)													
Spain	Atlantic	(lower estimate)	0.1	0.02	4	3.8	196	0	0	3	16	1	36	1	286
		(upper estimate)	72	4	134	135	426	64	224	4	30	2	41	2	365
Sweden	Kattegat	(estimate)	0.57	0.05	39	11	144	NI	NI	1.2	13	0.27	25	0.70	NI
	Skagerrak	(estimate)	0.04	0.01	3.2	1.0	11	NI	NI	0.13	0.92	0.04	2.1	0.08	NI
United Kingdom	North Sea North	(lower estimate)	1.0	0.10	75	42	338	9	0	1.2	38	1	46	1	281
		(upper estimate)	1.5	0.21	78	43	344	37	40.0	1.3	38	1	46	2	293
	North Sea South	(lower estimate)	1.3	0.07	43	93	274	1	0.04	1.4	53	4	59	4	177
		(upper estimate)	1.4	0.13	43	95	275	34	39	1.4	53	4	59	4	178
	North Sea (Channel)	(lower estimate)	0.29	0.04	25	6	88	0.42	0	0.27	18	0.67	14	0.67	75
		(upper estimate)	0.44	0.07	25	11	93	8.7	5.3	0.31	18	0.68	18	0.68	77
	Total North Sea	*(lower estimate)*	*2.6*	*0.21*	*143*	*141*	*700*	*10*	*0.04*	*2.8*	*109*	*5.8*	*119*	*6.5*	*533*
		(upper estimate)	*3.4*	*0.41*	*146*	*149*	*712*	*79*	*84*	*3.0*	*109*	*5.9*	*124*	*6.5*	*549*
	Celtic Sea	(lower estimate)	0.45	0.04	44	28	207	1	0	0.74	39	1.5	41	1.5	408
		(upper estimate)	1.3	0.13	45	41	209	28	2.8	0.82	39	1.5	43	1.5	411
	Irish Sea	(lower estimate)	1.2	0.17	82	58	374	0.4	0.39	3	32	2.5	39	2.9	496
		(upper estimate)	1.7	0.31	83	66	381	16	49	4	32	2.6	39	3	507
	Atlantic	(lower estimate)	0.33	0.02	61	13	142	5	0	1.4	12	0.92	15	2.1	211
		(upper estimate)	1.1	0.27	63	15	147	14	6.7	1.5	12	1	16	2.1	219
	Total non-North Sea	*(lower estimate)*	*2*	*0.23*	*187*	*99*	*723*	*5.9*	*0.39*	*5.4*	*83*	*4.9*	*95*	*6.4*	*1115*
		(upper estimate)	*4.1*	*0.71*	*191*	*122*	*737*	*59*	*59*	*5.9*	*83*	*5*	*97*	*6.5*	*1137*

^ 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

* Denmark's data have not been validated

Table 4a. Sum of Direct (Table 2) and Riverine (Table 3) Inputs to the Maritime Area of the OSPAR Convention in 2005 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)	0.8	0.3	31	21	193	4.5	0.32	3.2	25	1.2	31	1.3	250
		(upper estimate)	3	0.3	46	42	249	32	77	3.9	30	1.4	42	3.1	323
Denmark	North Sea		NI	NI	NI	NI	NI	NI	NI	0.01	0.09	0.01	0.12	0.01	NI
	Skagerrak		NI	NI	NI	NI	NI	NI	NI	0.00	0.01	0.00	0.02	0.00	NI
	Kattegat		NI	NI	NI	NI	NI	NI	NI	0.06	0.09	0.37	0.25	0.41	NI
France	Channel/North Sea	(lower estimate)	NI	NI	NI	NI	NI	NI	NI	15.5	63	2.2	0.0	2.50	217
		(upper estimate)	NI	NI	NI	NI	NI	NI	NI	15.5	63	2.2	0.0	2.50	217
	Atlantic	(lower estimate)	NI	NI	NI	NI	NI	NI	NI	0.0	0	0.0	0.0	0.00	0
		(upper estimate)	NI	NI	NI	NI	NI	NI	NI	0.0	0	0.0	0.0	0.00	0
Germany	North Sea	(lower estimate)	5.1	2.6	226	136	1056	23	4.3	8.8	146	2.3	189	9	1655
		(upper estimate)	5.4	2.7	227	137	1061	23	32	8.9	146	2.4	189	9	1701
Iceland	Atlantic														
Ireland (2)	Irish Sea	(lower estimate)	0.15	0.06	19	5	120	NI	NI	0.26	16	0.28	28	2.0	106
		(upper estimate)	0.59	0.72	20	10	120	NI	NI	0.26	16	0.28	28	2.0	106
	Celtic Sea	(lower estimate)	0.02	0.00	35	17	185	NI	NI	0.83	51	1.41	70	2.8	442
		(upper estimate)	2.30	3.42	47	36	186	NI	NI	0.87	51	1.42	71	2.8	442
	Atlantic	(lower estimate)	0.09	0.00	13	0	62	NI	NI	0.59	16	0.40	26	1.0	198
		(upper estimate)	1.99	2.89	27	20	66	NI	NI	0.63	16	0.44	26	1.0	198
Netherlands (3) (4)	North Sea	(lower estimate)	3.8	1.3	204	105	815	14	0	6	176	5.1	231	10	1190
		(upper estimate)	5.4	1.4	205	109	825	82	0	7	176	5.1	240	10	1192
Norway	Skagerrak	(lower estimate)	1.0	0.05	88	15	237	0	NI	4.3	16	0.35	30	0.8	297
		(upper estimate)	1.0	0.08	88	15	237	0	NI	4	16	0.37	30	0.8	297
	North Sea	(lower estimate)	0.75	0.15	118	15	164	0.00	NI	10.8	13.3	2	31	2.9	256
		(upper estimate)	0.82	0.17	118	15	164	0.00	NI	10.8	13.3	2	31	2.9	256
	Norwegian Sea	(lower estimate)	0.53	0.14	208	6	208	0.00	NI	16	7.2	3	33	4.5	693
		(upper estimate)	0.71	0.18	208	6	208	0.00	NI	17	7.2	3	33	4.5	693
	Barents Sea	(lower estimate)	0.17	0.04	47	1.48	20	0.00	NI	1.44	0.53	0.25	5.7	0.49	45
		(upper estimate)	0.22	0.05	47	1.5	20	0.00	NI	1.48	0.53	0.26	5.7	0.49	45
Portugal	Atlantic		0.0	NI	0	0.0	0	NI	NI	0.00	0	0.0	0	0.0	0
			0.0	NI	0	0.0	0	NI	NI	0.00	0	0.0	0	0.0	0

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	(lower estimate)	1.6	0.2	15	7	280	2.6	0.0	15	18	2.7	60	4.2	701
		(upper estimate)	82	5	162	187	521	76	238	18	32	4.1	66	5.1	789
Sweden	Kattegat	(lower estimate)	0.58	0.06	41	11.6	149	NI	NI	2.2	13	0.27	27	0.77	NI
	Skagerrak	(lower estimate)	0.04	0.01	3.9	1.0	12.1	NI	NI	0.27	0.9	0.04	2.4	0.09	NI
United Kingdom	North Sea North	(lower estimate)	1.1	0.1	100	59	370	11	0	11	41	2.6	61	3.8	607
		(upper estimate)	1.6	0.2	103	60	376	41	43	11	41	2.7	61	3.9	619
	North Sea South	(lower estimate)	1.4	0.17	60	99	342	1.3	0.04	8	61	8	80	8	347
		(upper estimate)	1.6	0.23	60	101	344	43	40	8	61	8	80	8	348
	North Sea Channel	(lower estimate)	0.30	0.05	31	7	100	0.7	0.00	8.7	20	2.0	24	2.0	95
		(upper estimate)	0.46	0.08	31	13	105	12	12	8.8	21	2.0	30	2.0	97
	North Sea	*(lower estimate)*	*2.8*	*0.3*	*191*	*165*	*813*	*13*	*0.04*	*27*	*123*	*12*	*165*	*13*	*1049*
		(upper estimate)	*3.7*	*0.5*	*195*	*173*	*825*	*96*	*95*	*28*	*123*	*12*	*171*	*13*	*1064*
	Celtic Sea	(lower estimate)	0.5	0.04	46	30	230	0.7	0.2	3.8	40	2.1	45	2.1	416
		(upper estimate)	1.3	0.14	47	42	232	29	4	3.9	40	2.1	47	2.1	418
	Irish Sea	(lower estimate)	1.2	0.19	84	63	400	1.3	0.39	9	34	3.4	47	3.9	506
		(upper estimate)	1.8	0.38	86	72	407	21	52	10	34	3.5	47	4.1	517
	Atlantic	(lower estimate)	0.36	0.03	67	15	169	4.9	0.00	6.4	14	2.4	25	4.3	241
		(upper estimate)	1.2	0.3	69	16	174	15	6.7	6.5	14	2.5	25	4.3	249
	non-North Sea	*(lower estimate)*	*2.1*	*0.26*	*197*	*107*	*798*	*6.9*	*0.6*	*20*	*88*	*7.9*	*116*	*10*	*1163*
		(upper estimate)	*4*	*0.8*	*202*	*130*	*814*	*65*	*62*	*20*	*88*	*8*	*120*	*10*	*1184*
Total reported:		(lower estimate)	**19**	**6**	**1437**	**615**	**5113**	**63**	**5**	**133**	**772**	**42**	**1045**	**66**	**8262**
		(upper estimate)	**112**	**18**	**1637**	**894**	**5458**	**375**	**504**	**138**	**792**	**44**	**1080**	**69**	**8508**

(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. Sum of Direct and Riverine Inputs to the Maritime Area of the OSPAR Convention in 2005 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***	(lower estimate)	0.17	0.04	47	1.48	20	0.00	NI	1.44	0.53	0.25	5.7	0.49	45
Atlantic Ocean	Barents Sea	(upper estimate)	0.22	0.05	47	1.5	20	0.00	NI	1.48	0.53	0.26	5.7	0.49	45
	Atlantic Ocean	(lower estimate)	0.45	0.03	80	15	231	4.9	0.00	7.0	30	2.8	50	5.3	439
	(main body)	(upper estimate)	3.2	3.2	96	36	240	15	6.7	7.2	30	2.9	51	5.3	447
	Bay of Biscay and	(lower estimate)	1.6	0.23	15	7	280	2.6	0.0	15	18	2.7	60	4.2	701
	Iberian Coast	(upper estimate)	82	5	162	187	521	76	238	18	32	4.1	66	5.1	789
North Sea	Kattegat	(lower estimate)	0.58	0.06	41	12	149	NI	NI	2.3	14	0.63	27	1.2	NI
		(upper estimate)	0.58	0.06	41	12	149	NI	NI	2.3	14	0.63	27	1.2	NI
	Skagerrak	(lower estimate)	1.0	0.06	92	16	249	0	NI	4.5	17	0.40	33	0.9	297
		(upper estimate)	1.0	0.1	92	16	249	0	NI	4.6	17	0.41	33	0.9	297
	North Sea	(lower estimate)	13	4.6	739	435	2940	53	4.7	48	462	21	623	34	4305
	(main body)	(upper estimate)	18	5.0	759	463	3019	221	192	49	467	21	642	37	4440
	Channel	(lower estimate)	0.30	0.05	31	7	100	0.7	0.00	24.2	84	4.1	24	4.5	312
		(upper estimate)	0.46	0.08	31	13	105	12	12	24.3	84	4.2	30	4.5	314
Norwegian Sea		(lower estimate)	0.53	0.14	208	6.4	208	0.00	NI	16	7.2	2.92	33	4.5	693
		(upper estimate)	0.71	0.18	208	6.4	208	0.0	NI	17	7.2	2.94	33	4.5	693
Irish Sea		(lower estimate)	1.4	0.25	103	68	520	1.3	0.39	10	50	3.7	75	5.9	612
		(upper estimate)	2.4	1.10	106	81	527	21	52	10	50	3.8	75	6.1	623
Celtic Sea		(lower estimate)	0.5	0.04	81	47	415	0.7	0.2	4.6	91	3.5	115	4.9	857
		(upper estimate)	3.6	3.56	93	78	418	29	4	4.8	91	3.6	118	4.9	860

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.

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]
Statistical Information provided by Belgium:								
Coastal Area	**2675**				**~0.497**		**2367**	NI
Western	1689	*Belgium*	>1082	NI	>0,305	NI	708	
		France	NI	NI	NI	NI		
Middle	499	*Belgium*			0.014		501	
Eastern	487	*Belgium*			0.177		1158	
Scheldt basin								
Scheldt	**22004**				**~10**		**11159**	1949-2005
		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**						**1,794**	1991-2005
		Belgium	NI		NI			
		Netherlands	NI		NI			
Statistical Information provided by Denmark:								
Vid å	248.3	*DK*	*248*	*81*			304	78-99
Brøns å	94.1	*DK*	*94*	*100*		*100*	106.6	74-99
Ribe å	675	*DK*	*675*	*100*		*100*	743.1	33-99
Kongeaen	426.6	*DK*	*427*	*100*		*100*	612.3	90-99
Sneum å	223	*DK*	*223*	*100*		*100*	280.8	66-99
Varde å	815	*DK*	*815*	*100*		*100*	1042.7	69-99
Skjern å	1558.4	*DK*	*1558*	*100*		*100*	2079.7	74-99
Stor å	1096.7	*DK*	*1097*	*100*		*100*	1399.4	71-99
Brede å	290	*DK*	*290*	*100*		*100*	327.5	94-99
Omme å	612	*DK*	*612*	*100*		*100*	728.9	83-99
Grøn å	563	*DK*	*563*	*100*		*100*	605.3	59-99
Total	**6602.1**	**=Total of Danish rivers discharging to the North Sea**					**8230**	**71-90**
Liver å	249.8	*DK*	*250*	*100*		*100*	223.3	95-99
Uggerby å	347.5	*DK*	*348*	*100*		*100*	316.6	89-99
	597.3	**=Total of Danish rivers discharging to the Skagerrak**					**863**	**71-90**
Karup å	626.8	*DK*	*527*	*100*		*100*	621.4	86-99
Jordbro å	110.9	*DK*	*111*	*100*		*100*	111.8	80-99
Skals å	556.4	*DK*	*556*	*100*		*100*	380.2	73-99
Simmersted å	214.9	*DK*	*215*	*100*		*100*	199	92-99
Elling å	132.2	*DK*	*132*	*100*		*100*	110.9	89-99
Voer å	238.7	*DK*	*239*	*100*		*100*	224.3	89-99
Ger å	153.8	*DK*	*154*	*100*		*100*	143.1	85-99
Lindeborg å	317.8	*DK*	*318*	*100*		*100*	297.4	83-99
Haslevgard å	75	*DK*	*75*	*100*		*100*	57.5	89-99
Kastbjerg å	96.3	*DK*	*96*	*100*		*100*	67.8	76-99
Guden å	2602.9	*DK*	*2,603*	*100*		*100*	2820.1	78-99
Ry å	285	*DK*	*285*	*100*		*100*	250.5	72-99
	5125.7	**=Total of Danish rivers discharging to the Kattegat**					**5284**	**71-90**
Statistical Information provided by France:								
Aa	2308	*France*		*100*	0.6	*100*	2,714	1989-2005
Canche	3895	*France*		*100*	0.4	*100*	4,579	1962-2005
Somme	5916	*France*		*100*	0.6	*100*	3,197	1963-2005
Béthune et Bresle	2153	*France*		*100*	0.2	*100*	2,074	1989-2005
Saane	1718	*France*		*100*	0.2	*100*	2,938	1997-2005
Seine	64953	*France*		*100*	13.9	*100*	44,842	1974-2006
Andelle	789	*France*		*100*	0.1	*100*	691	1973-2005
Eure	6023	*France*		*100*	0.6	*100*	2,246	1971-2005
Coastal area	2439	*France*		*100*	0.9	*100*	1,684	1989-2005
Risle	2545	*France*		*100*	0.2	*100*	1,642	1967-2005
Dives	1815	*France*		*100*	0.1	*100*	1,296	1969-2005
Douve	1474	*France*		*100*	0.1	*100*	1,053	1989-2005
Orne	2976	*France*		*100*	0.4	*100*	2,592	1983-2004
Seulles	547	*France*		*100*	0.1	*100*	518	1971-2005
Touques	1311	*France*		*100*	0.1	*100*	1,037	1982-2005
Vire	2077	*France*		*100*	0.1	*100*	2,246	1993-2005
Coastal area	1302	*France*		*100*	0.2	*100*	1,134	1989-2005
Sélune et Sée	1623	*France*		*100*	0.1	*100*	1,987	1990-2005
Sienne	1135	*France*		*100*	0.1	*100*	1,642	1989-2005
Aulne	4312	*France*		*100*	0.5	*100*	6,653	1970-2005
Rance et Couesnon	2848	*France*		*100*	0.3	*100*	2,160	1984-2005
Coastal area	4961	*France*		*100*	0.5	*100*	3,762	1989-2005
	119122	=Total of rivers discharging in ZONE II			20.1		92,687	
Blavet et Scorff	4649	*France*		*100*	0.5	*100*	5,702	1983-2005
Coastal area	2868	*France*		*100*	0.3	*100*	4,425	1989-2005
Vilaine	10144	*France*		*100*	0.9	*100*	6,048	1989-2005

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]
Erdre	3636	*France*		*100*	0.8	*100*	2,779	1989-2005
Loire	110178	*France*		*100*	6.7	*100*	73,699	1863-2005
Sèvre Nantaise	4664	*France*		*100*	0.5	*100*	4,579	1994-2005
Lay	4522	*France*		*100*	0.4	*100*	3,456	1969-2005
Sèvre Niortaise	4363	*France*		*100*	0.4	*100*	4,752	1994-2005
Arnoult	291	*France*		*100*	0	*100*	207	1989-2005
Boutonne	2141	*France*		*100*	0.1	*100*	1,524	1989-2005
Charente	7526	*France*		*100*	0.4	*100*	5,357	1977-2005
Livenne	1172	*France*		*100*	0.1	*100*	512	1989-2005
Seudre	988	*France*		*100*	0.1	*100*	432	1989-2005
Eyre	2036	*France*		*100*	0	*100*	1,901	1980-2005
Canal des étangs	2810	*France*		*100*	0.1	*100*	2,624	1989-2005
Dordogne	14605	*France*		*100*	0.5	*100*	21,859	1996-2004
Isle	8472	*France*		*100*	0.4	*100*	7,171	1972-2005
Coastal area	870	*France*		*100*	0.1	*100*	197	1989-2005
Dropt	2672	*France*		*100*	0.2	*100*	605	1989-2005
Garonne	38227	*France*		*100*	2.2	*100*	40,522	1967-2005
Lot	11541	*France*		*100*	0.4	*100*	13,392	1989-2004
Coastal area	3875	*France*		*100*	0.8	*100*	12,288	1989-2005
Coastal area	3105	*France*		*100*	0.2	*100*	2,898	1989-2005
Adour	7977	*France*		*100*	0.4	*100*	7,776	1918-2005
Bidouze	1041	*France*		*100*	0	*100*	1,015	1989-2005
Gaves réunis	5504	*France*		*100*	0.3	*100*	17,453	1923-2005
Luy	1367	*France*		*100*	0.1	*100*	1,814	1967-2005
Nive	1153	*France*		*100*	0.1	*100*	3,197	1967-2005
Coastal area	644	*France*		*100*	0.1	*100*	2,042	1989-2005
	263040	=total of rivers discharging in ZONE IV			17.2		250,226	
Statistical Information provided by Germany:								
Ems	15552						7690	1941-2002
		Germany	13152	85.00	3.75	85		
		Netherlands	2400	15.00	0.6	15		
Weser	46306	*Germany*	-	-	9.0	-	31445	1941-2002
Elbe	148268		148268	100	25.11	-	74100	1926-2000
		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	-	2399	1974-2005
Statistical Information provided by Ireland:								
Boyne	2695	Ireland	-	-	NI	-	3395	1975-2002
Liffey	1256	Ireland	-	-	NI	-	1561	1981-2002
Avoca	652	Ireland	-	0	NI	-	1314	1967-2000
Slaney	1762	Ireland	-	-	NI	-	3424	1980-2002
	6365	**=Total of main Irish rivers discharging to the Irish Sea**						
Barrow*	3067	Ireland	-	-	NI	-	4229	1946-1969
*New gauge recently installed. LTA still based on the period of reliable record for the old gauge.								
Nore	2530	Ireland	-	-	NI	-	3751	1972-2002
Suir	3610	Ireland	-	-	NI	-	6685	1968-2002
Blackwater	3324	Ireland	-	-	NI	-	7667	1956-2002
Lee	1253	Ireland	-	-	NI	-	3335	1957-2001
Bandon	608	Ireland	-	-	NI	-	1858	1975-2002
Deel	486	Ireland	-	-	NI	-	623	1983-2002
Maigue	1052	Ireland	-	-	NI	-	1583	1977-2002
Shannon Old Chan.	11700	Ireland	-	-	NI	-	4649	1932-2002
Shannon Tailrace		Ireland					17997	1932-2002
Fergus	1042	Ireland	-	-	NI	-	1626	1973-2002
	28672	**=Total of main Irish rivers discharging to the Celtic Sea**						
Corrib	3138	Ireland	-	-	NI	-	9477	1973-02 excl. 86-90, 92-93
Moy	2086	Ireland	-	-	NI	-	5306	1970-2002
Erne	4372	Ireland/UK	2572/1800	60/40	NI	-	8499	1951-2002
	9596	**=Total of main Irish rivers dischrging to the Atlantic**						
Statistical Information provided by The Netherlands (with assistance from Germany and Belgium)								
Rhine	185000				2) 55.6		4) 198720	1901-1995
		Switzerland	1) 28000	15	3.0	6		
		France	24000	13	3.7	7		
		Luxembourg	2500	1	0.3	1		
		Germany	105900	57	32.5	65		
		Netherlands	21000	11	10.9	21		
		Belgium	700	0				
		Austria	2500	1				

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]
		Liechtenstein	300	0				
		Italy	100	0				
Meuse	33500				3) 7.15		5) 28080	1911-1995
		France	8500	25	0.50			
		Luxembourg	100	0	0.05			
		Belgium	13150	39	2.00			
		Germany	4300	13	1.00			
		Netherlands	7400	22	3.60			
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						7690	1941-2002
		Germany	13152	85.00	3.75	85		
		Netherlands	2400	15.00	0.6	15		

1) Catchment areas rounded off to the nearest hundred km2
2) Population Rhine catchment per country requires further analysi
3) Population Meuse catchment: rough estimates
4) Estimated discharge at outlet: 2.300 m3/s * 24 h/d * 3600 s/h
5) Estimated discharge at outlet: 325 m3/s * 24 h/d * 3600 s/h

Statistical Information provided by Norway:

River	Catchment area	Countries	Share in catchment area [km2]	Share [%]	Population [10E6]	Population [%]	LTA*	LTA-period
Glomma (1)	41918	Norway		100.00	0.62	100	61350	1961-1990
Drammenselva (2)	17034	Norway		100.00	0.2	100	28850	1961-1990
Numedalslågen (3)	5577	Norway		100.00	0.04	100	10200	1961-1990
Skienselva (4)	10772	Norway		100.00	0.11	100	23535	1961-1990
Otra (5)	3738	Norway		100.00	0.03	100	12870	1961-1990
	79039	**=Total of Norwegian rivers discharging to the Skagerrak**						
Orreelva (6)	105	Norway		100.00	0.01	100	335	1961-1990
Suldalslågen (7)	1457	Norway		100.00	0.003	100	7420	1961-1990
	1562	**=Total of Norwegian rivers discharging to the North Sea**						
Orkla (8)	3053	Norway		100.00	0.02	100	5710	1961-1990
Vefsna (9)	4122	Norway		100.00	0.01	100	15655	1961-1990
	7175	**=Total of Norwegian rivers discharging to the Norwegian Sea**						
Altaelva (10)	7373	Norway		100.00	0.005	100	7495	1961-1990
	95149	**Total catchment for main rivers discharging to all four regions**						
	126706	**Total catchment for tributary rivers discharging to all four regions**						
	221855	**Total catchment for monitored rivers**						

Statistical Information provided by Portugal:

River	Catchment area	Countries	Share in catchment area [km2]	Share [%]	Population [10E6]	Population [%]	LTA*	LTA-period
Tejo	80149	Portugal	24380	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:

River	Catchment area	Countries	Share in catchment area [km2]	Share [%]	Population [10E6]	Population [%]	LTA*	LTA-period
Oyarzun	74	Spain	74	100	0.055	100	166	
Urumea	266	Spain	266	100	0.176	100	633	
Oria	860	Spain	860	100	0.020	100	740	
Urola	342	Spain	342	100	0.082	100	447	
Deva	531	Spain	531	100	0.146	100	694	
Artibay	106	Spain	106	100	0.016	100	NI	
Lea	81	Spain	81	100	0.010	100	NI	
Oca	132	Spain	132	100	0.022	100	NI	
Butron	175	Spain	175	100	0.024	100	NI	
Barbadun	135	Spain	135	100	0.020	100	NI	
Nervión	1764	Spain	1764	100	0.997	100	1,105	
Saja	955	Spain	955	100	0.104	100	1,166	
Nalón	4866	Spain	4866	100	0.539	100	6,977	
Miera	291	Spain	291	100	0.016	100	352	
Sella	1246	Spain	1246	100	0.035	100	832	
Masma	291	Spain	291	100	0.014	100	404	1970-2005
Oro	189	Spain	189	100	0.007	100	389	1970-2005
Landro	270	Spain	270	100	0.017	100	629	1975-2005
Sor	202	Spain	202	100	0.007	100	528	1996-2005
Mera	127	Spain	127	100	0.007	100	435	1970-2005
Forcadas	68	Spain	68	100	0.000	100	183	1970-2005
Grande de Jubia	182	Spain	182	100	0.004	100	318	1970-2005
Belelle	60	Spain	60	100	0.003	100	1,484	1970-2005
Eume	470	Spain	470	100	0.013	100	1,696	1970-2005
Mandeo	457	Spain	457	100	0.039	100	771	1970-2005
Mero	345	Spain	345	100	0.042	100	456	1984-2005

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]
Allones	516	Spain	516	100	0.049	100	988	1970-2005
Grande	283	Spain	283	100	0.002	100	647	1970-2005
Castro	140	Spain	140	100	0.004	100	167	1970-2005
Jallas	504	Spain	504	100	0.022	100	739	1970-2005
Tambre	1530	Spain	1530	100	0.059	100	3828	1994-2005
Traba	122	Spain	122	100	0.004	100	316	1970-2005
Ulla	2803	Spain	2803	100	0.104	100	1337	1971-2005
Umia	440	Spain	440	100	0.052	100	846	1970-2005
Lerez	450	Spain	450	100	0.085	100	1249	1970-1999
Verdugo	334	Spain	334	100	0.021	100	484	1970-2005
Miño	17247	Spain	16347	94.8	0.881		25716	1975-95
		Portugal	900	5.2				
Duero	97670	Spain	78960	80.8	3.093			
		Portugal	18710	19.2				
Tajo	80190	Spain	55810	69.6	6.459			
		Portugal	24380	30.4				
Guadiana	67122	Spain	55597	82.8	1.800		8556	1.912 - 1.995
		Portugal	11525	17.2				
Piedras	550	Spain	550	100	0.034	100	61	
Odiel	2417	Spain	2417	100	0.211	100	1,200	1967-1995
Tinto	1727	Spain	1727	100	0.090	100	178	1966-1995
Guadalquivir	63241	Spain	63241	100	4.966	100	3423	1942-88
Guadalete	3360	Spain	3360	100	0.555	100	413	
TOTAL	**355131**	**Spain**	**299616**	**84.4**	**20.907**	**NI**	**70553**	
		Portugal	**55515**	**15.6**	**NI**			
		TOTAL	**355131**	**100**				
Statistical Information provided by Sweden:					1995			
Vege å (95)	498	Sweden	498	100	0.04300	100	440	1961-1990
Rönne å (96)	1890	Sweden	1890	100	0.08810	100	2030	1961-1990
Stensån (97)	284	Sweden	284	100	0.00710	100	350	1961-1990
Lagan (98)	6444	Sweden	6444	100	0.11890	100	7410	1961-1990
Genevadsån (99)	225	Sweden	225	100	0.00470	100	350	1961-1990
Fylleån (100)	359	Sweden	359	100	0.00900	100	650	1961-1990
Nissan (101)	2682	Sweden	2682	100	0.08280	100	3690	1961-1990
Suseån (102)	441	Sweden	441	100	0.00760	100	640	1961-1990
Ätran (103)	3343	Sweden	3343	100	0.06560	100	5070	1961-1990
Himleån (104)	214	Sweden	214	100	0.00820	100	330	1961-1990
Viskan (105)	2201	Sweden	2201	100	0.12120	100	2760	1961-1990
Rolfsån (106)	723	Sweden	723	100	0.02710	100	1030	1961-1990
Kungsbackaån (107)	310	Sweden	310	100	0.03740	100	410	1961-1990
Göta älv (108)	50230	Sweden	42780.00	85.20	0.82190	ni	50530	1961-1990
		Norway	7450.00	14.80	ni	ni		
	69844	**=Total of Swedish rivers discharging to the Kattegat**						
Bäveån (109)	302	Sweden	302	100	0.02130	100	350	1961-1990
Örekilsälven (110)	1327	Sweden	1327	100	0.01450	100	2050	1961-1990
Strömsån (111)	253	Sweden	253	100	0.00490	100	390	1961-1990
Enningsdalsälven (112)	704	Sweden	704	100	0.00319	100	1360	1961-1990
	2586	**=Total of Swedish rivers discharging to the Skagerrak**						
Statistical Information provided by the United Kingdom:								
Ness (SC2b)	NI	-	-	-	NI	-	7,600	NI
Conon (SC2b)	NI	-	-	-	NI	-	NI	NI
Baeuly (SC2b)	NI	-	-	-	NI	-	NI	NI
Findhorn (SC2b)	NI	-	-	-	NI	-	NI	NI
Shin (SC2b)	NI	-	-	-	NI	-	NI	NI
Helmsdale (SC2b)	NI	-	-	-	NI	-	NI	NI
Naver (SC2b)	NI	-	-	-	NI	-	NI	NI
Thurso (SC2b)	NI	-	-	-	NI	-	NI	NI
Brora (SC2b)	NI	-	-	-	NI	-	NI	NI
Oykel (SC2b)	NI	-	-	-	NI	-	NI	NI
Nairn (SC2b)	NI	-	-	-	NI	-	NI	NI
Carron (Sutherland) (SC2	NI	-	-	-	NI	-	NI	NI
Wick (SC2b)	NI	-	-	-	NI	-	NI	NI
Halladale (SC2b)	NI	-	-	-	NI	-	NI	NI
Hope (SC2b)	NI	-	-	-	NI	-	NI	NI
Alness (SC2b)	NI	-	-	-	NI	-	NI	NI
Cassley (SC2b)	NI	-	-	-	NI	-	NI	NI
Fleet (SC2b)	NI	-	-	-	NI	-	NI	NI
Berriedale Water (Sc2b)	NI	-	-	-	NI	-	NI	NI
Borgie (SC2b)	NI	-	-	-	NI	-	NI	NI
Forss Water (SC2b)	NI	-	-	-	NI	-	NI	NI
Loch of Stenness (SC2b)	NI	-	-	-	NI	-	NI	NI
Glass (SC2b)	NI	-	-	-	NI	-	NI	NI
Strathy (Sc2b)	NI	-	-	-	NI	-	NI	NI

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]
Mickle Burn (SC2b)	NI	-	-	-	NI	-	NI	NI
Dunbeath Water (SC2b)	NI	-	-	-	NI	-	NI	NI
Spey (SC3)	NI	-	-	-	NI	-	5,600	NI
Dee (Grampian) (SC3)	NI	-	-	-	NI	-	NI	NI
Don (SC3)	NI	-	-	-	NI	-	NI	NI
Deveron (SC3)	NI	-	-	-	NI	-	NI	NI
Ythan (SC3)	NI	-	-	-	NI	-	NI	NI
Ugie (SC3)	NI	-	-	-	NI	-	NI	NI
Bervie Water (SC3)	NI	-	-	-	NI	-	NI	NI
Lossie (SC3)	NI	-	-	-	NI	-	NI	NI
Tay (SC4)	NI	-	-	-	NI	-	14,000	NI
Earn (SC4)	NI	-	-	-	NI	-	NI	NI
North Esk (Tayside) (SC4	NI	-	-	-	NI	-	NI	NI
South Esk (Tayside) (SC4	NI	-	-	-	NI	-	NI	NI
Eden SC4)	NI	-	-	-	NI	-	NI	NI
Lunan Water (SC4)	NI	-	-	-	NI	-	NI	NI
Dighty Water (SC4)	NI	-	-	-	NI	-	NI	NI
Tweed (SC5)	NI	-	-	-	NI	-	NI	NI
Forth (SC5)	NI	-	-	-	NI	-	4,300	NI
Whiteadder Water (SC5)	NI	-	-	-	NI	-	NI	NI
Leven (Fife) (SC5)	NI	-	-	-	NI	-	NI	NI
Almond (SC5)	NI	-	-	-	NI	-	NI	NI
Esk (Lothian) (SC5)	NI	-	-	-	NI	-	NI	NI
Tyne (SC5)	NI	-	-	-	NI	-	3,900	NI
Allan Water (SC5)	NI	-	-	-	NI	-	NI	NI
Devon (SC5)	NI	-	-	-	NI	-	NI	NI
Carron (Falkirk) (SC5)	NI	-	-	-	NI	-	NI	NI
Avon (SC5)	NI	-	-	-	NI	-	NI	NI
Eye Water (SC5)	NI	-	-	-	NI	-	NI	NI
Water of Leith (SC5)	NI	-	-	-	NI	-	NI	NI
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
Tot.N.Sea (N) catch.	50000						89300	1960 to 1990
Aire (E8)	NI	-	-	-	NI	-	NI	NI
Derwent (E8)	NI	-	-	-	NI	-	NI	NI
Don (E8)	NI	-	-	-	NI	-	NI	NI
Ouse (E8)	NI	-	-	-	NI	-	NI	NI
Wharfe (E8)	NI	-	-	-	NI	-	NI	NI
Ancholme (E8)	NI	-	-	-	NI	-	NI	NI
Trent (E8)	NI	-	-	-	NI	-	7800	NI
Idle (E8)	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
Tot.N.Sea (S) catch.	62000						32300	1960 to 1990

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]
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
Tot.Channel catch.	22000						16500	1960-1990
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
Tot.Celtic S. catch.	32000						36400	1960-1990
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

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]
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
Nith (SC1)	NI	-	-	-	NI	-	NI	NI
Annan (SC1)	NI	-	-	-	NI	-	NI	NI
Dee (Solway) (SC1)	NI	-	-	-	NI	-	NI	NI
Esk (Solway) (SC1)	NI	-	-	-	NI	-	NI	NI
Cree (SC1)	NI	-	-	-	NI	-	NI	NI
Bladnoch (SC1)	NI	-	-	-	NI	-	NI	NI
Water of Luce (SC1)	NI	-	-	-	NI	-	NI	NI
Urr Water (SC1)	NI	-	-	-	NI	-	NI	NI
Lochar Water (SC1)	NI	-	-	-	NI	-	NI	NI
Newry (NI2)	NI				NI	-	NI	NI
Quoile (NI2)	NI				NI	-	NI	NI
Lagan (NI2)	NI				NI	-	NI	NI
Tot.Irish Sea catch.	35000						48400	1960-1990
Clyde (SC2)	NI	-	-	-	NI	-	4,000	NI
Awe (SC2)	NI	-	-	-	NI	-	NI	NI
Leven (Loch Lomond (SC	NI	-	-	-	NI	-	NI	NI
Ayr (SC2)	NI	-	-	-	NI	-	NI	NI
Irvine (SC2)	NI	-	-	-	NI	-	NI	NI
Kelvin (SC2)	NI	-	-	-	NI	-	NI	NI
Stinchar (SC2)	NI	-	-	-	NI	-	NI	NI
Doon (SC2)	NI	-	-	-	NI	-	NI	NI
Water of Girvan (SC2)	NI	-	-	-	NI	-	NI	NI
White Cart Water (SC2)	NI	-	-	-	NI	-	NI	NI
Garnock (SC2)	NI	-	-	-	NI	-	NI	NI
Etive (SC2)	NI	-	-	-	NI	-	NI	NI
Eachaig (SC2)	NI	-	-	-	NI	-	NI	NI
Black Cart Water (SC2)	NI	-	-	-	NI	-	NI	NI
Gryfe (SC2)	NI	-	-	-	NI	-	NI	NI
Add (SC2)	NI	-	-	-	NI	-	NI	NI
Lochy (SC2a)	NI	-	-	-	NI	-	5,400	NI
Ewe (SC2a)	NI	-	-	-	NI	-	NI	NI
Shiel (SC2a)	NI	-	-	-	NI	-	NI	NI
Leven (Lochaber) (SC2a)	NI	-	-	-	NI	-	NI	NI
Morar (SC2a)	NI	-	-	-	NI	-	NI	NI
Inver (SC2a)	NI	-	-	-	NI	-	NI	NI
Carron (Wester Ross (SC	NI	-	-	-	NI	-	NI	NI
Gruinard (SC2a)	NI	-	-	-	NI	-	NI	NI
Broom (SC2a)	NI	-	-	-	NI	-	NI	NI
Kirkaig (SC2a)	NI	-	-	-	NI	-	NI	NI
Ling (SC2a)	NI	-	-	-	NI	-	NI	NI
Laxford (SC2a)	NI	-	-	-	NI	-	NI	NI
Abhainn Ghriomarstaidh (	NI	-	-	-	NI	-	NI	NI
Aline (SC2a)	NI	-	-	-	NI	-	NI	NI
Loch Linnhe (SC2a)	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
Tot.Atlantic catchm.	42000						49700	1960-1990

Annex 2: Suggestions for clarifying the use of the concepts of "unmonitored area" and "tributary river" under the RID Principles

The following suggestions provide a starting point for any further considerations on improving the RID data reporting on unmonitored areas and tributary rivers under the RID Principles.

1. Unmonitored areas/Areas not monitored:

Unmonitored areas include all areas *not* upstream from a RID sampling point.

This may include the following three main areas:

- areas downstream from the sampling point in monitored rivers;
- coastal unmonitored areas, cf. attached figure;
- the catchment areas of all unmonitored rivers (i.e., rivers without a RID sampling station).

The most important issue should be transparency on the use of the concept of "unmonitored area". This could be achieved by Contracting Parties including in their RID data reporting an explanation on how loads from each area are estimated. It is also important to bear in mind that some CPs monitors rivers on the borders of the next county.

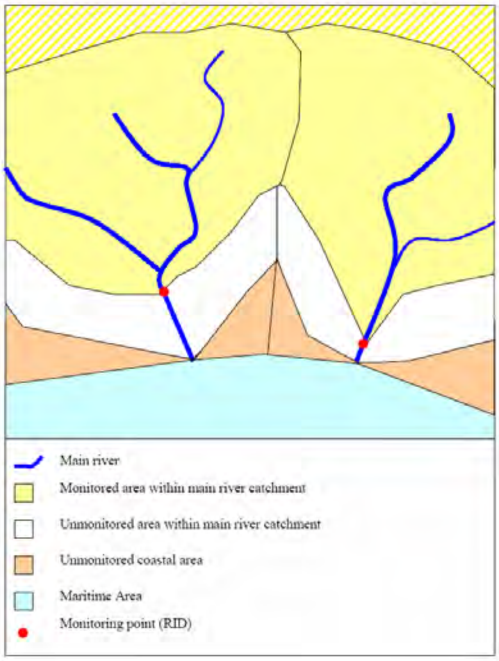

Figure 1. Illustration of two of the different types of unmonitored areas (illustration from the HARP-NUT Guideline 1 (reference number 2004-2)) In addition to this, the catchments of unmonitored rivers are included in the overall concept of unmonitored areas.

2. Tributary rivers

The analysis of the RID 2005 data revealed that Contracting Parties define the concept of tributary rivers differently. One suggestion towards a more consistent use of the concept of "tributary river" could be to define monitored rivers according to sampling frequency. Thus, rivers monitored monthly or more often could be "main rivers"; whereas rivers monitored less frequently could be labelled "tributary rivers".

Annex 3: Calculation of Loads

This Annex details the different load calculation practices reported by Contracting Parties in their RID text reports in 2005.

1. BELGIUM

1.1 Main Rivers

Whenever measurements lower than the detection limit were reported in the original data series for a given determinand, the minimum value is then labeled “ND” (not detected). This way account is given for the uncertainty about the exact value of this minimum. The same reasoning with respect to the reported maximum value is applied when no one measurement in the original data serie exeeds the detection limit for a given determinand. That value is than equally labeled “ND”.

For the calculation of the standard deviation of the sets of determinand concentrations, all concentrations lower than the detection limits were taken as half the value of the detection limits**.** When more than 30% of the measurements for a determinand were beneath the detection limit, no calculation for this parameter was made and the value reported is “NI” (No Information).

<u>Coastal Area</u>

For the second time since Belgium reports to OSPAR, monitored flow rates were used to calculate the inputs via the IJzer river. As a consequence, the formula proposed under point 5.11 of the “Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID)” was used again:

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

Where:

Qr is the mean flow rate for 2005

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

Ci is the concentration measured in sample i

<u>Scheldt estuary</u>

The flow rates for the Scheldt were calculated on the basis of the fresh water flow at the upstream measuring station “Schelle”, corrected with an empirical factor. This factor comprises corrections for downstream lateral drainage and for the actual water balance of the Antwerp harbor.

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 2005

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

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 to be situated 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.

1.2 Tributary Rivers

For the calculation of the standard deviation of the sets of determinand concentrations, all concentrations lower than the detection limits were taken as half the value of the detection limits. When more than 30% of the measurements for a determinand were beneath the detection limit no calculation for this parameter was made and the value reported was “NI” (No Information).

Coastal Area

Again, monitored flow rates were used to calculate the inputs via the Gent-Oostende canal. As a consequence, the same formula as mentioned for the main rivers, above, was used (i.e. formula proposed under point 5.11 of the “Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID)”) was used for this tributary only:

As in former years, due to the lack of flow rate data, the inputs of the other tributaries 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)”:

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

Where:

Qr is an estimated LTA flow rate

Ci is the concentration measured in sample i

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 Gent-Terneuzen canal were obtained from : Waterwegen en Zeekanaal NV Afdeling Bovenschelde Nederkouter 28, 9000 Gent Belgium. The loads of the Gent-Terneuzen canal were calculated using the above mentioned formula proposed under point 5.11 of the “Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID)”.

3. DENMARK

The total riverine inputs includes loads from the unmonitored part of monitored catchments and the unmonitored rivers including discharges from point sources in the catchment areas to surface waters. The totals to coastal waters therefore include all land based inputs that are not direct discharges.

The diffuse riverine loads from unmonitored areas are calculated by multiplying flow-weighted concentrations with a specific discharge and the size of the unmonitored catchment. Flow-weighted concentrations and specific discharges are selected from catchments with similar soil types, land-use, geology and climate, and with small inputs from point sources. Furthermore, loads from point sources are added to the calculated diffuse riverine load, yielding the total loads from unmonitored areas. The loads from point sources in unmonitored areas are in fact based on measured values of loads from point sources, as these areas are only unmonitored with respect to the riverine load.

Furthermore, the total riverine loads to coastal waters include direct loads from storm water overflow and scattered dwellings, but these sources are of minor importance.

4. FRANCE

4.1 Rivers

We used Rtrend software to calculate all the inputs. Water quality and runoff data are stocked in the Rtrend ADS base. We usually used CM2 or CM4 method for main rivers and largest tributaries (with 12 measures per year at least). But for most of micropollutants, too less data where available, so that we usually used CM2 Rtrend method. For each parameter, each zone and each year (2004 and 2005), we detailed number of measurements and chosen method in joined annexe1.

All the OSPAR recommendations where followed, and the localisation of main rivers monitoring stations have been done in non influenced zone. The part of the river above the monitoring station is considered as a OSPAR coast.

4.2 Sewage Effluents

Data about sewage effluents are not at present available.

4.3 Industrial and fish-farming Effluents

Data about industrial and fish-farming effluents are not at present available.

4.4 Unmonitored areas

We estimated inputs in referring to similar monitored areas (similar soils nature and occupation) as in precedent reporting.

5. NETHERLANDS

5.1 Rivers

For Noordzeekanaal, IJsselmeer and Haringvlietsluizen 12-13 samples per year. For Maassluis 24-25 samples per year. Loads calculated following each flow weighed concentration method. Calculations for PCBs are not included due to lack of measurements.

Tributary rivers : Because of discontinue flow of pumping-stations and sluices the loads have been determined with the right-towards-right-on method. The yearly load is calculated as the product of yearly average flow-rate and the yearly average concentration. This method is by the i-Bever user-manual recommend for this type of discharge points. There is dealt similarly with detection limits as by the OSPAR-method (literature: Klaver, H. en A. De Vries (1993). Vrachtberekeningsmethoden. Een casestudy voor Maas en Rijn. Werkdocumentnummer: GWWS-93.111X /RIZA93.021X.; i-Bever (2004). Gebruikers handleiding vrachten. Versie 1.6 Mei 2004, Rijkswaterstaat RIZA)

5.2 Wastewater and industrial effluents

- Method: Product of annual flow and flow-weighted concentration
- There are no measurements of PCBs and lindane in sewage effluents. There is only an estimate of the total national figure of PCBs and lindane in all sewage effluents available, with no further distinction to single effluents or catchments. As the total figure for sewage effluents is already very low (γ-HCH < 0.07 kg/yr, PCBs < 0.0007 kg/yr), the contribution of that part of sewage effluents that is discharged directly into the sea is negligible compared to the riverine inputs.

There are no measurements of SPM in industrial effluents because of problems with the database. Therefore the loads of previous year have been replicated.

6. NORWAY

6.1 Rivers

The formula given by the Paris Commission is used for calculating loads for all of the 46 rivers (main river sand tributaries):

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

Ci = measured concentration in sample *i*

Qi = corresponding flow for sample *i*

Qr = mean flow rate for each sampling period (i.e., annual flow)

N = number of samples taken in the sampling period

Essentially the formula expresses the annual load (L) as the product of a flow-weighted estimate of annual mean concentration and annual flow (Qa).

- For the remaining 109 rivers (rivers monitored once a year in the period 1990-2003), the calculation of loads is done as follows:
- For nutrients, S.P.M, Silica and TOC, the modelled average water discharge in 2004 was multiplied with average concentration for the period 1990-2003.
- For metals, the modelled average water discharge in 2004 was multiplied with average concentration for the period 2000-2003 (earlier data were not used due to high detection limits).

For the remaining area (includes those 92 remaining rivers that drain to the sea, but not included in either this or former RID studies; as well as areas downstream of the sampling points) the nutrient loads were calculated by means of the TEOTIL model. For metals, all discharges of metals from industry in these areas were considered to be direct discharges to the sea.

6.2 Direct discharges below monitoring points

With regard to nutrients Norway uses the TEOTIL model as a tool to assemble pollution load compilations of nitrogen and phosphorus in catchments or groups of catchments. The model estimates annual loads of phosphorus and nitrogen based on national statistical information on population, effluent treatment, industrial and agricultural point sources. Losses from agricultural fields and natural run-off from forest and mountain areas are based on an export coefficients approach.

TEOTIL was used for estimating the losses of nitrogen and phosphorus downstream RID monitoring points to Norwegian coastal waters in 2005 for all the 247 rivers.

Direct discharges of nutrients and heavy metals from sewage treatment plants downstream RID monitoring points are reported to Statistics Norway each year. Reporting form industry on nutrients and heavy metals is yearly to the Norwegian Pollution Control Authority.

7. SPAIN

7.1 Main Rivers

Measurement and calculation of riverine inputs data in Spain is carried out by the different River Basin Districts and Autonomous Communities (Regions). Therefore, methodologies change from one discharge area to another, and also within the same discharge area, as different laboratories perform the analyses. However, some general comments can be extracted.

Pais Vasco discharge area: the method used for the calculation of the annual load is the one described in paragraph 5.12 of the principles.

Guadiana, Guadalquivir and Galicia Costa: the method used is the one described in paragraph 5.11 of the principles. For the rest, the load has been calculated as the product of the best estimation of the annual flow and the annual mean concentration.

For the Guadiana discharge area loads of heavy metals from Odiel and Tinto have not been taken into account due to high natural concentrations that could distort the assessment of trends.

The basic sampling frequency is 12 samples a year, but it differs for each discharge area and parameter

For Norte River Basin District the concentrations of considered pollutants have been obtained by 12 analyses corresponding to every month of a year period.

7.2 Tributaries

Measurement and calculation of riverine inputs data in Spain is carried out by the different Autonomous Communities (Regions). Therefore, methodologies change from one discharge area to another, and also within the same discharge area, as different laboratories perform the analyses. However, some general comments can be extracted. NORTE I, II y III: The concentrations of pollutants were taken from monthly analysis. The methods used are the same that the ones presented in the table in D.1. The estimation of the annual load have been obtained using "expression 1" of the principles

7.3 Wastewater

Measurement and reporting of direct discharges data in Spain is carried out by the different Autonomous Communities (Regions). Therefore, methodologies change from one discharge area to another, and also within the same discharge area, as different laboratories perform the analyses. However, some general comments can be extracted.

There are basically four data sources for flow calculations: annual discharge declarations provided by sewage plant managers, discharge permits issued, official discharge registries based on direct measurement from sewage plants (performed daily, weekly or monthly depending on the plant), and population estimations (taking into account seasonal population variations).

For concentration values, data sources are: annual discharge declarations provided by sewage plant managers, laboratory measurements from samples of sewage effluents and other direct discharges, estimations based on RID methodology or on historical studies, and different detection limits depending on the lab analyses.

7.4 Industrial effluents

The sources of information for industrial effluents are: the industries' discharge declarations, regional discharge registries, direct control measurements, discharge permits, concentration values from previous years when effluents were similar and data were not available, and fixed values when measurements were below detection limits. The number of samples varies among different discharge sites.

8. SWEDEN

8.1 Rivers

Concentrations have been linearly interpolated and multiplied by daily flow values obtained from measurements.

Area losses are calculated for representative small rivers and applied to other small rivers and coastal areas

8.2 Wastewater

Water flow is measured continuously. Total N, Total P, BOD7 and CODCr are sampled (in proportion to flow) 12 – 52 times annually. Metals are sampled 1 – 12 times annually, on the biggest plant even 52 times. In computing annual emissions, concentrations are weighted by relevant water amounts. Estimated stormwater overflows at the plant have been added. For Cd and Hg, emission estimates are believed to be uncertain since most concentration measurements are probably below the limit of detection.

8.3 Industrial effluents

Varies among industries. Emissions are generally reported above certain threshold values, mostly well below those applied in the EPER register. Water flows are often not reported. A few facilities discharge very large (unreported) water amounts, mostly cooling water

8.4 Unmonitored areas

The load from unmonitored areas downstream monitoring sites are quantified by the area specific loss from the monitored parts, and the loads are included in the amounts given for the monitored areas. Generally, the monitored parts of the rivers cover some 95-100% of the total areas. Though, there are two exceptions Rivers Enningdalsälven and Rönneån covers only 80 and 51 %, respectively, of the total areas.

9. IRELAND

At present, only flow calculations are available for us on the Irish calculation methodology: The flow at time of sampling is recorded and used to calculate a flow-weighted value for each parameter. These values are extrapolated using the continuous flow recordings to give an estimate of loading to the sea throughout the year.

10. UNITED KINGDOM

Both of the formulae recommended by RID were used for calculating loads. The first formula requires the mean annual flow rate for a river and was used in some parts of Scotland where continuous flow records were available. In England and Wales and in western Scotland, the second formula was used. Best available estimates for flow were used for some smaller rivers with no gauging stations.

The aim of the survey, as in earlier years, has been to achieve at least 90% coverage of the overall inputs from the UK. As with earlier years, the total inputs reported have not been proportioned up to give a 100% estimated value. This means that the results reported are consistent with the estimates reported for earlier years. Because of the location of the monitoring stations, riverine inputs cover some 80% of the landmass. As direct inputs account for all significant inputs downstream of the riverine monitoring stations, it is considered that, overall, the 90% coverage target has been met. Some work is currently underway to check coverage in some less populated areas of the UK.

11. GERMANY

11.1 Rivers

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

Elbe:

$$L = \frac{Qr \cdot \sum_{i=1}^{n} (ci \cdot Qi)}{\sum_{i=1}^{n} (Qi)}$$

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:

$$L = \frac{\sum_{i=1}^{n} (ci \cdot Qi)}{n}$$

11.2 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 measurement site Farge. When the tide is outgoing (ebb stream) the RID measurement site Farge must be regarded as being located distinctly upstream of 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.

11.3 Sewage Effluent

For the **Elbe,** direct 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 (based on 4 to 8 2-hour-mixed-samples) were used to determine the inputs of the major dischargers. Inputs of minor dischargers are estimates. The loads of **Weser** downstream of the measurement sites for riverine inputs and those of the **Jade** are estimates based on population equivalents. Direct discharges to the **Ems** downstream of the measurement site for riverine inputs are partly measured (major discharges), partly estimated. Estimates for the **Eider** are included in the riverine inputs.

11.4 Industrial Effluents

For the **Elbe,** all direct 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. Input figures for small discharges are based on estimates. The loads of direct industrial discharges to **Weser** and **Ems** downstream of the measurement sites for riverine inputs and those of the **Jade** are estimates. Estimates for the **Eider** are included in the riverine inputs.

11.5 Unmonitored areas

Within the Eider catchment area the loads of the unmonitored part of the catchment area were determined by extrapolating the loads of the monitored parts of the catchment area.

Annex 4: Quality Assurance

1. Introduction

1.1 RID Principles

In general, the RID Principles (OSPAR agreement 1998-5, update 2005) should ensure that important QA issues are handled correctly by each Contracting Party, and the RID programme results should be such as to allow comparison between countries.

However there are a number of QA issues that need to be considered commonly. These are issues linked to:

- data quality as such;
- harmonisation and transparency in procedures, principles applied;
- reliability (methods in measurements, analyses, uncertainty);
- comparability of results, of procedures and tools;
- sufficient resource allocation per country to reach required common goals.

and how this should be achieved amongst CPs.

Issues linked to detection limits and analytical methods, technology linked to automatic monitoring stations-or increased sampling frequency (e.g. event based sampling) are ‘cost driven’.

1.2 Uncertainty

A number of questions can also be raised under the ‘chapeau’ of data uncertainty, viz.:

- Why is an awareness of uncertainty essential in evaluating our state of knowledge about environmental variables/systems?
- How can information on uncertainty be obtained in the first place and what are the problems encountered?
- How can this information be organised and used in a way that is useful for answering practical questions about the sufficiency and accuracy of results?
- Uncertainty at all levels of data gathering and ’data manipulation’
- What is ’acceptable’ uncertainty for water managers, for countries, for OSPAR?

Countries should try to assess the uncertainty of the results that they accept, or phrased in a different way, costs and benefits of more accurate data should be assessed and be clear to everybody.

2. Issue important in QA and uncertainty frameworks

2.1 Overall

A riverine input is a mass of a determinand carried to the maritime area by a watercourse (natural river or man-made watercourse) per unit of time. The objective of the water sampling, analyses and quantification process is to obtain as accurate as possible an estimate of the input load of the RID parameters to coastal waters, and to obtain information on the long-term trends in inputs where such information might provide an additional or a better basis for a trend assessment.

2.2 Selection of rivers

PARCOM requirements to measure 90 % of the load

Most difficult for countries with hundreds of rivers (e.g. Denmark, UK and Norway, as all cannot for practical reasons be monitored).

In case of unmonitored rivers, issues for QA are:

- *Transferability of results from none monitored river to a river with similar hydrological-chemical regime*
- *Modelling*

2.3 Sampling Strategy

Importance of agreed Sampling Protocol, same procedures for everybody

Trained workers (often best to have local staff, they will easily recognise changes and abnormal variations in the rivers, and they will also be able to take action if any unforeseen events occur.

Quick and safe transfer of samples to laboratory

2.3.1 Sampling Frequency

Cost driven, you will probably never get too many samples. There are few, if any, sensors that can analyse RID parameters continuously. Monitoring effort should be directed towards the rivers with the highest input loads, if not all rivers are monitored.

Insufficient sampling frequency is obviously a problem amongst some CPs (c.f. INPUT 07/3/1).

2.3.1 Site Selection

The sites should be located in regions of unidirectional flow (no back eddies). In order to ensure as uniform water quality as possible, sites where the water is well mixed should be chosen, such as at or immediately downstream a weir, in waterfalls, rapids or in channels in connection with hydroelectric power stations. Sampling sites should be located as close to the freshwater limit as possible, without being influenced by seawater (issue of ‘unmonitored areas’!).

Contracting Parties need to report distance from sea, and any problems with seawater intrusion. Linked to problem of quantification of loads from ‘unmonitored areas’.

2.4 Chemical parameters – detection limits and analytical methods

2.4.1 Appropriate analytical method

The RID principles state that it is necessary to choose an analytical method, which gives at least 70 % of positive findings (i.e. no more than 30% of the samples below the detection limit). The detection limit should be at least as low as the limits adopted by OSPAR in 2005.

The detection limit issue is clearly a considerable problem both within countries and for comparison of results, (c.f. INPUT 07/3/1 and INPUT 07/3/17).

2.4.2 Selection of laboratory

Optimally the same accredited laboratory should be used for all rivers within a country. If this is not possible, intercomparison of results should take place. In cases of changes of laboratories, over time intercomparison should be carried out during a certain ‘transfer of responsibility period’.

Most likely a problem in several countries both in terms of using several laboratories, and in cases where laboratories have changed in the period 1990 to date.

2.4.3 QA of data

Technical QA to be performed by laboratory staff to ensure that the technical aspects of the analysis have been appropriate.

Historical QA, monitoring results checked against historical data by qualified researchers with experience in assessing water quality data. This should be done as soon as possible after analysis so whenever anomalies are found, the samples can be re-analysed.

Trend analysis QA, long time-series e.g. 15 years, and possibly no data gaps will allow trend analysis to be undertaken. In addition to really giving an indication as to whether there is an upward or downward trend in concentrations/loads, it can also point to possible errors in data.

Proper trend analyses may be difficult to undertake in many cases, but is ideally an important tool for the forthcoming RID assessment.

2.5 Load calculations

2.5.1 Rivers

The formula given by the RID Principles should be used for calculating loads for all of the rivers (the annual load expressed as the product of a flow-weighted estimate of annual mean concentration and annual flow).

The issue of how to handle concentrations below detection limit (upper and lower estimates) needs to be clarified (upper equals detection limit, lower equals zero or half of detection limit?).

2.5.2 Areas below RID sampling point and unmonitored catchments

The HARP Guidelines or equivalent principles should be applied to calculate loads from:

- Municipal wastewater and scattered dwellings
- Aquaculture
- Industry
- Losses from urban areas

It is in that respect important to include as many (optimally all) WWTPs and industrial plants. The latter may, in many catchments and countries, introduce underestimation as monitoring only takes place for licensed discharges. Furthermore, *sampling frequency at industrial plants may be insufficient.*

Losses from urban areas may be underestimated or not taken account of at all. They may represent a large source of underestimation of inputs as many large cities are close to the sea.

With regard to diffuse losses, there are no common methodology, neither in HARP-NUT Guideline 6 (which deals only with N and P), nor is it an outcome of the recently finalised EUROHARP project. *Some countries have their own models for quantifying diffuse losses of nutrients, but in many cases data unavailability, accuracy and reliability introduce considerable errors in loads.*

The problem is probably even larger for diffuse losses of heavy metals. The issue of comparability of results between countries is in this case probably even more important than for riverine loads.

Addendum 1: National Reports on Riverine Inputs and Direct Discharges to Convention Waters during 2005

1. Belgium
2. Denmark
3. France
4. Germany
5. Ireland
6. Netherlands
7. Norway
8. Spain
9. Sweden
10. United Kingdom

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.

Table 4b, where provided, gives the total of riverine inputs and direct discharges country by country broken down by sea area.

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

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

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

Table 8 gives information concerning the analytical detection limits of determinands.

Table 9 gives, 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.

1. Belgium

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 by Belgium

Annual report on riverine inputs and direct discharges by Belgium to Convention waters during the year 2005

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

Federal Office for Scientific, Technical and Cultural Affairs

MUMM

Gulledelle 100

Tel: +32 2 773 21 21

Fax: +32 2 770 69 72

Email: m.moens@mumm.ac.be

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, sub-area and discharge area[1]	Nature of the receiving water[2]
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 (Tables 4a and 4b) for the year: 2005

Note: Table 4b is total direct discharges and riverine inputs to maritime area by region. Please provide totals for each OSPAR region and for total inputs.

B.1 Give general comments on the total riverine inputs and direct discharges (e.g. changes from last year, trends, percentage of particle bound determinand, results that need to be highlighted etc.):

The total flow rate is not significantly different from that in 2004, hence nutrient discharges are quite comparable with those for that preceding year. Lindane inputs have more or less doubled compared to 2004. Heavy metal discharges are more related to suspended matter discharges. Mercury, copper and lead discharge levels are quite comparable during the last three years, while there is a slight increase for Mercury and a notable decrease for cadmium and Zinc.

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

C. Direct discharges for the year: 2005

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 (cf. section 7 of the RID Principles), including for those under voluntary reporting:

No sewage effluents are discharged directly to Belgium's convention waters.

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the RID 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):

C.3 Give general comments on the discharges of sewage effluents (e.g. compared to previous years, and/or extent to which industrial effluents are discharged through sewerage systems):

Industrial Effluents (Table 5b)

C.4 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 7 of the RID Principles), including for those under voluntary reporting:

No industrial effluents are discharged directly to Belgium's convention waters.

C.5 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

C.6 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 storm water overflows discharge to Convention Waters under Belgian jurisdiction.

C.7 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):

C.8 Give general comments on industrial effluents (e.g. compared to previous years):

Total direct discharges (Table 5c)

C.9 Give general comments on total direct discharges (e.g. compared to previous years):

There are no longer direct discharges to Belgian convention waters since 1996.

D. Riverine inputs for the year: 2005

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 6 of the RID Principles), including for those under voluntary reporting:

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

For table 7 the following observations are to be noted.

Whenever measurements lower than the detection limit were reported in the original data series for a given determinand, the minimum value is then labelled "ND" (not detected). This way account is given for the uncertainty about the exact value of this minimum. The same reasoning with respect to the reported maximum value is applied when no one measurement in the original data series exceeds the detection limit for a given determinand. That value is than equally labelled “ND”.

For the calculation of the standard deviation of the sets of determinand concentrations, all concentrations lower than the detection limits were taken as half the value of the detection limits**.** When more than 30% of the measurements for a determinand were beneath the detection limit, no calculation for this parameter was made and the value reported is “NI” (No Information).

Coastal Area

For the second time since Belgium reports to OSPAR, monitored flow rates were used to calculate the inputs via the IJzer river.

Source of data: HIC - Hydrologisch Informatiecentrum MVG - LIN - AWZ - WLH Berchemlei 115, 2140 Borgerhout Belgium.

As a consequence, the formula proposed under point 5.11 of the “Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID)” was used again:

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

Where:

Qr is the mean flow rate for 2005

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

Ci is the concentration measured in sample i

Scheldt estuary

The flow rates for the Scheldt were calculated on the basis of the fresh water flow at the upstream measuring station “Schelle”, corrected with an empirical factor. As was explained in the 2001 submission report, this factor comprises corrections for downstream lateral drainage and for the actual water balance of the Antwerp harbour.

Source of data: Flemish Region, Departement Mobiliteit en Openbare Werken, Waterbouwkundig Laboratorium Berchemlei 115 2140 Borgerhout Belgium.

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 2005

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

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 to be situated 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):

Concentration measurements are always made in raw water samples. Consequently these values are considered to be total concentrations and no estimates or measurements with respect to the matrix (filtered water or suspended matter) are available.

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):

Other determinands available for the **IJzer River** are:

Ni t, Sn t, 123CPa, 12CEa, 2346CFol, 26CFol, 3CFol, TBMa, B(ghi)Pe, 2C4tByFol, EndoS, Endr.al, 44DDT, Telodrin, Dsulfoton, PCB 138, PCB 49, Demeton-S, Ffamidon, Alachlor, Picarb, BI, Al t, Be t, Cr t, 135MyBz, 1122CEa, 124CBz, 135CBz, 13CBz, 13CPa, c13CPe, 35CFol, DBCMa, IP, sByBz, 4MyFol, 2EyFol, c12CEe, 2C5MyFol, 24BrFol, 245-T, 24-DP, HpC, HCBz, MCPP, Diuron, DCvos, Demeton-O, Ethion, 1234CBz, Mbromuron, O2 sat, F-, Co t, Mo t, 24MyFol, iPyBz, PCFol, 235CFol, 236CFol, TtCEe, Chr, DiPyatraz, Dmetoat, Cumafos, Ioxynil, 2356CNiBz, Heptfos, 1235CBz, DCMa, SO4=, P t, Mn t, 2356CFol, 23CPe, 2CFol, 4CFol, Fen, Naft, PyBz, Ca t, B(e)P, 24DDE, 44DDE, Simaz, Terbutryn, Triazofos, Tfluralin, tCdane, TclofosMy, B t, Fe t, V t, COD, 111CEa, 12CBz, 24CFol, 4C3MyFol, HCEa, Acenaft, B(b)Flu, 12BEa, Te t, DBMa, nByBz, 2iPyFol, 35MyFol, Perylene, 4C2BzyFol, aHCH, 24DDT, 2345CNiBz, Propaz, Mevinfos, Sebutylaz, cCdane, CpfosMy, Cdazon, PCB 169, Carbdzim, pH, Cl-, NO2-, Ba t, 1112CEa, TCEe, Flu, 124MyBz, tByBz, Mg t, 2FyFol, 2BzyFol, Dieldrin, bEndo, 44DDD, Iproturon, Ethopfos, Bentazone, PirfosMy, Hexazinon, Prochlor, PCBz, Dinoterb, Clfyl a, Benzene, 112CEa, t13CPe, 234CFol, 2CTol, 345CFol, 3CTol, BDCMa, B(a)A, B(k)Flu, U t, 4EyFol, 23MyFol, 34MyFol, Endrin, cHpCEpx, 24DDD, Mlinuron, 1245CBz, Fenthion, As t, Ti t, oXyl, Toluene, 123CBz, 12CPa, 2345CFol, 34CFol, TCMa, Fluorene, Pyr, 2MyFol, 235MyFol, t12CEe, 24NiFol, MCPA, mBthiaz, AzinfosEy, Bromoxyn, 2hAtraz, Terbufos, T, H t, Sb t, Fe o, BOD5, 245CFol, Ant, B(a)P, BCMa, piPyTol, 3EyFol, 26MyFol, 25CFol, Metola, DEyatraz, Metoxur, Malathion, MCPB, PathionMy, Desmetryn, Prometryn, Diazinon, Na t, Ag t, 11CEa, 23CFol, 246CFol, 3CPe, 4C2MyFol, 4CTol, TtCMa, dBz(ah)An, 112CTFEa, 3MyFol, K t, DNOC, Propanil, Aldrin, Ctoluron, Cyanaz, AzinfosMy, Fenithion, Cprofam, 24-DB, Cfvinfos, Methidat, Dinoseb, Glyfosaat, Demeton-S-My, Cd t, Cu o, Mn o, Se t, Tl t, EyBz, mpXyl, 14CBz, CBz, Acenaftyl, BBz, Fol, 25MyFol, 4C35MyFol, Metaza, 24-D, aEndo, HCBdn, bHCH, Isodrin, MxyC, Atraz, Linuron, TrByaz, Benazolin, PCB , 1, PathionEy, BrfosEy, CpfosEy, PCB 170, AMPA, Carbaryl, Fonofos

For the **Scheldt River** other available determinands are:

EC 20, O2, Ni t, Sn t, EndoS, Endr.al, 44DDT, Telodrin, 123CPa, 12CEa, TBMa, B(ghi)Pe, PCB 49, Cr t, Al t, Be t, 135MyBz, HpC, HCBz, 1122CEa, 124CBz, 135CBz, 13CBz, 13CPa, c13CPe, DBCMa, IP, sByBz, c12CEe, 1234CBz, F-, O2 sat, Co t, Mo t, iPyBz, TtCEe, Chr, 2356CNiBz, 1235CBz, DCMa, SO4=, Mn t, 24DDE, 44DDE, 23CPe, Tfluralin, Fen, Naft, tCdane, PyBz, Ca t, B(e)P, B t, Fe t, COD, V t, Styrene, aHCH, 24DDT, 2345CNiBz, 111CEa, 12CBz, HCEa, Acenaft, B(b)Flu, 12BEa, Te t, cCdane, DBMa, nByBz, PCB 169, Perylene, Cl-, pH, Ba t, Dieldrin, bEndo, 44DDD, 1112CEa, TCEe, Flu, 124MyBz, tByBz, Mg t, PCBz, Clfyl a, Benzene, Endrin, cHpCEpx, 24DDD, 112CEa, 1245CBz, t13CPe, 2CTol, 3CTol, BDCMa, B(a)A, B(k)Flu, U t, As t, Ti t, oXyl, Toluene, 123CBz, 12CPa, TCMa, Fluorene, Pyr, t12CEe, T, Sb t, BOD5, Ant, B(a)P, BCMa, piPyTol, Na t, Ag t, Aldrin, 11CEa, 3CPe, 4CTol, TtCMa, dBz(ah)An, PCB 180, PCB 153, 112CTFEa, K t, Se t, Tl t, EyBz, mpXyl, aEndo, HCBdn, bHCH, gHCH, Isodrin, MxyC, 14CBz, CBz, PCB 31, Acenaftyl, BBz, PCB 170

D.4 Give general comments on the inputs from main rivers (e.g. significant changes in inputs, concentrations and flows compared to previous years):

IJzer river

The mean flow rate for this year is 50% of the LTA and 78% of it's value for 2004. Significantly higher inputs than in 2004 were monitored for cadmium, mercury and copper, lower figures for lead and zinc nevertheless. A threefold higher suspended matter load compared to 2004 could explain the increase for the first three metals. Lindane input level on the other hand has not significantly changed. Total nitrogen input decreased by 60% while total phosphorus input did not change significantly.

Scheldt river

The mean flow rate for 2005 was only slightly lower compared to 2004. Heavy metals inputs are around 50% lower than in 2004, a fact partially explained by some 22% lower suspended matter loads. Nutrients inputs are not significantly different.

Tributary Rivers (Tables 6b and 7b)

D.5 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 6 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 determinand.

For table 7 the following observations are to be noted.

Whenever measurements lower than the detection limit were reported in the original data series for a given determinand, the minimum value is then labelled "ND" (not detected). This way account is given for the uncertainty about the exact value of this minimum. The same reasoning with respect to the reported maximum value is applied when no one measurement in the original data series exceeds the detection limit for a given determinand. That value is than equally labelled "ND".

For the calculation of the standard deviation of the sets of determinand concentrations, all concentrations lower than the detection limits were taken as half the value of the detection limits. When more than 30% of the measurements for a determinand were beneath the detection limit no calculation for this parameter was made and the value reported was "NI" (No Information).

Coastal Area

Again, monitored flow rates were used to calculate the inputs via the Gent-Oostende canal.

Source of data: HIC - Hydrologisch Informatiecentrum MVG - LIN - AWZ - WLH Berchemlei 115, 2140 Borgerhout Belgium.

As a consequence, the formula proposed under point 5.11 of the "Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID)" was used for this tributary only:

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

Where:

Qr is the mean flow rate for 2005

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

Ci is the concentration measured in sample i

As in former years, due to the lack of flow rate data, the inputs of the other tributaries 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

Ci is the concentration measured in sample i

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 Gent-Terneuzen canal were obtained from : Waterwegen en Zeekanaal NV Afdeling Bovenschelde Nederkouter 28, 9000 Gent Belgium.

The loads of the Gent-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 2005, 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

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

D.6 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

Concentration measurements for the Ghent Terneuzen canal are always made in raw water samples. Consequently these values are considered to be total concentrations and no estimates or measurements with respect to the matrix (filtered water or suspended matter) are available.

D.7 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):

Determinands available for the **Gent-Terneuzen canal,** the **Gent-Oostende canal,** the **Leopold canal** and the **Schipdonk canal** are**:**

Ni t, Sn t, 123CPa, 12CEa, TBMa, B(ghi)Pe, EC 20, O2, Demeton-S, 4nOyFol, 2346CFol, 26CFol, 3CFol, 2C4tByFol, EndoS, Endr.al, 44DDT, Telodrin, Dsulfoton, PCB 49, Ffamidon, Alachlor, Picarb, BI, Al t, Be t, Cr t, 135MyBz, 1122CEa, 124CBz, 135CBz, 13CBz, 13CPa, c13CPe, DBCMa, IP, sByBz, c12CEe, Demeton-O, Methamfos, 35CFol, 4MyFol, 2EyFol, 2C5MyFol, 24BrFol, 245-T, 24-DP, HpC, HCBz, MCPP, Diuron, DCvos, Ethion, 1234CBz, Mbromuron, F-, Co t, Mo t, iPyBz, TtCEe, Chr, O2 sat, Foxim, 4nPyFol, 24MyFol, PCFol, 235CFol, 236CFol, DiPyatraz, Dmetoat, PCB 101, Cumafos, Ioxynil, 2356CNiBz, Heptfos, 1235CBz, DCMa, SO4=, Mn t, 23CPe, Fen, Naft, PyBz, Ca t, B(e)P, 2356CFol, 2CFol, 4CFol, 24DDE, 44DDE, Simaz, Terbutryn, Triazofos, Tfluralin, PCB 28, tCdane, TclofosMy, B t, Fe t, V t, Styrene, COD, 111CEa, 12CBz, HCEa, Acenaft, B(b)Flu, 12BEa, Te t, DBMa, nByBz, Perylene, 4tPyFol, 24CFol, 4C3MyFol, 2iPyFol, 35MyFol, 4C2BzyFol, aHCH, 24DDT, 2345CNiBz, Propaz, Mevinfos, cCdane, CpfosMy, Cdazon, PCB 169, Carbdzim, Sebutylaz, Cl-, Ba t, 1112CEa, TCEe, Flu, 124MyBz, tByBz, Mg t, pH, TCfon, 4tOyFol, 2FyFol, 2BzyFol, Clfyl a, Dieldrin, bEndo, 44DDD, Iproturon, Ethopfos, Bentazone, PirfosMy, Hexazinon, Prochlor, PCBz, Dinoterb, Benzene, 112CEa, t13CPe, 2CTol, 3CTol, BDCMa, B(a)A, B(k)Flu, U t, 234CFol, 345CFol, 4EyFol, 23MyFol, 34MyFol, Endrin, cHpCEpx, 24DDD, Mlinuron, 1245CBz, Fenthion, As t, Ti t, oXyl, Toluene, 123CBz, 12CPa, TCMa, Fluorene, Pyr, t12CEe, 4nNyFol, 2345CFol, 34CFol, 2MyFol, 235MyFol, 24NiFol, MCPA, mBthiaz, AzinfosEy, Bromoxyn, 2hAtraz, Terbufos, Sb t, BOD5, Ant, B(a)P, BCMa, piPyTol, Na t, T, 245CFol, 3EyFol, 26MyFol, 25CFol, Metola, DEyatraz, Metoxur, Malathion, MCPB, PathionMy, Desmetryn, Prometryn, Diazinon, Ag t, 11CEa, 3CPe, 4CTol, TtCMa, dBz(ah)An, 112CTFEa, K t, Demeton-S-My, 23CFol, 246CFol, 4C2MyFol, 3MyFol, DNOC, Propanil, Aldrin, Ctoluron, Cyanaz, AzinfosMy, Fenithion, Cprofam, 24-DB, Cfvinfos, Methidat, Dinoseb, Glyfosaat, Se t, Tl t, EyBz, mpXyl, 14CBz, CBz, Acenaftyl, BBz, Omethoaat, Fol, 25MyFol, 4C35MyFol, Metaza, 24-D, aEndo, HCBdn, bHCH, Isodrin, MxyC, Atraz, Linuron, TrByaz, Benazolin, PCB 31, PathionEy, BrfosEy, CpfosEy, PCB 170, AMPA, Carbaryl, Fonofos

For the **Vladslo vaart,** the **Langeleed and the Noordede** data for the following determinands are available:

Ni t, Sn t, EC 20, O2, BI, Al t, Be t, Cr t, Co t, Mo t, O2 sat, Mn t, Ca t, B t, Fe t, V t, COD, Te t, Cl-, Ba t, Mg t, pH, Clfyl a, U t, As t, Ti t, H t, Sb t, Fe o, BOD5, T, Na t, Ag t, K t, Mn o, Se t, Tl t, Cu o

D.8 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in Tables 6b and 7b:

Tables 6b and 7b cover all of the inputs, including those from polder effluents. The only inputs that are not covered then are the natural diffuse seepages from a narrow fringe along the coast that go straight into the sea. These are not materially measurable and do not have to be covered in this reporting.

D.9 Give general comments on the inputs from tributary rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

The overall flow rate for 2005 for the tributaries in the coastal zone was nearly the same as in 2004. Before that year, flow rates for the coastal zone were only based on estimated LTA's. Since last year, flow rates for the Gent-Oostende kanal are monitored and used for input calculations. It follows that the overall flowrate used for input estimations for the tributaries in the coastal area is now a composite of measured values and estimated LTA's.

To be noted is a decrease in cadmium load, confirmed by better LOD's, the other heavy metal inputs being roughly comparable to those for 2004. Lindane inputs have slightly decreased but for nutrients there is no noticeable change. Suspended matter inputs went down to 60% of the 2004 level.

Total riverine inputs (Table 6c)

D.10 Give general comments on the total riverine inputs (e.g. significant change in inputs, concentrations and flows compared to previous years):

As there are no direct discharges in Belgium, the comment on the total riverine inputs is the same as the one formulated under point B1 for total direct discharges and riverine inputs.

E. Unmonitored areas

E.1 Describe the methods of quantification used for the different determinands or groups of determinands:

No unmonitored areas are comprised in the Belgian report as explained under D.8

F. Limits of detection (Table 8)

F.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Give comments if the detection limits are higher than stated in the RID Principles:

Information about the limits of detection given by the monitoring authority is partly inconclusive. In some cases the limits reported in table 8 follow from the measurements themselves, and not from the nominal information given by the measuring authority. For Hg, γ-HCH, PCB, total N and SPM, no nominal detection limits were given by the monitoring organism. When for these determinands all measurements were above the detection limit, then this limit could not be deduced. Values for these determinands are then reported “NI” (No Information).

As samples from the same locality sometimes have more than one detection limit throughout the year for the same determinand, it was necessary to mention 2 figures, the minimum and the maximum detection limits, in one field in text format. Whenever the limits given by the monitoring authority were lower than those appearing from the monitored series, these nominal limits were used.

Another fact to be stated is that some of those limits are rather high (e.g. Cd, Hg, Zn, Cu, Pb, γ-HCH, PCB, NH4, NO3). Consequently, very often more than 30% of the measurements are under those limits. When all measurements for a given determinand are beneath the limit of detection, there is no information about the lowest value measured, and the minimum values in table 7 are then 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).

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. This spread often largely hampers the interpretation of the year to year variability between input loads.

G. Additional comments

G.1 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

As already noted under the points B.1, D.1 and D.5, monitored flow rates for the IJzer river and the Gent-Oostende canal were available for the second time since reporting. As the inputs for these rivers were formerly calculated on the basis of the LTA’s, these actual flow data surely mark the time series. It is as yet not perceivable to what amount or extend these data will be of influence on trends to be calculated in the future.

Another fact to be noted is the narrowing of the detection limits spread for cadmium (0.06 – 0.6µg/l) and again the high spread in detection limits for zinc (2-13µg/l).

ANNEX A

Note that several of the queries listed below are closely related to the information asked for in the “Full text report”

Please provide information related to:

1. Compliance with RID Principles compulsory parameters, and explain (if appropriate) why one or several parameters have not been analysed

   All compulsory parameters are measured and reported.

2. Number of samples per river and year, time of sampling (date), and how the sampling is organised (e.g. same organisation that co-ordinates the sampling in all rivers, or not?)

   The number of samples is reported in table 7. A schedule with sampling dates and rivers is attached.

   One and the same organisation (VMM – Vlaamse Milieu Maatschappij) A. Van De Maelestraat 96, B-9320 Erembodegem co-ordinates the sampling and does the analyses for all rivers.

3. Which laboratory is/which laboratories are contracted for the RID analysis? This question is made in order to understand if discrepancies in results are related to differences in laboratory performance.

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

4. Data compilation and how (method applied for quantification) direct discharges/losses are taken account of

   Since 1996 there are no longer direct inputs in convention waters under Belgian jurisdiction.

5. How are the estimates of losses from unmonitored areas, including downstream RID sampling points[1] calculated and included in the total riverine inputs.

   The only areas that could be qualified as “unmonitored” in Belgium are situated in a very narrow (no more than a few hundred metres and mostly less) fringe along the coast. In those areas a seepage and diffuse runoff go straight into the sea. These are not materially measurable, of very little impact and do not have to be covered in the RID reporting. All other downstream areas and polders are covered by monitoring and thus quantified in RID.

6. Sampling for all RID monitoring points. Coordinate system :UTM, date: WGS 1984

   This information has to be specified by the monitoring authority and will be communicated in the near future.

7. Surface area covered by RID rivers’ catchments

   These area’s are specified in the “Statistical information on catchment areas” document compiled by the Secretariat and add to 15392 km²

8. Percentage of CPs land area draining into Convention Area
   If this question is taken literally, then 100% of the Belgian area drains into Convention Area.

   50% drains directly into it through the Scheldt estuary and the coastal basins and is represented by the RID reportings. The other 50% drains indirectly into the Area through the Meuse and Rhine basins and contributes to the Netherlands' inputs.

9. Use of LOD or LOQ- please indicate which approach is used[2] and if changes in approach has taken place (and when) in the period 1990-2005

   Throughout the period, LOD’s have been in use without any change in procedure.

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[1] RID Principles, §8.

[2] INPUT 2006 SR, §3.25c

10. Detection/Quantification limits for each single parameter analysed according to the RID mandatory determinants to be analysed[3][4]

    This information is covered in table 8 of the yearly reports. It is to be noted that there was never only one LOD for any determinand for any year. LOD's always differed at least once throughout any monitoring yearly period.

11. How the water flow (and subsequent water load) is estimated, i.e. continuous recording of water flow, only when water sample is taken, or other

    For the Scheldt estuary, basic flow is measured at 7 flood-control dams in the upstream freshwater reaches. These quantities are corrected for downstream seepages and for harbour water in- and outflows. Due to this method, flow rates are only known with monthly intervals. As the tidal flowrates that govern at the sampling point for this river are in the order of 100.000 m^3/sec, monthly averages are the only practical way (apart from real time modelling) to obtain usable flow rates for input load calculations. Flow and concentrations of determinands are then combined as explained for this river in the text report.

    For the Gent-Terneuzen canal which is reported as a tributary of the Scheldt, flow is measured at two flood-control dams on a daily basis. Flow and concentrations of determinands are then combined as explained for this tributary in the text report.

    For the coastal area, the flow rates for most rivers are unmonitored. Load calculations are then made using LTA's estimated by the Vlaamse Milieu Maatschappij (VMM) in 1992. Two rivers are flow monitored only since 2004: the IJzer (reported as main river) and the Gent-Oostende canal (tributary). The former is monitored on a daily basis, the latter on an hourly basis giving rise to daily averages. Flow and concentrations of determinands are then combined as explained in the text report for these rivers.

12. Describe your data Quality Assurance procedures[5]

    These procedures have to be specified by the monitoring authority and will be communicated in the near future.

13. Describe, to the extent possible, the data collection procedures, i.e. sampling to laboratory; time span and sample handling

    These procedures have to be specified by the monitoring authority and will be communicated in the near future.

[3] INPUT 2006 SR, §3.25c
[4] LOD/LOQ may differ for riverine and direct inputs.
[5] INPUT 2006 SR, §3.27a

RID data 2005										
Scheldt estuary		**Coastal area**								
		Western coast				Middle coast		Eastern coast		
Main	Tributary	Main	Tributaries			Tributaries		Tributaries		
Scheldt	Gent-Terneuzen canal	Ijzer	Beverdijk	Langeleed	Vladslovaart	Noordede	Gent-Oostende canal	Schipdonk canal	Leopold canal	Blankenbergse vaart
12/01/2005	18/01/2005	5/01/2005	6/01/2005	6/01/2005	12/01/2005	17/01/2005	17/01/2005	18/01/2005	18/01/2005	17/01/2005
12/01/2005	10/02/2005	1/02/2005	2/02/2005	2/02/2005	9/02/2005	8/02/2005	8/02/2005	10/02/2005	10/02/2005	8/02/2005
9/02/2005	10/03/2005	28/02/2005	1/03/2005	4/04/2005	9/03/2005	14/03/2005	14/03/2005	15/03/2005	15/03/2005	14/03/2005
9/02/2005	14/04/2005	31/03/2005	4/04/2005	26/04/2005	11/04/2005	12/04/2005	12/04/2005	14/04/2005	14/04/2005	12/04/2005
14/03/2005	12/05/2005	28/04/2005	26/04/2005	30/05/2005	4/05/2005	9/05/2005	9/05/2005	10/05/2005	10/05/2005	9/05/2005
14/03/2005	9/06/2005	26/05/2005	30/05/2005	27/06/2005	1/06/2005	6/06/2005	6/06/2005	7/06/2005	7/06/2005	6/06/2005
12/04/2005	7/07/2005	23/06/2005	27/06/2005	26/07/2005	29/06/2005	4/07/2005	4/07/2005	5/07/2005	5/07/2005	4/07/2005
12/04/2005	11/08/2005	28/07/2005	26/07/2005	30/08/2005	3/08/2005	8/08/2005	8/08/2005	9/08/2005	9/08/2005	8/08/2005
9/05/2005	15/09/2005	29/08/2005	30/08/2005	3/10/2005	6/09/2005	7/09/2005	7/09/2005	8/09/2005	8/09/2005	7/09/2005
9/05/2005	13/10/2005	29/09/2005	3/10/2005	7/11/2005	5/10/2005	10/10/2005	10/10/2005	11/10/2005	11/10/2005	10/10/2005
9/06/2005	9/11/2005	27/10/2005	7/11/2005	30/11/2005	16/11/2005	17/11/2005	17/11/2005	17/11/2005	17/11/2005	17/11/2005
9/06/2005	8/12/2005	29/11/2005	30/11/2005		5/12/2005	6/12/2005	6/12/2005	7/12/2005	7/12/2005	6/12/2005
7/07/2005										
7/07/2005										
8/08/2005										
8/08/2005										
5/09/2005										
5/09/2005										
5/10/2005										
5/10/2005										
7/11/2005										
7/11/2005										
5/12/2005										
5/12/2005										

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2005 by Belgium

TOTAL INPUTS			Quantities --->												
Discharge region	Estimate	Flow rate m3/d)	Cd [10 3 kg]	Hg [10 3 kg]	Cu [10 3 kg]	Pb [10 3 kg]	Zn [10 3 kg]	g-HCH [kg]	PCBs [kg]	NH4-N [106 kg]	NO3-N [106 kg]	PO4-P [106 kg]	Total N [106 kg]	Total P [106 kg]	SPM [106 kg]
INPUTS TO OSPAR REGION II Greater North Sea															
RIVERINE INPUTS															
Main Rivers	lower		0.5	0.2	20	19	157	0.5	0.3	1.0	16	0.5	18	0.7	218
	upper	9890	2.3	0.2	34	39	211	21	58	1.6	21	0.7	29	2.0	290
Tributary Rivers	lower		0.3	0.1	10.1	2.2	36	4.0	0.0	2.2	8.7	0.7	12	0.6	32
	upper	4135	0.5	0.1	12.3	3.5	38	10.5	19	2.3	9.0	0.7	13	1.2	33
Total Riverine Inputs	**lower**		0.8	0.3	31	21	193	4.5	0.3	3.2	25	1.2	31	1.3	250
	upper	14026	2.8	0.3	46	42	249	32	77	3.9	30	1.4	42	3.1	323
DIRECT DISCHARGES															
Sewage Effluents	lower														
	upper	0													
Industrial Effluents	lower														
	upper	0													
Fish Farming	lower														
	upper	0													
Total Direct Inputs	**lower**														
	upper	**0**													
UNMONITORED AREAS															
Unmonitored Areas	lower														
	upper	0													
REGION TOTAL	**lower**														
	upper	**14026**													

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by Belgium

			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]
243	Ijzer	lower	0.000	0.006	2.0	0.712	3.9	0.469	0.000	0.071	1.0	0.045	1.2	0.011	6
		upper	0.023	0.006	2.0	0.754	4.0	0.8	1.2	0.072	1.0	0.045	1.2	0.078	6
		comment													
238	Coastal Area	lower	0.000	0.006	2.0	0.712	3.9	0.469	0.000	0.071	1.0	0.045	1.2	0.011	6
		upper	0.023	0.006	2.0	0.754	4.0	0.8	1.2	0.072	1.0	0.045	1.2	0.078	6
		comment													
102	Schelde	lower	0.489	0.150	19	18	153	0.000	0.322	0.9	15	0.444	17	0.679	212
		upper	2.3	0.207	32	38	207	21	57	1.6	20	0.617	28	1.9	283
		comment													
245	Schelde Basin	lower	0.489	0.150	19	18	153	0.000	0.322	0.9	15	0.444	17	0.679	212
		upper	2.3	0.207	32	38	207	21	57	1.6	20	0.617	28	1.9	283
		comment													
79	North Sea (BE)	lower	0.489	0.156	20	19	157	0.469	0.322	1.0	16	0.489	18	0.690	218
		upper	2.3	0.213	34	39	211	21	58	1.6	21	0.662	29	2.0	290
		comment													

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by Belgium

			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]
247	Beverdijk	lower	0.002		0.231	0.010	0.427	0.107	0.000	0.007	0.114	0.014	0.173	0.014	0.654
		upper	0.004		0.253	0.029	0.539	0.174	0.303	0.009	0.119	0.014	0.187	0.018	0.654
		comment													
246	Langeleed	lower	0.000		0.007	0.000	0.044			0.003	0.018	0.005	0.028	0.004	0.176
		upper	0.001		0.023	0.013	0.095			0.004	0.020	0.005	0.037	0.007	0.176
		comment													
248	Vladslovaart	lower	0.000		0.117	0.010	0.247			0.010	0.158	0.017	0.206	0.019	0.550
		upper	0.002		0.137	0.026	0.310			0.011	0.162	0.017	0.213	0.022	0.550
		comment													
239	Western Coastal Area	lower	**0.002**		**0.354**	**0.020**	**0.718**	**0.107**	**0.000**	**0.020**	**0.290**	**0.036**	**0.407**	**0.037**	**1.4**
		upper	**0.008**		**0.414**	**0.068**	**0.944**	**0.174**	**0.303**	**0.025**	**0.300**	**0.036**	**0.437**	**0.047**	**1.4**
		comment													
255	Blankenbergse vaart	lower	0.001		0.033	0.000	0.106	0.027	0.000	0.005	0.015	0.008	0.037	0.007	0.370
		upper	0.002		0.049	0.009	0.161	0.066	0.151	0.006	0.018	0.008	0.046	0.010	0.370
		comment													
252	Leopold canal	lower	0.000	0.006	0.126	0.000	1.340	0.074	0.000	0.118	0.422	0.054	0.731	0.058	1.7
		upper	0.014	0.006	0.357	0.116	1.6	0.417	1.3	0.118	0.422	0.054	0.731	0.087	1.7
		comment													
254	Schipdonk canal	lower	0.264	0.020	0.776	0.411	8.1	0.799	0.000	0.336	1.8	0.101	2.5	0.100	8.7
		upper	0.299	0.021	1.2	0.637	8.1	2.2	3.6	0.353	1.8	0.101	2.6	0.194	8.9
		comment													
242	Eastern Coastal Area	lower	**0.265**	**0.026**	**0.9**	**0.411**	**9.6**	**0.899**	**0.000**	**0.459**	**2.2**	**0.163**	**3.3**	**0.165**	**10.8**
		upper	**0.315**	**0.027**	**1.6**	**0.762**	**9.9**	**2.7**	**5.1**	**0.477**	**2.2**	**0.163**	**3.4**	**0.292**	**11.0**
		comment													

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by Belgium

			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]
249	Gent-Oostende canal	lower	0.000	0.025	0.964	0.686	7.6	0.000	0.000	0.301	1.5	0.127	2.1	0.080	4.4
		upper	0.028	0.025	1.2	0.864	7.6	2.1	4.1	0.306	1.5	0.127	2.2	0.164	4.4
		comment													
250	Noordede	lower	0.000		0.065	0.018	0.432	0.000	0.000	0.032	0.055	0.013	0.141	0.015	0.8
		upper	0.004		0.100	0.037	0.495	0.101	0.303	0.034	0.064	0.013	0.159	0.019	0.8
		comment													
241	Middle Coastal Area	lower	**0.000**	**0.025**	**1.030**	**0.703**	**8.1**	**0.000**	**0.000**	**0.333**	**1.6**	**0.140**	**2.3**	**0.095**	**5.3**
		upper	**0.031**	**0.025**	**1.3**	**0.901**	**8.1**	**2.2**	**4.4**	**0.341**	**1.6**	**0.140**	**2.3**	**0.183**	**5.3**
		comment													
238	Coastal Area	lower	**0.267**	**0.051**	**2.3**	**1.1**	**18**	**1.006**	**0.000**	**0.8**	**4.1**	**0.340**	**5.9**	**0.297**	**17**
		upper	**0.354**	**0.052**	**3.3**	**1.7**	**19**	**5.0**	**9.8**	**0.8**	**4.1**	**0.340**	**6.1**	**0.522**	**18**
		comment													
244	Gent-Terneuzen Canal	lower	0.031	0.048	7.737	1.1	18	3.002	0.000	1.344	4.6	0.375	6.6	0.324	14.5
		upper	0.113	0.052	8.9	1.8	19	5.5	9.0	1.439	4.9	0.400	7.1	0.638	15.7
		comment													
245	Schelde Basin	lower	**0.031**	**0.048**	**7.737**	**1.1**	**18**	**3.002**	**0.000**	**1.344**	**4.6**	**0.375**	**6.6**	**0.324**	**14.5**
		upper	**0.113**	**0.052**	**8.9**	**1.8**	**19**	**5.5**	**9.0**	**1.439**	**4.9**	**0.400**	**7.1**	**0.638**	**15.7**
		comment													
79	North Sea (BE)	lower	**0.298**	**0.099**	**10.1**	**2.2**	**36**	**4.0**	**0.000**	**2.2**	**8.7**	**0.714**	**12**	**0.622**	**32**
		upper	**0.467**	**0.104**	**12.3**	**3.5**	**38**	**10.5**	**19**	**2.3**	**9.0**	**0.739**	**13**	**1.2**	**33**
		comment													

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2005 by Belgium:

			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]
247	Beverdijk	lower													
		upper													
		minimum	ND		ND	ND	ND	ND	ND	ND	ND	0.02	2.11	ND	14
		maximum	0.92		88	4.8	94	21	ND	1.1	18	1.4	19.92	1.6	49
		more than 70% > D.L.	no		no	no	no			no	no	yes	yes	no	yes
		n	12		12	12	12	9	9	12	12	12	12	12	12
		info													
		st.Dev.	NI		I10	NI	NI	NI	NI	I10	NI	0.41	5.74	NI	11.91
243	Ijzer	lower													
		upper													
		minimum	ND	ND	ND	ND	ND	ND	ND	ND	0.96	0.02	4.94	ND	8
		maximum	ND	0.1	28	11	53	17	ND	2.6	20	1	20.15	1.2	87
		more than 70% > D.L.	no	yes	yes	no	yes	no	no	yes	yes	yes	yes	no	yes
		n	12	12	11	12	12	9	9	12	12	12	12	12	12
		info													
		st.Dev.	NI	0.03	7.63	NI	13.06	NI	NI	0.74	5.61	0.28	5.08	NI	21.60
246	Langeleed	lower													
		upper													
		minimum	ND		ND	ND	ND			ND	ND	0.32	ND	ND	7.8
		maximum	ND		4.6	ND	13			0.79	11	1	11.11	1	47
		more than 70% > D.L.	no		no	no	no			no	no	yes	yes	no	yes
		n	11		11	11	11			11	11	11	11	11	11
		info													
		st.Dev.	NI		NI	NI	NI			NI	NI	0.24	2.90	NI	11.00
248	Vladslovaart	lower													
		upper													
		minimum	ND		ND	ND	ND			ND	ND	0.1	2.18	ND	4.73
		maximum	ND		39	4.9	40			2	19	1.9	20.96	2.1	78
		more than 70% > D.L.	no		no	no	no			no	no	yes	yes	yes	yes
		n	12		12	12	12			12	12	12	12	12	12
		info													
		st.Dev.	NI		NI	NI	NI			NI	NI	0.64	7.18	0.79	19.10
239	Western Coastal Area	lower													
		upper													
		minimum	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**0.02**	**ND**	**ND**	**4.73**
		maximum	**ND**	**0.1**	**88**	**ND**	**94**	**21**	**ND**	**2.6**	**20**	**1.9**	**20.96**	**2.1**	**87**
		more than 70% > D.L.	**no**	**yes**	**no**	**no**	**no**	**no**	**no**	**no**	**yes**	**yes**	**yes**	**no**	**yes**
		n	**47**	**12**	**46**	**47**	**47**	**18**	**18**	**47**	**47**	**47**	**47**	**47**	**47**
		info													
		st.Dev.	**NI**	**0.03**	**NI**	**NI**	**NI**	**NI**	**NI**	**NI**	**6.29**	**0.45**	**6.20**	**NI**	**16.60**
255	Blankenbergse vaart	lower													
		upper													
		minimum	ND		ND	ND	ND	ND	ND	ND	ND	0.02	ND	ND	10
		maximum	0.61		24	ND	21	19	ND	1.6	5.8	1.2	8.27	1.7	49
		more than 70% > D.L.	no		no	no	no	no	no	no	no	yes	yes	no	yes
		n	12		12	12	12	9	9	12	12	12	12	12	12
		info													
		st.Dev.	NI		NI	NI	NI	NI	NI	NI	NI	0.34	2.00	NI	12.35

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2005 by Belgium:

			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]
252	Leopold canal	lower													
		upper													
		minimum	ND	ND	ND	ND	ND	ND	ND	0.42	1	0.21	4.21	ND	6.7
		maximum	ND	0.13	5	ND	22	6	ND	1.9	7.4	0.82	10.22	1.4	53
		more than 70% > D.L.	no	yes	no	no	yes	no	no	yes	yes	yes	yes	no	yes
		n	11	11	11	11	11	9	9	12	12	12	12	12	12
		info													
		st.Dev.	NI	0.03	NI	NI	5.51	NI	NI	0.41	2.35	0.20	2.21	NI	13.00
254	Schipdonk canal	lower													
		upper													
		minimum	ND	ND	ND	ND	16	ND	ND	ND	0.97	0.11	1.05	ND	ND
		maximum	9.7	0.16	6.2	5.3	53	18	ND	4.8	12	0.55	13.99	1.7	235
		more than 70% > D.L.	no	yes	no	no	yes	no	no	no	yes	yes	yes	no	yes
		n	11	11	11	11	11	9	9	12	12	12	12	12	12
		info													
		st.Dev.	NI	0.04	NI	NI	11.60	NI	NI	NI	3.25	0.14	3.72	NI	65.25
242	Eastern Coastal Area	lower													
		upper													
		minimum	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**0.02**	**ND**	**ND**	**ND**
		maximum	**ND**	**0.16**	**24**	**ND**	**53**	**19**	**ND**	**4.8**	**12**	**1.2**	**13.99**	**1.7**	**235**
		more than 70% > D.L.	**no**	**yes**	**no**	**no**	**yes**	**no**	**no**	**no**	**yes**	**yes**	**yes**	**no**	**yes**
		n	**34**	**22**	**34**	**34**	**34**	**27**	**27**	**36**	**36**	**36**	**36**	**36**	**36**
		info													
		st.Dev.	**NI**	**0.04**	**NI**	**NI**	**10.65**	**NI**	**NI**	**NI**	**3.11**	**0.26**	**3.45**	**NI**	**38.50**
249	Gent-Oostende canal	lower													
		upper													
		minimum	ND	ND	ND	ND	13	ND	ND	ND	3	0.27	3.78	ND	6
		maximum	ND	0.23	8.2	5.6	37	ND	ND	3.2	11	1.1	13.01	0.59	24
		more than 70% > D.L.	no	yes	no	no	yes	no	no	yes	yes	yes	yes	no	yes
		n	12	12	12	12	12	9	9	12	12	12	12	12	12
		info													
		st.Dev.	NI	0.06	NI	NI	7.53	NI	NI	1.10	2.65	0.23	2.84	NI	6.22
250	Noordende	lower													
		upper													
		minimum	ND		ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND	11
		maximum	ND		10	8.4	82	ND	ND	6.8	10	1.2	12.22	1.7	78
		more than 70% > D.L.	no		no	no	yes	no	no	no	no	yes	yes	no	yes
		n	12		12	12	12	9	9	12	12	12	12	12	12
		info													
		st.Dev.	NI		NI	NI	21.04	NI	NI	NI	NI	0.30	3.00	NI	17.62
241	Middle Coastal Area	lower													
		upper													
		minimum	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**0.05**	**ND**	**6**
		maximum	**ND**	**0.23**	**10**	**8.4**	**82**	**ND**	**ND**	**6.8**	**11**	**1.2**	**13.01**	**1.7**	**78**
		more than 70% > D.L.	**no**	**yes**	**no**	**no**	**yes**	**no**	**no**	**no**	**yes**	**yes**	**yes**	**no**	**yes**
		n	**24**	**12**	**24**	**24**	**24**	**18**	**18**	**24**	**24**	**24**	**24**	**24**	**24**
		info													
		st.Dev.	**NI**	**0.06**	**NI**	**NI**	**15.58**	**NI**	**NI**	**NI**	**3.30**	**0.26**	**3.10**	**NI**	**17.24**

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2005 by Belgium:

			1	5	6	2	7	8	9	10	11	12	13	14	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]
238	Coastal Area	lower													
		upper													
		minimum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		maximum	ND	0.23	88	ND	94	ND	ND	6.8	20	1.9	20.96	2.1	235
		more than 70% > D.L.	no	yes	no	no	yes	no	no	no	yes	yes	yes	no	yes
		n	105	46	104	105	105	63	63	107	107	107	107	107	107
		info													
		st.Dev.	NI	0.04	NI	NI	14.57	NI	NI	NI	4.89	0.36	4.87	NI	25.97
244	Gent-Terneuzen Canal	lower													
		upper													
		minimum	ND	ND	ND	ND	19	ND	ND	ND	4.2	0.43	5.88	ND	ND
		maximum	0.75	0.12	34	6.1	30	9	ND	3.3	8.5	0.64	11.21	1.2	62
		more than 70% > D.L.	no	yes	no	no	yes	no	no	yes	yes	yes	yes	no	yes
		n	12	12	12	12	12	9	9	12	12	12	12	11	12
		info													
		st.Dev.	NI	0.03	NI	NI	3.79	NI	NI	1.10	1.26	0.08	1.82	NI	16.79
102	Schelde	lower													
		upper													
		minimum	ND	0.04	ND	ND	18	ND	ND	ND	2.87	0.06	2.92	ND	6.4
		maximum	1	0.12	22	26	110	ND	2	1.1	6	0.33	7.24	0.65	138
		more than 70% > D.L.	no	yes	no	no	yes	no	no	no	yes	yes	yes	no	yes
		n	23	12	24	24	24	11	11	24	24	24	24	24	24
		info													
		st.Dev.	NI	0.03	NI	NI	19.86	NI	NI	NI	0.95	0.06	1.19	NI	29.51
245	Schelde Basin	lower													
		upper													
		minimum	ND	ND	ND	ND	18	ND	ND	ND	2.87	0.06	2.92	ND	ND
		maximum	1	0.12	34	26	110	7	ND	3.3	8.5	0.64	11.21	1.2	138
		more than 70% > D.L.	no	yes	no	no	yes	no	no	no	yes	yes	yes	no	yes
		n	35	24	36	36	36	20	20	36	36	36	36	35	36
		info													
		st.Dev.	NI	0.03	NI	NI	19.89	NI	NI	NI	1.45	0.20	2.25	NI	33.29
79	North Sea (BE)	lower													
		upper													
		minimum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		maximum	ND	0.23	88	ND	110	ND	ND	6.8	20	1.9	20.96	2.1	235
		more than 70% > D.L.	no	yes	no	no	yes	no	no	no	yes	yes	yes	no	yes
		n	140	70	140	141	141	83	83	143	143	143	143	142	143
		info													
		st.Dev.	NI	0.04	NI	NI	14.57	NI	NI	NI	4.30	0.36	4.87	NI	25.97

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 2005 by Belgium

			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]
247	Beverdijk	Sewage													
		Industrial													
		Riverine	0,06 - 0,12		0,6 - 3	0,35 - 2	5 - 13	2 - 6	1 - 12	0,08 - 0,5	0,1 - 0,77	0.1	NI	0,23 - 1	NI
243	Ijzer	Sewage													
		Industrial													
		Riverine	0,1 - 0,3	0.03	0,6 - 3	0,35 - 2	2 - 13	6	1 - 12	0,08 - 0,5	0.1	0.1	NI	0,23 - 1	NI
246	Langeleed	Sewage													
		Industrial													
		Riverine	0,1 - 0,12		0,6 - 4	0,6 - 2	5 - 13			0,08 - 0,5	0,1 - 0,77	0.1	NI	0,48 - 1	NI
248	Vladslovaart	Sewage													
		Industrial													
		Riverine	0,1 - 0,3		0,6 - 4	0,35 - 2	5 - 13			0,08 - 0,5	0,1 - 0,77	0.1	NI	0,48 - 1	NI
239	Western Coastal Area	Sewage													
		Industrial													
		Riverine	**0,06 - 0,3**	**0.03**	**0,6 - 4**	**0,35 - 2**	**2 - 13**	**2 - 6**	**1 - 12**	**0,08 - 0,5**	**0,1 - 0,77**	**0.1**	**NI**	**0,23 - 1**	**NI**
255	Blankenbergse vaart	Sewage													
		Industrial													
		Riverine	0,06 - 0,12		0,6 - 4	0,6 - 1,7	5 - 13	2 - 6	1 - 12	0,08 - 0,5	0,1 - 0,77	0.1	NI	0,23 - 1	NI
252	Leopold canal	Sewage													
		Industrial													
		Riverine	0,1 - 0,3	0.03	0,6 - 4	0,6 - 2	5 - 13	2 - 6	1 - 12	0.5	0.1	0.1	NI	0,48 - 1	NI
254	Schipdonk canal	Sewage													
		Industrial													
		Riverine	0,06 - 0,12	0,01 - 0,03	0,6 - 4	0,35 - 2	5	2 - 6	1 - 12	0,08 - 0,5	0.1	0.1	NI	0,48 - 1	2,37 - 4,73
242	Eastern Coastal Area	Sewage													
		Industrial													
		Riverine	**0,06 - 0,3**	**0,01 - 0,03**	**0,6 - 4**	**0,35 - 2**	**5 - 13**	**2 - 6**	**1 - 12**	**0,08 - 0,5**	**0,1 - 0,77**	**0.1**	**NI**	**0,48 - 1**	**NI**

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 2005 by Belgium

			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]
249	Gent-Oostende canal	Sewage													
		Industrial													
		Riverine	0,1 - 0,12	0.03	0,6 - 4	0,35 - 2	5	2 - 6	1 - 12	0,08 - 0,5	0.1	0.1	NI	0,94 - 1	NI
250	Noordende	Sewage													
		Industrial													
		Riverine	0,1 - 0,3		0,6 - 4	0,35 - 2	4 - 13	2 - 6	1 - 12	0,08 - 0,5	0,1 - 0,77	0.1	NI	0,07 - 1	NI
241	Middle Coastal Area	Sewage													
		Industrial													
		Riverine	**0,1 - 0,3**	**0.03**	**0,6 - 4**	**0,35 - 2**	**4 - 13**	**2 - 6**	**1 - 12**	**0,08 - 0,5**	**0,1 - 0,77**	**0.1**	**NI**	**0,07 - 1**	**NI**
238	Coastal Area	Sewage													
		Industrial													
		Riverine	**0,06 - 0,3**	**0,01 - 0,03**	**0,6 - 4**	**0,35 - 2**	**2 - 13**	**2 - 6**	**1 - 12**	**0,08 - 0,5**	**0,1 - 0,77**	**0.1**	**NI**	**0,23 - 1**	**NI**
244	Gent-Terneuzen Canal	Sewage													
		Industrial													
		Riverine	0,06 - 0,13	0.01	0,6 - 5	0,35 - 2	5	6	1 - 12	0,08 - 0,5	0.1	0.1	NI	0,86 - 1	2,37 - 4,73
102	Schelde	Sewage													
		Industrial													
		Riverine	0,06 - 0,6	NI	0,6 - 5	0,35 - 11	5	2 - 6	1 - 12	0,06 - 0,5	0.1	0.1	NI	0,13 - 1	NI
245	Schelde Basin	Sewage													
		Industrial													
		Riverine	**0,06 - 0,6**	**NI**	**0,6- 5**	**0,35 - 11**	**5**	**2 - 6**	**1 - 12**	**0,06 - 0,5**	**0.1**	**0.1**	**NI**	**0,13 - 1**	**NI**
79	North Sea (BE)	Sewage													
		Industrial													
		Riverine	**0,06 - 0,6**	**NI**	**0,6 - 5**	**0,35 - 11**	**2 - 13**	**2 - 6**	**1 - 12**	**0,06 - 0,5**	**0,1 - 0,77**	**0.1**	**NI**	**0,13 - 1**	**NI**

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 2005 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	278	561.6	0	0	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	NA	NA	NA	NA	NA	0	Mean
252	Leopold canal	NI	302.4	NI	NI	NI	1	Mean
256	Lissewege vaart	NA	NA	NA	NA	NA	0	Mean
254	Schipdonk canal	NI	820.8	NI	NI	1987-1992	1	Mean
242	Eastern Coastal Area	NI	1157.8	NI	NI	NI	3	Mean
249	Gent-Oostende canal	731	432	0	0	NI	1	Mean
250	Noordende	NI	69.1	NI	NI	NI	1	Mean
241	Middle Coastal Area	NI	501.1	NI	NI	NI	2	Mean
238	Coastal Area	NI	2367.3	NI	NI	NI	9	Mean
244	Gent-Terneuzen Canal	2031	1794	302	20736	1991-2005	1	Mean
102	Schelde	9612	11159	4752	20736	1949-2005	1	Mean
245	Schelde Basin	11643	12953	5054	41472	NI	2	Mean
79	North Sea (BE)	NI	15320	NI	NI	NI	11	Mean

2. Denmark

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 by Denmark	
Table 4b	Total Riverine Inputs and Direct Discharges to the Maritime Area
Table 5a	Sewage effluents. Reported Maritime Area of the OSPAR Convention in 2005 by Denmark
Table 5b	Industrial effluents. Maritime Area of the OSPAR Convention in 2005 by Denmark
Table 6a	Main riverine inputs. Reported Maritime Area of the OSPAR Convention in 2005 by Denmark
Table 6b	Tributary riverine inputs. Reported Maritime Area of the OSPAR Convention in 2005 by Denmark
Table 7	Contaminant Concentration. Reported Maritime Area of the OSPAR Convention in 2005 by Denmark
Table 8	Detection limits. Reported Maritime Area of the OSPAR Convention in 2005 by Denmark
Table 9	Catchment-dependent information. Reported Maritime Area of the OSPAR Convention in 2005 by Denmark

Annual report on riverine inputs and direct discharges by Denmark to Convention waters during the year 2005

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: __Denmark______________________________________

Name of river, sub-area and discharge area[1]	Nature of the receiving water[2]
Brøns Å	River in catchment to the North Sea
Brede Å	River in catchment to the North Sea
Omme Å	River in catchment to the North Sea
Kongeåen	River in catchment to the North Sea
Ribe Å	River in catchment to the North Sea
Skjern Å	River in catchment to the North Sea
Sneum Å	River in catchment to the North Sea
Store Å	River in catchment to the North Sea
Varde Å	River in catchment to the North Sea
Vid Å	River in catchment to the North Sea
Grøn Å	River in catchment to the North Sea
North Sea (DK)	Coastal water, includes direct discharges and unmonitored catchment area downstream river monitoring stations
Elling Å	River in catchment to the Kattegat
Ger Å	River in catchment to the Kattegat
Gudenå	River in catchment to the Kattegat
Havslevgårds Å	River in catchment to the Kattegat
Ry Å	River in catchment to the Kattegat
Jordbro Å	River in catchment to the Kattegat
Karup Å	River in catchment to the Kattegat
Kastbjerg Å	River in catchment to the Kattegat
Lindenborg Å	River in catchment to the Kattegat
Simested Å	River in catchment to the Kattegat
Skals Å	River in catchment to the Kattegat
Voer Å	River in catchment to the Kattegat
Kattegat (DK)	Coastal water, includes direct discharges and unmonitored catchment area downstream river monitoring stations
Liver Å	River in catchment to the Skagerrak
Uggerby Å	
Skagerrak (DK)	Coastal water, includes direct discharges and unmonitored catchment area downstream river monitoring stations

[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

Total catchment area ind Denmark to OSPAR is 27.500 km^2 which constitutes 64 % of the Danish land area.

B. Total riverine inputs and direct discharges (Tables 4a and 4b) for the year: ___2005____

Note: Table 4b is total direct discharges and riverine inputs to maritime area by region. Please provide totals for each OSPAR region and for total inputs.

B.1 Give general comments on the total riverine inputs and direct discharges (e.g. changes from last year, trends, percentage of particle bound determinand, results that need to be highlighted etc.):

Table 4b has been filled in using the forwarded format and is enclosed as a separate Word-document.

C. Direct discharges for the year: ___2005____

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 (cf. section 7 of the RID Principles), including for those under voluntary reporting:

In tables 5a and 5b give the total direct load to the coastal waters of North Sea, Kattegat and Skagerrak of sewage effluents and industrial effluents respectively.

In Denmark all point sources bigger than 30 PE are monitored even if they are situated in a unmonitored (part of) river catchment area. The frequency and sampling method is given in the table below:

Annual sampling frequency (minimum) for wastewater treatment plant outflows:

Plant capacity (PE)	Frequency/yr (min.)	Sampling method
$30 \le x < 200$	2	Random samples [1)]
$200 \le x < 1,000$	4	Time-weighted daily samples [2)]
$1,000 \le x < 50,000$	12	Flow-weighted daily samples
$50,000 \le x$	24	Flow-weighted daily samples

1) Time-weighted samples, random samples or empirical values, and 2) Time-weighted samples or random samples if the necessary facilities for collection of flow-weighted samples are not available. PE: Person equivalent to be equivalent to 21.9 kg organic matter per year measured as biochemical oxygen demand (BI_5), 4.4 kg total-N per year or 1.0 kg total-P per year for some years, but the P-value will be reduced in future.

Measurement of the water volume discharged is in general continual registration of the water volume on the day in question.

Calculation of total discharges follow the guidelines.

Plants with a capacity > 500PE covers 99% of the total wastewater load to wastewater treatment plants.

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the RID 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):

There are no estimates on total direct sewage effluent discharges of other determinants in 2005, but measurement have been performed on individual wastewater treatment plants of heavy metals and hazardous substances.

C.3 Give general comments on the discharges of sewage effluents (e.g. compared to previous years, and/or extent to which industrial effluents are discharged through sewerage systems):

Most of the purification measures in Denmark were taken during the 1980ties and 1990ties, therefore only small reduction in discharges from municipal wastewater treatment (MWWT) plants have been measuring during the latest years. Some industries have their wastewater treated by MWWT and that part is included under sewage effluent. Separate discharges from industries are included in table 5b.

Industrial Effluents (Table 5b)

C.4 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 7 of the RID Principles), including for those under voluntary reporting:

In Denmark all point sources bigger than 30 PE are monitored even if they are situated in a unmonitored (part of) river catchment area. The frequency and sampling method is given in the table below:

Table 4.4 Discharge classes for industries with separate wastewater discharges indicating the amount of nitrogen (total-N), phosphorus (total-P) and organic matter (BI_5 (modified) and COD) discharged together with the sampling frequency.

Discharge class	Discharge (tonnes/yr)				Frequency/yr
	BOD_5 (mod.)	**COD**	**Total-N**	**Total-P**	
I	0.6 < x < 4.3	1.6 < x < 10.8	0.13 < x < 0.9	0.005 < x < 0.3	2 samples
II	4.3 < x < 21.6	10.8 < x < 54	0.9 < x < 4.4	0.3 < x < 1.5	4 samples
III	21.6 < x < 108	54 < x < 270	4.4 < x < 22	1.5 < x < 7.5	12 samples
IV	x > 108	x > 270	x > 22	x > 7.5	12 samples

Measurement of the water volume discharged is in general continual registration of the water volume on the day in question.

Calculation of total discharges follow the guidelines.

C.5 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

None

C.6 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:

Stormwater overflows (not connected to MWWT) and other storm water in 2005 discharging directly:

	TN (tonnes)	TP (tonnes)
North Sea	13	3
Skagerrak	1	0,3
Kattegat	63	16

Scattered dwelling etc. in 2005 discharging directly:

	TN (tonnes)	TP (tonnes)
North Sea	0	0
Skagerrak	0	0
Kattegat	2	0,5

C.7 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):

Many heavy metals and hazardous substances are monitored on some waste water treatment plants and separate discharging industrial plants, but only for some selected plants. Therefore total have not been calculated for 2005, but annual loads for some plants can be provided if required.

C.8 Give general comments on industrial effluents (e.g. compared to previous years):

Same comment as under C.3.

Total direct discharges (Table 5c)

C.9 Give general comments on total direct discharges (e.g. compared to previous years):

D. Riverine inputs for the year: 2005

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 6 of the RID Principles), including for those under voluntary reporting:

All monitored RID rivers are reported as main rivers (tables 6a), therefore table 6b is not used.

The sampling frequency at each monitoring site is given in table 7 as “n”. The highest and the lowest measured concentrations for each substance are given in table 7 under maximum and minimum, respectively. Samples are collected as discrete samples. Stage is recorded continuously at all RID monitoring stations. Discharge is measured at least 12 times per year, and the run off (every 10 minutes) is calculated from a well-established stage-discharge relationship. Transport at each RID monitoring station is calculated by multiplying daily discharge with daily concentration, the latter estimated by linear interpolation of measured values.

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

D.4 Give general comments on the inputs from main rivers (e.g. significant changes in inputs, concentrations and flows compared to previous years):

Tributary Rivers (Tables 6b and 7b)

D.5 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 6 of the Principles):

All Danish RID-rivers are reported as main river using tables 6.a. Therefore, table 6.a the total riverine inputs includes loads from the unmonitored part of monitored catchments and the unmonitored rivers including discharges from point sources in the catchment areas to surface waters. The totals to coastal waters therefore include all landbased inputs that are not direct discharges. The diffuse riverine load from unmonitored areas is calculated by multiplying flow-weighted concentrations with a specific discharge and the size of the unmonitored catchment. Flow-weighted concentrations and specific discharge are selected from catchments with similar soil types, land-use, geology and climate, and with small inputs from point sources. Further, load from point sources is added to the calculated diffuse riverine load, yielding the total load from unmonitored areas. The load from point sources in unmonitored areas is in fact based on measured values of load from point sources, as these areas are only unmonitored with respect to the riverine load.

Further, the total riverine load to coastal waters includes direct load from storm water overflow and scattered dwellings but these sources are of minor importance.

Within few years, Denmark will develop a GIS-based empirical model for a even improved and even more harmonised methodology estimating the diffuse inputs from unmonitored areas.

D.6 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

None

D.7 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.8 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in Tables 6b and 7b:

None

D.9 Give general comments on the inputs from tributary rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

Total riverine inputs (Table 6c)

D.10 Give general comments on the total riverine inputs (e.g. significant change in inputs, concentrations and flows compared to previous years):

Total input of nitrogen and phosphorus was quite low in 2005 both for figures not corrected for flow and for flow corrected figures. This is explained by weather and run-off condition and further by measures against point sources and agriculture. The effect on wastewater purification is significant with very high reduction in discharge from all kind of point sources. The measures against agriculture have reduced nitrogen losses from agriculture markedly at root zone level (between 40-50%), but the losses to inland surface waters and further to coastal areas are delayed and it can take up to 30-100 years in parts of the catchment to the North Sea before the full effect of the measures will be observed. The measures against agriculture have not until very recently been directed to reduction in phosphorus losses, and no reductions in agricultural losses can yet be determined concerning phosphorus. In 2005 with precipitation lower than normal, but following a quite wet year less leaching than average conditions can be expected and thereby affecting the diffuse losses, which are the most important N and P source in Denmark. Agricultural losses are the main source within the diffuse sources.

Precipitation in 2005 for Denmark was with 647 mm 9 % under the normal 712 mm (average 1961-1990). Run off from Denmark was in average 328 mm and 6% lower than the normal average. 2004 followed one quite dry year with low discharge. Further, the average air temperature in 2005 was more than. 1°C over the normal.

The natural background losses were quite low in 2005 as shown in the table below:

	Precipitation	**Q_avg**	**TN_avg**	**TN_avg**	**TP_avg**	**TP_aqvg**
	Mm	**l/s/km^2**	mg/l	Kg/ha	mg/l	kg/ha
1989	581	4,9	1,6	2,6	0,048	0,068
1990	812	5,2	1,6	2,3	0,062	0,082
1991	654	5,9	1,4	2,4	0,051	0,082
1992	706	5,4	1,7	2,6	0,054	0,085
1993	758	5,7	1,6	2,6	0,050	0,075
1994	880	8,9	1,7	4,3	0,055	0,136
1995	652	7,2	1,6	3,3	0,052	0,107
1996	505	3,98	1,45	1,51	0,049	0,043
1997	622	3,42	1,30	1,32	0,042	0,034
1998	860	6,43	1,68	3,12	0,046	0,077
1999	905	7,92	1,52	3,26	0,055	0,130
2000	768	6,46	1,38	2,36	0,041	0,076
2001	751	6,4	1,31	2,23	0,048	0,084
2002	864	8,39	1,63	3,39	0,049	0,113
2003	630	4,66	1,24	1,37	0,048	0,063
2004	822	6,99	1,57	3,01	0,051	0,100
2005	647	5,14	1,44	2,06	0,049	0,0672

Q= discharge; med = median value; avg= average; TN = total nitrogen; TP = total phosphorus

Precipitation is the measured average for Denmark. The Danish OSPAR catchment area constitutes 64 % (or km^2) of the total Danish land area (43.100 km^2). Precipitation in the Danish OSPAR catchment is approx. 20-25% higher than the average for Denmark. Further, precipitation reaching ground is about 20% higher than measure precipitation.

The overall reduction in phosphorus inputs to Danish marine waters since 1989 have been reduced with approx. 80 % if the inputs are flow corrected. This reduction can only be assigned to a large reduction in the load from point sources (more than 90 % from the mid-1980s). There has been no reduction in the losses from diffuse sources concerning phosphorus.

A reduction of approx. 45% since 1989 in the nitrogen inputs to all Danish coastal waters can be calculated if the inputs are adjusted for discharge variation. This reduction in nitrogen inputs can be assigned to a reduction in the load from point sources (approx 75 % since the mid-1980s) but also as an effect of reduced losses from agriculture. To the North Sea, the Skagerrak and the Kattegat there is a significant trend (reduction) on a 99% level in total nitrogen discharges.

E. Unmonitored areas

E.1 Describe the methods of quantification used for the different determinands or groups of determinands:

Please read the comments under item D.5.

F. Limits of detection (Table 8)

F.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Give comments if the detection limits are higher than stated in the RID Principles:

No comments.

G. Additional comments

G.1 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

Denmark overall follows common agreed methodologies. Danish rivers are small and even been reporting 25 monitored rivers Denmark only covers 43% of the Danish catchment area to OSPAR convention. Monitoring in a lot of other small rivers are included in the sums in tables 6.a. Due to influence of tides in part of the catchment to the North Sea it will be impossible to cover the whole catchment. It should be remarked that even in unmonitored catchment discharges from point sources >30 PE are monitored.

Denmark some years ago make a new reporting of old of the inputs to the three coastal OSPAR waters that Denmark is discharging to. Therefore the Danish time series since 1989 are based on the same 25 RID monitoring stations and the same methodology. The monitoring criteria for point sources have also been unchanged since 1989. The Danish monitoring programme has until recently been focused on nitrogen and phosphorus compounds and organic matter. Since late 1990'ties also some heavy metals and hazardous substances have been monitored on few, selected rivers and point sources. For rivers most concentrations have been under the detection limit and no total loads to coastal waters are calculated.

Analysis have to be performed on accredited laboratories and only 3 or 4 laboratories have been involved for the past 3-4 years. Monitoring is performed by the Danish Counties, which can decided by themselves which laboratories they contract to perform chemical analysis.

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2005 by Denmark

Contracting Parties should use this format to report (i) their total inputs to each OSPAR region and (ii) their total inputs to their marine environment

TOTAL INPUTS			Quantities --->												
Discharge region	Estimate	Flow rate (1000 m3/d)	Cd [10 3 kg]	Hg [10 3 kg]	Cu [10 3 kg]	Pb [10 3 kg]	Zn [10 3 kg]	g-HCH [kg]	PCBs [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 [10^6 kg]
INPUTS TO OSPAR REGION *(North Sea 80)*															
RIVERINE INPUTS															
Main Rivers	lower upper	7811,9								0,353	7,358	0,0628	8,857	0,253	24,818
Tributary Rivers	lower upper														
Total Riverine Inputs	**lower** **upper**	7811,9								0,353	7,358	0,0628	8.857	0,253	24,818
DIRECT DISCHARGES															
Sewage Effluents	lower upper									0,0097	0,0876	0,0039	0,0973	0,0079	
Industrial Effluents	lower upper									0,0023	0,0045	0,0015	0,0226	0,0051	
Fish Farming	lower upper									0,1626	0,1626	0,0017	0,0 315	0,0026	
Total Direct Inputs	**lower** **upper**									0,1746	0,2547	0,0071	0,1514	0,0156	
UNMONITORED AREAS															
Unmonitored Areas	lower upper	4891,1								0,0789	4,266	0,0342	5,5206	0,1531	
REGION TOTAL	**lower** **upper**	12703								**0,6065**	**11,879**	**0,1041**	**14,529**	**0,4217**	

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2005 by Denmark

Contracting Parties should use this format to report (i) their total inputs to each OSPAR region and (ii) their total inputs to their marine environment

TOTAL INPUTS			**Quantities --->**												
Discharge region	**Estimate**	**Flow rate (1000 m3/d)**	**Cd [10^3 kg]**	**Hg [10^3 kg]**	**Cu [10^3 kg]**	**Pb [10^3 kg]**	**Zn [10^3 kg]**	**g-HCH [kg]**	**PCBs [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 [10^6 kg]**
INPUTS TO OSPAR REGION *(Kattegat 77)*															
RIVERINE INPUTS															
Main Rivers	lower	5030,2								0,157	5,082	0,0775	6,289	0,197	13,108
	upper														
Tributary Rivers	lower														
	upper														
Total Riverine Inputs	**lower**	5030,2								0,157	5,082	0,0775	6,289	0,197	13,108
	upper														
DIRECT DISCHARGES															
Sewage Effluents	lower									0,0405	0,3648	0,0184	0,4054	0,0368	
	upper														
Industrial Effluents	lower									0,0228	0,0455	0,0020	0,2275	0,0068	
	upper														
Fish Farming	lower									0	0	0	0	0	
	upper														
Total Direct Inputs	**lower**									0,0633	0,4103	0,0204	0,633	0,0436	
	upper														
UNMONITORED AREAS															
Unmonitored Areas	lower	8120,8								0,3378	11,943	0,1905	13,687	0,3756	
	upper														
REGION TOTAL	**lower**	**13151**								0,5581	17,435	0,2884	20,609	0,6162	
	upper														

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2005 by Denmark

Contracting Parties should use this format to report (i) their total inputs to each OSPAR region and (ii) their total inputs to their marine environment

TOTAL INPUTS			Quantities --->												
Discharge region	**Estimate**	**Flow rate (1000 m3/d)**	**Cd [10^3 kg]**	**Hg [10^3 kg]**	**Cu [10^3 kg]**	**Pb [10^3 kg]**	**Zn [10^3 kg]**	**g-HCH [kg]**	**PCBs [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 [10^6 kg]**
INPUTS TO OSPAR REGION *(Skagerrak 74)*															
RIVERINE INPUTS															
Main Rivers	lower	511,4								0,0635	0,6778	0,0116	0,894	0,0462	5,035
	upper														
Tributary Rivers	lower														
	upper														
Total Riverine Inputs	**lower**	511,4								0,0635	0,6778	0,0116	0,894	0,0462	5,035
	upper														
DIRECT DISCHARGES															
Sewage Effluents	lower									0,0011	0,0094	0,0004	0,0105	0,0008	
	upper														
Industrial Effluents	lower									0,001	0,0019	0,0002	0,0096	0,0005	
	upper														
Fish Farming	lower									0	0	0	0	0	
	upper														
Total Direct Inputs	**lower**									0,0021	0,0113	0,0006	0,0201	0,0013	
	upper														
UNMONITORED AREAS															
Unmonitored Areas	lower	394,6								0,0448	0,486	0,0064	0,6327	0,0245	
	upper														
REGION TOTAL	**lower**	**906**								0,1104	1,1758	0,0186	1,5468	0,072	
	upper														

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 2005 by Denmark

Figures are given in tonnes as a yearly load

			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 [tonnes]	11 NO3-N [tonnes]	12 PO4-P [tonnes]	13 Total N [tonnes]	14 Total P [tonnes]	3 SPM [kt]
110	Brøns å	lower													
		upper													
		comment													
291	Brede å	lower													
		upper													
		comment													
292	Omme å	lower													
		upper													
		comment													
112	Kongeåen	lower													
		upper													
		comment													
293	Ribe å	lower													
		upper													
		comment													
104	Skjern å	lower													
		upper													
		comment													
294	Sneum å	lower													
		upper													
		comment													
115	Storå	lower													
		upper													
		comment													
295	Varde å	lower													
		upper													
		comment													
109	Vid å	lower													
		upper													
		comment													
296	Grøn å	lower													
		upper													
		comment													
80	North Sea (DK)	lower								9.729	87.56	3.943	97.289	7.885	
		upper													
		comment													
125	Elling å	lower													
		upper													
		comment													
127	Ger å	lower													
		upper													
		comment													

103	Gudenå	lower													
		upper													
		comment													
129	Haslevgårds å	lower													
		upper													
		comment													
297	Ry å	lower													
		upper													
		comment													
120	Jordbro å	lower													
		upper													
		comment													
118	Karup å	lower													
		upper													
		comment													
130	Kastbjerg å	lower													
		upper													
		comment													
128	Lindenborg å	lower													
		upper													
		comment													
122	Simested å	lower													
		upper													
		comment													
121	Skals å	lower													
		upper													
		comment													
126	Voer å	lower													
		upper													
		comment													
77	Kattegat (DK)	lower								40.535	364.8	18.409	405.4	36.818	
		upper													
		comment													
123	Liver å	lower													
		upper													
		comment													
124	Uggerby å	lower													
		upper													
		comment													
74	Skagerrak (DK)	lower								1.051	9.454	0.38	10.505	0.76	
		upper													
		comment													

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 2005 by Denmark

Figures are given in tonnes as a yearly load

			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 [tonnes]	11 NO3-N [tonnes]	12 PO4-P [tonnes]	13 Total N [tonnes]	14 Total P [tonnes]	3 SPM [kt]
110	Brøns å	lower													
		upper													
		comment													
291	Brede å	lower													
		upper													
		comment													
292	Omme å	lower													
		upper													
		comment													
112	Kongeåen	lower													
		upper													
		comment													
293	Ribe å	lower													
		upper													
		comment													
104	Skjern å	lower													
		upper													
		comment													
294	Sneum å	lower													
		upper													
		comment													
115	Storå	lower													
		upper													
		comment													
295	Varde å	lower													
		upper													
		comment													
109	Vid å	lower													
		upper													
		comment													
296	Grøn å	lower													
		upper													
		comment													
80	North Sea (DK)	lower								2.26	4.52	1.525	22.601	5.082	
		upper													
		comment													
125	Elling å	lower													
		upper													
		comment													
127	Ger å	lower													
		upper													
		comment													
103	Gudenå	lower													
		upper													
		comment													
129	Haslevgårds å	lower													
		upper													
		comment													
297	Ry å	lower													
		upper													
		comment													
120	Jordbro å	lower													
		upper													
		comment													
118	Karup å	lower													
		upper													
		comment													
130	Kastbjerg å	lower													
		upper													
		comment													
128	Lindenborg å	lower													
		upper													
		comment													
122	Simested å	lower													
		upper													
		comment													
121	Skals å	lower													
		upper													
		comment													
126	Voer å	lower													
		upper													
		comment													
77	Kattegat (DK)	lower								22.75	45.5	2.027	227.5	6.757	
		upper													
		comment													
123	Liver å	lower													
		upper													
		comment													
124	Uggerby å	lower													
		upper													
		comment													
74	Skagerrak (DK)	lower								0.965	1.93	0.161	9.648	0.535	
		upper													
		comment													

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by Denmark

			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]
110	Brøns å	lower								0.0058	0.12	0.006	0.156	0.0022	0.374
		upper													
		comment													
291	Brede å	lower								0.0197	0.277	0.002	0.355	0.0095	1.444
		upper													
		comment													
292	Omme å	lower								0.0218	0.6456	0.0047	0.781	0.0223	2.448
		upper													
		comment													
112	Kongeåen	lower								0.0331	0.844	0.0087	0.976	0.0295	1.673
		upper													
		comment													
293	Ribe å	lower								0.0363	0.936	0.0082	1.163	0.0315	2.831
		upper													
		comment													
104	Skjern å	lower								0.0658	1.611	0.0085	1.949	0.0491	5.904
		upper													
		comment													
294	Sneum å	lower								0.0199	0.328	0.0028	0.404	0.0135	1.146
		upper													
		comment													
115	Storå	lower								0.0553	1.044	0.0084	1.283	0.0358	3.19
		upper													
		comment													
295	Varde å	lower								0.0595	1.013	0.006	1.21	0.0279	2.287
		upper													
		comment													
109	Vid å	lower								0.0124	0.172	0.0012	0.246	0.0074	1.142
		upper													
		comment													
296	Grøn å	lower								0.0233	0.367	0.0063	0.49	0.0245	2.753
		upper													
		comment													
80	North Sea (DK)	lower								0.5945	11.787	0.1002	14.364	0.4028	
		upper													
		comment													
125	Elling å	lower								0.0076	0.0973	0.0028	0.1278	0.0062	0.333
		upper													
		comment													
127	Ger å	lower								0.01	0.137	0.0017	0.183	0.0059	0.663
		upper													
		comment													
103	Gudenå	lower								0.057	1.684	0.0292	2.261	0.0866	6.276
		upper													
		comment													
129	Haslevgårds å	lower								0.0085	0.0992	0.002	0.126	0.0038	0.536
		upper													
		comment													
297	Ry å	lower								0.0169	0.3136	0.0065	0.4017	0.0155	1.797
		upper													
		comment													
120	Jordbr å	lower								0.0024	0.0616	0.0015	0.075	0.0032	
		upper													
		comment													
118	Karup å	lower								0.015	0.4653	0.0067	0.5582	0.0219	
		upper													
		comment													
130	Kastbjerg å	lower								0.0019	0.2049	0.0016	0.218	0.0026	0.189
		upper													
		comment													
128	Lindenborg å	lower								0.0102	0.5974	0.009	0.682	0.0137	1.322
		upper													
		comment													
122	Simested å	lower								0.0062	0.6631	0.0074	0.7325	0.0103	
		upper													
		comment													
121	Skals å	lower								0.0092	0.4916	0.005	0.5965	0.0141	
		upper													
		comment													
126	Voer å	lower								0.0121	0.2666	0.0041	0.3272	0.0136	1.992
		upper													
		comment													
77	Kattegat (DK)	lower								0.495	18.025	0.27	19.911	0.556	
		upper													
		comment													
123	Liver å	lower								0.0409	0.2824	0.0044	0.3937	0.0244	1.7886
		upper													
		comment													
124	Uggerby å	lower								0.0226	0.3954	0.0072	0.5	0.0218	3.246
		upper													
		comment													
74	Skagerrak (DK)	lower								0.108	11.758	0.0182	1.526	0.0704	
		upper													
		comment													

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by Denmark

			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]
110	Brøns å	lower													
		upper													
		comment													
291	Brede å	lower													
		upper													
		comment													
292	Omme å	lower													
		upper													
		comment													
112	Kongeåen	lower													
		upper													
		comment													
293	Ribe å	lower													
		upper													
		comment													
104	Skjern å	lower													
		upper													
		comment													
294	Sneum å	lower													
		upper													
		comment													
115	Storå	lower													
		upper													
		comment													
295	Varde å	lower													
		upper													
		comment													
109	Vid å	lower													
		upper													
		comment													
296	Grøn å	lower													
		upper													
		comment													
80	North Sea (DK)	lower													
		upper													
		comment													
125	Elling å	lower													
		upper													
		comment													
127	Ger å	lower													
		upper													
		comment													
103	Gudenå	lower													
		upper													
		comment													
129	Haslevgårds å	lower													
		upper													
		comment													
297	Ry å	lower													
		upper													
		comment													
120	Jordbr å	lower													
		upper													
		comment													
118	Karup å	lower													
		upper													
		comment													
130	Kastbjerg å	lower													
		upper													
		comment													
128	Lindenborg å	lower													
		upper													
		comment													
122	Simested å	lower													
		upper													
		comment													
121	Skals å	lower													
		upper													
		comment													
126	Voer å	lower													
		upper													
		comment													
77	Kattegat (DK)	lower													
		upper													
		comment													
123	Liver å	lower													
		upper													
		comment													
124	Uggerby å	lower													
		upper													
		comment													
74	Skagerrak (DK)	lower													
		upper													
		comment													

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2005 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	lower								0.154	3.261	0.017	4.356	0.057	9.639
		upper													
		minimum								0.024	1.5	0.0005	1.9	0.02	2.4
		maximum								0.48	5.1	0.029	6.6	0.19	25.8
		more than 70% > D.L.													
		n								18	18	18	18	18	18
		info													
		st.Dev.								0.102	1.198	0.008	1.251	0.051	6.12
291	Brede å	lower								0.149	2.2	0.018	2.833	0.069	10.656
		upper													
		minimum								0.018	1.1	0.0005	2	0.015	0.5
		maximum								0.33	3.4	0.036	3.9	0.24	28.8
		more than 70% > D.L.													
		n								17	18	18	18	18	18
		info													
		st.Dev.								0.093	0.654	0.01	0.598	0.055	8.504
292	Omme å	lower								0.088	2.574	0.018	3.1	0.087	9.58
		upper													
		minimum								0.024	2.05	0.009	2.3	0.042	2.7
		maximum								0.2	3.07	0.024	3.7	0.16	25
		more than 70% > D.L.													
		n								15	15	15	15	15	15
		info													
		st.Dev.								0.048	0.344	0.005	0.472	0.035	6.861
112	Kongeåen	lower								0.154	3.737	0.041	4.318	0.131	6.959
		upper													
		minimum								0.083	2.81	0.016	3.3	0.081	1.3
		maximum								0.2	4.98	0.053	5.9	0.19	15
		more than 70% > D.L.													
		n								17	17	17	17	17	17
		info													
		st.Dev.								0.036	0.775	0.009	0.904	0.032	4.428
293	Ribe å	lower								0.124	2.954	0.027	3.644	0.099	8.163
		upper													
		minimum								0.062	1.97	0.018	2.7	0.059	1.7
		maximum								0.18	4.06	0.059	4.8	0.16	19
		more than 70% > D.L.													
		n								16	16	16	16	16	16
		info													
		st.Dev.								0.028	0.632	0.01	0.762	0.029	4.429
104	Skjern å	lower	0.054	0.008	1.015	1.223	10.8			0.087	2.291	0.012	2.773	0.07	8.05
		upper													
		minimum	0.016	0	0.73	0.046	3.6			0.025	1.75	0.001	2.1	0.037	3
		maximum	0.092	0.002	1.3	2.4	18			0.18	2.74	0.018	3.5	0.12	12
		more than 70% > D.L.													
		n	2	2	2	2	2			15	11	15	11	11	12
		info													
		st.Dev.	0.0537	0.0011	0.403	1.665	10.18			0.046	0.357	0.004	0.473	0.025	2.514
294	Sneum å	lower								0.174	3.131	0.027	3.819	0.127	11.081
		upper													
		minimum								0.075	2.56	0.019	2.9	0.066	3.5
		maximum								0.36	3.8	0.04	5	0.27	25
		more than 70% > D.L.													
		n								16	16	16	16	16	16
		info													
		st.Dev.								0.08	0.44	0.007	0.65	0.05	5.919
115	Storå	lower								0.108	2.102	0.017	2.58	0.072	6.073
		upper													
		minimum								0.029	1.4	0.01	2	0.042	2.2
		maximum								0.19	2.86	0.026	3.5	0.11	14
		more than 70% > D.L.													
		n								17	15	17	15	15	15
		info													
		st.Dev.								0.053	0.482	0.005	0.516	0.019	2.806

295	Varde å	lower								0.158	2.771	0.016	3.307	0.077	6.333
		upper													
		minimum								0.07	2.13	0.01	2.6	0.041	3.8
		maximum								0.23	3.55	0.027	4.1	0.11	8.2
		more than 70% > D.L.													
		n								15	15	15	15	15	15
		info													
		st.Dev.								0.056	0.453	0.005	0.568	0.017	1.107
109	Vid å	lower								0.12	1.872	0.015	2.7	0.077	11.594
		upper													
		minimum								0.024	1.2	0.003	1.8	0.02	3.1
		maximum								0.3	3.1	0.029	4.3	0.2	18.3
		more than 70% > D.L.													
		n								18	18	18	18	18	18
		info													
		st.Dev.								0.065	0.578	0.008	0.594	0.054	4.474
296	Grøn å	lower								0.102	1.584	0.031	2.178	0.107	11.778
		upper													
		minimum								0.015	0.86	0.011	1.3	0.033	3.2
		maximum								0.3	2.5	0.093	3	0.27	23
		more than 70% > D.L.													
		n								18	17	18	18	18	18
		info													
		st.Dev.								0.059	0.546	0.018	0.483	0.072	5.895
80	North Sea (DK)	lower								0.14	2.56	0.020	3.09	0.080	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
		n													
		info													
		st.Dev.													
125	Elling å	lower								0.183	2.499	0.075	3.213	0.163	7.407
		upper													
		minimum								0.022	2.05	0.052	2.5	0.11	1.5
		maximum								0.32	3.33	0.13	4.6	0.27	18
		more than 70% > D.L.													
		n								15	15	15	15	15	15
		info													
		st.Dev.								0.1	0.326	0.024	0.59	0.047	5.452
127	Ger å	lower								0.186	2.555	0.037	3.446	0.116	11.762
		upper													
		minimum								0.024	1.46	0.027	1.9	0.056	2.3
		maximum								0.41	4.78	0.087	6.3	0.18	25
		more than 70% > D.L.													
		n								13	13	13	13	13	13
		info													
		st.Dev.								0.188	0.982	0.017	1.194	0.037	8.337
103	Gudenå	lower	0.0185	0.0013	1.014	0.26	24.63			0.058	1.529	0.033	2.111	0.088	5.659
		upper													
		minimum	0	0	0.61	0	1.1			0.009	0.611	0.003	1.2	0.045	1
		maximum	0.041	0.005	1.6	0.55	210			0.13	2.84	0.063	3.8	0.14	12
		more than 70% > D.L.													
		n	12	12	12	12	12			27	27	27	27	27	34
		info													
		st.Dev.	0.0122	0.0015	0.305	0.16	59.42			0.03	0.678	0.018	0.728	0.025	3.029
129	Haslevgårds å	lower								0.317	4.297	0.105	5.638	0.179	9.433
		upper													
		minimum								0.012	2.76	0.047	3.3	0.1	2.3
		maximum								0.89	7.3	0.18	8.6	0.28	24
		more than 70% > D.L.													
		n								16	16	16	16	16	15
		info													
		st.Dev.								0.28	1.328	0.035	1.774	0.055	6.67
297	Ry å	lower								0.154	3.019	0.07	3.894	0.163	15.541
		upper													
		minimum								0.0025	1.82	0.049	2.6	0.081	0.9
		maximum								0.31	4.79	0.11	6.3	0.32	42
		more than 70% > D.L.													
		n								17	17	17	17	17	17
		info													
		st.Dev.								0.105	0.89	0.018	1.013	0.058	14.426
120	Jordbro å	lower								0.065	1.766	0.042	2.147	0.091	5.356
		upper													
		minimum								0.012	1.34	0.012	1.7	0.066	2.1
		maximum								0.1	2.18	0.055	2.7	0.11	13
		more than 70% > D.L.													
		n								17	17	17	15	15	9
		info													
		st.Dev.								0.031	0.246	0.01	0.362	0.015	3.251

118	Karup å	lower								0.07	2.191	0.032	2.627	0.104	7.011
		upper													
		minimum								0.014	1.71	0.021	2	0.065	2.7
		maximum								0.12	2.6	0.052	3.2	0.16	15
		more than 70% > D.L.													
		n								15	15	15	15	15	9
		info													
		st.Dev.								0.033	0.296	0.007	0.386	0.027	3.893
130	Kastbjerg å	lower								0.064	7.03	0.061	7.506	0.102	6.747
		upper													
		minimum								0.005	4.05	0.031	5.1	0.043	2.3
		maximum								0.094	7.95	0.098	8.4	0.2	12
		more than 70% > D.L.													
		n								16	16	16	16	16	15
		info													
		st.Dev.								0.029	0.957	0.017	0.82	0.038	2.834
128	Lindenborg å	lower								0.087	5.265	0.082	6	0.124	10.407
		upper													
		minimum								0.024	1.95	0.027	4.3	0.037	1.8
		maximum								0.14	6.49	0.14	7.7	0.2	18
		more than 70% > D.L.													
		n								14	14	14	14	14	14
		info													
		st.Dev.								0.044	1.256	0.03	0.941	0.045	5.232
122	Simested å	lower								0.086	9.096	0.098	10.02	0.139	5.567
		upper													
		minimum								0.015	4.58	0.015	8.8	0.11	1.3
		maximum								0.24	10.6	0.13	11	0.17	9.7
		more than 70% > D.L.													
		n								16	16	16	15	15	9
		info													
		st.Dev.								0.066	1.302	0.029	0.723	0.021	2.82
121	Skals å	lower								0.071	3.489	0.033	4.193	0.1	10
		upper													
		minimum								0.0025	2.73	0.011	3.3	0.086	4.9
		maximum								0.26	4.39	0.058	5	0.11	15
		more than 70% > D.L.													
		n								16	16	16	15	15	9
		info													
		st.Dev.								0.082	0.444	0.016	0.448	0.009	3.514
126	Voer å	lower								0.144	3.099	0.054	3.86	0.175	23.82
		upper													
		minimum								0.037	1.49	0.025	3	0.13	6.3
		maximum								0.25	4.24	0.082	5.5	0.28	56
		more than 70% > D.L.													
		n								15	15	15	15	15	15
		info													
		st.Dev.								0.069	0.706	0.018	0.709	0.046	14.865
77	Kattegat (DK)	lower								0.13	3.63	0.06	4.14	0.110	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
		n													
		info													
		st.Dev.													
123	Liver å	lower								0.415	3.625	0.089	5.188	0.344	22.95
		upper													
		minimum								0.07	0.594	0.034	3.2	0.15	4.3
		maximum								1.6	4.99	0.51	7.1	1.1	55
		more than 70% > D.L.													
		n								16	16	16	16	16	16
		info													
		st.Dev.								0.408	1.122	0.116	1.356	0.258	14.772
124	Uggerby å	lower								0.169	2.967	0.068	3.794	0.184	22.119
		upper													
		minimum								0.029	2.09	0.043	2.7	0.12	3.7
		maximum								0.35	4.57	0.11	5.9	0.29	85
		more than 70% > D.L.													
		n								16	16	16	16	16	16
		info													
		st.Dev.								0.101	0.806	0.021	0.986	0.055	19.888
74	Skagerrak (DK)	lower								0.23	3.55	0.060	4.61	0.210	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
		n													
		info													
		st.Dev.													

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 2005 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	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
291	Brede å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
292	Omme å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
112	Kongeåen	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
293	Ribe å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
104	Skjern å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
294	Sneum å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
115	Stor å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
295	Varde å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
109	Vid å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
296	Grøn å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
80	North Sea (DK)	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
125	Elling å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
127	Ger å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
103	Gudenå	Sewage	>0,004	>0,0005	>0,04	>0,025	>0,5								
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
129	Haslevgårds å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
297	Ry å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
120	Jordbro å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
118	Karup å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
130	Kastbjerg å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
128	Linden borg å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
122	Simested å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
121	Skals å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
126	Voer å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
77	Kattegat (DK)	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
123	Liver å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
124	Uggerby å	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0
74	Skagerrak (DK)	Sewage													
		Industrial													
		Riverine								>0,01	>0,02	>0,005	>0,06	>0,01	> 2,0

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 2005 by Denmark

		Flow Rate [1000m³/d]	LTA 1000m³/d	inimum F 1000m³/d	aximum F 1000m³/d	LTA info (years)	Number of sites	Mean or Median	Catchment a km2
110	Brøns å	95.87	106	35.91	370.1	74-04	1	Mean	94.1
291	Brede å	323.61	338.1	115.33	1498.3	94-04	1	Mean	290
292	Omme å	665.36	735.5	319.32	1830.2	83-04	1	Mean	612
112	Kongeåen	583.88	619.1	245.38	2013.7	90-04	1	Mean	426.6
293	Ribe å	811.9	751.8	275.7	2568.6	33-04	1	Mean	675
104	Skjern å	1927.55	2272.2	1022.2	5709.9	93-04	1	Mean	1550
294	Sneum å	276.33	281.9	109.12	1277.4	66-04	1	Mean	223
115	Stor å	1299.74	1412.4	696.29	3845.5	71-04	1	Mean	1096.7
295	Varde å	972.31	1045.7	353.89	3628.3	69-04	1	Mean	815
109	Vid å	256.91	301.1	100.49	955.24	78-04	1	Mean	248.3
296	Grøn å	598.48	604.1	171.31	1902.1	59-04	1	Mean	563
80	**North Sea (DK)**	**12703**						**Mean**	**10809**
125	Elling å	103.45	120.8	47.63	617.78	89-04	1	Mean	132.2
127	Ger å	131.09	146.5	34.17	670.42	85-04	1	Mean	153.8
103	Gudenå	2614.18	2843.3	1549.3	6250.6	78-04	1	Mean	2602.9
129	Haslevgårds å	51.86	61.3	10.51	354.26	89-04	1	Mean	75
	Ry å	263.74	260	115.29	1223.1	72-04	1	Mean	285
120	Jordbro å	95.4	111.7	63.83	315.41	80-04	1	Mean	110.9
118	Karup å	582.35	633.6	362.69	1381.2	86-04	1	Mean	626.8
130	Kastbjerg å	76.96	70.2	39.48	212.63	76-04	1	Mean	96.3
128	Lindenborg å	303.95	306.8	179.46	855.99	83-04	1	Mean	317.8
122	Simested å	201.23	207.6	139.19	553.24	92-04	1	Mean	214.9
121	Skals å	384.22	387.1	218.48	817.69	73-04	1	Mean	556.4
126	Voer å	221.74	238.8	72.04	1418.6	89-04	1	Mean	238.7
77	**Kattegat (DK)**	**13151**						**Mean**	**15828**
123	Liver å	191.9	277.1			98-04	1	Mean	249.8
124	Uggerby å	319.48	342.2	92.73	1348.9	89-04	1	Mean	347.5
74	**Skagerrak (DK)**	**906**						**Mean**	**1098**

3. France

Annual report on riverine inputs and direct discharges by FRANCE to Convention waters during the year 2005

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

MEDAD (Ministère de l'Ecologie, du Développement et de l'Aménagement Durables)

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Email: Sylvie RAVALET (Head of the Ocean and Coastal Waters Unit): sylvie.ravalet@ecologie.gouv.fr

Email: René LALEMENT (Manager of the French Water Information System): rene.lalement@ecologie.gouv.fr

➢ Name, address and contact numbers of **technical contact** for riverine inputs:

IFEN (Institut Français de l'Environnement)

5 route d'Olivet – BP 16105

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Email: Aurélie DUBOIS (responsible for water): aurelie.dubois@ifen.ecologie.gouv.fr

A. General information

France is concerned with the OSPAR regions II and IV.

The reporting here is organised into 51 detailed zones gathered in sub and sub-sub regions, which correspond to the main French hydrographic basins (Artois-Picardie, Seine-Normandie, Loire-Bretagne and Adour-Garonne).

Tables 1 and 2 give a general overview of the French RID programme.

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

OSPAR region	OSPAR sub-region	OSPAR sub-sub region	OSPAR zone name	n°	OSPAR type	area (km²)	LTA (1000 m³/d)
OSPAR II	Artois-Picardie	Pas de Calais	II-AP-PC-Aa	1	unmonitored area	2308	2714
		Somme	II-AP-SO-Canche	2	tributary river	3895	4579
			II-AP-SO-SOMME	3	Main River	5916	3197
	Seine-Normandie	Normandie	II-SN-NO-Bethune	4	tributary river	2153	2074
			II-SN-NO-Saane	5	tributary river	1718	2938
		Seine	II-SN-SE-SEINE	6	Main River	64953	44842
			II-SN-SE-Andelle	7	tributary river	789	691
			II-SN-SE-Eure	8	tributary river	6023	2246
			II-SN-SE-H7	9	unmonitored area	2439	1684
			II-SN-SE-Risle	10	tributary river	2545	1642
		Nord Cotentin	II-SN-NC-Dives	11	tributary river	1815	1296
			II-SN-NC-Douve	12	tributary river	1474	1053
			II-SN-NC-Orne	13	tributary river	2976	2592
			II-SN-NC-Seulles	14	tributary river	547	518
			II-SN-NC-Touques	15	tributary river	1311	1037
			II-SN-NC-Vire	16	tributary river	2077	2246
		Sud Cotentin	II-SN-SC-I6	17	unmonitored area	1302	1134
			II-SN-SC-Selune	18	tributary river	1623	1987
			II-SN-SC-Sienne	19	tributary river	1135	1642
	Loire-Bretagne	Nord Bretagne	II-LB-NB-Aulne	20	tributary river	4312	6653
			II-LB-NB-Couesnon	21	tributary river	2848	2160
			II-LB-NB-J1J2	22	unmonitored area	4961	3762
OSPAR IV	Loire-Bretagne	Sud Bretagne	IV-LB-SB-Blavet	23	tributary river	4649	5702
			IV-LB-SB-J4	24	unmonitored area	2868	4425
			IV-LB-SB-VILAINE	25	Main River	10144	6048
		Loire	IV-LB-LO-Erdre	26	unmonitored area	3636	2779
			IV-LB-LO-LOIRE	27	Main River	110178	73699
			IV-LB-LO-Sevre-Nantaise	28	tributary river	4664	4579

		Sud Loire	IV-LB-SL-Lay	29	tributary river	4522	3456
		Sud Loire	IV-LB-SL-Sevre-Niortaise	30	tributary river	4363	4752
	Adour-Garonne	Charente	IV-AG-CH-Arnoult	31	unmonitored area	291	207
			IV-AG-CH-Boutonne	32	tributary river	2141	1524
			IV-AG-CH-CHARENTE	33	Main River	7526	5357
			IV-AG-CH-Livenne	34	unmonitored area	1172	512
			IV-AG-CH-Seudre	35	tributary river	988	432
		Bassin d'Arcachon	IV-AG-BA-Eyre	36	tributary river	2036	1901
			IV-AG-BA-S1	37	unmonitored area	2810	2624
		Gironde côté Dordogne	IV-AG-GD-DORDOGNE	38	Main River	14605	21859
			IV-AG-GD-Isle	39	tributary river	8472	7171
			IV-AG-GD-P9	40	unmonitored area	870	197
		Gironde côté Garonne	IV-AG-GG-Dropt	41	tributary river	2672	605
			IV-AG-GG-GARONNE	42	Main River	38227	40522
			IV-AG-GG-LOT	43	Main River	11541	13392
			IV-AG-GG-O9	44	unmonitored area	3875	12288
		Côte Landaise	IV-AG-CL-S3S4	45	unmonitored area	3105	2898
		Adour	IV-AG-AD-ADOUR	46	Main River	7977	7776
			IV-AG-AD-Bidouze	47	tributary river	1041	1015
			IV-AG-AD-GavesReunis	48	tributary river	5504	17453
			IV-AG-AD-Luy	49	tributary river	1367	1814
			IV-AG-AD-Nive	50	tributary river	1153	3197
			IV-AG-AD-Pays-Basque	51	unmonitored area	644	2042

Table 2: Characteristics of the 51 OSPAR zones

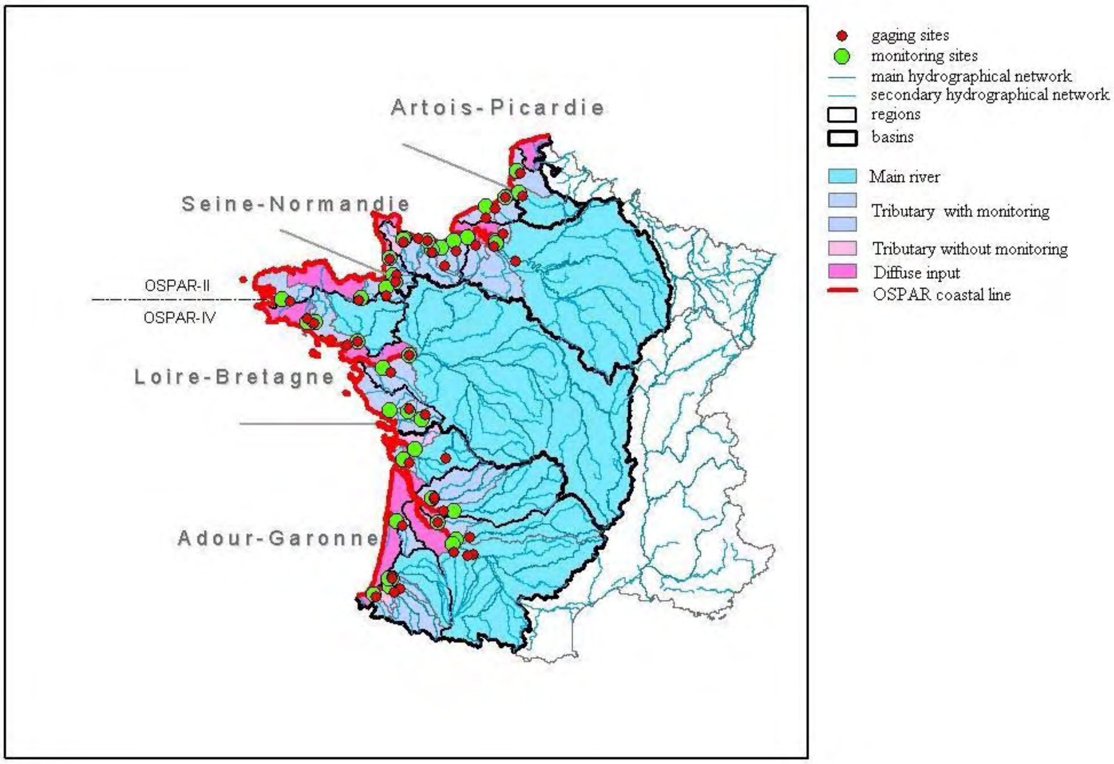
n°	Area (km^2)	Monitored area (km^2)	Population	monitored percentage (%)	Artificial areas (km^2)	Agricultural areas (km^2)	Forest (km^2)	Wetlands (km^2)	Nature of the receiving water	Tidal range (m)	
										coef 95	coef 45
1	2308	0	606932	0	255	1876	156	12	Coastal		
2	3895	1316	382876	34	190	3232	406	62	Coastal		
3	5916	5913	590939	100	223	5189	453	20	Estuary	8.95	5.05
4	2153	1800	160931	84	78	1725	342	2	Coastal		
5	1718	301	162014	18	83	1535	94	6	Coastal		
6	64953	64953	13942607	100	3364	44390	16749	53	Estuary	6.58	3.75
7	789	757	54321	96	26	573	187	0	Coastal		
8	6023	6023	603475	100	247	4478	1279	0	Coastal		
9	2439	0	932181	0	308	1474	528	39	Coastal		
10	2545	2199	156129	86	53	2065	416	3	Coastal		
11	1815	1400	107470	77	44	1656	112	3	Coastal		
12	1474	830	82539	56	24	1379	46	25	Coastal		
13	2976	2493	398837	84	134	2548	286	3	Coastal		
14	547	267	61510	49	33	498	9	7	Coastal		

15	1311	1210	98956	92	42	1127	140	1	Coastal		
n°	Area (km²)	Monitored area (km²)	Population	monitored percentage (%)	Artificial areas (km²)	Agricultural areas (km²)	Forest (km²)	Wetlands (km²)	Nature of the receiving water	Tidal range (m)	
										coef 95	coef 45
16	2077	1946	148111	94	50	1941	78	6	Coastal		
17	1302	0	164663	0	63	1089	103	44	Coastal		
18	1623	1148	87037	71	27	1517	40	33	Coastal		
19	1135	535	90296	47	35	1046	30	22	Coastal		
20	4312	1516	515782	35	228	3462	532	66	Coastal		
21	2848	1121	267158	39	117	2481	145	95	Coastal		
22	4961	0	485181	0	220	4138	522	69	Coastal		
23	4649	2398	497218	52	251	3624	636	93	Coastal		
24	2868	0	323296	0	155	2384	272	40	Coastal		
25	10144	10144	895082	100	321	8720	1064	12	Estuary	4.75	2.25
26	3636	0	816595	0	322	2806	199	244	Coastal		
27	110178	108767	6674979	99	2794	82424	24444	67	Estuary	5	2.45
28	4664	2356	515545	51	206	4246	163	31	Coastal		
29	4522	1277	389379	28	320	3917	195	71	Coastal		
30	4363	1361	421636	31	277	3795	230	56	Coastal		
31	291	0	21756	0	4	249	39	0	Coastal		
32	2141	0	137567	0	64	1885	167	15	Coastal		
33	7526	7526	432069	100	172	6147	1196	4	Estuary	5.1	2.45
34	1172	0	91813	0	63	792	236	79	Coastal		
35	988	378	59868	38	26	710	147	71	Coastal		
36	2036	1829	32437	90	29	236	1756	14	Estuary	3.9	2.1
37	2810	0	102569	0	92	637	1942	43	Coastal		
38	14605	14605	546257	100	237	7994	6239	41	Estuary	4.23	2.2
39	8472	6978	404147	82	149	5270	3006	5	Coastal		
40	870	0	85424	0	21	738	98	0	Coastal		
41	2672	1222	214506	46	81	2257	316	0	Coastal		
42	38227	38227	2238185	100	615	24986	11930	5	Estuary	4.23	2.2
43	11541	11541	351391	100	108	6341	4995	37	Coastal		
44	3875	0	752046	0	283	1171	2384	5	Coastal		
45	3105	0	152823	0	148	303	2522	14	Coastal		
46	7977	7977	371103	100	207	4566	3192	5	Estuary	3.5	1.65
47	1041	0	35923	0	10	662	365	0	Coastal		
48	5504	5434	315374	99	163	2088	3227	2	Coastal		
49	1367	1168	101217	85	46	1093	227	0	Coastal		
50	1153	906	116912	79	40	351	614	1	Coastal		
51	644	0	97348	0	34	169	124	1	Coastal		
Total	**382162**	**319822**	**37294410**	**84**	**13083**	**269980**	**94578**	**1527**			

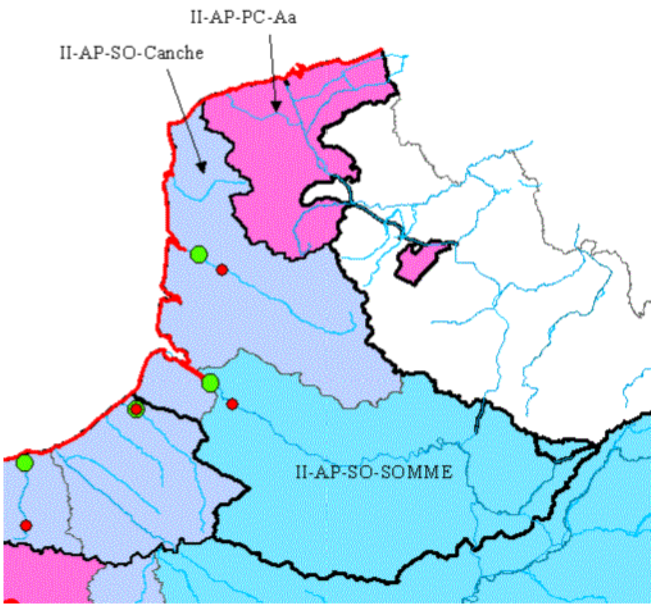
The French RID programme covers 382,162 km^2, hence 70 % of the total land area of France, and 84 % of the French OSPAR area is monitored in total.

To achieve our calculations with RTrend, we studied nine main rivers (see Table 1). However, if we consider, for example, the number of measurements taken, the load borne, etc., we see that three of them are actually main rivers in the region: the Loire, the Seine, and the Garonne.

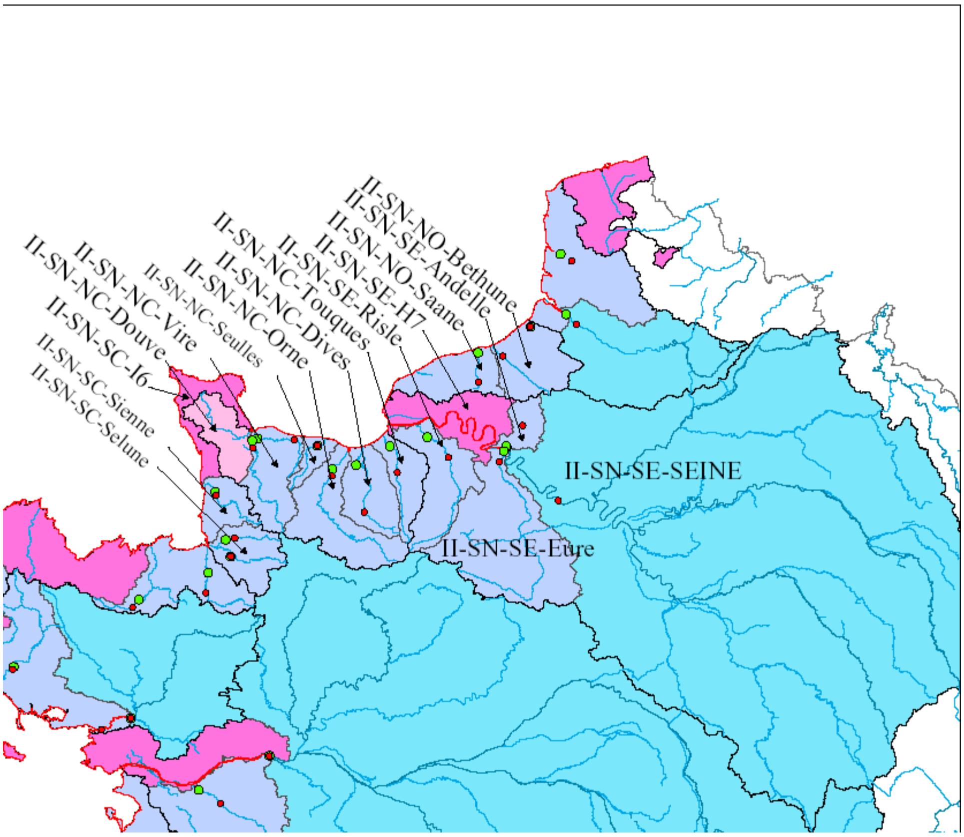
Figure 1: General map

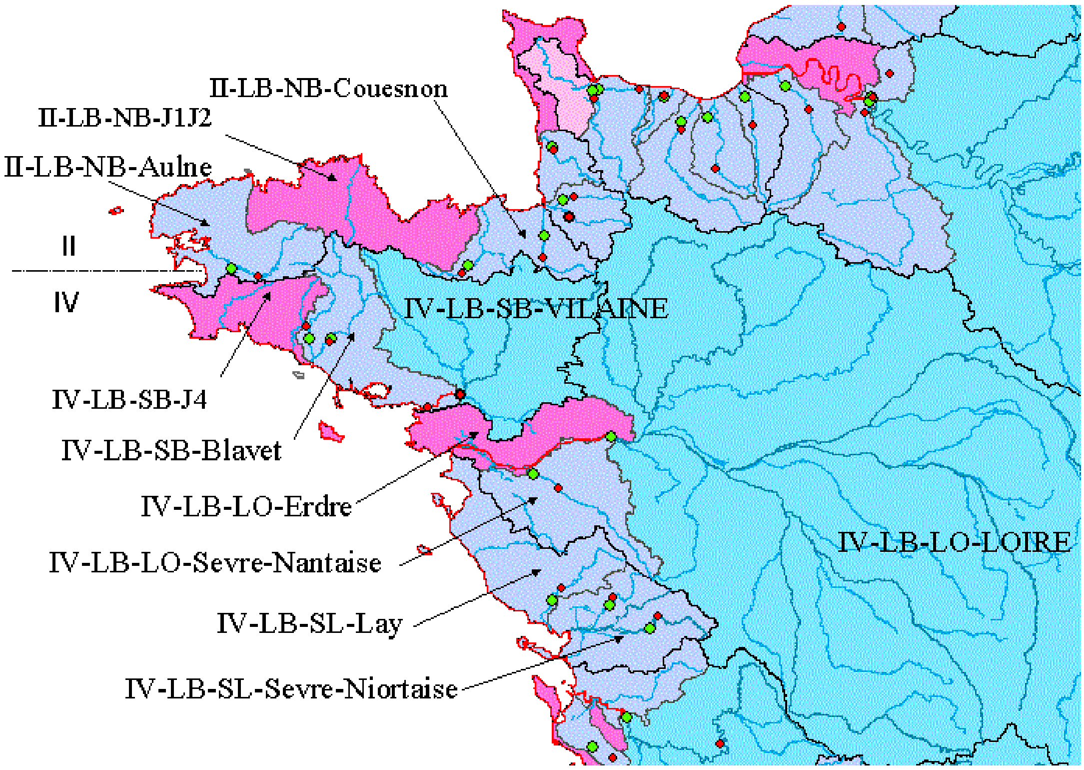


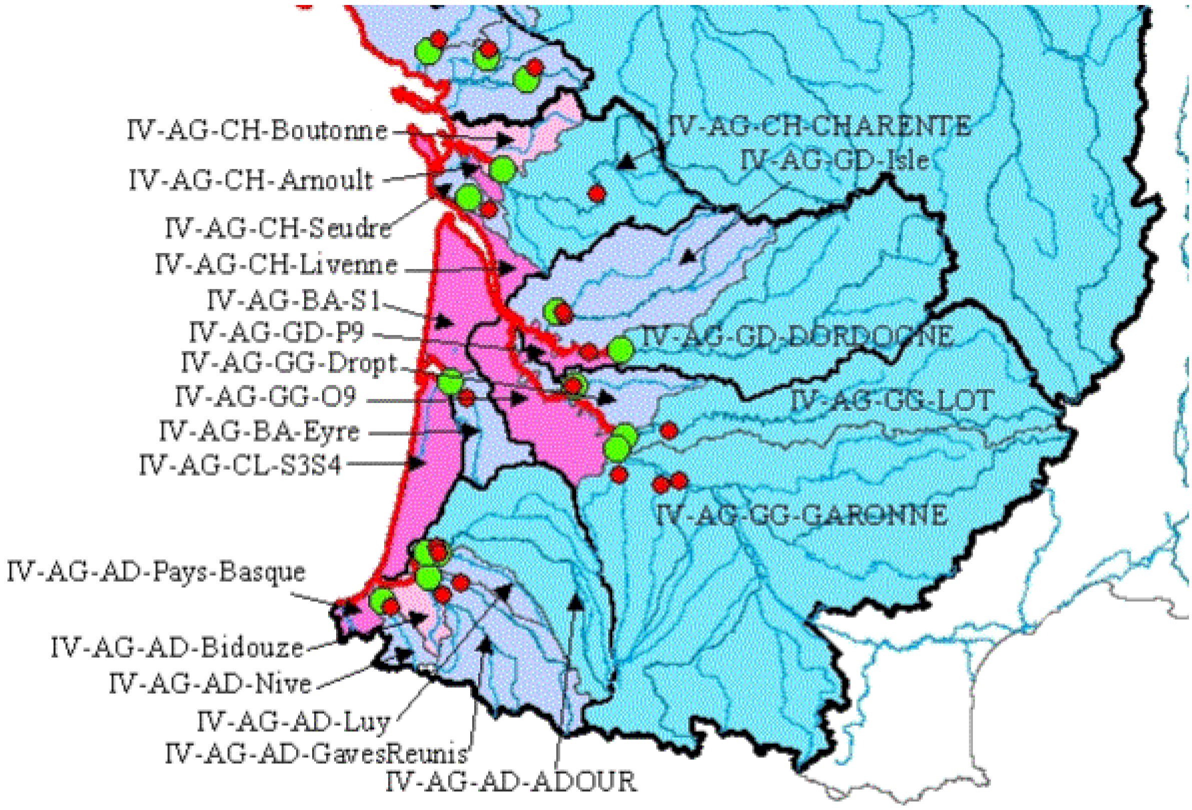
Figures 2 to 5: detailed maps for north to south



The runoff monitoring station of the main river the Seine has been moved upstream compared to where it was previously. Pertinent calculations have been modified to take this change into account.


II-SN-NO-Bethune
II-SN-SE-Andelle
II-SN-NO-Saane
II-SN-SE-H7
II-SN-SE-Risle
II-SN-NC-Touques
II-SN-NC-Dives
II-SN-NC-Orne
II-SN-NC-Seulles
II-SN-NC-Vire
II-SN-NC-Douve
II-SN-SC-I6
II-SN-SC-Sienne
II-SN-SC-Selune
II-SN-SE-SEINE
II-SN-SE-Eure


II-LB-NB-Couesnon
II-LB-NB-J1J2
II-LB-NB-Aulne
II
IV
IV-LB-SB-VILAINE
IV-LB-SB-J4
IV-LB-SB-Blavet
IV-LB-LO-Erdre
IV-LB-LO-Sevre-Nantaise
IV-LB-SL-Lay
IV-LB-SL-Sevre-Niortaise
IV-LB-LO-LOIRE



B. Total riverine inputs and direct discharges (Tables 4a and 4b) for the year 2005

Note: Table 4b shows total direct discharges and riverine inputs to maritime areas by region. Please provide totals for each OSPAR region and for total inputs.

B.1 Give general comments on the total riverine inputs and direct discharges (e.g. changes from last year, trends, percentage of particle bound determinand, results that need to be highlighted etc.):

This report is provisional because some data are not yet available. And as for previous years, when one input lacks for one parameter, we do not calculate the total input for the region or sub-region concerned, which is why Table 4a has not been fully completed.

C. Direct discharges for the year 2005

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 (cf. section 7 of the RID Principles), including for those under voluntary reporting:
C.2 Describe the determinands, other than those specified in paragraph 2.1 of the RID 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):

C.3 Give general comments on the discharges of sewage effluents (e.g. compared to previous years, and/or extent to which industrial effluents are discharged through sewerage systems):

Data about industrial effluents or waste from fish farming are not yet being reported.

Industrial Effluents (Table 5b)

C.4 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 7 of the RID Principles), including for those under voluntary reporting:

C.5 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

C.6 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:

C.7 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):

C.8 Give general comments on industrial effluents (e.g. compared to previous years):

Data about industrial effluents or waste from fish farming are not yet being reported.

Total direct discharges (Table 5c)

C.9 Give general comments on total direct discharges (e.g. compared to previous years):

N/A

D. Riverine inputs for the year 2005

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 6 of the RID Principles), including for those under voluntary reporting:

The monitoring stations have been chosen according to all the OSPAR recommendations (unidirectional freshwater flow, zone not influenced by seawater, etc.). Into the five sub-regions, the control of the monitoring network is ensured by the different main hydrographic basins (Artois-Picardie, Seine-Normandie, Loire-Bretagne, and Adour-Garonne, as detailed in part A). Analyses were performed by accredited laboratories.

The details about the numbers of measurements are given in Table 7.

We used Rtrend software to calculate all the inputs. Water quality and runoff data are saved in the Rtrend ADS database. We usually used the CM2 or the CM4 method for the main rivers and the largest tributaries (with 12 measurements per year at least). But as there were not enough data available for the majority of micropollutants, the CM2 RTrend method was used most of the time.

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):

Since France’s 2005 report, a lot of new parameters have been imported into the Rtrend database, such as DBO5, DCO, and micropollutants, as specified in Table 3 below:

Table 3: New parameters

PCB101	Alachlore	Glyphosate
PCB118	aminotriazole	Isoproturon
PCB138	AMPA	Mecoprop
PCB153	Atrazine	metolachlore
PCB180	atrazine deisopropyl	Oxadiazon
PCB28	Atrazine desethyl	Oxadixyl
PCB52	Bentazone	Simazine
2-4-D	chlortoluron	terbuthylazine
2-hydroxy atrazine	Diuron	terbuthylazine desethyl

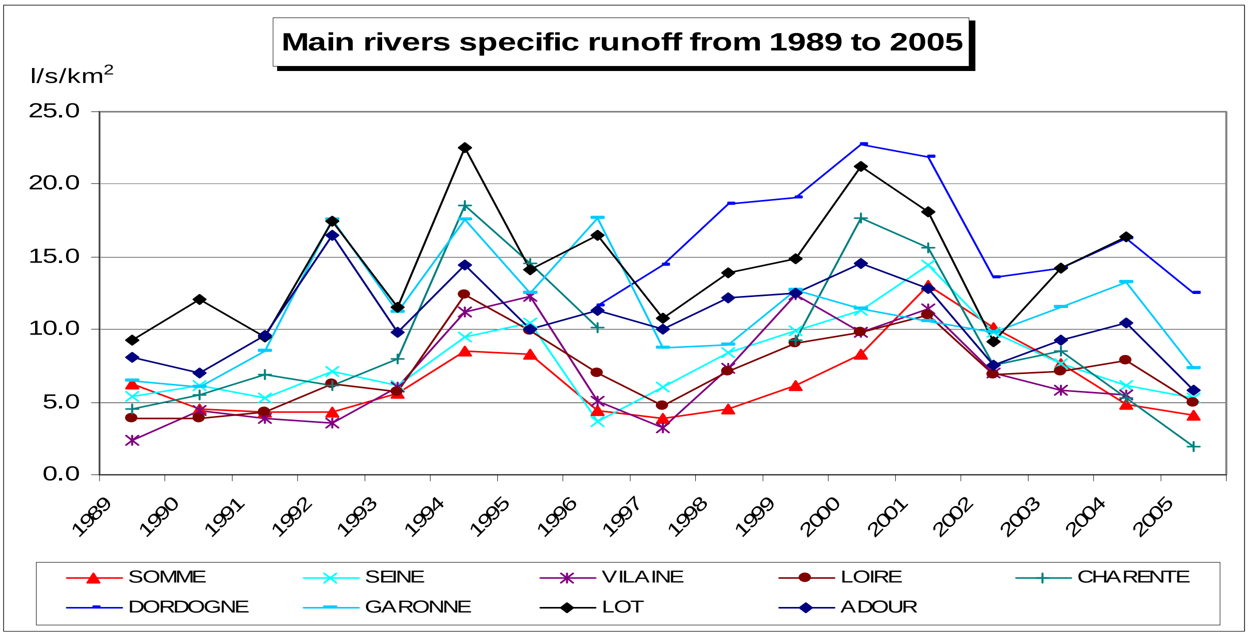
Loads were calculated for the seven PCBs separately, but very few data were available. Most of the time, there are not many data available for micropollutants, even for the main rivers.

D.4 Give general comments on the inputs from main rivers (e.g. significant changes in inputs, concentrations and flows compared to previous years):

Input variations have to be interpreted with the runoff variations, especially for micropollutants and SPM.

As illustrated below (figure 6), annual runoffs have generally increased in 2004 and then decreased in 2005, with corresponding impacts on the input data, for instance for NO_3. Sudden big floods do not appear in this graph. They can however significantly change the input values.

Figure 6: Specific runoffs in the main rivers



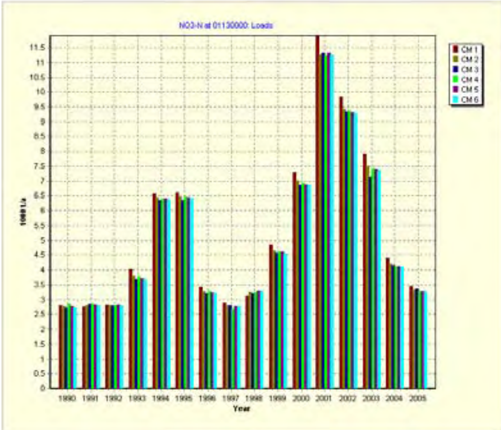
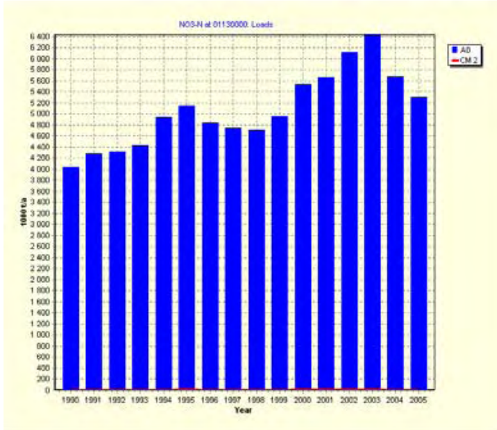
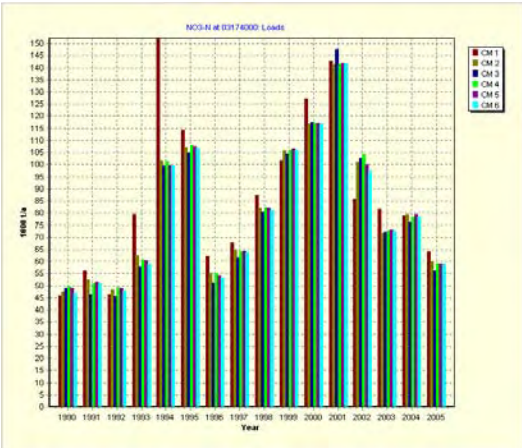
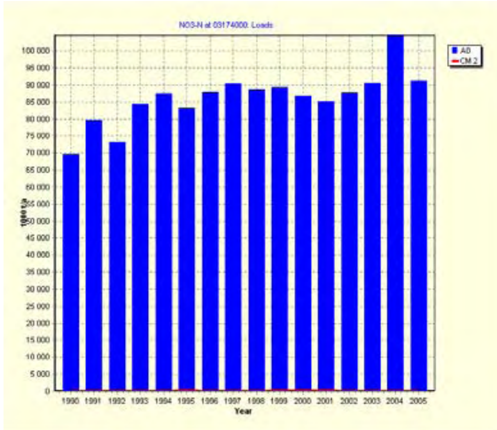
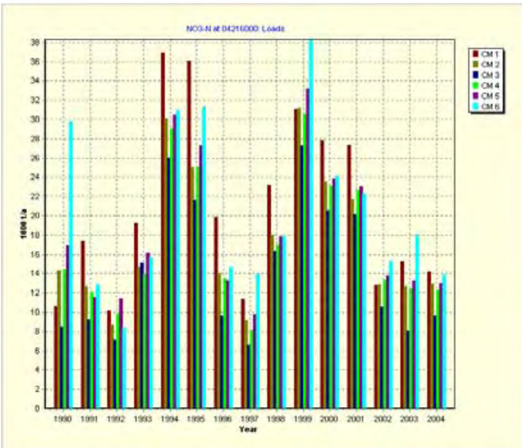
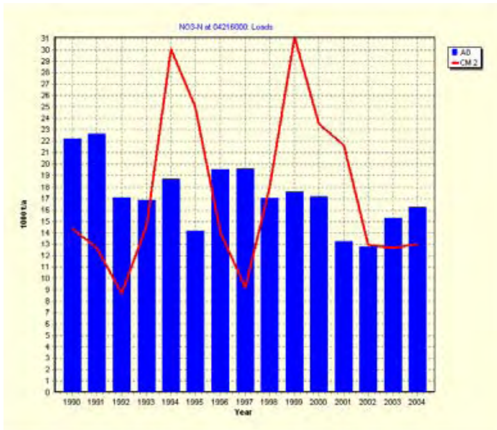
Tables 4 and 5 below show the inputs and trends into the main rivers since 1989 for a few parameters (macropollutants and micropollutants). The results obtained with the six Rtrend methods are presented.

We still had a few problems with the input units used in the “adjusted load calculation and analysis” Rtrend subroutine. A factor of 100 or 1000 can affect the scale, without affecting the result if we take it into account. Fortunately, in the conventional load calculation subroutine, the scales are correct.

The examples below show that it is interesting to compare the results of the CM1 to the CM6 load conventional calculation methods. We can see that every time we have enough measurements, there are not many differences in the results.

The results of inputs variations shown in Tables 4 and 5 need to be discussed by considering the annual runoff variations and frequencies and periods of quality monitoring, especially for micropollutants. For the main river LOT for instance, there was a big flood in December 2003. During this flood, a lot of SPM, with strong concentrations of cadmium, copper and zinc, was freed from the upstream sediments. These major loads were registered in the 2004 input. However, these loads are strongly approximate because no measurements were done when the runoff reached its maximum of 3,562 m^3/s. This example shows that it is sometimes difficult to understand the calculated input variations.

Table 4: NO_3 loads for the main rivers from north to south (only the conventional input scales are correct)

<table>
<tr><th>River Name</th><th>Available Inputs from 1989 to 2005</th><th>Rtrend trends calculations (A0 method)</th></tr>
<tr><td>II-AP-SO-SOMME</td><td>
</td><td>
</td></tr>
<tr><td>II-SN-SE-SEINE</td><td>
</td><td>
</td></tr>
<tr><td>IV-LB-SB-VILAINE</td><td>
</td><td>
</td></tr>
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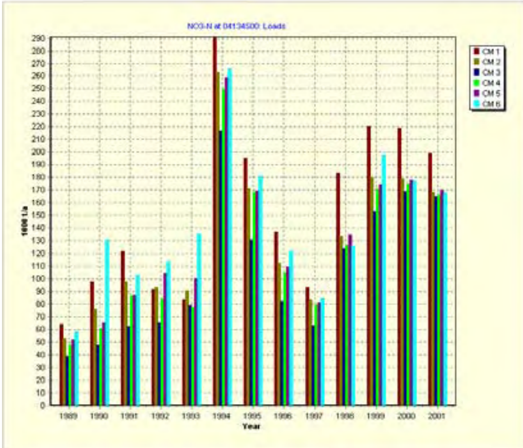
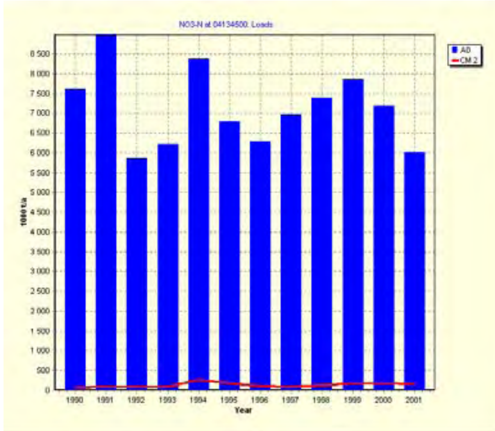
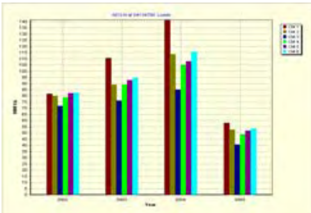
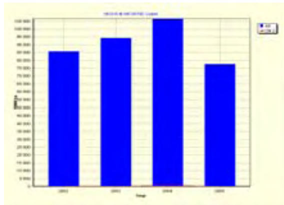
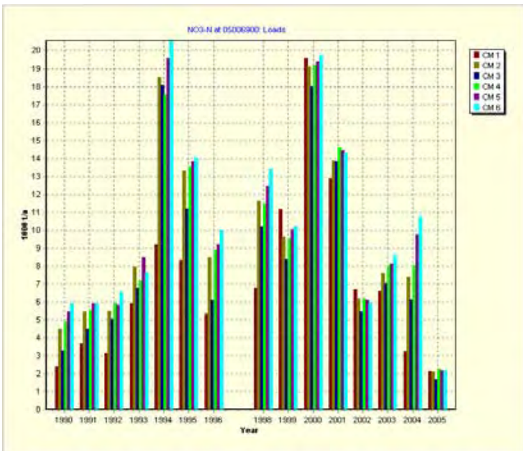
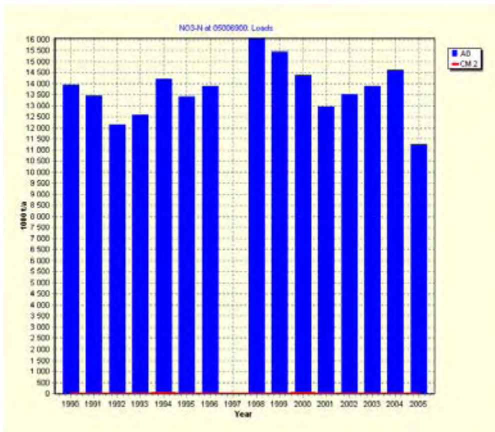
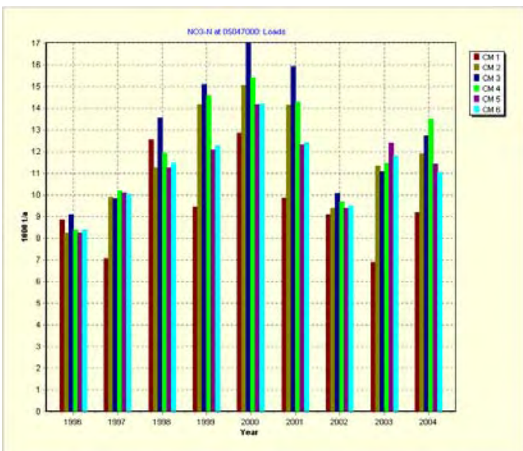
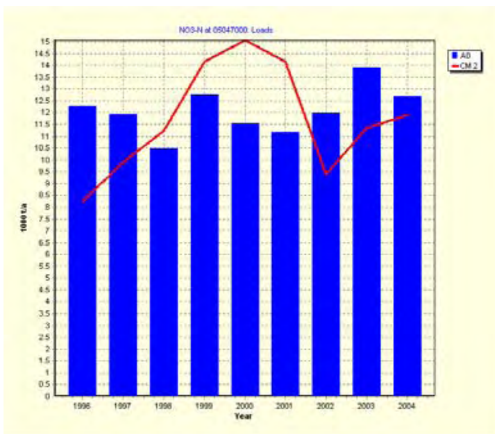
IV-LB-LO-LOIRE From 1989 to 2001		
From 2002 to 2005 (new quality monitoring station without changes in input series)	 (we were able to produce only one graph with Rtrend software, we have to export and use Excel software)	 (we have to calculate overall trends by using yearly load Rtrend calculation)
IV-AG-CH-CHARENTE		
IV-AG-GD-DORDOGNE		

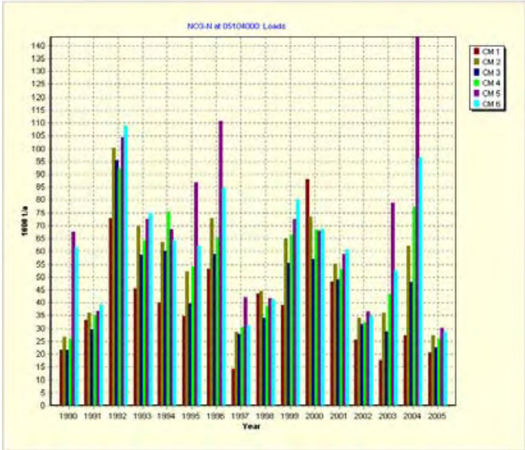
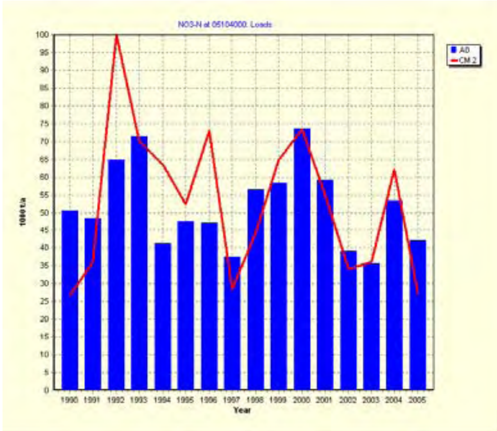
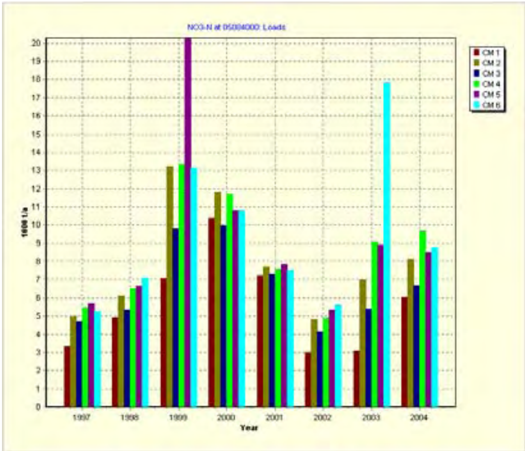
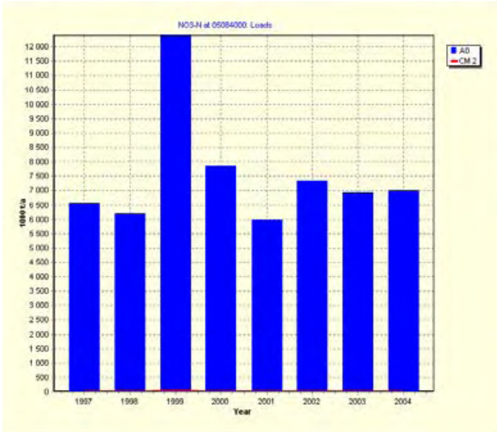
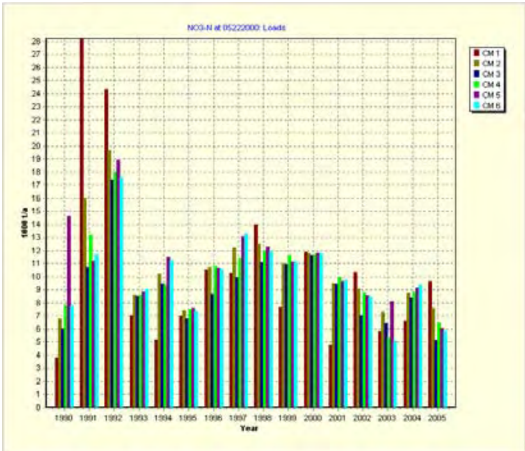
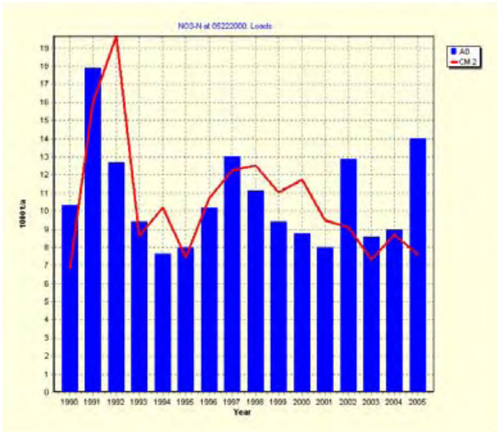
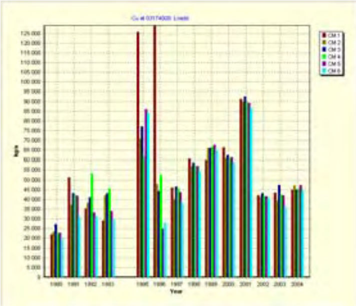
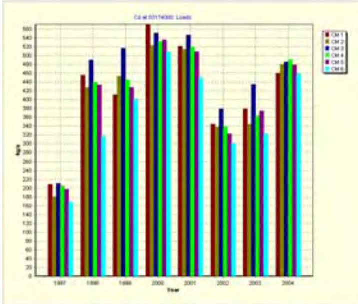
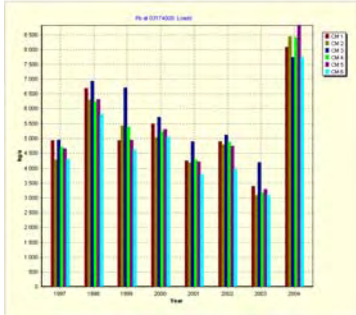
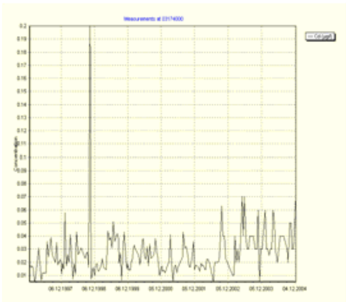
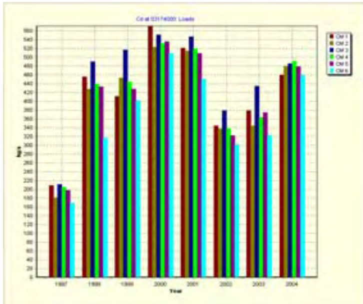
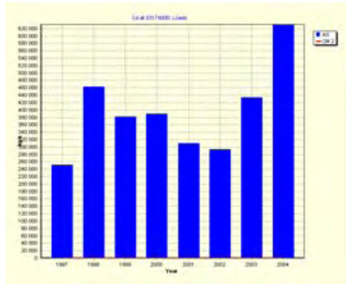
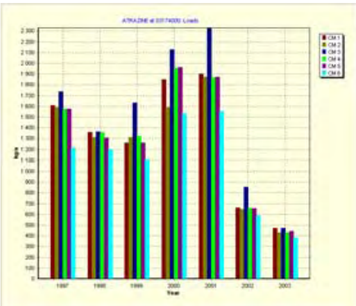
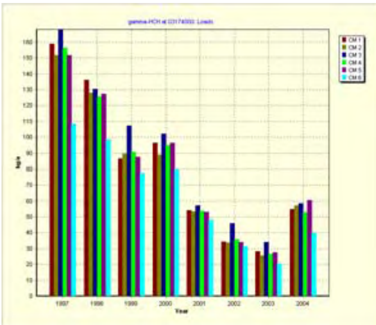
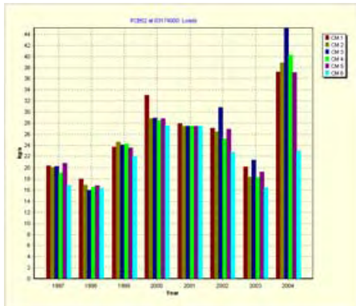
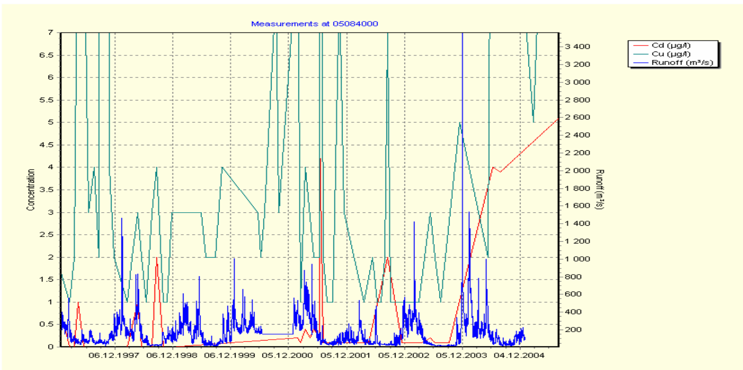
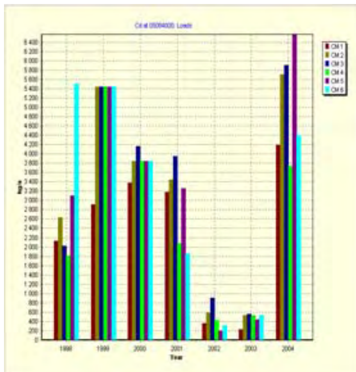
IV-AG-GG-GARONNE		
IV-AG-GG-LOT		
IV-AG-AD-ADOUR		

Table 5: Micropollutant input examples for the main rivers (maximum loads)

<table>
<tr><td rowspan="6">II-SN-SE-SEINE</td><td>Copper inputs</td><td>Zinc inputs</td><td>Lead inputs</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Cadmium concentrations</td><td>Cadmium inputs</td><td>Cadmium trends</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Atrazine inputs</td><td>g_HCH inputs</td><td>PCB_52</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td rowspan="2">IV-AG-GG-</td><td colspan="2">Runoff and cadmium and copper concentrations</td><td>Cadmium inputs</td></tr>
<tr><td colspan="2">
</td><td></td></tr>
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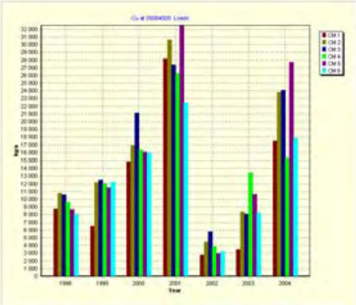
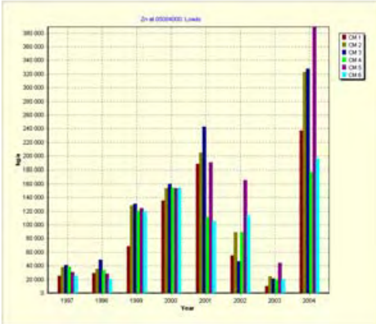
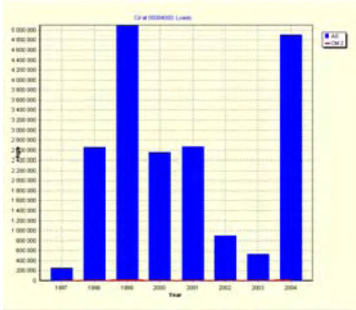
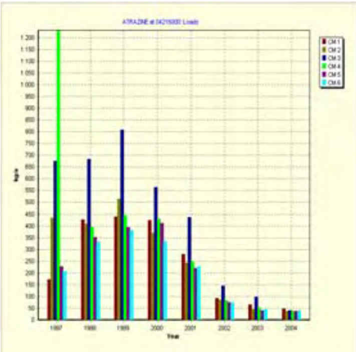
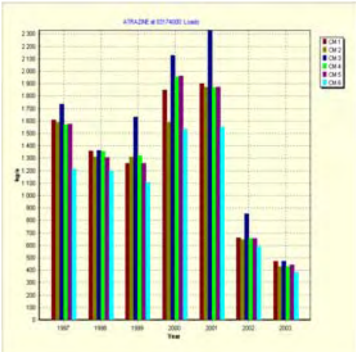
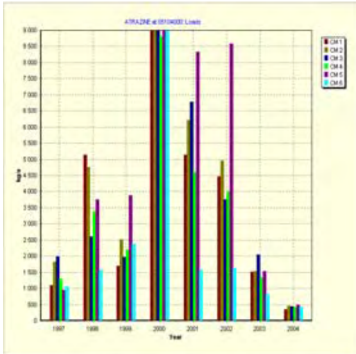
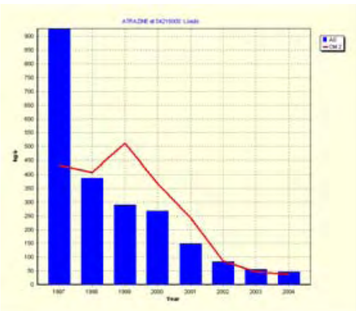
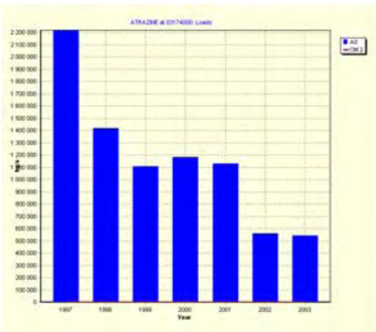
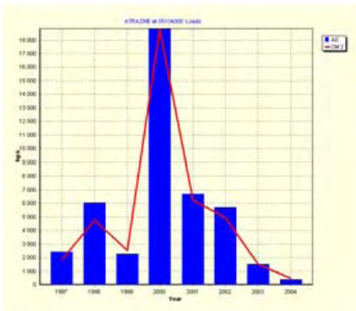
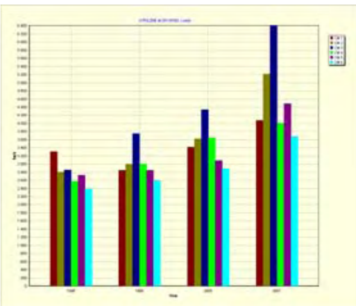
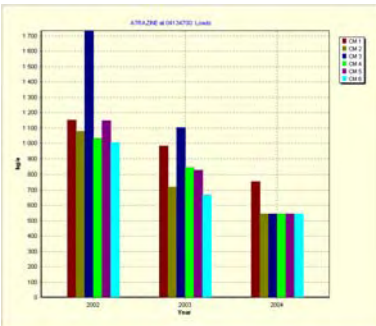
LOT	Copper inputs 	Zinc inputs 	Cadmium trends 
Atrazine	VILAINE inputs 	SEINE inputs 	GARONNE inputs 
	VILAINE Trends 	SEINE trends 	GARONNE trends 
	LOIRE inputs 1998 to 2001 	LOIRE inputs 2002 to 2004 	

Tributary Rivers (Tables 6b and 7b)

D.5 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 6 of the Principles):

The same comments apply here as for the main rivers. Micropollutant inputs are often strongly approximate because of the lack of data, even with the condition of at least four measurements per year. Therefore, the results may be heavily influenced by a single measurement, for example if one measurement is taken during a flood we can obtain a very significant input that is not completely representative.

D.6 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

None

D.7 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):

The same determinands as for the main rivers have been added. However, very few data are available.

D.8 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in Tables 6b and 7b:

None

D.9 Give general comments on the inputs from tributary rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

As for the main rivers, annual runoff has generally increased in 2004 and then decreased in 2005, with corresponding impacts on the loads.

Total riverine inputs (Table 6c)

D.10 Give general comments on the total riverine inputs (e.g. significant change in inputs, concentrations and flows compared to previous years):

It is difficult for France to compare and conclude on any differences since the data for 2005 are not complete.

E. Unmonitored areas

E.1 Describe the methods of quantification used for the different determinands or groups of determinands:

As in previous reports, the unmonitored areas are linked with a monitored one that presents similar characteristics for soil nature, land cover, etc. The inputs can also be estimated, thanks to the data from the reference tributary.

F. Limits of detection (Table 8)

F.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Give comments if the detection limits are higher than stated in the RID Principles:

There are no significant improvements here compared to the data in the last report. All limits are quantification limits. France’s limits are rather higher than the recommended limits; however, we cannot easily compare detection and quantification limits.

With the ongoing implementation of the comprehensive Water Information System for France, the availability of detection and quantification limits data should improve. Some of these are indeed missing in the data.

G. Additional comments

G.1 Indicate and explain, if appropriate:

- *where and why the applied procedures do not comply with agreed procedures*

None

- *significant changes in monitoring sites, important for comparison of the data before and after the date of the change;*

The main river SEINE runoff monitoring station has been moved in order to remedy the lack of runoff data. All loads have been recalculated since 1989.

- *incomplete or distorted data*

For each parameter with incomplete or distorted data, inputs were not calculated.

Measurement and flow rate data were checked for outlier values. However, when the number of measurements is insufficient (especially for SPM, total nitrogen and micropollutants) and the flow is very high, none of the different methods for input calculation is really suitable, and so the result is strongly approximate. Therefore, we have always indicated, in the “comment” item, the number of measurements in order to alert the user to the quality of the input value.

Missing 2004 data were imported to complete the Rtrend ADS database. All 2005 data are not yet available, but they will be imported into the Rtrend database for the next report. So the RID_France_2005 file is “provisional”: the final version of this report will be completed in the next round of INPUT reporting.

The RID_France_2004 file is now given here in its final version.

Table 4a. Total Riverine Inputs and Direct Discharges to each OSPAR Region
Reported Maritime Area of the OSPAR Convention by France 2005

TOTAL INPUTS			Quantities --->												
	Estimate	Flow rate (1000 m3/d)	Cd [10^3 kg]	Hg [10^3 kg]	Cu [10^3 kg]	Pb [10^3 kg]	Zn [10^3 kg]	g-HCH [kg]	PCBs [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 [10^6 kg]
INPUTS TO OSPAR II															
RIVERINE INPUTS															
Main Rivers	lower	31875								15.484	63.302	2.162		2.497	217.127
	upper									15.522	63.302	2.167		2.497	217.127
Tributary Rivers	lower														
	upper														
Total Riverine Inputs	**lower**														
	upper														
DIRECT DISCHARGES															
Sewage Effluents	lower														
	upper														
Industrial Effluents	lower														
	upper														
Fish Farming	lower														
	upper														
Total Direct Inputs	**lower**														
	upper														
UNMONITORED AREAS															
Unmonitored Areas	lower	6086								0.127	14.852	0.214		0.371	50.778
	upper									0.170	14.852	0.225		0.387	50.818
REGION II TOTAL	**lower**														
	upper														
INPUTS TO OSPAR IV															
RIVERINE INPUTS															
Main Rivers	lower														
	upper														
Tributary Rivers	lower														
	upper														
Total Riverine Inputs	**lower**														
	upper														
DIRECT DISCHARGES															
Sewage Effluents	lower														
	upper														
Industrial Effluents	lower														
	upper														
Fish Farming	lower														
	upper														
Total Direct Inputs	**lower**														
	upper														
UNMONITORED AREAS															
Unmonitored Areas	lower														
	upper														
REGION IV TOTAL	**lower**														
	upper														

(comment : items are not fullfilled if one input is absent in the total)

Table 4b. Total Riverine Inputs and Direct Discharges from each Contracting Party
Reported Maritime Area of the OSPAR Convention by France 2005

TOTAL INPUTS			**Quantities --->**													
OSPAR II and IV	**Estimate**	**Flow rate (1000 m3/d)**	**Cd [10^3 kg]**	**Hg [10^3 kg]**	**Cu [10^3 kg]**	**Pb [10^3 kg]**	**Zn [10^3 kg]**	**g-HCH [kg]**	**PCBs [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 [10^6 kg]**
RIVERINE INPUTS																
Main Rivers	lower															
	upper															
Tributary Rivers	lower															
	upper															
Total Riverine Inputs	**lower**															
	upper															
DIRECT DISCHARGES																
Sewage Effluents	lower															
	upper															
Industrial Effluents	lower															
	upper															
Fish Farming	lower															
	upper															
Total Direct Inputs	**lower**															
	upper															
UNMONITORED AREAS																
Unmonitored Areas	lower															
	upper															
REGIONS II and IV TOTAL	**lower**															
	upper															

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention by France 2005

NO DATA

			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]
1	II-AP-PC-Aa	lower													
		upper													
		comment													
2	II-AP-SO-Canche	lower													
		upper													
		comment													
3	II-AP-SO-SOMME	lower													
		upper													
		comment													
4	II-SN-NO-Bethune	lower													
		upper													
		comment													
5	II-SN-NO-Sa	lower													
		upper													
		comment													
6	II-SN-SE-SE	lower													
		upper													
		comment													
7	II-SN-SE-And	lower													
		upper													
		comment													
8	II-SN-SE-Eu	lower													
		upper													
		comment													
9	II-SN-SE-H	lower													
		upper													
		comment													
10	II-SN-SE-Ri	lower													
		upper													
		comment													
11	II-SN-NC-Di	lower													
		upper													
		comment													
12	II-SN-NC-Douve	lower													
		upper													
		comment													
13	II-SN-NC-Orne	lower													
		upper													
		comment													
14	II-SN-NC-Seulles	lower													
		upper													
		comment													
15	II-SN-NC-Touques	lower													
		upper													
		comment													
16	II-SN-NC-Vire	lower													
		upper													
		comment													
		lower													

17	II-SN-SC-I6	upper													
		comment													
18	II-SN-SC-Selune	lower													
		upper													
		comment													
19	II-SN-SC-Sienne	lower													
		upper													
		comment													
20	II-LB-NB-Aulne	lower													
		upper													
		comment													
21	II-LB-NB-Couesnon	lower													
		upper													
		comment													
22	II-LB-NB-J1J2	lower													
		upper													
		comment													
23	IV-LB-SB-Blavet	lower													
		upper													
		comment													
24	IV-LB-SB-J4	lower													
		upper													
		comment													
25	IV-LB-SB-VILAINE	lower													
		upper													
		comment													
26	IV-LB-LO-Erdre	lower													
		upper													
		comment													
27	IV-LB-LO-LOIRE	lower													
		upper													
		comment													
28	IV-LB-LO-Sevre-Nantaise	lower													
		upper													
		comment													
29	IV-LB-SL-Lay	lower													
		upper													
		comment													
30	IV-LB-SL-Sevre-Niortaise	lower													
		upper													
		comment													
31	IV-AG-CH-Arnoult	lower													
		upper													
		comment													
32	IV-AG-CH-Boutonne	lower													
		upper													
		comment													
33	IV-AG-CH-CHARENTE	lower													
		upper													
		comment													
34	IV-AG-CH-Livenne	lower													
		upper													
		comment													
35	IV-AG-CH-Seudre	lower													
		upper													
		comment													

36	IV-AG-BA-Eyre	lower													
		upper													
		comment													
37	IV-AG-BA-S1	lower													
		upper													
		comment													
38	IV-AG-GD-DORDOGNE	lower													
		upper													
		comment													
39	IV-AG-GD-Isle	lower													
		upper													
		comment													
40	IV-AG-GD-P9	lower													
		upper													
		comment													
41	IV-AG-GG-Dropt	lower													
		upper													
		comment													
42	IV-AG-GG-GARONNE	lower													
		upper													
		comment													
43	IV-AG-GG-LOT	lower													
		upper													
		comment													
44	IV-AG-GG-O9	lower													
		upper													
		comment													
45	IV-AG-CL-S3S4	lower													
		upper													
		comment													
46	IV-AG-AD-ADOUR	lower													
		upper													
		comment													
47	IV-AG-AD-Bidouze	lower													
		upper													
		comment													
48	IV-AG-AD-GavesReunis	lower													
		upper													
		comment													
49	IV-AG-AD-Luy	lower													
		upper													
		comment													
50	IV-AG-AD-Nive	lower													
		upper													
		comment													
51	IV-AG-AD-Pays-Basque	lower													
		upper													
		comment													

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention by France 2005

NO DATA

			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]
1	II-AP-PC-Aa	lower													
		upper													
		comment													
2	II-AP-SO-Canche	lower													
		upper													
		comment													
3	II-AP-SO-SOMME	lower													
		upper													
		comment													
4	II-SN-NO-Bethune	lower													
		upper													
		comment													
5	II-SN-NO-S[illegible]	lower													
		upper													
		comment													
6	II-SN-SE-S[illegible]	lower													
		upper													
		comment													
7	II-SN-SE-Ar[illegible]	lower													
		upper													
		comment													
8	II-SN-SE-E[illegible]	lower													
		upper													
		comment													
9	II-SN-SE-[illegible]	lower													
		upper													
		comment													
10	II-SN-SE-F[illegible]	lower													
		upper													
		comment													
11	II-SN-NC-D[illegible]	lower													
		upper													
		comment													
12	II-SN-NC-D[illegible]ve	lower													
		upper													
		comment													
13	II-SN-NC-Orne	lower													
		upper													
		comment													
14	II-SN-NC-Seulles	lower													
		upper													
		comment													
15	II-SN-NC-Touques	lower													
		upper													
		comment													
16	II-SN-NC-Vire	lower													
		upper													
		comment													
		lower													

17	II-SN-SC-I6	upper													
		comment													
18	II-SN-SC-Selune	lower													
		upper													
		comment													
19	II-SN-SC-Sienne	lower													
		upper													
		comment													
20	II-LB-NB-Aulne	lower													
		upper													
		comment													
21	II-LB-NB-Couesnon	lower													
		upper													
		comment													
22	II-LB-NB-J1J2	lower													
		upper													
		comment													
23	IV-LB-SB-Blavet	lower													
		upper													
		comment													
24	IV-LB-SB-J4	lower													
		upper													
		comment													
25	IV-LB-SB-VILAINE	lower													
		upper													
		comment													
26	IV-LB-LO-Erdre	lower													
		upper													
		comment													
27	IV-LB-LO-LOIRE	lower													
		upper													
		comment													
28	IV-LB-LO-Sevre-Nantaise	lower													
		upper													
		comment													
29	IV-LB-SL-Lay	lower													
		upper													
		comment													
30	IV-LB-SL-Sevre-Niortaise	lower													
		upper													
		comment													
31	IV-AG-CH-Arnoult	lower													
		upper													
		comment													
32	IV-AG-CH-Boutonne	lower													
		upper													
		comment													
33	IV-AG-CH-CHARENTE	lower													
		upper													
		comment													
34	IV-AG-CH-Livenne	lower													
		upper													
		comment													
35	IV-AG-CH-Seudre	lower													
		upper													
		comment													

36	IV-AG-BA-Eyre	lower													
		upper													
		comment													
37	IV-AG-BA-S1	lower													
		upper													
		comment													
38	IV-AG-GD-DORDOGNE	lower													
		upper													
		comment													
39	IV-AG-GD-Isle	lower													
		upper													
		comment													
40	IV-AG-GD-P9	lower													
		upper													
		comment													
41	IV-AG-GG-Dropt	lower													
		upper													
		comment													
42	IV-AG-GG-GARONNE	lower													
		upper													
		comment													
43	IV-AG-GG-LOT	lower													
		upper													
		comment													
44	IV-AG-GG-O9	lower													
		upper													
		comment													
45	IV-AG-CL-S3S4	lower													
		upper													
		comment													
46	IV-AG-AD-ADOUR	lower													
		upper													
		comment													
47	IV-AG-AD-Bidouze	lower													
		upper													
		comment													
48	IV-AG-AD-GavesReunis	lower													
		upper													
		comment													
49	IV-AG-AD-Luy	lower													
		upper													
		comment													
50	IV-AG-AD-Nive	lower													
		upper													
		comment													
51	IV-AG-AD-Pays-Basque	lower													
		upper													
		comment													

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention by France 2005

			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]
3	II-AP-SO-SOMME	lower								0.184	3.33	0.077	3.52	0.116	10.059
		upper								0.195	3.33	0.082	4	0.116	10.059
		comment	0	0	0	0	0	0	0	12	12	12	12	12	12
6	II-SN-SE-SEINE	lower								15.3	59.972	2.085	82.458	2.381	207.068
		upper								15.327	59.972	2.085	84.098	2.381	207.068
		comment	0	0	0	0	0	0	0	23	23	23	23	23	23
25	IV-LB-SB-VILAINE	lower													
		upper													
		comment	10	10	10	10	10	13	13	28	28	28	26	28	28
27	IV-LB-LO-LOIRE	lower	0	0	103.127	0	488.833	0	12.754	1.044	52.615	0.82		1.137	447.686
		upper	80.845	3.294	128.63	90.962	491.666	172.827	86.414	1.077	52.641	0.821		1.315	447.686
		comment	13	13	13	13	13	18	18	28	28	28	0	28	28
33	IV-AG-CH-CHARENTE	lower	0.451	0.08	14.074	18.625	85.515	0		0.039	2.088	0.019	0.355	0.032	1.638
		upper	0.451	0.082	14.074	18.625	85.515	815.785		0.041		0.02	2.442	0.034	1.638
		comment	7	7	7	7	7	16	0	12	12	12	12	12	12
38	IV-AG-GD-DORDOGNE	lower													
		upper													
		comment	2	2	2	2	2	0	0	11	11	11	10	11	10
42	IV-AG-GG-GARONNE	lower	3.294	0.126	263.863	184.296	777.175	0		0.172	27.332	0.285		0.464	114.958
		upper	3.294	0.255	263.863	184.296	777.175	3 814.597		0.364	27.332	0.323		0.584	114.958
		comment	2	2	2	2	2	10	0	7	7	7	0	7	6
43	IV-AG-GG-LOT	lower													
		upper													
		comment	14	14	14	14	14	11	0	13	13	13	12	13	12
46	IV-AG-AD-ADOUR	lower	2.124	0.255	54.431	45.414	212.223	0		0.356	7.611	0.12	8.921	0.557	200.49
		upper	2.124	0.258	54.431	45.414	212.223	2 765.557		0.356	7.611	0.121	9.758	0.557	200.49
		comment	7	7	7	7	7	16	0	12	12	12	10	12	10

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention by France 2005

			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]
2	II-AP-SO-Canche	lower						0		0.065	7.044	0.24	0	0.308	14.068
		upper						28.431		0.139	7.044	0.257	7.805	0.32	14.068
		comment	0	0	0	0	0	4	0	12	12	12	12	12	12
4	II-SN-NO-Bethune	lower								0.039	1.514	0.028		0.041	7.891
		upper								0.039	1.514	0.028		0.048	7.891
		comment	0	0	0	0	0	11	0	12	12	12	0	12	12
5	II-SN-NO-Saane	lower						0.257		0.011	1.552	0.017		0.023	2.734
		upper						0.399		0.011	1.552	0.017		0.029	2.734
		comment	0	0	0	0	0	12	0	12	12	12	0	12	12
7	II-SN-SE-Andelle	lower								0.007	0.675	0.008		0.01	1.777
		upper								0.007	0.675	0.008		0.015	1.777
		comment	0	0	0	0	0	0	0	12	12	12	0	12	12
8	II-SN-SE-Eure	lower						0.459		0.021	4.528	0.065		0.086	8.905
		upper						0.921		0.022	4.528	0.065		0.09	8.905
		comment	0	0	0	0	0	12	0	12	12	12	0	12	12
10	II-SN-SE-Risle	lower								0.014	1.505	0.022		0.034	4.266
		upper								0.015	1.505	0.022		0.039	4.266
		comment	0	0	0	0	0	0	0	6	6	6	0	6	6
11	II-SN-NC-Dives	lower						0.18		0.005	0.818	0.012	0.936	0.014	1.351
		upper						0.258		0.005	0.818	0.012	0.936	0.017	1.351
		comment	0	0	0	0	0	10	0	12	12	12	12	12	12
12	II-SN-NC-Douve	lower						0.146		0.004	0.664	0.009	0.76	0.012	1.097
		upper						0.21		0.004	0.664	0.009	0.76	0.014	1.097
		comment	0	0	0	0	0	3	0	12	12	12	12	12	12
13	II-SN-NC-Orne	lower						0		0.068	6.746	0.044	7.615	0.06	8.507
		upper						1.009		0.069	6.746	0.044	7.615	0.078	8.507
		comment	0	0	0	0	0	12	0	12	12	12	12	12	12
14	II-SN-NC-Seulles	lower						0		0.004	0.731	0.008	0.842	0.012	3.724
		upper						0.096		0.004	0.731	0.008	0.842	0.012	3.724
		comment	0	0	0	0	0	4	0	12	12	12	12	12	12
15	II-SN-NC-Touques	lower						0.055		0.008	0.67	0.018	0.854	0.026	2.842
		upper						0.306		0.009	0.67	0.018	0.854	0.028	2.842
		comment	0	0	0	0	0	12	0	11	11	11	11	11	11
16	II-SN-NC-Vire	lower								0.045	2.554	0.049	3.087	0.076	8.512
		upper								0.046	2.554	0.049	3.087	0.078	8.512
		comment	0	0	0	0	0	0	0	12	12	12	12	12	12
18	II-SN-SC-Selune	lower						0.438		0.024	3.25	0.011	3.728	0.011	10.813
		upper						0.733		0.024	3.25	0.011	3.728	0.041	10.813
		comment	0	0	0	0	0	4	0	12	12	12	12	12	12
19	II-SN-SC-Sienne	lower													
		upper													
		comment	0	0	0	0	0	0	0	12	12	12	12	12	12
20	II-LB-NB-Aulne	lower	0	0	2.816	0.304	48.204	0	0	0.028	10.613	0.014	9.93	0.1	17.369
		upper	6.264	0.171	7.143	8.847	48.204	17.139	8.568	0.06	10.613	0.026	11.757	0.1	17.534

		comment	10	10	10	10	10	15	15	24	24	24	24	24	24
21	II-LB-NB-Couesnon	lower								0.028	3.382	0.015	3.872	0.074	20.159
		upper								0.028	3.382	0.015	3.872	0.074	20.182
		comment	0	0	0	0	0	0	0	12	12	12	12	12	12
23	IV-LB-SB-Blavet	lower						0	0	0.008	8.363	0.023	8.734	0.093	8.778
		upper						12.031	6.016	0.041	8.363	0.027	9.162	0.093	8.889
		comment	0	0	0	0	0	9	9	18	18	18	18	18	18
28	IV-LB-LO-Sevre-Nantaise	lower						0	0	0.055	3.189	0.057		0.091	7.172
		upper						4.848	2.425	0.055	3.191	0.057		0.091	7.172
		comment	0	0	0	0	0	9	9	12	12	12	0	12	12
29	IV-LB-SL-Lay	lower						0	0	0.029	1.636	0.018		0.029	7.526
		upper						3.001	1.502	0.029	1.639	0.018		0.032	7.526
		comment	0	0	0	0	0	9	9	12	12	12	0	12	12
30	IV-LB-SL-Sevre-Niortaise	lower						0	0	0.202	2.974	0.087		0.122	1.803
		upper						4.337	2.168	0.202	2.974	0.087		0.122	1.95
		comment	0	0	0	0	0	9	9	12	12	12	0	12	12
32	IV-AG-CH-Boutonne	lower	0.128	0.023	4.003	5.298	24.325	0		0.011	0.594	0.005	0.101	0.009	0.466
		upper	0.128	0.023	4.003	5.298	24.325	232.051		0.012		0.006	0.695	0.01	0.466
		comment	2	2	2	2	2	11	0	10	9	10	0	10	6
35	IV-AG-CH-Seudre	lower													
		upper													
		comment	2	2	2	2	2	11	0	12	12	12	0	12	12
36	IV-AG-BA-Eyre	lower	0.81	0.004	4.344	3.347	79.193	0		0.017	0.642	0	0.67	0.001	2.531
		upper	0.81	0.013	4.344	3.347	79.193	169.199		0.018	0.651	0.008	0.952	0.017	2.531
		comment	2	2	2	2	2	11	0	14	14	14	12	14	13
39	IV-AG-GD-Isle	lower													
		upper													
		comment	2	2	2	2	2	11	0	10	10	10	10	10	10
41	IV-AG-GG-Dropt	lower	0	0	1.183	1.183	5.126	0		0.007	0.588	0.002		0.002	2.596
		upper	0.013	0.007	1.183	1.183	5.126	46.991		0.007	0.595	0.004		0.007	2.596
		comment	2	2	2	2	2	11	0	13	13	13	0	13	13
47	IV-AG-AD-Bidouze	lower	0.277	0.033	7.103	5.926	27.694	0		0.046	0.993	0.016	1.164	0.073	26.163
		upper	0.277	0.034	7.103	5.926	27.694	360.894		0.046	0.993	0.016	1.273	0.073	26.163
		comment													
48	IV-AG-AD-GavesReunis	lower	6.229	0.803	177.541	212.031	1 329.393	0		0.363	6.551	0.046	2.06	0.324	108.608
		upper	6.229	0.803	177.541	212.031	1 329.393	8 735.881		0.396	6.551	0.089	10.431	0.347	108.608
		comment	7	7	7	7	7	16	0	10	10	10	10	10	10
49	IV-AG-AD-Luy	lower	0.861	0.032	6.09	0.989	0			0.057	2.441	0.048		0.099	29.368
		upper	0.861	0.032	6.09	0.989	0.638			0.057	2.441	0.048		0.101	29.368
		comment	1	1	1	1	1	0	0	11	11	11	0	11	6
50	IV-AG-AD-Nive	lower								0	1.405	0		0	5.362
		upper								0.051	1.405	0.021		0.067	5.362
		comment	1	1	1	1	1	0	0	12	12	12	0	12	12

Table 6c. Unmonitored Areas
Reported Maritime Area of the OSPAR Convention by France 2005

			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]
1	II-AP-PC-Aa	lower						0		0.039	4.175	0.142	0	0.182	8.337
1	II-AP-PC-Aa	upper						16.85		0.082	4.175	0.153	4.626	0.189	8.337
1	II-AP-PC-Aa	comment													
9	II-SN-SE-H7	lower						0.186		0.009	1.834	0.026		0.035	3.606
9	II-SN-SE-H7	upper						0.373		0.009	1.834	0.026		0.036	3.606
9	II-SN-SE-H7	comment													
17	II-SN-SC-I6	lower						0		0.03	2.953	0.019	3.333	0.026	3.723
17	II-SN-SC-I6	upper						0.441		0.03	2.953	0.019	3.333	0.034	3.723
17	II-SN-SC-I6	comment													
22	II-LB-NB-J1J2	lower								0.049	5.89	0.027	6.744	0.128	35.112
22	II-LB-NB-J1J2	upper								0.049	5.89	0.027	6.744	0.128	35.152
22	II-LB-NB-J1J2	comment													
24	IV-LB-SB-J4	lower	0	0	1.873	0.202	32.06	0	0	0.019	7.059	0.009	6.605	0.066	11.552
24	IV-LB-SB-J4	upper	4.166	0.114	4.751	5.884	32.06	11.399	5.698	0.04	7.059	0.017	7.819	0.066	11.662
24	IV-LB-SB-J4	comment													
26	IV-LB-LO-Erdre	lower						0	0	0.023	1.316	0.015		0.023	6.052
26	IV-LB-LO-Erdre	upper						2.414	1.208	0.023	1.318	0.015		0.025	6.052
26	IV-LB-LO-Erdre	comment													
31	IV-AG-CH-Arnoult	lower	0.017	0.003	0.544	0.721	3.308	0		0.002	0.081	0.001	0.014	0.001	0.063
31	IV-AG-CH-Arnoult	upper	0.017	0.003	0.544	0.721	3.308	31.562		0.002		0.001	0.094	0.001	0.063
31	IV-AG-CH-Arnoult	comment													
34	IV-AG-CH-Livenne	lower						0	0	0.054	0.799	0.023		0.033	0.484
34	IV-AG-CH-Livenne	upper						1.165	0.582	0.054	0.799	0.023		0.033	0.524
34	IV-AG-CH-Livenne	comment													
37	IV-AG-BA-S1	lower	1.119	0.006	5.997	4.62	109.336	0		0.023	0.887	0	0.925	0.002	3.494
37	IV-AG-BA-S1	upper	1.119	0.018	5.997	4.62	109.336	233.602		0.025	0.899	0.011	1.314	0.023	3.494
37	IV-AG-BA-S1	comment													
40	IV-AG-GD-P9	lower													
40	IV-AG-GD-P9	upper													
40	IV-AG-GD-P9	comment													
44	IV-AG-GG-O9	lower	4.386	0.566	125.005	149.289	936.011	0		0.255	4.612	0.032	1.451	0.228	76.47
44	IV-AG-GG-O9	upper	4.386	0.566	125.005	149.289	936.011	6 150.833		0.279	4.612	0.063	7.344	0.245	76.47
44	IV-AG-GG-O9	comment													
45	IV-AG-CL-S3S4	lower	1.235	0.007	6.623	5.103	120.754	0		0.025	0.979	0	1.022	0.002	3.859
45	IV-AG-CL-S3S4	upper	1.235	0.02	6.623	5.103	120.754	257.995		0.027	0.993	0.012	1.451	0.025	3.859
45	IV-AG-CL-S3S4	comment													
51	IV-AG-AD-Pays-Basque	lower	0.729	0.094	20.774	24.809	155.548	0		0.042	0.766	0.005	0.241	0.038	12.708
51	IV-AG-AD-Pays-Basque	upper	0.729	0.094	20.774	24.809	155.548	1 022.159		0.046	0.766	0.01	1.221	0.041	12.708
51	IV-AG-AD-Pays-Basque	comment													

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention by France 2005

			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]
2	II-AP-SO-Canche	lower						0		0.049	4.968	0.158	0	0.207	10.333
		upper						20		0.1	4.968	0.172	5.503	0.215	10.333
		minimum								0.078	4.742	0.039		0.07	4
		maximum								0.233	5.419	1.273		1.3	21
		more than 70% > D.L.						0		33.333	100	58.333	0	83.333	100
		n	0	0	0	0	0	4	0	12	12	12	12	12	12
		info													
		St. Dev.								0.071	0.236	0.46		0.388	5.399
3	II-AP-SO-SOMME	lower								0.29	4.347	0.09	4.763	0.133	11.917
		upper								0.303	4.347	0.098	5.26	0.137	11.917
		minimum								0.093	3.387	0.049	4.121	0.08	7
		maximum								0.607	5.419	0.424	6.016	0.44	19
		more than 70% > D.L.								83.333	100	75	91.667	91.667	100
		n	0	0	0	0	0	0	0	12	12	12	12	12	12
		info													
		St. Dev.								0.176	0.61	0.116	0.632	0.101	3.728
4	II-SN-NO-Bethune	lower						0.364		0.075	3.519	0.081		0.124	18.133
		upper						1.091		0.075	3.519	0.081		0.124	18.133
		minimum						1		0.016	3.003	0.046		0.08	5
		maximum						2		0.179	4.11	0.111		0.19	47
		more than 70% > D.L.						27.273		91.667	100	100		100	100
		n	0	0	0	0	0	11	0	12	12	12	0	12	12
		info													
		St. Dev.						0.577		0.042	0.406	0.023		0.029	11.641
5	II-SN-NO-Saane	lower						0.833		0.043	5.203	0.061		0.081	9.25
		upper						1.333		0.044	5.203	0.061		0.093	9.25
		minimum						1		0.016	4.719	0.033		0.08	4
		maximum						3		0.117	5.645	0.082		0.11	21
		more than 70% > D.L.						50		83.333	100	100		83.333	100
		n	0	0	0	0	0	12	0	12	12	12	0	12	12
		info													
		St. Dev.						0.816		0.032	0.264	0.017		0.013	4.976
6	II-SN-SE-SEINE	lower								1.566	5.167	0.243	7.409	0.28	15.148
		upper								1.568	5.167	0.243	7.66	0.28	15.148
		minimum								0.49	4.29	0.085	5.922	0.12	4.8
		maximum								2.722	6.616	0.512	8.938	0.63	46
		more than 70% > D.L.								95.652	100	100	95.652	100	100
		n	0	0	0	0	0	0	0	23	23	23	23	23	23
		info													
		St. Dev.								0.658	0.732	0.111	0.79	0.136	9.371
7	II-SN-SE-Andelle	lower								0.039	3.837	0.049		0.058	9.75
		upper								0.04	3.837	0.049		0.081	9.75
		minimum								0.016	3.568	0.033		0.07	3
		maximum								0.101	4.11	0.065		0.11	19
		more than 70% > D.L.								83.333	100	100		66.667	100
		n	0	0	0	0	0	0	0	12	12	12	0	12	12

		info													
		St. Dev.								0.025	0.188	0.013		0.014	5.261
8	II-SN-SE-Eure	lower						0.583		0.03	6.802	0.101		0.133	12.767
		upper						1.333		0.031	6.802	0.101		0.138	12.767
		minimum						2		0.008	5.736	0.02		0.09	2
		maximum						3		0.078	7.836	0.147		0.18	43
		more than 70% > D.L.						25		91.667	100	100		91.667	100
		n	0	0	0	0	0	12	0	12	12	12	0	12	12
		info													
		St. Dev.						0.577		0.021	0.667	0.043		0.027	12.396
10	II-SN-SE-Risle	lower								0.039	4.151	0.064		0.1	11.967
		upper								0.04	4.151	0.064		0.112	11.967
		minimum								0.023	3.432	0.036		0.09	8
		maximum								0.109	5.013	0.095		0.14	22
		more than 70% > D.L.								83.333	100	100		83.333	100
		n	0	0	0	0	0	0	0	6	6	6	0	6	6
		info													
		St. Dev.								0.036	0.615	0.028		0.021	5.55
11	II-SN-NC-Dives	lower						1.5		0.032	5.615	0.104	6.44	0.126	7.15
		upper						2		0.034	5.615	0.104	6.44	0.132	7.15
		minimum						2		0.016	4.494	0.036	5.507	0.07	2.6
		maximum						6		0.062	6.503	0.163	7.351	0.18	22
		more than 70% > D.L.						50		75	100	100	100	91.667	100
		n	0	0	0	0	0	10	0	12	12	12	12	12	12
		info													
		St. Dev.						1.732		0.017	0.565	0.045	0.566	0.035	5.249
13	II-SN-NC-Orne	lower						0.5		0.053	5.29	0.05	6.179	0.073	7.133
		upper						1.083		0.053	5.29	0.05	6.179	0.084	7.133
		minimum						1		0.016	2.936	0.01	4.01	0.07	2.2
		maximum						2		0.187	9.032	0.082	9.843	0.11	20
		more than 70% > D.L.						41.667		91.667	100	100	100	83.333	100
		n	0	0	0	0	0	12	0	12	12	12	12	12	12
		info													
		St. Dev.						0.447		0.05	2.168	0.025	2.002	0.015	4.913
14	II-SN-NC-Seulles	lower						0		0.041	6.366	0.114	7.458	0.146	17.817
		upper						1		0.042	6.366	0.114	7.458	0.152	17.817
		minimum								0.016	3.997	0.046	4.697	0.1	1.6
		maximum								0.101	9.416	0.255	10.722	0.26	87
		more than 70% > D.L.						0		83.333	100	100	100	91.667	100
		n	0	0	0	0	0	4	0	12	12	12	12	12	12
		info													
		St. Dev.								0.027	1.908	0.072	2.067	0.053	24.3
15	II-SN-NC-Touques	lower						0.167		0.027	2.406	0.067	3.065	0.092	9.773
		upper						1.083		0.029	2.406	0.067	3.065	0.098	9.773
		minimum						2		0.016	2.168	0.039	2.791	0.07	4
		maximum						2		0.078	2.665	0.111	3.419	0.14	22
		more than 70% > D.L.						8.333		72.727	100	100	100	90.909	100
		n	0	0	0	0	0	12	0	11	11	11	11	11	11
		info													
		St. Dev.								0.022	0.157	0.023	0.181	0.021	5.64
		lower								0.227	2.99	0.184	4.423	0.229	13.217
		upper								0.228	2.99	0.184	4.423	0.247	13.217
		minimum								0.047	0.294	0.016	1.608	0.08	5.6

16	II-SN-NC-Vire	maximum								0.599	6.481	0.692	7.195	0.81	34
		more than 70% > D.L.								83.333	100	100	100	75	100
		n	0	0	0	0	0	0	0	12	12	12	12	12	12
		info													
		St. Dev.								0.186	2.385	0.242	2.065	0.28	8.123
18	II-SN-SC-Selune	lower						0		0.038	6.082	0.027	6.98	0.028	26.883
		upper						1		0.038	6.082	0.027	6.98	0.087	26.883
		minimum								0.008	4.539	0.01	5.545	0.07	4.4
		maximum								0.093	7.768	0.046	8.394	0.27	103
		more than 70% > D.L.						0		100	100	100	100	16.667	100
		n	0	0	0	0	0	4	0	12	12	12	12	12	12
		info													
		St. Dev.								0.025	0.861	0.011	0.721	0.141	27.329
19	II-SN-SC-Sienne	lower								0.054	4.166	0.035	5.148	0.046	11.933
		upper								0.055	4.166	0.036	5.148	0.087	11.933
		minimum								0.008	2.145	0.013	3.304	0.08	4.2
		maximum								0.163	5.894	0.085	6.665	0.13	45
		more than 70% > D.L.								91.667	100	83.333	100	41.667	100
		n	0	0	0	0	0	0	0	12	12	12	12	12	12
		info													
		St. Dev.								0.045	1.356	0.026	1.167	0.019	11.11
20	II-LB-NB-Aulne	lower	0	0	1.14	0.16	30.07	0	0	0.015	5.257	0.006	4.841	0.055	10.05
		upper	4.4	0.1	4.74	5.36	30.07	10	5	0.035	5.257	0.014	5.948	0.056	10.133
		minimum			1.4	1.6	2.7			0.031	1.332	0.013	2.164	0.02	3
		maximum			7	1.6	100			0.07	9.032	0.023	9.638	0.1	22
		more than 70% > D.L.	0	0	30	10	100	0	0	33.333	100	37.5	83.333	91.667	95.833
		n	10	10	10	10	10	15	15	24	24	24	24	24	24
		info													
		St. Dev.			2.884		27.919			0.015	1.985	0.003	2.028	0.02	4.74
21	II-LB-NB-Couesnon	lower								0.043	5.438	0.06	6.62	0.138	12.417
		upper								0.049	5.438	0.06	6.62	0.138	12.583
		minimum								0.031	3.613	0.016	4.877	0.07	3
		maximum								0.101	7.226	0.124	8.447	0.2	26
		more than 70% > D.L.								83.333	100	100	100	100	91.667
		n	0	0	0	0	0	0	0	12	12	12	12	12	12
		info													
		St. Dev.								0.021	1.189	0.037	1.23	0.045	7.09
23	IV-LB-SB-Blavet	lower						0	0	0.011	6.586	0.021	6.797	0.083	8.444
		upper						10	5	0.034	6.586	0.024	7.273	0.083	8.556
		minimum								0.031	3.839	0.013	4.751	0.04	3
		maximum								0.047	8.355	0.059	8.915	0.14	15
		more than 70% > D.L.						0	0	27.778	100	77.778	94.444	100	94.444
		n	0	0	0	0	0	9	9	18	18	18	18	18	18
		info													
		St. Dev.								0.007	1.416	0.016	1.292	0.025	4.1
25	IV-LB-SB-VILAINE	lower	0	0	0.6	0	16.88	0	0	0.104	4.421	0.017	5.752	0.11	17.929
		upper	4.9	0.19	5	5.8	17.18	10	5	0.11	4.461	0.018	5.91	0.11	17.929
		minimum			6		3.8			0.031	0.723	0.003	1.699	0.02	7
		maximum			6		47			0.35	8.807	0.056	10.046	0.21	50
		more than 70% > D.L.	0	0	10	0	80	0	0	82.143	82.143	53.571	88.462	100	100
		n	10	10	10	10	10	13	13	28	28	28	26	28	28
		info													
		St. Dev.					14.342			0.085	2.661	0.016	2.733	0.038	8.11

27	IV-LB-LO-LOIRE	lower	0	0	4.731	0	33.085	0	0.278	0.063	2.34	0.031		0.041	19.807
		upper	4.692	0.169	7.269	5.615	33.392	10	5	0.066	2.345	0.031		0.062	19.807
		minimum			4.5		1		5	0.008	0.542	0.007		0.04	2.8
		maximum			11		158		5	0.21	4.177	0.166		0.17	88.4
		more than 70% > D.L.	0	0	61.538	0	84.615	0	5.556	85.714	96.429	92.857		57.143	100
		n	13	13	13	13	13	18	18	28	28	28	0	28	28
		info													
		St. Dev.			2.086		46.389			0.055	1.18	0.031		0.03	15.376
28	IV-LB-LO-Sevre-Nantaise	lower						0	0	0.128	3.722	0.124		0.19	14.917
		upper						10	5	0.129	3.745	0.124		0.19	14.917
		minimum								0.023	0.181	0.069		0.12	7.6
		maximum								0.303	9.416	0.251		0.32	36
		more than 70% > D.L.						0	0	83.333	83.333	100		100	100
		n	0	0	0	0	0	9	9	12	12	12	0	12	12
		info													
		St. Dev.								0.082	3.748	0.048		0.055	7.414
29	IV-LB-SL-Lay	lower						0	0	0.104	2.992	0.046		0.085	32.083
		upper						10	5	0.105	3.048	0.046		0.093	32.083
		minimum								0.008	2.032	0.013		0.06	14
		maximum								0.311	10.274	0.085		0.15	53
		more than 70% > D.L.						0	0	91.667	58.333	100		83.333	100
		n	0	0	0	0	0	9	9	12	12	12	0	12	12
		info													
		St. Dev.								0.103	2.88	0.023		0.029	12.979
30	IV-LB-SL-Sevre-Niortaise	lower						0	0	0.096	3.502	0.148		0.176	1.792
		upper						10	5	0.097	3.502	0.148		0.176	1.792
		minimum								0.016	0.587	0.029		0.06	0.5
		maximum								0.334	6.729	0.47		0.5	6.6
		more than 70% > D.L.						0	0	91.667	100	100		100	100
		n	0	0	0	0	0	9	9	12	12	12	0	12	12
		info													
		St. Dev.								0.132	2.229	0.15		0.154	1.851
32	IV-AG-CH-Boutonne	lower	0.15	0.05	9.8	15	66	0		0.051	4.842	0.002		0.036	13.333
		upper	0.15	0.05	9.8	15	66	913.636		0.062	4.842	0.016		0.056	13.333
		minimum	0.1	0.03	7.5	7	38			0.054	0.113	0.016		0.05	7
		maximum	0.2	0.07	12.1	23	94			0.124	8.807	0.016		0.08	19
		more than 70% > D.L.	100	100	100	100	100	0		70	100	10		60	100
		n	2	2	2	2	2	11	0	10	9	10	0	10	6
		info													
		St. Dev.	0.071	0.028	3.253	11.314	39.598			0.025	3.228			0.013	4.082
33	IV-AG-CH-CHARENTE	lower	0.7	0.139	24.743	34.257	137	0		0.082	3.637	0.041	0.429	0.073	4.917
		upper	0.7	0.146	24.743	34.257	137	2 190.625		0.085	3.637	0.043	4.509	0.077	4.917
		minimum	0.1	0.04	11	9	40			0.054	1.423	0.023	5.153	0.06	2
		maximum	1.4	0.25	42.6	56.8	281			0.14	6.097	0.072	5.153	0.1	9
		more than 70% > D.L.	100	85.714	100	100	100	0		91.667	100	91.667	8.333	91.667	100
		n	7	7	7	7	7	16	0	12	12	12	12	12	12
		info													
		St. Dev.	0.455	0.071	10.649	15.897	79.356			0.031	1.556	0.017		0.013	2.275
35	IV-AG-CH-Seudre	lower	0.15	0.04	11.65	13	48	0		0.052	5.796	0.002		0.013	10.083
		upper	0.15	0.05	11.65	13	48	913.636		0.068	5.796	0.017		0.051	10.417
		minimum	0.1	0.08	9.5	8	35			0.054	2.258	0.023		0.05	2
		maximum	0.2	0.08	13.8	18	61			0.117	13.774	0.023		0.06	37
		more than 70% > D.L.	100	50	100	100	100	0		58.333	100	8.333		25	83.333

		n	2	2	2	2	2	11	0	12	12	12	0	12	12
		info													
		St. Dev.	0.071		3.041	7.071	18.385			0.021	2.873			0.006	11.08
36	IV-AG-BA-Eyre	lower	2.45	0.015	13.1	10	239	0		0.051	1.465	0.003	1.193	0.008	6.769
		upper	2.45	0.04	13.1	10	239	913.636		0.053	1.513	0.021	2.429	0.05	6.769
		minimum	0.2	0.03	2.8	7	41			0.008	0.723	0.016	1.851	0.05	3
		maximum	4.7	0.03	23.4	13	437			0.101	3.884	0.02	3.716	0.06	12
		more than 70% > D.L.	100	50	100	100	100	0		92.857	92.857	14.286	41.667	14.286	100
		n	2	2	2	2	2	11	0	14	14	14	12	14	13
		info													
		St. Dev.	3.182		14.566	4.243	280.014			0.027	0.931	0.002	0.681	0.007	2.682
38	IV-AG-GD-DORDOGNE	lower	1.15	0.085	25.05	26	1 119.500			0.048	1.829	0.019	0.661	0.053	7.6
		upper	1.15	0.085	25.05	26	1 119.500			0.058	1.829	0.02	2.909	0.055	7.8
		minimum	0.5	0.05	25	10	161			0.039	1.377	0.007	2.802	0.03	2
		maximum	1.8	0.12	25.1	42	2 078.000			0.124	2.484	0.036	3.811	0.13	23
		more than 70% > D.L.	100	100	100	100	100			72.727	100	90.909	20	90.909	90
		n	2	2	2	2	2	0	0	11	11	11	10	11	10
		info													
		St. Dev.	0.919	0.049	0.071	22.627	1 355.524			0.025	0.397	0.009	0.714	0.031	7.178
39	IV-AG-GD-Isle	lower	0.6	0.08	19.15	36.5	151	0		0.118	1.434	0.027	1.422	0.015	32
		upper	0.6	0.08	19.15	36.5	151	913.636		0.123	1.637	0.038	2.963	0.055	32
		minimum	0.3	0.08	17	20	137			0.054	0.994	0.023	2.315	0.05	4
		maximum	0.9	0.08	21.3	53	165			0.296	3.094	0.056	4.834	0.1	92
		more than 70% > D.L.	100	100	100	100	100	0		80	70	70	40	20	100
		n	2	2	2	2	2	11	0	10	10	10	10	10	10
		info													
		St. Dev.	0.424	0	3.041	23.335	19.799			0.071	0.725	0.012	1.074	0.035	33.589
41	IV-AG-GG-Dropt	lower	0.05	0.01	10	8	34.5	0		0.057	2.734	0.024		0.045	39.846
		upper	0.1	0.035	10	8	34.5	913.636		0.057	2.994	0.036		0.072	39.846
		minimum	0.1	0.02	9	7	30			0.008	0.768	0.02		0.05	9
		maximum	0.1	0.02	11	9	39			0.163	6.865	0.088		0.24	275
		more than 70% > D.L.	50	50	100	100	100	0		100	61.538	53.846		46.154	100
		n	2	2	2	2	2	11	0	13	13	13	0	13	13
		info													
		St. Dev.			1.414	1.414	6.364			0.044	2.081	0.026		0.071	71.131
42	IV-AG-GG-GARONNE	lower	0.35	0.01	26.85	22	90	0		0.018	2.548	0.039		0.063	12.5
		upper	0.35	0.035	26.85	22	90	1 004.500		0.04	2.548	0.041		0.07	12.5
		minimum	0.3	0.02	20	19	84			0.039	1.355	0.029		0.05	6
		maximum	0.4	0.02	33.7	25	96			0.047	6.097	0.062		0.09	24
		more than 70% > D.L.	100	50	100	100	100	0		42.857	100	85.714		85.714	100
		n	2	2	2	2	2	10	0	7	7	7	0	7	6
		info													
		St. Dev.	0.071		9.687	4.243	8.485			0.005	1.673	0.011		0.016	6.565
43	IV-AG-GG-LOT	lower	0.629	0.021	3.843	6.214	54	0		0.042	1.216	0.03	1.068	0.038	5.583
		upper	1.057	0.449	5.414	10	71.143	913.636		0.057	1.216	0.033	1.517	0.057	5.75
		minimum	3.7	0.09	5	43	337			0.039	0.452	0.023	0.867	0.05	2
		maximum	5.1	0.2	28.8	44	419			0.132	2.484	0.056	2.19	0.08	17
		more than 70% > D.L.	14.286	14.286	21.429	14.286	14.286	0		61.538	100	84.615	75	61.538	91.667
		n	14	14	14	14	14	11	0	13	13	13	12	13	12
		info													
		St. Dev.	0.99	0.078	12.034	0.707	57.983			0.033	0.518	0.013	0.423	0.011	4.23
		lower	0.9	0.133	31.971	21	128.714	0		0.331	3.511	0.1	4.008	0.31	43.4
		upper	0.9	0.14	31.971	21	128.714	2 190.625		0.331	3.511	0.102	4.863	0.31	43.4

46	IV-AG-AD-ADOUR	minimum	0.1	0.07	4.6	6	34			0.047	1.603	0.026	3.167	0.06	4
		maximum	1.9	0.21	42.3	41	178			1.167	7.858	0.307	10.392	0.79	308
		more than 70% > D.L.	100	85.714	100	100	100	0		100	100	91.667	80	100	100
		n	7	7	7	7	7	16	0	12	12	12	10	12	10
		info													
		St. Dev.	0.611	0.051	13.886	11.328	46.331			0.279	1.932	0.082	2.327	0.229	93.266
48	IV-AG-AD-GavesReunis	lower	1.143	0.167	34.929	42.7	277	0		0.085	1.316	0.01	0.337	0.066	20.5
		upper	1.143	0.167	34.929	42.7	277	2 190.625		0.089	1.316	0.018	2.182	0.071	20.5
		minimum	0.3	0.06	18.2	19	203			0.047	0.768	0.016	1.303	0.05	5
		maximum	1.9	0.22	53	70	384			0.202	2.484	0.029	2.067	0.14	84
		more than 70% > D.L.	100	100	100	100	100	0		90	100	50	20	90	100
		n	7	7	7	7	7	16	0	10	10	10	10	10	10
		info													
		St. Dev.	0.516	0.054	14.214	16.587	87.27			0.045	0.525	0.005	0.541	0.027	23.377
49	IV-AG-AD-Luy	lower	2.7	0.1	19.1	3.1	0			0.105	4.779	0.07		0.165	33.667
		upper	2.7	0.1	19.1	3.1	2			0.105	4.779	0.071		0.169	33.667
		minimum	2.7	0.1	19.1	3.1				0.039	0.723	0.029		0.05	7
		maximum	2.7	0.1	19.1	3.1				0.233	9.484	0.17		0.36	100
		more than 70% > D.L.	100	100	100	100	0			100	100	90.909		90.909	100
		n	1	1	1	1	1	0	0	11	11	11	0	11	6
		info													
		St. Dev.								0.054	3.009	0.049		0.104	34.279
50	IV-AG-AD-Nive	lower	0.2	0.05	76.4	9	91			0.026	0.943	0.015		0.036	4
		upper	0.2	0.05	76.4	9	91			0.045	0.943	0.023		0.057	4.167
		minimum	0.2	0.05	76.4	9	91			0.039	0.61	0.02		0.05	2
		maximum	0.2	0.05	76.4	9	91			0.078	1.468	0.042		0.08	8
		more than 70% > D.L.	100	100	100	100	100			50	100	50		58.333	91.667
		n	1	1	1	1	1	0	0	12	12	12	0	12	12
		info													
		St. Dev.								0.018	0.274	0.01		0.012	1.912

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention by France 2005

			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]
1	II-AP-PC-Aa	Sewage													
		Industrial													
		Riverine													
2	II-AP-SO-Canche	Sewage													
		Industrial													
		Riverine						20		0.077		0.032	5.503	0.05	
3	II-AP-SO-SOMME	Sewage													
		Industrial													
		Riverine								0.077		0.032	5.968	0.05	
4	II-SN-NO-Bethune	Sewage													
		Industrial													
		Riverine						1		0.007					
5	II-SN-NO-Saane	Sewage													
		Industrial													
		Riverine						1		0.007				0.07	
6	II-SN-SE-SEINE	Sewage													
		Industrial													
		Riverine								0.038			5.774		
7	II-SN-SE-Andelle	Sewage													
		Industrial													
		Riverine								0.007				0.07	
8	II-SN-SE-Eure	Sewage													
		Industrial													
		Riverine						1		0.007				0.07	
9	II-SN-SE-H7	Sewage													
		Industrial													
		Riverine													
10	II-SN-SE-Risle	Sewage													
		Industrial													
		Riverine								0.007				0.07	
11	II-SN-NC-Dives	Sewage													
		Industrial													
		Riverine						1		0.007				0.07	
12	II-SN-NC-Douve	Sewage													
		Industrial													
		Riverine						1						0.07	
13	II-SN-NC-Orne	Sewage													
		Industrial													
		Riverine						1		0.007				0.07	
14	II-SN-NC-Seulles	Sewage													
		Industrial													
		Riverine						1		0.007				0.07	
15	II-SN-NC-Touques	Sewage													
		Industrial													
		Riverine						1		0.007				0.07	
16	II-SN-NC-Vire	Sewage													
		Industrial													
		Riverine								0.007				0.07	
		Sewage													

17	II-SN-SC-I6	Industrial													
		Riverine													
18	II-SN-SC-Selune	Sewage													
		Industrial													
		Riverine						1						0.07	
19	II-SN-SC-Sienne	Sewage													
		Industrial													
		Riverine								0.007		0.009		0.07	
20	II-LB-NB-Aulne	Sewage													
		Industrial													
		Riverine	4.4	0.1	5.143	5.778		10	5	0.031		0.013	6.647	0.02	2
21	II-LB-NB-Couesnon	Sewage													
		Industrial													
		Riverine								0.031					2
22	II-LB-NB-J1J2	Sewage													
		Industrial													
		Riverine													
23	IV-LB-SB-Blavet	Sewage													
		Industrial													
		Riverine						10	5	0.031		0.013	8.561		2
24	IV-LB-SB-J4	Sewage													
		Industrial													
		Riverine													
25	IV-LB-SB-VILAINE	Sewage													
		Industrial													
		Riverine	4.9	0.19	4.889	5.8	1.5	10	5	0.031	0.225	0.003	1.374		
26	IV-LB-LO-Erdre	Sewage													
		Industrial													
		Riverine													
27	IV-LB-LO-LOIRE	Sewage													
		Industrial													
		Riverine	4.692	0.169	6.6	5.615	2	10	5	0.023	0.135	0.006		0.048	
28	IV-LB-LO-Sevre-Nantaise	Sewage													
		Industrial													
		Riverine						10	5	0.007	0.135				
29	IV-LB-SL-Lay	Sewage													
		Industrial													
		Riverine						10	5	0.007	0.135			0.05	
30	IV-LB-SL-Sevre-Niortaise	Sewage													
		Industrial													
		Riverine						10	5	0.007					
31	IV-AG-CH-Arnoult	Sewage													
		Industrial													
		Riverine													
32	IV-AG-CH-Boutonne	Sewage													
		Industrial													
		Riverine						913.636		0.038		0.016		0.05	
33	IV-AG-CH-CHARENTE	Sewage													
		Industrial													
		Riverine		0.05				2 190.625		0.038		0.016	4.451	0.05	
34	IV-AG-CH-Livenne	Sewage													
		Industrial													
		Riverine													
35	IV-AG-CH-Seudre	Sewage													
		Industrial													
		Riverine		0.02				913.636		0.038		0.016		0.05	2

36	IV-AG-BA-Eyre	Sewage													
		Industrial													
		Riverine		0.05				913.636		0.038	0.677	0.022	2.117	0.049	
37	IV-AG-BA-S1	Sewage													
		Industrial													
		Riverine													
38	IV-AG-GD-DORDOGNE	Sewage													
		Industrial													
		Riverine								0.038		0.009	2.809	0.03	2
39	IV-AG-GD-Isle	Sewage													
		Industrial													
		Riverine						913.636		0.023	0.677	0.038	2.568	0.05	
40	IV-AG-GD-P9	Sewage													
		Industrial													
		Riverine													
41	IV-AG-GG-Dropt	Sewage													
		Industrial													
		Riverine	0.1	0.05				913.636			0.677	0.027		0.05	
42	IV-AG-GG-GARONNE	Sewage													
		Industrial													
		Riverine		0.05				1 004.500		0.038		0.016		0.05	
43	IV-AG-GG-LOT	Sewage													
		Industrial													
		Riverine	0.5	0.5	2	4.417	20	913.636		0.038		0.016	1.797	0.05	2
44	IV-AG-GG-O9	Sewage													
		Industrial													
		Riverine													
45	IV-AG-CL-S3S4	Sewage													
		Industrial													
		Riverine													
46	IV-AG-AD-ADOUR	Sewage													
		Industrial													
		Riverine		0.05				2 190.625				0.019	4.274		
47	IV-AG-AD-Bidouze	Sewage													
		Industrial													
		Riverine													
48	IV-AG-AD-GavesReunis	Sewage													
		Industrial													
		Riverine						2 190.625		0.038		0.016	2.307	0.05	
49	IV-AG-AD-Luy	Sewage													
		Industrial													
		Riverine					2					0.019		0.04	
50	IV-AG-AD-Nive	Sewage													
		Industrial													
		Riverine								0.038		0.016		0.05	2
51	IV-AG-AD-Pays-Basque	Sewage													
		Industrial													
		Riverine													

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention by France 2005

		Flow Rate [1000m³/d]	LTA [1000m³/d]	Minimum FR [1000m³/d]	Maximum FR [1000m³/d]	LTA info (years)	Number of sites	Mean or Median
1	II-AP-PC-Aa	2307	0			0	0	Mean
2	II-AP-SO-Canche	3892	4579	2541	10766	1962 - 2005	1	Mean
3	II-AP-SO-SOMME	2108	3197	1665	3357	1963 - 2005	1	Mean
4	II-SN-NO-Bethune	1233	0	732	3460	0	1	Mean
5	II-SN-NO-Saane	819	2938	663	1759	1997-2005	1	Mean
6	II-SN-SE-SEINE	29766	44842	14525	71443	1975 - 2006	1	Mean
7	II-SN-SE-Andelle	481	691	364	813	1973 - 2005	1	Mean
8	II-SN-SE-Eure	1801	2246	1216	3796	1971 - 2005	1	Mean
9	II-SN-SE-H7	729	0			0	0	Mean
10	II-SN-SE-Risle	973	1642	720	3461	1967 - 2005	1	Mean
11	II-SN-NC-Dives	399	1296	145	3230	1969 - 2005	1	Mean
12	II-SN-NC-Douve	324	0			0	1	Mean
13	II-SN-NC-Orne	2762	2592	2571	5399	1983 - 2004	1	Mean
14	II-SN-NC-Seulles	261	518	43	1172	1971 - 2005	1	Mean
15	II-SN-NC-Touques	760	1037	500	3962	1982 - 2005	1	Mean
16	II-SN-NC-Vire	1318	2246	156	7620	1993 - 2005	2	Mean
17	II-SN-SC-I6	1209	0			0	0	Mean
18	II-SN-SC-Selune	1369	1987	349	7175	1990 - 2005	2	Mean
19	II-SN-SC-Sienne		1642			1985 - 2004	1	Mean
20	II-LB-NB-Aulne	4692	6653	460	34398	1970 - 2005	1	Mean
21	II-LB-NB-Couesnon	1057	2160	139	11909	1984 - 2005	2	Mean
22	II-LB-NB-J1J2	1841	0			0	0	Mean
23	IV-LB-SB-Blavet	3294	5702	433	23763	1983 - 2005	2	Mean
24	IV-LB-SB-J4	3121	0			0	0	Mean
25	IV-LB-SB-VILAINE		6134			1989 - 2004	1	Mean
26	IV-LB-LO-Erdre	661	0			0	0	Mean
27	IV-LB-LO-LOIRE	47318	73699	10478	180118	1863 - 2005	1	Mean
28	IV-LB-LO-Sevre-Nantaise	1327	4579	90	6291	1994 - 2005	1	Mean
29	IV-LB-SL-Lay	822	3456	2	7222	1969 - 2005	1	Mean
30	IV-LB-SL-Sevre-Niortaise	1188	4752	287	4309	1994 - 2005	2	Mean
31	IV-AG-CH-Arnoult	49	0			0	0	Mean
32	IV-AG-CH-Boutonne	358	0			0	1	Mean
33	IV-AG-CH-CHARENTE	1258	5357	170	5428	1977 - 2005	1	Mean
34	IV-AG-CH-Livenne	319	0			0	0	Mean
35	IV-AG-CH-Seudre		432			1970-2003	1	Mean
36	IV-AG-BA-Eyre	921	1901	330	2430	1980 - 2005	1	Mean
37	IV-AG-BA-S1	1272	0			0	0	Mean
38	IV-AG-GD-DORDOGNE	15841	21859	13397	18284	1996 - 2004	1	Mean
39	IV-AG-GD-Isle		7171			1972 - 2005	2	Mean
40	IV-AG-GD-P9		0			0	0	Mean
41	IV-AG-GG-Dropt	360	605	3	5234	2001 - 2006	1	Mean
42	IV-AG-GG-GARONNE	24318	40522	3905	78034	1967 - 2005	3	Mean
43	IV-AG-GG-LOT		13392			0	1	Mean
44	IV-AG-GG-O9	9622	0			0	0	Mean
45	IV-AG-CL-S3S4	1405	0			0	0	Mean
46	IV-AG-AD-ADOUR	4001	7776	951	23325	1918 - 2005	1	Mean
47	IV-AG-AD-Bidouze	522	0			0	1	Mean
48	IV-AG-AD-GavesReunis	13666	17453	3469	105964	1923 - 2005	2	Mean
49	IV-AG-AD-Luy	873	1814	62	15503	1967 - 2005	1	Mean
50	IV-AG-AD-Nive	3670	3197	1424	25805	1967 - 2005	1	Mean
51	IV-AG-AD-Pays-Basque	1599	0			0	0	Mean

4. Germany

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 by Germany

Annual report on riverine inputs and direct discharges by Germany to Convention waters during the year 2005

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

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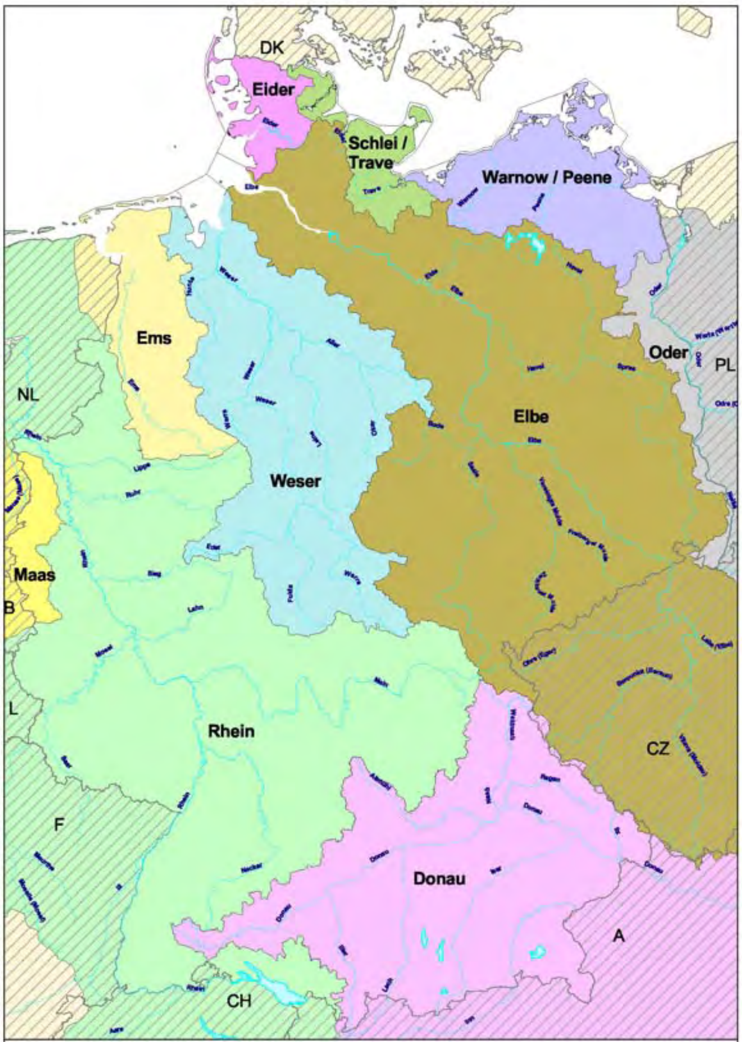
A. General information

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, sub-area and discharge area[1]	Nature of the receiving water[2]
Elbe St. Pauli (estuary)	tidal range 3.6 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



Flussgebietseinheiten in der Bundesrepublik Deutschland (Richtlinie 2000/60/EG - Wasserrahmenrichtlinie)

Die Markierung und Kennzeichnung der außerhalb der Grenzen der Bundesrepublik Deutschland liegenden Teile internationaler Flussgebietseinheiten dienen lediglich der Veranschaulichung und lassen Festlegungen anderer Staaten sowie internationale Abstimmungen unberührt.

Quelle: Umweltbundesamt, Februar 2002

B. Total riverine inputs and direct discharges for the year (Tables 4a and 4b)

Note: Table 4b is total direct discharges and riverine inputs to maritime area by region. Please provide totals for each OSPAR region and for total inputs.

B.1 Give general comments on the total riverine inputs and direct discharges (e.g. changes from last year, trends, percentage of particle bound determinand, results that need to be highlighted etc.):

The total riverine inputs and direct discharges are slightly higher in 2005 compared to 2004 due to a slightly increased flow rate and quantities. There are no significant changes in the concentrations and inputs of direct discharges during the year 2005.

C. Direct discharges for the year 2005

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 (cf. section 6 of the RID Principles), including for those under voluntary reporting:

*For the **Elbe,** direct 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 (based on 4 to 8 2-hour-mixed-samples) were used to determine the inputs of the major dischargers. Inputs of minor dischargers are estimates.*

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

*Direct discharges to the **Ems** downstream of the measurement site for riverine inputs are partly measured (major discharges), partly estimated.*

*Estimates for the **Eider** are included in the riverine inputs.*

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the RID 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

C.3 Give general comments on the discharges of sewage effluents (e.g. compared to previous years, and/or extent to which industrial effluents are discharged through sewerage systems):

There is almost no change compared to previous years.

Industrial Effluents (Table 5b)

C.4 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 RID Principles), including for those under voluntary reporting:

*For the **Elbe,** all direct 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. Input figures for small discharges are based on estimates.*

*The loads of direct industrial discharges to **Weser** and **Ems** downstream of the measurement sites for riverine inputs and those of the **Jade** are estimates.*

*Estimates for the **Eider** are included in the riverine inputs.*

C.5 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

None

C.6 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.7 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

C.8 Give general comments on industrial effluents (e.g. compared to previous years):

There is almost no change compared to previous years.

Total direct discharges (Table 5c)

C.9 Give general comments on total direct discharges (e.g. compared to previous years):

There have been no significant changes compared to previous years.

In the catchment area of the river Ems the direct discharges from sewage and industrial effluents were partly calculated on the basis of measurements (no estimates) and partly estimated. Therefore, these discharges (mostly lower) are not directly comparable to those of former years.

D. Riverine inputs for the year 2005

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 RID Principles), including for those under voluntary reporting:

*The load data for the **Elbe** at the Seemannshöft measurement site cover 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 estimates of direct inputs as provided 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): 26 measurements per year for all parameters to be monitored except heavy metals (25 measurements per year).*

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: 26 measurements per year for nutrients and 13 measurements per year for all the other parameters.*

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 measurement site Farge. When the tide is outgoing (ebb stream) the RID measurement site Farge must be regarded as being located distinctly upstream of 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):

Due to a systematic error in previous years, all LTA data since 1990 were recalculated.

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

D.4 Give general comments on the inputs from main rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

Compared to previous years (except 2002, flood year) there are no significant changes in the concentrations and inputs during the year 2005. Compared to 2004 there is a slight increase in the flow rate and the quantities of riverine inputs.

In 2005 the flow of the Elbe was close to the long-term average flow and comparable to the flow in 1999. A comparison of the two hydrological similar years shows a decrease of g-HCH, Nitrate and Total-N according to the concentration and quantity data.

In the river Weser, after a significant increase of the NH_4-N load in 2003, a reduction in 2004 was confirmed in 2005. The loads of heavy metals are in the same range as in previous years, except for the increasing load of mercury. The loads of suspended particulate matters are slightly increased.

For the river Ems there are no significant changes in inputs, concentrations and flows compared to previous years. The quantities are in the same range.

Additionally, in the rivers Eider and Weser there are still significant reductions of the concentrations and loads for lindane which is caused by the ban of this substance in November 1997.

Tributary Rivers (Tables 6b and 7b)

D.5 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 2 to 13 measurements per year were carried out for heavy metals, nutrients and SPM on the basis of representative random samples.*

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 26 measurements per year for nutrients and 13 measurements per year for all other parameters were carried out for all parameters, on the basis of representative random samples.*

D.6 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

None

D.7 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.8 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in tables 6b and 7b:

None

D.9 Give general comments on the inputs from tributary rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

In 2005 the flow of the Elbe was close to the long-term average flow and comparable to the flow in 1999. A comparison of the two hydrological similar years shows a decrease of g-HCH, Nitrate and Total-N according to the concentration and quantity data.

Total riverine inputs (Table 6c)

D.10 Give general comments on the total riverine inputs (e.g. significant change in inputs, concentrations and flows compared to previous years):

In 2005 the flow of the Elbe was close to the long-term average flow and comparable to 1999 and 2003. In 2005 the flow of the river Weser was lower than the long-term average flow and approximately comparable to 2003. (For more information see D4 because there are no measurements carried out for the Weser tributaries).

Only in the river Eider the flow was significantly lower (20 % below the LTA the third time in series) and comparable to the flow in the year 2003. Apart from a significant reduction in lindane and a slight increase in cadmium (cf D4), there is hardly any change in concentrations and inputs compared to previous years.

Flows and loads should not be compared to 2002 due to the high run-off in all German rivers and especially in the river Elbe during the summer flood event in 2002.

E. Unmonitored areas

E.1 Describe the methods of quantification used for the different determinands or groups of determinands:

Within the Eider catchment area the loads of the unmonitored part of the catchment area were determined by extrapolating the loads of the monitored parts of the catchment area.

F. Limits of detection (Table 8)

F.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Give comments if the detection limits are higher than stated in the RID principles:

See table 8 in the reporting formats.

G. Additional comments

G.1 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 and its tributaries as well as in the river Eider no measurements for PCBs (in water) were carried out, because the concentrations are mostly below the detection limit. This is also the case for γ-HCH measurements in water in the Elbe tributaries.

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2005 by Germany

Contracting Parties should use this format to report (i) their total inputs to each OSPAR region and (ii) their total inputs to their marine environment

TOTAL INPUTS			**Quantities --->**												
Discharge region	**Estimate**	**Flow rate (1000 m3/d)**	**Cd [10^3 kg]**	**Hg [10^3 kg]**	**Cu [10^3 kg]**	**Pb [10^3 kg]**	**Zn [10^3 kg]**	**g-HCH [kg]**	**PCBs [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 [10^6 kg]**
INPUTS TO OSPAR REGION ***(Provide Region name and number)***															
RIVERINE INPUTS															
Main Rivers	lower		4.8	2.5	212	129	985	23	4.3	6.6	136	2.0	175	7.5	1469
	upper	109104	5.0	2.6	212	129	985	23	29	6.7	136	2.1	175	7.5	1515
Tributary Rivers	lower		0.3	0.03	12.13	5.93	61	NI	NI	0.4	7.9	0.1	11	0.7	184
	upper	4400	0.3	0.03	12.13	5.93	61	NI	NI	0.4	7.9	0.1	11	0.7	184
Total Riverine Inp	**lower**		5.1	2.6	224	135	1046	23	4.3	7.1	144	2.2	185	8.2	1653
	upper	113504	5.3	2.6	224	135	1046	23	29	7.2	144	2.3	185	8.2	1699
DIRECT DISCHARGES															
Sewage Effluents	lower		0.01	0.01	1.8	0.8	10	0.02	0.04	1.7	1.2	0.07	2.7	0.3	1.9
	upper	384	0.04	0.04	2.3	0.9	15	0.3	1.9	1.7	1.2	0.07	2.7	0.3	1.9
Industrial Effluents	lower		0.002	0.00	0.1	0.02	0.1	NI	0	0.01	0.5	0.01	0.8	0.05	NI
	upper	138	0.01	0.02	0.20	0.50	0.10	NI	1.0	0.01	0.5	0.01	0.8	0.05	NI
Fish Farming	lower														
	upper	522													
Total Direct Input	**lower**		0.01	0.01	1.9	0.8	10	0.02	0.04	1.7	1.7	0.08	3.5	0.4	1.9
	upper	522	0.05	0.06	2.5	1.4	15	0.3	2.9	1.7	1.7	0.08	3.5	0.4	1.9
UNMONITORED AREAS															
Unmonitored Areas	lower														
	upper														
REGION TOTAL	**lower**		**5.1**	**2.6**	**226**	**136**	**1056**	**23**	**4.3**	**8.8**	**146**	**2.3**	**189**	**8.6**	**1655**
	upper	**114026**	**5.4**	**2.7**	**227**	**137**	**1061**	**23**	**32**	**8.9**	**146**	**2.4**	**189**	**8.6**	**1701**

The load from the unmonitored parts of the river Eider are included in the riverine loads.

Table 5a. Direct discharges to the maritime area in 2005 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)	31.9	0.01	0.01	0.3	0.1	2.1	0.01	0.01	0.03	0.05	0.02	0.08	0.008	0.4
(downstream of Herbrum)		(upper estimate)		0.01	0.01	0.3	0.1	2.1	0.01	0.01	0.03	0.05	0.02	0.08	0.008	0.4
Jade	Estuary	(lower estimate)	47	0.005	0.005	0.03	0.01	0.2	NI	NI	0.07	0.09	NI	0.1	0.01	NI
		(upper estimate)		0.005	0.005	0.03	0.01	0.2	NI	NI	0.07	0.09	NI	0.1	0.01	NI
Weser Estuary	Estuary	(lower estimate)	230	0.0	0.0	1.4	0.7	7.6	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	1.4	0.7	7.6	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:	**384**	**0.01**	**0.01**	**1.8**	**0.8**	**10**	**0.02**	**0.04**	**1.7**	**1.2**	**0.07**	**2.7**	**0.3**	**1.9**
				0.04	**0.04**	**2.3**	**0.9**	**15**	**0.3**	**1.9**	**1.7**	**1.2**	**0.07**	**2.7**	**0.3**	**1.9**

Table 5b. Direct discharges to the maritime area in 2005 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)	21.1	0.0001	0.0001	0.0037	0.0002	0.09	NI	NI	0.01	0.01	NI	0.03	0.007	NI
(downstream of Herbrum)		(upper estimate)		0.0001	0.0001	0.0037	0.0004	0.09	NI	NI	0.01	0.01	NI	0.03	0.007	NI
Jade	Estuary	(lower estimate)	6.6	0.001	0.001	0.03	0.005	0.02	NI	NI	0.0001	0.0009	NI	0	0.0008	NI
(area Wilhelmshaven)		(upper estimate)		0.001	0.003	0.03	0.005	0.02	NI	NI	0.000	0.001	NI	0	0.0008	NI
Weser Estuary	Estuary	(lower estimate)	40	0.001	0.0	0.1	0.01	0.02	NI	NI	0.0003	0.0006	NI	NI	0.002	NI
(area Nordenham)		(upper estimate)		0.001	0.002	0.1	0.01	0.03	NI	NI	0.0003	0.0006	NI	NI	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:	**138**	**0.002**	**0.002**	**0.1**	**0.02**	**0.1**	**NI**	**0**	**0.01**	**0.5**	**0.01**	**0.8**	**0.05**	NI
				0.01	**0.02**	**0.2**	**0.5**	**0.1**	**NI**	**1**	**0.01**	**0.5**	**0.01**	**0.8**	**0.05**	NI

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

Table 5c. Direct discharges to the maritime area in 2005 by Germany

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]
Ems Estuary	Estuary	(lower estimate)	53	0.01	0.01	0.3	0.1	2.2	0.01	0.01	0.0	0.1	0.02	0.1	0.0	0.4
		(upper estimate)		0.01	0.01	0.3	0.1	2.2	0.01	0.01	0.0	0.1	0.02	0.1	0.0	0.4
Jade	Estuary	(lower estimate)	54	0.006	0.01	0.1	0.0	0.2	NI	NI	0.07	0.1	NI	0.1	0.01	NI
		(upper estimate)		0.01	0.01	0.1	0.0	0.3	NI	NI	0.07	0.1	NI	0.1	0.01	NI
Weser Estuary	Estuary	(lower estimate)	270	0.001	0.0	1.5	0.7	7.6	0.01	0.03	1.6	0.9	0.04	2.1	0.3	1.1
		(upper estimate)		0.01	0.01	1.5	0.7	7.6	0.3	1.8	1.6	0.9	0.04	2.1	0.3	1.1
Elbe Estuary	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:	**522**	**0.02**	**0.02**	**1.9**	**0.9**	**10**	**0.02**	**0.04**	**1.7**	**1.7**	**0.08**	**3.6**	**0.4**	**1.9**
				0.05	**0.05**	**2.5**	**1.5**	**15**	**0.3**	**2.9**	**1.7**	**1.7**	**0.08**	**3.6**	**0.4**	**1.9**

(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 2005 by Germany

Main riverine inputs			Quantities --->												
Discharge area	Flow rate [1000 m³/d] 2005	Flow rate [1000 m³/d] LTA	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	6920	7690 (5)	0.25	0.03	9.8	4.7	43	1.0	1.1	0.8	16	0.09	22	0.6	42
(Herbrum: 70 %)			0.3	0.03	9.8	4.7	43	1.0	6.5	0.8	16	0.10	22	0.6	81
Weser	30242	31445(6)	1.2	1.0	41	39	237	4.7	3.2	1.6	41	0.6	58	1.9	318
(Farge: 90%)			1.2	1.0	41	39	237	4.7	22	1.6	41	0.6	58	1.9	325
Elbe Estuary	70000	74100 (7)	3.3	1.5	160	85	700	17	NI	4.0	77	1.3	91	4.9	1100
			3.5	1.5	160	85	700	17	NI	4.1	77	1.4	91	4.9	1100
Elbe tributaries (3)	2100	2100 (8)	0.02	0.02	2.8	1.9	21	NI	NI	0.17	2.6	0.05	3.1	0.24	64
			0.02	0.02	2.8	1.9	21	NI	NI	0.17	2.6	0.05	3.1	0.24	64
Elbe tributaries (4)	2300	2400 (9)	0.3	0.009	9.4	4.0	40	NI	NI	0.28	5.3	0.06	7.5	0.47	120
			0.3	0.009	9.4	4.0	40	NI	NI	0.28	5.3	0.06	7.5	0.47	120
Eider	1942	2399 (10)	0.04	0.004	1.31	0.42	4.6	0.25	NI	0.19	2.09	0.05	3.2	0.1	9.4
			0.04	0.004	1.31	0.42	4.6	0.25	NI	0.19	2.09	0.05	3.2	0.1	9.4
Total	**113504**		**5.1**	**2.6**	**224**	**135**	**1046**	**23**	**4.3**	**7.1**	**144**	**2.2**	**185**	**8.2**	**1653**
			5.3	**2.6**	**224**	**135**	**1046**	**23**	**29**	**7.2**	**144**	**2.3**	**185**	**8.2**	**1699**

(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) 1941 - 2002
(6) 1941 - 2002
(7) 1926 - 2000
(8) 1961 - 2000
(9) 1971 - 2000
(10) 1974 - 2005

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

Main river Ems	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 [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 2005	6920	7690	Mean	0.05	0.009	2.7	1.0	9.9	0.34	0.45	0.20	4.3	0.03	6.0	0.15	5.8
(Herbrum: 70 %)			upper	0.06	0.009	2.7	1.0	9.9	0.34	2.2	0.20	4.3	0.03	6.0	0.15	23
Minimum	2530			< 0.05	< 0.005	1.3	< 0.2	3.3	0.10	< 1.8	0.09	2.1	< 0.02	3.4	0.06	< 20
Maximum	22200			0.20	0.020	5.0	2.9	25	0.6	3.0	0.42	7.3	0.04	9.3	0.33	37
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	no
n				*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*

Contaminant concentrations -->

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 18(
(2) Suspended particulate matter
ND: Not detected
LTA: Long-term average flow: Ems: 1941 - 2002
> 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8)

Main river Weser	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 [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]
Weser 2005	30240	31445	Mean	0.1	0.09	3.8	2.9	18	0.5	0.3	0.1	3.2	0.06	4.6	0.2	28
(Farge: 90%)			upper	0.1	0.09	3.8	2.9	18	0.5	2.1	0.1	3.2	0.06	4.6	0.2	30
Minimum	14867			< 0.05	0.02	1.8	1.4	7.1	0.3	< 0.3	0.06	1.8	0.03	2.9	0.1	< 20
Maximum	86019			0.2	0.19	9.5	5.7	36	0.8	4.5	0.2	4.8	0.09	6.6	0.2	53
> 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*

Contaminant concentrations -->

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 18(
(2) Suspended particulate matter
ND: Not detected
LTA: Long-term average flow: Weser: 1941 - 2002
> 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8)

Main river Eider	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 [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]
Eider 2005	1942	2399	Mean	0.063	0.004	2.11	0.82	6.01	0.45	NI	0.17	2.1	0.061	3.5	0.17	19
			upper	0.063	0.004	2.11	0.82	6.01	0.45	NI	0.17	2.1	0.061	3.5	0.17	19
Minimum	-5484			< 0.02	< 0.001	0.8	< 0.2	2.1	0.32		0.01	0.07	0.006	1.1	0.09	1.0
Maximum	14550			0.44	0.02	5.9	2.2	11	0.76		0.60	6.3	0.127	7.9	0.2	50
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes
n				24	24	24	24	24	7		45	45	45	45	45	45

Contaminant concentrations -->

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matter
ND: Not detected
LTA: Long-term average flow: Eider: 1974 - 2005
> 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8)

Main river Elbe	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 [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]
Elbe Estuary	70000	74100	Median	0.13	0.065	6.0	3.6	29	0.8	NI	0.19	2.4	0.07	3.2	0.22	50
2005			upper	0.13	0.065	6.0	3.6	29	0.8	NI	0.19	2.4	0.07	3.2	0.22	50
Minimum	27700			< 0.075	0.032	4	2.1	14	< 0.5		< 0.05	1.3	< 0.03	1.9	0.13	24
Maximum	240000			0.27	0.11	13	6.1	50	1		0.34	5.1	0.09	5.7	0.34	70
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes
n			*n*	*26*	*26*	*26*	*25*	*26*	*13*		*26*	*26*	*26*	*26*	*26*	*26*

Contaminant concentrations -->

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 18(
(2) Suspended particulate matter
NI: No information
LTA: Long-term average flow: Elbe: 1926 - 200(
> 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8)

Left side tributaries of the Elbe	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 [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]
Elbe tributary (3)	2100	2100	Median	< 0.05	0.05	3.0	3.1	19	NI	NI	0.18	2.9	0.060	3.6	0.23	35
2005			upper	< 0.05	0.05	3.0	3.1	19	NI	NI	0.18	2.9	0.060	3.6	0.23	35
Minimum	590			< 0.05	0.022	0.5	< 1.2	< 10			< 0.05	1.3	< 0.030	1.7	0.10	12.0
Maximum	8100			0.15	0.10	8	14	54			0.61	7.6	0.14	7.5	0.50	166
> 70 % > d.l. ?			yes/no	no	yes	yes	no	yes			yes	yes	yes	yes	yes	yes
n				*2*	*2*	*13*	*2*	*13*			*13*	*13*	*13*	*13*	*13*	*13*

Contaminant concentrations -->

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 18(
(2) Suspended particulate matter
(3) Left side tributaries: Este, Lühe, Schwinge, Oste
NI: No information
LTA: Long-term average flow: Oste only: 1961 - 1987
Este, Lühe, Schwinge, Oste: 1961 - 2000
> 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	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 [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]
Elbe tributary (3)	2300	2400	Median	0.11	0.003	4.1	1.3	16	NI	NI	0.16	2.2	0.022	3.4	0.12	12
2005			upper	0.11	0.003	4.1	1.3	16	NI	NI	0.16	2.2	0.022	3.4	0.12	12
Minimum	1100			0.02	0.001	0.8	0.4	4.8			0.005	0.62	0.007	1.3	0.052	3.0
Maximum	4600			0.71	0.009	19	11	74			0.81	5.3	0.06	7.5	1.3	647
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	yes
n				*10*	*10*	*10*	*10*	*10*			*21*	*21*	*21*	*21*	*21*	*21*

Contaminant concentrations -->

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 18(
(2) Suspended particulate matter
(3) Right side tributaries: Pinnau, Krückau, Stör
NI: No information
LTA: Long-term average flow: Stör only: 1971 - 1987
Pinnau, Krückau, Stör: 1971 - 2000
> 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	0.05	0.1	NL	1.0	0.02	NL
	I		0.5	0.5	30	1.0	10	ND	ND	0.05	0.1	NL	1.0	0.02	NL
	R		0.05	0.005	0.5	0.2	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	0.1	0.2	1.0	0.5	ND	0.05	0.5	0.03	0.5	0.1	1.0
Eider	R		0.02	0.001	0.5	0.2	0.1	0.3	ND	0.01	0.05	0.005	0.05	0.01	1.0
Jade	S		0.5	0.5	30	1.0	10	ND	ND	0.05	0.1	ND	1.0	0.02	ND
	I		0.5	0.5	30	1.0	10	ND	ND	0.05	0.1	ND	1.0	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

5. Ireland

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 by Ireland

Annual report on riverine inputs and direct discharges by Ireland to Convention waters during the year 2005

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

Environmental Protection Agency
McCumiskey House, Richview, Clonskeagh Road
Dublin 14, Ireland
Tel: **+353 1 2680100**
Fax: **+353 1 2680199**
Email: **(Contact person – Shane O'Boyle) s.oboyle@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 waters**		**Cf. below table**
Celtic Sea	**Estuary/Coastal waters**		**Cf. below table**
Atlantic	**Estuary/Coastal waters**		**Cf. below table**

[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 (54^0 7' N, 6^0 18' W) to Hook Head (52^0 7' N, 6^0 56' W)

CELTIC SEA DISCHARGE AREA:

From Hook Head to Loop Head (52^0 33' N, 9^0 56' W)

ATLANTIC DISCHARGE AREA:
From Loop Head to border with N. Ireland (55^0 4' N, 7^0 16' W)

Wherever necessary in this report, use extra sheets of paper to give the information.

B. Total riverine inputs and direct discharges for the year 2005

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

Estimates/measurements of Direct Discharges made for 1990 are still being presented as there has been no update of the position. However, it is intended that a full update will be carried out in time for the next reporting cycle.

C. Direct discharges for the year 2005

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:

Estimates/measurements made for 1990 are still being presented as there has been no update of the position.

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:

Estimates/measurements made for 1990 are still being presented as there has been no update of the position.

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

NA

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.:

NA

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 2005

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:

Loads are calculated as the products of flow-weighted annual mean concentrations and annual flow. In 2005 seven sampling runs were made for each river in autumn and winter/early spring with at least 1 sampling event in summer (May or June). Nutrients were measured on an automated analyzer system (LACHAT) (total P following persulphate digestion), suspended solids by gravimetry and metals by ICP-MS.

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 0.15 ug/l currently achieved. It should be noted that this value is used to give an upper estimate of loading to the receiving water.

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 as 5-day BOD

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):

BOD (by extrapolation from main river loads)

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.:

NA

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.

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.

There has been no further update of the data for direct discharges since 1990. Riverine inputs in 2005 were based on measurements at the full set of sampling points used in previous years and sampling frequency was similar to 2004. Annual flow data from the Avoca river catchment, which was unavailable for 2004, is included in the 2005 report.

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

Pollutant loads in most rivers in 2005 were broadly similar to loads in 2004 reflecting the similarity in mean annual flows, e.g. in 2004 the annual flow for all rivers was 93.3 per cent of the LTA, in 2005 it was 92.6 per cent. Annual flows into the Irish Sea in 2005 were marginally lower than in 2004 and this is reflected in the reduction of input loads of certain parameters.

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

Sampling frequency is less than 12 times per annum but is concentrated in the period of expected higher river flows (October to May). The specified detection levels for metals cannot be achieved in the present circumstances. In both cases, the reason for the non-compliance is the lack of resources.

Table 5a. Direct inputs to the maritime area in 2005 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	3.706	0.866	21.44
Celtic Sea	Estuarine and coastal waters		0.01	NI	1.1	0.5	9.2	NI	NI	NI	NI	NI	1.323	0.387	8.57
Atlantic	Estuarine and coastal waters		0.002	NI	0.35	0.17	3.1	NI	NI	NI	NI	NI	0.414	0.12	2.579
Total:			0.032		4.85	2.17	41.3						5.443	1.373	32.589

Table 5b. Direct inputs to the maritime area in 2005 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	3.127	0.709	16.69
Celtic Sea	Estuarine and coastal waters		0.013	NI	2.1	3.9	12.3	NI	NI	NI	NI	NI	1.348	0.267	10.02
Atlantic	Estuarine and coastal waters		0.005	NI	0.48	0.22	4.6	NI	NI	NI	NI	NI	0.288	0.086	1.744
Total:			0.058		6.68	5.92	50.9						4.763	1.062	28.454

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 2005 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	6.833	1.575	38.13
Celtic Sea	Estuarine and coastal waters		0.023	NI	3.2	4.4	21.5	NI	NI	NI	NI	NI	2.671	0.654	18.59
Atlantic	Estuarine and coastal waters		0.007	NI	0.83	0.39	7.7	NI	NI	NI	NI	NI	0.702	0.206	4.323
Total:			0.09		11.53	8.09	92.2						10.206	2.435	61.043

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 2005 by Ireland

Main riverine inputs				Quantities --->													
Discharge area	Flow rate [1000 m3/d] 2005		Flow rate [1000 m3/d] LTA	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: Boyne	2842		3345	0.10	0.16	2.57	1.40	7.29	NM	NM	0.07	3.60	NM	0.07	5.00	0.10	15.30
				0.00	0.00	2.35	0.40	7.29			0.06			0.07			
Irish Sea: Liffey	1071		1544	0.04	0.06	0.70	0.40	5.93	NM	NM	0.04	0.95	NM	0.03	1.24	0.03	4.16
				0.00	0.00	0.50	0.01	5.93			0.04			0.03			
Irish Sea: Avoca	509		1749	0.06	0.03	2.06	1.07	20.35	NM	NM	0.02	0.34	NM	0.00	0.39	0.01	2.55
				0.06	0.00	2.06	1.06	20.34			0.02			0.00			
Irish Sea: Slaney	3257		2867	0.12	0.18	2.61	1.19	8.57	NM	NM	0.03	4.82	NM	0.06	5.72	0.11	16.08
				0.00	0.00	2.25	0.00	8.48			0.03			0.06			
Total Irish Sea:	**7679**			**0.33**	**0.42**	**7.95**	**4.05**	**42.14**			**0.16**	**9.71**		**0.16**	**12.36**	**0.26**	**38.09**
				0.06	**0.03**	**7.17**	**1.49**	**42.05**			**0.16**			**0.16**			
Celtic Sea: Barrow	2965		3846	0.11	0.16	2.21	1.08	8.29	NM	NM	0.03	3.81	NM	0.08	5.19	0.09	22.37
				0.00	0.00	1.74	0.00	8.18			0.03			0.08			
Celtic Sea: Nore	2917		3705	0.11	0.16	3.04	1.06	6.07	NM	NM	0.03	2.98	NM	0.09	4.23	0.12	20.67
				0.00	0.00	2.63	0.00	5.97			0.03			0.09			
Celtic Sea: Suir	6040		6623	0.22	0.33	3.47	2.61	14.41	NM	NM	0.05	4.91	NM	0.12	6.57	0.19	44.43
				0.00	0.00	2.02	0.71	14.31			0.05			0.12			
Celtic Sea: Blackwater	6268		7231	0.23	0.34	5.12	3.56	23.03	NM	NM	0.09	6.16	NM	0.18	7.49	0.31	72.63
				0.00	0.00	4.49	2.03	23.03			0.08			0.18			
Celtic Sea: Lee	3443		3476	0.13	0.19	1.89	1.85	7.42	NM	NM	0.05	3.18	NM	0.06	3.60	0.10	13.76
				0.00	0.00	1.17	0.83	7.39			0.05			0.06			
Celtic Sea: Bandon	1574		1820	0.06	0.09	1.44	1.76	4.79	NM	NM	0.04	1.91	NM	0.06	2.21	0.09	11.39
				0.00	0.00	1.20	1.57	4.77			0.04			0.06			
Celtic Sea: Deel	554		637	0.02	0.03	0.68	0.20	1.21	NM	NM	0.02	0.38	NM	0.03	0.64	0.04	3.66
				0.00	0.00	0.66	0.00	1.21			0.02			0.03			
Celtic Sea: Maigue	1270		1423	0.05	0.07	0.89	0.46	1.94	NM	NM	0.03	0.91	NM	0.07	1.59	0.07	7.35
				0.00	0.00	0.71	0.00	1.89			0.03			0.07			
Celtic Sea: Shannon	3774	combined	NA	0.14	0.21	2.66	1.70	12.90	NM	NM	0.08	1.81	NM	0.07	3.03	0.12	20.24
(old channel)		18536		0.00	0.00	2.15	0.64	12.90			0.08			0.07			
Celtic Sea: Shannon	14763		NA	0.45	0.68	5.17	4.50	24.40	NM	NM	0.08	6.36	NM	0.12	9.94	0.13	45.02
(tailrace)				0.00	0.00	1.33	0.00	25.49			0.07			0.13			
Celtic Sea: Fergus	1437		1607	0.05	0.08	1.56	0.52	2.21	NM	NM	0.03	0.50	NM	0.02	0.86	0.03	5.31
				0.00	0.00	1.43	0.00	2.21			0.03			0.02			
Total Celtic Sea:	**45005.32**			**1.55**	**2.33**	**28.12**	**19.31**	**106.67**			**0.54**	**32.89**		**0.90**	**45.34**	**1.29**	**266.83**
				0.00	**0.00**	**19.52**	**5.78**	**107.34**			**0.51**			**0.91**			

Main riverine inputs				Quantities --->													
Discharge area	Flow rate [1000 m3/d] 2005		Flow rate [1000 m3/d] LTA	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]
Atlantic: Corrib	12116		9055	0.44	0.66	4.54	4.42	9.70	NM	NM	0.14	3.90	NM	0.03	5.47	0.12	44.22
				0.00	0.00	0.24	0.00	8.05			0.14			0.01			
Atlantic: Moy	4859		5312	0.18	0.27	1.77	1.77	6.69	NM	NM	0.06	1.32	NM	0.03	2.35	0.07	18.05
				0.00	0.00	0.00	0.00	6.58			0.05			0.03			
Atlantic : Erne	8483		8786	0.35	0.46	6.36	3.10	10.04	NM	NM	0.09	2.34	NM	0.16	3.89	0.21	30.96
				0.05	0.00	5.78	0.00	9.41			0.08			0.16			
Total Atlantic:	**25458.47**			**0.97**	**1.39**	**12.67**	**9.29**	**26.42**			**0.29**	**7.56**		**0.22**	**11.71**	**0.40**	**93.24**
				0.05	**0.00**	**6.01**	**0.00**	**24.04**			**0.27**			**0.20**			
Grand total:				**2.85**	**4.15**	**48.74**	**32.66**	**175.23**			**0.99**	**50.16**		**1.28**	**69.42**	**1.95**	**398.16**
				0.12	**0.03**	**32.70**	**7.27**	**173.42**			**0.93**			**1.27**			

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

Table 6b. Riverine inputs to the maritime area in 2005 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	0.20	0.30	4.69	2.40	15.18	NM	NM	0.10	6.65	NM	0.13	8.72	0.19	29.53
		0.02	0.04	4.25	0.67	15.13			0.10			0.13			
Celtic Sea	100 minor catchment areas: 9800 km2	0.73	1.09	15.29	11.91	57.21	NM	NM	0.33	18.50	NM	0.51	22.46	0.84	156.11
		0.00	0.00	12.42	6.75	57.10			0.32			0.51			
Atlantic	180 minor catchment areas: 11498 km2	1.02	1.49	13.94	9.96	32.10	NM	NM	0.35	8.08	NM	0.22	13.13	0.42	100.42
		0.03	0.00	6.27	0.00	30.33			0.32			0.20			
Total:		**1.94**	**2.88**	**33.92**	**24.27**	**104.50**			**0.78**	**33.23**		**0.85**	**44.31**	**1.45**	**286.07**
		0.05	**0.04**	**23.38**	**9.15**	**102.62**			**0.75**			**0.84**			

NI: No information

(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 2005 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 (2) [t]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM (3) [kt]
Irish Sea	(upper estimate)	**0.53**	**0.72**	**12.63**	**6.45**	**57.32**			**0.26**	**16.36**		**0.28**	**21.08**	**0.45**	**67.62**
	(lower estimate)	**0.09**	**0.06**	**11.42**	**2.15**	**57.18**			**0.26**			**0.28**			
Celtic Sea	(upper estimate)	**2.28**	**3.42**	**43.41**	**31.22**	**164.44**			**0.87**	**51.39**		**1.42**	**67.80**	**2.13**	**422.94**
	(lower estimate)	**0.00**	**0.00**	**31.94**	**12.53**	**163.88**			**0.83**			**1.41**			
Atlantic	(upper estimate)	**1.98**	**2.89**	**26.61**	**19.25**	**58.52**			**0.63**	**15.64**		**0.44**	**24.84**	**0.82**	**193.67**
	(lower estimate)	**0.08**	**0.00**	**12.29**	**0.00**	**54.37**			**0.59**			**0.40**			
Total:	(upr est)	**4.79**	**7.03**	**82.66**	**56.92**	**279.73**			**1.77**	**83.39**		**2.13**	**113.73**	**3.40**	**684.23**
	(lr est)	**0.17**	**0.06**	**55.65**	**14.68**	**275.98**			**1.68**			**2.11**			

NI: No information

(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 2005

Main riverine inputs				Contaminant Concentrations --->													
Discharge area	Flow rate [1000 m³/d] annual 2005	LTA 2004	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 - 2005	2842	3356															
			Median	*>0.1*	NM	*2.0*	*<1.0*	*0.008*	NM	NM	*0.02*	*2.46*	*NM*	*0.05*	*4.4*	*0.063*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*0.004*			*<0.01*	*1.69*		*<0.005*	*1.07*	*0.038*	*<10*
Maximum				*>0.1*		*3.0*	*11.0*	*0.017*			*0.10*	*4.19*		*0.09*	*6.08*	*0.14*	*19*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*18*	*21*
Irish Sea: Liffey - 2005	1071	1471															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.011*	NM	NM	*0.08*	*2.06*	*NM*	*0.08*	*4.16*	*0.08*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*0.004*			*<0.01*	*1.22*		*0.02*	*1.48*	*0.06*	*<10*
Maximum				*>0.1*		*3.0*	*2.0*	*0.052*			*0.87*	*3.72*		*0.13*	*6.85*	*0.17*	*14*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*18*	*21*
Irish Sea: Avoca - 2005	509	NI															
			Median	*0.3*	NM	*10.0*	*5.0*	*0.10*	NM	NM	*0.11*	*1.75*	*NM*	*0.01*	*1.98*	*0.05*	*<10*
Minimum				*>0.1*		*2.0*	*<1.0*	*0.01*			*0.04*	*1.42*		*<0.005*	*1.77*	*0.021*	*<10*
Maximum				*0.7*		*22.0*	*8.0*	*0.24*			*1.48*	*3.47*		*0.05*	*4.44*	*0.10*	*23*
> 70 % > d.l. ?			***yes/no***	*yes*		*yes*	*yes*	*yes*			*yes*	*yes*		*no*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*21*	*21*
Irish Sea: Slaney - 2005	3257	2908															
			Median	*>0.1*	NM	*1.5*	*<1.0*	*0.006*	NM	NM	*<0.01*	*4.24*	*NM*	*0.04*	*4.95*	*0.07*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*3.47*		*0.01*	*4.14*	*0.03*	*<10*
Maximum				*>0.1*		*4.0*	*<1.0*	*0.011*			*0.09*	*5.28*		*0.08*	*6.95*	*0.20*	*20*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*14*		*14*	*14*	*14*			*14*	*14*		*14*	*14*	*14*	*14*
Celtic Sea: Barrow - 2005	2965	4076															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.005*	NM	NM	*0.03*	*3.235*	*NM*	*0.06*	*5.04*	*0.08*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*2.98*		*0.05*	*2.29*	*0.05*	*<10*
Maximum				*>0.1*		*4*	*<1.0*	*0.019*			*0.04*	*5.27*		*0.11*	*6.52*	*0.10*	*49*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*14*		*14*	*14*	*14*			*14*	*14*		*14*	*14*	*14*	*14*
Celtic Sea: Nore - 2005	2917	3688															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.005*	NM	NM	*0.022*	*2.85*	*NM*	*0.05*	*4.43*	*0.08*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*2.14*		*0.01*	*3.67*	*0.04*	*<10*
Maximum				*0.4*		*9*	*7*	*0.043*			*0.06*	*3.6*		*0.07*	*5.07*	*0.11*	*<10*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*18*		*18*	*18*	*18*			*18*	*18*		*18*	*18*	*18*	*18*
Celtic Sea: Suir - 2005	6040	7340															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.0065*	NM	NM	*0.03*	*2.58*	*NM*	*0.05*	*3.42*	*0.05*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*0.01*	*1.28*		*0.02*	*2.05*	*0.02*	*<10*
Maximum				*>0.1*		*3*	*3*	*0.011*			*0.05*	*3.7*		*0.15*	*5.34*	*0.18*	*46*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*20*		*20*	*20*	*20*			*21*	*21*		*21*	*21*	*21*	*21*
Celtic Sea: Blackwater - 2005	6268	7583															
			Median	*>0.1*	NM	*1.5*	*<1.0*	*0.011*	NM	NM	*0.01*	*2.7*	*NM*	*0.07*	*3.65*	*0.09*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*0.006*			*<0.01*	*2.05*		*0.03*	*2.59*	*0.03*	*<10*
Maximum				*>0.1*		*6*	*4*	*0.021*			*0.08*	*4.03*		*0.10*	*4.70*	*0.18*	*51*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*20*		*20*	*20*	*20*			*20*	*20*		*20*	*20*	*20*	*<10*
Celtic Sea: Lee - 2005	3443	3443															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.005*	NM	NM	*0.02*	*2.77*	*NM*	*0.05*	*3.29*	*0.07*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*1.98*		*0.01*	*2.45*	*0.03*	*<10*
Maximum				*>0.1*		*4*	*4*	*0.014*			*0.07*	*3.59*		*0.06*	*4.08*	*0.16*	*13*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*21*	*21*
Celtic Sea: Bandon - 2005	1574	1842															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.005*	NM	NM	*0.02*	*3.35*	*NM*	*0.05*	*4.50*	*0.07*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*2.85*		*0.02*	*2.98*	*0.03*	*<10*
Maximum				*>0.1*		*4*	*7*	*0.025*			*0.09*	*5.12*		*0.16*	*5.42*	*0.26*	*33*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*21*	*21*
Celtic Sea: Deel - 2005	554	627															
			Median	*>0.1*	NM	*2.5*	*<1.0*	*0.005*	NM	NM	*0.08*	*1.915*	*NM*	*0.135*	*3.21*	*0.135*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*0.004*			*<0.01*	*1.4*		*0.085*	*1.78*	*0.062*	*<10*
Maximum				*>0.1*		*5*	*<1.0*	*0.009*			*0.18*	*2.84*		*0.26*	*4.08*	*0.41*	*36*
> 70 % > d.l. ?			***yes/no***	*no*		*yes*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*14*		*14*	*14*	*14*			*14*	*14*		*14*	*14*	*14*	*14*
Celtic Sea: Maigue - 2005	1270	1531															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.004*	NM	NM	*0.05*	*1.965*	*NM*	*0.12*	*3.30*	*0.10*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*1.37*		*0.06*	*2.27*	*0.06*	*<10*
Maximum				*>0.1*		*3*	*<1.0*	*0.008*			*0.11*	*2.72*		*0.21*	*5.32*	*0.23*	*46*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*14*		*14*	*14*	*14*			*14*	*14*		*14*	*14*	*14*	*14*
Celtic Sea: Shannon** - 2005 (old channel)	3774	3076															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.009*	NM	NM	*0.03*	*1.44*	*NM*	*0.05*	*2.24*	*0.05*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*0.006*			*0.01*	*0.15*		*0.02*	*1.55*	*0.03*	*<10*
Maximum				*>0.1*		*6*	*2*	*0.014*			*0.17*	*2.08*		*0.10*	*3.49*	*0.20*	*34*

> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*21*	*21*
Celtic Sea: Shannon** - 2005 (tailrace)	14763	14783															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.004*	NM	NM	*0.01*	*1.39*	*NM*	*0.02*	*2.10*	*0.03*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*0.63*		*<0.005*	*0.94*	*0.02*	*<10*
Maximum				*>0.1*		*2*	*<1.0*	*0.021*			*0.05*	*1.97*		*0.04*	*3.12*	*0.05*	*<10*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*21*	*21*
Celtic Sea: Fergus - 2005	1437	1618															
			Median	*>0.1*	NM	*2*	*<1.0*	*0.004*	NM	NM	*0.065*	*1.015*	*NM*	*0.03*	*1.71*	*0.05*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*0.002*			*0.02*	*0.54*		*0.01*	*1.19*	*0.03*	*<10*
Maximum				*>0.1*		*8*	*<1.0*	*0.007*			*0.3*	*1.42*		*0.06*	*2.20*	*0.12*	*11*
> 70 % > d.l. ?			***yes/no***	*no*		*yes*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*14*		*14*	*14*	*14*			*14*	*14*		*13*	*14*	*14*	*14*
Atlantic: Corrib - 2005	12116	8535															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.002*	NM	NM	*0.03*	*0.75*	*NM*	*<0.005*	*1.16*	*0.03*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*0.08*		*<0.005*	*0.73*	*0.01*	*<10*
Maximum				*>0.1*		*2*	*<1.0*	*0.005*			*0.13*	*1.46*		*0.03*	*1.91*	*0.05*	*<10*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*no*			*yes*	*yes*		*no*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*21*	*21*
Atlantic: Moy - 2005	4859	5444															
			Median	*>0.1*	NM	*<1.0*	*<1.0*	*0.003*	NM	NM	*0.02*	*0.58*	*NM*	*0.01*	*1.06*	*0.04*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*0.38*		*<0.005*	*0.55*	*0.02*	*<10*
Maximum				*>0.1*		*<1.0*	*<1.0*	*0.009*			*0.13*	*1.09*		*0.16*	*3.76*	*0.06*	*11*
> 70 % > d.l. ?			***yes/no***	*no*		*no*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*21*	*21*
Atlantic : Erne - 2005	8483	8832															
			Median	*>0.1*	NM	*2*	*<1.0*	*0.003*	NM	NM	*0.01*	*0.72*	*NM*	*0.05*	*1.34*	*0.06*	*<10*
Minimum				*>0.1*		*<1.0*	*<1.0*	*<0.001*			*<0.01*	*0.09*		*0.01*	*0.95*	*0.04*	*<10*
Maximum				*0.3*		*13*	*<1.0*	*0.009*			*0.12*	*1.16*		*0.10*	*1.88*	*0.09*	*<10*
> 70 % > d.l. ?			***yes/no***	*no*		*yes*	*no*	*yes*			*yes*	*yes*		*yes*	*yes*	*yes*	*no*
n				*21*		*21*	*21*	*21*			*21*	*21*		*21*	*21*	*21*	*21*

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.

6. The Netherlands

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 by the Netherlands

Table 4a	Total riverine inputs and direct discharges to the maritime area in 2005 by the Netherlands
Table 4b	Total riverine inputs and direct discharges to the maritime area in 2005 by the Netherlands
Table 5a	Sewage effluents (direct discharges) to the maritime area in 2005 by the Netherlands
Table 5b	Industrial effluents (direct discharges) to the maritime area in 2005 by the Netherlands
Table 6a	Main riverine inputs to the maritime area in 2005 by the Netherlands
Table 6b	Tributary riverine inputs to the maritime area in 2005 by the Netherlands
Table 7	Contaminant concentrations of rivers in the Netherlands discharging to the maritime area in 2005 (Maassluis, Haringvlietsluis, IJsselmeer, Noordzeekanaal)
Table 8	Detection limits for contaminant concentrations of inputs from the Netherlands to the maritime area.
Table 9	Catchment-dependent information (flow rates, long term average flow rates) in 2005 by the Netherlands.

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 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 polder effluents/canals) included in the data report

Country: The Netherlands	
Name of river, sub area and discharge area	**Nature of the receiving water**
Western Scheldt Estuary:	
Spuikanaal Bath, Kanaal Gent-Terneuzen, polder effluents Westerschelde (Wielingen included)	Coastal water
Southern Delta Coast:	
Oosterschelde (Krammersluizen), polder effluents Oosterschelde	Coastal water
Northern Delta Coast:	
Haringvlietsluizen, Maassluis (Nieuwe Waterweg)	Coastal water
Closed Holland Coast:	
Noordzeekanaal, gemaal Katwijk (Oude Rijn) and polder effluents Closed Holland Coast (gemalen Scheveningen and Vlotwatering)	Coastal water
Wadden Coast:	
IJsselmeer (outlets Den Oever and Kornwerderzand) and polder effluents/canals Wadden Coast (Den Helder/De Helsdeur, Harlingen/Van Harinxmakanaal, Texel, Lauwersmeer, Roptazijl, Spuisluis Oostoever, Wieringermeer and Zwarte Haan)	Coastal water
Ems Dollard estuary:	
Polder effluents/canals Ems-Dollard (Damsterdiep, Duurswold, Eemskanaal, Nieuwe Statenzijl, Termunterzijl)	Coastal water

Figure 1 shows how the coast of the Netherlands is divided into six sections, namely the Ems Dollard estuary, the Wadden coast, the Closed Holland coast, Northern Delta coast, Southern Delta coast and the Western Scheldt estuary.

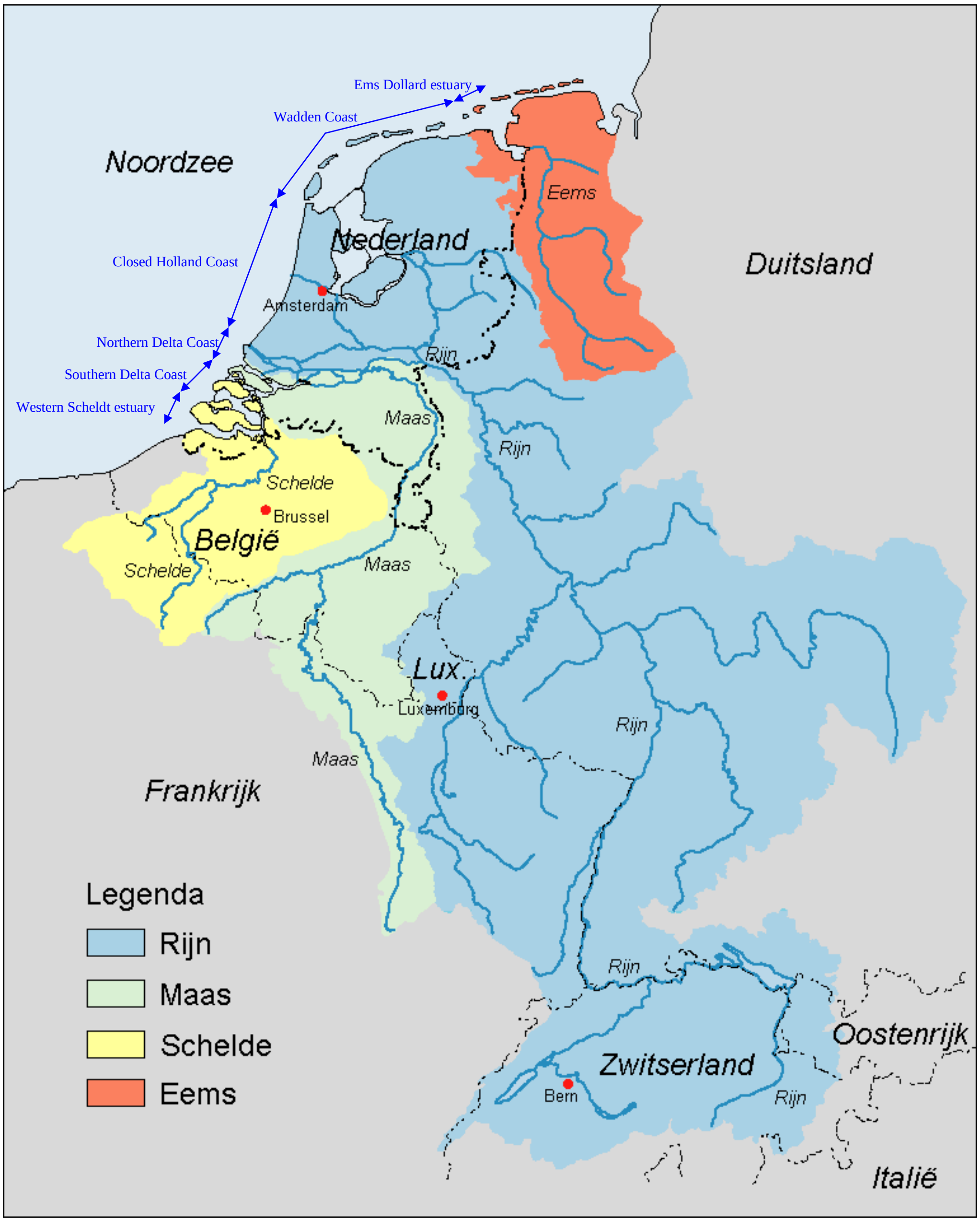

Figure 1 River basin of the rivers Rhine, Meuse, Scheldt and Ems

B. Total riverine inputs and direct discharges for the year 2005

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

- *Riverine Input data: including loads from countries upstream (Germany and Belgium)*

C. Direct discharges for the year 2005

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*
- *There are no measurements of PCBs and lindane in sewage effluents. There is only an estimate of the total national figure of PCBs and lindane in all sewage effluents available, with no further distinction to single effluents or catchments. As the total figure for sewage effluents is already*

very low (γ-HCH < 0.07 kg/yr, PCBs < 0.0007 kg/yr), the contribution of that part of sewage effluents that is discharged directly into the sea is negligible compared to the riverine inputs.

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):

There are no measurements of SPM in industrial effluents because of problems with the database. Therefore the loads of previous year have been replicated.

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

No information available. The expectation is that this attribution is low for the Netherlands.

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 2005

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:

For Noordzeekanaal, IJsselmeer and Haringvlietsluizen 12-13 samples per year. For Maassluis 24-25 samples per year. Loads calculated following each flow weighted concentration method. Calculations for PCBs are not included due to lack of measurements.

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):

PAHs.

Tributary Rivers (Table 6b)

D.4 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 5 of the Principles):

Because of discontinued flow from pumping-stations and sluices the loads have been determined with the right-towards-right-on method. The yearly load is calculated as the product of yearly average flow-rate and the yearly average concentration. This method is from the i-Bever user-manual recommended for this type of discharge point. The method given in the manual for dealing with detection limits is the same as the OSPAR method. (literature: Klaver, H. en A. De Vries (1993). Vrachtberekeningsmethoden. Een casestudy voor Maas en Rijn. Werkdocumentnummer: GWWS-93.111X /RIZA93.021X.; i-Bever (2004). Gebruikers handleiding vrachten. Versie 1.6 Mei 2004, Rijkswaterstaat RIZA)

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

Some station names in table 6b, 8 and 9, where measurements had taken place have been changed. Therefore the station Termunsterzijl has been changed to Termunterzijl, the station De Helsdeur has been changed to Den Helder/De Helsdeur and the station Krassekeet has been replaced by Texel. Texel includes the lateral discharges of 6 stations on the island Texel on the Wadden Coast, including Krassekeet.

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 the tables 6a and 6b:

Diffuse contributions such as atmospheric deposition, groundwater influence and runoff are not taken into account.

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 has included this information in table 8. PCBs are measured in the sediment-phase. Detection limits for PCBs are: PCB138 = 2 ug/kg, PCB153 = 3 ug/kg, other PCBs = 1 ug/kg.

The detection limits of some measurements for the locations Damsterdiep, Duurswold, Eemskanaal, Nieuwe Statenzijl, Termunterzijl, Den Helder / De Helsdeur, Harlingen/Van Harinxmakanaal, Texel, Lauwersmeer, Roptazijl, Spuisluis Oostoever, Wieringermeer and Zwarte Haan.are adapted.

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.

[none]

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

No comment

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

Tributary river input is missing from Closed Holland Coast, Western Scheldt Estuary and Southern Delta Coast. This contribution is, from experience over the last years, smaller than 5%.

Table 4a.
Reported Maritime Area of the OSPAR Convention in 2005 by the Netherlands

			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]
226	Ems Dollard Estuary	lower	0.0010	0.0109	1.5206	0.6899	0.2160	0.0732		0.3075	1.5256	0.1274	3.0218	0.1376	8.8110
		upper	0.1506	0.0196	3.141	2.727	22.142	1.158		0.324	1.535	0.127	3.167	0.141	9.612
		comment													
225	Wadden Coast	lower	0.2852	0.0990	34.596	10.990	55.888	0.4		1.0499	21.072	0.4188	33.446	1.845	261.434
		upper	1.0089	0.1349	34.719	14.280	61.350	20.1		1.1469	21.369	0.4277	42.057	2.082	261.512
		comment													
224	Closed Holland Coast	lower	0.1910	0.0250	6.905	1.128	31.118	1.4		0.5530	6.014	0.4910	8.790	0.628	22.105
		upper	0.2586	0.0385	7.517	1.941	34.831	3.0		0.5546	6.496	0.4908	13.338	0.799	24.617
		comment													
153	Northern Delta Coast	lower	3.1040	1.1550	157.284	89.736	699.466	12.2		4.5303	145.600	4.0646	179.940	7.200	893.526
		upper	3.9740	1.1563	158.921	89.955	701.069	58.0		4.5603	145.719	4.0646	180.366	7.249	895.337
		comment													
223	Southern Delta Coast	lower	0.0000	0.0000	0.000	0.000	0.000	0.000		0.0000	0.000	0.0000	0.000	0.000	0.000
		upper	0.0004	0.0001	0.008	0.006	0.150	0.000		0.0000	0.016	0.0000	0.030	0.008	0.023
		comment													
222	Western Schelde	lower	0.0000	0.0000	0.000	0.000	0.000	0.000		0.0000	0.000	0.0000	0.000	0.000	0.000
		upper	0.0498	0.0042	0.622	0.189	5.345	0.000		0.0000	0.396	0.0000	0.726	0.170	1.258
		comment													
82	North Sea (NL)	lower	3.5812	1.2898	200.306	102.544	786.688	14.1		6.4407	174.211	5.1018	225.198	9.811	1185.876
		upper	5.4422	1.3536	204.927	109.098	824.887	82.2		6.5854	175.530	5.1105	239.684	10.448	1192.358
		comment													

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2005 by the Netherlands

Contracting Parties should use this format to report (i) their total inputs to each OSPAR region and (ii) their total inputs to their marine environment

TOTAL INPUTS			**Quantities --->**												
Discharge region	**Estimate**	**Flow rate (1000 m³/d)**	**Cd [10³ kg]**	**Hg [10³ kg]**	**Cu [10³ kg]**	**Pb [10³ kg]**	**Zn [10³ kg]**	**g-HCH [kg]**	**PCBs [kg]**	**NH4-N [10⁶ kg]**	**NO3-N [10⁶ kg]**	**PO4-P [10⁶ kg]**	**Total N [10⁶ kg]**	**Total P [10⁶ kg]**	**SPM [10⁶ kg]**
INPUTS TO OSPAR REGION North Sea Region															
RIVERINE INPUTS															
	lower		3.4670	1.2770	190.856	99.326	780.675	13.6		5.4537	170.780	4.7263	216.540	8.858	1142.727
Main Rivers	upper		4.9660	1.2770	192.081	99.535	783.377	75.7		5.5265	170.792	4.7292	224.710	9.078	1143.809
	lower		0.1142	0.0128	9.450	3.218	6.013	0.5		0.9870	3.431	0.3755	8.658	0.952	43.149
Tributary Rivers	upper		0.2772	0.0560	9.522	6.632	13.212	6.5		1.0589	3.436	0.3813	8.789	0.952	43.984
	lower		3.6	1.3	200	103	787	14		6	174	5.1	225	10	1186
Total Riverine Inputs	**upper**		5.2	1.3	202	106	797	82		7	174	5.1	233	10	1188
DIRECT DISCHARGES															
	lower														
Sewage Effluents	upper		0.0252	0.0132	0.757	0.507	3.232				0.470		4.336	0.247	2.842
	lower														
Industrial Effluents	upper		0.1737	0.0075	2.566	2.425	25.067				0.833		1.848	0.171	1.723
	lower														
Fish Farming	upper														
	lower														
Total Direct Inputs	**upper**		0.20	0.02	3.3	2.9	28				1.3		6.2	0.42	5
UNMONITORED AREAS															
	lower														
Unmonitored Areas	upper														
	lower		3.8	1.3	204	105	815	14		6	176	5.1	231	10	1190
REGION TOTAL	**upper**		5.4	1.4	205	109	825	82		7	176	5.1	240	10	1192

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 2005 by the Netherlands

			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]
224	Closed Holland Coast	lower upper comment	0.0155	0.0096	0.389	0.311	1.482				0.178		3.774	0.123	2.292
225	Wadden Coast	lower upper comment	0.0002	0.0003	0.017	0.012	0.101				0.009		0.022	0.005	0.021
222	Western Schelde	lower upper comment	0.0078	0.0026	0.302	0.157	1.155				0.241		0.456	0.094	0.388
153	Northern Delta Coast	lower upper comment	0.0014	0.0005	0.042	0.021	0.343				0.026		0.055	0.017	0.119
223	Southern Delta Coast	lower upper comment	0.0004	0.0001	0.008	0.006	0.150				0.016		0.030	0.008	0.023
82	North Sea (NL)	lower upper comment	**0.0252**	**0.0132**	**0.757**	**0.507**	**3.232**				**0.470**		**4.336**	**0.247**	**2.842**

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 2005 by the Netherlands

			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]	mineral oil [t]	EOX [t]	PAK6 [t]
224	Closed Holland Coast	lower																
		upper	0.0031	0.0039	0.147	0.443	2.080				0.304		0.774	0.048	0.220	4.577	0.000	
		comment																
226	Ems Dollard Estuary	lower																
		upper	0.1200	0.0012	1.620	1.900	17.500				0.007		0.145	0.003	0.018	0.170	0.018	
		comment																
225	Wadden Coast	lower																
		upper	0.0000	0.0000	0.033	0.002	0.037				0.274		0.288	0.012	0.005	0.021	0.035	
		comment																
222	Western Schelde	lower																
		upper	0.0420	0.0016	0.320	0.032	4.190				0.155		0.270	0.076	0.870	2.400	0.007	0.010
		comment																
153	Northern Delta Coast	lower																
		upper	0.0086	0.0008	0.446	0.048	1.260				0.093		0.371	0.032	0.610	11.960	0.056	
		comment																
82	North Sea (NL)	lower																
		upper	**0.1737**	**0.0075**	**2.566**	**2.425**	**25.067**				**0.833**		**1.848**	**0.171**	**1.723**	**19.128**	**0.116**	**0.010**
		comment																

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by the Netherlands

			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]
282	Noordzeekanaal	lower	0.1910	0.0250	6.905	1.128	31.118	1.4		0.5530	6.014	0.4910	8.790	0.628	22.105
		upper	0.2400	0.0250	6.981	1.187	31.269	3.0		0.5546	6.014	0.4908	8.790	0.628	22.105
		comment													
224	**Closed Holland Coast**	lower	**0.1910**	**0.0250**	**6.905**	**1.128**	**31.118**	**1.4**		**0.5530**	**6.014**	**0.4910**	**8.790**	**0.628**	**22.105**
		upper	**0.2400**	**0.0250**	**6.981**	**1.187**	**31.269**	**3.0**		**0.5546**	**6.014**	**0.4908**	**8.790**	**0.628**	**22.105**
		comment													
157	IJsselmeer	lower	0.1720	0.0970	26.667	8.462	50.091	0.0		0.3704	19.166	0.1707	27.810	1.030	227.096
		upper	0.7620	0.0970	26.667	8.462	52.642	14.7		0.4116	19.178	0.1738	35.980	1.250	227.096
		comment													
225	**Wadden Coast**	lower	**0.1720**	**0.0970**	**26.667**	**8.462**	**50.091**	**0.0**		**0.3704**	**19.166**	**0.1707**	**27.810**	**1.030**	**227.096**
		upper	**0.7620**	**0.0970**	**26.667**	**8.462**	**52.642**	**14.7**		**0.4116**	**19.178**	**0.1738**	**35.980**	**1.250**	**227.096**
		comment													
154	Haringvlietsluizen	lower	0.5440	0.1270	30.042	11.186	109.026	12.2		0.9803	36.110	0.8860	45.660	1.480	79.847
		upper	0.7690	0.1270	30.042	11.186	109.026	16.5		0.9803	36.110	0.8860	45.660	1.480	80.929
		comment													
155	Maasluis	lower	2.5600	1.0280	127.242	78.550	590.440	0.0		3.5500	109.490	3.1786	134.280	5.720	813.679
		upper	3.1950	1.0280	128.391	78.700	590.440	41.5		3.5800	109.490	3.1786	134.280	5.720	813.679
		comment													
153	**Northern Delta Coast**	lower	**3.1040**	**1.1550**	**157.284**	**89.736**	**699.466**	**12.2**		**4.5303**	**145.600**	**4.0646**	**179.940**	**7.200**	**893.526**
		upper	**3.9640**	**1.1550**	**158.433**	**89.886**	**699.466**	**58.0**		**4.5603**	**145.600**	**4.0646**	**179.940**	**7.200**	**894.608**
		comment													
82	North Sea (NL)	lower	**3.4670**	**1.2770**	**190.856**	**99.326**	**780.675**	**13.6**		**5.4537**	**170.780**	**4.7263**	**216.540**	**8.858**	**1142.727**
		upper	**4.9660**	**1.2770**	**192.081**	**99.535**	**783.377**	**75.7**		**5.5265**	**170.792**	**4.7292**	**224.710**	**9.078**	**1143.809**
		comment													

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by the Netherlands

			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]
259	Katwijk	lower													
		upper													
		comment													
258	Scheveningen	lower													
		upper													
		comment													
257	Vlotwatering	lower													
		upper													
		comment													
224	**Closed Holland Coast**	lower	**0.0000**	**0.0000**	**0.000**	**0.000**	**0.000**	**0.0**		**0.0000**	**0.000**	**0.0000**	**0.000**	**0.000**	**0.000**
		upper	**0.0000**	**0.0000**	**0.000**	**0.000**	**0.000**	**0.0**		**0.0000**	**0.000**	**0.0000**	**0.000**	**0.000**	**0.000**
		comment													
280	Damsterdiep	lower	0.0000	0.0002	0.206	0.135	0.000	0.0		0.0210	0.142	0.0320	0.337	0.042	1.207
		upper	0.0051	0.0017	0.206	0.135	0.943	0.1		0.0232	0.142	0.0320	0.337	0.042	1.283
		comment													
266	Duurswold	lower	0.0010	0.0000	0.117	0.061	0.000			0.0203	0.156	0.0061	0.294	0.006	0.267
		upper	0.0031	0.0011	0.117	0.073	0.572			0.0218	0.156	0.0061	0.294	0.006	0.572
		comment													
267	Eemskanaal	lower	0.0000	0.0102	0.493	0.216	0.216	0.1		0.0851	0.613	0.0388	0.979	0.039	2.349
		upper	0.0080	0.0102	0.493	0.263	0.263	0.8		0.0879	0.613	0.0388	0.979	0.039	2.408
		comment													
268	Nieuwe Statenzijl	lower	0.0000	0.0004	0.622	0.206	0.000	0.0		0.1747	0.521	0.0349	1.199	0.035	3.807
		upper	0.0118	0.0043	0.622	0.275	2.366	0.2		0.1820	0.522	0.0349	1.199	0.035	4.151
		comment													
281	Termunterzijl	lower	0.0000	0.0000	0.083	0.071	0.000			0.0063	0.093	0.0155	0.213	0.016	1.180
		upper	0.0025	0.0010	0.083	0.081	0.499			0.0086	0.094	0.0155	0.213	0.016	1.180
		comment													
226	**Ems Dollard Estuary**	lower	**0.0010**	**0.0109**	**1.521**	**0.690**	**0.216**	**0.1**		**0.3075**	**1.526**	**0.1274**	**3.022**	**0.138**	**8.811**
		upper	**0.0306**	**0.0184**	**1.521**	**0.827**	**4.642**	**1.2**		**0.3236**	**1.528**	**0.1274**	**3.022**	**0.138**	**9.594**
		comment													
261	Den Helder / De Helsdeur	lower	0.0357	0.0010	1.522	0.000	3.058	0.0		0.1182				0.221	3.818
		upper	0.0658	0.0032	1.522	1.097	3.058	1.9		0.1182				0.221	3.818
		comment													
265	Harlingen/Van Harinxmakanaal	lower	0.0220	0.0000	1.141	1.129	0.224	0.4		0.0374	0.177	0.0486	0.445	0.069	4.951
		upper	0.0244	0.0036	1.213	1.354	0.949	0.6		0.0444	0.177	0.0486	0.445	0.069	4.951
		comment													
263	Texel	lower	0.0164	0.0000	0.229	0.000	0.785	0.0		0.0474	0.321	0.0010	0.136	0.036	0.779
		upper	0.0229	0.0010	0.229	0.327	0.785	0.7		0.0476	0.321	0.0010	0.267	0.036	0.831
		comment													
264	Lauwersmeer	lower	0.0000	0.0000	3.810	1.270	0.000			0.2425	1.019	0.1709	3.960	0.341	19.050
		upper	0.0015	0.0254	3.810	1.778	1.778			0.2886	1.019	0.1766	3.960	0.341	19.050
		comment													
287	Roptazijl	lower	0.0014	0.0000	0.170	0.037	0.000	0.0		0.0059	0.022	0.0132	0.058	0.017	0.586
		upper	0.0019	0.0005	0.170	0.048	0.113	0.0		0.0070	0.022	0.0132	0.058	0.017	0.586
		comment													
262	Spuisluis Oostoever	lower	0.0117	0.0006	0.268	0.000	0.358	0.0		0.0056	0.044		0.161	0.037	0.965
		upper	0.0192	0.0011	0.268	0.302	0.366	0.5		0.0062	0.045		0.161	0.037	0.965
		comment													
285	Wieringermeer	lower	0.0262	0.0004	0.706	0.000	1.372	0.0		0.2101	0.297		0.802	0.076	3.670
		upper	0.0424	0.0022	0.706	0.807	1.372	1.6		0.2101	0.297		0.802	0.076	3.670
		comment													
286	Zwarte Haan	lower	0.0000	0.0000	0.083	0.092	0.000	0.0		0.0123	0.026	0.0144	0.073	0.019	0.519
		upper	0.0686	0.0006	0.083	0.092	0.148	0.0		0.0133	0.026	0.0144	0.073	0.019	0.519
		comment													
225	**Wadden Coast**	lower	**0.1132**	**0.0020**	**7.929**	**2.528**	**5.797**	**0.4**		**0.6795**	**1.906**	**0.2481**	**5.636**	**0.815**	**34.338**
		upper	**0.2467**	**0.0376**	**8.002**	**5.805**	**8.569**	**5.4**		**0.7353**	**1.908**	**0.2539**	**5.768**	**0.815**	**34.390**
		comment													
290	Polder Effluents Westerschelde	lower													
		upper													
		comment													
289	Kanaal Gent - Terneuzen	lower													
		upper													
		comment													
288	Spuikanaal Bath	lower													
		upper													
		comment													
222	**Western Schelde**	lower	**0.0000**	**0.0000**	**0.000**	**0.000**	**0.000**			**0.0000**	**0.000**	**0.0000**	**0.000**	**0.000**	**0.000**
		upper	**0.0000**	**0.0000**	**0.000**	**0.000**	**0.000**			**0.0000**	**0.000**	**0.0000**	**0.000**	**0.000**	**0.000**
		comment													
153	**Northern Delta Coast**	lower													
		upper													
		comment													
260	Oosterschelde	lower													
		upper													
		comment													
283	Polder Effluents Oosterschelde	lower													
		upper													
		comment													
223	**Southern Delta Coast**	lower	**0.0000**	**0.0000**	**0.000**	**0.000**	**0.000**			**0.0000**	**0.000**	**0.0000**	**0.000**	**0.000**	**0.000**
		upper	**0.0000**	**0.0000**	**0.000**	**0.000**	**0.000**			**0.0000**	**0.000**	**0.0000**	**0.000**	**0.000**	**0.000**
		comment													
82	North Sea (NL)	lower	**0.1142**	**0.0128**	**9.450**	**3.218**	**6.013**	**0.518**		**0.9870**	**3.431**	**0.3755**	**8.658**	**0.952**	**43.149**
		upper	**0.2772**	**0.0560**	**9.522**	**6.632**	**13.212**	**6.525**		**1.0589**	**3.436**	**0.3813**	**8.789**	**0.952**	**43.984**
		comment													

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2005 by the Netherlands

			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 [µg/kg]	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]
282	Noordzeekanaal	lower													
		upper													
		minimum	0.05	0.002	0.5	0.10	1.00	1		0.01	0.62	0.080	1.53	0.11	4.0
		maximum	0.22	0.025	2.9	0.77	17.00	1		0.37	3.70	0.290	4.91	0.44	11.0
		more than 70% > D.L.													
		n	13	12	13	13	13	13		13	13	13	13	13	12
		info													
		st.Dev.	0.05	0.006	0.6	0.25	5.00	0		0.11	0.86	0.060	1.02	0.08	2.5
157	IJsselmeer	lower													
		upper													
		minimum	0.05	0.003	1.1	0.12	1.00	1		0.01	0.01	0.001	0.78	0.05	4.0
		maximum	0.08	0.022	2.5	1.70	11.00	1		0.13	3.70	0.045	4.73	0.41	58.0
		more than 70% > D.L.													
		n	13	13	13	13	13	13		13	13	13	13	13	13
		info													
		st.Dev.	0.01	0.006	0.4	0.59	3.53	0		0.04	1.21	0.017	1.25	0.10	14.6
154	Haringvlietsluizen	lower													
		upper													
		minimum	0.05	0.003	2.0	0.24	2.20	1		0.01	1.10	0.052	1.65	0.07	2.0
		maximum	0.12	0.034	2.8	1.50	15.00	2		0.16	3.70	0.130	4.64	0.22	9.5
		more than 70% > D.L.													
		n	13	13	13	13	13	13		13	13	13	13	13	12
		info													
		st.Dev.	0.02	0.008	0.2	0.39	3.85	0		0.04	0.91	0.028	1.00	0.04	2.3
155	Maasluis	lower													
		upper													
		minimum	0.05	0.001	0.5	0.10	5.40	1		0.01	1.15	0.042	0.60	0.06	9.0
		maximum	0.16	0.087	8.0	7.50	46.00	1		0.22	3.70	0.110	4.73	0.30	77.0
		more than 70% > D.L.													
		n	25	24	25	25	25	12		25	24	25	25	25	25
		info													
		st.Dev.	0.04	0.021	1.4	1.78	9.36	0		0.05	0.84	0.021	1.05	0.06	14.8

2) PCBs are measured in the sediment-phase, therefore data are in µg/kg.

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 2005 by the Netherlands

			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 [µg/kg]	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]
259	Katwijk	Sewage													
		Industrial													
		Riverine	0.1	0.02	1	2	5	1		0.2	0.05	0.01	0.1	0.02	5
282	Noordzeekanaal	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.01	0.001	0.1	0.1	1	10	(3)	0.01	0.01	0.005	0.1	0.1	5
258	Scheveningen	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.2	0.001	0.1	0.1	1	10	(3)	0.01	0.01	0.005	0.1	0.1	5
257	Vlotwatering	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.2	0.001	0.1	0.1	1	10	(3)	0.01	0.01	0.005	0.1	0.1	5
224	Closed Holland Coast	Sewage													
		Industrial													
		Riverine													
280	Damsterdiep	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.054	0.02	0.1	0.8	10	1	(3)	0.1	0.03	0.005	0.1	0.1	8
266	Duurswold	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.054	0.02	0.1	0.8	10	50	(3)	0.1	0.01	0.05	0.1	0.1	8
267	Eemskanaal	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.054	0.001	0.1	0.8	10	1	(3)	0.1	0.01	0.05	0.1	0.1	8
268	Nieuwe Statenzijl	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.054	0.02	0.1	0.8	10	50	(3)	0.1	0.03	0.005	0.1	0.1	8
281	Termunterzijl	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.054	0.02	0.1	0.8	10	1	(3)	0.1	0.03	0.005	0.1	0.1	5
226	Ems Dollard Estuary	Sewage													
		Industrial													
		Riverine													
261	Den Helder / De Helsdeur	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.2	0.02	0.1	5	1	10	5	0.01	0.01	0.005	0.1	0.1	5
265	Harlingen/Van Harinxmakanaal	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.05	0.02	5	5	5	1	0.5	0.02	0.02	0.005	0.1	0.1	5
284	IJsselmeer	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.05	0.001	0.1	0.1	0.05	10	(3)	0.01	0.01	0.005	0.1	0.1	5
263	Texel	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.2	0.01	0.1	5	1	10	10	0.03	0.01	0.005	0.1	0.1	8
264	Lauwersmeer	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.054	0.02	0.1	0.8	10	50	0.5	0.1	0.03	0.05	0.1	0.1	8
287	Roptazijl	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.05	0.02	0.1	1	5	1	(3)	0.1	0.02	0.005	0.1	0.1	5
262	Spuisluis Oostoever	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.2	0.01	0.1	5	2	10	50	0.03	0.01	0.005	0.1	0.1	5
285	Wieringermeer	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.2	0.01	0.1	5	1	10	(3)	0.01	0.01	0.005	0.1	0.1	5
286	Zwarte Haan	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.05	0.02	0.1	0.1	5	1	0.5	0.1	0.02	0.005	0.1	0.1	5
225	Wadden Coast	Sewage													
		Industrial													
		Riverine													
290	Polder Effluents Westerschelde	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.01	0.001	0.1	0.1	1	1	(3)	0.01	0.01	0.005	0.1	0.1	5
289	Kanaal Gent - Terneuzen	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.01	0.001	0.1	0.1	1	1	(3)	0.01	0.01	0.005	0.1	0.1	5
288	Spuikanaal Bath	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.01	0.001	0.1	0.1	1	1	(3)	0.01	0.01	0.005	0.1	0.1	5
222	Western Schelde	Sewage													
		Industrial													
		Riverine													
154	Haringvlietsluizen	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.05	0.001	0.1	0.1	0.1	1	(3)	0.01	0.01	0.005	0.1	0.1	5
155	Maasluis	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.01	0.001	0.1	0.1	0.05	1	(3)	0.01	0.01	0.005	0.1	0.1	5
153	Northern Delta Coast	Sewage													
		Industrial													
		Riverine													
260	Oosterschelde	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.01	0.001	0.1	0.1	1	1	(3)	0.01	0.01	0.005	0.1	0.1	5
283	Polder Effluents Oosterschelde	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.01	0.001	0.1	0.1	1	1	(3)	0.01	0.01	0.005	0.1	0.1	5
223	Southern Delta Coast	Sewage	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Industrial	1	0.1	1	30	1	50	(3)	0.1	0.01	0.01	0.1	0.2	10
		Riverine	0.01	0.001	0.1	0.1	1	1	(3)	0.01	0.01	0.005	0.1	0.1	5
82	North Sea (NL)	Sewage													
		Industrial													
		Riverine													

(3) PCBs are measured in the sediment-phase. Detection limits are: PCB138 = 2 µg/kg, PCB153 = 3 µg/kg, other PCBs = 1 µg/kg

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 2005 by the Netherlands

			Flow Rate [1000m³/d]	LTA [1000m³/d]	Minimum FR [1000m³/d]	Maximum FR [1000m³/d]	LTA info (years)	Number of sites	Mean or Median
259		Katwijk							
282		Noordzeekanaal	8301	8200					
258		Scheveningen							
257		Vlotwatering							
224	Closed Holland Coast		*8301*						
280		Damsterdiep	258	201	99	341	1985-2005	1	195
266		Duurswold	157	249	132	392	1985-2005	1	244
267		Eemskanaal	440	747	433	1332	1985-2005	1	760
268		Nieuwe Statenzijl	648	700	356	929	1985-2005	1	648
281		Termunterzijl	137	214	129	326	1985-2005	2	199
226	Ems Dollard Estuary		*1639.695*						
261		Den Helder / De Helsdeur	601	744	430	1064	1985-2005	1	685
265		Harlingen/Van Harinxmakanaal	497	471	353	605	1985-2005	1	471
157		IJsselmeer	40274	43200					
263		Texel	179	168	93	239	1985-2005	5	171
264		Lauwersmeer	3480	3781	2137	5625	1985-2005	1	3805
287		Roptazijl	62	65	41	99	1985-2005	1	66
262		Spuisluis Oostoever	165	387	126	923	1985-2005	1	374
285		Wieringermeer	442	404	292	466	1998-2005	1	424
286		Zwarte Haan	81	89	41	126	1985-2005	1	90
225	Wadden Coast		*45782*						
290		Polder Effluents Westerschelde							
289		Kanaal Gent - Terneuzen							
288		Spuikanaal Bath							
222	Western Schelde		*0*						
154		Haringvlietsluizen	33973	67800					
155		Maasluis	113699	115300					
153	Northern Delta Coast		*147672*	*183100*					
260		Oosterschelde							
283		Polder Effluents Oosterschelde							
223	Southern Delta Coast		*0*						
82	North Sea (NL)		203394						

7. Norway

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 by Norway

Annual report on riverine inputs and direct discharges by NORWAY to Convention Waters during the year 2005

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 and Figure 1 give general overview of the river systems and location of sampling sites and drainage basins in the Norwegian RID-programme.

T*able 1. 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 and discharge area[1]	Catchment area (km^2)	LTA, 1000 m^3/day	Nature of the receiving waters	Map reference number
Skagerrak:				
(1) Glomma	41918	61350	Coastal waters	M711:1913-1
(2) Drammenselva	17034	28850	"	1914-4
(3) Numedalslågen	5577	10200	"	1813-3
(4) Skienselva	10772	23535	"	1713-3
(5) Otra	3738	12870	"	1511-3
North Sea:				
(6) Orreelva	105	335	Coastal waters	M711:1212-3
(7) Suldalslågen	1457	7420	"	1313-4
The Norwegian Sea:				
(8) Orkla	3053	5710	Coastal waters	M711:1521-2
(9) Vefsna	4122	15655	"	1926-3
The Barents Sea:				
(10) Alta	7373	7495	Coastal waters	M711:1834-1

[1] i.e. name of length of coastline

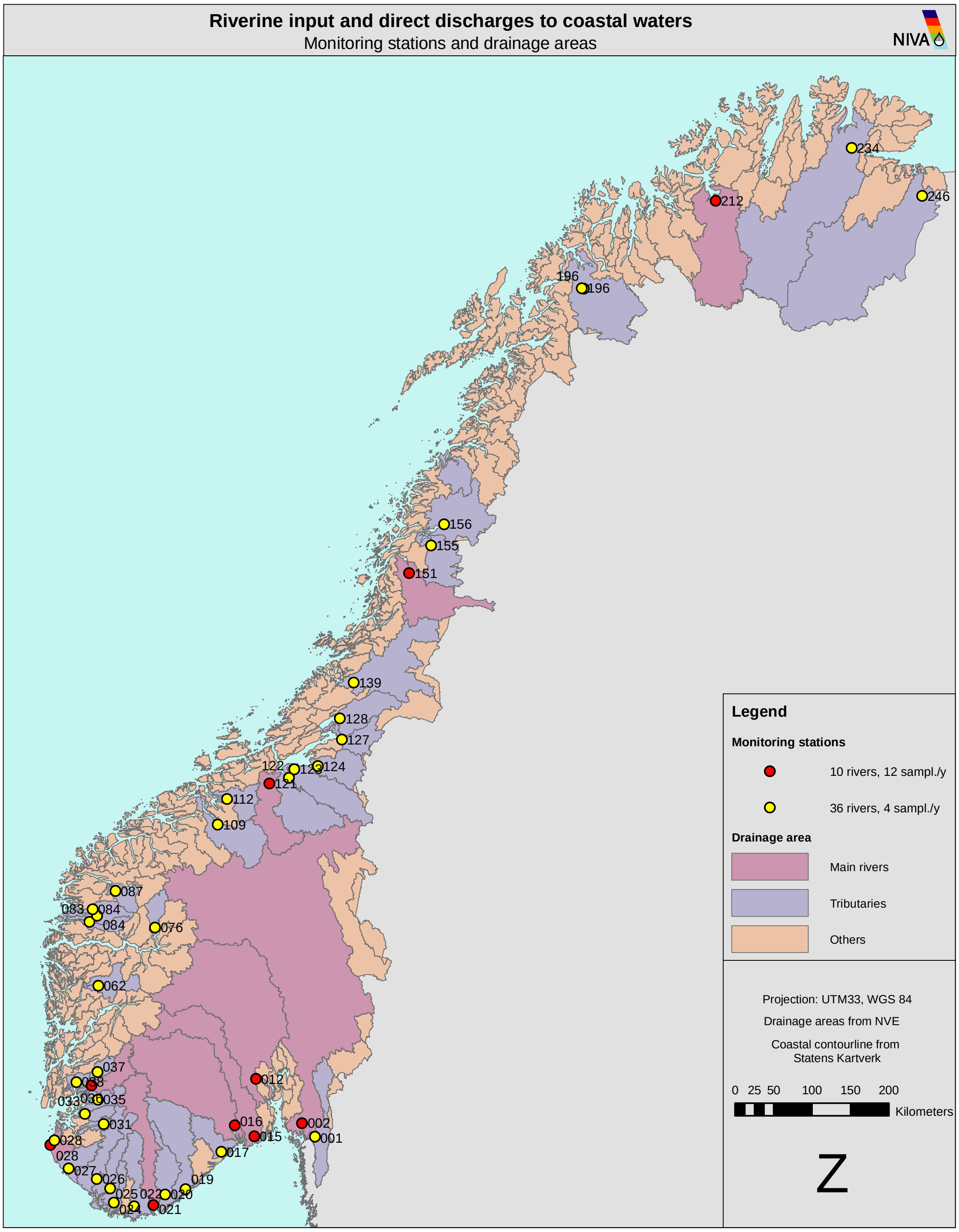


Figure 1. Map of the sampling sites and drainage basins included in the Norwegian RID-programme

B. Total riverine inputs and direct discharges (Tables 4a and 4b) for the year 2005

Note: Table 4b shows total direct discharges and riverine inputs to the Maritime Area by region, totals for each OSPAR region and for total inputs.

B.1 General comments on the total riverine inputs and direct discharges (e.g. changes from 2004, trends, percentage of particle bound determinant, results that need to be highlighted):

The Norwegian results for 2005 are given based on measurements for 10 main rivers, 36 smaller rivers and calculated for 109 other small rivers. The Norwegian coastline is divided into four areas, Skagerrak, North Sea, Norwegian Sea and Barents Sea. The numbers of main rivers are the same as earlier years. The numbers of monitored smaller rivers was in 2004 from 126 to 36 rivers. The 36 smaller rivers have been sampled four times each during the year 2005, instead of 126 smaller rivers sampled once a year previously. The 36 smaller rivers in this report are those minor rivers with the largest catchments and most important inputs of the previous 126. All of these 36 rivers have a separate outlet to the ocean from the ten larger rivers. The active monitoring programme covers drainage from approximately 72 % of the main land areas.

For discharges entering directly into marine recipients, i.e. sewage and industrial effluents, as well as discharges from aquaculture plants, estimates are based on data from effluent control programmes.

Diffuse losses of total phosphorus, total nitrogen, phosphates, nitrates and ammonia from coastal zones downstream RID monitoring points are estimated by use of area specific runoff coefficients and added to the total riverine input.

As from 2004, Norwegian Authorities have again contracted the Norwegian Institute for Water Research (NIVA) to perform the Norwegian RID programme. NIVA also performed the RID programme 1990-1998. Between 1999-2003 Aquateam performed the RID programme and used another laboratory. This means that 1990-1998 and 2004 onwards the analyses have been performed by NIVA and the period 1999-2003 the analyses were performed by AnalyCen laboratory.

The Skagerrak region is the part of the Norwegian coastline with the highest population, the most intensive agriculture and the largest rivers. The coastline is classified as an OSPAR problem area with regard to eutrophication. There are no aquaculture plants on the Skagerrak coast.

According to the results of the 2005 monitoring, total annual nutrient loads to coastal waters from land-based sources and fish farming in Norway are estimated to 9500 tonnes of phosphorus and 126 000 tonnes of nitrogen. Compared to 2004 this is an increase of 10% for phosphorous and approximately the same total input for nitrogen compared to 2004. The discharges from fish farming contribute to about 73% of the total phosphorous loading and 31% of the total nitrogen inputs. Riverine inputs of metals range from approximately 0.4 tonnes for mercury to 629 tonnes for zinc. Total input of lindane is estimated to about 10 kg.

Inputs of cadmium were estimated at about 2.7 tonnes, mercury 0.4 tonnes, arsenic 27 tonnes and lead about 37 tonnes. Copper and zinc comprised the largest inputs of heavy metals, which in 2005 amounted to 461 tonnes and 629 tonnes respectively. In general, riverine inputs of most heavy metal were lower in 2005 compared to 2004, but copper shows a significant increase. For mercury, cadmium, zinc, lead and arsenic there is a significant reduction in inputs.

With varying water regimes (e.g., between years, regions, and rivers and seasons), it is important to remember that the sampling is done once a month in the main rivers and four times a year in tributaries at fixed dates. This means that little or no account is taken of the water flow variations. This implies that in some years and for some rivers we could have hit or missed concentration peaks.

Overall for Norway, there was a general decline in the riverine loads for most substances between 2005 and 2004. This is mostly explained by the regional and intraregional differences in water discharges/regimes between the two years and changed seasonal distribution. This is explained in more detail below.

In fact, for Norway as a total, the water discharge was 4% higher in 2005 compared to 2004. However, there were large regional differences. For example, in the North Sea region (SW Norway) and the Barents Sea (N Norway), the water discharge was 18% and 20% respectively higher in 2005, compared to 2004. On the contrary, in both Skagerrak and the Norwegian Sea region the water discharge was 4% lower compared to 2004. These regional differences are especially attributed to high autumn precipitation in the south and west (cf. section 3.2, above), the runoff in the rivers of these regions were higher than usual, especially in November. Both river Glomma, Drammen river, Numedalslågen, Skien river, and Otra had significantly higher discharges in this month than normal. This also resulted in several extreme flood episodes during the *autumn, including several 100 year floods in the western part of the country. Whereas the southern rivers had lower water discharge than normal during the summer, the two northern rivers, Vefsna and Alta, as well as Orkla, had significantly higher water discharges in June. This was mainly caused by snowmelt: Whereas the snowmelt proceeded relatively slowly in most of Southern Norway, the spring floods were severe in the North, with 10 year floods in the far north (Finnmark) and 30-year floods in Troms county. The upper parts of river Vefsna had a 10-year flood due to snowmelt in June.*

These rather complex differences in the water regime in 2004 and 2005, in combination with the 'mixture' with differences in concentration levels between the 155 rivers and its internal seasonal distribution, resulted in generally lower total riverine loads in 2005 compared to 2004.

However there were some substances that also show increased riverine loads. More explicitly, the increased Zn and Cu loads for some of the main rivers (10) are explained by increased concentrations, some during the flooding periods. For example in Glomma, the above-mentioned November rain-period increased the Cu and Zn concentrations only slightly but the load significantly also in the annual total. The same pattern can also to a large extent be seen in the SPM concentrations. Total-P also showed a general increase compared to 2004. This is very much related to increased particle transport due to the water regime in 2005 in general and the above mentioned flood episodes in 2005 in special.

It should also be pointed out that modelled water discharge was used for the tributary rivers in both 2004 and 2005. The model was improved in 2005, which makes the results not fully comparable between 2004 and 2005 since no re-calculation of the 2004 load-data was performed.

Arsenic, chromium and nickel are sampled with the same frequency as the mandatory determinands mentioned in § 2.1 of the RID principles.

In 2004 and 2005, water sampling for the RID Programme was carried out through a network of fieldworkers and professional staff administered by the Norwegian Water Resources and Energy Directorate (NVE). The sampling was done according to international scientific procedures. Only staff and personnel that had local knowledge of the rivers and watersheds were involved in the project activities. There are several reasons for this. Local staff will easily recognise changes and abnormal variations in the rivers, and they will also be able to take action if any unforeseen episodes happen.

Sampling is performed as grab-samples at a representative cross-section of the river (normally from a bridge). Each site has been carefully selected (checked for back-waters, salt-water intrusion etc).

After sampling, the samples were immediately transferred to thermos bags (stored dark and cold) and shipped to NIVA for analysis. Chemical analyses were normally performed immediately with exception of samples that are preserved due to practical laboratory reasons. The minimum time span between sampling and laboratory analyses is zero days (rivers located near Oslo) and maximum 5-6 days for rivers in the vicinity.

C. Direct discharges for the year: 2005

Sewage Effluents (Table 5a)

C.1 Description of the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (cf. section 7 of the RID Principles), including for those under voluntary reporting:

Statistics Norway (SSB) and the Norwegian Pollution Control Authority (SFT) have jointly initiated annual registration of data of nutrients from all wastewater treatment plants in the country with a capacity of more than 50 person equivalents (p.e.). The data are updated each year by the County Environmental Agencies. The computer programme KOSTRA has been used for the reporting of effluent data from the municipalities directly to SSB. Discharge figures from KOSTRA are used in the transport model "TEOTIL" to calculate the total discharges of total phosphorus, ammonia, nitrates, orthophosphates and total nitrogen from population (wastewater treatment plants and scattered dwellings not connected to wastewater treatment plants), industry, agriculture and aquaculture sources to Norwegian coastal waters. The Norwegian Institute for Water Research (NIVA) performs this modelling. The figures take account of retention in lakes.

Based on our latest update, from 2002, the major part (53%) of the treatment plants have only primary treatment, 12% chemical treatment, 6% biological treatment, 14 % chemical and biological treatment and 15% unconventional, unknown or other treatment. The major part of treatment plants with only primary treatment are serving smaller settlements, while the majority of advanced treatment plants (plants with chemical and/or biological treatment) are found near the larger cities, and therefore treat the main part of the *produced wastewater. Of the total hydraulic capacity of 5.74 million p.e., chemical plants account for 37 %, primary treatment for 24%, chemical/biological for 27%, direct discharges for 8%, biological for 2% and others for 2%. In the North Sea area of Norway, most of the wastewater is treated in chemical or combined biological-chemical treatment plants, whereas the most common treatment methods along the coast from Hordaland county on the west coast of Norway and northwards are primary treatment or no treatment.*

C.2 Description of the determinands, other than those specified in paragraph 2.1 of the RID 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):

A number of heavy metals and POPs are included in a new regulation for monitoring inputs from sewage treatment plants. This include the heavy metals chromium, arsenic and nickel and the organic substances brominated flame retardants (BFRs), PAHs, PCB7, DEHP and nonylphenol. The report on these discharges has not yet been finalised. Sewage treatment plants >20 000 pe must monitor heavy metals and plants > 50 000 pe must in addition monitor the organic substances.

C.3 General comments on the discharges of sewage effluents (e.g. compared to previous years, and/or extent to which industrial effluents are discharged through sewerage systems):

From 2004 to 2005 there is an increase in discharges of most heavy metals from sewage treatment plants. The discharges of nutrients 2004-2005 are approximately on the same discharge level.

A large proportion of minor industries discharge their waste water through sewerage systems. Large industrial plants usually have their own treatment plant and own outlet to the sea (direct discharge).

The increase in discharge of metals through sewerage systems from 2004-2005 is because of the new regulation mentioned in C2. Therefore the increase in discharges is because of increased reporting of heavy metals.

Industrial Effluents (Table 5b)

C.4 Description of 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 7 of the RID Principles), including for those under voluntary reporting:

Sampling frequency for industrial wastewater varies from weekly composite samples to random grab samples. Sampling is though undertaken at least twice a year. Industrial wastewater discharged upstream the RID monitoring points are included in the riverine inputs. Industrial effluents downstream RID monitoring points are categorised as direct discharges. NIVA has applied the TEOTIL model for the estimation of total nitrogen and total phosphorous load based on reporting on discharges from relevant industrial plants. The data on discharges from individual industrial plants were provided from SFT's data base INKOSYS (SFT 2005), based on procedures for yearly reporting from industry.

The reporting of nutrients from industry has shown variable levels over the last few years. Compared to 2004 there is a huge increase in industrial discharge of nitrogen-compounds. The increase in discharges of nutrients from industry in this period does not necessarily reflect increased discharges, but more likely improved reporting.

C.5 Other relevant information (e.g. proportion of substance discharged as insoluble material):

No available information

C.6 Other discharges directly to Convention Waters - through e.g. urban run-off and storm water overflows - that are not covered by the data in Tables 5a and 5b:

Nutrient discharges (Tot-N, NH_4, Tot-P and PO_4) from fish farming effluents in 2005 are based on reporting from each fish farmer to the Norwegian Fisheries Directorate. Equations and factors described in OSPAR's HARP Guidelines (Harmonised Quantifications and Reporting Procedures for Nutrients) (SFT, 2000b) are used. The inputs of nutrients from fish-farming have increased from 2004 to 2005 because of increased production. Discharges from fish farming are included in the tables from each region and not as a separate table.

From 2000 on, the discharges of nutrients from fish farming have been included in the grand total values. These inputs were not included in the previous input calculations from 1990-1999, but they need to be taken into account when the results from different years are to be compared.

C.7 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 other determinants included.

C.8 General comments on industrial effluents (e.g. compared to previous years):

Industrial effluents represent a minor proportion of the total discharges from Norwegian land-based sources, both for nutrients and metals. A number of minor industrial plants have discharges to municipal sewage treatment systems and discharges from such industry are included in the figures from sewage effluents

For nutrients, industrial effluents represent approximately 2% of the total nutrient discharges into water bodies in Norway. For heavy metals the industrial discharges represent between 2-5 % of the total discharges.

The reporting of nutrients from industry has increased the last few years. For 2005 the reported discharges of nutrients from industry were higher than in previous years. This does not necessarily reflect a real increase in discharges of nutrients from industry, but more likely improved reporting.

Total direct discharges (Table 5c)

C.9 General comments on total direct discharges (e.g. compared to previous years):

Total direct discharges of nutrient inputs into Norwegian coastal waters are heavily influenced by the production of farmed fish.

Both for nitrogen and phosphorous fish farming contributes to the largest proportion of direct discharges. This is particularly the case for tot-P, where the contribution from fish farming is considerable. Nearly all fish farms in Norway are located on the west and northern coast. There are no fish farms on the Skagerrak coast.

Direct discharges of nutrients form sewerage systems decrease slightly each year.

Direct nutrient discharges from industry are in general low.

D. Riverine inputs for the year: 2005

Main Rivers (Tables 6a and 7a)

D.1 Description of 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 6 of the RID Principles), including for those under voluntary reporting:

Site selection

The sampling sites are located in regions of unidirectional freshwater flow. The sites chosen, have been areas where the water is well mixed (such as, at or immediately downstream a weir, in waterfalls, rapids or in channels in connection with hydroelectric power stations) and where uniform water quality is expected. When possible, samples are taken from the middle of bridges across the rivers. The water is well mixed both horizontally and vertically. Only one sampling site and one sampling depth have been used in each of the rivers.

The sampling sites were located as close to the freshwater limit as possible, but are not influenced by seawater.

Several of the most significant discharges from industrial plants and municipal wastewater treatment plants are located downstream of the RID sampling sites.

Co-ordinates for the river sampling stations are attached in an Excel-file.

Sampling Strategy and Frequency

Most monitoring effort has been directed towards the rivers with the highest input loads (Glomma and Drammen rivers), and the other rivers draining into the Skagerrak.

In the main rivers, with some exceptions, 12 random water samples or more have been taken at regular monthly intervals during the sampling period from January to December 2005. Two of the main rivers

(Glomma and Drammenselva) were sampled weekly or every fortnightly in the period with the highest anticipated flow (May – June/July) (See table 2).

Daily measurements of water flow were used in each of the 10 main rivers.

Table 2. Sampling frequency in the 10 Norwegian main rivers in 2005.

X: number of samples

River/Location	*J*	*F*	*M*	*A*	*M*	*J*	*J*	*A*	*S*	*O*	*N*	*D*
Glomma at Sarpsfoss	xx	x	x	x	xxxx	xxxx	x	x	x	x	x	[1)]
Drammen river upstream the town bridge	x	x	x	x	xxxx	xxxx	x	x	x	x	x	[1)]
Numedalslågen at Bommestad	x	x	x	x	x	x	x	x	x	x	x	x
Skien river at Klosterfoss	x	x	x	x	x	x	x	x	x	x	x	x
Otra at Skråstad	x	x	x	x	x	x	x	x	x	x	x	x
Orre near the 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 at Kvalfors [3)]		x	x	x			x		x			
Suldalslågen near the outlet	x	x	x	x	x	x	x	x	x	x	x	x
Alta river just upstream Alta	x	x	x	x	x	x	x	x	x	x	x	x

Chemical parameters – detection limits and analytical methods

In 2005, the following parameters were monitored:

Six fractions of nutrients (total phosphorus, orthophosphates, total nitrogen, ammonia, nitrate + nitrite and silicate)

Eight heavy metals (copper, zinc, cadmium, lead, mercury, arsenic, chromium, nickel)

One pesticide (lindane) and two general parameters (suspended particulate matter (S.P.M.) and total organic carbon (TOC).

Information on methodology and obtainable limits of detection for all parameters included in the sampling programme, are shown in the table below.

Table 3. *Obtainable limits of detection for all parameters included in the sampling programme*

Parameter	*Detection limit*	*Analytical Methods (NS: Norwegian Standard)*
Conductivity (mS/m)	-	NS-ISO 7888
Suspended particulate matter (S.P.M.) (mg/L)	0.6	NS 4733 modified
Total Organic Carbon (TOC) (mg C/L)	0.1-0.4	EPA number 415.1 and 9060A STD.
Total phosphorus (µg P/L)	1.0	NS 4725 – Peroxidisulphate oxidation method
Orthophosphate (PO4-P) (µg P/L)	1.0	NS 4724 – Automated molybdate method
Total nitrogen (µg N/L)	10	NS 4743 – Peroxidisulphate oxidation method
Nitrate (µgN/L)	4	NS-EN ISO 10304-1
Ammonia (NH4) (µg N/L)	2	NS-EN ISO 14911
Silicate (SiO2) (mg/L)	0.09	ISI/DIS 11885 + NIVA's accredited method E9-5
Lead (Pb) (µg Pb/L)	0.02	NIVA's accredited method E8-3
Cadmium (Cd) (µg Cd/L)	0.01	NIVA's accredited method E8-3
Copper (Cu) (µg Cu/L)	0.05-0.1	NIVA's accredited method E8-3
Zinc (Zn) (µg Zn/L)	0.1-0.5	NIVA's accredited method E8-3
Arsenic (As) (µg As/L)	0.05	NIVA's accredited method E8-3
Mercury (Hg) (ng Hg/L)	2	NS-EN 1483 and NIVA's accredited method E4-3

Parameter	***Detection limit***	***Analytical Methods (NS: Norwegian Standard)***
Lindane (ng/L)	*0.1*	*NIVA's accredited method H-3 (PCB)*

We have p.t. no information about detection limits used for the direct discharges reported by industry and waste water treatment plants.

For the period 1931-60 the annual specific runoff from the total area of Norway is estimated at 42.9 l/s km². Expressed in volumetric units this amounts to 438 km³ water which, distributed over the whole country, equals a mean runoff of 1350 mm. For the period 1961-1990 it is 1140 mm. Mean annual runoff in Norway and from the sub-regions to the main surrounding seas for the period 1931-60 is shown in Table 5. The mean run-off in Norway in 2002 and 2003 were 1013 mm and 1044 mm respectively. For the main rivers mean annual runoff for the last LTA-period (1961-90) have been estimated. As for precipitation, normals for Norway based on the LTA-period 1961-90 were published in 1993 (DNMI (met.no), 1993).

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

In 2003 there was a study on particle bound metals in the two main rivers (Glomma and Drammen river). The results show that there are great variances in particle bound metals between rivers and also between metals in the same river.

There is an ongoing study on particles in the river Numedalslågen. Preliminary results with basis in daily depth-integrated samples indicate that particle transport estimates with monthly grab-samples might be seriously underestimated especially in situations when water quality sampling misses water flow peaks. See Norwegian document for INPUT 2007.

Another result from the same river showed that alternative methods for load estimations (ratio-methods and linear interpolation method) may differ significantly compared to the RID-method in single years.

D.3 Description of 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):

Chromium, arsenic and nickel. These metals are monitored with the same frequency as the mandatory determinants and reported in the RID tables.

D.4 General comments on the inputs from main rivers (e.g. significant changes in inputs, concentrations and flows compared to previous years):

Compared to 2004, the inputs of heavy metals from main rivers in 2005 are in the same order of magnitude. Copper and zinc have increased, for the others only minor changes. Compared to 2004: For nutrients there is a slight increase of nitrate and a slight decrease for ammonia. Phosphorous show a slight increase.

Tributary Rivers (Tables 6b and 7b)

D.5 Description of 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 6 of the Principles)

In 2005, 36 minor rivers were samples four times each. This is a change from previous sampling strategy when 126-145 minor rivers were sampled once a year. The sampling has been sought to cover periods of high flows. More precisely, the year was divided into 4 seasons based on the typical meteorological condition and historical water flow records. From each of this strata one grab sample was collected.

In addition to the measurements in 36 tributary rivers, the inputs from 109 other tributary rivers were estimated based on previous years' concentrations and modelled 2004 water flow.

All of the minor rivers have separate outlet to the sea (not part of a main river).

Modelled daily water flow was used in the estimation of the loads in the tributary rivers.

D.6 Any other relevant information (e.g. proportion of substance transported by the river in particulate form):

No detailed information. See D 2.

D.7 Description of 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):

Chromium, arsenic and nickel.

D.8 Any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in Tables 6b and 7b:

No additional data

D.9 General comments on the inputs from tributary rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

There is an decrease for all determinants except SPM.

Total riverine inputs (Table 6c)

D.10 General comments on the total riverine inputs (e.g. significant change in inputs, concentrations and flows compared to previous years):

See D 4

E. Unmonitored areas

E.1 Description of the methods of quantification used for the different determinands or groups of determinands:

Norway has calculated the inputs of nutrients from unmonitored areas (downstream RID monitoring points and between catchments), based on the TEOTIL export-coefficient model

No estimation of metal loads is performed.

F. Limits of detection (Table 8)

F.1 Information concerning limits of detection is at Table 3 in this document.

G. Additional comments

G.1 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

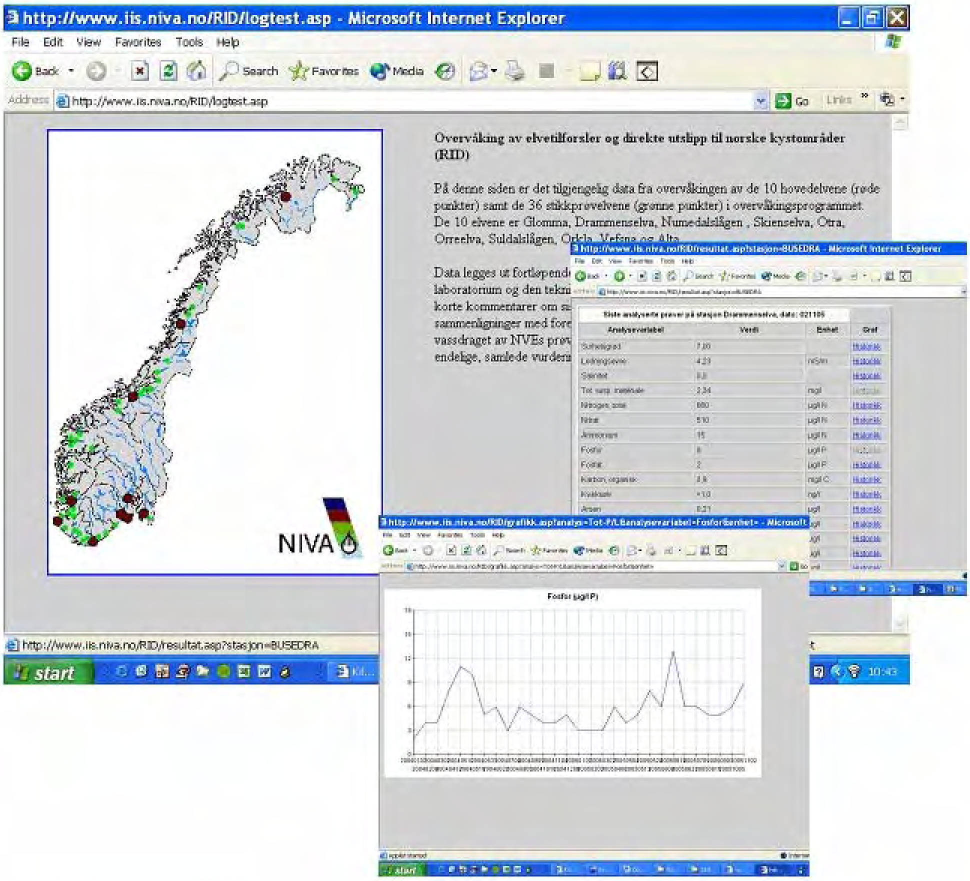
The numbers of monitored tributaries have been reduced from 126 to 36 rivers. The 36 tributaries have been monitored four times during the year 2005, instead of once a year previously.

In 2005, modelled water discharge data for the tributary rivers has been used compared to precipitation-corrected LTA-values.

No estimation of metal loads from unmonitored areas.

Quality assurance

Data from the laboratory analyses are transferred to a database and quality checked against historical data by researchers with long experience in assessing water quality data. Whenever any anomalies were found, the samples were re-analysed. Following this quality assurance, the data were transferred to NIVA's web pages, where an on-line system was established early in 2004 (see figure below). The system allows the authorised users (such as the Norwegian Pollution Control Authority) to view values and graphs of each of the monitored rivers. Data are uploaded continuously after each sampling. Parallel to this user interface, all data are stored in the QA-controlled historical database (1990-).



Calculation of loads

In the main rivers in Norway (10), continuous water discharge measurements are available (data obtained from the Norwegian Water Resources and Energy Directorate (NVE)). These gauging stations are for most rivers located in immediate connection to the sites for water quality sampling. For easier database handling and quality assurance, aggregated daily means are used in RID.

For the tributary rivers (36) which are monitored quarterly for water quality, as well as the remaining 109 rivers from the former RID studies, daily water discharge was simulated with a spatially distributed version of the HBV-model (Beldring et al. 2003). The use of this model was introduced in 2004. Earlier, the water discharge in the 145 rivers was calculated based on the 30 year average, and adjusted with precipitation data for the actual year. The introduction of more sophisticated hydrological modelling is done to improve the water discharge estimates in the tributary rivers.

The following formula given by the Paris Commission was used for calculating loads for the main (10) and tributary rivers (36):

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Ci = measured concentration in sample i
Qi = corresponding flow for sample i
Qr = mean flow rate for each sampling period N = number of samples taken in the sampling period

Essentially the formula expresses the annual load (L) as the product of a flow-weighted estimate of annual mean concentration and annual flow (Qr).

For the remaining 109 rivers (rivers monitored once a year in the period 1990-2003, but not in 2004-2005), the calculation of loads was done as follows:

- *For nutrients, S.P.M, Silica and TOC, the modelled average water discharge in 2005 was multiplied with average concentration for the period 1990-2003.*
- *For metals, the modelled average water discharge in 2005 was multiplied with average concentration for the period 2000-2003 (earlier data were not used due to high detection limits).*

For the remaining area (includes those 92 remaining rivers that drain to the sea, but not included in either this or former RID studies; as well as areas downstream of the sampling points) the nutrient loads were calculated by means of the TEOTIL model. For metals, all discharges of metals from industry in these areas were considered to be direct discharges to the sea.

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2005 by Norway

TOTAL INPUTS																				
Discharge region	Estimate	Flow rate (km^3/d)	Cd [tonnes]	Hg [tonnes]	Cu [tonnes]	Zn [tonnes]	Pb [tonnes]	As [tonnes]	Cr [tonnes]	Ni [tonnes]	NH_4-N [tonnes]	NO_3-N [tonnes]	PO_4-P [tonnes]	TOT-N [tonnes]	TOT-P [tonnes]	Si-O_2 [tonnes]	SPM [tonnes]	TOC [tonnes]	PCB [kg]	g-HCH [kg]
INPUTS TO OSPAR REGION: TOTAL NORWAY																				
RIVERINE INPUTS																				
Main Rivers	lower avg.		0,86	0,04	102,9	296,0	15,1	10,0	13,6	38,7	797	14 292	273	24 143	709	176 203	348 067	200 098	0	7,5
	upper avg.	180 942	0,92	0,08	102,9	296,0	15,1	10,1	16,0	38,7	844	14 292	294	24 143	710	176 203	348 067	200 098	71	12,7
Tributary Rivers (36)	lower avg.		0,70	0,03	78,8	219,4	12,3	8,7	17,6	86,1	549	10 599	205	22 264	572	201 476	361 679	199 069		
	upper avg.	259 908	0,94	0,10	78,8	219,4	12,3	9,7	22,5	86,1	767	10 603	262	22 264	573	201 476	361 711	199 069		
Tributary Rivers (109)	lower avg.		0,78	0,28	33,6	93,8	8,1	7,1	12,3	26,0	695	7 977	121	14 165	459	95 401	105 401	106 632		
	upper avg.	189 703	0,78	0,28	33,6	93,8	8,1	7,1	12,3	26,0	695	7 977	121	14 165	459	95 401	105 401	106 632		
Total Riverine Inputs	**lower avg.**		**2,35**	**0,34**	**215,3**	**609**	**35,401**	**25,7**	**43,6**	**150,8**	**2 041**	**32 868**	**599**	**60 572**	**1 740**	**473 081**	**815 146**	**505 798**		
	upper avg.	**630 553**	**2,65**	**0,46**	**215,3**	**609**	**35,407**	**26,8**	**50,9**	**150,9**	**2 307**	**32 873**	**677**	**60 572**	**1 741**	**473 081**	**815 179**	**505 798**		
DIRECT DISCHARGES																				
Sewage Effluents	lower avg.		0,04	0,03	8,53	13,33	0,67	0,21	1,02	3,60	6783	452	424	9044	707		7414			
	upper avg.		0,04	0,03	8,53	13,33	0,67	0,21	1,02	3,60	6783	452	424	9044	707		7414			
Industrial Effluents	lower avg.		0,06	0,01	9,66	6,48	1,43	0,44	2,40	8,34	1276	85	111	1701	186	0,02	468518			
	upper avg.		0,06	0,01	9,66	6,48	1,43	0,44	2,40	8,34	1276	85	111	1701	186	0,02	468518			
Fish Farming	lower avg.				227,77						22828	3424	4175	28535	6050					
	upper avg.				227,77						22828	3424	4175	28535	6050					
Total Direct Inputs	**lower avg.**		**0,09**	**0,03**	**246,0**	**20**	**2,10**	**0,6**	**3,4**	**11,9**	**30 887**	**3 961**	**4 710**	**39 280**	**6 943**	**0,02**	**475 932**			
	upper avg.		**0,09**	**0,03**	**246,0**	**20**	**2,10**	**0,6**	**3,4**	**11,9**	**30 887**	**3 961**	**4 710**	**39 280**	**6 943**	**0,02**	**475 932**			
UNMONITORED AREAS																				
Unmonitored Areas	lower avg.										1 757	17 175	228	26 181	813					
	upper avg.	239 043									1 757	17 175	228	26 181	813					
REGION TOTAL	**lower avg.**		**2,44**	**0,37**	**461,3**	**629**	**37,499**	**26,4**	**47,0**	**162,7**	**34 684**	**54 004**	**5 537**	**126 033**	**9 497**	**473 081**	**1 291 078**			
	upper avg.	**869 596**	**2,74**	**0,49**	**461,3**	**629**	**37,505**	**27,4**	**54,3**	**162,8**	**34 950**	**54 009**	**5 616**	**126 033**	**9 498**	**473 081**	**1 291 110**			

TOTAL INPUTS

Discharge region	Estimate	Flow rate (km^3/d)	Cd [tonnes]	Hg [tonnes]	Cu [tonnes]	Zn [tonnes]	Pb [tonnes]	As [tonnes]	Cr [tonnes]	Ni [tonnes]	NH_4-N [tonnes]	NO_3-N [tonnes]	PO_4-P [tonnes]	TOT-N [tonnes]	TOT-P [tonnes]	Si-O_2 [tonnes]	SPM [tonnes]	TOC [tonnes]	PCB [kg]	g-HCH [kg]
INPUTS TO OSPAR REGION: Skagerrak																				
RIVERINE INPUTS																				
	lower avg.		0,63	0,02	65,5	169	11,187	8	10	32	723	12 678	220	20 374	555	137 668	264 758	157 438	0	5,5
Main Rivers	upper avg.	130 019	0,63	0,05	65,5	169	11,187	8	12	32	723	12 678	231	20 374	555	137 668	264 758	157 438	49	10,0
	lower avg.		0,22	0,00	6,2	41	2,190	2	1	3	101	1 398	5	3 057	43	15 641	14 191	30 281		
Tributary Rivers (36)	upper avg.	23 986	0,22	0,01	6,2	41	2,190	2	1	3	105	1 398	11	3 057	43	15 641	14 191	30 281		
	lower avg.		0,10	0,01	4,0	15	0,973	1	1	2	120	1 495	17	2 328	59	6 834	13 978	12 776		
Tributary Rivers (109)	upper avg.	7 434	0,10	0,01	4,0	15	0,973	1	1	2	120	1 495	17	2 328	59	6 834	13 978	12 776		
	lower avg.		**0,95**	**0,04**	**75,7**	**225**	**14,350**	**11**	**12**	**37**	**944**	**15 571**	**242**	**25 759**	**657**	**160 143**	**292 928**	**200 496**		
Total Riverine Inputs	**upper avg.**	**161 439**	**0,95**	**0,07**	**75,7**	**225**	**14,350**	**11**	**14**	**37**	**948**	**15 571**	**260**	**25 759**	**657**	**160 143**	**292 928**	**200 496**		
DIRECT DISCHARGES																				
	lower avg.		0,03	0,01	2,7	7	0,267	0,1	0,5	1,3	2 516	167,7	56	3 354	93		2 159			
Sewage Effluents	upper avg.		0,03	0,01	2,7	7	0,267	0,1	0,5	1,3	2 516	167,7	56	3 354	93		2 159			
	lower avg.		0,02	0,01	9,2	4	0,457	0,4	1,4	4,0	800	53,3	53	1 067	88		1 629			
Industrial Effluents	upper avg.		0,02	0,01	9,2	4	0,457	0,4	1,4	4,0	800	53,3	53	1 067	88		1 629			
	lower avg.				0,3						17	2,5	3	21	4					
Fish Farming	upper avg.				0,3						17	2,5	3	21	4					
	lower avg.		**0,04**	**0,01**	**12,3**	**12**	**0,724**	**0,5**	**1,9**	**5,3**	**3 333**	**223,6**	**112**	**4 442**	**186**		**3 788**			
Total Direct Inputs	**upper avg.**		**0,04**	**0,01**	**12,3**	**12**	**0,724**	**0,5**	**1,9**	**5,3**	**3 333**	**223,6**	**112**	**4 442**	**186**		**3 788**			
UNMONITORED AREAS																				
	lower avg.										198	1 994	31	2 978	107					
Unmonitored Areas	upper avg.	7 833									198	1 994	31	2 978	107					
	lower avg.		**0,99**	**0,05**	**88,0**	**237**	**15,074**	**11,2**	**13,5**	**42,6**	**4 474**	**17 789**	**386**	**33 179**	**950**	**160 143**	**296 716**			
REGION TOTAL	**upper avg.**	**169 272**	**1,00**	**0,08**	**88,0**	**237**	**15,074**	**11,2**	**15,7**	**42,6**	**4 479**	**17 789**	**404**	**33 179**	**950**	**160 143**	**296 716**			

TOTAL INPUTS																				
Discharge region	**Estimate**	**Flow rate (km^3/d)**	**Cd [tonnes]**	**Hg [tonnes]**	**Cu [tonnes]**	**Zn [tonnes]**	**Pb [tonnes]**	**As [tonnes]**	**Cr [tonnes]**	**Ni [tonnes]**	**NH_4-N [tonnes]**	**NO_3-N [tonnes]**	**PO_4-P [tonnes]**	**TOT-N [tonnes]**	**TOT-P [tonnes]**	**Si-O_2 [tonnes]**	**SPM [tonnes]**	**TOC [tonnes]**	**PCB [kg]**	**g-HCH [kg]**
INPUTS TO OSPAR REGION: North Sea																				
RIVERINE INPUTS																				
Main Rivers	lower avg.		0,09	0,01	4,6	21	3,07	0,5	1	2	23	816	37	1 450	71	5 004	40 100	7 509	0	0,0
	upper avg.	13 022	0,09	0,01	4,6	21	3,07	0,6	1	2	36	816	38	1 450	71	5 004	40 100	7 509	7	1,4
Tributary Rivers (36)	lower avg.		0,26	0,01	18,1	82	5,97	2,1	6	9	218	6 309	96	8 917	216	43 012	166 191	44 914		
	upper avg.	86 339	0,32	0,04	18,1	82	5,97	2,7	8	9	276	6 309	119	8 917	216	43 012	166 223	44 914		
Tributary Rivers (109)	lower avg.		0,40	0,11	13,7	55	5,14	3,1	6	11	299	4 815	51	7 616	216	36 469	35 159	38 845		
	upper avg.	94 626	0,40	0,11	13,7	55	5,14	3,1	6	11	299	4 815	51	7 616	216	36 469	35 159	38 845		
Total Riverine Inputs	**lower avg.**		**0,74**	**0,13**	**36,4**	**158**	**14,18**	**5,7**	**12,7**	**21,2**	**540**	**11 941**	**184**	**17 983**	**503**	**84 485**	**241 450**	**91 267**		
	upper avg.	**193 987**	**0,81**	**0,15**	**36,4**	**158**	**14,18**	**6,3**	**15,5**	**21,2**	**611**	**11 941**	**208**	**17 983**	**503**	**84 485**	**241 482**	**91 267**		
DIRECT DISCHARGES																				
Sewage Effluents	lower avg.		0,01	0,02	5,81	5,35	0,40	0,09	0,55	2,21	2 208	147	161	2 944	269		4 131			
	upper avg.		0,01	0,02	5,81	5,35	0,40	0,09	0,55	2,21	2 208	147	161	2 944	269		4 131			
Industrial Effluents	lower avg.		0,00		0,2	0,41	0,004	0,0	0,5	3,9	336	22	40	448	66		10 803			
	upper avg.		0,00		0,2	0,41	0,004	0,0	0,5	3,9	336	22	40	448	66		10 803			
Fish Farming	lower avg.				75,6						7 669	1 150	1 404	9 586	2 035					
	upper avg.				75,6						7 669	1 150	1 404	9 586	2 035					
Total Direct Inputs	**lower avg.**		**0,01**	**0,02**	**81,6**	**5,8**	**0,406**	**0,1**	**1,0**	**6,1**	**10 213**	**1 320**	**1 605**	**12 978**	**2 370**		**14 934**			
	upper avg.		**0,01**	**0,02**	**81,6**	**5,8**	**0,406**	**0,1**	**1,0**	**6,1**	**10 213**	**1 320**	**1 605**	**12 978**	**2 370**		**14 934**			
UNMONITORED AREAS																				
Unmonitored Areas	lower avg.										602	5 930	55	9 131	195					
	upper avg.	74 049									602	5 930	55	9 131	195					
REGION TOTAL	**lower avg.**		**0,76**	**0,15**	**118,0**	**164**	**14,586**	**5,8**	**13,7**	**27,3**	**11 355**	**19 191**	**1 844**	**40 092**	**3 067**	**84 485**	**256 384**			
	upper avg.	**268 036**	**0,82**	**0,18**	**118,0**	**164**	**14,586**	**6,4**	**16,6**	**27,3**	**11 426**	**19 191**	**1 869**	**40 092**	**3 067**	**84 485**	**256 416**			

TOTAL INPUTS																				
Discharge region	**Estimate**	**Flow rate (km³/d)**	**Cd [tonnes]**	**Hg [tonnes]**	**Cu [tonnes]**	**Zn [tonnes]**	**Pb [tonnes]**	**As [tonnes]**	**Cr [tonnes]**	**Ni [tonnes]**	**NH_4-N [tonnes]**	**NO_3-N [tonnes]**	**PO_4-P [tonnes]**	**TOT-N [tonnes]**	**TOT-P [tonnes]**	**Si-O_2 [tonnes]**	**SPM [tonnes]**	**TOC [tonnes]**	**PCB [kg]**	**g-HCH [kg]**
INPUTS TO OSPAR REGION: Norwegian Sea																				
RIVERINE INPUTS																				
	lower avg.		0,15	0,00	29,5	103	0,534	1,1	1	3	29	700	6	1 520	34	15 653	19 452	17 543	0	0,0
Main Rivers	upper avg.	26 458	0,18	0,01	29,5	103	0,536	1,1	2	3	57	700	13	1 520	35	15 653	19 452	17 543	10	1,7
	lower avg.		0,12	0,01	30,9	83	3,087	3,2	10	31	129	2 774	89	7 774	220	72 716	167 803	73 586		
Tributary Rivers (36)	upper avg.	112 793	0,26	0,04	30,9	83	3,091	3,6	11	31	259	2 774	111	7 774	220	72 716	167 803	73 586		
	lower avg.		0,23	0,12	11,3	20	1,773	2,2	4	9	212	1 531	44	3 407	153	35 728	48 616	39 569		
Tributary Rivers (109)	upper avg.	68 759	0,23	0,12	11,3	20	1,773	2,2	4	9	212	1 531	44	3 407	153	35 728	48 616	39 569		
	lower avg.		**0,49**	**0,14**	**71,7**	**206**	**5,394**	**6,4**	**14,5**	**44,1**	**371**	**5 004**	**138**	**12 701**	**407**	**124 097**	**235 870**	**130 698**		
Total Riverine Inputs	**upper avg.**	**208 009**	**0,67**	**0,18**	**71,7**	**206**	**5,399**	**6,9**	**16,4**	**44,1**	**528**	**5 004**	**167**	**12 701**	**408**	**124 097**	**235 870**	**130 698**		
DIRECT DISCHARGES																				
	lower avg.					0,5				0,04	1 903	127	191	2 537	318		1 123			
Sewage Effluents	upper avg.					0,5				0,04	1 903	127	191	2 537	318		1 123			
	lower avg.		0,04		0,3	1,9	0,97	0,02	0,53	0,45	140	9	19	186	31	0,02	456 086			
Industrial Effluents	upper avg.		0,04		0,3	1,9	0,97	0,02	0,53	0,45	140	9	19	186	31	0,02	456 086			
	lower avg.				136,2						14 040	2 106	2 567	17 550	3 720					
Fish Farming	upper avg.				136,2						14 040	2 106	2 567	17 550	3 720					
	lower avg.		**0,04**		**136,4**	**2,4**	**0,97**	**0,02**	**0,5**	**0,5**	**16 083**	**2 242**	**2 777**	**20 274**	**4 070**		**457 210**			
Total Direct Inputs	**upper avg.**		**0,04**	**0,00**	**136,4**	**2,4**	**0,97**	**0,02**	**0,5**	**0,5**	**16 083**	**2 242**	**2 777**	**20 274**	**4 070**		**457 210**			
	lower avg.										873	8 276	135	12 461	479		0			
Unmonitored Areas	upper avg.	130 138									873	8 276	135	12 461	479		0			
	lower avg.		**0,53**	**0,14**	**208,1**	**208**	**6,362**	**6,5**	**15,0**	**44,6**	**17 326**	**15 523**	**3 050**	**45 436**	**4 957**	**124 097**	**693 080**			
REGION TOTAL	**upper avg.**	**338 147**	**0,71**	**0,18**	**208,1**	**208**	**6,367**	**6,9**	**16,9**	**44,6**	**17 484**	**15 523**	**3 079**	**45 436**	**4 957**	**124 097**	**693 080**			

TOTAL INPUTS																				
Discharge region	**Estimate**	**Flow rate (km^3/s)**	**Cd [tonnes]**	**Hg [tonnes]**	**Cu [tonnes]**	**Zn [tonnes]**	**Pb [tonnes]**	**As [tonnes]**	**Cr [tonnes]**	**Ni [tonnes]**	**NH_4-N [tonnes]**	**NO_3-N [tonnes]**	**PO_4-P [tonnes]**	**TOT-N [tonnes]**	**TOT-P [tonnes]**	**Si-O_2 [tonnes]**	**SPM [tonnes]**	**TOC [tonnes]**	**PCB [kg]**	**g-HCH [kg]**
INPUTS TO OSPAR REGION: Barents Sea																				
RIVERINE INPUTS																				
	lower avg.		0,00	0,00	3,3	3	0,265	0,6	1	1	22	98	10	800	49	17 878	23 757	17 608	0,0	0,0
Main Rivers	upper avg.	11 443	0,02	0,01	3,3	3	0,265	0,6	1	1	30	98	12	800	49	17 878	23 757	17 608	4,7	0,8
	lower avg.		0,11	0,00	23,6	13	1,009	1,8	2	43	101	117	15	2 515	94	70 108	13 494	50 288		
Tributary Rivers (36)	upper avg.	36 791	0,14	0,01	23,6	13	1,009	1,8	2	43	127	122	21	2 515	94	70 108	13 494	50 288		
	lower avg.		0,06	0,03	4,6	4	0,204	0,5	2	4	63	137	9	815	31	16 371	7 647	15 442		
Tributary Rivers (109)	upper avg.	18 885	0,06	0,03	4,6	4	0,204	0,5	2	4	63	137	9	815	31	16 371	7 647	15 442		
	lower avg.		**0,17**	**0,04**	**31,5**	**20**	**1,477**	**2,9**	**4,7**	**48,2**	**186**	**352**	**34**	**4 129**	**173**	**104 357**	**44 898**	**83 338**		
Total Riverine Inputs	**upper avg.**	**67 119**	**0,22**	**0,05**	**31,5**	**20**	**1,478**	**2,9**	**5,2**	**48,2**	**220**	**357**	**41**	**4 129**	**173**	**104 357**	**44 898**	**83 338**		
DIRECT DISCHARGES																				
	lower avg.										156	10	16	207	27					
Sewage Effluents	upper avg.										156	10	16	207	27					
	lower avg.																			
Industrial Effluents	upper avg.																			
	lower avg.				15,6						1 103	165	201	1 379	291					
Fish Farming	upper avg.				15,6						1 103	165	201	1 379	291					
	lower avg.				**15,6**						**1 258**	**176**	**217**	**1 586**	**317**					
Total Direct Inputs	**upper avg.**										**1 258**	**176**	**217**	**1 586**	**317**					
														15,6						
	lower avg.										84	974	7	1 611	32					
Unmonitored Areas	upper avg.	27 023									84	974	7	1 611	32					
	lower avg.		**0,17**	**0,04**	**47,1**	**20**	**1,477**	**2,9**	**4,7**	**48,2**	**1 528**	**1 502**	**257**	**7 326**	**523**	**104 357**	**44 898**			
REGION TOTAL	**upper avg.**	**94 142**	**0,22**	**0,05**	**31,5**	**20**	**1,478**	**2,9**	**5,2**	**48,2**	**1 562**	**1 506**	**265**	**7 326**	**523**	**104 357**	**44 898**			

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 2005 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 [t]	11 NO3-N [t]	12 PO4-P [t]	13 Total N [t]	14 Total P [t]	3 SPM [t]	15 As [t]	18 TOC [t]	16 Total Cr [t]	17 Ni [t]	20 AOX [t]
73 Barents Sea (NO)	lower								156	10	16	207	27						
	upper								156	10	16	207	27						
	comment																		
75 Skagerrak (NO)	lower	0.025	0.005	2.718	0.267	7.476			2516	168	56	3354	93	2159	0.118		0.469	1.349	
	upper	0.025	0.005	2.718	0.267	7.476			2516	168	56	3354	93	2159	0.118		0.469	1.349	
	comment																		
83 North Sea (NO)	lower	0.011	0.023	5.809	0.402	5.349			2208	147	161	2944	269	4131	0.087		0.551	2.213	
	upper	0.011	0.023	5.809	0.402	5.349			2208	147	161	2944	269	4131	0.087		0.551	2.213	
	comment																		
72 Norwegian Sea (NO)	lower					0.503			1903	127	191	2537	318	1123				0.038	
	upper					0.503			1903	127	191	2537	318	1123				0.038	
	comment																		

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 2005 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 [t]	11 NO3-N [t]	12 PO4-P [t]	13 Total N [t]	14 Total P [t]	3 SPM [t]	15 As [t]	18 TOC [t]	16 Total Cr [t]	17 Ni [t]	20 AOX [t]
73 Barents Sea (NO)	lower																		
	upper																		
	comment																		
75 Skagerrak (NO)	lower	0.016	0.005	9.241	0.457	4.141			800	53	53	1067	88	1629	0.418		1.399	3.977	
	upper	0.016	0.005	9.241	0.457	4.141			800	53	53	1067	88	1629	0.418		1.399	3.977	
	comment																		
83 North Sea (NO)	lower	0.001		0.161	0.004	0.405			336	22	40	448	66	10803	0.001		0.472	3.907	
	upper	0.001		0.161	0.004	0.405			336	22	40	448	66	10803	0.001		0.472	3.907	
	comment																		
72 Norwegian Sea (NO)	lower	0.039		0.259	0.968	1.936			140	9	19	186	31	456086	0.019		0.525	0.454	
	upper	0.039		0.259	0.968	1.936			140	9	19	186	31	456086	0.019		0.525	0.454	
	comment																		

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by Norway

			1.00 Cd [t]	5.00 Hg [kg]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [t]	11.00 NO3-N [t]	12.00 PO4-P [t]	13.00 Total N [t]	14.00 Total P [t]	3.00 SPM [kt]	15.00 As [t]	18.00 TOC [kt]	16.00 Total Cr [t]	17.00 Ni [t]	20.00 AOX [t]
168	Alta	lower	0.00	4.15	3.30	0.26	2.67	0.00	0.00	21.76	97.86	9.97	799.68	48.78	23.76	0.65	17.61	1.33	1.24	
		upper	0.02	7.70	3.30	0.27	2.67	0.79	4.70	29.55	97.86	11.88	799.68	48.78	23.76	0.65	17.61	1.40	1.25	
		comment																		
73	Barents Sea (NO)	lower	0.00	4.15	3.30	0.26	2.67	0.00	0.00	21.76	97.86	9.97	799.68	48.78	23.76	0.65	17.61	1.33	1.24	
		upper	0.02	7.70	3.30	0.27	2.67	0.79	4.70	29.55	97.86	11.88	799.68	48.78	23.76	0.65	17.61	1.40	1.25	
		comment																		
160	Drammenselva	lower	0.10	2.23	7.36	2.15	29.38	0.96	0.00	98.19	2102.23	9.10	3501.87	49.82	13.39	1.33	26.81	0.89	7.91	
		upper	0.10	8.53	7.36	2.15	29.38	1.73	8.54	98.19	2102.23	13.23	3501.87	49.82	13.39	1.36	26.81	1.19	7.91	
		comment																		
159	Glomma	lower	0.29	13.38	48.62	6.34	81.49	1.63	0.00	392.02	7671.73	191.91	11990.81	421.18	223.77	3.91	85.04	7.69	18.69	
		upper	0.29	26.36	48.62	6.34	81.49	4.46	23.90	392.02	7671.73	191.91	11990.81	421.18	223.77	3.91	85.04	8.18	18.69	
		comment																		
161	Numedalslågen	lower	0.06	2.21	2.12	0.76	17.42	0.11	0.00	69.30	826.17	11.17	1373.25	32.32	12.97	0.63	12.72	0.50	1.04	
		upper	0.06	4.06	2.12	0.76	17.42	0.58	3.30	69.30	826.17	11.37	1373.25	32.32	12.97	0.63	12.72	0.62	1.04	
		comment																		
163	Otra	lower	0.10	1.16	3.01	1.25	18.69	0.26	0.00	62.36	465.25	1.46	1047.71	16.40	4.91	0.91	12.24	0.23	2.43	
		upper	0.10	4.54	3.01	1.25	18.69	0.72	3.82	62.36	465.25	4.29	1047.71	16.40	4.91	0.91	12.24	0.50	2.43	
		comment																		
162	Skienselva	lower	0.08	2.67	4.38	0.68	22.10	2.56	0.00	100.66	1612.92	6.78	2460.50	35.40	9.72	0.96	20.62	0.55	2.05	
		upper	0.08	9.41	4.38	0.68	22.10	2.56	9.25	100.66	1612.92	10.64	2460.50	35.40	9.72	0.96	20.62	1.05	2.10	
		comment																		
75	Skagerrak (NO)	lower	0.63	21.65	65.49	11.19	169.08	5.52	0.00	722.53	12678.30	220.41	20374.14	555.12	264.76	7.74	157.44	9.87	32.13	
		upper	0.63	52.90	65.49	11.19	169.08	10.04	48.81	722.53	12678.30	231.44	20374.14	555.12	264.76	7.77	157.44	11.55	32.18	
		comment																		
164	Orreelva	lower	0.01	0.13	0.42	0.31	2.04	0.00	0.00	4.74	133.73	11.29	296.75	17.40	6.45	0.06	0.88	0.06	0.26	
		upper	0.01	0.19	0.42	0.31	2.04	0.03	0.15	4.98	133.73	11.29	296.75	17.40	6.45	0.06	0.88	0.07	0.26	
		comment																		
165	Suldalslågen	lower	0.08	5.85	4.18	2.76	19.21	0.04	0.00	18.32	682.52	25.22	1153.04	53.71	33.65	0.47	6.63	1.21	1.62	
		upper	0.08	8.71	4.18	2.76	19.21	1.38	7.24	30.63	682.52	26.66	1153.04	53.71	33.65	0.53	6.63	1.39	1.62	
		comment																		

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by Norway

		1.00 Cd [t]	5.00 Hg [kg]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [t]	11.00 NO3-N [t]	12.00 PO4-P [t]	13.00 Total N [t]	14.00 Total P [t]	3.00 SPM [kt]	15.00 As [t]	18.00 TOC [kt]	16.00 Total Cr [t]	17.00 Ni [t]	20.00 AOX [t]
83 North Sea (NO)	lower	0.09	5.97	4.60	3.07	21.25	0.04	0.00	23.06	816.25	36.51	1449.78	71.10	40.10	0.54	7.51	1.26	1.88	
	upper	0.09	8.90	4.60	3.07	21.25	1.41	7.39	35.61	816.25	37.95	1449.78	71.10	40.10	0.59	7.51	1.46	1.88	
	comment																		
166 Orkla	lower	0.15	2.49	27.29	0.17	55.14	0.00	0.00	19.95	418.69	4.06	806.71	15.49	7.52	0.35	8.32	0.81	2.21	
	upper	0.15	3.94	27.29	0.18	55.14	0.50	2.96	21.69	418.69	5.52	806.71	15.49	7.52	0.35	8.32	0.82	2.21	
	comment																		
167 Vefsna	lower	0.00	1.36	2.22	0.36	47.87	0.00	0.00	9.48	281.16	1.78	712.92	18.77	11.93	0.70	9.23	0.31	1.23	
	upper	0.03	6.92	2.22	0.36	47.87	1.25	7.50	35.10	281.16	7.15	712.92	19.16	11.93	0.70	9.23	0.82	1.23	
	comment																		
72 Norwegian Sea (NC	lower	0.15	3.85	29.51	0.53	103.01	0.00	0.00	29.43	699.85	5.84	1519.64	34.26	19.45	1.05	17.54	1.12	3.44	
	upper	0.18	10.86	29.51	0.54	103.01	1.75	10.46	56.79	699.85	12.67	1519.64	34.64	19.45	1.05	17.54	1.64	3.44	
	comment																		

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by Norway

		1 Cd [t]	5 Hg [kg]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [t]	11 NO3-N [t]	12 PO4-P [t]	13 Total N [t]	14 Total P [t]	3 SPM [kt]	15 As [t]	18 TOC [kt]	16 Total Cr [t]	17 Ni [t]	20 AOX [t]
73 Barents Sea (NO)	lower	0.2	32.8	28.2	1.2	17.6			164.6	254.0	24.0	3329.8	124.4	21.1	2.3	65.7	3.4	47.0	
	upper	0.2	45.2	28.2	1.2	17.6			190.7	258.7	29.3	3329.8	124.4	21.1	2.3	65.7	3.8	47.0	
	comment																		
75 Skagerrak (NO)	lower	0.3	13.5	10.2	3.2	56.0			221.1	2892.8	22.0	5385.1	102.1	28.2	2.9	43.1	1.8	5.1	
	upper	0.3	20.2	10.2	3.2	56.0			225.2	2892.8	22.0	5385.1	102.1	28.2	2.9	43.1	2.3	5.1	
	comment																		
83 North Sea (NO)	lower	0.7	122.5	31.8	11.1	136.9			517.0	11124.5	147.2	16533.1	431.6	201.4	5.2	83.8	11.4	19.3	
	upper	0.7	145.5	31.8	11.1	136.9			575.1	11124.5	170.3	16533.1	432.0	201.4	5.7	83.8	14.1	19.3	
	comment																		
72 Norwegian Sea (NO)	lower	0.3	137.3	42.2	4.9	102.8			341.4	4304.6	132.6	11181.2	373.1	216.4	5.4	113.2	13.4	40.7	
	upper	0.5	167.1	42.2	4.9	102.8			471.7	4304.6	154.6	11181.2	373.2	216.4	5.9	113.2	14.7	40.7	
	comment																		

Table 7, Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2005 by Norway

			1 Cd [µg/l]	5 Hg [ng/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 HCHG [ng/l]	9 PCB	10 NH4_N [µg/l N]	11 NO3_N [µg/l N]	12 PO4_P [µg/l P]	13 Tot_N [µg/l N]	14 Tot_P [µg/l P]	3 SPM [mg/l]	15 As [µg/l]	18 TOC [mg/l C]	16 Total Cr [µg/l]	17 Ni [µg/l]	20 AOX [mg/l]
168	Alta	lower	0	2	0.69675	0.02067	0.32833	0	1	2.75	31.75	0.6667	165.75	5.8333	1.5325	0.1158	3.5	0.216667	0.1783	
		upper	0.005	2.75	0.69675	0.02108	0.32833	0.175	1	5.6667	31.75	1.3333	165.75	5.8333	1.5325	0.1158	3.5	0.233333	0.1825	
		minimum	0.005	1	0.453	0.005	0.1	0.1	0.6	4	5	1	129	3	0.28	0.09	2.7	0.1	0.05	
		maximum	0.005	20	1.48	0.12	1.1	0.2	1.2	9	55	5	240	19	11.5	0.2	5.2	0.5	0.43	
		more than 70% > D,L,	no	no	yes	yes	yes	no	yes	no	yes	no	yes	yes	yes	yes	yes	yes	yes	
		n	12	12	12	12	12	4	3	12	12	12	12	12	12	12	12	12	12	
		info																		
		st,Dev,	0	5.4502	0.282518	0.03185	0.26319	0.05	0.3464	1.3707	15.5044	1.1547	30.21476	4.4484	3.15043	0.0394	0.59238	0.107309	0.0969	
73	Barents Sea (NO)	lower																		
		upper																		
		minimum																		
		maximum																		
		more than 70% > D,L,																		
		n																		
		info																		
		st,Dev,																		
160	Drammenselva	lower	0.011	0.250	0.880	0.254	3.345	0.103	1.000	12.0	237.5	1.0	400.6	5.8	1.5	0.2	3.100	0.094	0.895	
		upper	0.011	1.000	0.880	0.254	3.345	0.203	1	12	237.5	1.5	400.6	5.8	1.5	0.2	3.100	0.131	0.895	
		minimum	0.005	1.000	0.170	0.047	2.020	0.200	0.600	7	140	1	320	3	0.7	0.1	2.200	0.100	0.160	
		maximum	0.022	1.000	2.040	0.940	8.080	0.210	1.200	25	510	6	660	13	4.9	0.2	4	0.300	5.470	
		more than 70% > D,L,	yes	no	yes	yes	yes	no	yes	yes	yes	no	yes	yes	yes	yes	yes	no	yes	
		n	16	16	16	16	16	4	3	16	16	16	16	16	16	16	16	16	16	
		info																		
		st,Dev,	0.006	0.000	0.381	0.277	1.506	0.005	0.346	5.138	86.776	1.265	85.301	2.569	1.061	0.062	0.505	0.060	1.285	
159	Glomma	lower	0.013	0.676	2.094	0.273	3.818	0.100	1.000	17.1	342.5	8.1	530.6	17.6	9.5	0.176	3.806	0.313	0.849	
		upper	0.013	1.206	2.094	0.273	3.818	0.200	1	17.1	342.5	8.1	530.6	17.6	9.5	0.176	3.806	0.344	0.849	
		minimum	0.007	1.000	1.260	0.084	1.400	0.200	0.600	10	165	2	335	6	1.6	0.080	2.400	0.100	0.370	
		maximum	0.035	2.000	3.360	1.450	9.880	0.200	1.200	39	680	52	875	88	66.5	0.330	5.800	1.500	2.460	
		more than 70% > D,L,	yes	no	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	
		n	16	17	16	16	16	4	3	16	16	16	16	16	16	16	16	16	16	
		info																		
		st,Dev,	0.008	0.398	0.627	0.331	2.366	0	0.346	7.7	152.5	12.2	157.4	19.6	15.7	0.073	0.977	0.405	0.516	
161	Numedalslågen	lower	0.016	0.833	0.604	0.193	5.160	0.033	1.000	22.8	223.7	2.8	388.8	8.3	3.2	0.175	3.550	0.108	0.304	
		upper	0.017	1.333	0.604	0.193	5.160	0.183	1	22.8	223.7	2.8	388.8	8.3	3.2	0.175	3.550	0.158	0.304	
		minimum	0.005	1.000	0.396	0.090	2.010	0.130	0.600	10	75	1	200	4	1.1	0.100	2	0.100	0.200	
		maximum	0.039	2.500	1.150	0.622	11.700	0.200	1.200	46	505	9	725	25	12	0.310	7.400	0.500	0.530	
		more than 70% > D,L,	yes	no	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	
		n	12	12	12	12	12	4	3	12	12	12	12	12	12	12	12	12	12	
		info																		
		st,Dev,	0.012	0.492	0.202	0.145	3.180	0.035	0.346	9.4	145.7	2.3	171.5	5.8	3.1	0.075	1.355	0.116	0.094	
163	Otra	lower	0.020	0.333	0.696	0.236	3.926	0.033	0.900	12.9	99.4	0.3	222.9	3.7	1.3	0.206	2.508	0.033	0.488	
		upper	0.020	1.083	0.696	0.236	3.926	0.183	0.900	12.9	99.4	1	222.9	3.7	1.3	0.206	2.508	0.108	0.488	
		minimum	0.010	1.000	0.397	0.120	2.400	0.130	0.600	5	55	1	165	2	0.5	0.080	1.800	0.100	0.300	
		maximum	0.037	2.000	1.100	0.686	6.500	0.200	1.200	26	130	1	310	7	5.0	1.100	5.500	0.200	1.180	
		more than 70% > D,L,	yes	no	yes	yes	yes	no	yes	yes	yes	no	yes	yes	yes	yes	yes	no	yes	
		n	12	12	12	12	12	4	2	12	12	12	12	12	12	12	12	12	12	
		info																		
		st,Dev,	0.009	0.289	0.238	0.154	1.129	0.035	0.424	6.7	24.9	0	47.8	1.4	1.2	0.285	1.019	0.029	0.256	
162	Skienselva	lower	0.009	0.292	0.481	0.071	2.350	0.283	1.000	11.917	172.917	0.667	270.000	3.750	1.049	0.108	2.258	0.042	0.220	
		upper	0.009	1.042	0.481	0.071	2.350	0.283	1	11.917	172.917	1.167	270	3.750	1.049	0.108	2.258	0.108	0.224	
		minimum	0.005	1.000	0.301	0.028	1.500	0.260	0.600	7	100	1	225	3	0.450	0.080	1.900	0.100	0.050	
		maximum	0.010	1.500	0.912	0.130	3.670	0.300	1.200	31	220	2	330	5	2.400	0.220	2.500	0.200	0.550	
		more than 70% > D,L,	yes	no	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	no	yes	
		n	12	12	12	12	12	4	3	12	12	12	12	12	12	12	12	12	12	
		info																		
		st,Dev,	0.001	0.144	0.154	0.028	0.598	0.017	0.346	6.842	37.686	0.389	27.303	0.754	0.540	0.036	0.188	0.029	0.122	

Table 7, Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2005 by Norway

		1 Cd [µg/l]	5 Hg [ng/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 HCHG [ng/l]	9 PCB	10 NH4_N [µg/l N]	11 NO3_N [µg/l N]	12 PO4_P [µg/l P]	13 Tot_N [µg/l N]	14 Tot_P [µg/l P]	3 SPM [mg/l]	15 As [µg/l]	18 TOC [mg/l C]	16 Total Cr [µg/l]	17 Ni [µg/l]	20 AOX [mg/l]
75 Skagerrak (NO)	lower																		
	upper																		
	minimum																		
	maximum																		
	more than 70% > D,L,																		
	n																		
	info																		
	st,Dev,																		
164 Orreelva	lower	0.026	0.708	1.800	0.818	6.775	0.000	1.000	47	757	33	1488	67	18.274	0.315	5.442		0.183	1.196
	upper	0.026	1.208	1.800	0.818	6.775	0.175	1	47	757	33	1488	67	18.274	0.315	5.442		0.250	1.196
	minimum	0.005	1.000	0.658	0.092	1	0.100	0.600	5	1	3	620	29	2.830	0.200	4.500		0.100	0.260
	maximum	0.224	2.000	7.170	7.670	47.300	0.200	1.200	120	1900	255	3355	293	152	1	6.900		1.500	4.340
	more than 70% > D,L,	yes	no	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	
	n	12	12	12	12	12	4	3	12	12	12	12	12	12	12	12	12	12	
	info																		
	st,Dev,	0.062	0.334	1.726	2.161	13.098	0.050	0.346	35	746	70	806	72	42.160	0.222	0.722		0.403	1.036
165 Suldalslågen	lower	0.010	0.417	0.440	0.199	2.413	0.025	1.000	3.0	176.6	1.6	243.8	4.7	2.398	0.076	1.029		0.092	0.229
	upper	0.010	1.250	0.440	0.199	2.413	0.250	1	5.9	176.6	2.2	243.8	4.7	2.398	0.084	1.029		0.167	0.233
	minimum	0.005	1.000	0.200	0.034	1.300	0.100	0.600	4	64	1	155	1	0.310	0.050	0.550		0.100	0.050
	maximum	0.031	3.500	1.990	1.500	8.320	0.500	1.200	9	290	14	425	27	18.600	0.200	2.200		0.600	0.660
	more than 70% > D,L,	yes	no	yes	yes	yes	no	yes	no	yes	no	yes	yes	yes	yes	yes	no	yes	
	n	12	12	12	12	12	4	3	12	12	12	12	12	12	12	12	12	12	
	info																		
	st,Dev,	0.007	0.723	0.507	0.412	1.987	0.173	0.346	1.7	72.6	3.7	81.0	7.1	5.121	0.040	0.550		0.150	0.158
83 North Sea (NO)	lower																		
	upper																		
	minimum																		
	maximum																		
	more than 70% > D,L,																		
	n																		
	info																		
	st,Dev,																		
166 Orkla	lower	0.060	0.708	10.239	0.068	22.544	0.000	1.000	6.917	180.083	1.667	321.417	5.917	3.808	0.135	2.983		0.325	0.840
	upper	0.060	1.375	10.239	0.069	22.544	0.175	1	7.333	180.083	2.333	321.417	5.917	3.808	0.135	2.983		0.342	0.840
	minimum	0.010	1.000	2.320	0.005	3.130	0.100	0.600	5	28	1	137	2	0.190	0.080	1.800		0.100	0.540
	maximum	0.120	4.000	22	0.413	43.100	0.200	1.200	11	330	14	475	30	32.300	0.380	8.200		1.700	2.330
	more than 70% > D,L,	yes	no	yes	yes	yes	no	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	
	n	12	12	12	12	12	4	3	12	12	12	12	12	12	12	12	12	12	
	info																		
	st,Dev,	0.031	0.856	5.159	0.111	11.655	0.050	0.346	1.923	99.244	3.725	102.365	7.798	9.016	0.088	1.799		0.436	0.487
167 Vefsna	lower	0.000	0.208	0.357	0.039	10.174	0.000	1.050	2.000	65.750	0.250	136.750	2.333	1.289	0.106	1.483		0.083	0.170
	upper	0.005	1.042	0.357	0.040	10.174	0.175	1.050	5.333	65.750	1.083	136.750	2.500	1.289	0.106	1.483		0.142	0.170
	minimum	0.005	1.000	0.260	0.005	0.200	0.100	0.600	4	13	1	51	1	0.170	0.060	0.840		0.100	0.070
	maximum	0.005	1.500	0.609	0.160	115	0.200	1.200	7	135	2	215	5	5.860	0.220	2		0.300	0.360
	more than 70% > D,L,	no	no	yes	yes	yes	no	yes	no	yes	no	yes	yes	yes	yes	yes	no	yes	
	n	12	12	12	12	12	4	4	12	12	12	12	12	12	12	12	12	12	
	info																		
	st,Dev,	0	0.144	0.099	0.041	33.015	0.050	0.300	0.888	47.221	0.289	59.396	1.243	1.545	0.038	0.388		0.067	0.082
72 Norwegian Sea (NO)	lower																		
	upper																		
	minimum																		
	maximum																		
	more than 70% > D,L,																		
	n																		
	info																		
	st,Dev,																		

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 2005 by Norway

			1 Cd [µg/l]	5 Hg [ng/l]	6 Cu [µg/l]	2.000 Pb [µg/l]	7.000 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	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
73	Barents Sea (NO)	Sewage																		
		Industrial																		
		Riverine																		
160	Drammenselva	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
159	Glomma	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
170	Inner Oslofjord	Sewage																		
		Industrial																		
		Riverine																		
161	Numedalslågen	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
163	Otra	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
162	Skienselva	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
75	Skagerrak (NO)	Sewage																		
		Industrial																		
		Riverine																		

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 2005 by Norway

			1 Cd [µg/l]	5 Hg [ng/l]	6 Cu [µg/l]	2.000 Pb [µg/l]	7.000 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	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
165	Suldalslågen	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
83	North Sea (NO)	Sewage																		
		Industrial																		
		Riverine																		
166	Orkla	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
167	Vefsna	Sewage																		
		Industrial																		
		Riverine	0.005	1	0.01	0.005	0.050	0.2	0.2	0.005	0.001	0.001	0.01	0.001	0.1	0.05	0.1	0.05	100	
72	Norwegian Sea (NO)	Sewage																		
		Industrial																		
		Riverine																		

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 2005 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	11,443	7495	2177	23082	1961-90	1	mean
73	Barents Sea (NO)							
160	Drammenselva	23,373	28850	7439	85867	1961-90	1	mean
159	Glomma	61,414	61350	19911	134952	1961-90	1	mean
170	Inner Oslofjord							
161	Numedalslågen	8,786	10200	3433	27318	1961-90	1	mean
163	Otra	11,788	12870	4754	21292	1961-90	1	mean
162	Skienselva	24,657	23535	6353	56647	1961-90	1	mean
75	Skagerrak (NO)							
164	Orreelva	424	335	35	1354	1961-90	1	mean
165	Suldalslågen	12,598	7420	1148	12547	1961-90	1	mean
83	North Sea (NO)							
166	Orkla	8,123	5710	943	67561	1961-90	1	mean
167	Vefsna	18,334	15655	2179	49052	1961-90	1	mean
72	Norwegian Sea (NO)							

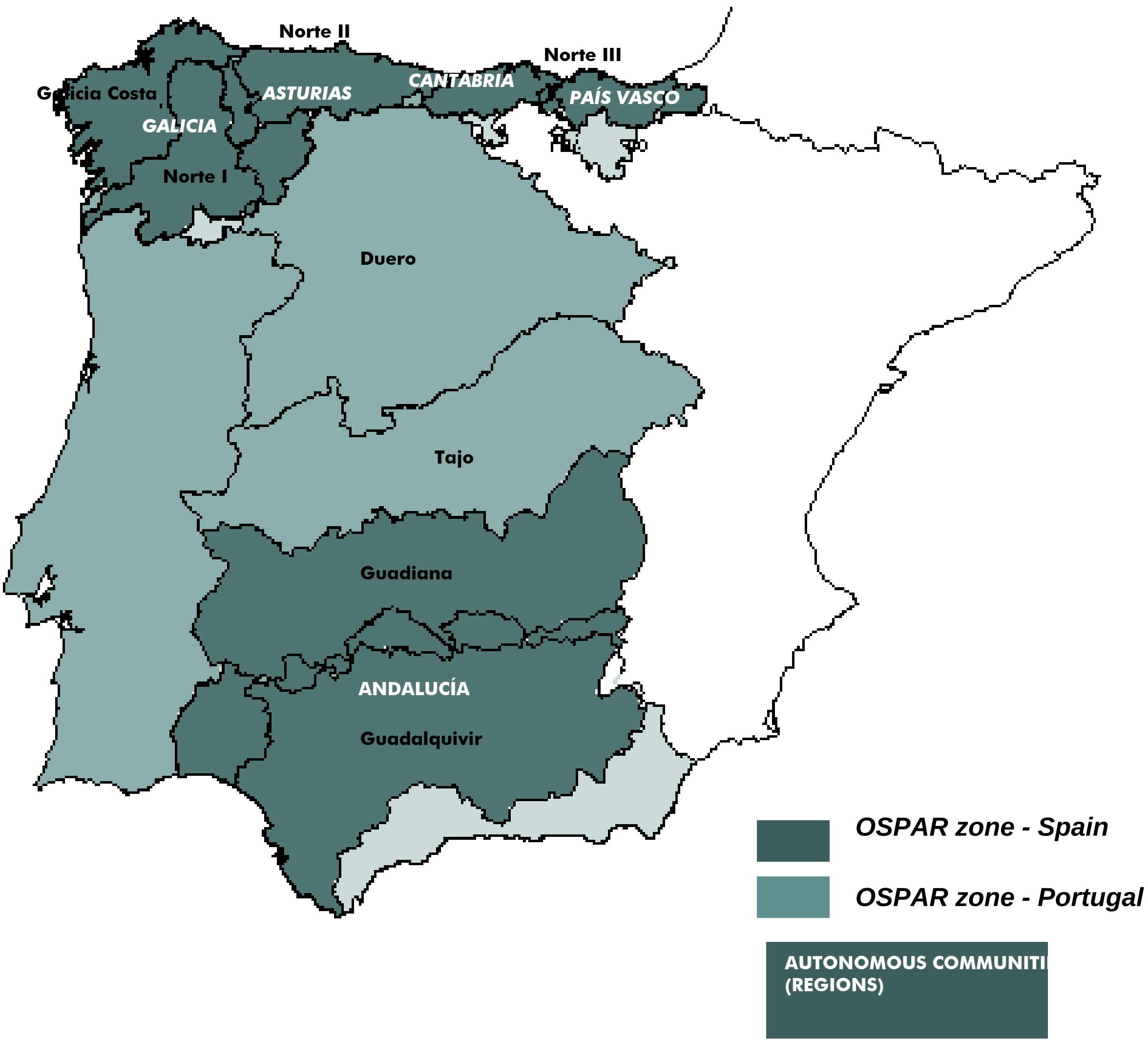
Table 10. Fish Farming Effluents
Reported Maritime Area of the OSPAR Convention in 2005 by Norway

		10 NH4-N [t]	11 NO3-N [t]	12.0000 PO4-P [t]	13 Total N [t]	14 Total P [t]	3 SPM [t]	15 As [t]	16 Total Cr [t]	17 Ni [t]	18 TOC [t]	20 AOX [t]
73 Barents Sea (NO)	lower	1103	165	201	1379	291						
	upper	1103	165	201	1379	291						
	comment											
75 Skagerrak (NO)	lower	17	3	3	21	4						
	upper	17	3	3	21	4						
	comment											
83 North Sea (NO)	lower	7669	1150	1404	9586	2035						
	upper	7669	1150	1404	9586	2035						
	comment											
72 Norwegian Sea (NC	lower	14040	2106	2567	17550	3720						
	upper	14040	2106	2567	17550	3720						
	comment											

8. Spain

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 by Spain	
Table 4a	Total Direct discharges and Riverine inputs to the maritime area in 2005 by Spain.
Table 5a	Direct discharges to the maritime area in 2005 by Spain (sewage effluents)
Table 5b	Direct discharges to the maritime area in 2005 by Spain (industrial effluents)
Table 5c	Direct discharges to the maritime area in 2005 by Spain (total direct discharges)
Table 6a	Riverine inputs to the maritime area in 2005 by Spain (main riverine inputs)
Table 6b	Riverine inputs to the maritime area in 2005 by Spain (tributary riverine inputs)
Table 6c	Riverine inputs to the maritime area in 2005 by Spain (total riverine inputs)
Table 7a	Contaminant concentrations of Spanish rivers discharging to the maritime area (main riverine inputs)
Table 7b	Contaminant concentrations of Spanish rivers discharging to the maritime area (tributary riverine inputs)
Table 8	Detection limits for contaminant concentration of Spanish inputs to the maritime area

Spanish annual report on Riverine Inputs and Direct Discharges (RID) to Convention waters during the year 2005



Annual report on riverine inputs and direct discharges by Spain to Convention waters during the year 2005

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

MINISTERIO DE MEDIO AMBIENTE
Pza. San Juan de la Cruz s/n
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A. General information

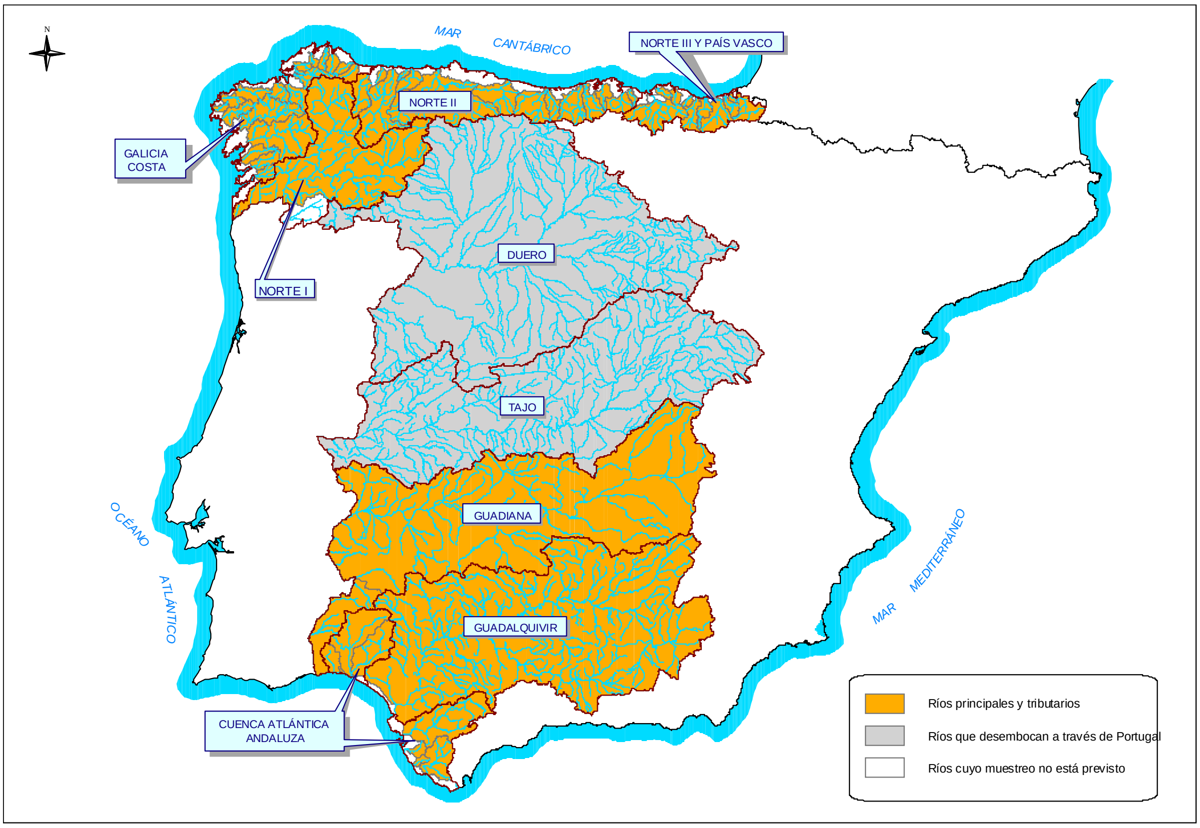
Table 1: General overview of river systems (for riverine inputs) and direct discharge areas (for direct discharges) included in the data report

Country: SPAIN			
Name of river, subarea and discharge area[1]		**Nature of the receiving water[2]**	**National reference number**
Discharge area	**Name of river**		
País Vasco	Oyarzun	coastal water	0102
	Urumea	coastal water	0103
	Oria	coastal water	0104
	Urola	coastal water	0105
	Deva	coastal water	0106
	Artibay	coastal water	0107
	Oca	coastal water	0108
	Butrón	coastal water	0109
	Cadagua	estuary	011003
	Galindo	estuary	011005
	Asúa	estuary	011008
	Barbadum	coastal water	
	Lea	Coastal water	
	Ibaizabal	estuary	
Norte III	Nervión	coastal water	0110
Norte II	Saja	coastal water	0115
	Nalón	coastal water	0119
	Sella	coastal water	0145
	Miera	coastal water	0146
Galicia Costa	Masma	coastal water	0125
	Oro	coastal water	0126
	Landro	coastal water	0127
	Sor	coastal water	0128
	Mera	coastal water	0129
	Grande de Jubia	coastal water	0130
	Belelle	coastal water	0131
	Eume	coastal water	0132
	Mandeo	coastal water	0133
	Mero	coastal water	0134
	Allones	coastal water	0135

Country: SPAIN			
Name of river, subarea and discharge area[1]		Nature of the receiving water[2]	National reference number
Discharge area	Name of river		
	Grande	coastal water	0136
	Castro	coastal water	0137
	Jallas	coastal water	0138
	Tambre	coastal water	0139
	Ulla	coastal water	0140
	Umia	coastal water	0141
	Lerez	coastal water	0142
	Verdugo - Oitabén	coastal water	0143
	Forcadas	coastal water	
	Furelos	tributary	014003
	Deza	tributary	014004
	Traba	coastal water	
Norte I	Miño	coastal water	0144
	Louro	Miño tributary	014428
Guadiana	Guadiana	coastal water	0401
	Piedras	coastal water	0402
	Odiel	coastal water	0403
	Tinto	coastal water	0404
Guadalquivir	Guadalquivir	coastal water	0501
	Guadaira	Guadalquivir tributary	050151
	Guadiamar	Guadalquivir tributary	050140
	Guadalete	coastal water	0502

[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

The Spanish area draining waters to the Convention waters is divided into nine discharge areas, the seven mentioned above and two more transboundary rivers (Duero and Tajo) that have to be monitored by Portugal. (See map below)



B. Total riverine inputs and direct discharges (Tables 4a and 4b) for the year 2005

B.1 Give general comments on the total riverine inputs and direct discharges (e.g. changes from last year, trends, percentage of particle bound determinand, results that need to be highlighted etc.):

This table shows the upper and lower values calculated as the addition of coastal and estuary direct discharges plus the upper and lower values of riverine inputs.

Increases in flow values for certain rivers and direct discharges are due to the addition of new control sites.

When no data were available for direct discharges, calculations were made assuming a 0 value.

Total riverine inputs and direct discharges in comparison to previous years

Year		2003		2004		2005	
Estimate		lower	upper	lower	upper	lower	upper
Flow rate (1000 m^3/d)		75,053.1		50,358.9		41,264.3	
Cd	[10^3 kg]	1.069	76.213	2.372	92.030	1.584	82.450
Hg	[10^3 kg]	0.220	13.273	1.438	4.675	0.225	5.136
Cu	[10^3 kg]	21.815	196.679	64.708	218.272	15.338	162.401
Pb	[10^3 kg]	20.543	202.936	3.147	356.161	7.314	187.299
Zn	[10^3 kg]	492.748	592.066	452.302	686.849	279.706	520.897
g-HCH	[kg]	8.185	52.071	0.983	108.926	2.587	76.203
PCBs	[kg]	9.441	216.537	17.639	333.894	0.003	237.557
NH_4-N	[10^6 kg]	20.194	21.289	18.977	20.298	15.415	17.970
NO_3-N	[10^6 kg]	70.765	70.895	40.290	40.382	17.596	32.285
PO_4-P	[10^6 kg]	2.447	3.355	1.745	2.763	2.731	4.114

Year	2003		2004		2005	
Estimate	lower	upper	lower	upper	lower	upper
Total N [10^6 kg]	88.539	88.981	64.066	64.672	59.725	65.522
Total P [10^6 kg]	4.625	4.828	3.728	4.391	4.189	5.058
SPM [10^6 kg]	839.127	847.703	764.860	782.106	701.050	788.927

C. Direct discharges for the year 2005

Explanatory note: The discharge areas named “Norte I” and “Norte III” only correspond to riverine inputs, not existing there any direct discharge to them. For this reason both areas are not included in the tables 5a to 5c.

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 (cf. section 7 of the RID Principles), including for those under voluntary reporting:

Measurement and reporting of direct discharges data in Spain is carried out by the different Autonomous Communities (Regions). Therefore, methodologies change from one discharge area to another, and also within the same discharge area, as different laboratories perform the analyses. However, some general comments can be extracted.

There are basically four data sources for flow calculations: annual discharge declarations provided by sewage plant managers, discharge permits issued, official discharge registries based on direct measurement from sewage plants (performed daily, weekly or monthly depending on the plant), and population estimations (taking into account seasonal population variations).

For concentration values, data sources are: annual discharge declarations provided by sewage plant managers, laboratory measurements from samples of sewage effluents and other direct discharges, estimations based on RID methodology or on historical studies, and different detection limits depending on the lab analyses.

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):

Other parameters measured in sewage effluents are DQO and DBO_5 *(Andalucía, Galicia and País Vasco), fats and oils (Andalucía and País Vasco), COT and PAHs (Andalucía), and Ni and Cr (Galicia).*

C.3 Give general comments on the discharges of sewage effluents (e.g. compared to previous years, and/or extent to which industrial effluents are discharged through sewerage systems):

Increases in flow values for the Norte II discharge area are due to the inclusion of new sewage plants in the reporting system.

Industrial Effluents (Table 5b.)

C.4 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 7 of the RID Principles), including for those under voluntary reporting:

The sources of information for industrial effluents are: the industries’ discharge declarations, regional discharge registries, direct control measurements, discharge permits, concentration values from previous years when effluents were similar and data were not available, and fixed values when measurements were below detection limits.

The number of samples varies among different discharge sites.

C.5 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

In the Andalucía region, the flow considered for industrial effluents includes refrigeration water (82% of total flow), but parameter measurements only reflect the analyses of water from industrial processes, which only represents 18% of industrial discharges.

In the País Vasco discharge area hydroelectric refrigeration waters have not been included in the industrial effluents.

C.6 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.:

Urban run-off and stormwater overflows were not sampled separately, but some sewage plants and industries include those discharges in their declarations. Also, in Andalucía there are some authorised stormwater and run-off discharge sites, but flow measurements are not available.

C.7 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):

Galicia has included DBO_5 and DQO in the analyses, but values have not been submitted. There is only additional information for the Andalucía region (parameters recommended by EPER for industrial activities), but classified by provinces and not by discharge area:

Pollutant load (t/year) Industrial direct discharges 2005				
Province	**Cádiz**	**Huelva**	**Sevilla**	**Total**
Flow rate (10^3 m^3/year)	4,622	329,785	58	334,465
Fats and Oils		22.25	12.7	35
DQO		5,467	124	5,591
COT	3.4	2,115	50.5	2,168.9
Arsenic (As)	0.002	3.7		3.7
Chromo (Cr)	0.01	0.2		0.21
Nickel (Ni)	0.01	0.4		0.41
PAHs (kg/year)	0.123	8.1		8.223
1,2 dichloroethane		0.2		0.2
AOX – Organochlorates	0.06	74.8		74.86
Phenols		1.3		1.3
Chlorides		2.959		2.959
Cyanides	0.00001	1		1.00001
Fluorides		7.5		7.5
Non polar HC		0.07		0.07
Cl_3CH.		0.2		0.2

C.8 Give general comments on industrial effluents (e.g. compared to previous years):

In 2003 Galicia included marine culture factories discharges in the industrial effluents data. In 2004 and 2005 these data have been included in a separate table, and therefore flow rate is significantly lower than in 2003.

Total direct discharges (Table 5c)

C.9 Give general comments on total direct discharges (e.g. compared to previous years):

Flow rate has increased probably because of the improved availability of discharges data. Zn concentration values have increased due to a higher discharge by a sewage plant in the País Vasco discharge area.

Total direct discharges to the maritime area 2003-2005

Year		2003		2004		2005	
Estimate		lower	upper	lower	upper	lower	upper
Flow rate (1000 m^3/d)		3,869.39		4,282.25		5,020.20	
Cd	[10 ^{3} kg]	0.461	5.028	1.354	9.153	1.480	10.601
Hg	[10 ^{3} kg]	0.212	1.059	0.963	1.652	0.203	1.046
Cu	[10 ^{3} kg]	4	11.674	6.921	18.792	11.276	28.783
Pb	[10 ^{3} kg]	1.242	40.269	2.057	46.052	3.560	52.691
Zn	[10 ^{3} kg]	32.97	48.089	36.803	44.939	83.700	95.156
g-HCH	[kg]	0.757	18.205	0.15	18.43	2.575	12.472
PCBs	[kg]	1.135	26.401	0	23.7	0.000	13.482
NH_4-N	[10^6 kg]	9.607	10.609	11.671	12.705	12.821	13.905
NO_3-N	[10^6 kg]	1.866	1.919	1.567	1.626	1.855	2.082
PO_4-P	[10^6 kg]	1.032	1.062	0.855	0.91	2.224	2.338
Total N	[10^6 kg]	21.63	22.066	20.388	20.995	23.982	24.734
Total P	[10^6 kg]	2.213	2.369	2.399	2.575	3.216	3.449
SPM	[10^6 kg]	352.3	360.163	334.43	341.603	414.848	424.244

D. Riverine inputs for the year 2005

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 6 of the RID Principles), including for those under voluntary reporting:

Measurement and calculation of riverine inputs data in Spain is carried out by the different River Basin Districts and Autonomous Communities (Regions). Therefore, methodologies change from one discharge area to another, and also within the same discharge area, as different laboratories perform the analyses. However, some general comments can be extracted.

Pais Vasco discharge area: the method used for the calculation of the annual load is the one described in paragraph 5.12 of the principles.

Guadiana, Guadalquivir and Galicia Costa: the method used is the one described in paragraph 5.11 of the principles. For the rest, the load has been calculated as the product of the best estimation of the annual flow and the annual mean concentration.

For the Guadiana discharge area loads of heavy metals from Odiel and Tinto have not been taken into account due to high natural concentrations that could distort the assessment of trends.

The basic sampling frequency is 12 samples a year, but it differs for each discharge area and parameter (see Table 7).

For Norte River Basin District the concentrations of considered pollutants have been obtained by 12 analyses corresponding to every month of a year period. The methods used are the following:

Métodos de medición

PARÁMETROS	NORMA DE REFERENCIA	METODO ANALÍTICO	UNIDAD
Cadmio	EPA 6010B EPA 6020A	Espectrometría de emisión de plasma de acoplamiento inductivo Espectrometría de masas con plasma acoplado inductivamente.	mg Cd/l
Mercurio	UNE 77-057-83	Fluorescencia atómica	mg Hg/l
Cobre	EPA 6010B EPA 6020A	Espectrometría de emisión de plasma de acoplamiento inductivo Espectrometría de masas con plasma acoplado inductivamente.	mg Cu/l
Plomo	EPA 6010B EPA 6020A	Espectrometría de emisión de plasma de acoplamiento inductivo Espectrometría de masas con plasma acoplado inductivamente.	mg Pb/l
Zinc	EPA 6010B EPA 6020A	Espectrometría de emisión de plasma de acoplamiento inductivo Espectrometría de masas con plasma acoplado inductivamente.	mg Zn/l
Amonio	ASTM D 1426-93	Espectrofotometría UV/vis.	mg N/l
Nitratos (Nitrógeno nítrico)	AOAC Official Method 973.50	Espectrofotometría UV/vis. Cromatografía iónica	mg NO_3^-/l

PARÁMETROS	NORMA DE REFERENCIA	METODO ANALÍTICO	UNIDAD
Nitrógeno Total Kjeldahl (NTK)	ISO 5663-1984	Digestión, destilación y titulación potenciométrica.	mg N/l
Nitritos	UNE 77-026-82	Espectrofotometría UV/vis.	mg NO_2/l
Fosfatos	UNE 77-029-83	Espectrofotometría UV/vis.	mg P_2O_5/l
Fósforo total	UNE 77-029-83	Espectrofotometría UV/vis.	mg P/l
Sólidos en suspensión	UNE-EN 77-033-082:1982	Gravimetría	mg/l
Dureza	EPA 6010B	Espectroscopia de emisión de plasma de acoplamiento inductivo con espectrofotómetro de emisión óptica.	mg $CaCO_3$/l
Compuestos organoclorados (19 compuestos)	ASTM D 5812-96	Extracción y cromatografía de gases con detectores de captura electrónica.	ng/l
Aceite mineral	UNE 77038:1983	Extracción y medida de absorbancia con método IR.	mg/l
PAH's (11 compuestos)	EPA METHOD 550.1	Extracción cromatografía líquida de alta resolución con detector de fluorescencia.	ng/l
PCB's (7 congéneres)	ASTM D 3534-85	Extracción y cromatografía de gases-masas con detector de captura electrónica.	ng/l

Flow values are monthly averages and the estimation of discharges has been obtained using expression number 1.

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

No important comments to be made

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):

Norte River Basin District includes the following determinands in the monitoring programme of Nervión, Saja, Nalón and Miño rivers: PAHs, mineral oil and PCBs.

D.4 Give general comments on the inputs from main rivers (e.g. significant changes in inputs, concentrations and flows compared to previous years):

		INPUTS FROM MAIN RIVERS 2004 - 2005												
		Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
		[10^3 kg]	[10^3 kg]	[10^3 kg]	[10^3 kg]	[10^3 kg]	[kg]	[kg]	[10^6 kg]	[10^6 kg]	[10^6 kg]	[10^6 kg]	[10^6 kg]	[10^6 kg]
2005	lower	0,096	0,022	3,979	1,976	176,158	0,011	0,003	1,994	12,620	0,476	30,736	0,828	273,123
	upper	70,769	3,096	126,201	123,567	400,868	62,936	222,454	3,304	25,549	1,454	35,231	1,462	335,921
2004	lower	0,000	0,467	34,452	0,409	138,167	0,000	16,030	5,579	33,865	0,782	37,972	1,061	380,705
	upper	80,644	2,454	171,159	293,679	358,525	88,862	305,907	5,859	33,895	1,478	37,972	1,548	390,774

Tributary Rivers (Tables 6b and 7b)

D.5 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 6 of the Principles):

Measurement and calculation of riverine inputs data in Spain is carried out by the different Autonomous Communities (Regions). Therefore, methodologies change from one discharge area to another, and also within the same discharge area, as different laboratories perform the analyses. However, some general comments can be extracted.

NORTE I, II y III: The concentrations of pollutants were taken from monthly analysis. The methods used are the same that the ones presented in the table in D.1.

The estimation of the annual load have been obtained using "expression 1" of the principles

D.6 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

No important comments to be made

D.7 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):

For the Guadalquivir discharge area PCBs have been measured.

For the Norte discharge area mineral oil, PCBs and PAHs have been measured.

D.8 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in Tables 6b and 7b:

No important comments to be made

D.9 Give general comments on the inputs from tributary rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

The following table represents differences between inputs from tributary rivers in 2004 and 2005

		INPUTS FROM TRIBUTARY RIVERS 2004 - 2005												
		Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
		[10^3 kg]	[10^3 kg]	[10^3 kg]	[10^3 kg]	[10^3 kg]	[kg]	[kg]	[10^6 kg]	[10^6 kg]	[10^6 kg]	[10^6 kg]	[10^6 kg]	[10^6 kg]
2005	lower	0,008	0,000	0,083	1,778	19,849	0,000	0,000	0,599	3,122	0,030	5,007	0,144	13,079
	upper	1,079	0,995	7,418	11,041	24,873	0,796	1,621	0,761	4,655	0,322	5,557	0,147	28,762
2004	lower	1,018	0,008	23,335	0,681	277,333	0,833	1,609	1,727	4,858	0,108	5,706	0,268	49,724
	upper	2,233	0,569	28,321	16,429	283,386	1,634	4,286	1,735	4,861	0,375	5,706	0,268	49,730

Total riverine inputs (Table 6c)

D.10 Give general comments on the total riverine inputs (e.g. significant change in inputs, concentrations and flows compared to previous years):

TOTAL RIVERINE INPUTS 2002 - 2005									
Year		2002		2003		2004		2005	
Estimate		lower	upper	lower	upper	lower	upper	lower	upper
Flow rate (1000 m^3/d)		73.504,20		71.183,74		46.076,65		36.244,06	
Cd	[10^3 kg]	1,27	9,173	0,608	71,185	1,018	82,877	0,104	71,848
Hg	[10^3 kg]	0,093	11,769	0,01	12,214	0,475	3,023	0,021	4,0903
Cu	[10^3 kg]	10,29	116,723	17,815	185,005	57,787	199,48	4,0621	133,618
Pb	[10^3 kg]	5,402	68,164	19,302	162,667	1,09	310,109	3,7537	134,608
Zn	[10^3 kg]	849,918	855,228	459,777	543,977	15,5	641,911	196,006	425,741
g-HCH	[kg]	9,25	24,947	7,428	33,866	0,833	90,496	0,011	63,731
PCBs	[kg]	19,863	34,917	8,306	190,135	17,639	310,194	0,003	224,075
NH_4-N	[10^6 kg]	10,91	11,054	10,587	10,681	7,306	7,594	2,593	4,0654
NO_3-N	[10^6 kg]	108,806	109,231	68,899	68,796	38,723	38,756	15,741	30,203
PO_4-P	[10^6 kg]	1,635	2,308	1,414	2,293	0,89	1,853	0,506	1,776
Total N	[10^6 kg]	57,079	57,122	66,909	66,915	43,677	43,677	35,743	40,787
Total P	[10^6 kg]	3,354	3,357	2,411	2,459	1,329	1,816	0,9721	1,609
SPM	[10^6 kg]	228,482	229,74	486,826	487,54	430,429	440,503	286,201	364,683

Significant differences between years 2002-2003 and 2004-2005 have been detected in flow values due to a severe drought suffered by Spain in the last two years.

F. Limits of detection (Table 8)

F.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Give comments if the detection limits are higher than stated in the RID Principles.

There are variations in these values from urban to industrial effluents and among the different discharge areas because analyses were carried out by different laboratories. Limits of detection for marine culture discharges are only provided by País Vasco.

G. Additional comments

G.1 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

When no data were available, calculations were made assuming a 0 value.

Methods vary depending on the laboratory that carried out the analyses, and may not be consistent with RID methodology.

Some increases in flow rates and pollutant inputs, instead of reflecting the actual evolution of inputs, may be due to more information availability than in previous years because discharge declarations and registries are undergoing an on-going improvement.

Loads from Odiel and Tinto have not been taken into account due to high natural concentrations of heavy metals that could distort the assessment of trends.

Table 4a. Total Direct discharges and Riverine inputs to the maritime area in 2005 by Spain.

Total inputs			Quantities --->												
Discharge area	**Estimate**	**Flow rate (1000 m3/d)**	**Cd [10^3 kg]**	**Hg [10^3 kg]**	**Cu [10^3 kg]**	**Pb [10^3 kg]**	**Zn [10^3 kg]**	**g-HCH [kg]**	**PCBs [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 [10^6 kg]**
PAÍS VASCO	lower	10,995.39	0.670	0.019	12.507	5.415	114.256	0.000	0.003	2.582	7.549	0.474	19.961	1.062	94.609
	upper		6.813	3.822	36.808	71.091	128.820	0.019	0.016	2.674	7.549	1.373	20.217	1.135	94.783
NORTE III	lower	904.61	0.000	0.000	0.260	0.087	15.037	0.000	0.000	0.108	0.745	0.011	1.311	0.042	2.937
	upper		0.330	0.017	1.767	1.037	15.037	3.302	11.279	0.109	0.745	0.020	1.311	0.055	2.937
NORTE II	lower	7,498.83	0.571	0.173	1.452	1.446	77.056	0.000	0.000	6.134	2.762	0.344	20.819	2.088	355.882
	upper		7.346	0.861	19.969	19.984	84.105	25.254	49.413	6.157	2.775	0.386	20.873	2.241	358.569
GALICIA COSTA	lower	11,879.22	0.000	0.000	0.031	0.302	0.109	0.000	0.000	0.000	0.000	0.000	0.466	0.073	2.993
	upper		0.247	0.092	22.841	10.020	33.075	0.000	0.000	2.224	14.372	0.351	5.951	0.271	83.622
NORTE I (Miño)	lower	6,942.17	0.000	0.000	0.060	0.010	39.281	0.000	0.000	0.200	1.951	0.021	5.301	0.021	4.704
	upper		2.534	0.127	12.692	9.287	50.223	25.339	38.012	0.244	1.951	0.101	5.301	0.193	9.091
GUADIANA	lower	1,003.00	0.004	0.026	0.966	0.037	3.640	0.000	0.000	1.270	1.861	0.331	4.143	0.173	218.916
	upper		62.709	0.070	63.667	63.527	160.921	11.911	126.770	1.440	2.012	0.331	4.143	0.433	218.916
GUADALQUIVIR	lower	2,041.03	0.339	0.006	0.062	0.018	30.327	2.587	0.000	5.120	2.728	1.549	7.725	0.730	21.009
	upper		2.471	0.148	4.658	12.354	48.717	10.377	12.068	5.123	2.880	1.552	7.725	0.730	21.009
TOTAL	**lower**	**41,264.26**	**1.584**	**0.225**	**15.338**	**7.314**	**279.706**	**2.587**	**0.003**	**15.415**	**17.596**	**2.731**	**59.725**	**4.189**	**701.050**
	upper		**82.450**	**5.136**	**162.401**	**187.299**	**520.897**	**76.203**	**237.557**	**17.970**	**32.285**	**4.114**	**65.522**	**5.058**	**788.927**

Table 5a. Sewage direct discharges to the maritime area in 2005 by Spain.

Sewage direct discharges				Quantities --->												
Discharge area	Nature of receiving waters	Flow rate (1000 m3/d)	Estimate	Cd [10^3 kg]	Hg [10^3 kg]	Cu [10^3 kg]	Pb [10^3 kg]	Zn [10^3 kg]	g-HCH [kg]	PCBs [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 [10^6 kg]
PAIS VASCO	Coastal	229.86	lower	0.630	0.019	6.284	2.135	50.648	NI	NI	1.369	0.028	0.025	2.654	0.292	58.127
			upper	2.022	0.081	8.319	18.891	51.334	NI	NI	1.375	0.028	0.025	2.654	0.296	58.127
	Estuary	362.48	lower	0.013	NI	1.873	0.000	14.054	NI	NI	0.124	0.925	0.324	1.112	0.074	1.544
			upper	0.997	NI	8.197	13.632	16.028	NI	MI	0.168	0.925	0.324	1.368	0.138	1.565
Norte II (Cantabria)	Coastal	198.50	lower	0.091	NI	0.002	0.087	2.010	NI	NI	0.699	0.084	NI	6.667	1.608	15.040
			upper	0.091	NI	0.002	0.089	2.019	NI	NI	0.699	0.084	NI	6.667	1.608	15.040
	Estuary	16.25	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.310	0.087	1.675
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.365	0.087	1.675
Norte II (Asturias)	Coastal	126.75	lower	0.000	0.000	0.000	0.000	0.025	NI	NI	1.567	0.014	0.222	2.253	0.231	2.731
			upper	2.510	0.230	3.395	8.856	2.522	NI	NI	1.567	0.026	0.222	2.253	0.231	2.731
	Estuary	42.36	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.220	0.020	0.026	0.290	0.037	0.492
			upper	0.773	0.093	1.237	0.928	0.773	NI	NI	0.220	0.020	0.026	0.290	0.037	0.492
SUBTOTAL NORTE II	Coastal	325.25	lower	0.091	0.000	0.002	0.087	2.035	0.000	0.000	2.266	0.098	0.222	8.920	1.839	17.770
			upper	2.601	0.230	3.397	8.945	4.541	0.000	0.000	2.266	0.110	0.222	8.920	1.839	17.770
	Estuary	58.61	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.220	0.020	0.026	0.600	0.124	2.167
			upper	0.773	0.093	1.237	0.928	0.773	0.000	0.000	0.220	0.020	0.026	0.655	0.124	2.167
GALICIA COSTA	Coastal	7.59	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.064
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.064
	Estuary	239.83	lower	0.000	NI	0.000	0.288	0.082	NI	NI	NI	NI	NI	0.466	0.073	2.929
			upper	0.223	NI	0.223	0.987	0.464	NI	NI	NI	NI	NI	0.466	0.073	2.929
GUADIANA (Andalucía)	Coastal	22.00	lower	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.571	0.000	0.029	0.479	0.024	0.361
			upper	0.048	0.008	0.102	0.225	0.450	0.401	0.465	0.368	0.012	0.011	0.285	0.009	0.439
	Estuary	58.01	lower	0.000	0.000	0.124	0.000	0.393	0.000	0.000	0.536	0.165	0.080	0.510	0.067	1.055
			upper	0.103	0.019	0.280	0.411	1.022	1.059	0.479	0.740	0.190	0.098	0.704	0.083	0.976
GUADALQUIVIR (Andalucía)	Coastal	76.87	lower	0.000	0.000	0.000	0.000	0.000	2.411	0.000	0.965	0.378	0.440	0.979	0.181	1.899
			upper	1.113	0.017	1.257	2.526	1.363	3.663	1.311	0.965	0.397	0.440	0.979	0.181	1.899
	Estuary	246.35	lower	0.262	0.006	0.008	0.018	2.590	0.164	0.000	3.232	0.061	1.020	3.538	0.427	3.465
			upper	1.107	0.081	1.481	3.596	4.409	6.263	10.320	3.232	0.194	1.020	3.538	0.427	3.465
TOTAL	**Coastal**	**661.57**	**lower**	**0.721**	**0.019**	**6.307**	**1.910**	**52.683**	**2.411**	**0.000**	**5.171**	**0.505**	**0.715**	**13.032**	**2.336**	**78.221**
			upper	**5.784**	**0.336**	**13.075**	**30.587**	**57.687**	**4.065**	**1.777**	**4.974**	**0.548**	**0.697**	**12.838**	**2.324**	**78.299**
	Estuary	**965.27**	**lower**	**0.275**	**0.006**	**2.004**	**0.306**	**17.120**	**0.164**	**0.000**	**4.113**	**1.171**	**1.450**	**6.226**	**0.765**	**11.159**
			upper	**3.203**	**0.192**	**11.417**	**19.552**	**22.696**	**7.321**	**10.800**	**4.361**	**1.329**	**1.468**	**6.731**	**0.845**	**11.102**
OVERALL TOTAL:		**1,626.84**	**lower**	**0.996**	**0.026**	**8.311**	**2.216**	**69.802**	**2.575**	**0.000**	**9.284**	**1.675**	**2.165**	**19.258**	**3.101**	**89.380**
			upper	**8.987**	**0.529**	**24.492**	**50.139**	**80.383**	**11.386**	**12.576**	**9.335**	**1.877**	**2.165**	**19.569**	**3.170**	**89.402**

Table 5b. Industrial direct discharges to the maritime area in 2005 by Spain.

Industrial direct discharges				Quantities --->												
Discharge area	**Nature of receiving waters**	**Flow rate (1000 m3/d)**	**Estimate**	**Cd [10^3 kg]**	**Hg [10^3 kg]**	**Cu [10^3 kg]**	**Pb [10^3 kg]**	**Zn [10^3 kg]**	**g-HCH [kg]**	**PCBs [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 [10^6 kg]**
PAIS VASCO	**Coastal**	10.36	lower	0.000	0.000	0.010	0.000	0.185	NI	NI	0.034	0.009	0.003	0.044	0.023	0.065
			upper	0.038	0.004	0.039	0.189	0.199	NI	NI	0.034	0.009	0.003	0.044	0.023	0.065
	Estuary	11.29	lower	0.000	0.000	0.650	0.019	0.454	NI	NI	0.034	0.000	NI	NI	0.001	0.671
			upper	0.006	0.002	0.684	0.028	0.458	NI	NI	0.034	0.000	NI	NI	0.001	0.671
Norte II (Cantabria)	**Coastal**	54.71	lower	0.188	0.081	0.599	NI	0.521	NI	NI	0.385	0.000	NI	0.571	0.015	315.016
			upper	0.188	0.081	0.599	NI	0.521	NI	NI	0.385	0.000	NI	0.571	0.015	315.016
	Estuary	48.98	lower	0.000	0.061	0.001	0.001	0.001	NI	NI	0.462	NI	NI	0.532	0.007	6.016
			upper	0.000	0.061	0.001	0.001	0.001	NI	NI	0.462	NI	NI	0.532	0.007	6.016
Norte II (Asturias)	**Coastal**	39.91	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.004	0.007	0.036	0.014	0.651
			upper	0.728	0.073	1.165	0.728	0.728	NI	NI	0.015	0.005	0.007	0.036	0.014	0.651
	Estuary	52.38	lower	0.292	0.030	0.850	0.976	9.484	NI	NI	2.462	0.100	0.014	3.293	0.016	1.052
			upper	0.530	0.197	0.942	1.166	9.525	NI	NI	2.462	0.101	0.014	3.293	0.016	1.052
SUBTOTAL NORTE II	**Coastal**	94.61	lower	0.188	0.081	0.599	0.000	0.521	0.000	0.000	0.385	0.004	0.007	0.607	0.028	315.667
			upper	0.917	0.154	1.764	0.728	1.249	0.000	0.000	0.400	0.005	0.007	0.607	0.028	315.667
	Estuary	101.36	lower	0.292	0.091	0.851	0.976	9.485	0.000	0.000	2.924	0.100	0.014	3.825	0.024	7.068
			upper	0.530	0.258	0.944	1.167	9.527	0.000	0.000	2.924	0.101	0.014	3.825	0.024	7.068
GALICIA COSTA	**Coastal**	35.12	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	NI	0.077	NI	NI	NI	NI	NI	0.488	NI	NI	0.003	0.008	2.193
	Estuary	462.19	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	0.023	0.010	NI	0.003	0.034	NI	NI	0.529	NI	NI	0.437	0.156	4.932
GUADIANA (Andalucía)	**Coastal**	0.00	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Estuary	903.52	lower	0.004	0.006	0.822	0.037	3.247	0.000	0.000	0.142	0.045	0.032	0.213	0.031	1.750
			upper	0.098	0.013	0.824	0.431	3.299	1.081	0.905	0.142	0.069	0.033	0.213	0.031	1.750
GUADALQUIVIR (Andalucía)	**Coastal**	0.17	lower	0.000	0.000	0.001	0.000	0.005	0.000	0.000	0.001	0.002	0.000	0.001	0.001	0.004
			upper	0.002	0.000	0.003	0.005	0.006	0.004	0.000	0.001	0.002	0.000	0.001	0.001	0.004
	Estuary	12.65	lower	0.000	0.000	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.022
			upper	0.000	0.000	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.022
TOTAL	**Coastal**	**140.27**	**lower**	**0.188**	**0.081**	**0.610**	**0.000**	**0.711**	**0.000**	**0.000**	**0.421**	**0.016**	**0.011**	**0.652**	**0.052**	**315.736**
			upper	**0.957**	**0.234**	**1.805**	**0.921**	**1.455**	**0.004**	**0.000**	**0.923**	**0.016**	**0.011**	**0.655**	**0.060**	**317.929**
	Estuary	**1,491.00**	**lower**	**0.296**	**0.097**	**2.355**	**1.032**	**13.187**	**0.000**	**0.000**	**3.100**	**0.145**	**0.047**	**4.040**	**0.057**	**9.511**
			upper	**0.657**	**0.283**	**2.485**	**1.630**	**13.318**	**1.081**	**0.905**	**3.628**	**0.170**	**0.047**	**4.477**	**0.212**	**14.443**
OVERALL TOTAL:		**1,631.27**	**lower**	**0.484**	**0.177**	**2.965**	**1.032**	**13.897**	**0.000**	**0.000**	**3.520**	**0.160**	**0.058**	**4.693**	**0.109**	**325.246**
			upper	**1.614**	**0.517**	**4.290**	**2.551**	**14.772**	**1.086**	**0.906**	**4.552**	**0.186**	**0.058**	**5.132**	**0.273**	**332.372**

Table 5b1. Marine culture factories discharges to the maritime area in 2005 by Spain.

Industrial direct discharges				Quantities --->												
Discharge area	**Nature of receiving waters**	**Flow rate (1000 m3/d)**	**Estimate**	**Cd [10^3 kg]**	**Hg [10^3 kg]**	**Cu [10^3 kg]**	**Pb [10^3 kg]**	**Zn [10^3 kg]**	**g-HCH [kg]**	**PCBs [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 [10^6 kg]**
PAIS VASCO	Coastal	146.40	lower	NI	NI	NI	NI	NI	NI	NI	0.017	0.019	0.001	0.031	0.006	0.210
			upper	NI	NI	NI	NI	NI	NI	NI	0.017	0.019	0.001	0.031	0.006	0.210
	Estuary	0.00	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Norte II (Cantabria)	Coastal	NI	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Estuary	NI	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Norte II (Asturias)	Coastal	NI	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Estuary	NI	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
SUBTOTAL NORTE II	Coastal		lower													
			upper													
	Estuary		lower													
			upper													
GALICIA COSTA	Coastal	1,077.22	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.079	0.001	0.000	0.969
	Estuary	518.98	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	NI	NI	NI	NI	NI	NI	NI	0.001	NI	0.035	NI	NI	1.279
GUADIANA (Andalucía)	Coastal	0.00	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Estuary	19.48	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.011
			upper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.011
GUADALQUIVIR (Andalucía)	Coastal	0.00	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Estuary	0.00	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	**Coastal**	**1,223.62**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.017**	**0.019**	**0.001**	**0.031**	**0.006**	**0.210**
			upper	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.017**	**0.019**	**0.080**	**0.032**	**0.006**	**1.180**
	Estuary	**538.46**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	**0.000**	**0.000**	**0.000**	**0.011**
			upper	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.035**	**0.000**	**0.000**	**1.291**
OVERALL TOTAL:		**1,762.09**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.017**	**0.019**	**0.001**	**0.032**	**0.006**	**0.222**
			upper	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.018**	**0.019**	**0.115**	**0.032**	**0.007**	**2.470**

Table 5c. Total direct discharges to the maritime area in 2005 by Spain.

Total direct discharges				Quantities --->												
Discharge area	Nature of receiving waters	Flow rate (1000 m3/d)	Estimate	Cd [10^3 kg]	Hg [10^3 kg]	Cu [10^3 kg]	Pb [10^3 kg]	Zn [10^3 kg]	g-HCH [kg]	PCBs [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 [10^6 kg]
PAIS VASCO	Coastal	386.62	lower	0.630	0.019	6.295	2.135	50.833	0.000	0.000	1.419	0.056	0.029	2.729	0.321	58.403
			upper	2.060	0.085	8.358	19.079	51.533	0.000	0.000	1.426	0.056	0.029	2.729	0.325	58.403
	Estuary	373.77	lower	0.013	0.000	2.523	0.019	14.508	0.000	0.000	0.158	0.925	0.324	1.112	0.074	2.214
			upper	1.003	0.002	8.881	13.660	16.486	0.000	0.000	0.202	0.925	0.324	1.368	0.139	2.236
Norte II (Cantabria)	Coastal	253.21	lower	0.279	0.081	0.601	0.087	2.531	0.000	0.000	1.084	0.084	0.000	7.238	1.622	330.056
			upper	0.279	0.081	0.600	0.089	2.540	0.000	0.000	1.084	0.084	0.000	7.238	1.622	330.056
	Estuary	65.23	lower	0.000	0.061	0.001	0.001	0.001	0.000	0.000	0.462	0.000	0.000	0.842	0.095	7.691
			upper	0.000	0.061	0.001	0.001	0.001	0.000	0.000	0.462	0.000	0.000	0.897	0.095	7.691
Norte II (Asturias)	Coastal	166.65	lower	0.000	0.000	0.000	0.000	0.025	0.000	0.000	1.567	0.018	0.229	2.290	0.245	3.382
			upper	3.238	0.303	4.561	9.584	3.250	0.000	0.000	1.582	0.030	0.229	2.290	0.245	3.382
	Estuary	94.73	lower	0.292	0.030	0.850	0.976	9.484	0.000	0.000	2.682	0.119	0.040	3.583	0.053	1.544
			upper	1.303	0.290	2.179	2.094	10.298	0.000	0.000	2.682	0.120	0.040	3.583	0.054	1.544
SUBTOTAL NORTE II	Coastal	419.86	lower	0.279	0.081	0.601	0.087	2.556	0.000	0.000	2.651	0.103	0.229	9.527	1.868	333.437
			upper	3.517	0.384	5.161	9.673	5.790	0.000	0.000	2.666	0.115	0.229	9.527	1.868	333.437
	Estuary	159.96	lower	0.292	0.091	0.851	0.976	9.485	0.000	0.000	3.144	0.119	0.040	4.425	0.148	9.235
			upper	1.303	0.351	2.181	2.095	10.300	0.000	0.000	3.144	0.120	0.040	4.480	0.148	9.235
GALICIA COSTA	Coastal	1,119.94	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.064
			upper	0.000	0.077	0.000	0.000	0.000	0.000	0.000	0.488	0.000	0.079	0.004	0.008	3.226
	Estuary	1,221.00	lower	0.000	0.000	0.000	0.288	0.082	0.000	0.000	0.000	0.000	0.000	0.466	0.073	2.929
			upper	0.246	0.010	0.223	0.990	0.498	0.000	0.000	0.530	0.000	0.035	0.902	0.228	9.140
GUADIANA (ANDALUCIA)	Coastal	22.00	lower	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.571	0.000	0.029	0.479	0.024	0.361
			upper	0.048	0.008	0.102	0.225	0.450	0.401	0.465	0.368	0.012	0.011	0.285	0.009	0.439
	Estuary	981.01	lower	0.004	0.006	0.946	0.037	3.640	0.000	0.000	0.678	0.211	0.113	0.724	0.098	2.816
			upper	0.200	0.032	1.104	0.842	4.321	2.140	1.385	0.882	0.260	0.131	0.918	0.114	2.738
GUADALQUIVIR (ANDALUCIA)	Coastal	77.05	lower	0.000	0.000	0.001	0.000	0.005	2.411	0.000	0.966	0.381	0.441	0.980	0.181	1.903
			upper	1.116	0.018	1.259	2.531	1.369	3.668	1.312	0.966	0.399	0.441	0.980	0.181	1.903
	Estuary	259.00	lower	0.262	0.006	0.040	0.018	2.590	0.164	0.000	3.233	0.061	1.020	3.540	0.429	3.486
			upper	1.107	0.081	1.513	3.596	4.409	6.263	10.320	3.233	0.194	1.020	3.540	0.429	3.486
TOTAL	Coastal	2,025.46	lower	**0.910**	**0.100**	**6.917**	**2.222**	**53.394**	**2.411**	**0.000**	**5.609**	**0.539**	**0.727**	**13.715**	**2.394**	**394.167**
			upper	**6.741**	**0.571**	**14.881**	**31.508**	**59.142**	**4.069**	**1.777**	**5.915**	**0.583**	**0.788**	**13.525**	**2.391**	**397.408**
	Estuary	2,994.73	lower	**0.570**	**0.103**	**4.359**	**1.338**	**30.306**	**0.164**	**0.000**	**7.213**	**1.316**	**1.496**	**10.267**	**0.822**	**20.681**
			upper	**3.860**	**0.475**	**13.902**	**21.182**	**36.014**	**8.403**	**11.705**	**7.990**	**1.499**	**1.550**	**11.208**	**1.058**	**26.836**
OVERALL TOTAL:		**5,020.20**	**lower**	**1.480**	**0.203**	**11.276**	**3.560**	**83.700**	**2.575**	**0.000**	**12.821**	**1.855**	**2.224**	**23.982**	**3.216**	**414.848**
			upper	**10.601**	**1.046**	**28.783**	**52.691**	**95.156**	**12.472**	**13.482**	**13.905**	**2.082**	**2.338**	**24.734**	**3.449**	**424.244**

Table 6a. Main riverine inputs to the maritime area in 2005 by Spain

Main riverine inputs				Quantities --->												
Discharge area (or name of river)	Flow rate [1000 m³/d] 2005	LTA	Estimate	Cd [10³ kg]	Hg [10³ kg]	Cu [10³ kg]	Pb [10³ kg]	Zn [10³ kg]	g-HCH [kg]	PCBs [kg]	NH4-N [10⁶ kg]	NO3-N [10⁶ kg]	PO4-P [10⁶ kg]	Total N [10⁶ kg]	Total P [10⁶ kg]	SPM [10⁶ kg]
Deva	1257.14	NI	lower	0.000	0.000	0.516	0.688	13.536	NI	NI	0.450	0.564	0.073	2.282	0.130	5.449
			upper	0.459	0.459	2.524	4.703	14.110	NI	NI	0.450	0.564	0.148	2.282	0.131	5.449
Urola	1002.50	NI	lower	0.000	0.000	0.000	0.000	2.129	0.000	0.000	0.005	0.603	0.000	1.057	0.058	0.847
			upper	0.366	0.366	1.830	3.659	3.460	0.004	0.004	0.016	0.603	0.096	1.057	0.058	0.899
Oria	2424.38	NI	lower	0.000	0.000	2.655	0.000	0.000	NI	NI	0.196	1.113	0.000	3.602	0.191	10.486
			upper	0.885	0.885	4.867	8.849	4.424	NI	NI	0.196	1.113	0.231	3.602	0.191	10.486
Urumea	864.73	NI	lower	0.000	0.000	0.168	0.289	3.893	0.000	0.003	0.007	0.185	0.000	1.667	0.050	1.306
			upper	0.316	0.316	1.615	3.183	4.550	0.003	0.000	0.015	0.185	0.082	1.667	0.050	1.345
Oyarzun	370.58	NI	lower	0.000	0.000	0.135	0.135	12.670	0.000	0.000	0.004	0.162	0.000	0.252	0.012	0.291
			upper	0.135	0.135	0.755	1.375	12.782	0.001	0.001	0.007	0.162	0.035	0.252	0.012	0.342
Barbadun	264.80	NI	lower	0.000	0.000	0.000	0.113	1.563	0.000	0.000	0.002	0.123	0.000	0.180	0.006	0.353
			upper	0.097	0.097	0.483	0.999	1.965	0.001	0.001	0.004	0.123	0.025	0.180	0.006	0.353
Butrón	478.96	NI	lower	0.000	0.000	0.000	0.000	0.509	0.000	0.000	0.084	0.422	0.042	0.912	0.057	1.713
			upper	0.175	0.175	0.874	1.748	1.224	0.002	0.002	0.084	0.422	0.062	0.912	0.057	1.713
Oca	413.99	NI	lower	0.027	0.000	0.137	0.165	1.250	0.000	0.000	0.156	0.200	0.006	1.211	0.051	1.056
			upper	0.165	0.151	0.824	1.539	1.800	0.002	0.002	0.156	0.200	0.040	1.211	0.051	1.056
Lea	257.98	NI	lower	0.000	0.000	0.077	0.103	0.933	0.000	0.000	0.003	0.098	0.000	0.153	0.005	0.334
			upper	0.094	0.094	0.505	0.959	1.275	0.001	0.001	0.005	0.098	0.025	0.153	0.005	0.334
Artibay	189.59	NI	lower	0.000	0.000	0.000	0.000	0.321	0.000	0.000	0.010	0.045	0.000	0.544	0.006	0.430
			upper	0.069	0.069	0.346	0.692	0.541	0.001	0.001	0.012	0.045	0.018	0.544	0.007	0.440
PAÍS VASCO SUBTOTAL	**7,524.64**	**0.00**	**lower**	**0.027**	**0.000**	**3.689**	**1.493**	**36.803**	**0.000**	**0.003**	**0.916**	**3.515**	**0.121**	**11.859**	**0.566**	**22.264**
			upper	**2.760**	**2.746**	**14.623**	**27.705**	**46.131**	**0.014**	**0.011**	**0.946**	**3.515**	**0.761**	**11.859**	**0.568**	**22.416**
Nervión	904.61	904.61	lower	0.000	0.000	0.260	0.087	15.037	0.000	0.000	0.108	0.745	0.011	1.311	0.042	2.937
			upper	0.330	0.017	1.767	1.037	15.037	3.302	11.279	0.109	0.745	0.020	1.311	0.055	2.937
NORTE III SUBTOTAL	**904.61**	**904.61**	**lower**	**0.000**	**0.000**	**0.260**	**0.087**	**15.037**	**0.000**	**0.000**	**0.108**	**0.745**	**0.011**	**1.311**	**0.042**	**2.937**
			upper	**0.330**	**0.017**	**1.767**	**1.037**	**15.037**	**3.302**	**11.279**	**0.109**	**0.745**	**0.020**	**1.311**	**0.055**	**2.937**
Saja	1,710.86	1,710.86	lower	0.000	0.000	0.000	0.382	27.427	0.000	0.000	0.114	0.592	0.007	1.429	0.025	6.200
			upper	0.624	0.031	3.122	2.085	27.427	6.245	21.849	0.120	0.592	0.029	1.429	0.062	6.200
Nalón	4,434.91	4,434.91	lower	0.000	0.002	0.000	0.000	29.341	0.000	0.000	0.197	1.653	0.062	4.503	0.030	6.990
			upper	1.619	0.081	8.094	5.075	32.073	16.187	27.564	0.199	1.653	0.072	4.503	0.132	8.845
Sella	549.68	549.68	lower	0.000	0.000	0.000	0.000	6.265	0.000	NI	0.016	0.186	0.002	0.703	0.013	0.000
			upper	0.201	0.010	1.003	0.808	6.265	2.006	NI	0.016	0.186	0.010	0.703	0.023	0.602
Miera	223.56	223.56	lower	0.000	0.000	0.000	0.000	1.981	0.000	NI	0.012	0.110	0.003	0.231	0.004	0.019
			upper	0.082	0.004	0.408	0.249	2.250	0.816	NI	0.012	0.110	0.006	0.231	0.008	0.250
NORTE II SUBTOTAL	**6,919.01**	**6,919.01**	**lower**	**0.000**	**0.002**	**0.000**	**0.382**	**65.014**	**0.000**	**0.000**	**0.339**	**2.540**	**0.075**	**6.867**	**0.073**	**13.210**
			upper	**2.525**	**0.126**	**12.627**	**8.216**	**68.015**	**25.254**	**49.413**	**0.347**	**2.540**	**0.117**	**6.867**	**0.225**	**15.897**

Table 6a. Main riverine inputs to the maritime area in 2005 by Spain

Main riverine inputs				Quantities --->												
Discharge area (or name of river)	Flow rate [1000 m³/d] 2005	Flow rate [1000 m³/d] LTA	Estimate	Cd [10 ^{3} kg]	Hg [10 ^{3} kg]	Cu [10 ^{3} kg]	Pb [10 ^{3} kg]	Zn [10 ^{3} kg]	g-HCH [kg]	PCBs [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 [10^6 kg]
Masma	297.98	397.62	lower	0.00000	0.00000	0.00053	0.00000	0.00028	NI	NI	0.00000	0.00000	0.000	0.00000	NI	0.00000
			upper	0.00002	0.00012	0.80440	0.00054	1.70305	NI	NI	0.02817	0.41878	0.003	0.13389	NI	0.52499
Ouro	219.92	370.05	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.492	0.739	0.000	NI	NI	0.025	0.228	0.001	0.084	NI	0.521
Landro	385.61	592.88	lower	0.000	0.000	0.001	0.001	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.969	1.154	2.064	NI	NI	0.048	0.332	0.003	0.127	NI	1.420
Sor	311.41	527.77	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.704	0.000	0.934	NI	NI	0.011	0.221	0.000	0.057	NI	0.636
Mera	205.93	418.03	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.432	0.000	0.851	NI	NI	0.008	0.237	0.001	0.061	NI	0.512
Jubía	163.37	311.67	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.471	0.000	0.819	NI	NI	0.020	0.233	0.001	0.076	NI	0.704
Forcadas	68.87	140.70	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.106	0.000	0.352	NI	NI	0.005	0.103	0.000	0.035	NI	0.227
Belelle	107.72	220.07	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.141	0.000	0.384	NI	NI	0.004	0.195	0.000	0.054	NI	0.226
Eume	829.95	1695.65	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	1.768	0.001	4.719	NI	NI	0.050	0.952	0.001	0.460	NI	1.062
Mandeo	290.38	771.01	lower	0.000	0.000	0.001	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.637	0.000	0.644	NI	NI	0.040	0.420	0.003	0.127	NI	1.285
Mero	293.76	456.19	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	2.027	0.000	1.309	NI	NI	0.034	0.764	0.002	0.214	NI	0.578
Allones	557.78	942.19	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	1.325	0.001	2.843	NI	NI	0.129	1.545	0.030	0.503	NI	7.197
Grande	365.40	647.05	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.887	1.307	1.217	NI	NI	0.092	0.695	0.015	0.254	NI	6.170
Castro	94.25	166.91	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.136	0.000	0.314	NI	NI	0.012	0.098	0.003	0.035	NI	0.311
Jallas	417.04	738.51	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.788	0.001	0.658	NI	NI	0.073	0.941	0.009	0.290	NI	1.453
Tambre	1416.18	3828.06	lower	0.000	0.000	0.004	0.000	0.002	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.001	2.864	0.002	2.153	NI	NI	0.211	3.220	0.030	0.946	0.014	14.653
Traba	628.21	315.61	lower	0.000	0.000	0.001	0.001	0.001	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	1.894	2.042	1.914	NI	NI	0.117	1.443	0.071	0.418	NI	1.740
Ulla	734.40	1337.48	lower	0.000	0.000	0.013	0.011	0.013	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.001	0.003	2.800	3.780	2.415	NI	NI	0.056	0.007	0.011	0.326	NI	3.927
Umia	523.49	846.27	lower	0.000	0.000	0.000	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.818	0.000	2.269	NI	NI	0.041	0.426	0.008	0.129	0.020	1.280
Lérez	307.93	1248.93	lower	0.000	0.000	0.001	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.325	0.001	2.419	NI	NI	0.041	0.220	0.008	0.117	NI	10.420

Table 6a. Main riverine inputs to the maritime area in 2005 by Spain

Main riverine inputs				Quantities --->												
Discharge area (or name of river)	Flow rate [1000 m³/d] 2005	LTA	Estimate	Cd [10 ³ kg]	Hg [10 ³ kg]	Cu [10 ³ kg]	Pb [10 ³ kg]	Zn [10 ³ kg]	g-HCH [kg]	PCBs [kg]	NH4-N [10⁶ kg]	NO3-N [10⁶ kg]	PO4-P [10⁶ kg]	Total N [10⁶ kg]	Total P [10⁶ kg]	SPM [10⁶ kg]
Verdugo _ Oitabén	219.78	483.92	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.231	0.000	0.497	NI	NI	0.011	0.140	0.002	0.047	NI	0.726
GALICIA COSTA SUBTOTAL	**8,659.29**	**16,826.63**	**lower**	**0.000**	**0.000**	**0.030**	**0.014**	**0.025**	**NI**	**NI**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
			upper	**0.001**	**0.005**	**20.620**	**9.030**	**30.478**	**NI**	**NI**	**1.056**	**12.839**	**0.204**	**4.496**	**0.034**	**55.573**
Miño	6,728.40	6,728.40	lower	0.000	0.000	0.000	0.000	35.513	0.000	0.000	0.103	1.891	0.012	4.988	0.000	3.742
			upper	2.456	0.123	12.279	9.038	46.455	24.559	36.406	0.146	1.891	0.092	4.988	0.172	8.128
NORTE I SUBTOTAL	**6,728.40**	**6,728.40**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**35.513**	**0.000**	**0.000**	**0.103**	**1.891**	**0.012**	**4.988**	**0.000**	**3.742**
			upper	**2.456**	**0.123**	**12.279**	**9.038**	**46.455**	**24.559**	**36.406**	**0.146**	**1.891**	**0.092**	**4.988**	**0.172**	**8.128**
Guadiana		8,556.00	lower	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.020	1.650	0.190	2.940	0.050	215.740
			upper	62.460	0.030	62.460	62.460	156.150	9.370	124.920	0.190	1.740	0.190	2.940	0.310	215.740
Piedras	NI	NI	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Odiel *		1,200.00	lower	28.830	0.000	3,154.700	27.010	7,981.460	0.000	0.000	0.100	0.210	0.010	0.340	0.000	1.930
			upper	28.830	0.000	3,154.700	27.010	7,981.460	1.310	17.520	0.110	0.220	0.010	0.340	0.040	1.930
Tinto *		178.00	lower	10.880	0.000	1,943.630	13.700	3,076.550	0.050	0.000	0.090	0.040	0.020	0.130	0.010	0.470
			upper	10.880	0.000	1,943.630	13.700	3,076.550	0.230	2.600	0.090	0.040	0.020	0.130	0.010	0.470
GUADIANA SUBTOTAL	**NI**	**9,934.00**	**lower**	**0.000**	**0.020**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.020**	**1.650**	**0.190**	**2.940**	**0.050**	**215.740**
			upper	**62.460**	**0.030**	**62.460**	**62.460**	**156.150**	**9.370**	**124.920**	**0.190**	**1.740**	**0.190**	**2.940**	**0.310**	**215.740**
Guadalquivir	1567.80	19808.00	lower	0.069	0.000	0.000	0.000	23.766	0.000	0.000	0.384	2.226	0.053	2.627	0.080	13.594
			upper	0.226	0.046	1.717	5.722	37.418	0.401	0.401	0.387	2.226	0.055	2.627	0.080	13.594
Guadalete	98.29	1515.00	lower	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.124	0.052	0.015	0.144	0.017	1.637
			upper	0.011	0.003	0.108	0.359	1.184	0.036	0.025	0.124	0.052	0.015	0.144	0.017	1.637
GUADALQUIVIR SUBTOTAL	**1,666.09**	**21,323.00**	**lower**	**0.069**	**0.000**	**0.000**	**0.000**	**23.766**	**0.011**	**0.000**	**0.508**	**2.279**	**0.067**	**2.771**	**0.097**	**15.231**
			upper	**0.237**	**0.049**	**1.824**	**6.081**	**38.602**	**0.437**	**0.426**	**0.511**	**2.279**	**0.070**	**2.771**	**0.097**	**15.231**
TOTAL	**32,402.04**	**62,635.65**	**lower**	**0.096**	**0.022**	**3.979**	**1.976**	**176.158**	**0.011**	**0.003**	**1.994**	**12.620**	**0.476**	**30.736**	**0.828**	**273.123**
			upper	**70.769**	**3.096**	**126.201**	**123.567**	**400.868**	**62.936**	**222.454**	**3.304**	**25.549**	**1.454**	**35.231**	**1.462**	**335.921**

*** Loads from Odiel and Tinto have not been taken into account due to high natural concentrations of heavy metals that could distort the assessment of trends**

Table 6b. Tributary riverine inputs to the maritime area in 2005 by Spain

Tributary riverine inputs				Quantities --->												
Discharge area (or name of river)	Flow rate [1000 m³/d] 2005	Flow rate [1000 m³/d] LTA	Estimate	Cd [10 ³ kg]	Hg [10 ³ kg]	Cu [10 ³ kg]	Pb [10 ³ kg]	Zn [10 ³ kg]	g-HCH [kg]	PCBs [kg]	NH4-N [10⁶ kg]	NO3-N [10⁶ kg]	PO4-P [10⁶ kg]	Total N [10⁶ kg]	Total P [10⁶ kg]	SPM [10⁶ kg]
Asúa	70.90	NI	lower	0.000	0.000	0.000	0.031	0.184	0.000	0.000	0.002	0.038	0.000	0.061	0.003	0.318
			upper	0.026	0.026	0.129	0.266	0.266	0.000	0.000	0.003	0.038	0.007	0.061	0.003	0.318
Cadagua	1,384.84	NI	lower	0.000	0.000	0.000	1.053	1.895	0.000	0.000	0.034	0.723	0.000	1.343	0.031	3.709
			upper	0.505	0.505	2.527	5.686	3.791	0.005	0.005	0.043	0.723	0.132	1.343	0.033	3.709
Ibaizabal	1,249.60	NI	lower	0.000	0.000	0.000	0.684	10.034	NI	NI	0.051	2.291	0.000	2.853	0.066	7.680
			upper	0.456	0.456	2.281	4.675	10.604	NI	NI	0.054	2.291	0.119	2.853	0.067	7.680
Galindo	5.01	NI	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.002	0.000	0.003	0.000	0.022
			upper	0.002	0.002	0.009	0.018	0.009	NI	NI	0.000	0.002	0.000	0.003	0.000	0.022
PAÍS VASCO SUBTOTAL	**2,710.36**	**NI**	**lower**	**0.000**	**0.000**	**0.000**	**1.768**	**12.113**	**0.000**	**0.000**	**0.088**	**3.053**	**0.000**	**4.260**	**0.100**	**11.728**
			upper	**0.989**	**0.989**	**4.946**	**10.646**	**14.670**	**0.005**	**0.005**	**0.099**	**3.053**	**0.258**	**4.260**	**0.103**	**11.728**
NORTE III SUBTOTAL			**lower**													
			upper													
NORTE II SUBTOTAL			**lower**													
			upper													
Furelos	294.44	512.25	lower	0.000	0.000	0.001	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	0.592	0.001	0.406	NI	NI	0.051	0.460	0.007	0.187	NI	1.699
Deza	584.56	1,509.70	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	NI	0.000
			upper	0.000	0.000	1.405	0.000	1.693	NI	NI	0.100	1.073	0.026	0.362	NI	13.984
GALICIA COSTA SUBTOTAL	**879.00**	**2,021.95**	**lower**	**0.000**	**0.000**	**0.002**	**0.000**	**0.002**	**NI**	**NI**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
			upper	**0.000**	**0.000**	**1.998**	**0.001**	**2.099**	**NI**	**NI**	**0.151**	**1.533**	**0.033**	**0.549**	**0.000**	**15.683**
Louro	213.768	213.768	lower	0.000	0.000	0.060	0.010	3.767	0.000	0.000	0.098	0.061	0.009	0.313	0.021	0.962
			upper	0.078	0.004	0.413	0.249	3.767	0.780	1.606	0.098	0.061	0.009	0.313	0.021	0.962
NORTE I SUBTOTAL	**213.77**	**213.77**	**lower**	**0.000**	**0.000**	**0.060**	**0.010**	**3.767**	**0.000**	**0.000**	**0.098**	**0.061**	**0.009**	**0.313**	**0.021**	**0.962**
			upper	**0.078**	**0.004**	**0.413**	**0.249**	**3.767**	**0.780**	**1.606**	**0.098**	**0.061**	**0.009**	**0.313**	**0.021**	**0.962**
GUADIANA SUBTOTAL			**lower**													
			upper													
Guadaira	34.45	1,515.00	lower	0.000	0.000	0.007	0.000	0.291	0.000	0.000	0.413	0.004	0.021	0.431	0.023	0.361
			upper	0.004	0.001	0.044	0.129	0.661	0.009	0.009	0.413	0.004	0.021	0.431	0.023	0.361
Guadiamar	4.45	611.00	lower	0.008	0.000	0.015	0.000	3.675	0.000	0.000	0.000	0.003	0.000	0.004	0.000	0.028
			upper	0.008	0.000	0.017	0.016	3.675	0.001	0.001	0.000	0.003	0.000	0.004	0.000	0.028
GUADALQUIVIR SUBTOTAL	**38.90**	**2,126.00**	**lower**	**0.008**	**0.000**	**0.022**	**0.000**	**3.966**	**0.000**	**0.000**	**0.414**	**0.007**	**0.021**	**0.434**	**0.023**	**0.389**
			upper	**0.012**	**0.001**	**0.061**	**0.146**	**4.336**	**0.010**	**0.010**	**0.414**	**0.008**	**0.021**	**0.434**	**0.023**	**0.389**
TOTAL	**3,842.02**	**4,361.72**	**lower**	**0.008**	**0.000**	**0.083**	**1.778**	**19.849**	**0.000**	**0.000**	**0.599**	**3.122**	**0.030**	**5.007**	**0.144**	**13.079**
			upper	**1.079**	**0.995**	**7.418**	**11.041**	**24.873**	**0.796**	**1.621**	**0.761**	**4.655**	**0.322**	**5.557**	**0.147**	**28.762**

Table 6c. Total riverine inputs to the maritime area in 2005 by Spain

Total riverine inputs				**Quantities --->**												
Discharge area (or name of river)	**Flow rate [1000 m³/d]**		**Estimate**	**Cd [10^3 kg]**	**Hg [10^3 kg]**	**Cu [10^3 kg]**	**Pb [10^3 kg]**	**Zn [10^3 kg]**	**g-HCH [kg]**	**PCBs [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 [10^6 kg]**
	2005	**LTA**														
PAÍS VASCO SUBTOTAL	**10,235.00**	**NI**	lower	0.027	0.000	3.689	3.261	48.916	0.000	0.003	1.005	6.568	0.121	16.119	0.666	33.992
			upper	3.750	3.736	19.569	38.351	60.802	0.019	0.016	1.045	6.568	1.019	16.119	0.671	34.144
NORTE III SUBTOTAL	**904.61**	**904.61**	lower	0.000	0.000	0.260	0.087	15.037	0.000	0.000	0.108	0.745	0.011	1.311	0.042	2.937
			upper	0.330	0.017	1.767	1.037	15.037	3.302	11.279	0.109	0.745	0.020	1.311	0.055	2.937
NORTE II SUBTOTAL	**6,919.01**	**6,919.01**	lower	0.000	0.002	0.000	0.382	65.014	0.000	0.000	0.339	2.540	0.075	6.867	0.073	13.210
			upper	2.525	0.126	12.627	8.216	68.015	25.254	49.413	0.347	2.540	0.117	6.867	0.225	15.897
GALICIA COSTA SUBTOTAL	**9,538.29**	**18,848.58**	lower	0.000	0.000	0.031	0.014	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.001	0.005	22.618	9.031	32.577	0.000	0.000	1.206	14.372	0.237	5.045	0.034	71.256
NORTE I SUBTOTAL	**6,942.17**	**6,942.17**	lower	0.000	0.000	0.060	0.010	39.281	0.000	0.000	0.200	1.951	0.021	5.301	0.021	4.704
			upper	2.534	0.127	12.692	9.287	50.223	25.339	38.012	0.244	1.951	0.101	5.301	0.193	9.091
GUADIANA SUBTOTAL	**NI**	**9,934.00**	lower	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.020	1.650	0.190	2.940	0.050	215.740
			upper	62.460	0.030	62.460	62.460	156.150	9.370	124.920	0.190	1.740	0.190	2.940	0.310	215.740
GUADALQUIVIR SUBTOTAL	**1,704.99**	**23,449.00**	lower	0.077	0.000	0.022	0.000	27.732	0.011	0.000	0.921	2.286	0.088	3.205	0.121	15.619
			upper	0.248	0.050	1.885	6.227	42.939	0.447	0.436	0.924	2.287	0.091	3.205	0.121	15.619
TOTAL	**36,244.06**	**66,997.37**	**lower**	**0.104**	**0.022**	**4.062**	**3.754**	**196.007**	**0.011**	**0.003**	**2.594**	**15.741**	**0.507**	**35.743**	**0.972**	**286.201**
			upper	**71.848**	**4.090**	**133.618**	**134.609**	**425.742**	**63.731**	**224.075**	**4.065**	**30.203**	**1.776**	**40.788**	**1.609**	**364.683**

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2005

Main river				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m^3/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
	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]
OYARZUN (País Vasco)	370.58	NI														
Lower estimate			Mean	0.000	0.000	0.775	0.000	73.908	0.000	45.000	0.032	1.200	0.000	1.500	0.051	1.638
Upper estimate				1.000	1.000	5.358	10.000	74.325	10.000	50.000	0.051	1.200	0.261	1.500	0.051	2.013
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.039	0.842	0.261	1.050	0.014	1.000
Maximum				1.000	1.000	9.300	10.000	201.000	10.000	90.000	0.086	2.007	0.261	2.300	0.103	5.400
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
n				*12*	*4*	*12*	*12*	*12*	4	2	*12*	*8*	*8*	*8*	*8*	*8*
URUMEA (País Vasco)	864.73	NI														
Lower estimate			Mean	0.000	0.000	1.508	0.000	13.475	10.000	10.000	0.133	0.603	0.000	6.481	0.050	4.300
Upper estimate			Mean	1.000	1.000	5.675	10.000	14.725	10.000	15.000	0.149	0.603	0.261	6.481	0.051	4.425
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.039	0.436	0.261	0.650	0.010	1.000
Maximum				1.000	1.000	9.100	10.000	50.000	10.000	20.000	0.537	0.885	0.261	24.390	0.134	15.800
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
n				*12*	*4*	*12*	*12*	*12*	4	2	*12*	*8*	*8*	*8*	*8*	*8*
ORIA (País Vasco)	2,424.38	NI														
Lower estimate			Mean	0.000	NI	0.000	0.000	5.100	NI	NI	0.342	1.332	0.000	1.665	0.048	6.000
Upper estimate			Mean	1.000	NI	5.000	10.000	7.600	NI	NI	0.342	1.332	0.261	1.665	0.048	6.000
Minimum				1.000	NI	5.000	10.000	5.000	NI	NI	0.078	0.835	0.261	1.050	0.011	2.800
Maximum				1.000	NI	5.000	10.000	10.200	NI	NI	0.607	1.829	0.261	2.280	0.085	9.200
> 70 % > d.l. ?			*yes/NO*	NO		NO	NO	NO			NO	NO	NO	NO	NO	yes
n				*2*		*2*	*2*	*2*			*2*	*2*	*2*	*2*	*2*	*2*
UROLA (País Vasco)	1,002.50	NI														
Lower estimate			Mean	0.000	0.000	3.500	0.000	4.855	0.000	15.000	0.035	2.160	0.035	3.338	0.158	6.088
Upper estimate			Mean	1.000	1.000	7.591	10.000	8.036	10.000	20.000	0.053	2.160	0.263	3.338	0.158	6.213
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.039	1.490	0.261	2.240	0.058	1.000
Maximum				1.000	1.000	27.600	10.000	14.700	10.000	30.000	0.101	3.252	0.280	6.690	0.287	12.200
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
n				*11*	*4*	*11*	*11*	*11*	4	2	*11*	*8*	*8*	*8*	*8*	*8*
DEVA (País Vasco)	1,257.14	NI														
Lower estimate			Mean	0.000	NI	0.925	0.000	41.625	NI	NI	7.598	1.136	0.147	4.544	0.265	13.225
Upper estimate			Mean	1.000	NI	5.300	10.000	41.625	NI	NI	7.598	1.136	0.310	4.544	0.265	13.225
Minimum				1.000	NI	5.000	10.000	11.000	NI	NI	0.086	0.603	0.261	1.470	0.037	1.700
Maximum				1.000	NI	7.400	10.000	74.000	NI	NI	53.363	1.897	0.448	7.490	0.512	40.000
> 70 % > d.l. ?			*yes/NO*	NO		NO	NO	NO			NO	NO	NO	NO	NO	yes
n				*8*		*8*	*8*	*8*			*8*	*8*	*8*	*8*	*8*	*8*
BARBADUN (País Vasco)	264.80	NI														

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2005

Main river				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m^3/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
	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]
Lower estimate			Mean	0.000	0.000	2.533	0.000	4.250	0.000	0.000	0.110	1.174	0.000	1.630	0.067	8.963
Upper estimate			Mean	1.000	1.000	6.700	10.000	8.417	10.000	10.000	0.136	1.174	0.261	1.630	0.068	9.213
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.039	0.829	0.261	1.040	0.010	1.000
Maximum				1.000	1.000	24.800	10.000	34.000	10.000	10.000	1.097	1.445	0.261	3.020	0.118	58.000
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
n				12	4	12	12	12	4	2	12	8	8	8	8	8
BUTRON (País Vasco)	478.96	NI														
Lower estimate			Mean	0.000	0.000	1.891	1.136	4.900	0.000	0.000	0.495	1.531	0.198	4.150	0.399	12.400
Upper estimate			Mean	1.000	1.000	6.436	10.227	7.627	10.000	10.000	0.495	1.531	0.361	4.150	0.399	12.400
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.101	0.596	0.261	1.400	0.059	6.200
Maximum				1.000	1.000	20.800	12.500	13.000	10.000	10.000	1.742	1.987	0.951	17.000	1.018	29.600
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	yes
n				11	4	11	11	11	4	2	11	8	8	8	8	8
OCA (País Vasco)	413.99	NI														
Lower estimate			Mean	0.000	0.000	6.164	1.182	6.036	0.000	0.000	0.369	1.230	0.000	3.208	0.347	6.350
Upper estimate			Mean	1.000	1.000	8.891	10.273	9.673	10.000	10.000	0.373	1.230	0.261	3.208	0.348	6.350
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.039	0.768	0.261	1.000	0.010	2.200
Maximum				1.000	1.000	22.400	13.000	48.400	10.000	10.000	1.626	2.077	0.261	7.770	1.861	12.000
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	yes
n				11	4	11	11	11	4	2	11	8	8	8	8	8
LEA (País Vasco)	257.98	NI														
Lower estimate			Mean	0.000	0.000	0.691	0.000	0.909	0.000	0.000	0.010	0.801	0.000	2.414	0.040	2.563
Upper estimate			Mean	1.000	1.000	5.236	10.000	5.455	10.000	10.000	0.042	0.801	0.261	2.414	0.041	2.688
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.039	0.587	0.261	0.910	0.010	1.000
Maximum				1.000	1.000	7.600	10.000	10.000	10.000	10.000	0.062	1.163	0.261	5.860	0.091	6.200
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
n				11	4	11	11	11	4	2	11	8	8	8	8	8
ARTIBAY (País Vasco)	189.59	NI														
Lower estimate			Mean	0.000	0.000	1.509	1.000	8.127	0.000	0.000	0.340	0.817	0.000	6.234	0.086	13.888
Upper estimate			Mean	1.000	1.000	5.600	10.091	10.855	10.000	10.000	0.358	0.817	0.261	6.234	0.087	14.013
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.039	0.361	0.261	0.870	0.010	1.000
Maximum				1.000	1.000	9.800	11.000	49.000	10.000	10.000	2.831	1.206	0.261	24.010	0.275	55.500
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
n				11	4	11	11	11	4	2	11	8	8	8	8	8
SAJA (Norte II)	1,710.86	1,710.86														
Lower estimate				0.000	0.091	6.375	0.000	149.818	0.000	0.000	0.524	1.043	0.068	3.040	0.181	17.545

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2005

Main river				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
	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]
Upper estimate				1.909	0.200	12.625	27.500	149.818	10.000	70.000	0.524	1.043	0.075	3.040	0.195	17.545
Minimum				0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.632	0.000	1.644	0.000	3.000
Maximum				2.000	0.500	24.000	40.000	283.000	10.000	70.000	1.400	1.761	0.190	4.595	0.710	83.000
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*YES*	*NO*	*NO*	*YES*	*YES*	*NO*	*YES*	*YES*	*YES*
n				11	11	8	8	11	11	5	10	10	10	10	10	11
NALÓN (Norte II)	4,434.91	4,434.91														
Lower estimate				0.000	0.055	5.889	0.000	3.636	0.000	0.000	0.058	1.107	0.064	2.088	0.108	4.182
Upper estimate				1.909	0.100	12.556	25.000	25.455	10.000	70.000	0.072	1.107	0.068	2.088	0.127	5.818
Minimum				0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.677	0.000	1.695	0.000	0.000
Maximum				2.000	0.200	20.000	40.000	20.000	10.000	70.000	0.140	1.254	0.165	2.434	0.350	12.000
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO
n				11	11	9	9	9	11	4	11	11	11	11	11	11
SELLA (Norte II)	549.68	549.68														
Lower estimate				0.000	0.057	2.429	0.000	5.714	0.000	0.000	0.057	0.775	0.029	2.027	0.044	25.000
Upper estimate				1.857	0.129	12.429	20.714	27.429	10.000	0.000	0.062	0.775	0.035	2.027	0.094	27.143
Minimum				0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.429	0.000	1.829	0.000	0.000
Maximum				2.000	0.200	20.000	40.000	40.000	10.000	0.000	0.078	0.946	0.070	2.335	0.180	165.000
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO
n				7	7	7	7	7	7	0	7	7	7	7	7	7
MIERA (Norte II)	223.56	223.56														
Lower estimate				0.000	0.014	5.286	0.000	2.857	0.000	0.000	0.191	1.321	0.175	3.310	0.203	11.571
Upper estimate				1.857	0.100	11.000	20.714	28.571	10.000	0.000	0.191	1.321	0.175	3.310	0.203	13.286
Minimum				0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.704	0.000	1.996	0.000	0.000
Maximum				2.000	0.100	14.000	40.000	30.000	10.000	0.000	0.330	1.606	0.587	4.930	0.490	55.000
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	NO
n				7	7	7	7	7	7	0	7	7	7	7	7	7
MASMA (Galicia Costa)	297.98	397.62														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.151	4.427	0.021	NI	NI	2.667
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.151	4.427	0.021	NI	NI	2.667
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.022	2.591	0.006	NI	NI	0.800
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.710	5.356	0.044	NI	NI	8.000
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
ORO (Galicia Costa)	219.92	370.05														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.175	2.986	0.011	NI	NI	3.633
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.175	2.986	0.011	NI	NI	3.633

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2005

Main river				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 [µg/l]	g-HCH [ng/l]	PCBs [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]
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.026	1.912	0.004	NI	NI	1.600
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.671	3.793	0.028	NI	NI	12.000
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
LANDRO (Galicia Costa)	385.61	592.88														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.170	2.293	0.012	NI	NI	2.800
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.170	2.293	0.012	NI	NI	2.800
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.024	1.620	0.004	NI	NI	1.200
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.482	2.925	0.022	NI	NI	6.400
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
SOR (Galicia Costa)	311.41	527.77														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.078	1.950	0.002	NI	NI	1.567
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.078	1.950	0.002	NI	NI	1.567
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.007	1.100	0.000	NI	NI	0.400
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.188	2.847	0.003	NI	NI	5.200
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
MERA (Galicia Costa)	205.93	418.03														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.087	2.977	0.005	NI	NI	4.900
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.087	2.977	0.005	NI	NI	4.900
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.028	2.480	0.001	NI	NI	0.400
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.268	3.400	0.014	NI	NI	28.400
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
Jubía (Galicia Costa)	163.37	311.67														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.136	2.729	0.010	NI	NI	7.033
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.136	2.729	0.010	NI	NI	7.033
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.000	2.000	0.000	NI	NI	2.400
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.429	3.600	0.052	NI	NI	13.200
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
Forcadas (Galicia Costa)	68.87	140.70														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.188	3.212	0.011	NI	NI	16.233
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.188	3.212	0.011	NI	NI	16.233
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.043	0.130	0.003	NI	NI	1.600

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2005

Main river				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 [µg/l]	g-HCH [ng/l]	PCBs [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]
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.504	6.530	0.049	NI	NI	150.000
> 70 % > d.l. ?			yes/NO	NO	NO	NO	NO	NO			YES	YES	YES			YES
n				1	1	1	1	1			12	12	12			12
Belelle (Galicia Costa)	107.72	220.07														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.057	4.444	0.004	NI	NI	2.000
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.057	4.444	0.004	NI	NI	2.000
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.008	1.119	0.000	NI	NI	0.400
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.169	5.691	0.006	NI	NI	7.600
> 70 % > d.l. ?			yes/NO	NO	NO	NO	NO	NO			YES	YES	YES			YES
n				1	1	1	1	1			12	12	12			12
EUME (Galicia Costa)	829.95	1,695.65														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.104	2.657	0.003	NI	NI	2.300
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.104	2.657	0.003	NI	NI	2.300
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.007	1.893	0.001	NI	NI	0.400
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.282	3.000	0.006	NI	NI	7.200
> 70 % > d.l. ?			yes/NO	NO	NO	NO	NO	NO			YES	YES	YES			YES
n				1	1	1	1	1			12	12	12			12
MANDEO (Galicia Costa)	290.38	771.01														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.202	4.625	0.009	NI	NI	4.533
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.202	4.625	0.009	NI	NI	4.533
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.034	3.187	0.004	NI	NI	1.600
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.560	5.948	0.017	NI	NI	16.400
> 70 % > d.l. ?			yes/NO	NO	NO	NO	NO	NO			YES	YES	YES			YES
n				1	1	1	1	1			12	12	12			12
MERO (Galicia Costa)	293.76	456.19														
Lower estimate				0.000	0.000	7.900	0.000	0.000	NI	NI	0.247	5.696	0.007	NI	NI	6.800
Upper estimate				2.000	1.000	7.900	50.000	5.000	NI	NI	0.247	5.696	0.007	NI	NI	6.800
Minimum				2.000	1.000	n.d	50.000	5.000	NI	NI	0.060	1.040	0.002	NI	NI	2.800
Maximum				2.000	1.000	7.900	50.000	5.000	NI	NI	0.552	8.810	0.012	NI	NI	14.400
> 70 % > d.l. ?			yes/NO	NO	NO	NO	NO	NO			YES	YES	YES			YES
n				2	2	2	2	2			12	12	12			12
ALLONES (Galicia Costa)	557.78	942.19														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.260	9.176	0.093	NI	NI	6.433
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.260	9.176	0.093	NI	NI	6.433
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.063	6.900	0.026	NI	NI	2.800
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.804	10.918	0.248	NI	NI	26.000

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2005

Main river				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m^3/d]		Mean or median?	Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCBs [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]
	annual	LTA														
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
GRANDE (Galicia Costa)	365.40	647.05														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.268	6.994	0.080	NI	NI	4.500
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.268	6.994	0.080	NI	NI	4.500
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.041	5.300	0.024	NI	NI	0.800
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.630	9.580	0.196	NI	NI	18.400
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
CASTRO (Galicia Costa)	94.25	166.91														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.118	2.976	0.005	NI	NI	3.500
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.118	2.976	0.005	NI	NI	3.500
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.014	1.944	0.002	NI	NI	0.400
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.366	3.600	0.008	NI	NI	9.600
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
JALLAS (Galicia Costa)	417.04	738.51														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.149	6.074	0.007	NI	NI	3.633
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.149	6.074	0.007	NI	NI	3.633
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.042	3.300	0.004	NI	NI	1.600
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.349	7.790	0.012	NI	NI	6.800
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
TAMBRE (Galicia Costa)	1,416.18	3,828.06														
Lower estimate				0.000	0.000	25.000	19.500	0.000	NI	NI	0.180	6.229	0.017	NI	NI	7.467
Upper estimate				2.000	1.000	25.000	19.500	5.000	NI	NI	0.180	6.229	0.017	NI	NI	7.467
Minimum				2.000	1.000	NI	NI	5.000	NI	NI	0.046	4.850	0.006	NI	NI	2.000
Maximum				2.000	1.000	25.000	19.500	5.000	NI	NI	0.601	7.193	0.070	NI	NI	51.200
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				2	2	2	2	2			12	12	12			12
Traba (Galicia Costa)	628.21	315.61														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.397	6.073	0.135	NI	NI	3.033
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.397	6.073	0.135	NI	NI	3.033
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.077	4.820	0.038	NI	NI	0.800
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	1.060	8.375	0.275	NI	NI	11.600
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2005

Main river				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 [µg/l]	g-HCH [ng/l]	PCBs [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]
n				1	1	1	1	1			12	12	12			12
ULLA (Galicia Costa)	734.40	1,337.48														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.229	2.852	0.014	NI	NI	3.500
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.229	2.852	0.014	NI	NI	3.500
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.050	1.960	0.003	NI	NI	1.200
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.583	3.500	0.048	NI	NI	15.200
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				2	2	2	2	2			12	12	12			12
UMIA (Galicia Costa)	523.49	846.27														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.193	2.675	0.020	NI	NI	3.600
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.193	2.675	0.020	NI	NI	3.600
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.023	2.100	0.006	NI	NI	0.800
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.372	3.300	0.054	NI	NI	10.000
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				2	2	2	2	2			12	12	12			12
LÉREZ (Galicia Costa)	307.93	1,248.93														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.066	1.837	0.004	NI	NI	2.233
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.066	1.837	0.004	NI	NI	2.233
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.000	0.520	0.001	NI	NI	0.400
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.315	2.500	0.011	NI	NI	12.400
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
VERDUGO (Galicia Costa)	219.78	483.92														
Lower estimate				0.000	0.000	0.000	0.000	0.000	NI	NI	0.052	1.670	0.008	NI	NI	2.000
Upper estimate				2.000	1.000	10.000	50.000	5.000	NI	NI	0.052	1.670	0.008	NI	NI	2.000
Minimum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.000	1.340	0.001	NI	NI	0.400
Maximum				2.000	1.000	10.000	50.000	5.000	NI	NI	0.187	2.400	0.020	NI	NI	5.600
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*			*YES*	*YES*	*YES*			*YES*
n				1	1	1	1	1			12	12	12			12
MIÑO (Norte I)	6,728.40	6,728.40														
Lower estimate				0.000	0.145	2.895	0.000	7.364	0.000	0.000	0.042	0.873	0.002	1.905	0.006	3.818
Upper estimate				1.909	0.209	13.889	25.000	27.364	10.000	70.000	0.060	0.873	0.023	1.905	0.070	5.182
Minimum				0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.519	0.000	1.522	0.000	0.000
Maximum				2.000	0.800	21.000	40.000	40.000	10.000	70.000	0.125	1.581	0.023	2.584	0.070	15.000
> 70 % > d.l. ?			*yes/NO*	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO
n				11	11	9	9	3	11	4	11	11	11	11	11	11

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2005

Main river / Discharge area	Flow rate [1000 m^3/d] annual	Flow rate [1000 m^3/d] LTA	Mean or median?	Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCBs [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]
GUADIANA (Guadiana)	0.00	8,556.00														
Lower estimate				0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.005	0.510	0.083	0.983	0.075	27.417
Upper estimate				20.000	0.006	20.000	20.000	50.000	3.000	40.000	0.051	0.518	0.083	0.983	0.100	27.417
Minimum				20.000	0.005	20.000	20.000	50.000	3.000	40.000	0.050	0.090	0.046	0.500	0.100	15.000
Maximum				20.000	0.011	20.000	20.000	50.000	3.000	40.000	0.062	1.717	0.131	2.200	0.100	72.000
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*	*NO*	*NO*	*NO*	*YES*	*YES*	*YES*	*YES*	*YES*
n				12	12	12	12	12	12	12	12	12	12	12	12	12
PIEDRAS (Guadiana)	NI	NI														
Lower estimate				0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.077	0.610	0.062	0.983	0.008	32.667
Upper estimate				20.000	0.006	20.000	20.000	50.000	3.000	40.000	0.086	0.632	0.062	0.983	0.100	32.667
Minimum				20.000	0.005	20.000	20.000	50.000	3.000	40.000	0.050	0.090	0.036	0.400	0.100	13.000
Maximum				20.000	0.012	20.000	20.000	50.000	3.000	40.000	0.164	1.062	0.134	1.400	0.100	64.000
> 70 % > d.l. ?			*yes/NO*	*NO*	*NO*	*NO*	*NO*	*NO*	*NO*	*NO*	*YES*	*YES*	*YES*	*YES*	*NO*	*YES*
n				12	12	12	12	12	12	12	12	12	12	12	12	12
ODIEL (Guadiana)	0.00	1,200.00														
Lower estimate				37.500	0.002	4,696.667	27.500	10,693.333	0.000	0.000	0.195	0.378	0.008	0.650	0.000	32.583
Upper estimate				40.833	0.006	4,696.667	35.833	10,693.333	3.000	40.000	0.212	0.401	0.011	0.667	0.100	32.583
Minimum				20.000	0.005	140.000	20.000	710.000	3.000	40.000	0.050	0.090	0.004	0.200	0.100	2.000
Maximum				70.000	0.010	9,910.000	70.000	18,940.000	3.000	40.000	0.663	1.310	0.049	1.500	0.100	257.000
> 70 % > d.l. ?			*yes/NO*	*YES*	*NO*	*YES*	*NO*	*YES*	*NO*	*NO*	*NO*	*YES*	*NO*	*YES*	*NO*	*YES*
n				12	12	12	12	12	12	12	12	12	12	12	12	12
TINTO (Guadiana)	0.00	178.00														
Lower estimate				61.667	0.001	13,185.833	159.167	13,455.833	0.000	0.000	1.244	1.617	0.049	2.542	0.033	20.083
Upper estimate				65.000	0.005	13,185.833	159.167	13,455.833	3.000	40.000	1.244	1.617	0.050	2.542	0.117	20.083
Minimum				20.000	0.005	410.000	30.000	820.000	3.000	40.000	0.086	0.587	0.004	0.800	0.100	1.000
Maximum				150.000	0.009	36,110.000	650.000	30,940.000	3.000	40.000	2.418	2.575	0.336	4.400	0.300	178.000
> 70 % > d.l. ?			*yes/NO*	*YES*	*NO*	*YES*	*YES*	*YES*	*NO*	*NO*	*YES*	*YES*	*NO*	*YES*	*NO*	*YES*
n				12	12	12	12	12	12	12	12	12	12	12	12	12

Table 7b. Contaminant concentrations of Spanish tributary rivers discharging to the maritime area. 2005

Tributary river				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 [µg/l]	g-HCH [ng/l]	PCBs [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]
ASUA (País Vasco)	70.90	NI														
Lower estimate			Mean	0.000	0.000	3.664	0.000	7.682	0.000	0.000	0.240	1.265	0.039	2.309	0.137	6.175
Upper estimate			Mean	0.001	0.001	7.300	0.010	9.500	10.000	10.000	0.247	1.265	0.267	2.309	0.139	6.175
Minimum				0.001	0.001	5.000	0.010	5.000	10.000	10.000	0.039	0.781	0.261	0.990	0.010	1.300
Maximum				0.001	0.001	24.900	0.010	20.200	10.000	10.000	0.661	1.831	0.310	5.740	0.339	20.400
> 70 % > d.l. ?			*yes/no*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
n				*11*	*4*	*11*	*11*	*11*	4	2	*11*	*8*	*8*	*8*	*8*	*8*
CADAGUA (País Vasco)	1,384.84	NI														
Lower estimate			Mean	0.000	0.000	0.525	0.001	7.233	10.000	0.000	0.080	1.259	0.000	1.883	0.082	6.313
Upper estimate			Mean	0.001	0.001	5.108	0.011	10.150	17.500	10.000	0.087	1.259	0.261	1.883	0.082	6.313
Minimum				0.001	0.001	5.000	0.010	5.000	10.000	10.000	0.039	0.474	0.261	0.690	0.023	2.000
Maximum				0.001	0.001	6.300	0.016	37.000	40.000	10.000	0.187	1.874	0.261	3.840	0.215	11.700
> 70 % > d.l. ?			*yes/no*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
n				*12*	*4*	*12*	*12*	*12*	4	2	*12*	*8*	*8*	*8*	*8*	*8*
GALINDO (País Vasco)	5.01	NI														
Lower estimate			Mean	0.000	NI	0.000	0.000	0.000	NI	NI	0.669	0.542	0.000	2.760	0.175	2.300
Upper estimate			Mean	0.001	NI	5.000	0.010	5.000	NI	NI	0.669	0.542	0.261	2.760	0.180	2.800
Minimum				0.001	NI	5.000	0.010	5.000	NI	NI	0.062	0.045	0.261	2.390	0.010	1.000
Maximum				0.001	NI	5.000	0.010	5.000	NI	NI	1.276	1.039	0.261	3.130	0.349	4.600
> 70 % > d.l. ?			*yes/no*	no		NO	NO	NO			NO	NO	NO	NO	NO	NO
n				*2.000*		*2*	*2*	*2*			*2*	*2*	*2*	*2*	*2*	*2*
Ibaizabal (País Vasco)	1,249.60	NI														
			Mean	0.000	NI	0.900	0.000	7.713	NI	NI	0.109	3.420	0.000	5.730	0.102	9.988
			Mean	0.001	NI	5.275	0.010	9.588	NI	NI	0.119	3.420	0.261	5.730	0.102	9.988
				0.001	NI	5.000	0.010	5.000	NI	NI	0.039	1.416	0.261	2.050	0.014	2.800
				0.001	NI	7.200	0.010	15.900	NI	NI	0.226	8.671	0.261	15.340	0.234	27.600
			yes/no	NO		NO	NO	NO			NO	NO	NO	NO	NO	NO
				8		*8*	*8*	*8*			*8*	*8*	*8*	*8*	*8*	*8*
LOURO (Norte I)	213.77	213.77														
Lower estimate			Mean	0.000	0.127	13.111	0.000	65.182	3.636	0.000	1.961	1.127	0.091	4.575	0.337	35.091
Upper estimate			Mean	1.909	0.164	18.667	25.000	74.273	11.818	70.000	1.961	1.127	0.091	4.575	0.337	35.091
Minimum				0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.271	0.000	2.094	0.000	10.000
Maximum				2.000	0.500	28.000	40.000	360.000	20.000	70.000	6.747	2.619	0.300	10.889	0.810	142.000
> 70 % > d.l. ?			*yes/no*	NO	NO	NO	NO	NO	NO	NO	SI	SI	SI	SI	SI	SI

Table 7b. Contaminant concentrations of Spanish tributary rivers discharging to the maritime area. 2005

Tributary river				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or median?	Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCBs [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]
	annual	LTA														
n				11	11	9	9	11	11	5	11	11	11	11	11	11
GUADAIRA (Guadalquivir)	34.45	1,515.00														
Lower estimate			median	1.000	0.080	3.000	10.000	279.000	0.700	0.700	0.030	0.450	0.020	0.450	0.020	8.000
Upper estimate				9.700	0.080	87.000	10.000	3,359.000	0.700	44.000	0.427	6.184	0.180	6.667	0.115	113.000
Minimum				0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.338	0.000	0.370	1.342	0.558	0.000
Maximum				0.000	0.000	22.000	0.000	0.000	0.000	40.000	31.785	2.352	2.533	39.039	2.719	108.500
> 70 % > d.l. ?			*yes/no*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
n				12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	11.000	12.000	12.000	12.000

Table 8. Detection limits for contaminant concentrations of Spanish inputs to the maritime area 2005

Sampling point	Type		Cd	Hg	Cu	Pb	Zn	g-HCH	PCB's	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
			Detection limits for contaminant concentrations -->												
			[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]
País Vasco	S	-	10.000	1.000	10.000	200.000	10.000	NI	NI	0.300	0.100	0.020	1.000	0.500	2.000
País Vasco	I	-	20.000	5.000	50.000	50.000	50.000	NI	NI	0.050	0.100	0.020	0.500	0.100	1.000
País Vasco	MC		NI	NI	NI	NI	NI	NI	NI	0.050	0.100	0.020	0.500	0.100	2.000
País Vasco (all sampling points)	R	(all sampling points)	1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.039	0.023	0.261	0.200	0.010	1.000
Norte III (Nervión)	R	(all sampling points)													
Norte II (Asturias)	S	-	50.000	5.000	80.000	200.000	50.000	NI	NI	1.000	0.500	0.050	10.000	0.050	2.000
Norte II (Asturias)	I	-	50.000	5.000	80.000	200.000	50.000	NI	NI	1.000	0.500	0.050	10.000	0.050	2.000
Norte II (Cantabria)	S (lab. 1)	-	<1,000	<1,000	<1,000	<1,000	<1,000	NI	NI	<0,020	<0,100	NI	<5,000	<0,020	<1,000
Norte II (Cantabria)	I (lab. 1)		<1,000	<1,000	<1,000	<1,000	<1,000	NI	NI	<0,020	<0,100	NI	<6,000	<0,030	<2,000
Norte II (Cantabria)	S & I (lab. 2)		<50,000	<1,001	<50,000	<100,000	<100,000	NI	NI	NI	NI	NI	NI	NI	NI
Norte II (all sampling points)	R	(all sampling points)	1.000	0.050	5.000	3.000	0.010	10.000	70 (sum) 10 (individual)	0.004	0.113	0.023	1.455	0.070	3.000
Galicia Costa	S & I	-	100.000	0.100	100.000	100.000	100.000	NI	NI	NI	NI	NI	NI	NI	NI
Galicia Costa (all sampling points)	R	(all sampling points)	0.200	6.800	0.400	4.400	2.500			0.020	0.100	0.001	0.020	0.010	0.500
Norte I (all sampling points)	R	(all sampling points)													
Guadiana & Guadalquivir (Andalucía)	S & I (lab. 1)	-	6.000	1.000	11.000	28.000	56.000	50.000	50.000	0.100	1.550	0.200	0.500	0.200	2.500
Guadiana & Guadalquivir (Andalucía)	S & I (lab. 2)	-	44.000	1.100	55.000	111.000	55.000	50.000	50.000	0.100	6.000	0.100	5.000	0.300	2.500
Guadiana (all sampling points)	R	(all sampling points)	20.000	0.005	20.000	20.000	50.000	3.000	40.000	0.060	0.090	0.004	0.200	0.100	1.000
Guadalquivir (all sampling points)	R	(all sampling points)	0.300	0.080	3.000	10.000	33.000	0.700	0.700	0.030	0.040	0.020	0.030	0.020	1.700

9. Sweden

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 by Sweden

Table 4b	Total riverine inputs and direct discharges to the Maritime Area in 2005 by Sweden
Table 5a	Direct discharges (sewage effluents) to the Maritime Area of the OSPAR Convention in 2005 by Sweden
Table 5b	Direct discharges (industrial effluents) to the Maritime Area of the OSPAR Convention in 2005 by Sweden
Table 5c	Total direct discharges to the Maritime area in 2005 by Sweden
Table 6a	Main riverine inputs to the Maritime Area of the OSPAR Convention in 2005 by Sweden
Table 6b	Tributary riverine inputs to the Maritime Area of the OSPAR Convention in 2005 by Sweden
Table 6c	Total riverine inputs to the maritime area in 2005 by Sweden
Table 7a	Contaminant concentrations
Table 8	Detection limits

Annual report on riverine inputs and direct discharges by Sweden to Convention waters during the year: 2005

Name, address and contact numbers of reporting authority to which any further enquiry should be addressed: Swedish National Protection Agency SE 106 48 Stockholm Contact Person: Håkan Staaf Tel: +46 8 698 1000 (Agency) + 46 8 698 1442 Fax: Email:

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: Sweden	
Name of river, subarea and discharge area[1]	Nature of the receiving water[2]
Rönne å (96), Kattegat, major, 1897 km^2	Coastal
Stensån (97), Kattegat, minor*, 284 km^2	Coastal
Lagan (98), Kattegat, major, 6 452 km^2	Coastal
Genevadsån (99), Kattegat, minor*, 224 km^2	Coastal
Fylleån (100), Kattegat, minor*, 394 km^2	Coastal
Nissan (101), Kattegat, major, 2 686 km^2	Coastal
Suseån (102), Kattegat, minor*, 450 km^2	Coastal
Ätran (103), Kattegat, major, 3 342 km^2	Coastal
Himleån (104), Kattegat, minor*, 201 km^2	Coastal
Viskan (105), Kattegat, major, 2 202 km^2	Coastal
Rolfsån (106), Kattegat, minor*, 694 km^2	Coastal
Kungsbackaån (107), Kattegat, minor*, 302 km^2	Coastal
Göta älv (108) Kattegat,, major, 50 119 km^2	Coastal
Bäveån (109), Skagerrak, major, 301 km^2	Coastal
Örekilsälven (110), Skagerrak, major, 1 340 km^2	Coastal
Strömsån (111), Skagerrak, major, 256 km^2	Coastal
Enningsdalsälven (112), Skagerrak, major, 782 km^2	Coastal

[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

* Note! Minor rivers are not monitored. The input is based on the area input from the two small watersystems Genevadsån and Fylleån. These inputs are not given separately, but included with the input from the tributaries.

Map indicating the river systems and catchments.

Note! The drainage system of River Göta älv is only partly shown.

B. Total riverine inputs and direct discharges (Tables 4a and 4b) for the year: 2005

Note: Table 4b is total direct discharges and riverine inputs to maritime area by region. Please provide totals for each OSPAR region and for total inputs.

B.1 Give general comments on the total riverine inputs and direct discharges (e.g. changes from last year, trends, percentage of particle bound determinand, results that need to be highlighted etc.):

As noted in the headline for Table 4b, our data for “Riverine inputs from Tributary rivers” covers both “Minor rivers” and “Unmonitored areas”. It is also noted there that identical values have been given in rows lower and upper. We lack necessary raw data to produce these interval estimates. We believe, however, that the only case where the difference is non-negligible concerns Hg and Cd from point sources.

C. Direct discharges for the year: 2005

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 (cf. section 7 of the RID Principles), including for those under voluntary reporting:

Water flow is measured continuously. Total N, Total P, BOD7 and CODCr are sampled (in proportion to flow) 12 – 52 times annually. Metals are sampled 1 – 12 times annually, on the biggest plant even 52 times.

In computing annual emissions, concentrations are weighted by relevant water amounts. Estimated stormwater overflows at the plant have been added. For Cd and Hg, emission estimates are believed to be uncertain since most concentration measurements are probably below the limit of detection.

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the RID 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.

C.3 Give general comments on the discharges of sewage effluents (e.g. compared to previous years, and/or extent to which industrial effluents are discharged through sewerage systems):

None.

Industrial Effluents (Table 5b)

C.4 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 7 of the RID Principles), including for those under voluntary reporting:

This varies among industries. Emissions are generally reported above certain threshold values, mostly well below those applied in the EPER register. Water flows are often not reported. A few facilities discharge very large (unreported) water amounts, mostly cooling water.

C.5 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

None.

C.6 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:

As mentioned in C.1, estimated stormwater overflows at the plant are included. Contributions from overflows in the sewage net are believed to be small.

Annual reporting is restricted to municipal treatment plants designed for more than 2 000 i.e. (“person equivalents”) and “the most important” industrial point sources

C.7 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.

C.8 Give general comments on industrial effluents (e.g. compared to previous years):

None.

Total direct discharges (Table 5c)

C.9 Give general comments on total direct discharges (e.g. compared to previous years):

None.

D. Riverine inputs for the year: 2005

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 6 of the RID Principles), including for those under voluntary reporting:

In table 6a, concentrations have been linearly interpolated and multiplied by daily flow values obtained from measurements.

In table 7a, arithmetical means of concentrations are given.

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):

Most standard water chemical analyses are performed, including common metals.

D.4 Give general comments on the inputs from main rivers (e.g. significant changes in inputs, concentrations and flows compared to previous years):

The inputs from the major rivers are largely on the same levels as previous years. However, the Cd loads from three major rivers, Ätran, Nissan, and Lagan, were found to be exceptionally high, most certainly due to contamination during the sampling. Therefore, to make it possible to compare the Cd input to the sea with previous years, the load from these rivers has been replaced by the average load for the period 2001–2003 (Table 6). However, no data on cadmium concentrations have been given for these rivers (Table 7).

Tributary Rivers (Tables 6b and 7b)

D.5 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 6 of the Principles):

Area losses are calculated for representative small rivers and applied to other small rivers and coastal areas (see note on Table 1).

Details can be found at http://info1.ma.slu.se/ma/www_ma.acgi$Load?ID=Intro (in Swedish).

D.6 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

None.

D.7 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.8 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in Tables 6b and 7b:

None.

D.9 Give general comments on the inputs from tributary rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

None.

Total riverine inputs (Table 6c)

D.10 Give general comments on the total riverine inputs (e.g. significant change in inputs, concentrations and flows compared to previous years):

The total riverine inputs are largely on the same levels as previous years. The Cd load from some major rivers were believed to be affected by contamination, and therefore have been replaced by the average load for 2001–2003 (see note on D.4).

E. Unmonitored areas

E.1 Describe the methods of quantification used for the different determinands or groups of determinands:

The load from unmonitored areas downstream monitoring sites are quantified by the area specific loss from the monitored parts, and the loads are included in the amounts given for the monitored areas. Generally, the monitored parts of the rivers cover some 95-100% of the total areas. Though, there are two exceptions Rivers Enningdalsälven and Rönneån covers only 80 and 51 %, respectively, of the total areas.

F. Limits of detection (Table 8)

F.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Give comments if the detection limits are higher than stated in the RID Principles:

None.

G. Additional comments

G.1 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

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2005 by Sweden Unmonitored areas included in Tributary Rivers. Identical values are given in row lower and upper.

Contracting Parties should use this format to report (i) their total inputs to each OSPAR region and (ii) their total inputs to their marine environment

TOTAL INPUTS			Quantities --->												
Discharge region	Estimate	Flow rate (1000 m3/d)	Cd [10^3 kg]	Hg [10^3 kg]	Cu [10^3 kg]	Pb [10^3 kg]	Zn [10^3 kg]	g-HCH [kg]	PCBs [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 [10^6 kg]
INPUTS TO OSPAR REGION KATTEGAT															
RIVERINE INPUTS															
Main Rivers	lower	58822	0,253	0,0444	36,6	10,09	133,0	NI	NI	0,944	9,80	0,208	19,4	0,572	NI
	upper		0,253	0,0444	36,6	10,09	133,0	NI	NI	0,944	9,80	0,208	19,4	0,572	NI
Tributary Rivers	lower	6705	0,040	0,0049	2,3	1,39	10,6	NI	NI	0,223	3,64	0,059	5,6	0,127	NI
	upper		0,040	0,0049	2,3	1,39	10,6	NI	NI	0,223	3,64	0,059	5,6	0,127	NI
Total Riverine Inputs	**lower**	65527	0,293	0,0493	38,9	11,48	143,6	NI	NI	1,167	13,44	0,267	25,0	0,699	NI
	upper		0,293	0,0493	38,9	11,48	143,6	NI	NI	1,167	13,44	0,267	25,0	0,699	NI
DIRECT DISCHARGES															
Sewage Effluents	lower	415	0,0073	0,0087	1,7276	0,0715	3,9078	NI	NI	1,0367	NI	NI	1,5435	0,0575	NI
	upper		0,0073	0,0087	1,7276	0,0715	3,9078	NI	NI	1,0367	NI	NI	1,5435	0,0575	NI
Industrial Effluents	lower	116	0,0081	0,0011	0,3080	0,0510	1,9340	NI	NI	0,014	NI	NI	0,1834	0,0167	NI
	upper		0,0081	0,0011	0,3080	0,0510	1,9340	NI	NI	0,014	NI	NI	0,1834	0,0167	NI
Fish Farming	lower		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	upper		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Total Direct Inputs	**lower**	531	0,0153	0,0098	2,0356	0,1225	5,8418	NI	NI	1,0507	NI	NI	1,7269	0,0742	NI
	upper		0,0153	0,0098	2,0356	0,1225	5,8418	NI	NI	1,0507	NI	NI	1,7269	0,0742	NI
UNMONITORED AREAS															
Unmonitored Areas	lower														
	upper														
REGION TOTAL	**lower**	66058	0,3083	0,0591	40,9356	11,6025	149,4418	NI	NI	2,2177	13,44	0,267	26,7269	0,7732	NI
	upper		0,3083	0,0591	40,9356	11,6025	149,4418	NI	NI	2,2177	13,44	0,267	26,7269	0,7732	NI

INPUTS TO OSPAR REGION SKAGERRAK															
RIVERINE INPUTS															
Main Rivers	lower	3491	0,020	0,0044	1,6	0,47	5,6	NI	NI	0,056	0,43	0,018	1,0	0,037	NI
	upper		0,020	0,0044	1,6	0,47	5,6	NI	NI	0,056	0,43	0,018	1,0	0,037	NI
Tributary Rivers	lower	3370	0,021	0,0049	1,6	0,52	5,8	NI	NI	0,072	0,49	0,024	1,1	0,046	NI
	upper		0,021	0,0049	1,6	0,52	5,8	NI	NI	0,072	0,49	0,024	1,1	0,046	NI
Total Riverine Inputs	**lower**	6861	0,041	0,0093	3,2	0,99	11,4	NI	NI	0,128	0,92	0,042	2,1	0,083	NI
	upper		0,041	0,0093	3,2	0,99	11,4	NI	NI	0,128	0,92	0,042	2,1	0,083	NI
DIRECT DISCHARGES															
Sewage Effluents	lower	53	0,0004	0,0004	0,0660	0,0096	0,2210	NI	NI	0,1257	NI	NI	0,2752	0,0066	NI
	upper		0,0004	0,0004	0,0660	0,0096	0,2210	NI	NI	0,1257	NI	NI	0,2752	0,0066	NI
Industrial Effluents	lower	11	0,0005	0,0005	0,6709	0,0072	0,4712	NI	NI	0,0140	NI	NI	0,0296	0,0026	NI
	upper		0,0005	0,0005	0,6709	0,0072	0,4712	NI	NI	0,0140	NI	NI	0,0296	0,0026	NI
Fish Farming	lower		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	upper		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Total Direct Inputs	**lower**	64	0,0008	0,0009	0,7369	0,0168	0,6922	NI	NI	0,1397	NI	NI	0,3048	0,0092	NI
	upper		0,0008	0,0009	0,7369	0,0168	0,6922	NI	NI	0,1397	NI	NI	0,3048	0,0092	NI
UNMONITORED AREAS															
Unmonitored Areas	lower														
	upper														
REGION TOTAL	**lower**	6925	0,0418	0,0102	3,9369	1,0068	12,0922	NI	NI	0,2677	0,92	0,042	2,4048	0,0922	NI
	upper		0,0418	0,0102	3,9369	1,0068	12,0922	NI	NI	0,2677	0,92	0,042	2,4048	0,0922	NI
TOTAL INPUTS TO OSPAR REGIONS															
RIVERINE INPUTS															
Main Rivers	lower	62312	0,273	0,0488	38,2	10,56	138,6	NI	NI	1	10,22	0,226	20,5	0,609	NI
	upper		0,273	0,0488	38,2	10,56	138,6	NI	NI	1	10,22	0,226	20,5	0,609	NI
Tributary Rivers	lower	10075	0,061	0,0098	3,9	1,91	16,4	NI	NI	0,295	4,13	0,083	6,7	0,173	NI
	upper		0,061	0,0098	3,9	1,91	16,4	NI	NI	0,295	4,13	0,083	6,7	0,173	NI

Total Riverine Inputs	**lower**	72387	0,334	0,0586	42,1	12,47	155	NI	NI	1,295	14,35	0,309	27,2	0,782	NI
	upper		0,334	0,0586	42,1	12,47	155	NI	NI	1,295	14,36	0,309	27,1	0,782	NI
DIRECT DISCHARGES															
Sewage Effluents	lower	468	0,0076	0,0090	1,794	0,081	4,129	NI	NI	1,162	NI	NI	1,819	0,064	NI
	upper		0,0076	0,0090	1,794	0,081	4,129	NI	NI	1,162	NI	NI	1,819	0,064	NI
Industrial Effluents	lower	127	0,0085	0,0016	0,979	0,058	2,405	NI	NI	0,028	NI	NI	0,213	0,019	NI
	upper		0,0085	0,0016	0,979	0,058	2,405	NI	NI	0,028	NI	NI	0,213	0,019	NI
Fish Farming	lower		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	upper		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Total Direct Inputs	**lower**	595	0,0162	0,0106	2,773	0,139	6,534	NI	NI	1,190	NI	NI	2,032	0,083	NI
	upper		0,0162	0,0106	2,773	0,139	6,534	NI	NI	1,190	NI	NI	2,032	0,083	NI
UNMONITORED AREAS															
Unmonitored Areas	lower														
	upper														
REGION TOTAL	**lower**	72982	0,3502	0,069232	44,8729	12,6092	161,5342	NI	NI	2,4850	14,35	0,309	29,23174	0,865389	NI
	upper		0,3502	0,069232	44,8729	12,6092	161,5342	NI	NI	2,4850	14,36	0,309	29,13174	0,865389	NI

Table 5a. Direct discharges to the maritime area in 2005 by Sweden

Sewage effluents			Quantities --->												
Discharge area	Number of sites (#)	Flow rate [1000 m3/d]	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]
Kattegat	15	415	0.0073	0.0087	1.728	0.071	3.908	NI	NI	1.037	NI	NI	1.544	0.058	NI
Skagerrak	19	53	0.0004	0.0004	0.066	0.010	0.221	NI	NI	0.126	NI	NI	0.275	0.007	NI
Total:	34	468	0.008	0.009	1.794	0.081	4.129	NI	NI	1.162	NI	NI	1.819	0.064	NI

Table 5b. Direct discharges to the maritime area in 2005 by Sweden

Industrial effluents			Quantities --->												
Discharge area	Number of sites (#)	Flow rate [1000 m^3/d]	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]
Kattegat	4	116	0.0081	0.0011	0.308	0.051	1.934	NI	NI	0.014	NI	NI	0.183	0.017	NI
Skagerrak	7	11	0.0005	0.0005	0.671	0.007	0.471	NI	NI	0.014	NI	NI	0.030	0.003	NI
Total:	11	127	0.009	0.002	0.979	0.058	2.405	NI	NI	0.028	NI	NI	0.213	0.019	NI

Table 5c. Direct discharges to the maritime area in 2005 by Sweden

Total direct discharges			Quantities ---> (lower estimate (aa)/upper estimate (bb)); alternatively: (estimate (aa), precision in % (bb))												
Discharge area	Number of sites (#)	Flow rate [1000 m^3/d]	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]
Kattegat	19	531	0.0153	0.0098	2.036	0.122	5.842	NI	NI	1.051	NI	NI	1.727	0.074	NI
Skagerrak	26	64	0.0008	0.0009	0.737	0.017	0.692	NI	NI	0.140	NI	NI	0.305	0.009	NI
Overall total:	45	595	0.016	0.011	2.772	0.139	6.534	NI	NI	1.191	NI	NI	2.032	0.083	NI

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

Table 6a. Riverine inputs to the maritime area in 2005 by Sweden

Main riverine inputs	Quantities --->														
Discharge area Kattegat, Skagerrak	Flow rate [1000 m³/d] 2005	LTA 1961-90	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]
Rönneå	1452	2030	0.019	0.0021	0.9	0.39	6.3	NI	NI	0.049	1.13	0.014	1.7	0.034	NI
Lagan	6480	7410	0,038 (3)	0.0069	5.2	1.18	17.8	NI	NI	0.115	1.09	0.019	2.5	0.057	NI
Nissan	3456	3690	0,029 (3)	0.0054	3	0.94	17.1	NI	NI	0.124	0.45	0.013	1.2	0.032	NI
Ätran	4320	5070	0,03 (3)	0.0051	6.7	1.33	24.1	NI	NI	0.121	0.82	0.022	1.8	0.046	NI
Viskan	3024	3450	*0.017*	*0.0014*	*1.2*	*0.35*	*4.4*	NI	NI	0.128	0.57	0.02	1.2	0.047	NI
Göta älv	40090	50530	0.12	0.0235	19.6	5.9	63.3	NI	NI	0.407	5.74	0.12	11	0.356	NI
Bäveån	372	350	0.003	0.0005	0.3	0.09	0.9	NI	NI	0.007	0.04	0.002	0.1	0.005	NI
Örekilsälven	1676	2050	0.01	0.0024	0.8	0.26	2.9	NI	NI	0.036	0.25	0.012	0.6	0.023	NI
Strömsån	320	390	0.002	0.0005	0.2	0.05	0.6	NI	NI	0.007	0.05	0.002	0.1	0.004	NI
Enningdalsälven	1123	1360	0.005	0.001	0.3	0.07	1.2	NI	NI	0.006	0.09	0.002	0.2	0.005	NI
Total:	62312	76330	0.273	0.0488	38.2	10.56	138.6	NI	NI	1	10.22	0.226	20.5	0.609	NI

Table 6b. Riverine inputs to the maritime area in 2005 by Sweden (smaller rivers and coastal areas)

Tributary riverine inputs	Quantities --->														
Discharge area Kattegat, Skagerrak	Flow rate [1000 m³/d] 2005	LTA 1961-90	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]
smaller rivers and coastal areas in Kattegat	6705		0.04	0.0049	2.3	1.39	10.6	NI	NI	0.223	3.64	0.059	5.6	0.127	NI
smaller rivers and coastal areas in Skagerrak	3370		0.021	0.0049	1.6	0.52	5.8	NI	NI	0.072	0.49	0.024	1.1	0.046	NI
Total:			0.061	0.0098	3.9	1.91	16.4	NI	NI	0.295	4.13	0.083	6.7	0.173	NI

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

Table 6c. Riverine inputs to the maritime area in 2005 by Sweden

Total Riverine Inputs			Quantities --->												
Discharge area	Flow rate [1000 m³/d] 2005	LTA 1961-90	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]
Kattegat	65527		0.566	0.0493	38.9	11.48	143.6	NI	NI	1.167	13.44	0.267	25	0.699	NI
Skagerrak	6861		0.041	0.0093	3.2	0.99	11.4	NI	NI	0.128	0.92	0.042	2.1	0.083	NI
Overall total:	72388		0,334 (3)	0.0586	42.1	12.47	155	NI	NI	1.295	14.36	0.309	27.1	0.782	NI

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180.
(2) Suspended particulate matte
LTA: Long-term average flow: specify perio
(3) At least some of the Cd concentrations are most certainly affected by some kind of Cd contamination at sampling. The cause of the contamination is still under investiga

Table 7a. Contaminant concentrations of Swedish rivers discharging to the maritime area 2005

Main river				Contaminant concentrations -->												
Discharge area Kattegat	Flow rate [1000 m³/d] annual	LTA	Mean or median?	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]
Rönne å	1452	2,030	mean	0.024		1.41	0.476	8.72	ni	ni	0.054	1.08	0.0116	2.15	0.053	ni
Minimum				0.007		0.95	0.25	4.6			0.032	0.41	0.007	1.7	0.023	
Maximum				0.048		2	0.74	17			0.092	1.74	0.016	2.89	0.098	
> 70 % > d.l. ?			*yes*													
n				12	0	12	12	12			12	12	12	12	12	0
Lagan	6480	7,410	mean	calc	0.0029	2.29	0.494	7.84	ni	ni	0.04	0.3	0.0058	0.86	0.022	ni
Minimum					0.0017	1.1	0.38	5.4			0.006	0.18	0.004	0.68	0.013	
Maximum					0.0046	4.3	0.69	12			0.07	0.42	0.01	1.04	0.032	
> 70 % > d.l. ?			*yes*	0												
n					12	9	9	9			12	12	12	12	12	0
Nissan	3456	3,690	mean	calc	0.004	2.63	0.732	14.18	ni	ni	0.093	0.39	0.0098	1.03	0.026	ni
Minimum					0.0025	1.7	0.46	11			0.038	0.2	0.005	0.84	0.011	
Maximum					0.0067	4.1	1.38	31			0.241	0.55	0.031	1.23	0.079	
> 70 % > d.l. ?			*yes*	0												
n					12	11	11	11			12	12	12	12	12	0
Ätran	4320	5,070	mean	calc	0.003	3.8	0.77	14.13	ni	ni	0.066	0.52	0.0123	1.11	0.028	
Minimum					0.0015	1	0.19	3.6			0.008	0.33	0.003	0.85	0.01	
Maximum					0.0065	18	4.5	72			0.351	0.67	0.069	1.54	0.107	
> 70 % > d.l. ?			*yes*	0												
n					12	11	11	11			12	12	12	12	12	
Viskan	3024	3,450	mean	calc	calc		calc		ni	ni	0.096	0.58	0.0138	1.16	0.032	ni
Minimum											0.017	0.29	0.007	0.8	0.013	
Maximum											0.38	0.99	0.039	1.61	0.096	
> 70 % > d.l. ?			*yes*													
n				0	0	0	0	0	0		12	12	12	12	12	0
Göta älv	40090	50,530	mean	0.007	0.0016	1.3	0.353	3.98	ni	ni	0.029	0.39	0.0071	0.75	0.023	
Minimum				0.005	0.0005	0.84	0.15	2.3			0.011	0.16	0.002	0.48	0.005	
Maximum				0.018	0.0027	1.6	1	8.5			0.06	0.53	0.018	1.02	0.054	
> 70 % > d.l. ?			*yes*													
n				12	12	12	12	12			12	12	12	12	12	0

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

Table 7a, cont. Contaminant concentrations of Swedish rivers discharging to the maritime area 2005

Main rivers, cont.				Contaminant concentrations -->												
Discharge area Skagerrak	Flow rate [1000 m³/d] annual	LTA	Mean or median?	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]
Bäveån	372	350	mean	0.016	0.0034	2.25	0.653	6.1	ni	ni	0.054	0.28	0.0148	0.84	0.035	ni
Minimum				0.005	0.0018	1.2	0.36	3.8			0.016	0.1	0.006	0.57	0.013	
Maximum				0.025	0.0069	4.6	1.71	11			0.093	0.44	0.024	1.21	0.06	
> 70 % > d.l. ?			***yes***													
n				12	12	12	12	12			12	12	12	12	12	0
Örekilsälven	1676	2,050	mean	0.015	0.0033	1.22	0.371	4.04	ni	ni	0.063	0.35	0.0146	0.89	0.034	
Minimum				0.005	0.002	0.82	0.26	1.9			0.038	0.2	0.007	0.67	0.016	
Maximum				0.024	0.0052	1.6	0.52	5.6			0.131	0.56	0.03	1.06	0.053	
> 70 % > d.l. ?			***yes***													
n				12	12	12	12	12			12	12	12	12	12	
Enningdalsälven	1123	1,360	mean	0.012	0.0022	0.73	0.154	2.78	ni	ni	0.016	0.2	0.0038	0.59	0.012	ni
Minimum				0.006	0.0015	0.39	0.06	1.6			0.007	0.12	0.002	0.48	0.007	
Maximum				0.019	0.0028	0.93	0.23	3.8			0.036	0.3	0.006	0.7	0.02	
> 70 % > d.l. ?			***yes***													
n				12	12	12	12	12			12	12	12	12	12	0

(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
(3) At least some of the concentrations are most certainly affected by some kind of Cd contamination at sampling. The cause of the contamination is still under investigation. Therefore, no concentrations are given. For comparison, the input to the Sea from this river is given as the average input during 2001–2003.

Table 8. Detection limits for contaminant concentrations of Swedish 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]
main rivers	R			0.003	0.0001	0.004	0.02	0.2	na	na	0.001	0.001	0.001	0.05	0.005	na

 # 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

10. United Kingdom

Annual report on riverine inputs and direct discharges to Convention waters during the year 2005 by the United Kingdom

Text report, including Tables A-E

Table 4b	Total riverine inputs and direct discharges to the maritime area in 2005 by the United Kingdom
Table 5a	Sewage Effluents. Reported Maritime Area of the OSPAR Convention in 2005 by the United Kingdom
Table 5b	Industrial effluents. Reported Maritime Area of the OSPAR Convention in 2005 by the United Kingdom
Table 6c	Riverine inputs. Reported Maritime Area of the OSPAR Convention in 2005 by the United Kingdom
Table 8	Limits of Detection and Limits of Quantification UK RID Monitoring Data

Annual Report on Riverine Inputs and Direct Discharges by The United Kingdom to Convention Waters during the year 2005 (Second Draft October 06)

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: **UK**	
Name of river, sub-area and discharge area[1]	**Nature of the receiving water**[2]
The results are presented as summary statistics for each of six sea areas adjacent to the UK, namely: the North Sea (North); the North Sea (South); the Channel; the Celtic Sea; the Irish Sea; and the Atlantic. Each of these six sea areas is subdivided into sampling regions. The boundaries of these sampling regions are generally the same as or very close to the boundaries of the ICES Zones and are indicated on the map which accompanies this report (which also shows UK rivers and the catchment areas related to the six sea areas).	

[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

*Include map indicating the river systems and catchments (e.g. to fit on A4 page)***.** **MAP attached**

B. Total riverine inputs and direct discharges (Tables 4a and 4b) for the year:

Information provided by the UK on total riverine inputs and direct discharges to the OSPAR Convention Area

The UK has provided **3 tables in the attached xl file** (**tables A, B and C**) which show the estimates of inputs to the OSPAR Maritime Area for the years 1990 to 2005. These are included to show how inputs of the various determinants are changing over time. ***However, comparisons between years must be approached with extreme caution, due to the fact that rainfall patterns differ from region to region and from year to year and strongly influence flows and the amount of land run-off, which in turn affect the loads of most determinands measured***.

Table A gives the annual estimates of UK **Direct** Inputs (sewage plus industrial) from 1990 to 2005.

Table B gives the annual estimates of UK **Riverine** Inputs from 1990 to 2005

Table C gives the annual estimates of UK **Total** Inputs (direct plus riverine) from 1990 to 2005

Note that Tables A, B and C do not include inputs from fish farms in the sea

Table D provides information on how the total inputs (direct, excluding fish farms, plus riverine) are distributed across the 6 UK sea areas (North Sea North, North Sea South, Channel, Celtic Sea, Irish Sea and Atlantic).

Table DF provides information on how the total inputs (direct, **including fish farms in the sea**, plus riverine) are distributed across the 6 UK sea areas (North Sea North, North Sea South, Channel, Celtic Sea, Irish Sea and Atlantic).

In addition, **the new table 4B (agreed at INPUT 2005),** which provides information on UK total riverine inputs, and direct discharges to each OSPAR region has been included. This table also provides information on UK inputs from fish farming in the sea. In connection with this table, the UK has not included a row on tributary rivers, as the riverine data provided by our agencies includes both main rivers and the small number of associated tributary rivers combined together.

B.1 Give general comments on the total riverine inputs and direct discharges (e.g. changes from last year, trends, percentage of particle bound determinand, results that need to be highlighted etc.):

Generally speaking 2005 was a year with slightly lower rainfall and river flows than in 2004, particularly in the east and south of the UK. This has resulted in the total loadings (particularly riverine) to tidal waters being slightly lower than in 2004. Values for all determinants except for NH4-N and Suspended Particulate matter are lower than for 2004, and all values are well below the average value for 1990 to 2005.

C. Direct discharges for the year: 2005

Sewage Effluents (Table 5a) Note Table 5a is provided in the attached spreadsheet

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 (cf. section 7 of the RID Principles), including for those under voluntary reporting:

Methods of Measurement and Calculation for Direct and Riverine inputs

The Environment Agency in England and Wales and the Scottish Environment Protection Agency in Scotland were the statutory bodies that executed the survey. The Environment and Heritage Service undertook the survey in Northern Ireland. Methods used varied from region to region (see table 8 on detection and quantification limits) but all are subjected to formal analytical quality assurance procedures.

Generally, all the main river systems are sampled approximately monthly at a sampling point close to but upstream of the tidal limit, (i.e. the point at which the unidirectional fresh water flow ceases).

All significant “Direct” discharges of industrial or sewage effluent downstream of the riverine sampling points (i.e. direct to estuaries and to coastal waters) were sampled.

Parameters Monitored

The parameters monitored by the UK followed closely those required by the RID Principles. Acid digestions to include organic forms of nitrogen and phosphorous **were not undertaken** in England and Wales. In order to provide an estimate for England and Wales and to avoid a major anomaly in reporting overall totals, total phosphorous inputs are assumed to be equal orthophosphate phosphorous inputs. (Although this will lead to an underestimation of total P, a study of river waters and sewage effluents in the Thames region showed that the ratio of the two determinants was close to unity - INPUT 1997 5/info.3 refers. Also, the underestimation is reasonably consistent year on year and, thus, will not significantly affect the consideration of patterns of change).

Inputs of PCBs are reported as the sum of the seven recommended congeners (IUPAC numbers 28, 52, 101, 118, 138, 153 and 180). However, it should be noted that a large number of rivers and direct discharges are not now monitored for PCBs because monitoring in the early years has shown that concentrations are consistently below the level of detection (LOD). Consequently, input estimates of PCBs are imprecise ***and any comparison between the overall estimates for different years will be misleading***.

Estimation of Annual Load

Both of the formulae recommended by RID were used for calculating loads. The first formula requires the mean annual flow rate for a river and was used in some parts of Scotland where continuous flow records were available. In England and Wales and in western Scotland, the second formula was used. Best available estimates for flow were used for some smaller rivers with no gauging stations.

The aim of the survey, as in earlier years, has been to achieve at least 90% coverage of the overall inputs from the UK. As with earlier years, the total inputs reported have not been proportioned up to give a 100% estimated value. This means that the results reported are consistent with the estimates reported for earlier years. Because of the location of the monitoring stations, riverine inputs cover some 80% of the landmass. As direct inputs account for all significant inputs downstream of the riverine monitoring stations, it is considered that, overall, the 90% coverage target has been met. Some work is currently underway to check coverage in some less populated areas of the UK.

Information on Concentrations

Information on concentrations has not been included.

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the RID 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):

Information on PCBs has been included for a number of sites where previous sampling has indicated that this chemical is likely to be present.

C.3 Give general comments on the discharges of sewage effluents (e.g. compared to previous years, and/or extent to which industrial effluents are discharged through sewerage systems):

A number of results are lower in 2004, and some are higher but there is no discernable trend between the 2004 and 2005 data. Information on the industrial discharges entering the sewerage is not held centrally and has not been provided due to lack of resources. However, it is likely to be significant.

Industrial Effluents (Table 5b)

Note: Table 5b is included in the attached spreadsheet

C.4 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 7 of the RID Principles), including for those under voluntary reporting:

The methods and calculations are broadly similar to those reported above.

C.5 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

This information is not available.

C.6 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 storm water overflows were sampled. It is considered that the contribution of storm water to total UK inputs will have been small and, with ongoing improvements relating to such discharges, it is progressively diminishing. Also, the riverine (tidal limit) sampling covers storm water overflows to inland river systems. Consequently, it is believed that no significant error will have resulted from not specifically monitoring these inputs.

C.7 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):

Information on PCBs has been included for a number of sampling regions.

C.8 Give general comments on industrial effluents (e.g. compared to previous years):

Industrial effluent levels in 2005 compared to 2004 are somewhat variable. Most values are lower, but some are higher. There is generally insufficient knowledge to give reasons for these changes and to say whether they are significant.

Total direct discharges (Table 5c)

Note: Table 5c ha not been provided. The UK believes that Table A and Table 4b both provided in the attached spreadsheet give a better understanding of the situation with respect to inputs and trends of total direct discharges in the UK.

C.9 Give general comments on total direct discharges (e.g. compared to previous years):

Generally speaking 2005 was a year with slightly lower rainfall and river flows than in 2004. This has resulted in loadings (particularly riverine) to tidal waters being slightly lower than in 2004. Overall values for lead, ammonium-N, Total N and Suspended particulate matter are slightly higher than in 2004, but all values are lower than the average value for 1990 to 2005.

D. Riverine inputs for the year: 2005

Main Rivers (Tables 6a and 7a)

Note: In the UK, main rivers and the small number of tributary rivers are reported together and the results for Table 6c are in the attached spreadsheet.

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 6 of the RID Principles), including for those under voluntary reporting:

The methods and calculations are broadly similar to those reported above.

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

Suspended Particulate Matter measurements are included in table 6c

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):

Information on PCBs has been included for a number of sites

D.4 Give general comments on the inputs from main rivers (e.g. significant changes in inputs, concentrations and flows compared to previous years):

The total UK riverine flow was around 7% less than in 2004, although there were significantly lower flows in the East and South of the UK. In some areas, e.g. Northern Ireland, flows were higher. Flows in the North Sea North, and the Atlantic Regions exceeded both the Long Term National Average flow, and the Average Flow for 1990 to 2005.

Tributary Rivers (Tables 6b and 7b)

D.5 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 6 of the Principles):

Not relevant for the UK situation. UK tributary rivers are not reported separately.

D6 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

Not relevant for the UK situation. UK tributary rivers are not reported separately.

D.7 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):

Not relevant for the UK situation. UK tributary rivers are not reported separately.

D.8 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in Tables 6b and 7b:

Not relevant for the UK situation. UK tributary rivers are not reported separately.

D.9 Give general comments on the inputs from tributary rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

Not relevant for the UK situation. UK tributary rivers are not reported separately.

Total riverine inputs (Table 6c)

Table 6c is included in the attached spreadsheet

D.10 Give general comments on the total riverine inputs (e.g. significant change in inputs, concentrations and flows compared to previous years):

Overall, the values for all parameters except for Suspended Particulate Matter are lower in 2005 than for 2004. This generally reflects the slightly lower flows in 2005. All values are lower than the average values from 1990 to 2005.

E. Unmonitored areas

E.1 Describe the methods of quantification used for the different determinands or groups of determinands:

As with earlier years, the total inputs reported have not been proportioned up to give a 100% estimated value. The reason for this is to maintain consistency with results that have been reported in earlier years. Because of the location of the monitoring stations, riverine inputs cover some 80% of the landmass. As direct inputs account for all significant inputs downstream of the riverine monitoring stations, it is considered that, overall, the 90% coverage target has been met. However work is currently underway to check coverage in some less populated areas of the UK.

Also, additional factors, such as the uptake of nutrients by shellfish in shellfish-growing areas (which will reduce the input levels) have not been factored into the RID reporting.

F. Limits of detection (Table 8)

F.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Give comments if the detection limits are higher than stated in the RID Principles:

Information on the various detection limits and limits of quantification used in England and Wales, Northern Ireland and Scotland are included in the attached spreadsheet (see workbook “Table 8”). Several regions have reported that the detection limits recommended by INPUT 2005 are too stringent for the RID purposes and are not achievable with the equipment available.

G. Additional comments

G.1 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*

Any differences with the agreed procedures have been described in the answers to the relevant questions in the text above. In a very small number of cases, it has been necessary to estimate values when a site has not been fully monitored, or when subsequent evaluation has indicated that the results are not of good quality.

UK Rivers and Catchment Areas in Relation to OSPAR Sea Areas

(also showing boundaries of inputs' sampling regions NI 1 & 2, E 1 - E 30 and SC 1 - SC 5)

Table A: Annual Estimates of UK Direct Inputs (Sewage plus Industrial) to the OSPAR Maritime Area from 1990 to 2005

25.09.06 RM

Sewage plus Industrial to All Sea Areas	Quantity: 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]	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
1990	29.91	34.39	3.69	4.59	286.9	303.1	114.9	171.2	1742	1751	191	227	79	307			23.1	23.2	21.8	22.2	117.7	119.4	23.9	24.3	1283	1283
1991	18.80	22.10	3.36	3.50	272.6	278.9	133.0	146.2	1664	1668	140	185	224	429			21.1	21.2	22.1	22.3	99.7	100.2	25.1	25.2	1210	1212
1992	12.83	14.87	1.98	2.24	245.3	251.8	125.1	141.7	1360	1362	145	180	127	460	78.4	78.5	25.3	25.4	19.4	19.5	111.8	112.1	21.9	21.9	952	952
1993	9.40	11.61	1.07	1.32	208.5	215.5	129.3	143.5	1149	1150	142	156	27	162	68.7	68.8	20.5	20.7	13.7	13.8	100.7	101.1	15.4	15.4	638	638
1994	6.08	7.90	0.87	1.08	212.7	220.4	112.7	128.1	1149	1150	108	150	11	185	64.0	64.1	19.4	19.6	15.8	15.8	93.4	93.7	17.6	17.7	629	629
1995	6.04	7.75	0.62	0.80	226.2	232.5	104.4	114.2	988	990	123	154	7	168	59.7	59.9	19.3	19.5	15.3	15.3	88.8	89.1	16.9	17.1	658	659
1996	7.34	8.44	0.55	0.71	157.2	161.1	101.1	106.1	760	761	82	95	34	277	53.9	53.9	16.4	16.7	15.1	15.1	78.0	78.2	16.8	16.8	543	543
1997	5.78	7.00	0.49	0.62	156.0	163.5	93.0	97.9	634	635	176	197	3	177	55.3	55.4	17.5	17.7	15.8	15.8	81.8	82.1	18.1	18.1	570	570
1998	3.77	4.85	0.62	0.81	149.7	152.0	97.3	100.8	541	541	64	125	363	471	56.4	56.4	18.5	18.7	14.3	14.3	82.5	82.5	17.5	17.5	672	673
1999	4.35	5.28	0.63	0.73	152.5	155.2	86.4	90.2	584	585	51	80	78	162	50.2	50.3	18.2	18.5	14.4	14.5	75.4	75.8	16.0	16.0	618	618
2000	2.43	3.37	0.53	0.67	140.5	142.6	76.7	80.1	525	526	33	60	8	125	41.2	41.4	20.3	20.4	13.8	13.8	72.9	72.9	15.2	15.2	402	402
2001	1.86	2.61	0.59	0.80	108.7	111.7	57.9	60.6	363	364	23	58	46	99	42.5	42.6	19.7	19.8	12.3	12.4	71.5	71.5	13.9	13.9	650	650
2002	2.72	3.35	0.42	0.74	77.4	79.6	36.8	38.6	316	319	9	38	4	32	40.3	40.4	21.6	21.7	9.7	9.8	69.3	69.3	11.0	11.1	382	382
2003	2.57	2.86	0.49	0.62	71.4	73.4	31.1	32.1	259	259	5.7	27.7	8.3	57.5	42.8	43.0	20.3	20.5	9.6	9.7	75.0	75.4	10.9	11.1	326	327
2004	0.48	0.75	0.17	0.27	64.9	66.5	27.1	28.0	269	270	15.7	37.6	2.2	47.0	37.0	37.1	19.7	19.9	10.2	10.7	61.6	62.3	12.2	12.7	311	311
2005	0.29	0.55	0.16	0.23	58.5	59.6	31.6	33.1	189	190	4	24	0.2	15	38.8	38.9	18.8	19.0	9.4	9.5	66.6	69.3	10.7	10.9	563	563
2006																										
Ave UK Direct	**7.2**	**8.6**	**1.0**	**1.2**	**161.8**	**166.7**	**84.9**	**94.5**	**780.8**	**782.5**	**82.1**	**112.1**	**63.9**	**198.3**	**52.1**	**52.2**	**20.0**	**20.2**	**14.5**	**14.7**	**84.2**	**84.7**	**16.5**	**16.6**	**650.4**	**650.8**

Table B: Annual Estimates of UK Riverine Inputs to the OSPAR Maritime Area from 1990 to 2005

Riverine Total to All Sea Ar	Flow Rate ml/d	Quantity: 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]	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
1990	255791	9.37	29.72	2.20	7.68	478.7	536.1	403.1	493.1	2104	2188	213	562	71	3865			176.1	176.3	16.1	16.4	203.9	204.6	13.6	13.9	1569	1584
1991	252010	16.34	41.56	1.86	7.01	343.8	433.7	374.8	510.7	1909	2119	463	736	14	1699			185.2	185.3	14.1	14.4	242.6	243.0	14.9	15.2	1344	1397
1992	290034	11.36	30.42	1.68	6.05	455.1	477.4	340.7	399.0	2488	2514	299	509	34	954	19.5	19.7	211.7	220.0	15.9	16.2	274.9	282.9	17.3	17.4	2138	2152
1993	279151	9.50	28.09	3.12	7.58	453.9	488.8	466.2	523.7	2017	2053	332	572	110	2535	18.0	18.2	217.5	224.7	15.6	15.9	281.3	292.3	18.5	18.7	2219	2232
1994	306000	8.70	28.83	1.45	6.26	466.2	501.4	383.4	430.7	2193	2321	254	489	11	1937	17.7	18.3	251.6	252.1	16.6	17.1	298.4	302.0	18.0	18.5	2622	2651
1995	261776	6.15	22.89	1.42	5.33	389.9	410.5	265.5	303.8	1733	1806	241	454	0	1701	20.1	20.3	240.9	241.1	16.8	17.1	287.4	288.6	19.5	19.7	1803	1820
1996	223803	4.16	18.30	1.41	3.93	291.7	308.3	187.4	224.1	1337	1354	173	275	39	1131	16.6	17.0	204.2	204.2	15.4	15.7	235.8	236.1	17.0	17.1	1205	1244
1997	237547	5.96	12.64	2.53	4.80	331.5	333.9	274.9	290.9	1523	1543	116	222	100	527	15.8	16.1	189.8	190.0	15.2	16.2	221.0	221.8	17.9	17.9	1732	1772
1998	315014	8.27	16.38	2.81	5.08	459.8	463.7	437.6	452.8	1933	1944	117	373	35	1196	14.8	15.5	274.5	279.2	19.0	19.2	306.7	310.7	21.3	21.5	1849	1901
1999	308803	8.82	17.54	1.70	3.55	503.3	509.0	447.6	467.8	1999	2024	102	414	4	1426	13.6	14.4	284.1	285.3	21.2	21.9	315.7	316.1	22.8	23.4	3268	3292
2000	365078	9.08	22.05	2.48	4.32	519.1	529.2	516.2	538.4	2523	2553	112	395	51	1519	14.2	14.8	319.0	319.5	21.5	21.9	359.1	359.1	23.3	23.5	2947	2978
2001	290131	7.39	13.06	1.11	1.87	474.3	477.8	407.4	431.5	2024	2051	54	230	43	419	15.7	16.3	302.1	303.3	20.5	20.8	336.5	336.8	21.7	21.9	3221	3245
2002	313746	8.10	14.80	2.21	3.22	448.7	453.3	468.8	487.7	2120	2168	9	256	0	265	12.9	13.5	274.0	274.9	15.6	15.9	304.0	304.5	17.4	17.6	2587	2605
2003	223774	4.25	7.33	1.05	1.49	255.7	262.2	156.6	179.1	1133	1155	15	124	2	202	8.9	9.4	186.4	186.7	10.7	11.6	217.9	218.1	11.6	12.4	834	869
2004	282173	4.70	8.50	0.67	1.50	361.4	369.1	348.7	381.6	1518	1554	14.3	149.1	0.2	197.3	9.1	9.6	205.7	205.9	31.4	31.7	225.0	246.4	32.8	33.1	1408	1455
2005	262195	4.50	7.51	0.44	1.11	329.9	337.0	240.4	270.4	1422	1449	16	138	0.4	143	8.2	8.9	191.7	191.9	10.6	10.9	214.2	221.0	12.9	13.1	1649	1685
2006																											
Ave UK Riveri	279188	**7.9**	**20.0**	**1.8**	**4.4**	**410.2**	**430.7**	**357.5**	**399.1**	**1873.4**	**1924.8**	**158.2**	**368.7**	**32.3**	**1232.1**	**14.7**	**15.1**	**232.1**	**233.8**	**17.3**	**17.7**	**270.3**	**274.0**	**18.8**	**19.1**	**2024.7**	**2055.1**
LTA Flow Rate	273080																										

Table C: Annual Estimates of Total UK (Direct plus Riverine) Inputs to the OSPAR Maritime Area from 1990 to 2005

Riverine plus Direct to All Sea Areas	Quantity: 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]	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
1990	39.28	64.11	5.89	12.28	766	839	518	664	3846	3939	404	789	150	4172			199.3	199.4	37.9	38.6	321.6	324.0	37.5	38.1	2852	2867
1991	35.14	63.66	5.22	10.51	616	713	508	657	3573	3786	602	921	237	2128			206.3	206.5	36.3	36.7	342.3	343.2	40.0	40.4	2554	2609
1992	24.19	45.29	3.65	8.30	700	729	466	541	3848	3877	444	689	162	1414	98.0	98.2	236.9	245.4	35.3	35.6	386.7	395.0	39.2	39.3	3090	3105
1993	18.90	39.70	4.19	8.90	662	704	595	667	3166	3203	475	729	137	2697	86.7	87.0	238.0	245.4	29.4	29.6	382.0	393.4	33.9	34.1	2857	2870
1994	14.78	36.73	2.33	7.35	679	722	496	559	3341	3472	362	639	22	2121	81.7	82.5	270.9	271.6	32.3	33.0	391.8	395.7	35.7	36.2	3251	3280
1995	12.19	30.65	2.04	6.13	616	643	370	418	2721	2796	364	608	8	1869	79.8	80.2	260.1	260.6	32.0	32.5	376.1	377.7	36.4	36.7	2462	2479
1996	11.50	26.74	1.96	4.65	449	469	288	330	2097	2115	255	370	73	1408	70.5	70.9	220.6	220.9	30.5	30.8	313.8	314.3	33.7	33.9	1748	1787
1997	11.75	19.64	3.03	5.43	488	497	368	389	2157	2178	292	419	103	705	71.1	71.6	207.3	207.8	30.9	31.9	302.8	303.8	36.0	36.0	2302	2342
1998	12.04	21.23	3.43	5.89	609	616	535	554	2473	2485	181	497	398	1667	71.2	71.9	293.0	297.9	33.3	33.5	389.2	393.2	38.8	39.1	2521	2573
1999	13.17	22.82	2.33	4.29	656	664	534	558	2583	2609	153	494	82	1588	63.8	64.7	302.4	303.8	35.6	36.4	391.1	392.0	38.8	39.4	3886	3910
2000	11.51	25.42	3.01	4.99	660	672	593	618	3048	3079	145	455	59	1644	55.4	56.2	339.3	339.9	35.3	35.7	432.0	432.1	38.5	38.8	3348	3380
2001	9.25	15.67	1.70	2.66	583	589	465	492	2387	2415	77	288	89	518	58.2	58.9	321.8	323.0	32.9	33.2	408.0	408.3	35.6	35.8	3870	3895
2002	10.82	18.14	2.63	3.95	526	533	506	526	2436	2486	19	294	4	297	53.2	53.9	295.6	296.6	25.3	25.7	373.3	373.8	28.3	28.7	2968	2987
2003	6.82	10.19	1.54	2.11	327	336	188	211	1392	1414	20	152	10	259	51.7	52.4	206.7	207.3	20.3	21.3	293.0	293.4	22.5	23.5	1161	1195
2004	5.19	9.25	0.84	1.77	426	436	375.8	409.6	1788	1824	30	187	2	244	46.1	46.8	225.3	225.7	41.7	42.4	286.6	308.7	45.0	45.7	1719	1766
2005	4.79	8.06	0.60	1.34	388.4	396.6	272.0	303.5	1611	1639	20	162	1	157	47.0	47.8	210.5	210.9	20.0	20.5	280.8	290.3	23.6	24.0	2212	2249
2006																										
Ave UK Total Inputs	**15.1**	**28.6**	**2.8**	**5.7**	**572.0**	**597.4**	**442.4**	**493.6**	**2654.2**	**2707.3**	**240.2**	**480.8**	**96.1**	**1430.5**	**66.7**	**67.3**	**252.1**	**253.9**	**31.8**	**32.3**	**354.4**	**358.7**	**35.2**	**35.6**	**2675.1**	**2705.9**

Table D: Total UK (Direct plus Riverine) Inputs to the OSPAR Maritime Area in 2005 by Sea Area (RTT = Regional Task Team)

Riverine plus Direct to Sea Area:	Quantity: 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]	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
North Sea (N)	1.14	1.64	0.11	0.23	100.2	103.2	59.0	59.9	370	376	11	41	0.0	43	11.1	11.2	41.3	41.3	2.6	2.7	60.7	60.9	3.8	3.9	607	619
North Sea (S)	1.36	1.60	0.17	0.23	60.2	60.2	99.0	100.9	342	344	1	43	0.0	40	7.6	7.6	61.2	61.2	7.6	7.6	80.0	80.2	7.6	7.6	347	348
Channel	0.30	0.46	0.05	0.08	31.0	31.3	6.8	12.5	100	105	1	12	0.0	12	8.7	8.8	20.4	20.5	2.0	2.0	23.9	29.6	2.0	2.0	95	97
RTT II Total	**2.80**	**3.70**	**0.34**	**0.54**	**191**	**195**	**165**	**173**	**813**	**825**	**13**	**96**	**0.0**	**95**	**27.3**	**27.6**	**123**	**123**	**12.1**	**12.3**	**165**	**171**	**13.3**	**13.5**	**1049**	**1064**
Celtic Sea	0.47	1.33	0.04	0.13	45.7	46.7	29.7	42.4	230	232	1	29	0.2	4	3.8	3.9	40.1	40.1	2.1	2.1	44.7	47.3	2.1	2.1	416	418
Irish Sea	1.15	1.81	0.19	0.38	84.3	86.2	62.8	71.6	400	407	1	21	0.4	52	9.5	9.7	33.7	33.9	3.4	3.5	46.9	47.1	3.9	4.1	506	517
Atlantic	0.36	1.21	0.03	0.29	66.9	69.0	14.7	16.2	169	174	5	15	0.0	7	6.4	6.5	13.9	13.9	2.4	2.5	24.6	25.3	4.3	4.3	241	249
RTT III Total	**1.99**	**4.36**	**0.26**	**0.79**	**197**	**202**	**107**	**130**	**798**	**814**	**7**	**65**	**0.6**	**62**	**19.7**	**20.2**	**88**	**88**	**7.9**	**8.1**	**116**	**120**	**10.3**	**10.5**	**1163**	**1184**
All Sea Areas	**4.8**	**8.1**	**0.6**	**1.3**	**388.4**	**396.6**	**272.0**	**303.5**	**1611.1**	**1639.0**	**19.6**	**161.6**	**0.7**	**157.4**	**47.0**	**47.8**	**210.5**	**210.9**	**20.0**	**20.5**	**280.8**	**290.3**	**23.6**	**24.0**	**2212.0**	**2248.5**

Table DF: Total UK (Direct, including sea fish farms plus Riverine) Inputs to the OSPAR Maritime Area in 2005 by Sea Area

Riverine plus Direct to Sea Area:	Quantity: 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]	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
North Sea (N)	1.14	1.64	0.11	0.23	117.0	120.0	59.0	59.9	373	379	11	41	0.0	43	11.1	11.2	41.3	41.3	2.6	2.7	63.9	64.2	4.2	4.3	607	619
North Sea (S)	1.36	1.60	0.17	0.23	60.2	60.2	99.0	100.9	342	344	1	43	0.0	40	7.6	7.6	61.2	61.2	7.6	7.6	80.0	80.2	7.6	7.6	347	348
Channel	0.30	0.46	0.05	0.08	31.0	31.3	6.8	12.5	100	105	1	12	0.0	12	8.7	8.8	20.4	20.5	2.0	2.0	23.9	29.6	2.0	2.0	95	97
RTT II Total	**2.80**	**3.70**	**0.34**	**0.54**	**208**	**211**	**165**	**173**	**816**	**829**	**13**	**96**	**0.0**	**95**	**27.3**	**27.6**	**123**	**123**	**12.1**	**12.3**	**168**	**174**	**13.8**	**13.9**	**1049**	**1064**
Celtic Sea	0.47	1.33	0.04	0.13	45.7	46.7	29.7	42.4	230	232	1	29	0.2	4	3.8	3.9	40.1	40.1	2.1	2.1	44.7	47.3	2.1	2.1	416	418
Irish Sea	1.15	1.81	0.19	0.38	84.3	86.2	62.8	71.6	400	407	1	21	0.4	52	9.5	9.7	33.7	33.9	3.4	3.5	46.9	47.1	3.9	4.1	506	517
Atlantic	0.36	1.21	0.03	0.29	111.6	113.7	14.7	16.2	174	180	5	15	0.0	7	6.4	6.5	13.9	13.9	2.4	2.5	30.2	30.9	5.0	5.1	241	249
RTT III Total	**1.99**	**4.36**	**0.26**	**0.79**	**242**	**247**	**107**	**130**	**804**	**819**	**7**	**65**	**0.6**	**62**	**19.7**	**20.2**	**88**	**88**	**7.9**	**8.1**	**122**	**125**	**11.0**	**11.3**	**1163**	**1184**
All Sea Areas	**4.8**	**8.1**	**0.6**	**1.3**	**449.9**	**458.1**	**272.0**	**303.5**	**1619.8**	**1647.7**	**19.6**	**161.6**	**0.7**	**157.4**	**47.0**	**47.8**	**210.5**	**210.9**	**20.0**	**20.5**	**289.6**	**299.1**	**24.8**	**25.2**	**2212.0**	**2248.5**

Note for the NH4-N value in tables table A, B and C, the average was calculated on base of 14 rather than 16 due to fact that 2 years early data is missing

Table E. UK Riverine Flows 23.10.06 RM

1990 flows added 29 Jan 2003 (updating info submitted to OSPAR in UK RID 2001 report).
Order and division of areas changed Oct 2003 to correspond with 6 UK areas of assessment.

E19 for 2004 estimated because one site not reported.

Zone	No.	Annual Riverine Flow Rate (Ml/day)																	
Sea Area	sites	LTA	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Ave 90-05
SC2b	24	31547	34332	31547	31547	31142	31547	31547	31547	31547	31547	31574	30048	26526	29253	21617	34016	32275	**30726**
SC3	8	14050	13724	17107	12503	12061	14647	15114	14050	14171	15311	14263	19616	15630	15112	15803	17311	15809	**15139**
SC4	7	20766	24041	21081	20176	23820	24752	21809	18732	19954	24151	20665	26229	18653	20989	20676	22886	23212	**21989**
SC5	14	8691	9385	8000	10212	11319	10434	7982	7626	7772	10254	8460	9288	6045	9481	8312	8406	8314	**8831**
E1	3	8052	6476	5576	8052	7170	10024	6588	4496	8549	9716	12925	12655	10121	13603	4171	6814	9346	**8518**
E2	3	3833	3610	3166	3833	4840	3480	3162	2927	3731	4233	3771	7186	2818	3528	2361	5434	3357	**3840**
E3	1	908	1041	1314	908	1237	1984	919	1259	1126	1281	995	4183	2095	1560	1027	2060	1250	**1515**
E4																			
E5	1	1490	348	2217	1490	2762	2170	3834	904	954	1743	3069	2184	1630	1141	975	2431	1747	**1850**
N Sea (N)		**89337**	**92957**	**90008**	**88721**	**94351**	**99038**	**90955**	**81541**	**87805**	**98237**	**95722**	**111389**	**83518**	**94667**	**74942**	**97288**	**95310**	**92278**
E6	1	533	533	533	533	533	533	533	533	533	533	150	592	777	467	248	533.1816	523.8864	**505**
E7	0																		
E8	9	20040	14506	15785	17351	21326	20723	14586	9843	15164	20210	25742	35228	27300	23823	22502	17526	15967	**19849**
E9	9	2870	1225	1741	4464	4627	5624	4547	2711	1192	3761	6714	7574	9352	6191	4006	5822	2766	**4520**
E10	8	1210	628	959	1185	3034	2415	2187	1286	976	2088	2198	3119	3284	2835	1729	2948	2292	**2073**
E11	3	350	127	286	420	611	474	459	233	95	318	639	543	1090	961	464	283	138	**446**
E12	11	7750	4390	2658	4097	6464	5960	8195	3339	2013	6995	7730	10425	13510	10108	7464	5482	2549	**6336**
N Sea (S)		**32753**	**21409**	**21962**	**28050**	**36595**	**35729**	**30507**	**17945**	**19972**	**33904**	**43174**	**57481**	**55313**	**44385**	**36413**	**32594**	**24236**	**33729**
E13	3	1410	506	756	1125	1172	2386	2287	782	610	1370	745	2349	1756	2106	852	1437	756	**1312**
E14	4	970	663	718	837	1502	1030	1751	760	914	829	1695	2350	2172	2225	934	633	545	**1222**
E15	2	1510	463	681	770	1993	1561	1282	944	718	1207	1162	1504	2000	1498	1512	1118	745	**1197**
E16	4	3020	1250	2654	2554	3253	4112	3866	2916	2538	3967	3354	2842	4042	5533	1507	2953	2611	**3122**
E17	5	4450	3534	3608	5380	4227	6400	4066	3025	2786	4929	3487	5024	4014	3604	3424	3106	4147	**4048**
E18	13	5098	3849	3970	5098	5698	5193	3520	3459	3280	4420	5708	6364	3832	6256	4056	4360	3346	**4526**
Channel		**16458**	**10265**	**12387**	**15764**	**17845**	**20682**	**16772**	**11886**	**10845**	**16723**	**16150**	**20433**	**17816**	**21222**	**12285**	**13609**	**12151**	**15427**
E19	2	650	774	829	999	917	786	582	784	534	819	652	1234	474	827	394	480	661	**734**
E20	3	2890	2883	3055	2803	3460	4372	3161	1848	2273	4556	2775	4955	2283	3161	1732	2150	2016	**2968**
E21	3	865	288	1006	729	863	544	1182	194	851	1526	1383	1970	1241	1484	1014	806	1243	**1020**
E22	2	11450	7082	9652	10003	10913	11533	12848	6920	6748	13731	13402	15961	15029	12806	13545	11251	10575	**11375**
E23	7	12370	11131	11570	12502	9741	17221	10760	9238	9370	17190	14439	15827	11957	11297	7530	13826	9632	**12077**
E24	6	2610	2348	2228	3182	3329	3137	1859	2359	2869	2878	2726	4787	3955	3208	1803	2142	2465	**2830**
E25	8	5630	3068	4198	4934	7153	4849	3137	4855	5096	7576	5662	8016	8841	6322	3853	4955	5282	**5487**
Celtic Sea		**36465**	**27574**	**32538**	**35152**	**36376**	**42442**	**33529**	**26198**	**27742**	**48276**	**41039**	**52750**	**43780**	**39105**	**29871**	**35299**	**31876**	**36472**
E26	7	6190	4130	5613	5926	10300	8591	4321	5812	5564	10648	7733	9912	9419	10477	5199	8356	8764	**7548**
E27	6	5500	4053	4422	5037	4220	7269	3785	3880	3952	5874	7630	8386	7086	5634	3584	5635	5946	**5400**
E28	3	4840	4614	3045	5636	3633	5589	3910	3750	4062	5943	5436	7413	5934	6183	3828	6572	5195	**5046**
E29	7	9920	9832	8162	8865	6950	9168	6139	4682	7387	13097	11059	10435	11067	12781	5678	7882	7385	**8786**
E30	2	6580	6526	5953	7734	6113	7494	5310	4536	5552	6596	7865	10000	5459	5609	4559	5550	5205	**6254**
NI2	3	1490	1490	1490	1490	1120	1490	1320	1441	2479	2033	1819	1814	994	1600	935	1303	1610	**1527**
SC1	11	13880	17432	15088	34290	13880	18040	16851	14107	13880	17054	18593	20295	10468	13643	14247	15004	12550	**16589**
Irish Sea		**48400**	**48077**	**43773**	**68978**	**46216**	**57641**	**41636**	**38208**	**42875**	**61245**	**60135**	**68255**	**50427**	**55927**	**38030**	**50301**	**46654**	**51149**
NI1	7	16710	16710	16710	16710	14170	16710	16782	16539	15566	22126	20530	18547	11078	21906	11454	15370	17223	**16758**
SC2	13	14640	18282	16313	18343	16632	15439	15818	13170	14420	16183	13738	18019	12842	16016	9409	16705	14017	**15334**
SC2a	11	18317	20514	18317	18317	16967	18317	15772	18317	18317	18317	18317	18203	15355	20515	11370	21007	20728	**18041**
Atlantic		**49667**	**55506**	**51340**	**53370**	**47769**	**50466**	**48372**	**48026**	**48303**	**56626**	**52585**	**54769**	**39275**	**58437**	**32233**	**53082**	**51968**	**50133**
Total UK		**273080**	**255788**	**252008**	**290035**	**279152**	**305998**	**261771**	**223804**	**237542**	**315011**	**308806**	**365077**	**290129**	**313743**	**223774**	**282173**	**262195**	**279188**

NI2 for 2003 corrected by rm 2005

Table 4b: Total UK Riverine Inputs and Direct Discharges (including sea fish farms) to the OSPAR Maritime Area in 2005

(Note: fish farming only occurs in the North Sea North, and Atlantic OSPAR Sea Areas and only certain determinands are measured.)

(Note: RTT represents "Regional Task Team Areas")

Riverine plus Direct discharges to RTT Sea areas Table 4b			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
North Sea North	sewage	lower	0.02	0.01	4.56	2.54	19.05	1.54	0.00	8.70	2.30	0.98	12.14	1.15	15.45
		upper	0.02	0.01	4.56	2.54	19.05	4.62	2.90	8.70	2.32	0.99	12.14	1.16	15.46
		comment													
North Sea North	industrial	lower	0.08	0.01	20.99	14.57	12.96	0.00	0.00	1.19	0.73	0.81	2.58	1.17	310.48
		upper	0.09	0.01	20.99	14.58	12.96	0.08	0.06	1.19	0.73	0.82	2.58	1.17	310.48
		comment													
North Sea North	riverine	lower	1.04	0.10	74.70	41.87	338.08	9.24	0.00	1.16	38.23	0.78	45.93	1.47	281.09
		upper	1.53	0.21	77.63	42.76	344.05	36.61	40.00	1.27	38.27	0.90	46.22	1.54	293.17
		comment													
North Sea North	fish farms	lower			16.80		3.18						3.22	0.44	
		upper			16.80		3.18						3.22	0.44	
		comment													
North Sea North TOTAL	sewage + industrial riverine and farms	lower	1.14	0.11	117.05	58.99	373.26	10.78	0.00	11.05	41.27	2.57	63.88	4.23	607.02
		upper	1.64	0.23	119.98	59.88	379.23	41.31	42.96	11.16	41.32	2.71	64.16	4.31	619.12
		comment													
North Sea South	sewage	lower	0.03	0.02	8.48	3.59	38.00	0.76	0.00	5.85	8.33	3.24	20.27	3.24	26.45
		upper	0.09	0.02	8.48	3.74	38.00	9.57	1.40	5.88	8.33	3.27	20.43	3.27	26.50
		comment													
North Sea South	industrial	lower	0.05	0.08	8.31	1.95	30.86	0.00	0.00	0.35	0.01	0.02	0.44	0.02	143.21
		upper	0.08	0.08	8.31	2.45	31.17	0.03	0.06	0.35	0.01	0.03	0.44	0.03	143.21
		comment													
North Sea South	riverine	lower	1.27	0.07	43.45	93.43	273.50	0.50	0.04	1.36	52.82	4.31	59.29	4.31	177.02
		upper	1.43	0.13	43.45	94.70	275.13	33.53	38.75	1.39	52.82	4.32	59.29	4.32	178.33
		comment													
North Sea South	fish farms	lower													
		upper													
		comment													
North Sea South TOTAL	sewage + industrial riverine and farms	lower	1.36	0.17	60.24	98.97	342.36	1.26	0.04	7.56	61.16	7.58	80.01	7.58	346.68
		upper	1.60	0.23	60.24	100.89	344.30	43.12	40.20	7.62	61.17	7.61	80.16	7.61	348.04
		comment													
Channel	sewage	lower	0.01	0.01	6.03	1.08	11.98	0.28	0.00	8.43	2.47	1.28	9.99	1.28	19.82
		upper	0.02	0.01	6.03	1.20	11.98	3.24	6.62	8.46	2.57	1.31	11.20	1.31	19.86
		comment													
Channel	industrial	lower	0.00	0.00	0.04	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.19
		upper	0.00	0.00	0.04	0.00	0.22	0.10	0.00	0.01	0.01	0.01	0.02	0.01	0.20
		comment													
Channel	riverine	lower	0.29	0.04	24.90	5.75	88.15	0.42	0.00	0.27	17.92	0.67	13.91	0.67	75.32
		upper	0.44	0.07	25.19	11.34	92.93	8.67	5.33	0.31	17.92	0.68	18.34	0.68	77.12
		comment													
Channel	fish farms	lower													
		upper													
		comment													
Channel TOTAL	sewage + industrial riverine and farms	lower	0.30	0.05	30.97	6.83	100.35	0.70	0.00	8.70	20.39	1.96	23.93	1.96	95.33
		upper	0.46	0.08	31.25	12.54	105.13	12.01	11.95	8.78	20.51	2.00	29.56	2.00	97.17
		comment													
RTT 11 TOTAL	sewage + industrial riverine and farms	lower	2.80	0.34	208.25	164.79	815.98	12.74	0.04	27.31	122.81	12.11	167.81	13.76	1049.03
		upper	3.70	0.54	211.47	173.31	828.66	96.44	95.12	27.56	123.00	12.32	173.89	13.92	1064.34
		comment													
Celtic Sea	sewage	lower	0.01	0.00	1.47	0.47	12.06	0.00	0.00	2.98	0.94	0.62	3.32	0.62	4.31
		upper	0.03	0.00	1.47	0.77	12.06	0.90	0.17	3.02	0.98	0.64	4.43	0.64	4.34
		comment													
Celtic Sea	industrial	lower	0.01	0.00	0.52	0.76	11.09	0.00	0.23	0.08	0.00	0.01	0.09	0.01	2.88
		upper	0.01	0.00	0.52	0.76	11.09	0.00	0.96	0.08	0.00	0.01	0.09	0.01	2.88
		comment													
Celtic Sea	riverine	lower	0.45	0.04	43.71	28.47	206.88	0.73	0.00	0.74	39.14	1.47	41.25	1.47	408.49
		upper	1.29	0.13	44.69	40.83	209.20	28.35	2.81	0.82	39.14	1.49	42.74	1.49	410.76
		comment													
Celtic Sea	fish farms	lower													
		upper													
		comment													
Celtic Sea TOTAL	sewage + industrial riverine and farms	lower	0.47	0.04	45.69	29.70	230.03	0.73	0.23	3.81	40.08	2.10	44.66	2.10	415.68
		upper	1.33	0.13	46.68	42.36	232.34	29.25	3.94	3.92	40.12	2.14	47.26	2.14	417.98
		comment													
Irish Sea	sewage	lower	0.03	0.00	2.67	0.80	25.51	0.85	0.00	6.17	1.69	0.75	8.01	0.80	9.87
		upper	0.12	0.05	3.58	1.09	26.00	4.16	0.30	6.20	1.69	0.80	8.23	0.86	10.01
		comment													
Irish Sea	industrial	lower	0.00	0.02	0.02	4.47	0.10	0.00	0.00	0.00	0.00	0.16	0.35	0.24	0.51
		upper	0.00	0.02	0.02	4.47	0.10	0.01	2.21	0.00	0.00	0.16	0.35	0.24	0.51
		comment													
Irish Sea	riverine	lower	1.12	0.17	81.65	57.57	373.95	0.44	0.39	3.28	32.04	2.48	38.52	2.87	495.71
		upper	1.69	0.31	82.64	66.04	380.88	16.42	49.10	3.54	32.18	2.58	38.52	2.96	506.61
		comment													
Irish Sea	fish farms	lower													
		upper													
		comment													
Irish Sea TOTAL	sewage + industrial riverine & farms	lower	1.15	0.19	84.34	62.84	399.56	1.28	0.39	9.45	33.74	3.40	46.88	3.90	506.09
		upper	1.81	0.38	86.24	71.60	406.98	20.58	51.62	9.74	33.88	3.54	47.10	4.06	517.13
		comment													
Atlantic	sewage	lower	0.02	0.01	5.09	1.29	24.14	0.10	0.00	4.48	0.72	1.28	6.67	1.84	19.04
		upper	0.07	0.02	5.27	1.33	24.21	0.87	0.00	4.48	0.73	1.28	6.73	1.84	19.04
		comment													
Atlantic	industrial	lower	0.01	0.00	0.34	0.10	2.73	0.00	0.00	0.51	1.63	0.22	2.67	0.37	10.87
		upper	0.03	0.00	0.35	0.17	2.74	0.01	0.01	0.51	1.63	0.22	2.67	0.37	10.87
		comment													
Atlantic	riverine	lower	0.33	0.02	61.48	13.30	141.84	4.76	0.00	1.41	11.51	0.92	15.30	2.07	211.28
		upper	1.12	0.27	63.37	14.73	147.24	14.40	6.69	1.53	11.54	0.96	15.90	2.08	219.18
		comment													
Atlantic	fish farms	lower			44.70		5.56						5.59	0.77	
		upper			44.70		5.56						5.59	0.77	
		comment													
Atlantic TOTAL	sewage + industrial riverine and farms	lower	0.36	0.03	111.61	14.69	174.27	4.85	0.00	6.40	13.86	2.42	30.23	5.04	241.20
		upper	1.21	0.29	113.69	16.22	179.75	15.29	6.69	6.53	13.90	2.47	30.88	5.06	249.10
		comment													
RTT 111 TOTAL	sewage + industrial riverine and farms	lower	1.99	0.26	241.63	107.22	803.86	6.87	0.62	19.66	87.68	7.92	121.77	11.05	1162.97
		upper	4.36	0.79	246.61	130.18	819.07	65.11	62.25	20.19	87.90	8.15	125.25	11.26	1184.21
		comment													
All Sea Areas TOTAL	sewage + industrial riverine and farms	lower	4.79	0.60	449.89	272.01	1619.84	19.60	0.65	46.97	210.49	20.03	289.58	24.81	2212.00
		upper	8.06	1.34	458.08	303.49	1647.73	161.56	157.37	47.75	210.90	20.47	299.14	25.17	2248.55
		comment													

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 2005 by United Kingdom

23.10.06 RM

OSPAR RID data 2004 UK Sewage Inputs Table 5a			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
181	SC2b	lower	0.00	0.00	0.18	0.04	0.93	0.09	0.00	0.51	0.06	0.08	0.63	0.08	2.25
		upper	0.00	0.00	0.18	0.04	0.93	0.10	0.00	0.51	0.06	0.08	0.63	0.08	2.25
		comment													
182	SC3	lower	0.00	0.00	0.62	1.06	3.83	0.17	0.00	1.22	0.21	0.15	1.55	0.19	2.17
		upper	0.00	0.00	0.62	1.06	3.83	0.21	0.00	1.22	0.21	0.15	1.55	0.19	2.17
		comment													
183	SC4	lower	0.00	0.00	0.22	0.07	1.11	0.37	0.00	0.90	0.08	0.10	1.10	0.12	0.51
		upper	0.00	0.00	0.22	0.07	1.11	0.37	0.00	0.90	0.09	0.10	1.10	0.12	0.51
		comment													
184	SC5	lower	0.01	0.00	1.48	0.93	6.51	0.91	0.00	2.39	0.56	0.30	3.52	0.41	3.54
		upper	0.01	0.00	1.48	0.93	6.51	0.91	0.00	2.39	0.56	0.30	3.52	0.41	3.55
		comment													
185	E1	lower	0.00	0.00	0.03	0.01	0.41	0.00	0.00	0.04	0.09	0.01	0.14	0.01	0.08
		upper	0.00	0.00	0.03	0.01	0.41	0.06	0.08	0.04	0.09	0.01	0.14	0.01	0.09
		comment													
186	E2	lower	0.00	0.00	0.63	0.13	2.86	0.00	0.00	1.26	0.08	0.16	1.50	0.16	1.39
		upper	0.00	0.00	0.63	0.13	2.86	2.28	1.57	1.26	0.09	0.17	1.50	0.17	1.39
		comment													
187	E3	lower	0.00	0.00	0.04	0.01	0.20	0.00	0.00	0.18	0.00	0.03	0.21	0.03	0.19
		upper	0.00	0.00	0.04	0.01	0.20	0.09	0.18	0.18	0.01	0.03	0.21	0.03	0.19
		comment													
188	E4	lower	0.00	0.00	0.55	0.08	1.06			0.44	0.22	0.01	0.67	0.01	1.14
		upper	0.00	0.00	0.55	0.08	1.06			0.44	0.23	0.01	0.67	0.01	1.15
		comment													
189	E5	lower	0.00	0.00	0.81	0.22	2.14	0.00	0.00	1.77	0.99	0.14	2.83	0.14	4.17
		upper	0.00	0.00	0.81	0.22	2.14	0.60	1.07	1.77	0.99	0.14	2.83	0.14	4.17
		comment													
84a	**North Sea North (UK)**		**0.02**	**0.01**	**4.6**	**2.5**	**19.0**	**1.5**	**0.0**	**8.7**	**2.3**	**0.98**	**12.1**	**1.15**	**15.5**
			0.02	**0.01**	**4.6**	**2.5**	**19.0**	**4.6**	**2.9**	**8.7**	**2.3**	**0.99**	**12.1**	**1.16**	**15.5**
OSPAR RID data 2004 UK Sewage Inputs Table 5a			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
190	E6	lower	0.00	0.00	0.11	0.04	0.59	0.00	0.00	0.27	0.02	0.04	0.29	0.04	0.47
		upper	0.00	0.00	0.11	0.04	0.59	0.09	0.26	0.27	0.02	0.04	0.29	0.04	0.47
		comment													
191	E7	lower	0.00		0.04	0.01	0.28	0.00	0.00	0.13	0.00		0.13		0.13
		upper	0.00		0.04	0.01	0.28	0.06	0.09	0.13	0.00		0.13		0.13
		comment													
192	E8	lower	0.00	0.00	0.42	0.24	2.16	0.00	0.00	1.49	0.00	0.09	1.99	0.09	1.87
		upper	0.00	0.00	0.42	0.24	2.16	0.48	1.05	1.50	0.01	0.09	1.99	0.09	1.88
		comment													
193	E9	lower	0.00	0.00	0.33	0.02	1.16	0.03		0.25		0.21	0.81	0.21	0.75
		upper	0.00	0.00	0.33	0.05	1.16	0.16		0.25		0.21	0.81	0.21	0.75
		comment													
194	E10	lower	0.00	0.00	0.32	0.12	1.47	0.00		0.59		0.07	0.88	0.07	0.92
		upper	0.00	0.00	0.32	0.12	1.47	0.09		0.60		0.08	0.88	0.08	0.92
		comment													
195	E11	lower	0.00	0.01	0.43	0.10	1.32	0.00		0.34		0.27	0.92	0.27	0.80
		upper	0.00	0.01	0.43	0.10	1.32	0.15		0.34		0.27	0.92	0.27	0.80
		comment													
196	E12	lower	0.03	0.01	6.83	3.07	31.02	0.73		2.77	8.31	2.57	15.25	2.57	21.51
		upper	0.08	0.02	6.83	3.18	31.02	8.54		2.79	8.31	2.59	15.41	2.59	21.55
		comment													
84b	**North Sea South (UK)**	lower	**0.03**	**0.02**	**8.5**	**3.6**	**38.0**	**0.8**	**0.0**	**5.8**	**8.3**	**3.24**	**20.3**	**3.24**	**26.4**
		upper	**0.09**	**0.02**	**8.5**	**3.7**	**38.0**	**9.6**	**1.4**	**5.9**	**8.3**	**3.27**	**20.4**	**3.27**	**26.5**
		comment													
OSPAR RID data 2004 UK Sewage Inputs Table 5a			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
197	E13	lower	0.00	0.00	3.00	0.39	5.07	0.05	0.00	1.64	0.78	0.34	2.50	0.34	6.81
		upper	0.01	0.00	3.00	0.42	5.07	0.89	1.41	1.64	0.79	0.34	2.50	0.34	6.81
		comment													
198	E14	lower	0.01	0.00	1.98	0.50	3.92	0.10	0.00	2.88	0.11	0.30	3.06	0.30	9.28
		upper	0.01	0.00	1.98	0.50	3.92	0.90	2.92	2.88	0.14	0.31	3.06	0.31	9.29
		comment													
199	E15	lower	0.00	0.01	0.64	0.13	1.94	0.00	0.00	2.67	0.12	0.30	2.88	0.30	1.45
		upper	0.00	0.01	0.64	0.17	1.94	0.52	2.29	2.67	0.17	0.30	2.88	0.30	1.45
		comment													
200	E16	lower	0.00	0.00	0.07	0.02	0.33	0.00		0.27	0.47	0.10	0.32	0.10	0.48
		upper	0.00	0.00	0.07	0.03	0.33	0.20		0.27	0.48	0.11	0.78	0.11	0.48
		comment													
201	E17	lower	0.00	0.00	0.27	0.02	0.42	0.13		0.49	0.56	0.12	0.65	0.12	0.56
		upper	0.00	0.00	0.27	0.07	0.42	0.50		0.50	0.56	0.13	1.05	0.13	0.58
		comment													
202	E18	lower	0.00		0.06	0.02	0.30	0.01		0.49	0.42	0.12	0.59	0.12	1.24
		upper	0.00		0.06	0.02	0.30	0.22		0.50	0.42	0.12	0.94	0.12	1.25
		comment													
86	**Channel (UK)**	lower	**0.01**	**0.01**	**6.0**	**1.1**	**12.0**	**0.3**	**0.0**	**8.4**	**2.5**	**1.28**	**10.0**	**1.28**	**19.8**
		upper	**0.02**	**0.01**	**6.0**	**1.2**	**12.0**	**3.2**	**6.6**	**8.5**	**2.6**	**1.31**	**11.2**	**1.31**	**19.9**
		comment													

Gaps were filled by using PO4-P Data

OSPAR RID data 2004 UK Sewage Inputs Table 5a			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
203	E19	lower	0.00	0.00	0.07	0.00	0.08	0.00		0.08	0.01	0.00	0.02	0.00	0.04
		upper	0.00	0.00	0.07	0.02	0.08	0.06		0.08	0.01	0.00	0.09	0.00	0.04
		comment													
204	E20	lower	0.00	0.00	0.05	0.02	0.41	0.00		0.12	0.14	0.04	0.23	0.04	0.21
		upper	0.00	0.00	0.05	0.03	0.41	0.12		0.12	0.14	0.04	0.25	0.04	0.21
		comment													
205	E21	lower	0.00	0.00	0.26	0.03	0.65	0.00		0.63	0.03	0.06	0.32	0.06	0.88
		upper	0.00	0.00	0.26	0.09	0.65	0.13		0.63	0.05	0.06	0.72	0.06	0.88
		comment													
206	E22	lower	0.01	0.00	0.49	0.27	4.39	0.00		1.73	0.19	0.27	1.71	0.27	1.86
		upper	0.01	0.00	0.49	0.27	4.39	0.59		1.73	0.21	0.28	2.31	0.28	1.86
		comment													
207	E23	lower	0.00	0.00	0.42	0.11	3.01		0.00	0.00		0.17		0.17	0.27
		upper	0.01	0.00	0.42	0.23	3.01		0.17	0.01		0.17		0.17	0.30
		comment													
208	E24	lower	0.00	0.00	0.15	0.05	3.30			0.42	0.50	0.06	0.95	0.06	0.87
		upper	0.00	0.00	0.15	0.11	3.30			0.43	0.51	0.06	0.95	0.06	0.88
		comment													
209	E25	lower	0.00		0.03	0.00	0.21			0.00	0.07	0.03	0.10	0.03	0.18
		upper	0.00		0.03	0.02	0.21			0.01	0.07	0.03	0.10	0.03	0.18
		comment													
90	Celtic Sea (UK)	lower	**0.01**	**0.00**	**1.5**	**0.5**	**12.1**	**0.0**	**0.0**	**3.0**	**0.9**	**0.62**	**3.3**	**0.62**	**4.3**
		upper	**0.03**	**0.00**	**1.5**	**0.8**	**12.1**	**0.9**	**0.2**	**3.0**	**1.0**	**0.64**	**4.4**	**0.64**	**4.3**
		comment													

OSPAR RID data 2004 UK Sewage Inputs Table 5a			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
210	E26	lower					0.25			0.00	0.04	0.02	0.07	0.02	0.04
		upper					0.25			0.00	0.04	0.02	0.07	0.02	0.04
		comment													
211	E27	lower	0.00	0.00	0.07	0.05	0.94		0.00	0.03	0.17	0.07	0.27	0.07	1.25
		upper	0.00	0.00	0.07	0.07	0.94		0.30	0.03	0.17	0.07	0.27	0.07	1.25
		comment													
212	E28	lower	0.00	0.00	0.89	0.45	15.92	0.21		5.45	0.92	0.30	6.44	0.30	5.59
		upper	0.03	0.00	0.89	0.45	15.92	3.40		5.46	0.92	0.35	6.44	0.35	5.62
		comment													
213	E29	lower	0.00	0.00	0.60	0.18	2.91			0.04	0.24	0.12	0.30	0.12	0.47
		upper	0.00	0.00	0.60	0.18	2.91			0.05	0.24	0.12	0.30	0.12	0.48
		comment													
219	E30	lower													
		upper													
		comment													
215	NI2	lower	0.03	0.00	1.04	0.09	5.20	0.63		0.57	0.29	0.22	0.76	0.26	2.30
		upper	0.09	0.05	1.94	0.36	5.68	0.74		0.57	0.29	0.22	0.98	0.27	2.40
		comment													
214	SC1	lower	0.00	0.00	0.07	0.02	0.30	0.00	0.00	0.08	0.03	0.01	0.18	0.02	0.23
		upper	0.00	0.00	0.07	0.02	0.30	0.02	0.00	0.08	0.03	0.01	0.18	0.02	0.23
		comment													
88	Irish Sea (UK)	lower	**0.03**	**0.00**	**2.7**	**0.8**	**25.5**	**0.8**	**0.0**	**6.2**	**1.7**	**0.75**	**8.0**	**0.80**	**9.9**
		upper	**0.12**	**0.05**	**3.6**	**1.1**	**26.0**	**4.2**	**0.3**	**6.2**	**1.7**	**0.80**	**8.2**	**0.86**	**10.0**
		comment													

OSPAR RID data 2004 UK Sewage Inputs Table 5a			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
218	NI1	lower	0.00	0.00	0.18	0.03	1.61	0.05		0.20	0.03	0.04	0.22	0.12	0.76
		upper	0.01	0.01	0.34	0.06	1.67	0.09		0.20	0.03	0.04	0.27	0.12	0.77
		comment													
216	SC2	lower	0.019	0.007	4.810	1.240	22.237	0.040		4.203	0.689	1.233	6.358	1.705	18.064
		upper	0.055	0.009	4.838	1.242	22.237	0.769		4.203	0.696	1.233	6.364	1.705	18.064
		comment													
217	SC2a	lower	0.00	0.00	0.09	0.02	0.30	0.01		0.08	0.00	0.01	0.09	0.01	0.21
		upper	0.00	0.00	0.09	0.02	0.30	0.02		0.08	0.00	0.01	0.09	0.01	0.21
		comment													
92	Atlantic (UK)	lower	**0.02**	**0.01**	**5.1**	**1.3**	**24.1**	**0.1**	**0.0**	**4.5**	**0.7**	**1.28**	**6.7**	**1.84**	**19.0**
		upper	**0.07**	**0.02**	**5.3**	**1.3**	**24.2**	**0.9**	**0.0**	**4.5**	**0.7**	**1.28**	**6.7**	**1.8**	**19.0**
		comment													

UK Totals	lower	**0.13**	**0.05**	**28.3**	**9.8**	**130.7**	**3.5**	**0.0**	**36.6**	**16.5**	**8.16**	**60.4**	**8.93**	**95**
SEWAGE	upper	**0.35**	**0.12**	**29.4**	**10.7**	**131.3**	**23.3**	**11.4**	**36.7**	**16.6**	**8.29**	**63.2**	**9.07**	**95**

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 2005 by United Kingdom

23.10.06 RM

OSPAR RID data 2004 UK Industrial Inputs Table 5b			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
181	SC2b	lower	0.00	0.00	4.72	0.02	0.64	0.00		0.04	0.07	0.13	0.35	0.16	2.00
		upper	0.00	0.00	4.72	0.02	0.64	0.01		0.04	0.07	0.13	0.35	0.16	2.00
		comment													
182	SC3	lower													
		upper													
		comment													
183	SC4	lower	0.00	0.00	0.02	0.00	0.06	0.00		0.02	0.00	0.01	0.02	0.01	0.04
		upper	0.00	0.00	0.02	0.00	0.06	0.01		0.02	0.00	0.01	0.02	0.01	0.04
		comment													
184	SC5	lower	0.01	0.00	4.70	0.06	5.46	0.00		0.29	0.00	0.39	0.54	0.72	11.55
		upper	0.01	0.00	4.70	0.06	5.46	0.03		0.29	0.01	0.39	0.54	0.72	11.55
		comment													
185	E1	lower			10.50	13.20									293.62
		upper			10.50	13.20									293.62
		comment													
186	E2	lower													
		upper													
		comment													
187	E3	lower													
		upper													
		comment													
188	E4	lower													
		upper													
		comment													
189	E5	lower	0.08	0.00	1.03	1.28	6.80	0.00	0.00	0.84	0.65	0.28	1.67	0.28	3.28
		upper	0.08	0.00	1.04	1.29	6.80	0.03	0.06	0.84	0.65	0.28	1.67	0.28	3.28
		comment													
North Sea North (UK)			0.08	0.01	21.0	14.6	13.0	0.0	0.0	1.2	0.7	0.81	2.6	1.17	310.5
			0.09	0.01	21.0	14.6	13.0	0.1	0.1	1.2	0.7	0.82	2.6	1.17	310.5
OSPAR RID data 2004 UK Industrial Inputs Table 5b			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
190	E6	lower	0.01	0.07	7.24	0.52	2.57								129.57
		upper	0.03	0.07	7.24	0.96	2.85								129.57
		comment													
191	E7	lower													
		upper													
		comment													
192	E8	lower	0.01	0.01	1.06	1.06	19.45	0.00	0.00	0.32	0.01	0.01	0.39	0.01	13.49
		upper	0.02	0.01	1.07	1.13	19.47	0.03	0.06	0.32	0.01	0.01	0.39	0.01	13.49
		comment													
193	E9	lower	0.03	0.00	0.01	0.36	8.84	0.00		0.02		0.01	0.05	0.01	0.15
		upper	0.03	0.00	0.01	0.36	8.84	0.00		0.02		0.01	0.05	0.01	0.15
		comment													
194	E10	lower													
		upper													
		comment													
195	E11	lower													
		upper													
		comment													
196	E12	lower													
		upper													
		comment													
84 North Sea South (UK)		lower	0.05	0.08	8.3	1.9	30.9	0.0	0.0	0.3	0.0	0.02	0.4	0.02	143.2
		upper	0.08	0.08	8.3	2.4	31.2	0.0	0.1	0.3	0.0	0.03	0.4	0.03	143.2
		comment												= Gaps were filled by using PO4-P Data	
OSPAR RID data 2004 UK Industrial Inputs Table 5b			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
197	E13	lower	0.00	0.00	0.03		0.21	0.00		0.00	0.00	0.00	0.02	0.00	0.19
		upper	0.00	0.00	0.03		0.21	0.10		0.01	0.01	0.01	0.02	0.01	0.20
		comment													
198	E14	lower													
		upper													
		comment													
199	E15	lower	0.00		0.00	0.00	0.01								
		upper	0.00		0.00	0.00	0.01								
		comment													
200	E16	lower	0.00		0.01	0.00	0.06								0.01
		upper	0.00		0.01	0.00	0.06								0.01
		comment													
201	E17	lower													
		upper													
		comment													
202	E18	lower													
		upper													
		comment													
86 Channel (UK)		lower	0.00	0.00	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.2
		upper	0.00	0.00	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.01	0.0	0.01	0.2
		comment													

OSPAR RID data 2004 UK Industrial Inputs Table 5b			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
203	E19	lower													
		upper													
		comment													
204	E20	lower													
		upper													
		comment													
205	E21	lower													
		upper													
		comment													
206	E22	lower	0.00	0.00	0.00	0.00	0.02			0.00	0.00	0.00	0.00	0.00	0.01
		upper	0.00	0.00	0.00	0.00	0.02			0.00	0.00	0.00	0.00	0.00	0.01
		comment													
207	E23	lower	0.01	0.00	0.37	0.18	2.28		0.23						2.81
		upper	0.01	0.00	0.37	0.18	2.28		0.96						2.81
		comment													
208	E24	lower	0.01	0.00	0.15	0.57	8.78			0.08		0.01	0.09	0.01	0.05
		upper	0.01	0.00	0.15	0.58	8.78			0.08		0.01	0.09	0.01	0.05
		comment													
209	E25	lower													
		upper													
		comment													
90	Celtic Sea (UK)	lower	**0.01**	**0.00**	**0.5**	**0.8**	**11.1**	**0.0**	**0.2**	**0.1**	**0.0**	**0.01**	**0.1**	**0.01**	**2.9**
		upper	**0.01**	**0.00**	**0.5**	**0.8**	**11.1**	**0.0**	**1.0**	**0.1**	**0.0**	**0.01**	**0.1**	**0.01**	**2.9**
		comment													
OSPAR RID data 2004 UK Industrial Inputs Table 5b			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
210	E26	lower													
		upper													
		comment													
211	E27	lower							0.00						
		upper							2.21						
		comment													
212	E28	lower		0.01		4.47							0.34		
		upper		0.01		4.47							0.34		
		comment													
213	E29	lower		0.01											
		upper		0.01											
		comment													
219	E30	lower													
		upper													
		comment													
215	NI2	lower	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		upper	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		comment													
214	SC1	lower	0.00	0.000	0.018	0.001	0.087	0.000		0.003	0.003	0.160	0.008	0.239	0.508
		upper	0.000	0.000	0.018	0.001	0.087	0.006		0.003	0.003	0.160	0.008	0.239	0.508
		comment													
88	Irish Sea (UK)	lower	**0.00**	**0.02**	**0.02**	**4.47**	**0.10**	**0.00**	**0.00**	**0.00**	**0.00**	**0.16**	**0.35**	**0.24**	**0.51**
		upper	**0.00**	**0.02**	**0.02**	**4.47**	**0.10**	**0.01**	**2.21**	**0.00**	**0.00**	**0.16**	**0.35**	**0.24**	**0.51**
		comment													
OSPAR RID data 2004 UK Industrial Inputs Table 5b			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
218	NI1	lower	0.00	0.00	0.03	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
		upper	0.02	0.00	0.05	0.07	0.09	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.05
		comment													
216	SC2	lower	0.01	0.00	0.30	0.10	2.61	0.00		0.51	1.63	0.22	2.66	0.37	10.70
		upper	0.01	0.00	0.30	0.10	2.61	0.01		0.51	1.63	0.22	2.66	0.37	10.70
		comment													
217	SC2a	lower	0.00	0.00	0.01	0.00	0.04	0.00		0.00	0.00	0.00	0.00	0.00	0.12
		upper	0.00	0.00	0.01	0.00	0.04	0.00		0.00	0.00	0.00	0.00	0.00	0.12
		comment													
92	Atlantic (UK)	lower	0.01	0.00	0.34	0.10	2.73	0.00	0.00	0.51	1.63	0.22	2.67	0.37	10.87
		upper	0.03	0.00	0.35	0.17	2.74	0.01	0.01	0.51	1.63	0.22	2.67	0.37	10.87
		comment													

UK Totals INDUSTRIAL	lower	**0.16**	**0.11**	**30.21**	**21.85**	**57.94**	**0.00**	**0.23**	**2.14**	**2.38**	**1.23**	**6.16**	**1.82**	468.15
	upper	**0.20**	**0.11**	**30.2**	**22.4**	**58.3**	**0.23**	**3.30**	**2.15**	**2.39**	**1.24**	**6.16**	**1.82**	**468**

UK Totals DIRECT (Sew + Ind)	lower	**0.29**	**0.16**	**58.5**	**31.6**	**188.7**	**3.5**	**0.2**	**38.8**	**18.8**	**9.4**	**66.6**	**10.7**	**563**
	upper	**0.55**	**0.23**	**59.6**	**33.1**	**189.6**	**23.6**	**14.7**	**38.9**	**19.0**	**9.5**	**69.3**	**10.9**	**563**

Table 6c. Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2005 by United Kingdom

25.09.06 RM

OSPAR RID data 2004 UK Riverine Inputs Table 6c			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
181	SC2b	lower	0.02	0.02	3.98	1.52	36.35	2.37		0.06	2.63	0.14	2.48	0.37	24.19
		upper	0.36	0.04	6.77	2.15	38.53	5.14		0.10	2.66	0.19	2.77	0.38	33.91
		comment					estimate								
182	SC3	lower	0.10	0.03	30.16	4.58	75.59	2.15		0.25	9.92	0.17	11.25	0.24	35.39
		upper	0.21	0.03	30.17	4.59	75.59	3.14		0.26	9.92	0.18	11.25	0.24	36.79
		comment					estimate								
183	SC4	lower	0.08	0.00	10.91	3.52	39.34	3.56		0.18	8.63	0.08	9.89	0.24	38.36
		upper	0.11	0.04	11.05	3.52	39.34	3.56		0.18	8.63	0.09	9.89	0.24	39.33
		comment													
184	SC5	lower	0.07	0.01	7.04	4.35	26.91	1.09		0.18	4.54	0.12	5.30	0.35	49.20
		upper	0.08	0.02	7.04	4.35	26.91	1.11		0.18	4.54	0.12	5.30	0.35	49.21
		comment													
185	E1	lower	0.55	0.02	15.66	5.98	68.75	0.00	0.00	0.15	7.54	0.06	10.53	0.06	99.76
		upper	0.56	0.04	15.66	6.22	72.54	13.36	20.32	0.20	7.54	0.10	10.53	0.10	99.76
		comment													
186	E2	lower	0.16	0.01	3.13	8.75	64.48	0.07	0.00	0.22	1.75	0.04	2.52	0.04	21.79
		upper	0.16	0.02	3.13	8.75	64.48	5.85	12.72	0.23	1.75	0.07	2.52	0.07	21.79
		comment													
187	E3	lower	0.03	0.01	2.32	5.72	14.43	0.00	0.00	0.07	1.48	0.07	1.80	0.07	6.62
		upper	0.03	0.01	2.32	5.72	14.43	1.65	2.85	0.07	1.48	0.07	1.80	0.07	6.62
		comment													
188	E4	lower													
		upper													
		comment													
189	E5	lower	0.04	0.00	1.50	7.45	12.23	0.00	0.00	0.06	1.74	0.09	2.16	0.09	5.77
		upper	0.04	0.01	1.50	7.45	12.23	2.80	4.12	0.06	1.74	0.09	2.16	0.09	5.77
		comment													
84a	North Sea North (UK)		1.04	0.10	74.70	41.87	338.08	9.24	0.00	1.16	38.23	0.78	45.93	1.47	281.09
			1.53	0.21	77.63	42.76	344.05	36.61	40.00	1.27	38.27	0.90	46.22	1.54	293.17
OSPAR RID data 2004 UK Riverine Inputs Table 6c			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
190	E6	lower	0.00	0.00	0.50	0.64	4.98	0.00	0.00	0.01	0.19	0.00	0.27	0.00	6.69
		upper	0.00	0.00	0.50	0.64	4.98	0.87	1.14	0.01	0.19	0.00	0.27	0.00	6.69
		comment													
191	E7	lower													
		upper													
		comment													
192	E8	lower	1.21	0.06	32.92	88.85	227.44	0.01	0.00	1.00	32.80	2.72	37.83	2.72	151.55
		upper	1.24	0.09	32.92	88.92	228.64	25.74	20.88	1.01	32.80	2.72	37.83	2.72	151.57
		comment													
193	E9	lower	0.01	0.00	3.26	0.46	12.26	0.00	0.00	0.09	7.32	0.32	7.47	0.32	4.40
		upper	0.07	0.01	3.26	0.84	12.48	2.54	10.21	0.10	7.32	0.32	7.47	0.32	5.25
		comment													
194	E10	lower	0.01	0.01	1.24	0.35	8.19	0.08	0.04	0.04	4.01	0.10	4.08	0.10	4.68
		upper	0.01	0.02	1.24	0.38	8.40	1.69	6.12	0.04	4.01	0.10	4.08	0.10	4.82
		comment													
195	E11	lower	0.00	0.00	0.17	0.10	0.59	0.00	0.00	0.00	0.39	0.02	0.40	0.02	1.05
		upper	0.00	0.00	0.17	0.11	0.59	0.12	0.37	0.00	0.39	0.02	0.40	0.02	1.06
		comment													
196	E12	lower	0.04	0.00	5.36	3.03	20.04	0.41	0.00	0.23	8.11	1.15	9.24	1.15	8.65
		upper	0.11	0.01	5.36	3.81	20.04	2.56	0.03	0.23	8.11	1.15	9.24	1.15	8.95
		comment													
84b	North Sea South (UK)	lower	1.27	0.07	43.45	93.43	273.50	0.50	0.04	1.36	52.82	4.31	59.29	4.31	177.02
		upper	1.43	0.13	43.45	94.70	275.13	33.53	38.75	1.39	52.82	4.32	59.29	4.32	178.33
		comment													
OSPAR RID data 2004 UK Riverine Inputs Table 6c			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
197	E13	lower	0.00	0.00	1.51	0.41	4.03	0.08	0.00	0.04	1.66	0.13	1.71	0.13	7.60
		upper	0.04	0.00	1.61	0.93	4.59	0.67	2.00	0.04	1.66	0.13	1.71	0.13	7.61
		comment													
198	E14	lower	0.05	0.01	0.97	1.41	2.74	0.01	0.00	0.02	1.06	0.10	1.09	0.10	5.85
		upper	0.07	0.01	0.97	1.61	2.77	0.44	1.32	0.02	1.06	0.10	1.09	0.10	5.85
		comment													
199	E15	lower	0.00	0.02	0.63	0.05	1.38	0.00	0.00	0.03	1.75	0.04	1.80	0.04	2.93
		upper	0.03	0.02	0.63	0.56	1.99	0.63	2.02	0.03	1.75	0.04	1.80	0.04	2.99
		comment													
200	E16	lower	0.06	0.00	2.37	0.54	9.66	0.22		0.07	5.24	0.23	4.08	0.23	9.90
		upper	0.06	0.01	2.40	1.84	10.23	2.08		0.07	5.24	0.23	5.35	0.23	10.28
		comment													
201	E17	lower	0.04	0.00	4.15	1.95	13.87	0.11		0.06	4.81	0.13	4.06	0.13	26.79
		upper	0.11	0.01	4.23	3.72	16.26	3.22		0.08	4.81	0.13	4.91	0.13	27.38
		comment													
202	E18	lower	0.13	0.00	15.28	1.39	56.48	0.01		0.04	3.40	0.05	1.18	0.05	22.25
		upper	0.14	0.01	15.35	2.68	57.09	1.62		0.07	3.41	0.06	3.48	0.06	23.00
		comment													

			Cd	Hg	Cu	Pb	Zn	g-HCH	PCB	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
86	Channel (UK)	lower	0.29	0.04	24.90	5.75	88.15	0.42	0.00	0.27	17.92	0.67	13.91	0.67	75.32
		upper	0.44	0.07	25.19	11.34	92.93	8.67	5.33	0.31	17.92	0.68	18.34	0.68	77.12
		comment													
OSPAR RID data 2004 UK Riverine Inputs Table 6c			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
203	E19	lower	0.05	0.00	4.15	0.47	19.62	0.00		0.01	0.78	0.02	0.43	0.02	5.05
		upper	0.05	0.00	4.15	0.49	19.62	0.06		0.02	0.78	0.02	0.80	0.02	5.16
		comment													
204	E20	lower	0.03	0.00	1.75	0.13	3.79	0.00		0.02	2.67	0.03	1.82	0.03	9.61
		upper	0.03	0.01	1.77	1.52	5.70	1.93		0.03	2.67	0.03	2.71	0.03	9.82
		comment													
205	E21	lower	0.01	0.01	2.51	0.95	6.81	0.00		0.10	2.91	0.21	3.00	0.21	16.81
		upper	0.04	0.01	2.51	1.46	6.89	1.01		0.10	2.91	0.21	3.04	0.21	16.83
		comment													
206	E22	lower	0.19	0.03	20.83	18.76	80.35	0.00	0.00	0.33	21.63	1.00	23.66	1.00	194.92
		upper	0.42	0.06	20.83	19.51	80.48	17.71	2.81	0.33	21.63	1.00	23.84	1.00	194.97
		comment													
207	E23	lower	0.03	0.00	8.02	5.42	34.54	0.73		0.16	7.22	0.15	7.47	0.15	106.11
		upper	0.36	0.03	8.37	10.62	34.73	4.75		0.20	7.22	0.16	7.47	0.16	107.08
		comment													
208	E24	lower	0.14	0.00	3.11	1.30	40.26	0.00		0.03	0.77	0.02	0.81	0.02	23.21
		upper	0.20	0.01	3.11	2.71	40.26	0.83		0.04	0.77	0.03	0.81	0.03	23.72
		comment													
209	E25	lower	0.00	0.00	3.34	1.45	21.52	0.00		0.08	3.16	0.04	4.05	0.04	52.80
		upper	0.20	0.02	3.96	4.52	21.52	2.06		0.10	3.16	0.05	4.05	0.05	53.18
		comment													
90	Celtic Sea (UK)	lower	0.45	0.04	43.71	28.47	206.88	0.73	0.00	0.74	39.14	1.47	41.25	1.47	408.49
		upper	1.29	0.13	44.69	40.83	209.20	28.35	2.81	0.82	39.14	1.49	42.74	1.49	410.76
		comment													
OSPAR RID data 2004 UK Riverine Inputs Table 6c			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
210	E26	lower	0.15	0.00	6.83	11.29	121.78	0.00		0.06	3.02	0.06	4.49	0.06	43.86
		upper	0.44	0.03	7.17	15.98	121.78	3.29		0.11	3.15	0.08	4.49	0.08	47.68
		comment													
211	E27	lower	0.15	0.00	23.60	0.38	77.62	0.00		0.06	3.04	0.10	3.32	0.10	6.28
		upper	0.33	0.02	24.25	3.80	77.62	1.90		0.08	3.05	0.12	3.32	0.12	9.12
		comment													
212	E28	lower	0.35	0.08	18.00	16.86	69.12	0.00	0.00	2.53	11.52	1.29	14.46	1.29	63.36
		upper	0.39	0.09	18.00	16.91	69.56	2.00	13.91	2.53	11.52	1.33	14.46	1.33	63.49
		comment													
213	E29	lower	0.13	0.04	8.30	4.58	20.22	0.00	0.39	0.28	5.25	0.43	5.61	0.43	79.83
		upper	0.13	0.06	8.30	4.79	24.49	2.83	20.14	0.31	5.25	0.44	5.61	0.44	81.47
		comment													
219	E30	lower	0.10	0.01	5.24	10.24	21.95	0.00	0.00	0.11	3.79	0.11	3.94	0.11	50.84
		upper	0.10	0.03	5.24	10.29	24.12	2.06	14.44	0.13	3.79	0.11	3.94	0.11	52.07
		comment													
215	NI2	lower	0.00	0.01	4.45	0.20	7.45	0.25	0.00	0.12	1.94	0.14	2.08	0.31	12.99
		upper	0.04	0.03	4.45	0.26	7.50	0.61	0.60	0.12	1.94	0.14	2.08	0.31	13.00
		comment													
214	SC1	lower	0.24	0.03	15.23	14.02	55.81	0.19		0.13	3.49	0.35	4.62	0.56	238.55
		upper	0.26	0.06	15.23	14.02	55.81	3.72		0.26	3.49	0.35	4.62	0.56	239.79
		comment													
88	Irish Sea (UK)	lower	1.12	0.17	81.65	57.57	373.95	0.44	0.39	3.28	32.04	2.48	38.52	2.87	495.71
		upper	1.69	0.31	82.64	66.04	380.88	16.42	49.10	3.54	32.18	2.58	38.52	2.96	506.61
		comment													
OSPAR RID data 2004 UK Riverine Inputs Table 6c			1.00 Cd [t]	5.00 Hg [t]	6.00 Cu [t]	2.00 Pb [t]	7.00 Zn [t]	8.00 g-HCH [kg]	9.00 PCB [kg]	10.00 NH4-N [kt]	11.00 NO3-N [kt]	12.00 PO4-P [kt]	13.00 Total N [kt]	14.00 Total P [kt]	3.00 SPM [kt]
218	NI1	lower	0.00	0.00	39.01	2.22	44.36	1.68	0.00	0.53	6.00	0.44	6.60	0.88	92.07
		upper	0.57	0.20	39.12	3.30	47.62	7.09	6.69	0.57	6.00	0.44	6.64	0.88	92.74
		comment													
216	SC2	lower	0.17	0.01	19.70	10.54	75.66	1.12		0.84	4.85	0.43	6.72	0.46	108.40
		upper	0.21	0.05	19.70	10.54	75.66	3.49		0.90	4.86	0.43	6.73	0.46	109.54
		comment													
217	SC2a	lower	0.16	0.01	2.77	0.54	21.82	1.95		0.04	0.66	0.05	1.99	0.73	10.81
		upper	0.34	0.02	4.55	0.89	23.96	3.82		0.06	0.69	0.09	2.53	0.75	16.91
		comment					estimate								
92	Atlantic (UK)	lower	0.33	0.02	61.48	13.30	141.84	4.76	0.00	1.41	11.51	0.92	15.30	2.07	211.28
		upper	1.12	0.27	63.37	14.73	147.24	14.40	6.69	1.53	11.54	0.96	15.90	2.08	219.18
		comment													

UK Totals RIVERINE	lower	**4.50**	**0.44**	**329.9**	**240.4**	**1422**	**16.1**	**0.4**	**8.2**	**191.7**	**10.63**	**214.2**	**12.86**	**1649**
	upper	**7.51**	**1.11**	**337.0**	**270.4**	**1449**	**138.0**	**142.7**	**8.9**	**191.9**	**10.94**	**221.0**	**13.07**	**1685**

UK Totals (Direct + Riverine)	lower	**4.79**	**0.60**	**388.4**	**272.0**	**1611**	**19.6**	**0.7**	**47.0**	**210.5**	**20.03**	**280.8**	**23.60**	**2212**
	upper	**8.06**	**1.34**	**396.6**	**303.5**	**1639**	**161.6**	**157.4**	**47.8**	**210.9**	**20.47**	**290.3**	**23.96**	**2249**

Table 8: Limits of Detection and Limits of Quantfication for UK RID Monitoring Data

		Limit of Detection												
OSPAR area	Type	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
Scotland		[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[mg/l]	[mg/l]
SC1, SC2	Sewage effluent	0.1	0.009	0.05	0.18	0.79	10		40	100	3	100	3	2
	Industrial effluent	0.02	0.007	0.05	0.18	0.79	3		40	100	3	100	3	2
	Riverine input	0.02	0.009	0.05	0.05	0.79	0.6		30	100	3	100	3	2
SC2A, SC2B, SC3	S	0.11	0.005	0.13	0.09	1.77	2		10	30	8	100	3	2
	I	0.11	0.005	0.4	0.08	0.31	2		5	30	8	100	3	2
	R	0.11	0.002	0.33	0.09	1.77	0.31		5	30	8	100	3	2
SC4, SC5	S	0.07	0.01	0.6	1	4	0.1		10	150	4	100	4	2
	I	0.07	0.01	20	10	40	10		10	150	4	100	4	2
	R	0.008	0.005	0.6	0.2	4	0.1		5	100	4	100	4	2

		Limit of Quantification (Minimum Reportable Value)												
OSPAR area	Type	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
England and Wales		[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[mg/l]
E1 to E30	Sewage effluent	0.01	0.01	0.1	0.1	0.5	5	35	500	1000	500	100		3
	Industrial effluent	0.01	0.01	0.1	0.1	0.5	5	35	500	1000	500	100		3
	Riverine input	0.01	0.01	0.1	0.1	0.5	1	7	30	200	20	100		3

		Limit of Detection												
OSPAR area	Type (3)	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
Northern Ireland		[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	ug/l	ug/l	[ug/l]	[ug/l]	[ug/l]	[mg/l]
NI1 and NI2	All measurements	0.02	0.02	0.27	0.03	2.96	1	1	3	1.4	1.2	21	3.0	2

		Limit of Quantification												
OSPAR area	Type (3)	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
Northern Ireland		[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	ug/l	ug/l	[ug/l]	[ug/l]	[ug/l]	[mg/l]
NI1 and NI2	Sewage effluent	1	1	20	4	20	5	5	40	50	50	50	50	2
	Industrial effluent	1	1	20	4	20	5	5	40	50	50	50	50	2
	Riverine input	0.1	0.05	1	0.4	3	1	1	40	50	10	50	50	2

For direct discharges, the LQ for Cd is 20ug/l and the LQ for Pb is 100ug/l for saline samples

For clarification the two limits are defined as follows:

- **Limit of detection**

The lowest concentration of analyte in a sample that can be detected,
but not necessarily quantified under the stated conditions of the test.

- **Limit of quantification / Minimum Reportable Value**

The lowest concentration of an analyte that can be determined with acceptable precision
and accuracy under the stated conditions of the test.

Addendum 2: RID data from Iceland for 1997 – 2005

Annual report on riverine inputs and direct discharges by Iceland to Convention waters during the year: _1997 -2005_

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

Gunnar S. Jónsson
Environmental and Food Agency of Iceland
Sudurlandsbraut 24, IS – 108 Reykjavik, ICELAND
Tel: +354 591 2000
Fax: +354 591 2020
Email: gunnar@ust.is

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: ____ICELAND____________________________	
Name of river, subarea and discharge area[1]	Nature of the receiving water[2]
Ölfusá, Ölfusá við Selfoss,	Coastal water
Þjórsá, Þjórsá við Urriðafoss	Coastal area

[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 (Tables 4a and 4b) for the year: 1997-2005

Note: Table 4b is total direct discharges and riverine inputs to maritime area by region. Please provide totals for each OSPAR region and for total inputs.

B.1 Give general comments on the total riverine inputs and direct discharges (e.g. changes from last year, trends, percentage of particle bound determinand, results that need to be highlighted etc.):

Total N and P measured are total dissolved (measured in filtered samples). Anthropogenic inputs are expected to be low compared to natural background. The low number of samples each year increase variations in calculation therefore also raw data are given in tables for calculating trends

C. Direct discharges for the year: _______

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 (cf. section 7 of the RID Principles), including for those under voluntary reporting:

No direct sewage effluents into Þjórsá. Total number of inhabitants probably less than 2000.

Sewage effluents into Ölfusá are downstream of the sampling site. Total number of inhabitants in the catchement are around 10.000.

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the RID 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

C.3 Give general comments on the discharges of sewage effluents (e.g. compared to previous years, and/or extent to which industrial effluents are discharged through sewerage systems):

The population of Iceland is about 300,000. The majority of the inhabitants, approximately 90%, live by the coast. Around 70% of the population lives in the southwest part of the country, in the Faxa bay area. Only about 6% of the population lives in rural areas and less than 1000 people are living above 200 m altitude.

The rivers are thus generally free for sewage and industrial discharges. The riverine inputs with Icelandic rivers are thus mostly natural background values. Anthropogenic inputs with rivers are low due to low population density

Industrial Effluents (Table 5b)

C.4 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 7 of the RID Principles), including for those under voluntary reporting:

Not relevant

C.5 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):
Not relevant

C.6 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:

Not available

C.7 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):

Not avilable

C.8 Give general comments on industrial effluents (e.g. compared to previous years):

No direct industrial effluents into Þjórsá. Total number of inhabitants probably less than 2000
Industrial(slaughterhouse, dairy and waste burial site) effluents into River Ölfusá are downstream of the sampling site. These effluents have not been estimated separately

Total direct discharges (Table 5c)

C.9 Give general comments on total direct discharges (e.g. compared to previous years):

Not available

D. Riverine inputs for the year: 1997 - 2005

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 6 of the RID Principles), including for those under voluntary reporting:

See enclosed document

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

Has not been estimated

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):

SiO2	**Na**	**K**	**Ca**	**Mg**	**CO2**	**SO4**	**SO4**	**Cl**	**TDS**	**TDS**	**DOC**	**POC**	
PON	**SS**	**P**	**PO4-P**	**NO3-N**	**NO2-N**	**NH4-N**	**Ntot**		**F**	**Al**	**Fe**	**B****	**Mn**
Sr	**As**	**Ba**	**Cd**	**Co**	**Cr**	**Cu**	**Ni**	**Pb**	**Zn**	**Hg**	**Mo**	**Ti**	

D.4 Give general comments on the inputs from main rivers (e.g. significant changes in inputs, concentrations and flows compared to previous years):

The low number of samples each year increase variations in calculation therefore also raw data are given in tables for calculating trends.

Tributary Rivers (Tables 6b and 7b)

D.5 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 6 of the Principles):

None

D.6 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

None

D.7 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.8 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in Tables 6b and 7b:

None

D.9 Give general comments on the inputs from tributary rivers (e.g. significant change in inputs, concentrations and flows compared to previous years):

None

Total riverine inputs (Table 6c)

D.10 Give general comments on the total riverine inputs (e.g. significant change in inputs, concentrations and flows compared to previous years):

None

E. Unmonitored areas

E.1 Describe the methods of quantification used for the different determinands or groups of determinands:

None

F. Limits of detection (Table 8)

F.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Give comments if the detection limits are higher than stated in the RID Principles:

None

G. Additional comments

G.1 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 rivers are thus generally free for sewage and industrial discharges. The riverine inputs with Icelandic rivers are thus mostly natural background values. Anthropogenic inputs with rivers are low because of low population density.

Explanatory text with data from two Icelandic rivers, monitored during 1997-2005

Attached are the RID tables but they are only partially filled, because of lack of information. Therefore tables with data and some information in this document based on request in the letter from the Chairman of INPUT, Mr Jon Fuglestad are also attached.

First, general information concerning INPUT from Icelandic rivers:
The population of Iceland is about 300,000. The majority of the inhabitants, approximately 90%, live by the coast. Around 70% of the population lives in the southwest part of the country, in the Faxa bay area. Only about 6% of the population lives in rural areas and less than 1000 people are living above 200 m altitude. The rivers are generally free for sewage and industrial discharges. The riverine inputs with Icelandic rivers are thus mostly natural background values because of low population density and cultivated area is relatively small.

Discharge of nutrients (N and P) to the sea (total estimate from Iceland):
Table. Estimated antrophogenic discharge of Nitrogen (Tot N) and Phosphorous (Tot P) from inhabitants and industries (fish and agriculture) in 2002

	Total N, tonnes	Total P, tonnes
Capital region	1,729	323
West	388	67
Westfjords	183	32
Northwest	290	50
Northeast	723	124
East	1,526	254
South	600	103
Total	*5,439*	*952*

The high values for the capital region and east is because of population density and fish industries in the capital region and fish industries in the east.

Rivers Ölfusá and Þjórsá in South Iceland have been monitored since 1996. The rivers discharge into Coastal waters South of Iceland (Region I, Arctic Waters):
River Ölfusá: Catchment area 5,678 km^2, Long time discharge: 376 m3/sec
River Þjórsá: Catchment area 7,380 km^2, Long time discharge: 350 m3/sec

There is no direct anthropogenic discharge into Þjórsá. Total number of inhabitants is probably less than 2000.

The main anthropogenic discharges into River Ölfusá are downstream of the sampling site. Total number of inhabitants is around 10,000. The total size of cultivated grass fields is estimated as 114 km^2 (grain fields are 0,2 km^2) or 2% of the catchment area. The usual use of fertilizers for grass fields is 100 kg N/ha and 30 kg P / ha.

Answer to the letter from the Chairman of INPUT, Mr Jon Fuglestad

Process to be carried out as follows:

1. The 'Full text report'[1] that is submitted annually together with the RID tables (**deadline 30 September 2006**) should be completed to include, to the extent possible, answers to the elements/queries listed in Annex A below. CPs' RID reports should be submitted to the OSPAR Secretariat as usual (see mail from Paula Creedon 30 August)

Information related to:

1. Compliance with RID Principles compulsory parameters, and explain (if appropriate) why one or several parameters have not been analysed

For the annual discharge calculation, data given are the total N and P (total dissolved N and P as measured on filtrated samples), River / sampling site, year, Tot-discharge, mean flow/yr and catchment area

For Þjórsá and Ölfusá more raw data are given, including date of sampling, discharge at sampling date, temperature and some N and P data.

2. Number of samples per river and year, time of sampling (date), and how the sampling is organised (e.g. same organisation that co-ordinates the sampling in all rivers, or not?)

See data tables for Rivers Ölfusá and Þjórsá. 7 samplings in 2005. Data sampling and processing: University of Iceland, Science Institute and Energy Authority. Data from: University of Iceland, Science Institute and Energy Authority Database

3. Which laboratory is/which laboratories are contracted for the RID analysis? This question is made in order to understand if discrepancies in results are related to differences in laboratory performance.

Nutrients were measured at the University lab. However, change was made from 1998 for total P. After 1998, P = ICP-MS (SGAP). Some discrepancies were observed at the transition period.

4. Data compilation and how (method applied for quantification) direct discharges/losses are taken account of.

Not relevant

5. How are the estimates of losses from unmonitored areas, including downstream RID sampling points[2] calculated and included in the total riverine inputs.

Not relevant

6. Sampling for all RID monitoring points. Coordinate system :UTM, date: WGS 1984

Not available

7. Surface area covered by RID rivers' catchments

River Ölfusá: Catchment area 5,678 km^2, Long time discharge: 376 m^3/sec
River Þjórsá: Catchment area 7,380 km^2, Long time discharge: 350 m^3/sec

8. Percentage of CPs land area draining into Convention Area

Average runoff from Iceland is estimated as 5.5 m^3/sec
Total area of Iceland is 103,022 km^2

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[1] Appendix 2 to "Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID principles). Agreement 1998-5, revised in 2005 and updated in 2006.

[2] RID Principles, §8.

9. Use of LOD or LOQ- please indicate which approach is used[3] and if changes in approach has taken place (and when) in the period 1990-2005

Not used for Total N and P from Ölfusá or Þjórsá

10. Detection/Quantification limits for each single parameter analysed according to the RID mandatory determinants to be analysed[4 5]

"Less than" is referred as appropriate in data table.

11. How the water flow (and subsequent water load) is estimated, i.e. continuous recording of water flow, only when water sample is taken, or other

Continuous recording of water flow

Describe your data Quality Assurance procedures[6]

12. Describe, to the extent possible, the data collection procedures, i.e. sampling to laboratory; time span and sample handling

Unfortunetely, the method description has not yet been translated but here is the Icelandic version for the record:

AÐFERÐIR (Methods)
Hér verður aðferðum við sýnatöku og efnagreiningar lýst ítarlega. Þetta er gert til þess að auðvelda mat á gæðum niðurstaðna.
Rennsli (discharge)
Aurburðar- og efnasýni voru oftast tekin nærri síritandi vatnshæðarmælum í rekstri Vatnamælinga Orkustofnunar. Stöðvarnar eru reknar samkvæmt samningi fyrir hvern stað. Við sýnatöku var gengið úr skugga um að stöðvarnar væru í lagi. Rennsli fyrir hvert sýni var reiknað út frá rennslislykli, sem segir fyrir um vensl vatnshæðar og rennslis. Á vetrum kunna að vera tímabil þar sem vatnshæð er trufluð vegna íss í farvegi. Þá er rennsli við sýnatöku áætlað út frá samanburði við lofthita og úrkomu á hverjum tíma og rennsli nálægra vatnsfalla. Öll sýni, sem hér eru til umfjöllunar, voru tekin nærri síritandi vatnshæðarmælum og rennslið gefið upp sem augnabliksgildi þegar sýnataka fór fram. Augnabliksgildið er gefið í tímaraðatöflum fyrir einstök vatnsföll, og meðaltal augnabliksrennsla fyrir einstök vatnsföll í Töflu 1. Augnarbliksrennsli geta verið töluvert frábrugðin dagsmeðalrennsli sem sýnd eru á myndum 2, 7 og 12.
Sýnataka (Sampling)
Sýni til efnarannsókna voru tekin af brú úr meginál ánna með plastfötu og hellt í 5 l brúsa. Áður höfðu fatan og brúsinn verið þvegin vandlega með árvatninu. Hitastig árvatnsins var mælt með „thermistor" mæli og var hitaneminn látinn síga ofan af brú niður í meginál ánna. Aurburðarsýni voru tekin á Suðurlandi með tvenns konar sýnatökum. Í Þjórsá við Urriðafoss voru sýnin tekin með handsýnataka (DH48) sem festur var á stöng, og sýnið tekið ýmist af hægri eða vinstri bakka undir brúnni við Þjóðveg 1. Vitað er að sýnatakinn nær ekki út í ána þar sem aurstyrkur er mestur, þ.e. undir botn í aðalstrengnum, og því vanmeta þessi sýni heildaraurstyrk árinnar (Jórunn Harðardóttir og Svava Björk Þorláksdóttir, 2002). Aurburðarsýni úr Ytri Rangá voru tekin með sama sýnataka (Sigurður R. Gíslason o.fl. 2003a). Flest aurburðarsýnin, sem tekin eru úr Sogi, Ölfusá, Hvítá, Tungufljóti, Þjórsá við Sandafell og Brúará, voru tekin með aurburðarfiski (S49) á spili úr mesta streng ánna, en hann safnar heilduðu sýni frá vatnsborði, að botni og að vatnsborði á nýjan leik. Ef ís var á ánum þurfti þó stundum að grípa til handsýnataka við sýnatökuna (Sigurður R. Gíslason o.fl. 2003a). Aurburðarsýnið sem notað var til mælinga á lífrænum aurburði (POC) var tekið með sama hætti og fyrir ólífrænan aurburð. Það var ávallt tekið eftir að búið var að taka sýni fyrir ólífrænan aurburð. Sýninu var safnað í sýruþvegnar aurburðarflöskur sem höfðu verið þvegnar í 4 klst. í 1 N HCl sýru fyrir sýnatöku. Flöskurnar voru merktar að utan, en ekki með pappírsmerki inni í flöskuhálsinum eins og tíðkast fyrir ólífrænan aurburð.
Meðhöndlun sýna (Sample treatment)
Sýni til rannsókna á uppleystum efnum voru meðhöndluð strax á sýnatökustað. Vatnið var síað í gegnum sellulósa asetat-síu með 0,2 µm porustærð. Þvermál síu var 142 mm og Sartorius® („in line pressure filter holder, SM16540") síuhaldari úr tefloni notaður. Sýninu var þrýst í gegnum síuna með „peristaltik"-dælu. Slöngur voru úr sílikoni. Síur, síuhaldari og slöngur voru þvegnar með því að dæla a.m.k. einum lítra af árvatni í gegnum síubúnaðinn og lofti var hleypt af síuhaldara með þar til gerðum loftventli. Áður en sýninu var safnað voru sýnaflöskurnar þvegnar þrisvar sinnum hver með síuðu árvatni.
Fyrst var vatn sem ætlað var til mælinga á reikulum efnum, pH, leiðni og basavirkni, síað í tvær dökkar, 275 ml og 60 ml, glerflöskur. Næst var safnað í 1000 ml „high density pólýethelýn" flösku til mælinga á brennisteinssamsætum. Síðan var vatn síað í 190 ml „low density pólýethelýn" flösku.til mælinga á styrk anjóna. Þá var safnað í tvær 90 ml „high density pólýethelýn"

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[3] INPUT 2006 SR, §3.25c
[4] INPUT 2006 SR, §3.25c
[5] LOD/LOQ may differ for riverine and direct inputs.
[6] INPUT 2006 SR, §3.27a

sýruþvegnar flöskur til snefilefnagreininga. Þessar flöskur voru sýruþvegnar af rannsóknaraðilanum SGAB Analytica, sem annaðist snefilefnagreiningarnar og sumar aðalefnagreiningar. Út í þessar flöskur var bætt einum millilítra af fullsterkri hreinsaðri saltpéturssýru í lok söfnunar á hverjum stað. Þá var síuðu árvatni safnað á fjórar sýruþvegnar 20 ml „high density pólýethelýn" flöskur. Flöskurnar voru þvegnar með 1 N HCl fyrir hvern leiðangur. Ein flaska var ætluð fyrir hverja mælingu eftirfarandi næringarsalta; NO3, NO2, NH4, PO4,. Sýnin til mælinga á NH4, og PO4 voru sýrð með 0,5 ml af þynntri (1/100) brennisteinssýru. Vatn ætlað til mælinga á heildarmagni á lífrænu og ólífrænu uppleystu næringarefnanna N og P var síað í sýruþvegna 100 ml flösku. Þessi sýni voru geymd í kæli söfnunardaginn en fryst í lok hvers dags. Sýni til mælinga á DOC var síað eins og önnur vatnssýni. Það var síað í 30 ml sýruþvegna „low density pólýethelýn flösku". Sýrulausnin (1 N HCl) stóð a.m.k. 4 klst. í flöskunum fyrir söfnun, en þær tæmdar rétt fyrir leiðangur og skolaðar með afjónuðu vatni. Þessi sýni voru sýrð með 0,4 ml af 1,2 N HCl og geymd í kæli þar til þau voru send til Svíþjóðar
þar sem þau voru greind. Aurburðarflöskurnar sem settar voru í aurburðartakann fyrir söfnun á POC voru þvegnar í 4 klukkustundir í 1 N HCl sýru áður en farið var í söfnunarleiðangur. Allar flöskur og sprautur sem komu í snertingu við sýnin fyrir POC og DOC voru þvegnar í 4 klukkustundir í 1 N HCl sýru.

Efnagreiningar og meðhöndlun sýna á rannsóknarstofu að lokinni söfnun (Analysis and sample treatment in Lab.)

Efnagreiningar voru gerðar á Raunvísindastofnun, Orkustofnun, SGAB Analytica í Luleå í Svíþjóð, Umeå Marine Sciences Center, í Umeå í Svíþjóð og við Stokkhólmsháskóla. Niðurstöður þeirra greininga sem búið er að framkvæma eru sýndar í Töflum 3a og 3b og í Töflum 4, 5 og 6. Meðalefnasamsetning straumvatnanna er gefin upp í Töflu 1 og reiknaður meðalframburður í Töflu 2. Það er gert til að fljótlegt sé að bera saman straumvötnin. Að lokum eru næmi og
samkvæmni mælinga gefin í Töflu 7.

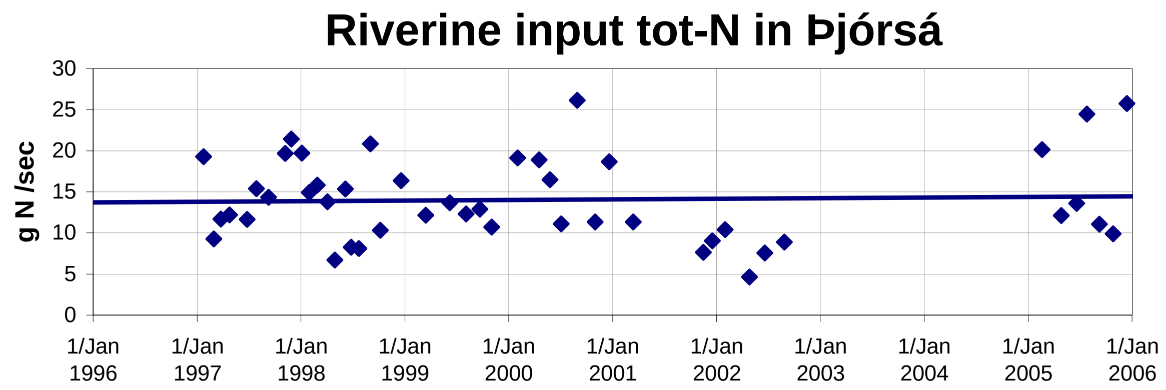
Uppleyst efni

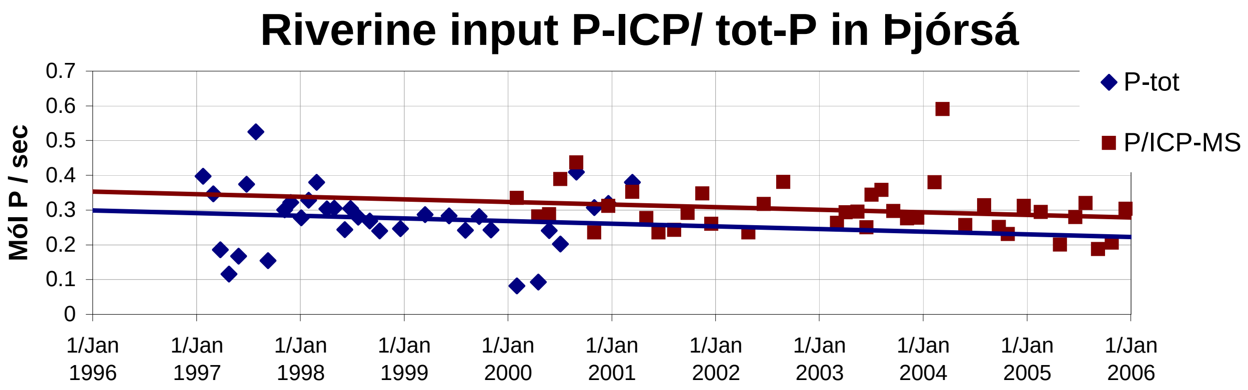
Basavirkni („alkalinity"), leiðni og pH var mælt með títrun, rafskautiog leiðnimæli á Raunvísindastofnun að loknum sýnatökuleiðangri. Endapunktur títrunar var ákvarðaður með Gran-falli (Stumm og Morgan, 1996). Aðalefni og
snefilefni voru mæld af SGAB Analytica með ICP-AES, ICP-MS (Mass Spectrometry with Inductively Coupled Plasma) og atómljómun; AF (Atomic Fluorescense). Notaðar voru tvær tegundir massagreina með plasmanu; svokallað ICP-QMS, þar sem „quadrupole" er notaður til að nema massa efnanna, og hins vegar ICP-SMS þar sem „a combination of a magnetic and an electrostatic sector" er notað til skilja að massa efnanna. Þegar styrkur efnanna var lítill var notast við ICP-SMS. Kalí (K) var greint með ICP-AES en styrkur þess var stundum undir næmi aðferðarinnar og voruð þau sýni þá mæld með litgleypnimælingu (AA) á Orkustofnun. Næringarsöltin NO3, NO2, NH4, og PO4 sem og heildarmagn af uppleystu lífrænu og ólífrænu nitri og fosfór, Ntot og Ptot voru greind með sjálfvirkum litrófsmæli Raunvísindastofnunar („autoanalyzer"). Sýni til næringarsaltagreininga voru tekin úr frysti og látin standa við stofuhita nóttina fyrir efnagreiningu þannig að þau bráðnuðu að fullu. Sýni til mælinga á Ptot og Ntot voru geisluð í kísilstautum í þar til gerðum geislunarbúnaði á
Raunvísindastofnun. Fyrir geislun voru settir 0,02 ml af fullsterku vetnisperoxíði í 20 millilítra af sýni. Þessi sýni voru greind innan tveggja daga eftir geislun. Flúor, klór og súlfat voru mæld með jónaskilju á Raunvísindastofnun. Sýni til greininga á
heildarmagni uppleysts kolefnis (DOC) og á magni lífræns aurburðar (POC og PON) voru send til Umeå Marine Sciences Center í Umeå í Svíþjóð strax og búið var að sía POC og PON-sýni í gegnum glersíur eins og lýst verður hér á eftir. Sýni til mælinga á brennisteinssamsætum voru látin seytla í gegnum jónaskiptasúlur með sterku anjónajónaskiptaresini.
Sýnaflöskur voru vigtaðar fyrir og eftir jónaskipti til þess að hægt væri að leggja mat á heildarmagn brennisteins í jónaskiptaefni. Þegar allt sýnið hafði seytlað í gegn og loft komist í jónaskiptasúlurnar var þeim lokað og þær sendar til
Stokkhólms til samsætumælinga. Loftið var látið komast inn í súlurnar til þess að tryggja að nægt súrefni væri í þeim svo að allur brennisteinn héldist á formi súlfats (SO4).

Svifaur.

Magn svifaurs og heildarmagn uppleystra efna (TDSmælt) var mælt á Orkustofnun samkvæmt staðlaðri aðferð (Svanur Pálsson og Guðmundur Vigfússon 2000). Sýni til mælinga á lífrænum aurburði (POC, Particle Organic Carbon og PON,
Particle Organic Nitrogen) sem tekin voru í sýruþvegnu aurburðarflöskurnar voru síuð í gengnum þar til gerðar glersíur. Glersíurnar og álpappír sem notaður var til þess að geyma síurnar í voru „brennd" við 450 °C í 4 klukkustundir fyrir síun. Síuhaldarar og vatnssprautur sem notaðar voru við síunina voru þvegnar í 4 klukkustundir í 1 N HCl. Allt vatn og aurburður sem var í aurburðarflöskunum var síað í gegnum glersíurnar og magn vatns og aurburðar mælt með því að vigta flöskurnar fyrir og eftir síun. Síurnar voru þurrkaðar í álumslögum við um 50 °C í einn sólarhring áður en þær voru sendar til Umeå Marine Sciences Center í Svíþjóð til efnagreininga.

Environmental and Food Agency of Iceland. October 5, 2006-10-04
Gunnar Steinn Jónsson


Riverine input tot-N in Þjórsá
g N /sec
30
25
20
15
10
5
0
1/Jan 1996
1/Jan 1997
1/Jan 1998
1/Jan 1999
1/Jan 2000
1/Jan 2001
1/Jan 2002
1/Jan 2003
1/Jan 2004
1/Jan 2005
1/Jan 2006


Riverine input P-ICP/ tot-P in Þjórsá
Mól P / sec
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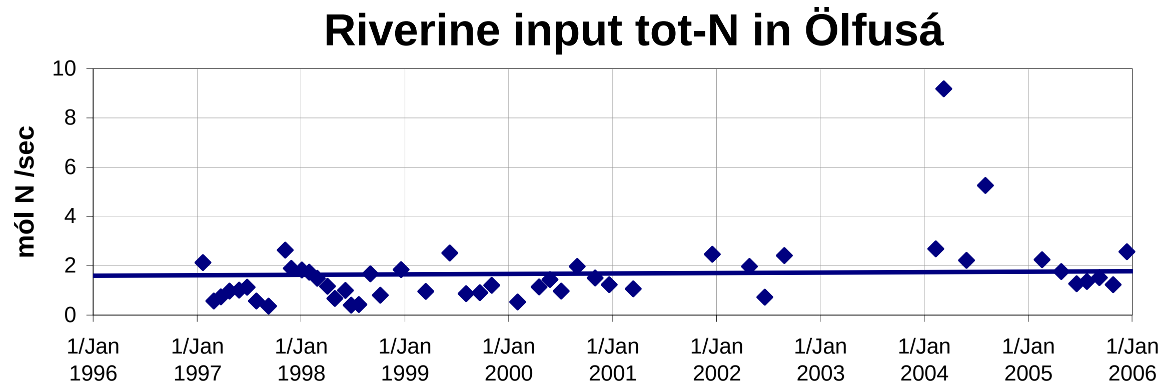
0.6
0.5
0.4
0.3
0.2
0.1
0
1/Jan 1996
1/Jan 1997
1/Jan 1998
1/Jan 1999
1/Jan 2000
1/Jan 2001
1/Jan 2002
1/Jan 2003
1/Jan 2004
1/Jan 2005
1/Jan 2006
P-tot
P/ICP-MS


Riverine input tot-N in Ölfusá
mól N /sec
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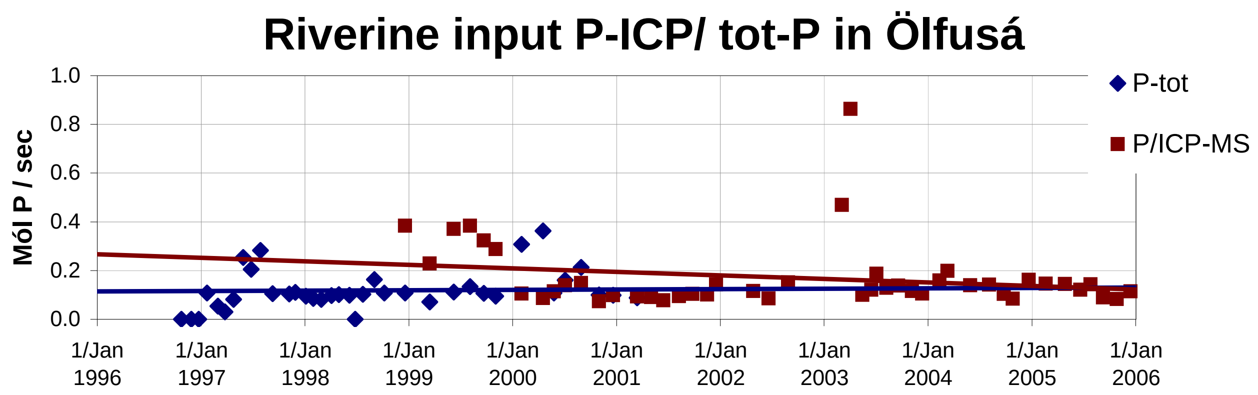
8
6
4
2
0
1/Jan 1996
1/Jan 1997
1/Jan 1998
1/Jan 1999
1/Jan 2000
1/Jan 2001
1/Jan 2002
1/Jan 2003
1/Jan 2004
1/Jan 2005
1/Jan 2006


Riverine input P-ICP/ tot-P in Ölfusá
Mól P / sec
1.0
0.8
0.6
0.4
0.2
0.0
1/Jan 1996
1/Jan 1997
1/Jan 1998
1/Jan 1999
1/Jan 2000
1/Jan 2001
1/Jan 2002
1/Jan 2003
1/Jan 2004
1/Jan 2005
1/Jan 2006
P-tot
P/ICP-MS

Riverine input with some rivers in Iceland, 1997 - 2005

Total area of Iceland is 103,022 km2

Average runoff from Iceland is estimated as 5,5 m3/sec

Some of the data in the table are "less than" value shown. Which cells of the table this is true for is shown on the next sheet "Less Than".

River / sampling site	Year	Tot-discharge GL/yr	mean flow/yr m^3/sec	Drainage Area km^2	N_{total} tons/yr	P_{total} tons/yr
Ölfusá / Selfoss	**1997**	12,405	393	5678	581.0	117.0
Þjórsá / Urriðafoss		11,656	370	7380	483.0	253.0
Ytri Rangá / Árbæjarfoss		1,387	40	572	82.1	64.4
Ölfusá / Selfoss	**1998**	10,282	326	5678	512.0	96.0
Þjórsá / Urriðafoss		9,935	315	7380	420.0	266.0
Ölfusá / Selfoss	**1999**	11,828	375	5678	645.0	111.0
Þjórsá / Urriðafoss		10,818	343	7380	415.0	269.0
Jökulsá á Fjöllum		5,299	168	5178	203.0	174.0
Jökulsá á Dal / Hjarðarhaga		4,636	147	3322	245.7	49.8
Jökulsá í Fljótsdal		1,025	32.5	558	37.2	8.1
Fellsá		225	7.13	125	6.6	0.3
Grímsá		751	23.8	479		
Lagarfljót / Lagarfossvirkjun		3,501	111	2782	145.3	5.3
Fjarðará / Fjarðarselsvirkjun		124	3.93	46.3	3.5	0.1
Ölfusá / Selfoss	**2000**	12,142	384	5678	590.0	110.0
Þjórsá / Urriðafoss		11,257	356	7380	525.0	214.0
Jökulsá á Fjöllum		6,229	197	5178	207.8	277.3
Jökulsá á Dal / Brú		4,079	129	2090		
Jökulsá á Dal / Hjarðarhaga		4,838	153	3322	202.2	85.3
Jökulsá í Fljótsdal		939	29.7	558	39.8	10.4
Fellsá		203	6.43	125	6.9	0.7
Grímsá		692	21.9	479		
Lagarfljót / Lagarfossvirkjun		3,086	97.6	2782	147.5	20.9
Fjarðará / Fjarðarselsvirkjun		89	2.82	46.3	3.7	0.3
Ölfusá / Selfoss	**2001**	10,377	329	5678	616.0	88.0
Þjórsá / Urriðafoss		10,314	327	7380	296.0	277.0
Jökulsá á Fjöllum		5,173	164	5178	268.3	250.6

Jökulsá á Dal / Brú		3,532	112	2090	305.0	65.1
Jökulsá á Dal / Hjarðarhaga		4,447	141	3322	346.6	56.5
Jökulsá í Fljótsdal		1,025	32.5	558	51.9	10.1
Fellsá		239	7.59	125	12.7	0.5
Grímsá		861	27.3	479		
Lagarfljót / Lagarfossvirkjun		3,816	121	2782	238.2	16.68
Fjarðará / Fjarðarselsvirkjun				46.3		
Ytri Rangá / Árbæjarfoss	**2002**	12,204	387	5678	672	100
Þjórsá / Urriðafoss		11,794	374	7380	202	180
Ölfusá / Selfoss	**2003**	12,930	410	5678		252
Þjórsá / Urriðafoss		12,614	400	7380		313
Ölfusá / Selfoss	**2004**	13,592	431	5678	1385	108
Þjórsá / Urriðafoss		11,700	371	7380		284
Ölfusá / Selfoss	**2005**	12,299	390	5678	803	120
Þjórsá / Urriðafoss		11,101	352	7380	605	278

Data source:
Sigurður Reynir Gíslason*, Árni Snorrason, Eydís Salome Eiríksdóttir, Bergur Sigfússon, Sverrir Óskar Elefsen, Jórunn Harðardóttir, Ásgeir Gunnarsson, Einar Örn Hreinsson, Peter Torssander, Marin I. Kardjilov og Níels Örn Óskarsson. 2003.
Efnasamsetning, rennsli og aurburður straumvatna á Austurlandi IV.
Gagnagrunnur Raunvísindastofnunar og Orkustofnunar
(University of Iceland, Science Institute and Energy Authority Database)
RH-03-2003. *Raunvisindastofnun Háskólans, Dunhaga 3, 107 Reykjavík
And:
Sigurður Reynir Gíslason*, Árni Snorrason, Eydís Salome Eiríksdóttir, Bergur Sigfússon, Sverrir Óskar Elefsen, Jórunn Harðardóttir, Ásgeir Gunnarsson og Peter Torssander. 200
Efnasamsetning, rennsli og aurburður straumvatna á Suðurlandi VI.
Gagnagrunnur Raunvísindastofnunar og Orkustofnunar
(University of Iceland, Science Institute and Energy Authority Database)
RH-04-2003. Raunvisindastofnun Háskólans, Dunhaga 3, 107 Reykjavík

River / Sampling site	Year	N_{total} tons/yr	P_{total} tons/yr	Cd tons/yr	Cu tons/yr	Pb tons/yr	Hg tons/yr
Ölfusá / Selfoss	**1997**			<			<
Þjórsá / Urriðafoss		<		<			<
Ytri Rangá / Árbæjarfoss				<			<
Ölfusá / Selfoss	**1998**			<			<
Þjórsá / Urriðafoss				<			<
Ytri Rangá / Árbæjarfoss				<			<
Ölfusá / Selfoss	**1999**			<			<
Þjórsá / Urriðafoss				<			<
Jökulsá á Fjöllum				<			<
Jökulsá á Dal / Hjarðarhaga				<			<
Jökulsá í Fljótsdal				<	<		<
Fellsá			<	<			<
Grímsá			<	<			<
Lagarfljót / Lagarfossvirkjun				<			<
Fjarðará / Fjarðarselsvirkjun			<	<			<
Ölfusá / Selfoss	**2000**			<		<	<
Þjórsá / Urriðafoss				<		<	<
Jökulsá á Fjöllum				<			<
Jökulsá á Dal / Brú				<			<
Jökulsá á Dal / Hjarðarhaga				<			<
Jökulsá í Fljótsdal				<		<	<
Fellsá			<	<			<
Grímsá							<
Lagarfljót / Lagarfossvirkjun				<			<
Fjarðará / Fjarðarselsvirkjun			<				<
Ölfusá / Selfoss	**2001**			<		<	<
Þjórsá / Urriðafoss				<		<	<
Jökulsá á Fjöllum				<		<	<
Jökulsá á Dal / Brú				<		<	<
Jökulsá á Dal / Hjarðarhaga				<		<	<
Jökulsá í Fljótsdal				<		<	<
Fellsá				<		<	<
Grímsá				<		<	<
Lagarfljót / Lagarfossvirkjun				<		<	<
Þjórsá / Urriðafoss	**2002**						
Jökulsá á Fjöllum							
Jökulsá á Dal / Brú							
Jökulsá á Dal / Hjarðarhaga							
Jökulsá í Fljótsdal							
Fellsá							
Grímsá							
Lagarfljót / Lagarfossvirkjun							
Fjarðará / Fjarðarselsvirkjun							

Þjórsá við Urriðafoss

Long time discharge: 350 m3/sec

Dato	Discharge m^3/sek	Water-temp ℃	tot-P mól/sec	Riverine inp Tot P Tons/yr	P ICP-MS mól/sec	Riverine inp P ICP-MS Tons/yr	Tot N mól/sec	tot-N Tons/yr
22.10.1996 11:30	331.0	3.0						
26.11.1996 12:05	299.0							
22.12.1996 11:00	337.0							
23.01.1997 12:00	306.0	0.1	0.3978				19.2784	
28.02.1997 10:05	315.0		0.3465				9.2612	
25.03.1997 10:55	309.0	0.6	0.1854				11.6805	
24.04.1997 11:00	290.0	1.2	0.1160				12.1803	
28.05.1997 13:15	740.0	5.0	0.1672					
25.06.1997 11:30	416.0	9.8	0.3744				11.6482	
28.07.1997 10:40	428.0	12.2	0.5251				15.4006	
08.09.1997 12:30	532.0	7.6	0.1546				14.3571	
30.09.1997 11:15	638.0	4.2						
06.11.1997 11:30	323.0	1.4	0.3009				19.6933	
27.11.1997 11:10	339.0	3.3	0.3216	**252.9939**			21.4377	**483.2694**
03.01.1998 11:05	293.0	1.3	0.2776				19.7327	
29.01.1998 11:00	293.0		0.3282				14.9251	
27.02.1998 11:20	314.0		0.3796				15.7992	
03.04.1998 11:10	293.0	0.9	0.3037				13.8073	
29.04.1998 09:45	317.0	3.1	0.3051				6.7097	
05.06.1998 10:15	319.0	8.3	0.2434				15.3370	
26.06.1998 10:35	403.0	9.3	0.3049				8.2786	
23.07.1998 09:30	348.0	8.5	0.2796				8.1044	
01.09.1998 10:00	480.0	1.8	0.2690				20.8594	
06.10.1998 09:50	247.0	6.2	0.2398				10.3359	
18.12.1998 11:10	247.0	0.0	0.2467	**266.4518**			16.3546	**419.9491**
15.03.1999 11:15	277.0	0.5	0.2866				12.1517	
07.06.1999 11:40	336.0	7.7	0.2837				13.6886	
04.08.1999 10:30	339.0	12.1	0.2418				12.3111	
21.09.1999 11:00	402.0	7.6	0.2812				12.9022	
02.11.1999 11:45	257.0	0.2	0.2431	**269.1863**		0.0000	10.6987	**414.6278**
01.02.2000 13:30	311.0	0.0	0.0814		0.3344		19.1402	
17.04.2000 16:30	311.0	-0.1	0.0933		0.2812		18.8789	
25.05.2000 13:30	451.0	5.9	0.2414		0.2883		16.4669	
03.07.2000 12:30	451.0	11.7	0.2023		0.3888		11.1126	
29.08.2000 11:00	550.0	11.3	0.4089		0.4369		26.1415	
31.10.2000 12:30	263.0	2.1	0.3073		0.2352		11.3461	
19.12.2000 14:15	267.0	0.2	0.3189	**213.8826**	0.3121	294.4999	18.6750	**524.9585**
13.03.2001 12:00	325.0	0.5	0.3797		0.3526		11.3204	
02.05.2001 11:40	328.0	6.8			0.2764			
14.06.2001 10:40	249.0	9.5			0.2356			
08.08.2001 10:40	328.0	10.1			0.2425			
24.09.2001 10:40	361.0	7.2			0.2914			
15.11.2001 11:50	350.0	2.4			0.3481		7.6396	
17.12.2001 11:05	301.0	2.0			0.2605	**276.9532**	9.0454	**295.9007**
31.01.2002 11:20	319.0	0.0					10.4075	
26.04.2002 12:05	474.0	0.3			0.2357		4.6200	
19.06.2002 12:45	507.0	7.8			0.3176		7.5466	
27.08.2002 15:35	534.0	9.6			0.3810	**180.2478**	8.8975	**202.3942**
4.3.2003 14:15	327	1.6			0.2630			
3.4.2003 12:40	321	3.6			0.2939			
15.5.2003 11:45	349	5.9			0.2953			
16.6.2003 12:57	333	9.7			0.2502			
4.7.2003 12:20	420	11.8			0.3443			
8.8.2003 12:35	515	12.6			0.3576			
18.9.2003 12:10	393	5.5			0.2967			
6.11.2003 12:20	261	1.2			0.2757			
12.12.2003 11:10	286	2.7			0.2779	**313.5121**		

Þjórsá við Urriðafoss

Long time discharge: 350 m3/sec

Dato	Discharge m^3/sek	Water-temp ℃	tot-P mól/sec	Riverine inp Tot P Tons/yr	P ICP-MS mól/sec	Riverine inp P ICP-MS Tons/yr	Tot N mól/sec	tot-N Tons/yr
10.2.2004 11:40	339	0.0			0.3798			
9.3.2004 12:15	914	3.9			0.5902			
28.5.2004 12:05	330	9.4			0.2568			
3.8.2004 17:05	448	11.4			0.3139			
24.9.2004 11:45	323	6.6			0.2513			
25.10.2004 12:35	243	0.4			0.2307			
20.12.2004 13:14	283	-0.6			0.3116	**284.4683**		
18.2.2005 12:00	302	-0.2			0.2946		20.1401	
27.4.2005 11:45	311	4.3			0.2005		12.1092	
20.6.2005 12:30	329	10.6			0.2795		13.6166	
26.7.2005 12:27	470	13.6			0.3199		24.4806	
8.9.2005 11:32	226	5.3			0.1877		11.0608	
26.10.2005 12:41	227	0.0			0.2064		9.8783	
13.12.2005 12:22	284	1.7			0.3031	**277.7802**	25.7444	**604.8005**
						146.2532		

Ölfusá við Selfoss

Long time discharge: 376 m3/sec

Dato	Discharge m^3/sek	Water-temp ℃	tot-P mól/sec	Riverine inp Tot P Tons/yr	P ICP-MS mól/sec	Riverine inp P ICP-MS Tons/yr	Tot N mól/sec	tot-N Tons/yr
22.10.1996 10:15	364.0	4.8	0.0000					
26.11.1996 10:15	294.0		0.0000					
22.12.1996 18:00	263.0		0.0000					
21.01.1997 11:00	360.0		0.1080				2.1240	
28.02.1997 18:00	270.0		0.0540				0.5670	
25.03.1997 09:20	308.0	0.2	0.0308				0.7392	
24.04.1997 18:00	405.0	3.4	0.0810				0.9720	
28.05.1997 20:40	634.0	6.2	0.2536				1.0144	
25.06.1997 10:30	341.0	9.3	0.2046				1.1253	
28.07.1997 09:30	364.0	12.6	0.2820				0.5717	
08.09.1997 11:10	426.0	7.1	0.1048				0.3650	
30.09.1967 09:50	673.0	4.0	0.1067				3.2503	
06.11.1997 10:00	392.0	1.9	0.1037				2.6354	
27.11.1997 10:00	341.0	4.1	0.1108	117.4050			1.9006	580.7893
03.01.1998 09:00	372.0	1.1	0.0943				1.8349	
29.01.1998 09:45	355.0	0.4	0.0854				1.7399	
27.02.1998 10:00	282.0		0.0812				1.4873	
03.04.1998 09:50	291.0	1.8	0.0972				1.1662	
29.04.1998 08:35	311.0	2.0	0.1009				0.6760	
05.06.1998 09:00	303.0	8.1	0.0982				1.0024	
26.06.1998 09:20	335.0	1.4	0.0000				0.3996	
23.07.1998 08:30	264.0	1.1	0.1031				0.4330	
01.09.1998 08:50	526.0	11.4	0.1636				1.6787	
06.10.1998 08:40	298.0	7.8	0.1073				0.8025	
18.12.1998 09:50	310.0	-0.2	0.1082	96.1881	0.3836		1.8399	512.2624
15.03.1999 10:30	220.0	0.2	0.0707		0.2287		0.9658	
07.06.1999 10:20	364.0	-	0.1123		0.3712		2.5243	
04.08.1999 09:30	388.0	12.4	0.1346		0.3841		0.8639	
21.09.1999 10:45	351.0	9.7	0.1065		0.3232		0.9145	
02.11.1999 09:30	323.0	1.8	0.0945	110.5997	0.2878	340.1041	1.2119	644.8872
01.02.2000 10:30	320.0	-0.1	0.3077		0.1054		0.5374	
17.04.2000 15:00	326.0	0.0	0.3632		0.0863		1.1405	
25.05.2000 11:30	449.0	6.7	0.1080		0.1145		1.4386	
03.07.2000 11:00	396.0	13.3	0.1605		0.1394		0.9710	
29.08.2000 10:30	424.0	9.5	0.2123		0.1479		1.9794	
31.10.2000 10:30	305.0	2.2	0.0998		0.0733		1.5062	
19.12.2000 12:20	287.0	0.7	0.0989	193.6785	0.0992	109.8324	1.2367	589.5699
13.03.2001 10:00	277.0	0.7	0.0883		0.0939		1.0645	
02.05.2001 10:00	319.0	5.9			0.0912			
14.06.2001 09:00	232.0	9.1			0.0779			
08.08.2001 08:50	298.0	10.1			0.0941			
24.09.2001 09:20	388.0	4.3			0.1037			
15.11.2001 10:10	413.0	3.3			0.1016			
17.12.2001 09:55	549.0	1.4			0.1431	87.8791	2.4699	615.8743
31.01.2002 10:05		0.0						
26.04.2002 10:40	534.0	1.5			0.1157		1.9677	
19.06.2002 11:00	374.0	7.1			0.0860		0.7219	
27.08.2002 14:20	390.0	9.7			0.1511	99.5061	2.4178	672.3105
4.3.2003 11:35	429	1.8			0.4695			
3.4.2003 11:15	418	2.8			0.8628			
15.5.2003 10:30	323	7.2			0.1001			
16.6.2003 11:53	336	8.7			0.1202			
4.7.2003 11:00	382	11.4			0.1864			
8.8.2003 11:25	374	12.9			0.1292			
18.9.2003 10:40	429	5.9			0.1384			
6.11.2003 10:46	379	1.5			0.1160			
12.12.2003 10:00	361	0.7			0.1046	251.7892		

Ölfusá við Selfoss

Long time discharge: 376 m3/sec

Dato	Discharge m^3/sek	Water-temp ℃	tot-P mól/sec	Riverine inp Tot P Tons/yr	P ICP-MS mól/sec	Riverine inp P ICP-MS Tons/yr	Tot N mól/sec	tot-N Tons/yr
10.2.2004 10:00	445	0.0			0.1594		2.6910	
9.3.2004 10:45	1375	4.4			0.1984		9.1795	
28.5.2004 11:00	415	9.4			0.1394		2.2267	
3.8.2004 12:40	426	10.3			0.1415		5.2648	
24.9.2004 13:50	369	6.7			0.1040			
25.10.2004 11:10	300	0.7			0.0842			
20.12.2004 11:05	409	-0.7			0.1612	107.7560		1384.8270
18.2.2005 10:20	425	-0.4			0.1455		2.2417	
27.4.2005 09:57	418	5.7			0.1443		1.7670	
20.6.2005 10:50	353	10.6			0.1209		1.2771	
26.7.2005 10:40	395	13.8			0.1426		1.3670	
8.9.2005 10:05	312	5.7			0.0895		1.5229	
26.10.2005 10:39	293	-0.1			0.0829		1.2276	
13.12.2005 10:35	370	2.7			0.1141	120.7614	2.5653	803.0201