Assessment and Monitoring Series

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

Presentation and Assessment of the OSPAR Contracting Parties' RID 2006 Data

OSPAR Commission 2008	Norwegian Institute for Agricultural and Environmental Research

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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Executive summary 5
Récapitulatif 9
1. Introduction 13
2. RID data reporting for 2006 15
3. Assessment of the data 17
3.1 Country submission of information 17
3.2 Updated information from the OSPAR RID data report 17
3.3 New questionnaire for the OSPAR RID 2006 data report 24
3.4 Completeness of monitoring and reporting on unmonitored areas 24
3.5 Sampling sites and coverage of monitored areas 25
3.6 Direct discharges and losses 27
3.7 Sampling procedures 30
3.8 Laboratory analyses and change of detection limits over time 31
3.9 Hydrological data and calculation practices 37
3.10 Main and tributary rivers - harmonisation of approaches 38
3.11 Use of the RID data for other purposes 38
3.12 Quality assurance 39
4. Total inputs to the OSPAR maritime area in 2006 42
4.1 Overview of RID 2006 data 43
4.2 Cadmium inputs 45
4.3 Mercury inputs 47
4.4 Lead inputs 49
4.5 Copper inputs 51
4.6 Zinc inputs 53
4.7 Inputs of total nitrogen 55
4.8 Inputs of total phosphorus 57
4.9 Inputs of suspended particulate matter (SPM) 59
4.10 Water discharges to the OSPAR maritime area in 2006 61
5. Comparison of reported inputs in 2005 and 2006 62
5.1 Input of metals 62
5.2 Input of nutrients and SPM 64
6. General conclusions and recommendations 66
7. References 67

Annexes and Addendum

Annex I: RID 2006 Data Overview Tables
Annex II: Questionnaire for the 2006 Assessment
Annex III: Overview of submitted replies to Questionnaire for the 2006 Assessment
Annex IV: Co-ordinates and maps of RID sampling sites
Annex V: Overview of areas downstream sampling points per RID catchment
Annex VI: Changes in the laboratory detection limits as reported by the Contracting Parties
Annex VII: Suggestions for clarifying the use of the concepts of “unmonitored area” and “tributary river” under the RID Principles
Annex VIII: Comments and observations on “Example for steps in quality assurance”, Belgium

Addendum 1: National Reports on Riverine Inputs and Direct Discharges to Convention Waters in 2006

Executive summary

This report presents the results of monitoring undertaken by OSPAR Contracting Parties within the framework of the Comprehensive Study of Riverine Inputs and Direct Discharges (RID) during 2006. The purpose of the report is to pinpoint some of the challenges to be faced in order to improve the reliability and usefulness of the results of the RID Programme, and to suggest how to meet these challenges. They include: uncertainties, knowledge gaps, lack of documentation on harmonised practises, approaches and methodologies amongst Contracting Parties. Furthermore, the report provides an overview of compliance by Contracting Parties with their reporting requirement for RID 2006 data and its completeness, an analysis of the generation and reporting of RID 2006 inputs by Contracting Parties, including a comparison with 2005 inputs and, in the light of this analysis, an overview of the riverine inputs and direct discharges reported for 2006.

Assessment of data

Completeness of monitoring

According to the RID Principles, 90% of the land area draining into the maritime area should be monitored. Of the countries that have submitted information, only the Netherlands and Belgium report that more than 90% of the land area draining into the maritime area is monitored. France, Norway, Sweden and UK all monitor less than the required area. However, these countries do monitor direct discharges downstream of the riverine sampling sites, and also report on unmonitored rivers.

Direct discharges

A number of Contracting Parties reported discharges from point sources such as industries, sewage treatment plants and fish farming. For all point sources amongst Contracting Parties it is believed that the number of samples varies among the different discharge sites, but no specific information has been made available. The completeness of reporting direct discharges of RID parameters to the sea also seems to vary considerably amongst Contracting Parties. Losses from urban areas may be underestimated or are not taken account of at all. They may represent a large source of underestimation of inputs as many large cities are located close to the sea.

Sampling procedures

It is not clear whether all Contracting Parties have standard procedures for sampling and whether these are used consistently within each country. Common sampling standards should therefore be an issue of consideration for future INPUT meetings. In slow flowing rivers, depth integrated samples will usually provide a better estimate of the total transport of particles and substances transported associated with particulate matter. Sampling during flood events is regarded as important in order to achieve realistic estimates of the loads, but most Contracting Parties that have submitted information do not allow for extra sampling during floods.

Laboratory analyses

For chemical analysis of samples, several countries use different laboratories both for riverine inputs and direct discharges. Only Ireland, Norway and Sweden (except for mercury) use the same laboratory for all rivers monitored. The fact that detection limits may vary considerably for river sample analyses within the same country when different laboratories perform the analyses, and also that they use different analytical methods or change analytical method at different moments in time, demonstrates that great care must be taken when undertaking and interpreting trend analysis. According to the RID Principles, it is necessary to choose an analytical method that gives at least 70% of positive findings (*i.e.* no more than 30% of the samples below the detection limit). Some countries have rather high LODs or LOQs for some substances, and especially for substances detected at low concentrations, such as the metals cadmium and mercury. This leads to considerable differences in input estimates for some substances when either upper or lower estimates are used. The detection limit issue is clearly a considerable problem both within countries and for comparison of results between countries. Trustworthy trend analyses may be difficult to undertake in many cases, but when the data are reliable they will represent an important tool for the forthcoming RID assessments.

Hydrological data

The interpolation method used to calculate riverine inputs has a significant impact on the results. Most countries use the recommended RID method, although there are variations for some rivers and countries, which in particular seem to be due to the lack of continuous flow data, or flow data for the actual sampling date. Three Contracting Parties have reported continuous flow measurements, whereas two countries have

reported daily recordings. For all practical purposes, daily measurements should be sufficient for calculating loads in large rivers.

Main and tributary rivers

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 the determining feature. One other possibility could be to refer to 'main rivers' and 'other rivers', where the main rivers are those with substantial inputs/loads. Finally, one could abandon the notion of main and tributary rivers and only refer to 'rivers'.

Quality assurance

There are a number of Quality Assurance (QA) issues linked to data quality that need to be considered: harmonisation and transparency in procedures, principles applied, reliability (methods and measurements, analyses, uncertainty), comparability of results, procedures and tools, and sufficient resource allocation per country to reach required common goals. The data quality will be influenced by *e.g.* selection of rivers (in countries where not all rivers can be monitored for practical and financial reasons), sampling strategy (when and where to sample), sampling frequency, considerations linked to storm flow events, detection limits, analytical methods and load calculations. Contracting Parties should endeavour to assess the uncertainty of the results that they 'accept', *i.e.* costs and benefits of more accurate data should be assessed and become a common understanding to all parties involved.

Inputs to the OSPAR maritime area in 2006

General

Differences in achieved limits of detection and the reporting of upper and lower estimates can influence the results of the RID Study, as well as the data comparability between countries and data reliability. There is a need for additional information to supplement RID monitoring results for the purpose of improving their reliability.

There are discrepancies in how Contracting Parties report upper and lower values. 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.

Taking into account the differences in the methodology used by Contracting Parties to calculate the upper estimate (use of LOD or LOQ and/or use of 100% or 50% of these values for analytical results below the LOD/LOQ), a direct comparison of the upper estimations of loads of pollutants reported by Contracting Parties could not be done. In general, the values included in the table 16 and the foregoing analysis could show higher values for Contracting Parties using LOQ instead LOD. The lower estimate values are not affected by this problem and they could be directly compared.

Cadmium

Total cadmium inputs to the OSPAR maritime area in 2006 reported by Contracting Parties range from 0.6 tonnes in Sweden to 11 tonnes reported by the UK (based on upper estimates), with the exception of Spain that reported a total cadmium load of 99 tonnes based on the upper (LOQ based) estimates. Reported Spanish loads were of similar magnitude in 2003 - 2005. When segregating the data by input sources, riverine inputs are significantly larger than the direct discharges for all countries when comparing upper estimates. Reported riverine inputs by the UK and Germany are also significantly higher than the direct discharges reported by these two countries when comparing lower estimates. In contrast, the riverine inputs reported by Spain based on lower estimates are almost negligible compared to the corresponding direct discharges.

Mercury

Total mercury inputs in 2006 reported by Contracting Parties range from 0.1 tonnes in Sweden to 5 tonnes reported by Spain. The input data for mercury provide another example of how the relative contribution of each Contracting Party to total inputs may differ depending on whether lower or upper estimates are used. Based on upper estimates (LOQ based), Spain provided 36% of total mercury inputs, whereas only 7% if based on lower estimates. In the latter case, the Netherlands provided the highest inputs of mercury to the OSPAR maritime area in 2006 (44%).

The inputs reported by Spain are higher than the corresponding figures reported by other Contracting Parties for both riverine inputs and direct discharges when comparing upper estimates, and for direct discharges when comparing lower estimates. In contrast, the riverine inputs reported by Spain equal zero when based on lower estimates.

Lead

The total inputs of lead in 2006 reported by Contracting Parties range from 17 tonnes in Sweden to 705 tonnes reported by the UK. As for cadmium and mercury, the relative contribution of each country to the total inputs depends on whether the lower or upper estimates are used. The differences in results are, however, less significant than for cadmium and mercury. The inputs reported by the UK represent the largest contribution to total inputs of lead to the maritime area at a magnitude ranging between 56% (upper estimate) and 69% (lower estimate). Germany and the Netherlands contributed 10% each to total inputs based on upper estimates, whereas 13% and 12% based on lower estimates, respectively. Spain contributed 18% based on upper estimates, whereas close to 0% when based on lower estimates. Reported riverine inputs of lead are for most countries significantly higher than the direct discharges. The riverine inputs reported by Spain (2.2 tonnes) based on lower estimates are, however, just slightly above the corresponding direct discharges (*i.e.* 2.0 tonnes).

Copper

The total inputs of copper to the OSPAR maritime area in 2006 reported by Contracting Parties range from 50 tonnes in Sweden to 491 tonnes reported by the UK. The UK and Norway reported the largest inputs of copper, regardless of whether upper or lower estimates are used. The UK contributed 28%, whereas Norway contributed 26% to total inputs based on upper estimates. The corresponding figures based on lower estimates are 34% and 31%, respectively.

For most countries the reported direct discharges (based on upper estimates) are considerably lower than the riverine inputs. For Norway, however, the direct discharges equal the riverine inputs of copper. The high direct discharges reported by Norway are explained by the fact that Norway reports discharges of copper from the cleaning of fish cages in the fish farming industry. Regardless of whether upper or lower estimates are used, the riverine inputs of copper reported by the UK are significantly higher than the inputs reported by other Contracting Parties.

Zinc

The total inputs of zinc in 2006 reported by Contracting Parties range from 170 tonnes in Sweden to 2475 tonnes reported by the UK. The UK was in 2006 the single largest contributor of zinc inputs regardless of whether upper or lower estimates are used, followed by Germany and the Netherlands. Based on upper estimates, the UK contributed 40%, whereas Germany and the Netherlands contributed 16% and 14% to total inputs, respectively. The corresponding figures based on lower estimates are 44%, 18% and 15%, respectively. Only the figures reported by Spain show an almost 50% discrepancy between the LOQ based upper estimate and the lower estimate. For all countries the reported riverine inputs of zinc are considerably higher than the direct discharges. The UK reported the highest riverine inputs and direct discharges, regardless of whether upper or lower estimates are used.

Nitrogen

The total inputs of nitrogen to the OSPAR maritime area in 2006 reported by Contracting Parties range from 40 tonnes in Sweden to 275 tonnes reported by the UK. In general, the reported total nitrogen inputs show less difference between the upper and lower estimates than the inputs reported for metals. For both estimates, the UK reported the highest inputs in 2006, followed by the Netherlands, Germany and France. The UK and the Netherlands contributed approximately 23% each to total inputs, whereas Germany and France contributed 15% and 14%, respectively (based on upper estimates). The corresponding figures based on lower estimates are 26%, 24%, 16% and 12%, respectively. For all countries riverine inputs contribute the larger part of the inputs of total nitrogen to the maritime area in 2006. The highest contributions to riverine inputs of total nitrogen were reported by the Netherlands. The UK reported the highest direct discharges.

Phosphorus

The total inputs of phosphorus to the OSPAR maritime area in 2006 reported by Contracting Parties range from 1 tonne in Sweden to 21 tonnes reported by the UK. As for total nitrogen, the differences between upper and lower estimates are less explicit than for metals, most likely due to the lower detection limits and higher concentrations of nutrients compared to metals. The UK reported the highest inputs of phosphorus in 2006, regardless of whether upper or lower estimates are used. The differences between reported riverine inputs and direct discharges are less significant for phosphorus loads than for other substances. The reported riverine inputs are slightly higher than the corresponding direct discharges for most countries. The Netherlands and the UK reported the highest riverine inputs of phosphorus in 2006.

Suspended particular matter

Suspended particulate matter (SPM) is the determinand for which most Contracting Parties reported the most similar values for upper and lower estimates. The UK reported the highest SPM inputs in 2006,

followed by France and Germany. The relative contributions of these countries to the total inputs were 26%, 24% and 15% based on upper estimates, and 26%, 25% and 15% based on lower estimates, respectively. The reported riverine inputs of SPM are higher than the corresponding direct discharges for all countries. The UK (2643 kt) and France (2424 kt) reported the highest riverine inputs of SPM in 2006. Norway was the single largest contributor to total direct discharges.

Water discharge

The total inputs to the OSPAR maritime area can also be assessed based on the total amount of water discharged to the sea from each country. Such an assessment is somewhat difficult as Contracting Parties have based their calculations of water discharge on differing data sets. According to the available data, Norway is the country with the highest contribution of water discharged to the maritime area, followed by France, UK and the Netherlands. This pattern is similar both for total water discharges from each Contracting Party and for monitored rivers only, but the differences between the countries are reduced when only water discharges from monitored rivers are considered. In order to have an accurate picture of the real situation Contracting Parties need to harmonise procedures and completeness of reporting.

2005 and 2006 inputs

The 2005 and 2006 RID data reported by each Contracting Party have been compared in order to get an indication of potential increases or reductions in inputs to the OSPAR maritime area. There were in general few significant changes, for any parameter, in inputs from 2005 to 2006 reported by Contracting Parties.

Récapitulatif

Le présent rapport présente les résultats de la surveillance continue entreprise par les Parties contractantes OSPAR dans le cadre de l'Étude exhaustive des apports fluviaux et des rejets directs (RID) en 2006. Le rapport a pour objectifs d'indiquer quelques-uns des problèmes auxquels il faudra s'attaquer pour améliorer la fiabilité et l'utilité des résultats du Programme RID, et de suggérer comment traiter ces problèmes. Ceux-ci comprennent les incertitudes, les lacunes dans les connaissances, ainsi que le manque de documentation sur les pratiques, les approches et les méthodologies harmonisées parmi les Parties contractantes. En outre, le rapport indique succinctement comment les Parties contractantes ont respecté leurs engagements de notification pour les données RID 2006 et l'exhaustivité de ces données, présente une analyse de la production et de la notification des apports RID 2006 par les Parties contractantes, en établissant des comparaisons avec les apports de 2005 et, à la lumière de cette analyse, présente une vue d'ensemble des apports fluviaux et des rejets directs notifiés pour 2006.

Évaluation des données

Exhaustivité de la surveillance continue

En vertu des Principes RID, 90% de la zone terrestre dont les eaux s'écoulent dans la zone maritime doivent faire l'objet d'une surveillance continue. Parmi les pays qui ont présenté des informations, seuls les Pays-Bas et la Belgique déclarent que plus de 90% de la zone terrestre dont les eaux s'écoulent dans la zone maritime font l'objet d'une surveillance continue. La France, la Norvège, la Suède et le Royaume-Uni pratiquent tous une surveillance continue sur une surface inférieure à la surface requise. Toutefois, ces pays surveillent quand même les rejets directs en aval des sites d'échantillonnage fluviaux, et présentent aussi des notifications concernant des fleuves qui ne sont pas visés par la surveillance continue.

Rejets directs

Plusieurs Parties contractantes ont notifié des rejets provenant de sources ponctuelles, par exemple des usines, des stations d'épuration des eaux usées et des centres de pisciculture. Pour toutes les sources ponctuelles chez les Parties contractantes, on pense que le nombre d'échantillons varie d'un site de rejet à l'autre, mais aucune information précise n'a été fournie dans ce domaine. L'exhaustivité de la notification des rejets directs de paramètres RID en mer semble aussi varier considérablement parmi les Parties contractantes. Les pertes en provenance de zones urbaines peuvent être sous-estimées ou bien elles ne sont pas prises en compte du tout. Il se peut qu'elles contribuent dans une grande mesure à une sous-estimation des apports, car beaucoup de grandes villes se trouvent près de la mer.

Procédures d'échantillonnage

On ne sait pas très bien si toutes les Parties contractantes ont mis en place ou non des procédures normalisées pour l'échantillonnage, et si ces procédures sont utilisées ou non de manière cohérente dans chaque pays. Il faudra donc examiner la question des normes d'échantillonnage communes lors des futures réunions d'INPUT. Dans les fleuves à écoulement lent, des échantillons intégrés prélevés à des profondeurs définies de la colonne d'eau produiront généralement une meilleure estimation du transport total des particules et des substances véhiculées en association avec des matières particulaires. L'échantillonnage durant les inondations est jugé important afin de produire des estimations réalistes des charges, cependant la plupart des Parties contractantes qui ont fourni des informations ne prévoient pas d'échantillonnage additionnel durant les inondations.

Analyses en laboratoire

Pour l'analyse chimique des échantillons, plusieurs pays font appel à différents laboratoires, tant pour les apports fluviaux que pour les rejets directs. Seules l'Irlande, la Norvège et la Suède (sauf pour le mercure) font appel au même laboratoire pour tous les fleuves faisant l'objet d'une surveillance continue. Le fait que les limites de détection puissent varier considérablement pour les analyses d'échantillons fluviaux dans un même pays quand différents laboratoires exécutent les analyses, et aussi que ces laboratoires utilisent différentes méthodes d'analyse ou changent de méthode d'analyse à différents moments, indique qu'il faut se montrer très prudent lorsqu'on entreprend une analyse des tendances et lorsqu'on interprète les résultats de cette analyse. En vertu des Principes RID, il est nécessaire de choisir une méthode d'analyse qui produise au moins 70% de résultats positifs (c'est-à-dire pas plus de 30% des échantillons en dessous de la limite de détection). Certains pays ont des limites de détection (LOD) ou des limites de quantification (LOQ) assez élevées pour certaines substances, et en particulier pour les substances détectées à de faibles concentrations, par exemple des métaux comme le cadmium et le mercure. Cela aboutit à des différences considérables entre les estimations des apports pour certaines substances selon que des estimations supérieures ou inférieures sont utilisées. La question de la limite de détection est manifestement un gros problème, aussi bien au niveau national que quand il s'agit de comparer les résultats entre les pays. Dans de

nombreux cas, il peut s'avérer difficile d'entreprendre des analyses fiables des tendances, mais quand les données sont fiables, elles représentent un outil important pour les évaluations RID ultérieures.

Données hydrologiques

La méthode d'interpolation utilisée pour calculer les apports fluviaux influence considérablement les résultats. La plupart des pays utilisent la méthode RID recommandée, bien qu'il existe des variations pour certains fleuves et certains pays, ces variations semblant résulter en particulier d'un manque de données d'écoulement continues, ou de données d'écoulement pour la date effective d'échantillonnage. Trois Parties contractantes ont notifié des mesures d'écoulement continues, tandis que deux pays ont notifié des enregistrements quotidiens. À toutes fins utiles, des mesures quotidiennes devraient être suffisantes pour calculer les charges dans les grands fleuves.

Fleuves principaux et affluents

INPUT 2007 a considéré une proposition dont le but était de parvenir à une conception plus universelle des affluents en utilisant comme caractéristique déterminante la fréquence d'échantillonnage plutôt que les caractéristiques des canaux fluviaux. Une autre possibilité consisterait à se référer à des « fleuves principaux » et à d'« autres fleuves », les fleuves principaux étant ceux qui présentent des apports/charges substantiels. Enfin, on pourrait supprimer la notion de fleuves principaux et d'affluents, en se référant exclusivement à des « fleuves ».

Assurance de qualité

Il faut examiner un certain nombre de questions concernant l'Assurance de qualité (AQ), liées à la qualité des données à proprement parler, à l'harmonisation et à la transparence des procédures, aux principes appliqués, à la fiabilité (méthodes et mesures, analyses, incertitude), à la comparabilité des résultats, aux procédures et aux outils, et à l'allocation de ressources suffisantes par pays pour la réalisation d'objectifs communs à atteindre. La qualité des données sera influencée, par exemple, par la sélection des fleuves (dans les pays où tous les fleuves ne peuvent pas faire l'objet d'une surveillance continue, pour des raisons pratiques et financières), la stratégie d'échantillonnage (quand et où prélever les échantillons), la fréquence d'échantillonnage, les considérations relatives à l'évacuation des eaux d'orage, les limites de détection, les méthodes d'analyse et les calculs des charges. Les Parties contractantes devraient s'efforcer d'évaluer l'incertitude des résultats qu'elles « acceptent », c'est-à-dire que les coûts et bénéfices de données plus exactes devraient être évalués et devenir un concept partagé par toutes les parties concernées.

Apports dans la zone maritime OSPAR en 2006

Généralités

Les différences entre les limites de détection obtenues, et la notification d'estimations supérieures ou inférieures, peuvent influencer les résultats de l'Étude RID, ainsi que la comparabilité des données entre les pays et la fiabilité des données. On a besoin d'informations additionnelles pour compléter les résultats de la surveillance continue RID, afin d'améliorer la fiabilité de ces résultats.

Il existe des différences dans la manière dont les Parties contractantes notifient les valeurs supérieures et inférieures. L'idée générale est que pour les estimations inférieures, les résultats d'analyse en dessous de la limite de détection seront notifiés comme des valeurs nulles ; tandis que pour les estimations supérieures, les résultats d'analyse en dessous de la limite de détection peuvent être notifiés soit comme des valeurs égales à la limite de détection, soit comme des valeurs correspondant à la moitié de la limite de détection.

Une comparaison directe des estimations supérieures des charges de polluants notifiées par les Parties contractantes n'est pas réalisable, en tenant compte des différences que présente la méthodologie utilisée par les Parties contractantes pour calculer l'estimation supérieure (utilisation de la LOD ou de la LOQ et/ou utilisation de 100% ou de 50% de ces valeurs pour les résultats analytiques inférieurs à la LOD/LOQ). En général, les valeurs qui figurent dans le tableau 16 et l'analyse qui le précède pourraient révéler des valeurs plus élevées pour les Parties contractantes qui utilisent la LOQ au lieu de la LOD. Les valeurs d'estimation inférieures ne sont pas affectées par ce problème et peuvent être comparées directement.

Cadmium

Les apports totaux de cadmium en 2006 dans la Zone maritime OSPAR notifiés par les Parties contractantes varient de 0,6 tonne en Suède à 11 tonnes notifiées par le Royaume-Uni (en se basant sur des estimations supérieures), à l'exception de l'Espagne, qui a notifié une charge totale de cadmium de 99 tonnes, basée sur des estimations supérieures (LOQ). Les charges notifiées par l'Espagne étaient d'importance similaire en 2003 - 2005. Quand on classe les données par sources d'apports, les apports fluviaux sont significativement supérieurs aux rejets directs pour tous les pays quand on compare des estimations supérieures. Les apports fluviaux notifiés par le Royaume-Uni et par l'Allemagne sont aussi significativement supérieurs aux rejets

directs notifiés par ces deux pays quand on compare des estimations inférieures. Par contre, les apports fluviaux basés sur des estimations inférieures notifiés par l'Espagne sont presque négligeables par comparaison avec les rejets directs correspondants.

Mercure

Les apports totaux de mercure en 2006 notifiés par les Parties contractantes varient de 0,1 tonne en Suède à 5 tonnes notifiées par l'Espagne. Les données concernant les apports de mercure offrent un autre exemple de la manière dont la contribution relative de chaque Partie contractante aux apports totaux peut différer selon que des estimations inférieures ou supérieures sont utilisées. Quand on se base sur des estimations supérieures (fondés sur la LOQ), l'Espagne a représenté 36% des apports totaux de mercure, alors que cette contribution est de 7% seulement si l'on se base sur des estimations inférieures. Dans ce dernier cas, ce sont les Pays-Bas qui ont produit les apports de mercure les plus élevés dans la Zone maritime OSPAR en 2006 (44%).

Les apports notifiés par l'Espagne sont supérieurs aux chiffres correspondants notifiés par les autres Parties contractantes tant pour les apports fluviaux que pour les rejets directs quand on compare des estimations supérieures, et pour les rejets directs quand on compare des estimations inférieures. Par contre, les apports fluviaux notifiés par l'Espagne ont une valeur nulle quand on se base sur des estimations inférieures.

Plomb

Les apports totaux de plomb en 2006 notifiés par les Parties contractantes varient de 17 tonnes en Suède à 705 tonnes notifiées par le Royaume-Uni. Comme pour le cadmium et le mercure, la contribution relative de chaque pays aux apports totaux varie selon que des estimations inférieures ou supérieures sont utilisées. Les différences entre les résultats sont toutefois moins significatives que pour le cadmium et le mercure. Les apports notifiés par le Royaume-Uni représentent la contribution la plus élevée aux apports totaux de plomb dans la Zone maritime, avec une importance variant de 56% (estimation supérieure) à 69% (estimation inférieure). L'Allemagne et les Pays-Bas ont chacun apporté une contribution de 10% aux apports totaux quand on se base sur des estimations supérieures, tandis que leurs contributions ont été de 13% et 12% quand on se base sur des estimations inférieures, respectivement. L'Espagne a apporté une contribution de 18% quand on se base sur des estimations supérieures, tandis que cette contribution est proche de 0% quand on se base sur des estimations inférieures. Pour la plupart des pays, les apports fluviaux de plomb notifiés sont significativement supérieurs aux rejets directs. Les apports fluviaux notifiés par l'Espagne (2,2 tonnes), quand on se base sur des estimations inférieures, sont toutefois légèrement supérieurs aux rejets directs correspondants (c'est-à-dire 2,0 tonnes).

Cuivre

Les apports totaux de cuivre dans la Zone maritime OSPAR en 2006 notifiés par les Parties contractantes varient de 50 tonnes en Suède à 491 tonnes notifiées par le Royaume-Uni. Le Royaume-Uni et la Norvège ont notifié les apports de cuivre les plus importants, ceci en utilisant des estimations supérieures ou inférieures. Le Royaume-Uni a apporté une contribution de 28%, tandis que la Norvège a apporté une contribution de 26% aux apports totaux, quand on se base sur des estimations supérieures. Les chiffres correspondants quand on se base sur des estimations inférieures sont de 34% et 31%, respectivement.

Pour la plupart des pays, les rejets directs notifiés (basés sur des estimations supérieures) sont largement inférieurs aux apports fluviaux. Pour la Norvège, toutefois, les rejets directs sont égaux aux apports fluviaux de cuivre. Les rejets directs élevés notifiés par la Norvège s'expliquent par le fait que la Norvège notifie des rejets de cuivre provenant du nettoyage des cages à poissons utilisées dans le secteur de la pisciculture. Que l'on utilise des estimations supérieures ou inférieures, les apports fluviaux de cuivre notifiés par le Royaume-Uni sont significativement supérieurs aux apports notifiés par les autres Parties contractantes.

Zinc

Les apports totaux de zinc en 2006 notifiés par les Parties contractantes varient de 170 tonnes en Suède à 2 475 tonnes notifiées par le Royaume-Uni. Le Royaume-Uni, en 2006, a apporté à lui seul la plus haute contribution aux apports de zinc, ceci en utilisant des estimations supérieures ou inférieures, avec ensuite l'Allemagne et les Pays-Bas. Quand on se base sur des estimations supérieures, le Royaume-Uni a apporté une contribution de 40%, tandis que l'Allemagne et les Pays-Bas ont apporté une contribution de 16% et 14% aux apports totaux, respectivement. Les chiffres correspondants quand on se base sur des estimations inférieures sont de 44%, 18% et 15%, respectivement. Seuls les chiffres notifiés par l'Espagne présentent une différence de presque 50% entre l'estimation supérieure basée sur la LOQ et l'estimation inférieure. Pour tous les pays, les apports fluviaux de zinc notifiés sont largement supérieurs aux rejets directs. Le Royaume-Uni a notifié les apports fluviaux et les rejets directs les plus élevés, ceci en utilisant des estimations supérieures ou inférieures.

Azote

Les apports totaux d'azote dans la Zone maritime OSPAR en 2006 notifiés par les Parties contractantes varient de 40 tonnes en Suède à 275 tonnes notifiées par le Royaume-Uni. En général, les apports totaux d'azote notifiés présentent une moindre différence entre les estimations supérieures et inférieures que les apports notifiés pour les métaux. Pour les deux estimations, le Royaume-Uni a notifié les apports les plus élevés en 2006, avec ensuite les Pays-Bas, l'Allemagne et la France. Le Royaume-Uni et les Pays-Bas ont apporté une contribution d'approximativement 23% chacun aux apports totaux, tandis que l'Allemagne et la France ont apporté une contribution de 15% et 14%, respectivement (en se basant sur des estimations supérieures). Les chiffres correspondants quand on se base sur des estimations inférieures sont de 26%, 24%, 16% et 12%, respectivement. Pour tous les pays, les apports fluviaux représentent la contribution la plus importante aux apports d'azote total dans la Zone maritime en 2006. Les contributions les plus élevées aux apports fluviaux d'azote total ont été notifiées par les Pays-Bas. Le Royaume-Uni a notifié les rejets directs les plus élevés.

Phosphore

Les apports totaux de phosphore dans la Zone maritime OSPAR en 2006 notifiés par les Parties contractantes varient de 1 tonne en Suède à 21 tonnes notifiées par le Royaume-Uni. Comme pour l'azote total, les différences entre les estimations supérieures et inférieures sont moins explicites que pour les métaux, ceci étant probablement dû aux limites de détection inférieures et aux concentrations supérieures de substances nutritives par comparaison avec les métaux. Le Royaume-Uni a notifié les apports de phosphore les plus élevés en 2006, ceci en utilisant des estimations supérieures ou inférieures. Les différences entre les apports fluviaux et les rejets directs notifiés sont moins significatives pour les charges de phosphore que pour d'autres substances. Les apports fluviaux notifiés sont légèrement supérieurs aux rejets directs correspondants pour la plupart des pays. Les Pays-Bas et le Royaume-Uni ont notifié les apports fluviaux de phosphore les plus élevés en 2006.

Matières particulaires en suspension

Les matières particulaires en suspension (MPS) sont le déterminand pour lequel la plupart des Parties contractantes ont notifié les valeurs les plus similaires pour les estimations supérieures et inférieures. Le Royaume-Uni a notifié les apports de MPS les plus élevés en 2006, avec ensuite la France et l'Allemagne. Les contributions relatives de ces pays aux apports totaux ont été de 26%, 24% et 15% quand on se base sur des estimations supérieures, et de 26%, 25% et 15% quand on se base sur des estimations inférieures, respectivement. Les apports fluviaux de MPS notifiés sont supérieurs aux rejets directs correspondants pour tous les pays. Le Royaume-Uni (2 643 kt) et la France (2 424 kt) ont notifié les apports fluviaux de MPS les plus élevés en 2006. La Norvège a apporté à elle seule la contribution la plus importante aux rejets directs totaux.

Rejets d'eau

Les apports totaux dans la Zone maritime OSPAR peuvent aussi être évalués d'après la quantité totale d'eau rejetée en mer à partir de chaque pays. Cette évaluation est assez difficile, car les Parties contractantes ont basé leurs calculs des rejets d'eau sur différents ensembles de données. Selon les données disponibles, la Norvège est le pays qui apporte la contribution la plus importante aux rejets d'eau dans la Zone maritime, avec ensuite la France, le Royaume-Uni et les Pays-Bas. La situation est similaire quand on considère les rejets d'eau totaux de chaque Partie contractante et quand on considère seulement les fleuves faisant l'objet d'une surveillance continue, toutefois les différences entre les pays sont réduites quand on considère seulement les rejets provenant de fleuves faisant l'objet d'une surveillance continue. Pour que l'on puisse se faire une idée précise de la situation réelle, les Parties contractantes doivent harmoniser leurs procédures et l'exhaustivité de la notification.

Apports en 2005 et en 2006

Les données RID 2005 et 2006 notifiées par chaque Partie contractante ont été comparées afin d'obtenir une indication des augmentations ou des réductions potentielles des apports dans la Zone maritime OSPAR. D'une manière générale, on a observé peu de changements significatifs, de 2005 à 2006, des apports notifiés par les Parties contractantes, quel que soit le paramètre.

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 (RID). The basis for the RID Study is set out in the RID Principles (agreement 1998-5, as updated).[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 river-borne 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, describe 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 pollutant.

The following determinands should 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)

[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 updated in 2005 and 2007.

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]."

Contracting Parties are requested to report the relevant data annually (by 1 November) 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.

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 currently being prepared for 2009.

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

In addition to the presentation of the RID data for 2005, Norway prepared an analysis of the reliability, accuracy, comparability and completeness of the reported data. The analysis was based on information submitted by Contracting Parties as part of their RID data reports and in response to a questionnaire, circulated by Norway, to collect information on data generation and reporting for the purposes of the report. This exercise has been repeated for the 2006 data and a more complete questionnaire filled in by Contracting Parties, see section 3.

The purpose of this report is to pinpoint some of the challenges which need to be faced in order to improve the reliability and usefulness of the results of the RID Study. These challenges include: uncertainties, knowledge gaps, lack of documentation on harmonised practises, approaches and methodologies among Contracting Parties. In doing so, the report also provides a source of information to facilitate the assessment of the RID data in 2008/2009.

This report provides an overview of compliance by Contracting Parties with their reporting requirement for RID 2006 data and its completeness (section 2), an analysis of the generation and reporting of RID 2006 inputs by Contracting Parties (section 3), and, in the light of this analysis, an overview of the riverine inputs and direct discharges reported for 2006 (section 4), including a comparison with 2005 inputs (section 5). Conclusions and recommendations are summarised in section 6.

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

3 Provided that a suitable method is available.

4 INPUT November 1995 agreed not to advocate routine Convention-wide monitoring of riverine inputs of pesticides, but to address specific requests from SIME or DIFF* on a case-by-case basis. (* Secretariat note: DIFF was discontinued by OSPAR 2000. The work formerly undertaken by DIFF was carried out by SPDS until 2004/2005 and, since then, by HSC.)

2. RID data reporting for 2006

RID 2006 data reports have been submitted by Belgium, France, Germany, the Netherlands, Norway, Spain, Sweden and the UK. Portugal, Ireland and Iceland had not submitted their reports by the deadline. While their national reports are presented in Addendum 1, the reported information came too late to be taken into account in this report. All national RID reports are presented in Addendum 1 to this report.

The national data reported by Contracting Parties have been summarised in the overview tables at Annex I. 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 2006 data reports is presented in Annex 1.

Table 1a at Annex I gives an overview of data reported by Contracting Parties in 2006 for the categories direct discharges (sewage effluents, industrial effluents), riverine inputs (main and tributary rivers) and coastal areas. This information is summarised in Table 1. 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 2006 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 1: Overview of information for 2006 reported by Contracting Parties on inputs to the OSPAR maritime area (based on overview table 1a at Annex I) (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[1]					
	Germany			*		
	Netherlands			*		
	Norway			**		
	UK East coast					***
Arctic Waters	Iceland[1]					
Kattegat	Denmark[1]					
	Sweden			*		
Skagerrak	Denmark[1]					
	Norway			**		
	Sweden			*		
Channel	France					
	UK					***
Irish Sea	Ireland[1]					
	UK					***
Celtic Sea	Ireland[1]					
	UK					***
Norwegian Sea	Norway			**		
Barents Sea	Norway			**		
Atlantic	France					
	Ireland[1]					
	Portugal[1]					
	Spain					
	UK					***

[1] Denmark has not submitted 2006 RID data. Iceland, Ireland and Portugal submitted their data too late to be taken into account in this table and the report. This is reflected in the table as "no information".

* 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 I, 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 national RID 2006 data reports differs for riverine inputs and direct discharges and shows some important gaps (Table 2).

Table 2: Overview of mandatory determinands reported by Contracting Parties in 2006 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 I. The table only indicates parameter coverage, and not whether the data reported for each parameter is complete.

Country	Cd	Hg	Cu	Pb	Zn	µ-HCH	NH_4-N	NO_3-N	PO_4-P	total N	total P	SPM
Belgium[1]												
Denmark[2]												
France[3]												
Germany												
Iceland[1]												
Ireland[2]												
Netherlands												
Norway												
Portugal[2]												
Spain												
Sweden												
UK												

1 Belgium does not report direct discharges as this is "not applicable".
2 Denmark has not submitted 2006 RID data. Iceland, Ireland and Portugal submitted their data too late to be taken into account in this report. This is reflected in the table as "no information".
3 France has reported inputs of metals for 2 main rivers, but does not report total inputs when data are not complete.

Table 2, therefore, gives an overview of the parameters measured by each Contracting Party, but as for Table 1, it does not show the frequency with which each parameter has been sampled and analysed, nor the number of rivers each determinand is measured in.

Contracting Parties report on determinands as follows:

- Only three countries, Germany, Spain and the United Kingdom, report all mandatory determinands for both rivers and direct discharges.
- Belgium reports on all mandatory determinands for rivers, but does not report on direct discharges as this is "not applicable".
- The Netherlands and Norway report on all determinands for rivers, but for direct discharges neither country reports lindane, and the Netherlands does not report on ammonia and orthophosphate.
- Sweden does not report on lindane or SPM discharges/ inputs, and does not report on nitrate or orthophosphate in direct discharges.

In general, determinands in direct discharges (especially for nutrient parameters) are less well reported than those in riverine inputs. There are significant gaps in the reporting of metals for both riverine inputs and direct discharges, especially for mercury. Significant gaps exist for lindane with only six Contracting Parties reporting riverine inputs of lindane (55%); direct discharges are only reported by one third of Contracting Parties. A number of Contracting Parties did not report direct discharges of nutrients.

In terms of geographic coverage, the OSPAR Region II (Greater North Sea), especially the main body of the North Sea, is the area that is most completely covered, although even there gaps still exist. There are substantial gaps for Region IV (Bay of Biscay/Iberian coast), especially for metals and lindane. Region V is not relevant with regard to riverine inputs (open sea).

To assist the further review of the RID Principles agreed by ASMO 2005, and to provide an example of how annual RID data reports could be prepared following the example of the CAMP data report, Norway offered to prepare such a report for the RID 2005 data. This was reported in Skarbøvik and Borgvang (2007). This report also included an analysis of the RID data reliability, accuracy, comparability and completeness. In order to further improve the platform for data and information assessment, as well as the reliability and comparability of national input estimates to the OSPAR maritime area, a revised and more complete questionnaire was sent to Contracting Parties. This questionnaire is at Annex II, and the replies from Contracting Parties are at Annex III.

3. Assessment of the data

3.1 Country submission of information

Table 3 gives an overview of the status of Contracting Parties for which this report is based. The agreed deadline for submission of national information was 1 November 2007.

Table 3. Overview of submitted information from Contracting Parties

Country	RID Report submitted	RID Data submitted	Questionnaire filled in
Denmark	-	No	No
Belgium [1]	10 Oct 2007	Yes	Yes
France	22 Jan 2008	Yes	Yes
Germany	30 Oct 2007	Yes	No
Iceland[2]	12 Nov 2007 and Oct / Nov 2008	No	No
Ireland[2]	3 July 2008	Yes	No
Netherlands	30 Oct 2007	Yes	Yes
Norway	20 Nov 2007	Yes	Yes
Portugal[2]	14 Mar 2008	Yes	No
Spain	5 Nov 2007	Yes	Yes
Sweden	1 Nov 2007	Yes	Yes
United Kingdom	3 Dec 2007 (draft)	Yes	Yes

[1] Belgium has also submitted information on a river by river basis as requested in the questionnaire, see Annex III continued.
[2] Iceland, Ireland and Portugal submitted their data too late to be taken into account in this report

3.2 Updated information from the OSPAR RID data report

In the OSPAR RID 2005 data report, overviews on the information on data assessment by Contracting Parties were organised in two tables (Tables 4 and 5; Skarbøvik and Borgvang 2007). Additional information has been given for the 2006 assessment, and new tables have therefore been assembled, see Table 4 and Table 5 below.

The information in the tables is organised as follows:

Table 4

- Number of rivers monitored
- Number of maritime areas per country
- Size of Convention area for each 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 several institutes

Table 5

- 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 area
- Whether all parameters have been analysed in compliance with the RID principles.

Table 4: Compilation of submitted information on data quality – A (2006 version)

Country	Number of rivers	Number of areas	Size of Convention Area (for the country)	One or many labs	Monitoring carried out by one or more institute(s)?
Belgium	2 main rivers, 9 tributaries	1 North Sea Again divided into Scheldt estuary and Belgian Coastal zone; again divided into 3 sub-areas	Surface area covered by RID river catchment: 15.392 km^2 100% of the Belgian area drains into Convention Area. 50% drains directly into the Convention Area through the Scheldt estuary and the coastal basins and is represented by the RID reporting. The other 50% drains indirectly into the Convention Area through the Meuse and Rhine basins and contributes to the Dutch 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 km^2, which constitutes 64% of the Danish land area.	NI	NI
France	3 main rivers, 35 tributaries and 13 unmonitored areas.	2 Channel/North Sea and Atlantic, again divided into four sub-regions.	Surface covered by RID programme: 382,162 km^2 ; 70% of the total surface of the country. Monitored area : 319,822 km^2	Different labs, but all must be authorised by the Ministry of the Environment (at least accredited).	4 different river basin district authorities called "Water Agencies" for the OSPAR area.
Germany	4 main rivers (plus tributaries in the case of the Elbe)	1 North Sea	Total German OSPAR Catchment area: 275 852 km^2 Draining via German Rivers: 165 884 km^2 Ems 15 008 km^2 (German catchment share) Weser 49 000 km^2 Elbe 97 175 km^2 (German catchment share) Eider 4 701 km^2 Draining via rivers discharging in the Netherlands: 109 968 km^2 Rhine 106 000 km^2 (German catchment share) Meuse 3 968 km^2 (German catchment share)	Many: Ems: Niedersächsicher Landesbetrieb für Wasserwirtschaft, Künsten- und Naturschutz + contractors Weser: Niedersächsicher Landesbetrieb für Wasserwirtschaft, Künsten- und Naturschutz + contractors Elbe: ARGE Elbe + contractors Eider: Landeslabor Schleswig-Holstein + contractors	Co-ordinating Institutions: Ems: Niedersächsicher Landesbetrieb für Wasserwirtschaft, Künsten- und Naturschutz Weser: Flussgebietsgemeinschaft Weser Elbe: ARGE Elbe Eider: Landesamt für Natur und Umwelt Schleswig-Holstein (LANU)

Country	Number of rivers	Number of areas	Size of Convention Area (for the country)	One or many labs	Monitoring carried out by one or more institute(s)?
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 during 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 and Dublin.	Sampling is organised 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 tributaries	1 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.	61,56% of the surface of Spain drains into the Convention Area, but 34,96% is controlled by Spain and 26,61% (Duero and Tajo) by Portugal.	Each River Basin District has its own laboratory or laboratories. In some cases monitoring is carried out by contracts with private laboratories.	Different River Basin Districts. CH Norte, CH Guadiana, CH Guadalquivir, País Vasco, Galicia Costa, Junta de Andalucía.

Country	Number of rivers	Number of areas	Size of Convention Area (for the country)	One or many labs	Monitoring carried out by one or more institutes?
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 mercury analyses, which are performed by a sub-contractor.	One institute responsible for 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 39 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 5: Compilation of submitted information on data quality – B (2006 version)

Country	Number of samples/year main rivers	Number of samples/year tributary rivers	Downstream sampling points – what is measured/calculated?	Direct discharges	Are all parameters included?
Belgium	11-12 for heavy metals 13-14 for nutrients 10 for γ-HCH and PCBs		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	Minimum of 12 measurements per year	Main tributary rivers: 12/yr. Other: 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 parameters are monitored but not for all the stations.
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 and industry: Elbe, direct discharges of sewage effluents determined downstream of the measurement site. Weser and Jade: estimates based on population equivalents and 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.

Country	Number of samples/year main rivers	Number of samples/year tributary rivers	Downstream sampling points – what is measured/ calculated?	Direct discharges	Are all parameters included?
Iceland	7 samples/yr in 2005.	None	Nothing is calculated downstream of sampling points.	It appears that direct discharges are not included. Only discharges in the two monitored rivers are included. No discharges from industrial plants along the coast are included.	NI
Ireland	In general 6-7 sampling runs are made for each river in January to March and October to December periods. Sampling also 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 non-compliance is the lack of resources.	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 µg/l). It should be noted that this value is used to give an upper estimate of loading to the receiving water. Lindane is not measured due to lack of 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 weighted 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 sent 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 section 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.

Country	Number of samples/year main rivers	Number of samples/year tributary rivers	Downstream sampling points – what is measured/calculated?	Direct discharges	Are all parameters included?
Spain	Generally 12/yr, but differs for each discharge area and parameter.	Generally 12/yr	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, BOD_7 and COD_{Cr} 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. Discharges 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 from 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 programme from 2007 onwards).
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. 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.

3.3 New questionnaire for the OSPAR RID 2006 data report

For the OSPAR RID 2006 data report, a new questionnaire was developed, partly aimed at filling some of the gaps in the OSPAR RID 2005 data report, partly to cover new issues and challenges in the RID Study.

The complete questionnaire is given in Annex II, and a summary of the answers received is given in Annex III. The questions are related to the following issues:

- Completeness of monitoring (related to the requirement of monitoring 90% of the total land area).
- Sampling sites and coverage of monitored areas (related to the distance from the sampling site to the sea, with information on what is done to estimate the areas downstream of the sampling sites).
- Direct discharges and diffuse losses (related to methodology estimations).
- Sampling procedures (related to the representativeness of the samples, as well as the question on common sampling strategies).
- Laboratory analyses and change of detection limits over time (related in particular to the long-term RID assessment in order to be able to produce reliable trend analyses).
- Hydrological data and calculation practices (related to the type of hydrological monitoring performed by the Contracting Parties).
- Transboundary rivers and harmonisation (related to the need for harmonisation of monitoring in shared river basins).
- Use of the RID data for purposes other than reporting within OSPAR.

3.4 Completeness of monitoring and reporting on unmonitored areas

According to the RID Principles, 90% of the land area draining into the maritime area should be monitored. The question whether or not all Contracting Parties fulfil this requirement was raised in the OSPAR RID 2005 data report, but as the answers given were incomplete, the issue has been raised again. Of the countries that have submitted information, only the Netherlands, Germany and Belgium report that more than 90% is monitored, see Table 6 for details.

Table 6: Completeness of monitoring. (See the details of the questionnaires in Annex III)

Country	Is monitoring carried out in more than 90% of the land area draining into the maritime area?
Belgium	Yes
Denmark	No information submitted
France	No, 84% is monitored
Germany	Yes
Iceland	No information submitted
Ireland	No information submitted
Netherlands	Yes
Norway	No, about 50% is monitored, the remaining modelled
Portugal	No information submitted
Spain	Under study
Sweden	No, 88.7% is monitored
UK	No, about 80% is monitored, the rest is assumed to be covered by monitoring direct discharges downstream

France, Norway, Sweden and UK all monitor less than the required area. However, these countries also monitor direct discharges downstream of the riverine sampling sites, as well as in unmonitored rivers; these

inputs are not covered by the overview. The inputs from remaining areas are estimated by different methods, see Annex VI.

3.5 Sampling sites and coverage of monitored areas

As stated in the OSPAR RID 2005 data report (Skarbøvik and Borgvang, 2007), monitoring downstream of river sampling points is covered by the RID Principles as follows:

a. "direct discharges" defined 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 as any sub-catchment(s) located downstream 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).

INPUT 2007 considered a proposal, included and illustrated at Annex III in Skarbøvik and Borgvang (2007), for a definition to promote a common understanding of "unmonitored area". The proposal 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;
- unmonitored coastal areas;
- catchment area of all unmonitored rivers (rivers without a RID sampling station).

Contracting Parties have been asked to give either the area downstream each sampling point, or, if this was not readily available, the distance from the sampling point to the sea.

A detailed description of how unmonitored areas downstream sampling points are dealt with and the methodology for estimations, where these are conducted, are given in Table 5; Addendum 1 provides the data for each river basin.

To date, only France, Norway and Sweden have provided information on the unmonitored areas downstream the sampling points. For these countries, the unmonitored area ranges from about 3,000 to about 30,000 km^2.

This preliminary overview suggests that for some countries, a relative significant area in catchments reported as "monitored" is in fact not monitored. Four of the Contracting Parties have reported that they do not estimate the inputs from these areas, whereas six Contracting Parties have reported different methodologies for estimates, as follows (based on Skarbøvik and Borgvang, 2007):

- Belgium: Assumes that there are no sources downstream of sampling points.
- France: The area downstream of the river sampling points is regarded as "OSPAR Coast" for the main rivers. All other areas downstream of the sampling points are included as tributaries or unmonitored areas.
- Germany: Calculations of inputs by extrapolation of the monitored areas, for the Eider catchment.
- Iceland: Pollution sources downstream of the two monitored rivers are not included in the reporting.
- Ireland: Calculations of inputs by extrapolation of the monitored areas.
- The Netherlands: 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.
- 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; waste water treatment plants; fish farming).
- Spain: Inputs from unmonitored areas are not calculated.
- Sweden: Calculations of inputs by extrapolation of the monitored areas.

From the above listed information, it is clear that Contracting Parties have different ways of dealing with the areas downstream of the river sampling points. Since coastal areas in Europe are often important sites for industry, cities or tourist resorts, fish farming, harbours and other activities, it is possible that the areas downstream the sampling points may contribute significantly to the total inputs. In order to gain more knowledge as to the magnitude of these contributions, the Contracting Parties were asked to provide the co-ordinates of each sampling point.

The following countries have submitted co-ordinates for their river sampling sites:

- Belgium
- France
- Germany
- Netherlands
- Norway
- Spain
- Sweden

These co-ordinates of sampling sites have been used to produce a map of Contracting Parties' river sampling sites, see Figure 2.

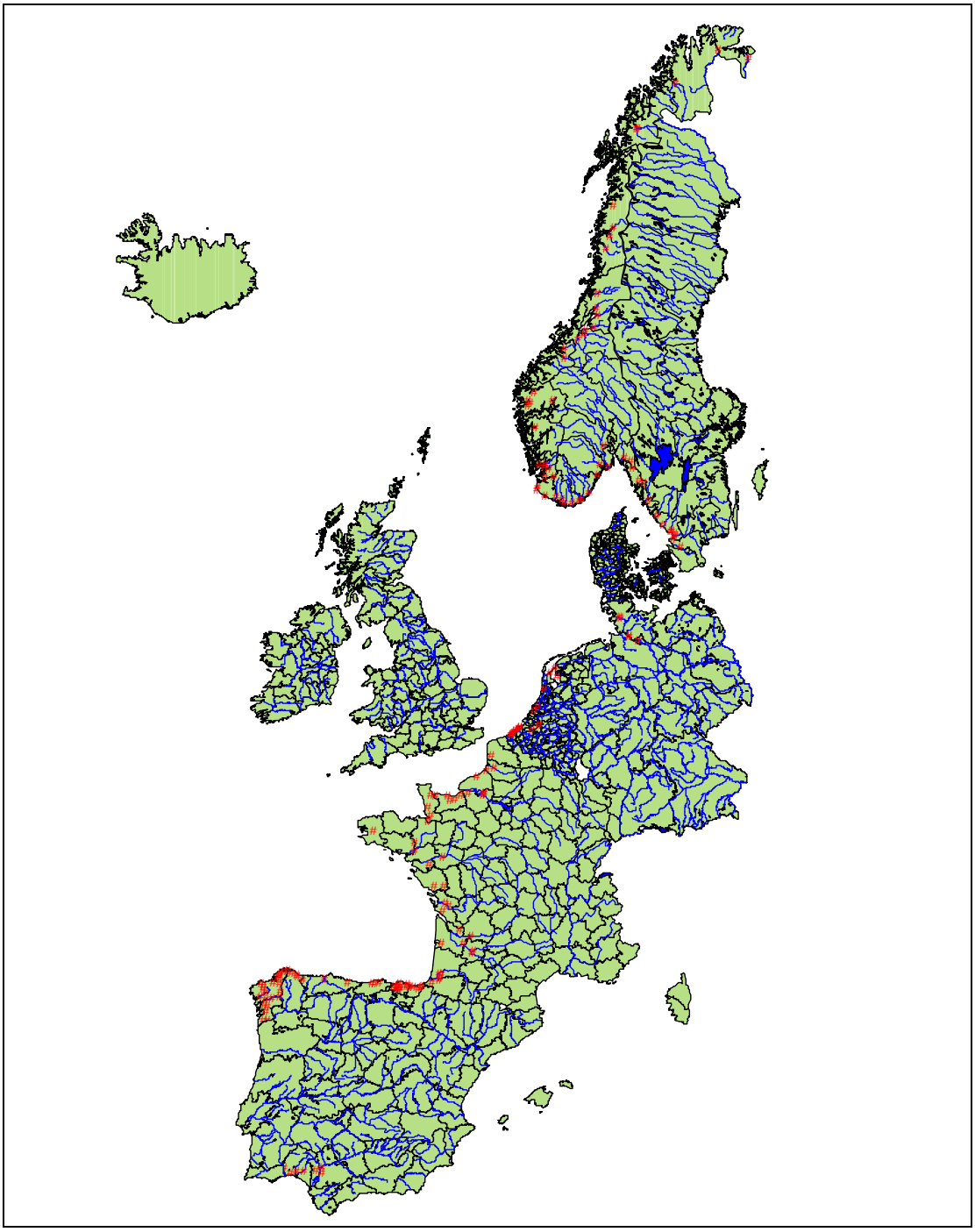

Figure 2: Sampling sites of the RID Study indicated with red dots. Denmark, Iceland, Ireland, Portugal and the UK have not reported co-ordinates of sampling sites. The Ems and Weser sampling sites in Germany are not included in the map.

3.6 Direct discharges and losses

A number of Contracting Parties have reported data from point sources such as industries, sewage treatment plants and fish farming. Table 7 gives information on how such discharges/losses are estimated; additional information is given in Annex III and Addendum 1. Some countries do not seem to include such data in their reporting, for example 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' catchments. This area is estimated to be around 30 km^2 and the losses are mainly through seepage.

For all point source estimations made by Contracting Parties, it is believed that the number of samples varies among the different discharge sites, but no specific information has been made available.

Table 7: Methods for estimating direct discharges and diffuse losses

Country	General	Sewage effluents	Industrial effluents	Urban runoff/storm water
Belgium	No inputs downstream monitoring points.	NA	NA	NA
Denmark	NI	NI	NI	NI
France	The French register collected for EPER should take into account the diffuse losses with estimation methods.	The wastewater treatment plants located downstream the monitoring stations are taken into account. For the unmonitored areas, only the discharges located at the outlet are accounted for. France uses the efficiency data of the wastewater treatment plant. The efficiency is calculated each year thanks to regular measurements made by the operators of the treatment plants.	The data used to estimate industrial discharges are extracted from the French database collected for EPER/E-PRTR. All the industrial facilities declared for EPER and located downstream the monitoring station of the zone accounted for. For the unmonitored areas, only the discharges located at the outlet are accounted for.	NI
Germany	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.	For the **Elbe,** direct discharges of sewage effluents were determined downstream 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.	For the **Elbe,** all direct discharges of industrial effluents were determined downstream 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.	NI
Ireland	NI	NI	NI	NI
Netherlands	Environmental annual reports of (larger) industries in which discharges are reported. Annual	An annual questionnaire sent out by the Netherlands	Used methodology is: Product of annual flow and flow weighted	NI

Country	General	Sewage effluents	Industrial effluents	Urban runoff/storm water
	questionnaires are completed by administrators of rivers on annual direct and indirect loads from smaller industries. No information on diffuse losses quantification reported.	Central Bureau of Statistics to the administrators of Sewage treatment plants for annual loads. Provides the information used to estimate loads from sewage effluents.	concentrations.	
Norway	In addition to estimations of discharges from industrial plants and sewage effluents, discharges from fish farming and diffuse losses are estimated, see Annex VII.	The annual discharges of nutrients from municipal wastewater effluents are usually estimated as the product of annual flow and flow-weighted concentrations. For plants with no reporting requirements, as well as for populations not connected to public treatment systems, the discharges are estimated by multiplying the number of people with standard Norwegian per capita load figures reduced by the removal efficiency of the treatment plants.	The estimates of industrial discharges are based on the discharges reported by industries. Only industries required to report such discharges are registered. Sampling frequency for industrial wastewater varies from weekly composite samples to random grab samples, at least twice a year. Total nitrogen and total phosphorus loads from industry not connected to municipal treatment plants are modelled (TEOTIL).	None
Portugal	NI	NI	NI	NI
Spain	Marine culture discharges are calculated through the maximum authorised difference in concentration from input water and discharges. Diffuse losses are not quantified. No quantification of losses/discharges from unmonitored areas.	There are 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.	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. In general, flow values are the sum of authorised discharges, whereas concentration values are calculated through sampling. Load calculations are therefore obtained multiplying the volume of discharges authorised and the concentrations obtained in lab analyses.	NI
Sweden	Marine fish farms are not included. 88.7% of area monitored. The remainder is estimated from area specific losses from monitored	Information about discharges is collected from a national database containing emission declarations	Information about discharges is collected from a national database containing emission declarations	Only the part entering the sewage collection systems and reach UWWTPs is sampled.

Country	General	Sewage effluents	Industrial effluents	Urban runoff/storm water
	reference areas.	from all facilities with an environmental permit. Estimates are based on legally binding measurement programmes and the sampling frequency is normally 2-4 times a month.	from all facilities with an environmental permit. Estimates are based on legally binding measurement programmes and the sampling frequency is normally 2-4 times a month.	
United Kingdom	As direct inputs account for the most significant inputs downstream of the riverine monitoring stations, it is considered that for most regions, the 90% coverage target has probably been met. However some work is currently underway to check coverage in some less populated areas of the UK where the estimates of coverage are less certain. Diffuse losses are not quantified.	RID principles guidance applied for quantification.	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. RID principles guidance applied for quantification.	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.

3.7 Sampling procedures

It is not clear whether all Contracting Parties have standard procedures for sampling and whether these are used consistently within each country. In the OSPAR RID 2005 data report, it became clear that the usual procedure is that a (large) number of persons are involved in the sampling of rivers. *Common sampling standards should therefore be considered by Contracting Parties.*

For particles and substances transported associated with particulate matter, the concentration distribution in the river cross section is usually not homogeneous unless the water is turbulent. Thus*, in slow flowing rivers, depth integrated samples will usually provide a better estimate of the total transport*. Similarly, in wide rivers, and especially downstream tributary inlets, the concentrations may vary from one bank to the other.

In the 2006 questionnaire, Contracting Parties were therefore asked to describe how the samples were taken. Whereas all Contracting Parties reported that only one sample is taken in the river cross section, the answers were more varied in relation to the depth distribution, as summarised in Table 8.

Table 8: Sampling depth

Country	Sampling depth
Belgium	Unknown
Denmark	No information submitted
France	Mid-depth
Germany	No information submitted
Iceland	No information submitted
Ireland	No information submitted
Netherlands	1 m below surface level
Norway	Sampling sites in turbulent water, about 0.30 m below surface
Portugal	No information submitted
Spain	Surface samples
Sweden	0.5 m below river surface
UK	0.25 m below river surface

Consequently, the practices vary, but most countries seem to collect the samples somewhere between the surface and 1 meter below the surface. If this is done in slow-flowing reaches of the rivers, there is a risk of underestimating the particulate and particle associated loads.

Riverine loads are usually highest during floods and in some types of rivers a majority of the load may be transported during a few days of high flood conditions. Hence, sampling during flood events is regarded as important in order to achieve realistic estimates of the loads. However, most Contracting Parties that have submitted information do not allow for extra sampling during floods, see Table 9. This may be due to the extra costs associated with such additional sampling, which not only comprise costs of analyses, but also the logistics of organising sampling at short notice during flood events.

Table 9. Extent of flood sampling

Country (River name)	Extent of flood or event based sampling
Belgium	Unknown
Denmark	No information submitted.
France	No event based sampling, but the hydrological situation during the sampling has to be indicated and the sample has to be as representative as possible.
Germany	Additional sampling triggered by (major) flood events is performed (Elbe).
Iceland	No information submitted.
Ireland	No information submitted.
Netherlands	No
Norway	During extreme floods additional sampling is undertaken in some of the main rivers. For tributary rivers, the samples should preferably be event based samples, taken 4 times a year during snowmelt floods, summer low flow, autumn rains and winter low flow.
Portugal	No information submitted.
Spain	No
Sweden	No
UK	No. Sampling done on pre-determined days selected by statistics to give random sampling.

3.8 Laboratory analyses and change of detection limits over time

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

Concerning detection limits, Contracting Parties were 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 lose 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 on LODs/LOQs reported by Contracting Parties is presented in Tables 11 and 12 below, based on a compilation prepared by Germany for INPUT 2007. Not all Contracting Parties submitted information: information on LODs/LOQs is missing from Portugal for analysis of river samples and from Belgium, Denmark, France, Norway, Portugal and Sweden for analysis of direct discharge samples. Information submitted by some other Contracting Parties is incomplete.

It is not always clear from the information submitted by Contracting Parties to which extent the reported values 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 Northern region. Spain 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 that submitted information on LODs/LOQs reported a range of values. In most cases, the reason for this is 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. For instance, the different detection limits for Spanish laboratories are reflected in Table 8 of the national Spanish RID 2006 data report. The national RID data report of the UK details that the detection limits are different in Scotland, England and Wales, and Northern Ireland, but that the limits achieved within each of the regions are consistent.

The fact that detection limits may vary considerably for river sample analyses within the same country when different laboratories perform the analyses, and also that they use different analytical methods or change analytical method at different times, demonstrates that great care must be taken when undertaking and interpreting trend analysis. An example of this is illustrated by changes in detection limits for mercury and total phosphorus reported for two Belgian main rivers, Scheldt and IJzer, see Table 10. This is used as an example as only Belgium replied to the questionnaire on a 'river by river basis', as requested in the questionnaire dispatched by Norway. Belgium reported that there was a change in laboratories that performed the chemical analysis in 1993. It is not known whether there have been any changes in laboratories after that (see Annex III).

Table 10: Changes in detection limits for mercury (Hg) and total phosphorus reported for two Belgian main rivers, Scheldt and IJzer

Changed in year	**Determinand**	**River**	
	Hg	Scheldt	IJzer
1993		0,01 to 1 µg/l	
1997		0,01 to 0,03 µg/l	
1998		0,03 to 0,2 µg/l	
2000		0,2 to 0,03 µg/l	0,01 to 0,03 µg/l
2001		0,03 to 0,01 µg/l	0,03 to ? µg/l
2002		0,01 to ? µg/l	
2003		? to 0,08 µg/l	? to 0,09 µg/l
2004		0,08 to 0,03 µg/l	0,09 to 0,03 µg/l
2006			0,03 to 0,1 µg/l
	Total P	Scheldt	IJzer
1993		0,01 to 0,2 mg/l	
1994		0,2 to 0,1 mg/l	0,01 to ? mg/l
1995		0,1 to 0,2 mg/l	
1997		0,2 to 1 mg/l	
1998			? to 1 mg/l
2000		1 to 0,5 mg/l	
2001		0,5 to 0,48 mg/l	1 to 0,94 mg/l
2002		0,48 to 0,94 mg/l	
2004		0,94 to 0,7 mg/l	
2005		0,7 to 1 mg/l	0,94 to 1 mg/l
2006			1 to 0,86 mg/l

As shown in Tables 11 and 12, some countries have rather high LODs/LOQs for some substances, and especially for substances that are detected at low concentrations, 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 input estimates for some substances when either upper or lower estimates are used as exemplified by the data in Section 4 submitted by Contracting Parties for 2006.

According to the RID Principles, it is necessary to choose an analytical method which gives at least 70% 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 13 shows the results for Norway in 2006, where eleven parameters analysed had more than 30% of the samples below the detection limit (mainly PCB compounds and Lindane). Also some metals (*e.g.* Cd, Cr and Hg) and orthophosphate were detected at concentrations below the detection limit. 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 12 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 Contracting Parties.

Table 11: Limits of Detection or Quantification achieved by Contracting Parties, as far as reported, for river sample analysis

Parameter	Recommended		Belgium[5]	Denmark	France	Germany	Ireland	Netherlands	Norway	Spain	Sweden	UK
Cd	**0.01**	**(µg/l)**	0.06 - 0.6	NI	0.5 - 2.0	0.02 - 0.05	0.1	0.01 - 0.1	0.005	0.2 - 20	0.003	0.008 - 0.11
Hg	**0.005**	**(µg/l)**	0.01 - 0.03	NI	0.05 - 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	0.1 - 0.5	1	0.1 - 1.0	0.01	0.4 - 20	0.04	0.05 - 0.6
Pb	**0.01**	**(µg/l)**	0.35 - 11	NI	4.0 - 5.0	0.2	1	0.1 - 2.0	0.005	3.0 - 30	0.02	0.03 - 0.2
Zn	**0.1**	**(µg/l)**	2 - 13	NI	2.0 - 20	0.1 - 1.0	1	1.0 - 5.0	0.05	0.3 - 100	0.2	0.79 - 4.0
γ-HCH	**0.5**	**(ng/l)**	2 - 6	NI	1.0 - 20	0.08 - 0.5	NI	1.0	0.2	0.01 - 10	--	0.1 - 1.0
PCB	**--**	**(ng/l)**	1 - 12	NI	5.0	1.8	NI	[6]	0.2	0.01 - 40	--	1.0
NH_4-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 - 0.09	0.001	0.003 - 0.03
NO_3-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 - 0.3	0.001	0.0014 - 0.1
PO_4-P	**0.005**	**(mg/l)**	0.1	>0.005	0.003 - 0.032	0.005 - 0.03	5	0.005 - 0.01	0.001	0.001 - 0.18	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	0.1	0.5 - 5.0	--	2.0

NI: no information

[5] Detection limits for Belgium are based on answers to questionnaire. As samples from the same site sometimes have more than one detection limit throughout the year for the same parameter, the minimum and the maximum detection limits are listed.

[6] PCBs are measured in the sediment phase. Detection limits for PCBs are: PCB138 = 2 µg /kg, PCB153 = 3 µg /kg, other PCBs = 1 µg /kg

Table 12: Limits of Detection or Quantification achieved by Contracting Parties, as far as reported, for analysis of direct discharge samples

Parameter	Recommended		Germany	Netherlands	Spain	UK
Cd	**0.5**	**(µg/l)**	0.1 - 0.5	1.0	6.0 - 100	0.02 - 0.11
Hg	**0.5**	**(µg/l)**	0.1 - 0.5	0.1	0.1 - 60	0.005 - 0.02
Cu	**10.0**	**(µg/l)**	1.0 - 30	1.0	<10 - 100	0.05 - 20
Pb	**1.0**	**(µg/l)**	1.0	30	<10 - 200	0.03 - 10
Zn	**5.0**	**(µg/l)**	10	1.0	<10 - 100	0.31 - 40
γ-HCH	**--**	**(ng/l)**	--	50	50	0.1 - 10
PCB	**--**	**(ng/l)**	1.0	--	50	1.0
NH_4-N	**0.05**	**(mg/l)**	0.05	0.1	<0.02 - 1.0	0.003 - 0.04
NO_3-N	**0.1**	**(mg/l)**	0.1	0.01	0.1 - 6.0	0.0014 - 0.15
PO_4-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 - <6	0.021 - 0.1
Total P	**0.05**	**(mg/l)**	0.02 - 0.05	0.2	<0.02 - 0.5	0.003 - 4.0
SPM	**--**	**(mg/l)**	--	10	1.0 - <5	2.0

Table 13: A Norwegian example of analytical methods applied and proportion of analyses below detection limits. Norwegian RID Report 2006, 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[7] 4720	0	271	0
Conductivity (mS/m)	NS-ISO 7888	0	271	0
Suspended particulate matter (S.P.M.) (mg/L)	NS 4733 modified	0	271	1
Total Organic Carbon (TOC) (mg C/L)	EPA number 415.1 and 9060A STD.	0	271	0
Total phosphorus (µg P/L)	NS 4725 – Peroxidisulphate oxidation method	0	271	0
Orthophosphate (PO_4-P) (µg P/L)	NS 4724 – Automated molybdate method	38	271	103
Total nitrogen (µg N/L)	NS 4743 – Peroxidisulphate oxidation method	0	271	0
Nitrate (µg N/L)	NS-EN ISO 10304-1	4	271	10
Ammonia (NH_4) (µg N/L)	NS-EN ISO 14911	4	271	12
Silicate (SiO_2) (Si/ICD; mg/L)	ICP-AES and ISO 11885 + NIVA's accredited method E9-5	0	271	0
Lead (Pb) (µg Pb/L)	ICP-MS; NIVA's accredited method E8-3	1	271	4
Cadmium (Cd) (µg Cd/L)	ICP-MS; NIVA's accredited method E8-3	26	271	70
Copper (Cu) (µg Cu/L)	ICP-MS; NIVA's accredited method E8-3	0	271	0
Zinc (Zn) (µg Zn/L)	ICP-MS; NIVA's accredited method E8-3	3	271	7
Arsenic (As) (µg As/L)	ICP-MS; NIVA's accredited method E8-3	10	271	27
Mercury (Hg) (ng Hg/L)	ICP-MS; NIVA's accredited method E8-3	68	271	185
Chromium (Cr) (µg Cr/L)	ICP-MS; NIVA's accredited method E8-3	30	271	82
Nickel (Ni) (µg Ni/L)	NS-EN 1483 and NIVA's accredited method E4-3	3	271	7
Lindane (ng/L)	NIVA's accredited method H3-2 (PCB)	93	40	37
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	40	40
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	40	40
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

[7] NS: Norwegian Standard

3.9 Hydrological data and calculation practices

As demonstrated by Borgvang *et al.* (2006), the interpolation method used to calculate riverine loads have a significant impact on the result. 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

As noted in the OSPAR RID 2005 data report, most countries use this formula, although there are variations for some rivers and countries which seem to be due to the lack of continuous flow data, or flow data for the sampling date. In order to study this further, an overview has been produced of the hydrological data coverage for the RID catchments, see Table 14.

Table 14: Water flow monitoring

Country	Water flow monitoring				Comments
	Continuous	Daily	Weekly	Monthly	
Belgium				X	Monthly water flow monitoring in Scheldt. Monitoring procedures in other rivers vary, *i.e.*, continuous, daily or monthly monitoring. In some rivers the water flow measured in 1993 is used as annual mean.
Denmark					NI
France	X				Daily data are used for the calculations.
Germany	X				Load calculations are based on mean daily flows.
Iceland					NI
Ireland					NI
Netherlands		X			
Norway	X				Continuous monitoring in the main rivers, modelled water discharge in tributaries.
Spain					Cannot give a general answer because it depends on the authority performing the analysis.
Sweden	X				
UK		X			Varying, but generally daily

Consequently, three Contracting Parties have reported continuous flow measurements, whereas two countries have reported daily recordings. *For all practical purposes, daily measurements should be sufficient for calculating loads in larger rivers*. On the other hand, monthly measurements (reported by Belgium for the Scheldt), may give more significant uncertainties in the input calculations.

3.10 Main and tributary rivers - harmonisation of approaches

The frequency of river sampling required by the RID Principles differs for main and tributary rivers for many Contracting Parties. 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 2006 suggest that different approaches are used by Contracting Parties in classifying rivers as main or tributary rivers and in reporting related inputs.

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 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 report that the sampling is based on “representative random sampling”. It is not clear what this “representativeness” is based on, and no country seems to report that planned event-based sampling is carried out (*e.g.* sampling during flood events).

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 has identified under the RID Principles 10 rivers as “main rivers” and 36 rivers as ”tributaries”. In Iceland, where the 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 Ireland, report all rivers without any distinction of type. UK does not report on specific rivers, but on regions, sub-regions and zones.

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. However, 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 that riverine channel patterns as determining feature. One other possibility could be to refer to ‘main rivers’ and ‘other rivers’, where the main rivers are those with substantial inputs/loads. Finally, one could abandon the notion of main and tributary rivers by referring only to ‘rivers’.

3.11 Use of the RID data for other purposes

In the context of the RID programme and RID reporting, international reporting and implementation of *e.g.* EC Directives (such as the Water Framework Directive and the Nitrates Directive), OSPAR measures, such as PARCOM Recommendations 88/2 and 89/4, reporting to international organisations such as the EEA (EIONET), it is important to seek synergies, avoid duplication of effort and maximise the use of available reliable and comparable monitoring results.

In that respect the use and availability of long-term time series such as the monitoring carried out within RID may prove to be of importance, also for *e.g.* the development of catchment related management plans and detection of trends (Table 15).

In order to assess the current situation with regard to the use of RID data by Contracting Parties and suggest improvements based on some Contracting Parties' experiences, the questionnaire in Annex II also deals with how RID data are used. Table 15 shows the current situation in those Contracting Parties that have responded. *Contracting Parties will be invited to study the status of the use of RID data and suggest, whenever appropriate, how to maximise the use within the various countries and at international level.*

Table 15: The use of RID data for purposes other than OSPAR trend monitoring

Type of use	Yes	No	Comments
General national watershed planning	Spain, Sweden, UK		Spain: National sewage treatment plan.
Used for setting environmental goals	Spain, Sweden		Spain: In application of Directive 2006/11 EC on Hazardous Substances.
Used in connection with the implementation of the EU Water Framework Directive	France, The Netherlands, Spain, Sweden, UK		France: The OSPAR recommendations have been taken into account for the selection of monitoring stations in the monitoring programme. The Netherlands: Riverine input data are used for WFD, but as WFD has defined water bodies, calculations are made using raw data, not the compiled RID data. Spain: Used for the analyses of pressures on coastal and transitional waters.
Regional and local watershed planning	France, Spain, Sweden		France: Planning, some Water Agencies integrate the results obtained within RID to programme measurements. Spain: Taken into account in drafting river basin management plans.
Other international reporting	France, Sweden		France: EIONET Water data flows by the European Environment Agency Sweden: HELCOM, EEA (EIONET).
Research and development:	France, Sweden, UK		France: In progress with the French institute Ifremer, involved in another OSPAR programme (EUC).
Other (please specify):	Norway		Norway: RID data are used within other monitoring programmes in Norway to complement and/or assess results, *e.g.* Outer Oslofjord, coastal monitoring programme, as well as within the SOA linked to the TEOTIL estimates.
Papers/ reports where national (or international) RID data have been used: France: A co-operation is in progress with Ifremer to highlight the RID Data. Spain: Medio ambiente en España 2006 – Annual report from the Spanish Ministry of the Environment			

3.12 Quality assurance

"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 inputs of the agreed 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.

In general, the RID Principles should ensure that important Quality Assurance (QA) issues are handled adequately by each Contracting Party, and the RID Study 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 Contracting Parties. 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'.

In 2006, most Contracting Parties reported that the QA procedures were available only in their respective national languages, 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, in 2006, proposals for possible QA steps based on their QA procedures for the Norwegian RID Report. This covered 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 should be used as a starting point for the review of section 10 of the RID Principles by INPUT 2008. Belgian comments to the proposals are at Annex VIII.

The QA issues are linked to uncertainty, selection of rivers (in countries where not all rivers can be monitored for practical and financial reasons), sampling strategy (when and where to sample, frequency, considerations linked to storm flow events), detection limits, analytical methods and load calculations.

Uncertainty

A number of questions can also be raised about data uncertainty, *viz*:

- Why is an awareness of uncertainty essential in evaluating the state of knowledge about environmental variables/systems?
- How can information on uncertainty be obtained in the first place and what are the problems to be solved?
- How can the uncertainty related 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?

Contracting Parties should endeavour 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 become understood by all parties involved.

Selection of rivers

Every Contracting Party should aim to measure 90% of the total inputs to the maritime area as outlined in the RID Principles. This is obviously most difficult for countries with a large number of rivers (*e.g.* Denmark, UK and Norway), as not all can be monitored for practical and budgetary reasons. In the case of unmonitored rivers, examples of issues for QA are the transferability of results from one monitored river to a river with a similar hydrological-chemical regime, and modelling practices.

Sampling strategy

With regard to a sampling strategy, the following important aspect should be considered:

- *Importance of an agreed sampling protocol:* the same procedures for everybody.
- *Trained workers*: it is often best to involve local staff as they will easily recognise changes and abnormal variations in the rivers. They will also be able to take action if any unforeseen events occur.
- *Quick and safe transfer of samples to laboratory*. There will probably never be too many samples. There are few, if any, sensors that can analyse RID parameters continuously. If not all rivers are monitored, *monitoring efforts should be directed towards the rivers with the highest inputs*. Insufficient sampling frequency is obviously a challenge when assessing whether the monitoring provides reliable results.

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 of 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 should report the distance from the monitoring points to the sea, and any problems with seawater intrusion.*

Chemical parameters – detection limits and analytical methods

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 use of different detection limits is clearly a considerable problem both within countries and for comparison of result between countries.

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 an intercomparison should be carried out during a certain "transfer of responsibility period". This is most likely a problem in some countries both in terms of using several laboratories and in cases where laboratories have changed in the period 1990 to date.

Technical QA is to be performed by laboratory staff to ensure that the technical aspects of the analysis have been appropriate. Historical QA, *i.e.* monitoring results checked against historical data, should be undertaken by qualified researchers with experience in assessing water quality data. This should be done as soon as possible after analysis so that whenever anomalies are found the samples can be re-analysed.

Trend analysis QA, *i.e.* 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.

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

Input calculations

The formula given by the RID Principles should be used for calculating inputs for all of the rivers (the annual input 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 limits (upper and lower estimates) needs to be clarified (upper equals detection limit, lower equals zero or half of detection limit).

The Guidelines for Harmonised Quantification and Reporting Procedures (HARP)[8] or equivalent principles should be applied to calculate loads from:

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

It is important to include as many (optimally all) waste water treatment plants and industrial plants as possible. Monitoring of discharges from industrial plants may, in many catchments and countries, introduce underestimation as monitoring only takes place for licensed discharges. Furthermore, *the actual 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 located close to the sea.

With regard to diffuse losses, there is no common methodology, neither in HARP-NUT Guideline 6 (which deals only with N and P; OSPAR agreement 2007-8), nor is it an outcome of the EUROHARP project (see www.euroharp.org). 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.

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8 OSPAR has adopted a suite of HARP Guidelines for the quantification of nutrients (HARP-NUT Guidelines, OSPAR agreements 2004-2a – 2004-2i and Agreement 2007-8).

Concluding remarks on quality assurance

It follows from the foregoing analysis that there is a whole range of possible sources of errors that are linked 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;
- which parameters are analysed;
- calculation practises;
- quality assessment procedures; and
- the number of institutions involved per country in the various parts of the national programmes.

RID data reported by Contracting Parties must be seen and assessed against this background. Contracting Parties are invited to summarise principles from the foregoing for inclusion in revised RID Principles.

4. Total inputs to the OSPAR maritime area in 2006

This section summarises and visualises national RID data reported for 2006 for five metals, lindane, PCBs, five nutrient species and suspended particulate matter (SPM). Ideally, charts like those shown in this section should reflect actual differences in inputs between Contracting Parties, both in terms of the parameters measured and in terms of the two different input 'pathways' to the sea (riverine inputs and direct discharges). The inputs should, furthermore, properly reflect the pollution 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 Section 3, and also in the OSPAR RID 2005 data report (Skarbøvik and Borgvang, 2007) this is, however, not always the case.

Furthermore, it should be noted that all riverine inputs reflect a mix of natural and anthropogenic sources, with natural sources in many cases being negligible compared to anthropogenic sources. No attempt has been made in this report to distinguish between the two.

This section considers the issue of data comparability and reliability, and intends to exemplify how differences in achieved limits of detection and the reporting of upper and lower estimates can influence the results of the RID Study.

When presenting the RID data of Contracting Parties in charts, this is not done for the purpose of comparing the national RID results, but to demonstrate the factors interfering with comparability. The purpose is to highlight the importance of how national data are reported and are supplemented by information which allows their interpretation. The charts shown are intended to raise awareness of the additional information needed to supplement RID monitoring results for the purpose of improving their reliability.

Furthermore, this section intends 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 amongst Contracting Parties. Issues that may need further considerations are for example:

a. Are discharges from large cities located near the coast included in data reported as direct discharges below the sampling points?

b. Are there Contracting Parties other than Norway with extensive discharges from fish farming industry that are unaccounted for today?

c. How can the completeness of reporting on direct discharges that today appears to vary significantly amongst Contracting Parties' RID data be improved?

4.1 Overview of RID 2006 data

The national RID data reported by Contracting Parties are aggregated in the overview tables in Annex I. Based on these overview tables, Tables 16 and 17 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 (SPM).

The total inputs reported by Contracting Parties are presented as upper estimates in Table 16 and lower estimates in Table 17. 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 seen in light of the LODs/LOQs reported in section 3.8. 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 be reported either as *equal to* the detection limit; or as *half the value of* the detection limit.

Another source of discrepancies for the upper estimates may stem from the use of the limit of quantification (LOQ) instead of the limit of detection (LOD). Countries using LOQ obtain loads of contaminants (based on upper estimates) that are significantly higher than those using the LOD or half the LOD.

It should also be noted that whereas most Contracting Parties report their values as upper and lower estimates, some Contracting Parties do not report on both. To improve the understanding of the charts on total loads (riverine and direct), they have been organised so that all countries are listed both for upper and lower values, despite the fact that both estimates are not reported by all countries. This means that for example Sweden is listed in both charts even though Sweden does not report on lower estimates, whereas the loads reported are included in the chart based on upper estimates.

Taking into account the differences in the methodology used by Contracting Parties to calculate the upper estimate (use of LOD or LOQ and/or use of 100% or 50% of these values for analytical results below the LOD/LOQ), a direct comparison of the upper estimates of loads of pollutants reported by Contracting Parties could not be done. In general, the values included in Table 16 and the following analysis could show higher values for Contracting Parties using LOQ instead of LOD. The lower estimate values are not affected by this problem and can therefore be directly compared.

Table 16: Upper load estimates as the sum of direct discharges and riverine inputs to the maritime area in 2006 by country

Country	Cd tons	Hg tons	Cu tons	Pb tons	Zn tons	g-HCH kg	PCBs kg	NH_4-N kt	NO_3-N kt	PO_4-P kt	Total N kt	Total P kt	SPM kt
Belgium	2	1	51	22	241	21	84	5	36	2	50	5	393
Denmark[1]	-	-	-	-	-	-	-	-	-	-	-	-	-
France[2]	-	-	-	-	-	-	-	18.5	378	4.8	153.2	9.5	2424
Germany	4.8	2.7	211	130	1007	25	24	9.1	138	2.1	167	7.6	1533
Ireland[1]	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	8.3	3.6	229	121	836	3	68	8	192	5.5	251	10	1299
Norway	2.8	0.3	441	53	595	12.7	-	35.6	46.3	6.9	111	15.5	1289
Portugal[1]	-	-	-	-	-	-	-	-	-	-	-	-	-
Spain	99	5	230	226	795	210	704	15	59	3	76	5	552
Sweden	0.6	0.1	49.6	17.6	170.3	-	-	2.8	21.7	0.4	40.1	1.2	-
UK	11	1	491	705	2475	169	225	44	235	18	275	21	2643

Table 17: Lower load estimates as the sum of direct discharges and riverine inputs to the maritime area in 2006 by country

Country	Cd tons	Hg tons	Cu tons	Pb tons	Zn tons	g-HCH kg	PCBs kg	NH_4-N kt	NO_3-N kt	PO_4-P kt	Total N kt	Total P kt	SPM kt
Belgium	1	0.4	37	14	190	1.2	0	4.7	30	1.3	37	1.1	300
Denmark[1]	-	-	-	-	-	-	-	-	-	-	-	-	-
France[2]	-	-	-	-	-	-	-	17.9	378	4.7	125.3	8.8	2422
Germany	4.4	2.6	210	129	996	24	0.5	9.1	138	1.9	167	7.6	1426
Ireland[1]	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	9.1	3.6	230	124	843	79	73	8	194	5.7	254	11	1306
Norway	2.6	0.3	441	53	595	3	-	35.6	46.3	6.9	111	15.5	1289
Spain	3	0.6	21	4	415	2	0.1	12	30	1.6	67	2.8	450
Portugal[1]	-	-	-	-	-	-	-	-	-	-	-	-	-
Sweden[3]	-	-	-	-	-	-	-	-	-	-	-	-	-
UK	7.6	0.7	482	668	2396	29.4	3.6	44.1	233	17.7	271	20.4	2613

[1] No data reported within the agreed deadline
[2] The reported inputs from France do only reflect riverine inputs, as direct discharges data are not yet available
[3] Sweden does not report on lower load estimates

4.2 Cadmium inputs

Total cadmium inputs to the OSPAR maritime area in 2006 reported by Contracting Parties range from 0.6 tonnes in Sweden to 11 tonnes reported by the UK (based on upper estimates), with the exception of Spain that reported a total cadmium load of 99 tonnes based on the upper (LOQ based) estimates (Figure 3). Reported Spanish loads were of similar magnitude in the period 2003 - 2005.

Figure 3 illustrates how the use of upper and lower estimates and related national reporting practices can distort RID results and make comparison between Contracting Parties erroneous. Inputs reported as lower estimates would suggest that inputs are highest in the Netherlands and the UK, with contributions of 31% and 28% to total inputs, respectively, whereas Spain would be the single largest contributor if upper estimates are used. Based on the upper estimates, the contribution of Spain to the total inputs is 76%, whereas only 11% if based on lower estimates.

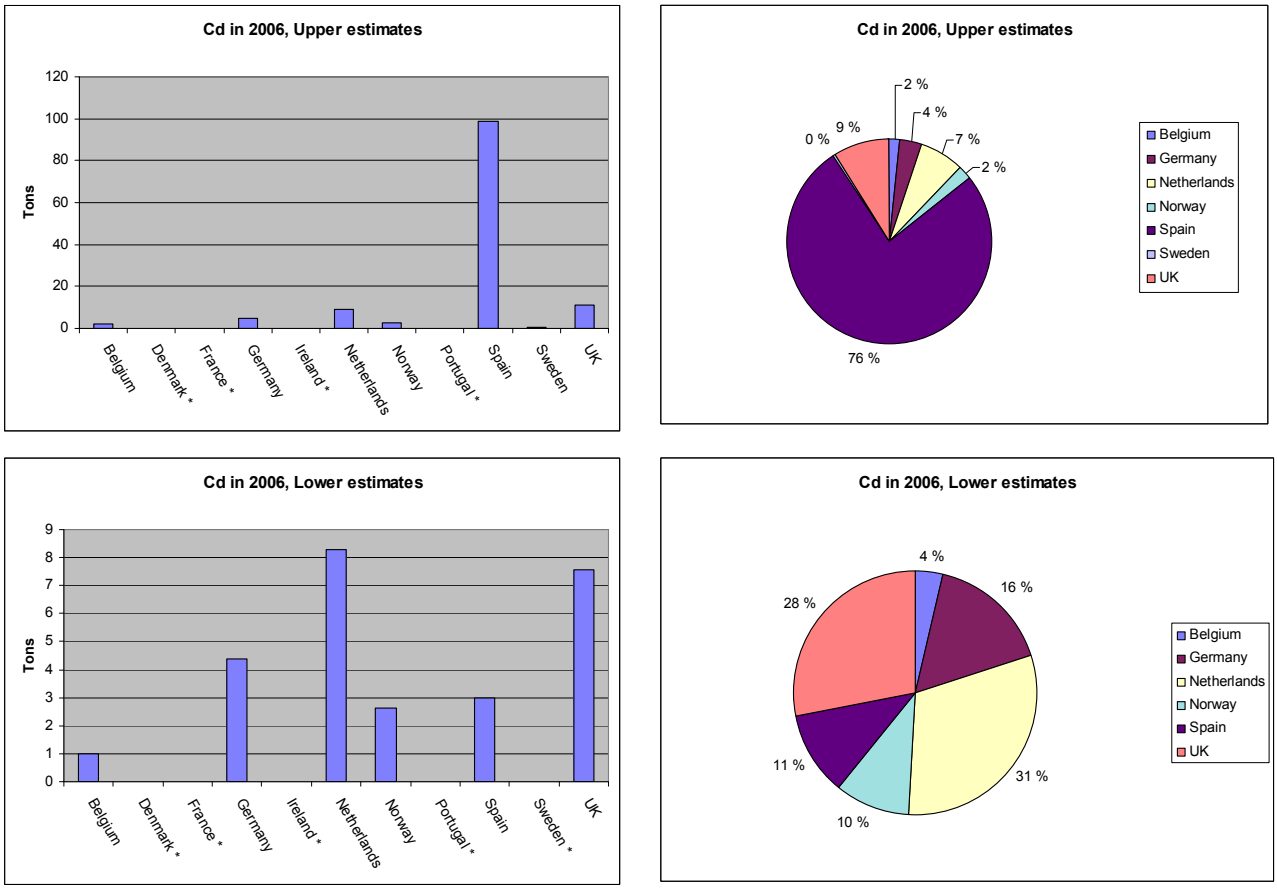


Figure 3: Illustration of cadmium inputs (in tonnes) reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability and relative contributions (%). Sweden does not report lower estimates. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

When segregating the data by input sources, riverine inputs are significantly larger than the direct discharges for all countries when comparing upper estimates (Figure 4). Reported riverine inputs by the UK and Germany are also significantly higher than the direct discharges reported by these two countries when comparing lower estimates. In contrast, the riverine inputs reported by Spain based on lower estimates are almost negligible compared to the corresponding direct discharges. The Netherlands does not report lower estimates of direct discharges.

The inputs reported by Spain are highest for both riverine inputs and direct discharges when comparing upper estimates, whereas significantly lower than both the Netherlands and the UK riverine inputs when comparing lower estimates.

Riverine inputs: Direct discharges :

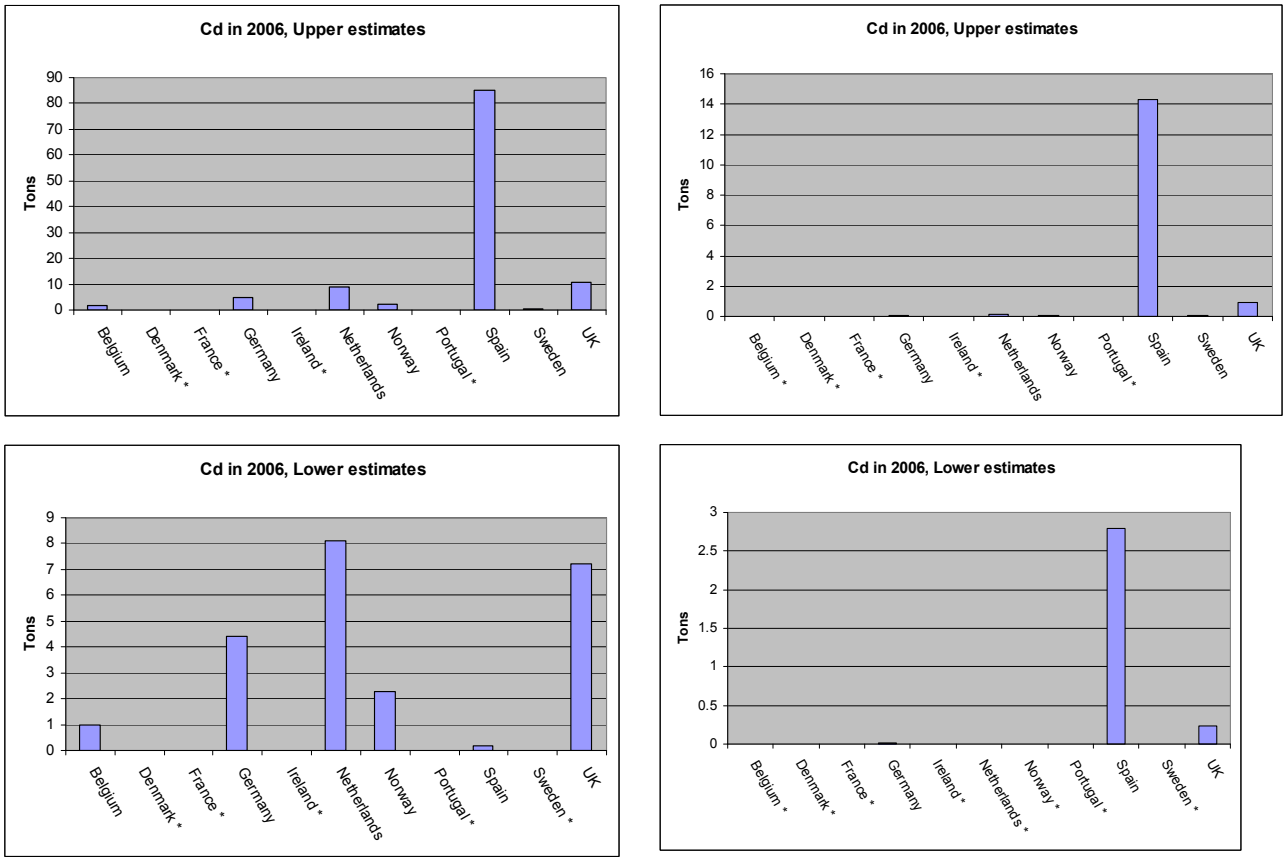


Figure 4: Illustration of riverine inputs (in tonnes) and direct discharges (in tonnes) reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability. There are no direct discharges in Belgium. Sweden does not report lower estimates. Swedish data based on upper estimates are too small to show in the figure. The Netherlands does not report lower estimates of direct discharges. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

4.3 Mercury inputs

Total mercury inputs in 2006 reported by Contracting Parties range from 0.1 tonnes in Sweden to 5 tonnes reported by Spain (Figure 5).

The input data for mercury provide another example of how the relative contribution of each Contracting Party to the total inputs may differ depending on whether lower or upper estimates are used. Based on upper estimates (LOQ based), Spain contributed 36% of the total mercury inputs, whereas only 7% if based on lower estimates. In the latter case, the Netherlands contributed with the highest inputs of mercury to the OSPAR maritime area in 2006 (44%).

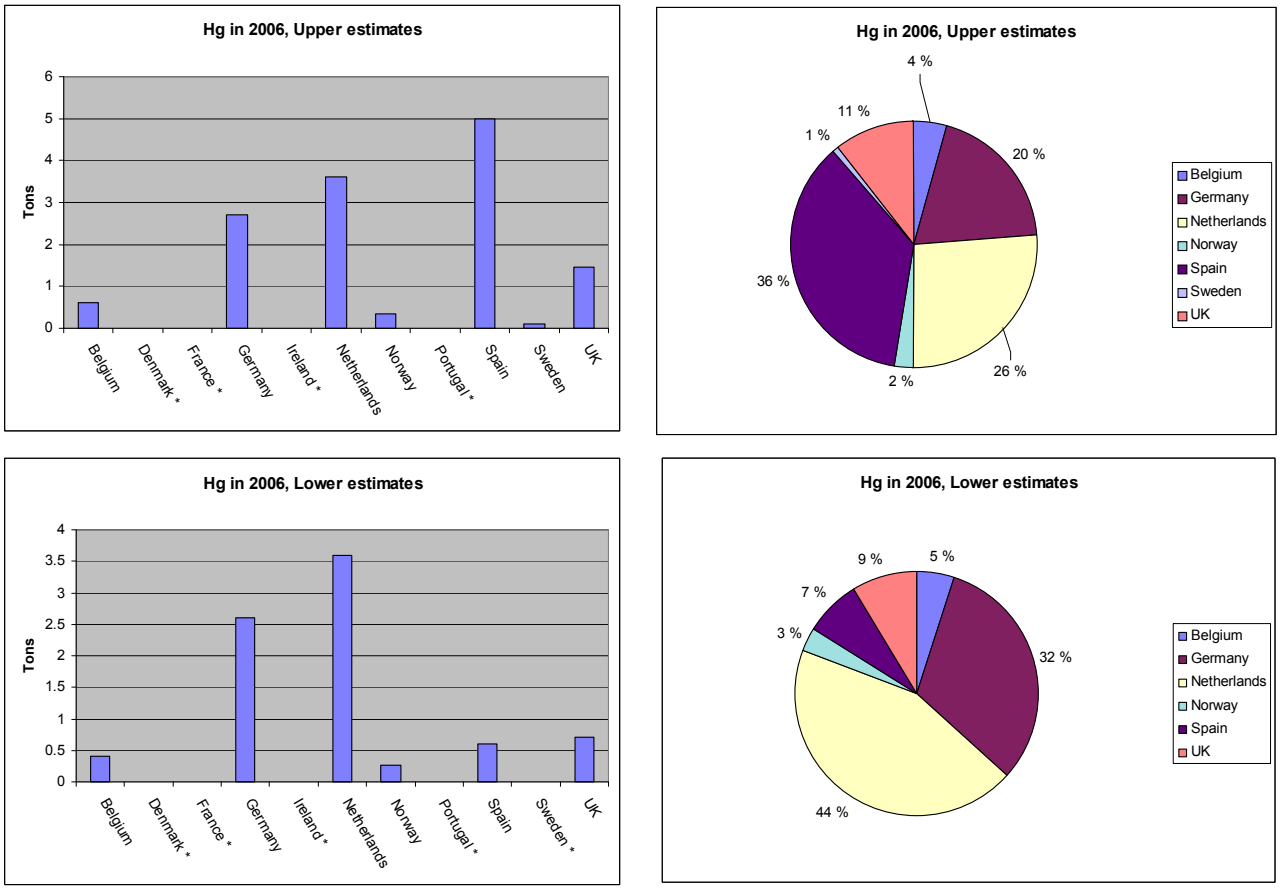


Figure 5: Illustration of mercury inputs (in tonnes) reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability and relative contributions (%). There are no direct discharges in Belgium. Sweden does not report lower estimates. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

When comparing the data on mercury inputs by input sources, riverine inputs are significantly higher than direct discharges for most countries (Figure 6).

The inputs reported by Spain (LOQ based) are higher than the corresponding figures reported by other Contracting Parties for both riverine inputs and direct discharges when comparing upper estimates, and for direct discharges when comparing lower estimates. In contrast, the riverine inputs reported by Spain equal zero when based on lower estimates.

Riverine inputs : Direct discharges :

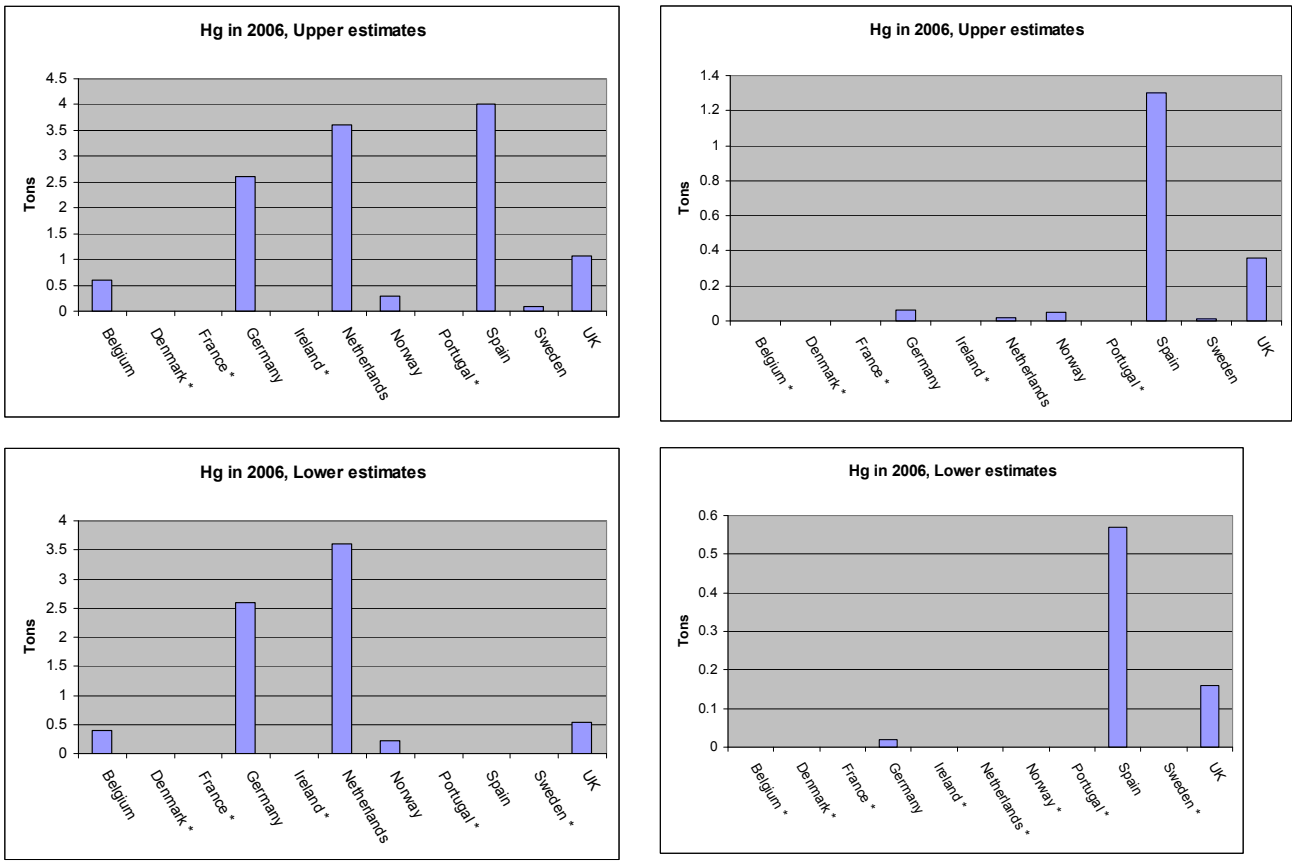


Figure 6: Illustration of riverine inputs (in tonnes) and direct discharges (in tonnes) of mercury reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability. There are no direct discharges in Belgium. Sweden does not report lower estimates. The Netherlands does not report lower estimates of direct discharges. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

4.4 Lead inputs

The total inputs of lead to the maritime area in 2006 reported by Contracting Parties range from 17 tonnes in Sweden to 705 tonnes reported by the UK (Figure 7).

As for cadmium and mercury, the relative contribution of each country to the total inputs depends on whether the lower or upper estimates are used. The differences in results are, however, less significant than for the cadmium and mercury. The reason for this is assumed to be that lead is often found in significantly higher concentrations than cadmium and mercury, an aspect that will reduce the uncertainty linked to detection limits.

The inputs reported by the UK represent the largest contribution to the total inputs of lead to the maritime area at a magnitude ranging between 56% (upper estimate) and 69% (lower estimate). Germany and the Netherlands contributed 10% each to total inputs based on upper estimates, but 13% and 12% when based on lower estimates, respectively. Spain contributed 18% based on upper estimates, but close to 0% when based on lower estimates. Again, this illustrates the differences in detection limits and the subsequent difficulties in comparing data from Contracting Parties.

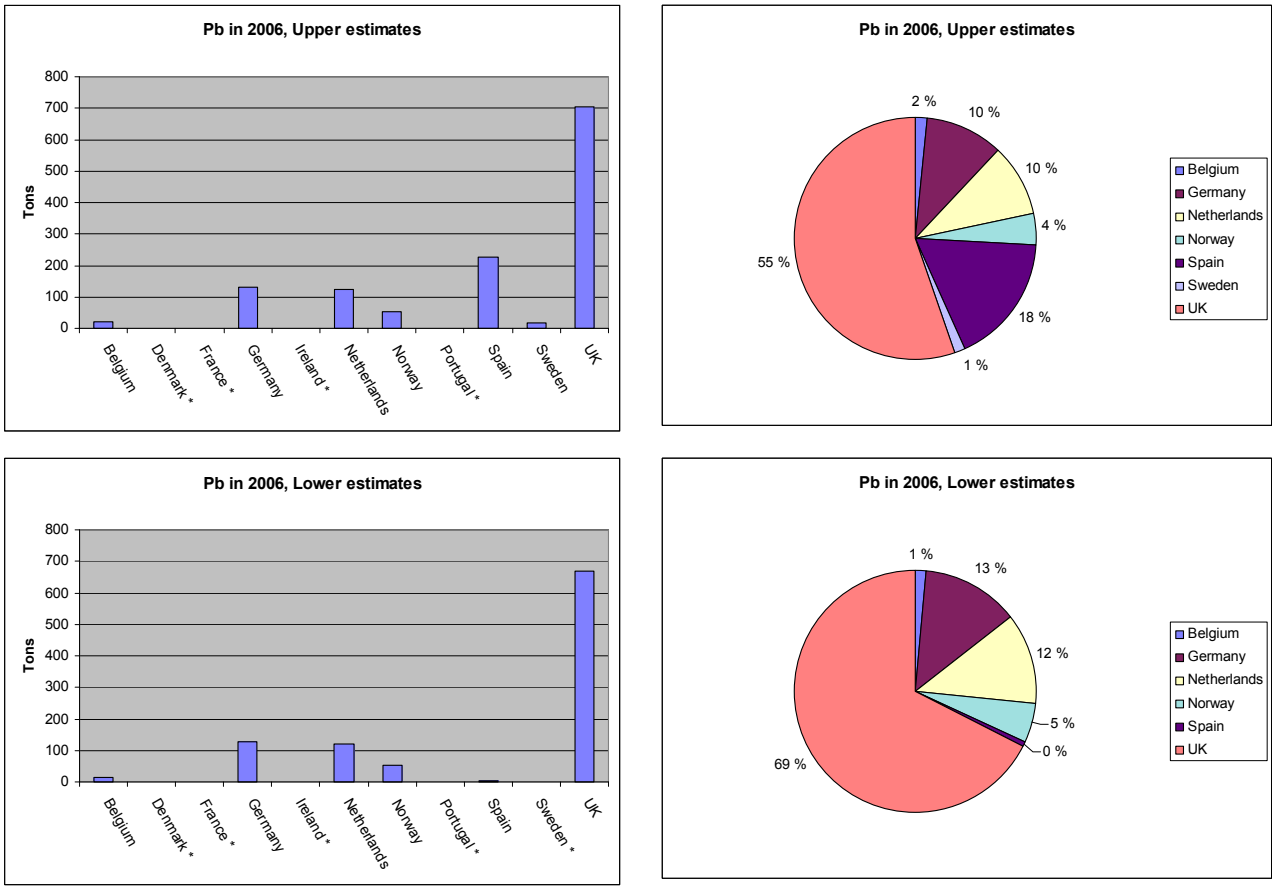


Figure 7: Illustration of lead inputs (in tonnes) reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability and relative contributions (%). There are no direct discharges in Belgium. Sweden does not report lower estimates. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

Reported riverine inputs of lead are for most countries significantly higher than the direct discharges (Figure 8). The riverine inputs reported by Spain (2.2 tonnes) based on lower estimates are, however, just slightly above the corresponding direct discharges (2.0 tonnes).

Regardless of the estimate used, the riverine inputs reported by the UK are considerably higher than the riverine inputs reported by other Contracting Parties. For both riverine inputs and 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 (LOQ based) would be the most significant contributor to the total direct discharges if upper estimates were used, whereas the UK would contribute the most if based on lower estimates.

Riverine inputs : Direct discharges :

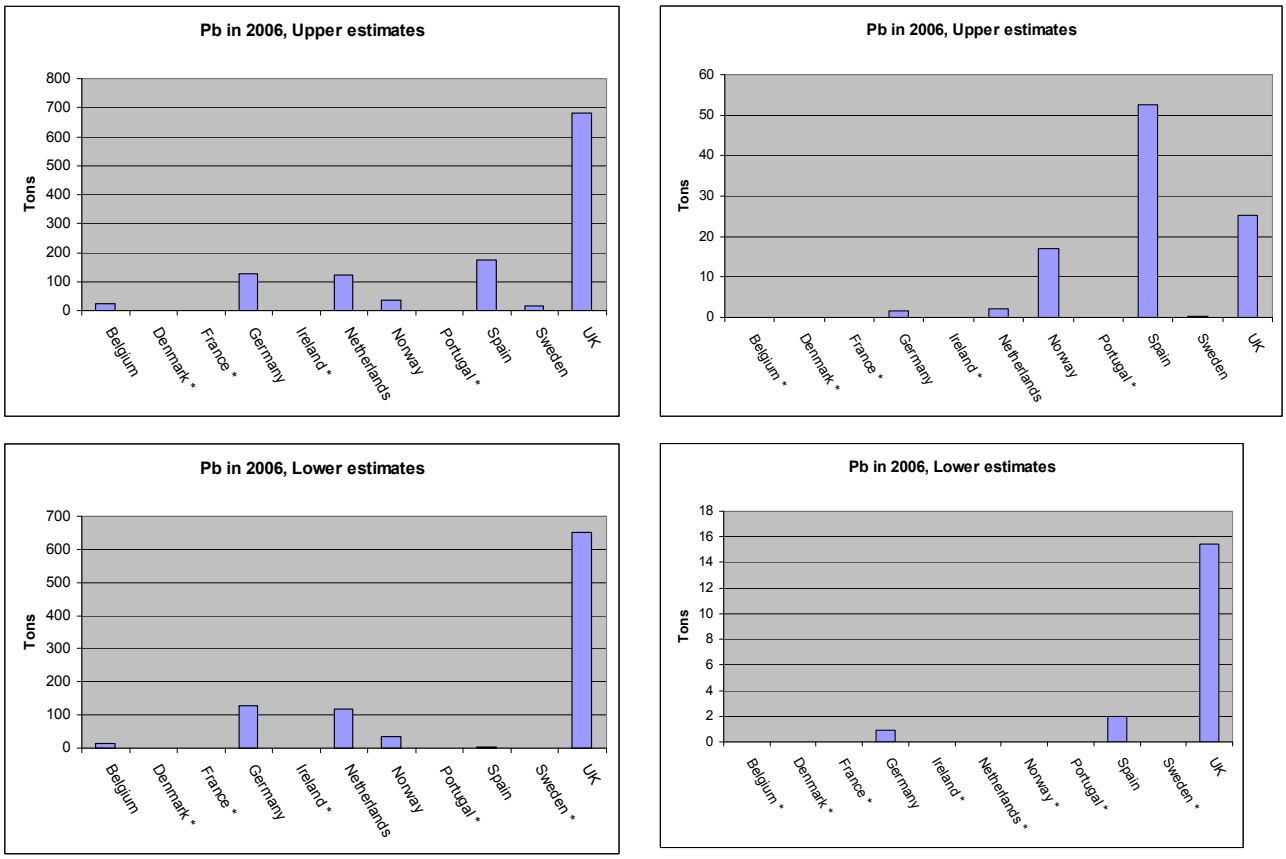


Figure 8: Illustration of riverine inputs (in tonnes) and direct discharges (in tonnes) of lead reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability. There are no direct discharges in Belgium. Sweden does not report lower estimates. The riverine inputs reported by Spain (lower estimates) are too small to show in the chart. The Netherlands does not report lower estimates of direct discharges. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

4.5 Copper inputs

The total inputs of copper to the OSPAR maritime area in 2006 reported by Contracting Parties range from 50 tonnes in Sweden to 491 tonnes reported by the UK (Figure 9). The UK and Norway reported the largest inputs of copper, regardless of whether upper or lower estimates are used. The UK contributed 28%, whereas Norway contributed 26% to total loads based on upper estimates. The corresponding figures based on lower estimates are 34% and 31%, respectively.

As for lead, the relative contribution of each country to the total copper inputs does not differ as much as for cadmium and mercury depending on whether upper or lower estimates are used. This is again assumed to be explained by the fact that copper is often detected in relatively high concentrations, so that the respective detection limits do not affect the calculation of inputs as much.

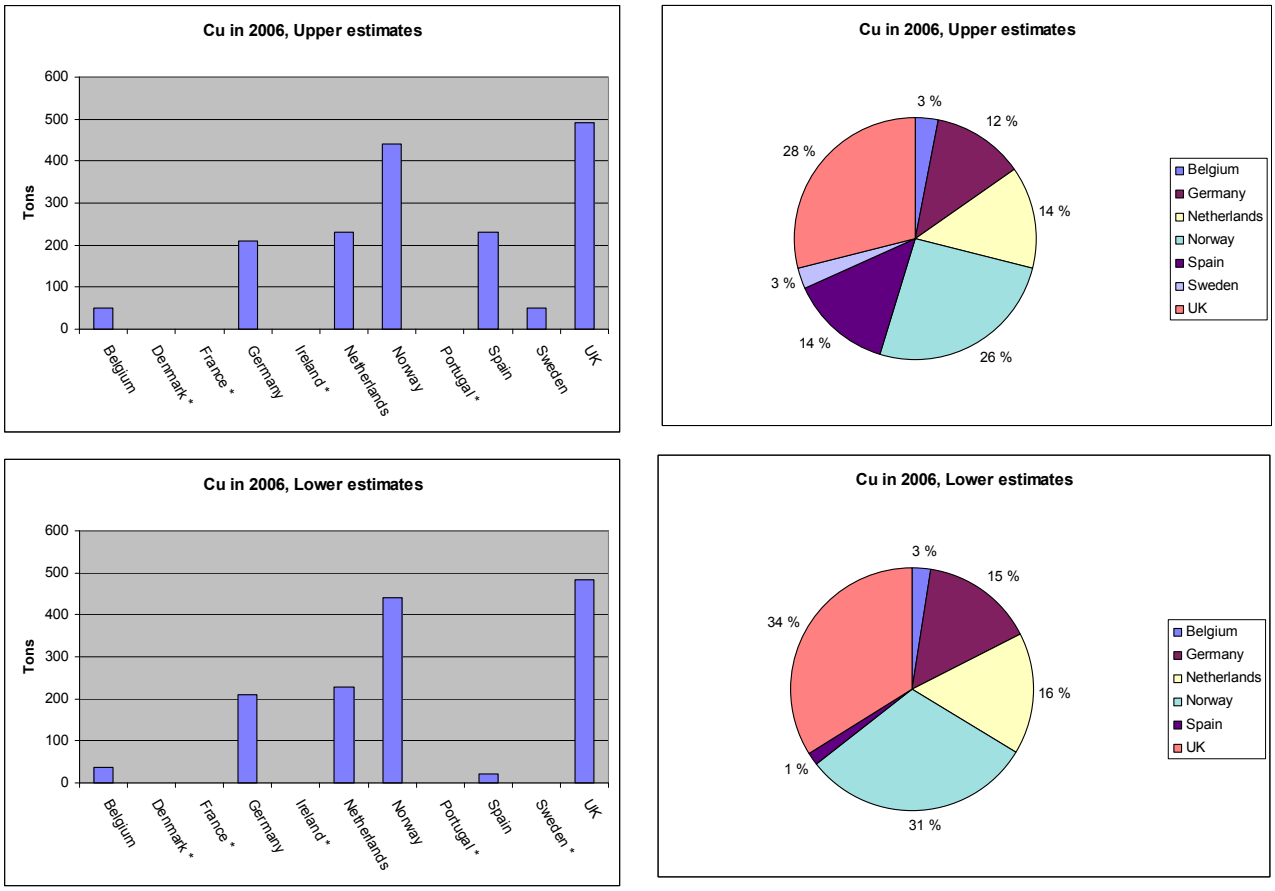


Figure 9: Illustration of copper inputs (in tonnes) reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability and relative contributions (%). There are no direct discharges in Belgium. Sweden does not report lower estimates. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

For most countries the reported direct discharges (based on upper estimates) are considerably lower than the riverine inputs. For Norway, however, the direct discharges equal the riverine inputs of copper (Figure 10). The high direct discharges reported by Norway are explained by the fact that Norway reports 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 algal growth. The discharges reported by Norway are, however, uncertain as they are only estimates and not based on monitoring data.

Regardless of whether upper or lower estimates are used, the riverine inputs of copper reported by the UK are significantly higher than the inputs reported by the other Contracting Parties.

Riverine inputs: Direct discharges :

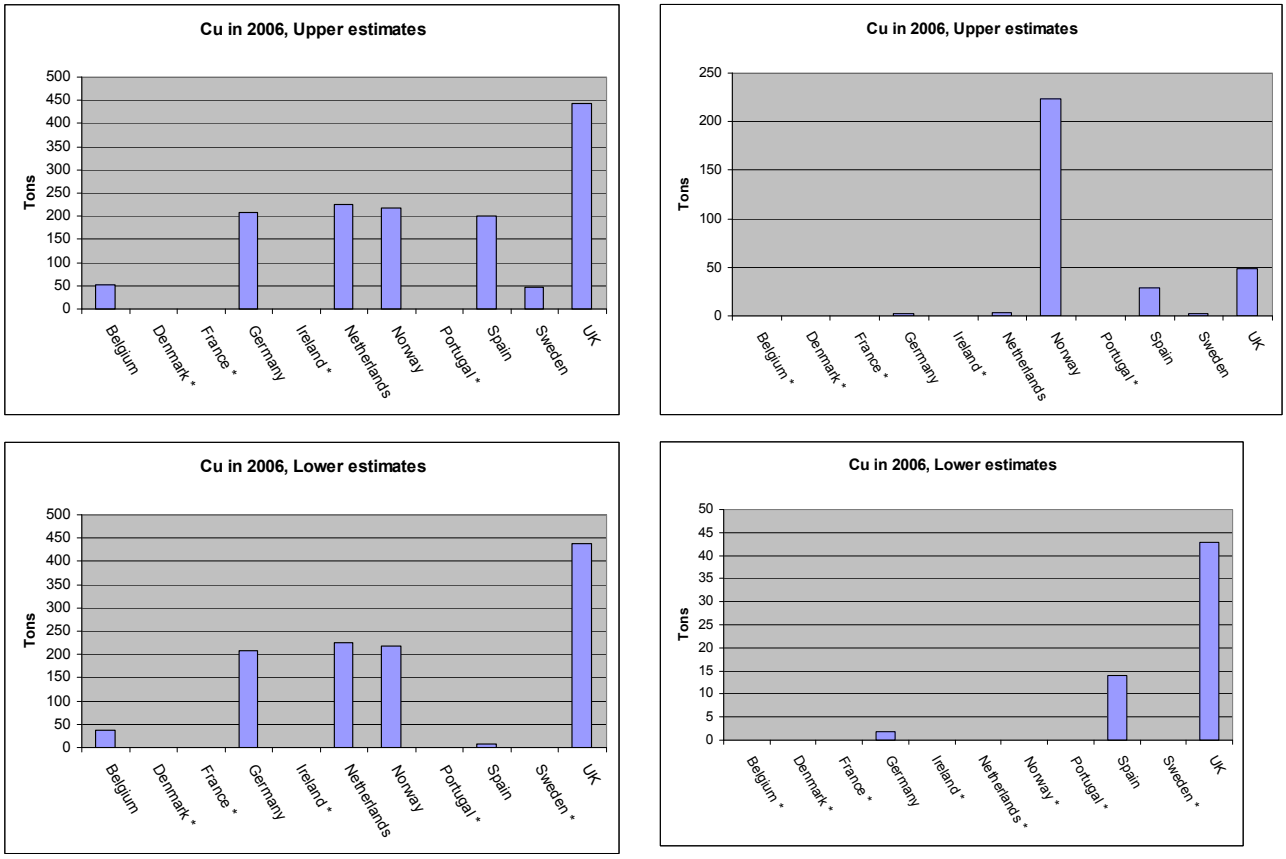


Figure 10: Illustration of riverine inputs (in tonnes) and direct discharges (in tonnes) of copper reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability. There are no direct discharges in Belgium. Sweden does not report lower estimates. The Netherlands does not report lower estimates of direct discharges. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

4.6 Zinc inputs

The total inputs of zinc to the maritime area in 2006 reported by Contracting Parties range from 170 tonnes in Sweden to 2475 tonnes reported by the UK (Figure 11).

The UK was in 2006 the single largest contributor of zinc inputs regardless of whether upper or lower estimates are used, followed by Germany and the Netherlands. Based on upper estimates, the UK contributed 40%, whereas Germany and the Netherlands contributed 16% and 14% to total loads, respectively. The corresponding figures based on lower estimates are 44%, 18% and 15%, respectively.

As zinc is often found in relatively high concentrations, the upper and lower estimates reported by Contracting Parties are more or less consistent, and the relative contribution of each country does not depend as much on whether upper or lower estimates are used. 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.

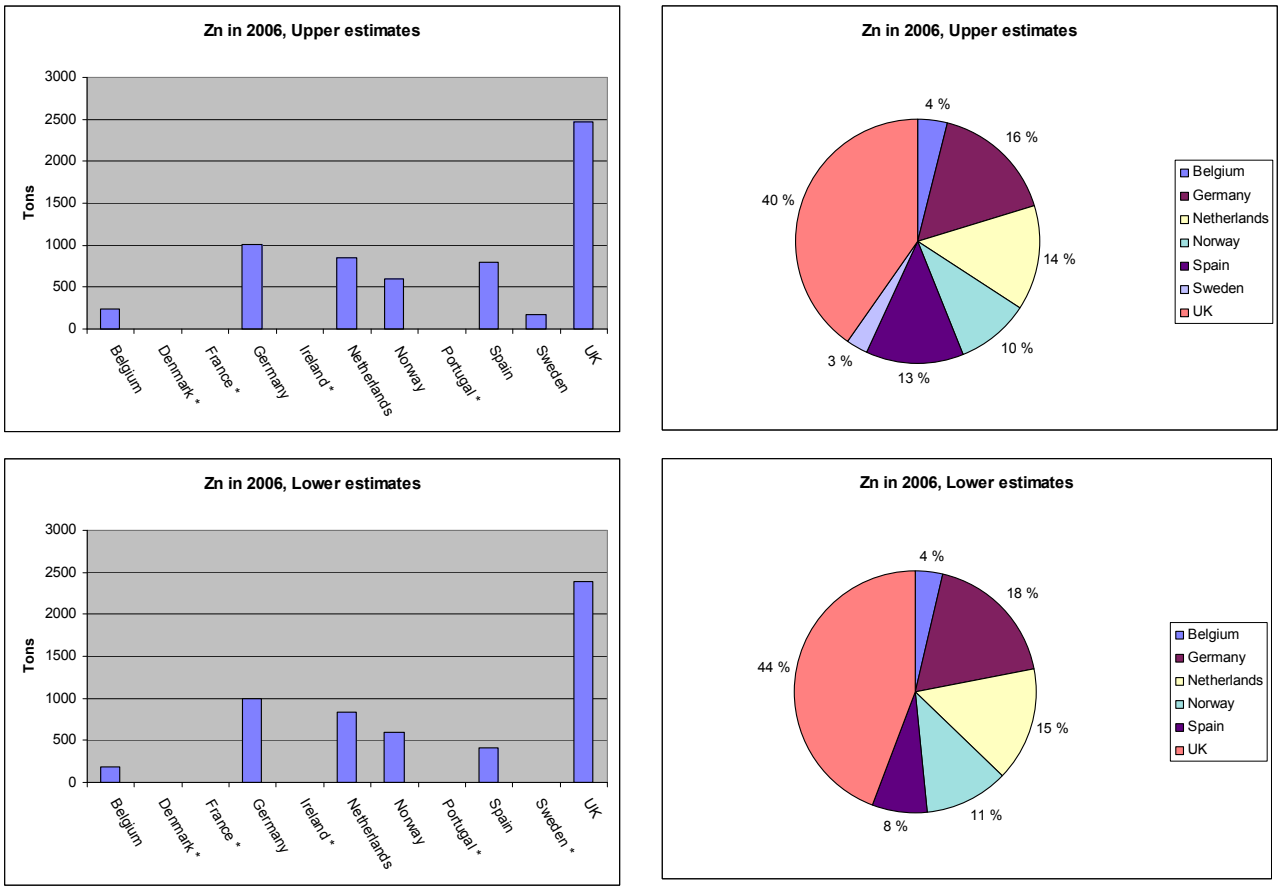


Figure 11: Illustration of zinc inputs (in tonnes) reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability and relative contributions (%). There are no direct discharges in Belgium. Sweden does not report lower estimates. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

For all countries the reported riverine inputs of zinc are considerably higher than the direct discharges. The UK reported the highest riverine inputs and direct discharges, regardless of whether upper or lower estimates are used (Figure 12).

Germany was in 2006 the second largest contributor to the total riverine inputs of zinc, followed by the Netherlands. Spain was the second largest contributor to direct discharges. Germany, the Netherlands, Norway and Sweden reported relatively low contributions to direct discharges.

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

Riverine inputs: Direct discharges :

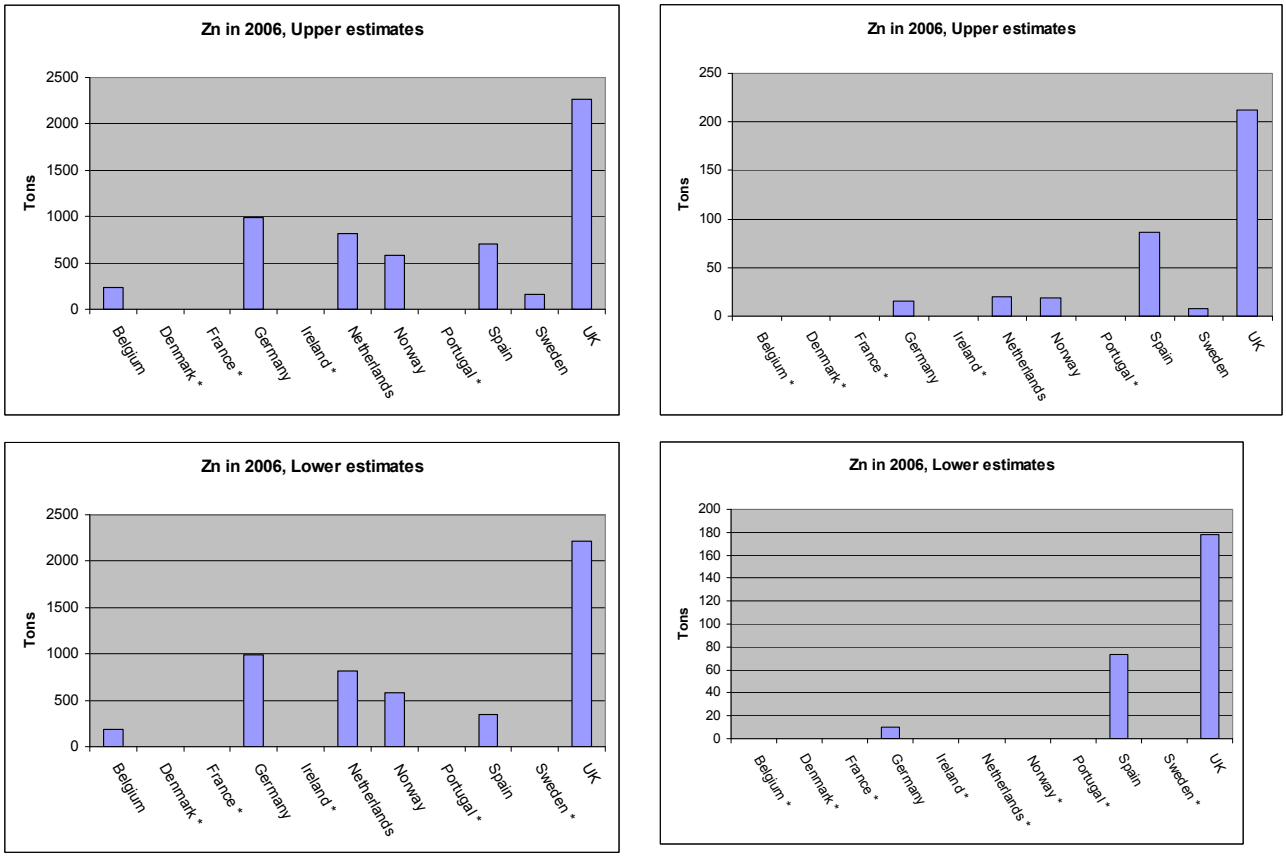


Figure 12: Illustration of riverine inputs (in tonnes) and direct discharges (in tonnes) of zinc reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability. There are no direct discharges in Belgium. Sweden does not report lower estimates. The Netherlands does not report lower estimates of direct discharges. No total input data reported by Denmark and France. Data of Ireland and Portugal were not available in time for inclusion.

4.7 Inputs of total nitrogen

The total inputs of nitrogen to the OSPAR maritime area in 2006 reported by Contracting Parties range from 40 tonnes in Sweden to 275 tonnes reported by the UK (Figure 13).

In general, the reported total nitrogen inputs show less difference between the upper and lower estimates than the inputs reported for metals. For both estimates, the UK reported the highest inputs in 2006, followed by the Netherlands, Germany and France. The UK and the Netherlands contributed approximately 23% each to total inputs, whereas Germany and France contributed 15% and 14%, respectively (based on upper estimates). The corresponding figures based on lower estimates are 26%, 24%, 16% and 12%, respectively.

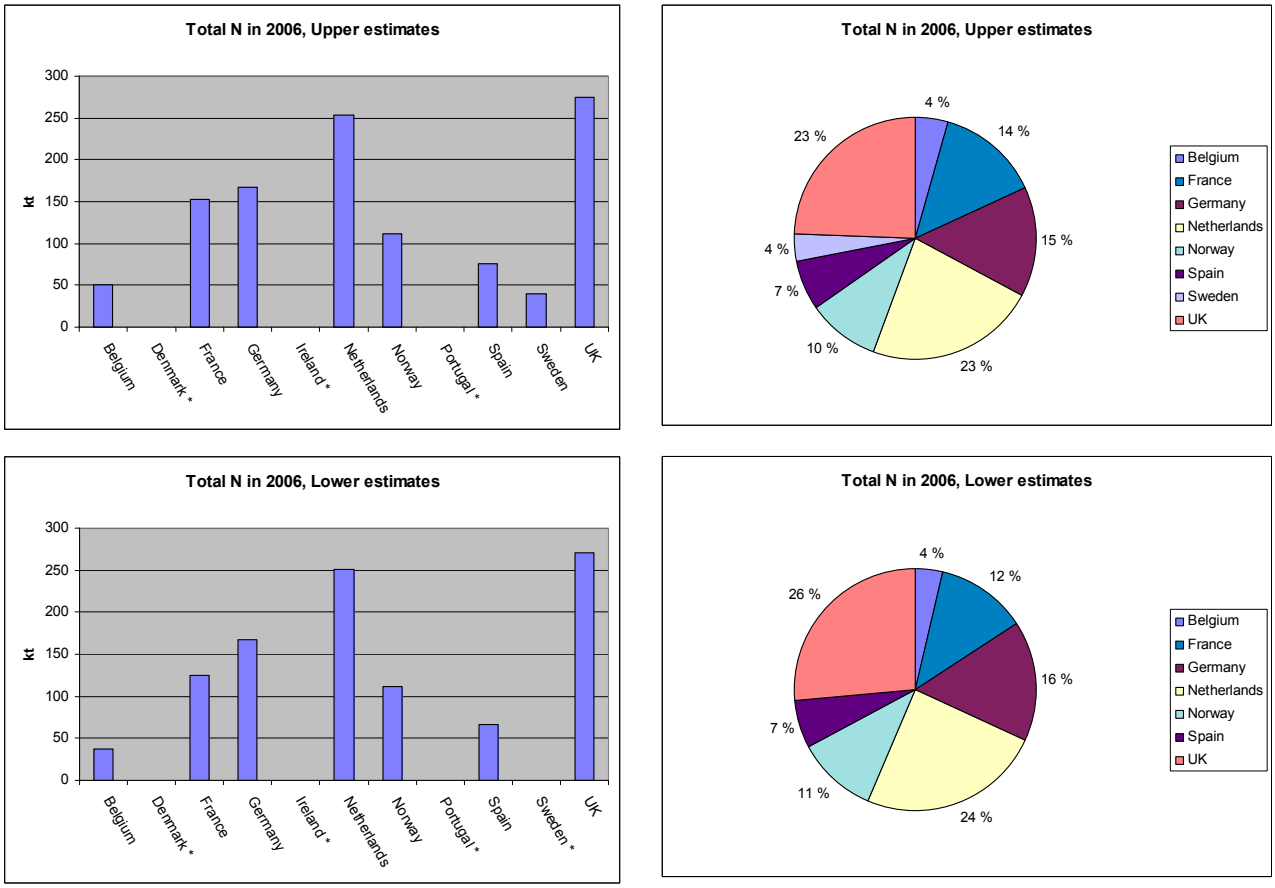
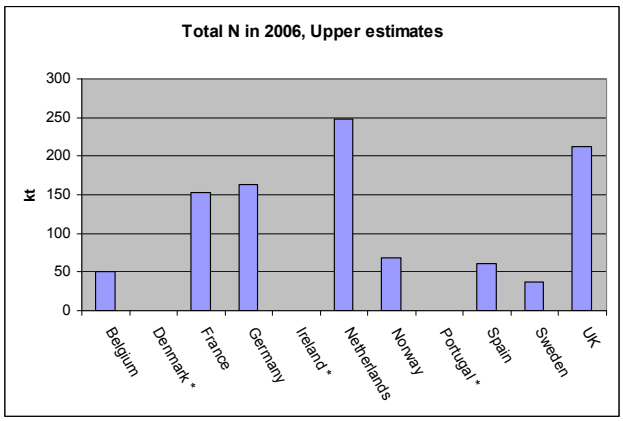


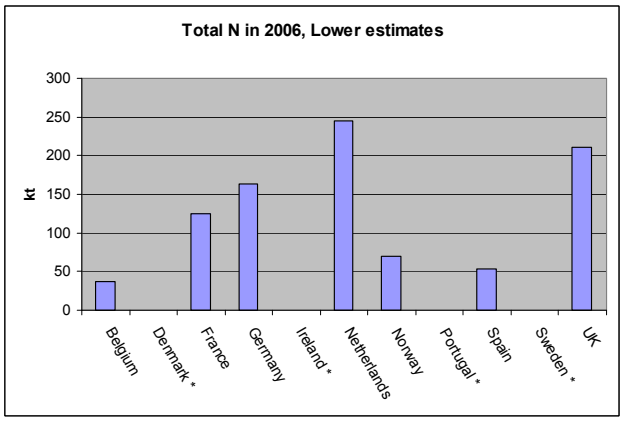
Figure 13: Illustration of total nitrogen inputs (in tonnes) reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability and relative contributions (%). There are no direct discharges in Belgium. Sweden does not report lower estimates. No data reported by Denmark. Data of Ireland and Portugal were not available in time for inclusion.

For all countries riverine inputs contribute the larger part of the inputs of total nitrogen to the maritime area in 2006 (Figure 14).

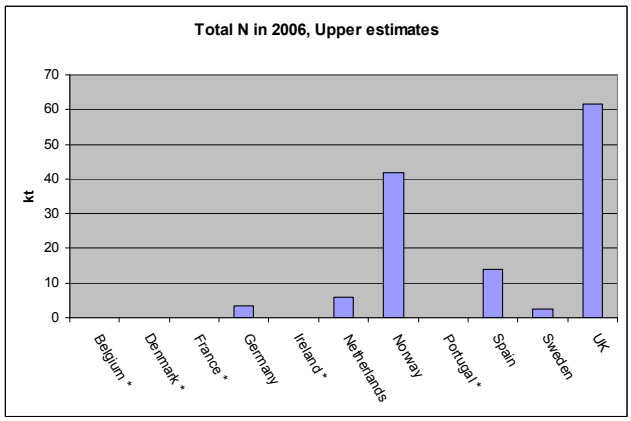
The highest contributions to riverine inputs of total nitrogen were reported by the Netherlands, followed by the UK, Germany and France. The UK reported the highest direct discharges, followed by Norway and Spain. A large part of the Norwegian direct discharges is related to discharges from the fish farming industry. France did not report on direct discharges of nitrogen in 2006.

Riverine inputs :





Direct discharges :



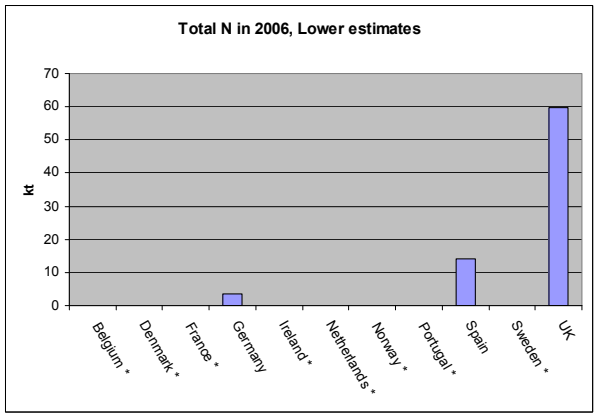


Figure 14: Illustration of riverine inputs (in tonnes) and direct discharges (in tonnes) of total nitrogen reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability. There are no direct discharges in Belgium. No direct discharges reported by France. Sweden does not report lower estimates. The Netherlands does not report lower estimates of direct discharges. No data reported by Denmark. Data of Ireland and Portugal were not available in time for inclusion.

4.8 Inputs of total phosphorus

The total inputs of phosphorus to the OSPAR maritime area in 2006 reported by Contracting Parties range from 1 tonne in Sweden to 21 tonnes reported by the UK (Figure 15).

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

The UK reported the highest inputs of phosphorus in 2006, followed by Norway, regardless of whether upper or lower estimates are used. The relative contributions to total loads by these two countries were 27% and 21% based on upper estimates, and 32% and 23% based on lower estimates, respectively.

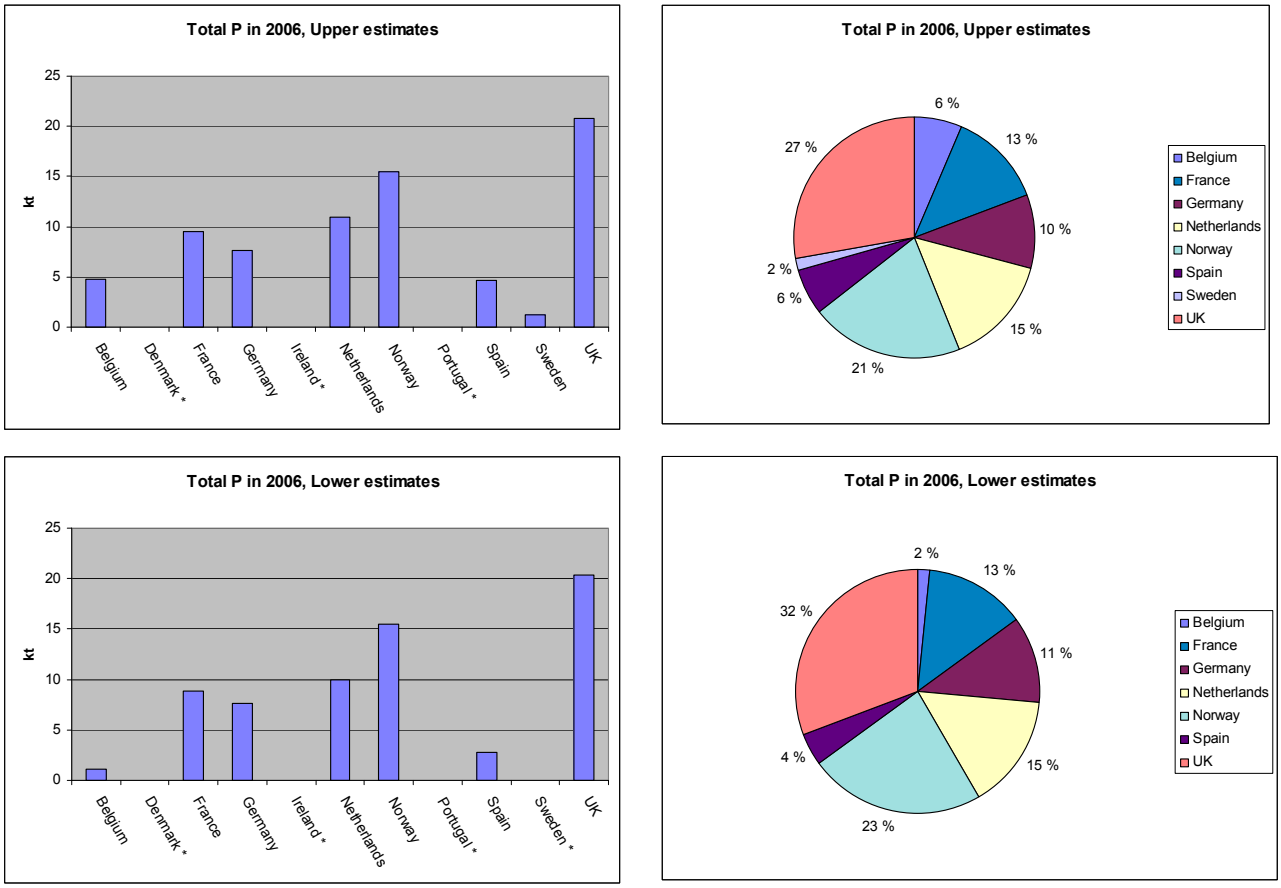
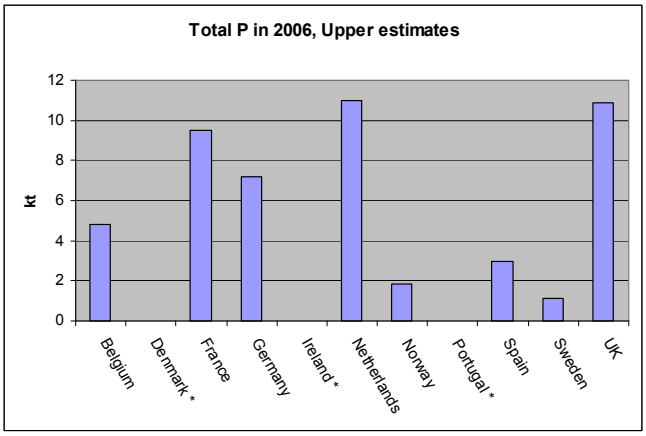


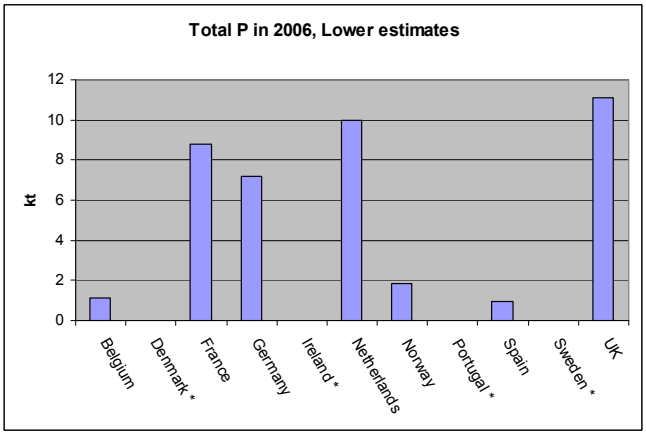
Figure 15: Illustration of total phosphorus inputs (in tonnes) reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability and relative contributions (%). There are no direct discharges in Belgium. Sweden does not report lower estimates. No data reported by Denmark. Data of Ireland and Portugal were not available in time for inclusion.

The differences between reported riverine inputs and direct discharges are less significant for phosphorus loads than for other substances. The reported riverine inputs are slightly higher than the corresponding direct discharges for most countries. For Norway, however, the reported direct discharges are considerably higher than the riverine inputs, being 13.5 kt and 1.8 kt, respectively. The relatively high phosphorus figures from direct discharges in Norway are due to high contributions from the fish farming industry (Figure 16). France did not report on direct discharges of phosphorus in 2006.

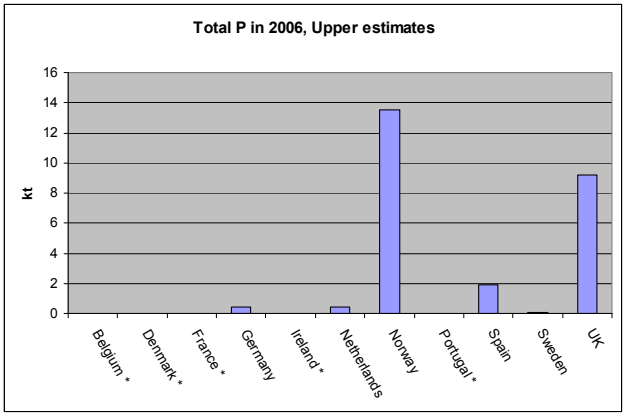
The Netherlands and the UK reported the highest riverine inputs of phosphorus in 2006, followed by France and Germany.

Riverine inputs :





Direct discharges :



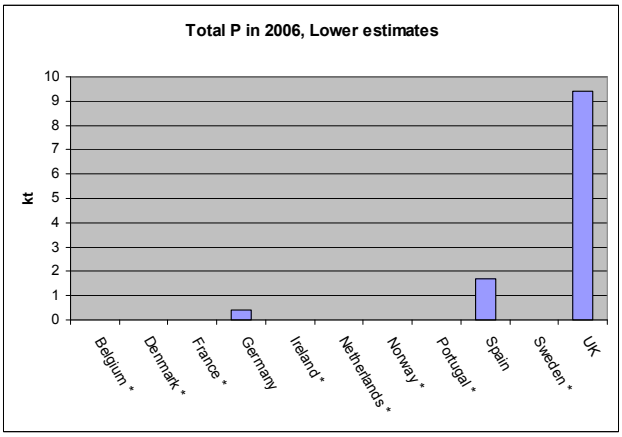


Figure 16: Illustration of riverine inputs (in tonnes) and direct discharges (in tonnes) of total phosphorus reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability. There are no direct discharges in Belgium. No direct discharges reported by France. Sweden does not report lower estimates. The Netherlands does not report lower estimates of direct discharges. No data reported by Denmark. Data of Ireland and Portugal were not available in time for inclusion.

4.9 Inputs of suspended particulate matter (SPM)

Suspended particulate matter (SPM) is the determinand for which most Contracting Parties reported the most similar values for upper and lower estimates (Figure 17). The consistency between upper and lower limits for this substance does, however, not necessarily reflect that the estimates are correct, as it only reflects the results of the laboratory analyses and not the reliability of the monitoring methodology.

The UK reported the highest SPM inputs in 2006, followed by France and Germany. The relative contributions of these countries to total inputs were 26%, 24% and 15% based on upper estimates, and 26%, 25% and 15% based on lower estimates, respectively.

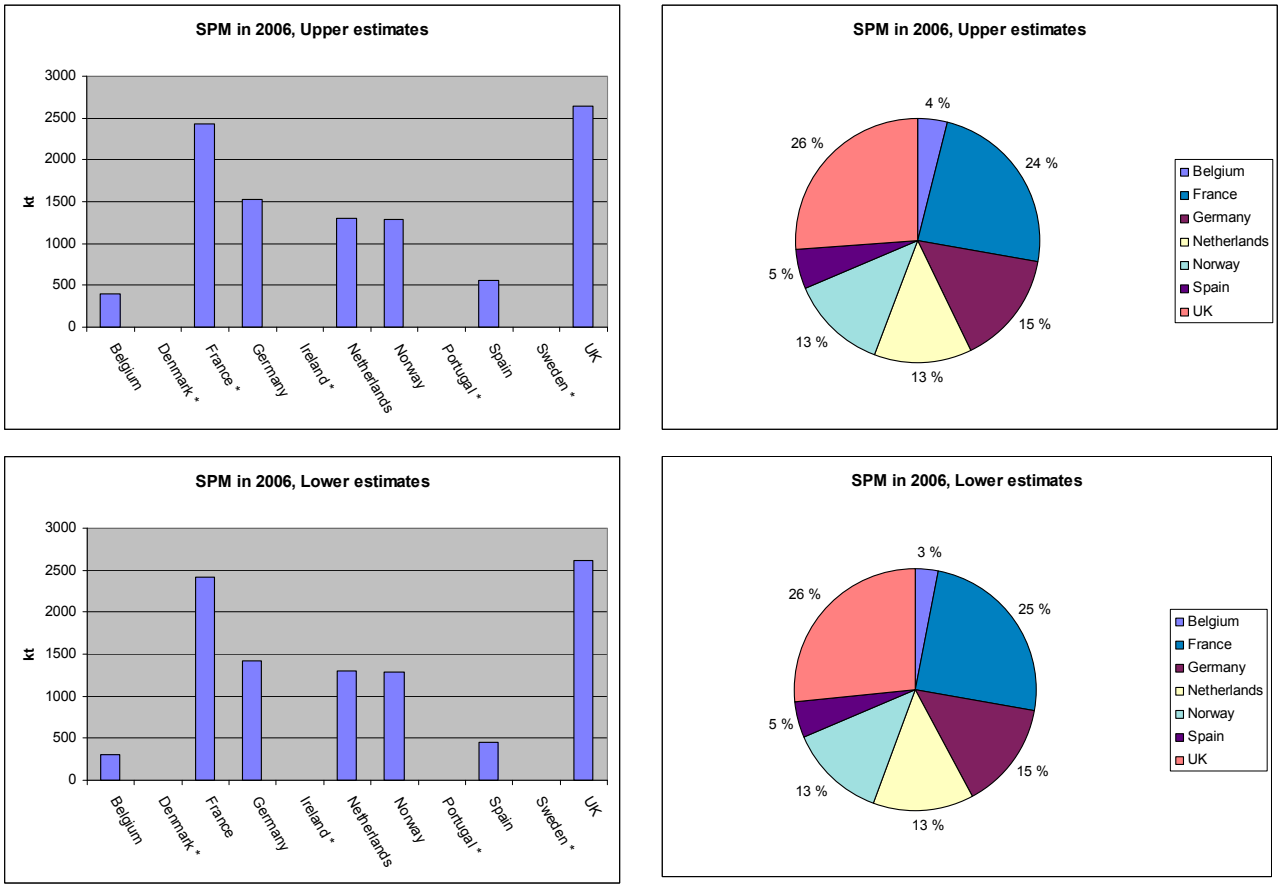


Figure 17: Illustration of total inputs of suspended particulate matter (in tonnes) reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability and relative contributions (%). There are no direct discharges in Belgium. Sweden does not report SPM inputs. No data reported by Denmark. Data of Ireland and Portugal were not available in time for inclusion.

The reported riverine inputs of SPM are higher than the corresponding direct discharges for all countries (Figure 18). However, the difference between the two sources is less explicit for Norway and Spain. France did not report direct discharges of suspended solids in 2006.

The UK (2643 kt) and France (2424 kt) reported the highest riverine inputs of SPM in 2006. Norway was the single largest contributor to the total direct discharges.

Riverine inputs : Direct discharges :

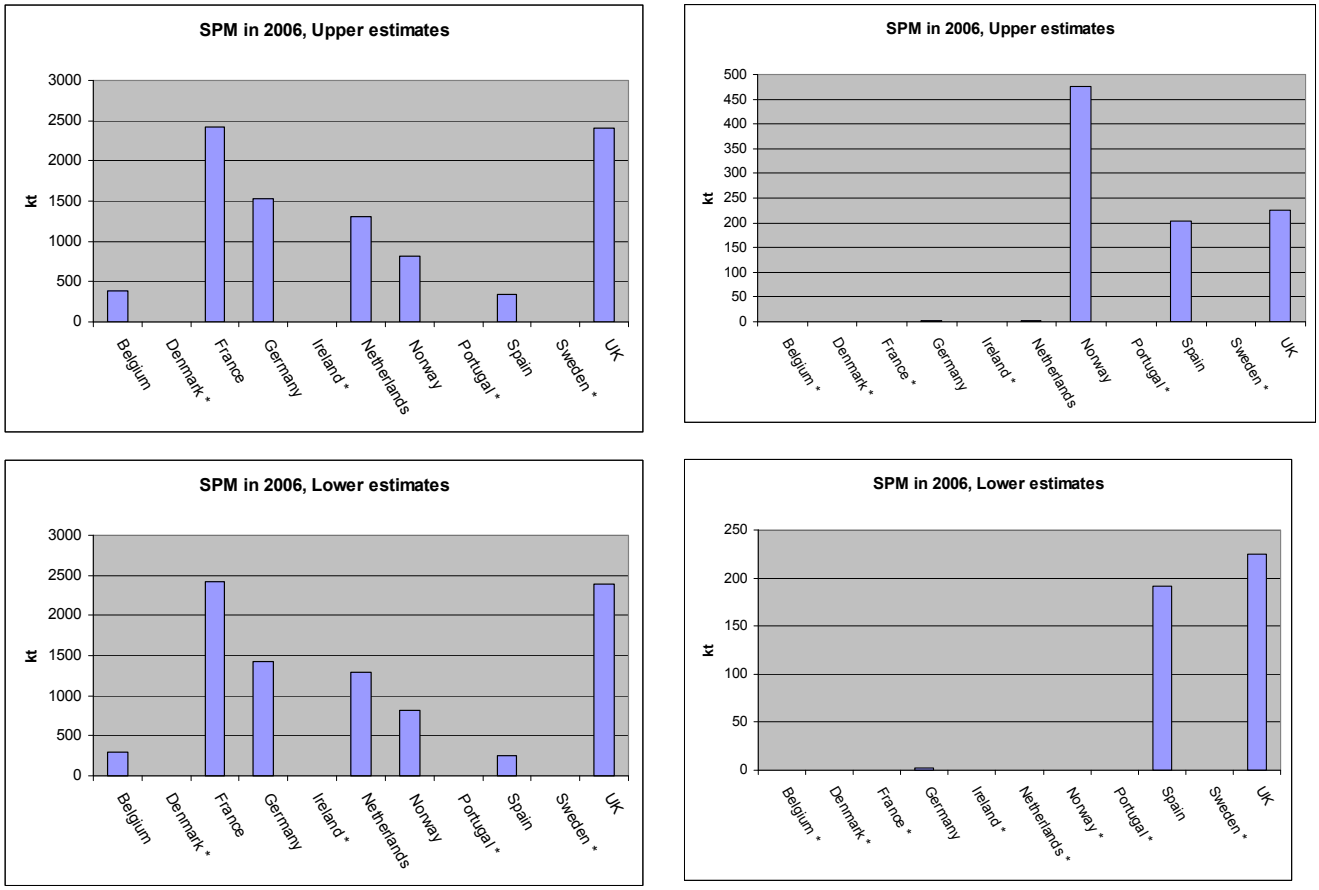


Figure 18: Illustration of riverine inputs (in tonnes) and direct discharges (in tonnes) of total suspended particulate matter reported by Contracting Parties in 2006 as upper and lower estimates and their implications on data comparability. There are no direct discharges in Belgium. No direct discharges reported by France. Sweden does not report SPM inputs. The Netherlands does not report lower estimates of direct discharges. No data reported by Denmark. Data of Ireland and Portugal were not available in time for inclusion.

4.10 Water discharges to the OSPAR maritime area in 2006

The total inputs to the OSPAR maritime area can also be assessed based on the total amount of water discharged to the sea from each country. However, such an assessment is somewhat difficult as Contracting Parties have based their calculations of water discharges on differing data sets, as follows:

- Belgium has included the water discharge for monitored rivers and tributaries, but not unmonitored areas or direct discharges;
- France and Norway have included water discharge in monitored rivers, tributaries and unmonitored areas, but not direct discharges;
- Germany and Sweden have included rivers, tributaries and industrial and sewage effluents, but not unmonitored areas;
- The Netherlands have included monitored riverine inputs, but the Ems Dollard Estuary, the Western Schelde and the Southern Delta Coast are reported with zero water discharge;
- Spain and UK have reported water discharge as a total for the maritime sub-areas, and it is unclear whether the direct discharges and the unmonitored areas are included.

Thus, the total water discharges shown in the upper panels of Figure 19 is based on different calculation methods, but reflects nevertheless the total discharge to the maritime area as reported by each Contracting Party. In the lower panels of the same figure, only water discharges in the monitored rivers are shown.

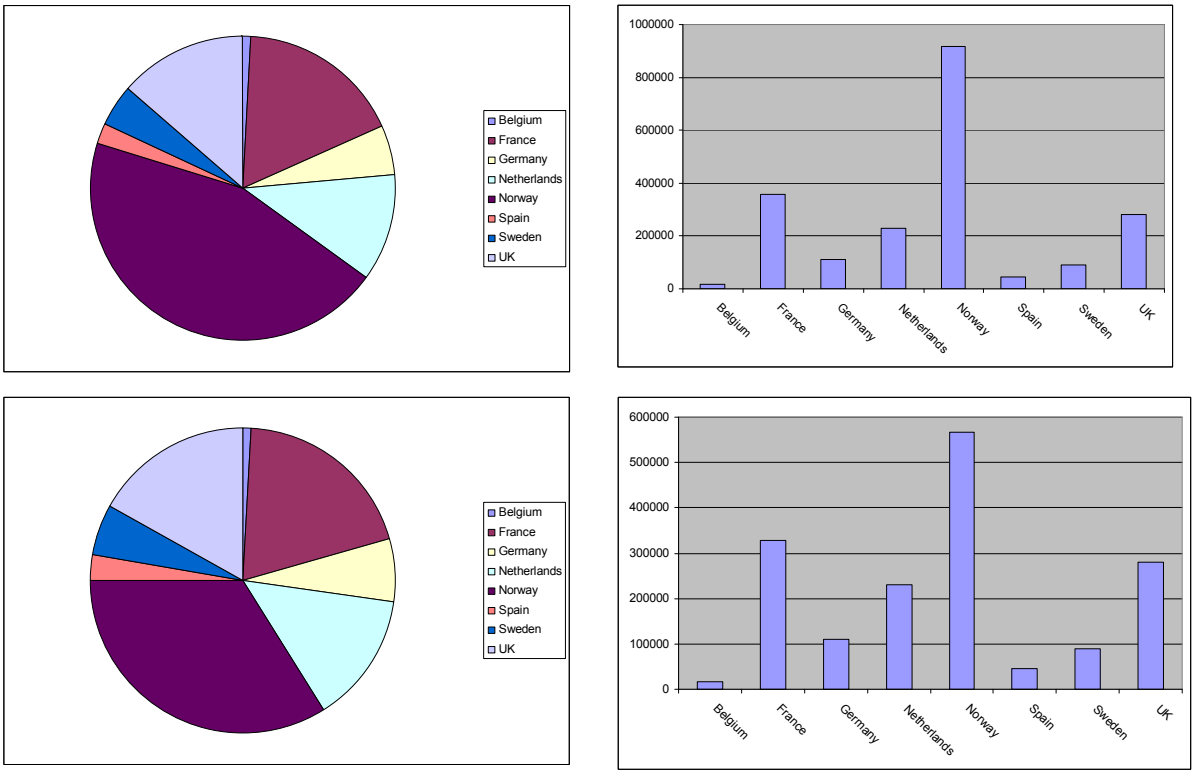


Figure 19: Water discharge (in 1000 m^3/day) to the OSPAR maritime area by country, as totals reported (upper panels) and as inputs only from the monitored rivers (lower panels).

According to the available data, Norway is the country with the highest contribution of water discharge to the sea, followed by France, UK and the Netherlands. This pattern is similar both for total water discharge from each Contracting Party and for monitored rivers only, but the differences between the countries are less when only water discharges from monitored rivers are shown.

5. Comparison of reported inputs in 2005 and 2006

The 2005 and 2006 RID data reported by each Contracting Party have been compared in order to get an indication of potential increases or reductions in inputs to the OSPAR maritime area. There were in general few significant changes in inputs, of any parameter, from 2005 to 2006 reported by the Contracting Parties. For each determinand, only Contracting Parties that have reported data for both 2005 and 2006 are included.

5.1 Input of metals

The total inputs of cadmium, mercury, lead and zinc in 2006 reported by the UK were for all determinands higher than the inputs in 2005 both for upper and lower estimates, with the most significant increases for lead and zinc, 400 tonnes and 840 tonnes, respectively (Figure 20). The higher inputs reported in 2006 are due to a reported increase in riverine inputs.

The total inputs in 2006 reported by Spain were for most determinands higher than the inputs in 2005 both for upper and lower estimates, to a large extent due to an increase in riverine inputs. Spain reported a slight decrease in mercury inputs (upper estimates) and lead inputs (lower estimates).

The increased inputs of cadmium and mercury reported by the Netherlands are also due to increased riverine inputs. The Netherlands does not report lower estimates of direct discharges.

The differences between inputs in 2006 and 2005 reported by Norway, Germany and Belgium are insignificant.

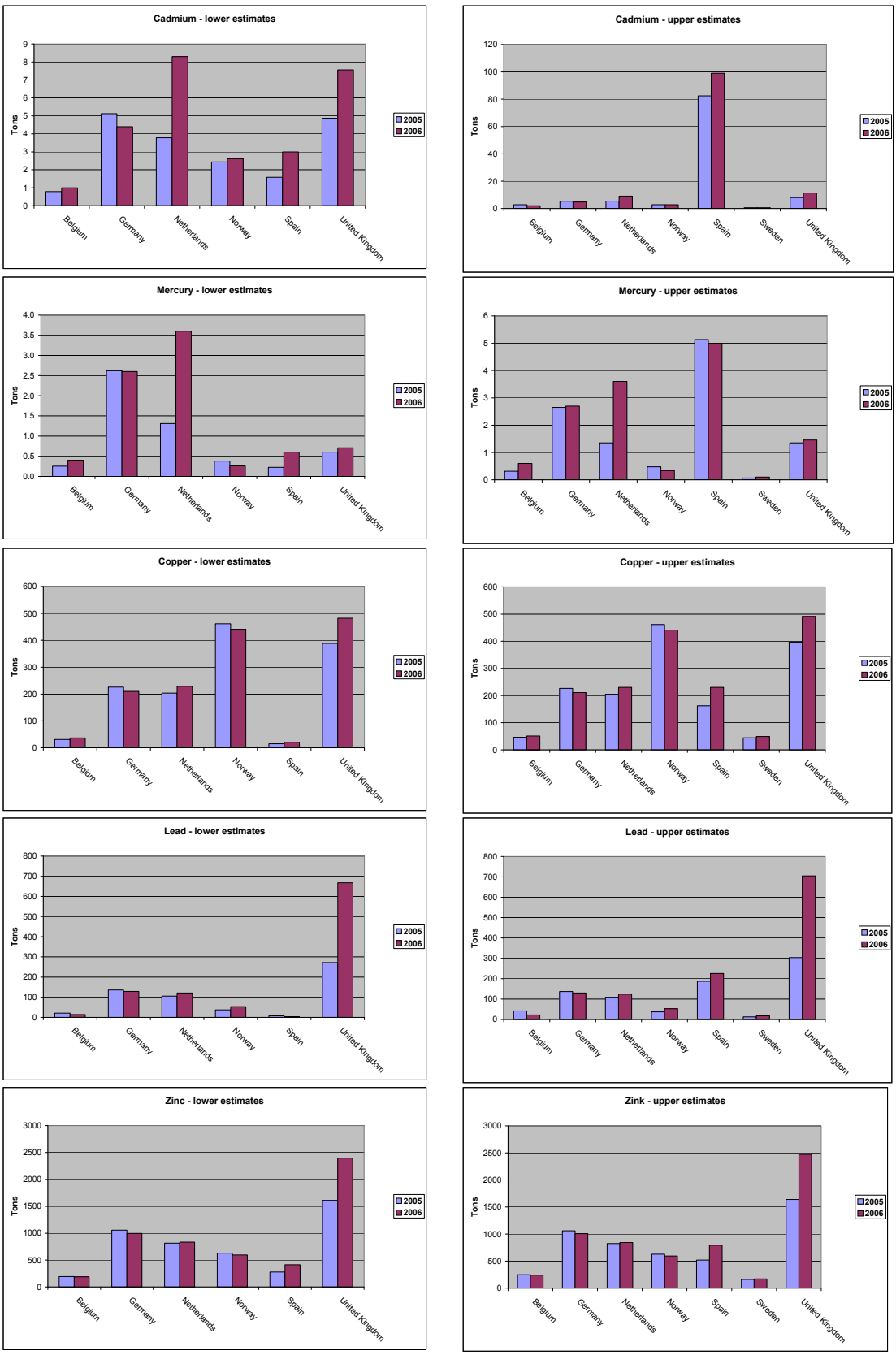


Figure 20: Illustration of total inputs (in tonnes) of cadmium, mercury, lead, copper and zinc reported by Contracting Parties in 2005 and 2006 as lower and upper estimates. Sweden does not report lower estimates. No total input data reported by Denmark and France in 2006. Data of Ireland and Portugal for 2006 were not available in time for inclusion.

5.2 Input of nutrients and SPM

The reported inputs of total nitrogen in 2006 to the OSPAR maritime area were more or less of the same order of magnitude as the corresponding inputs in 2005. Belgium, Netherlands, Norway, Spain and Sweden reported a slight increase in nitrogen inputs, whereas Germany and the UK reported somewhat lower inputs in 2006 compared to the 2005 inputs. France did not report inputs of total nitrogen in 2005.

France reported significant increases in inputs of total phosphorus and SPM due to an increase in riverine inputs. France did not report on direct discharges for 2006.

Both Spain and the UK reported a slight decrease in direct discharges of nitrogen in 2006 compared to the reported inputs in 2005, 10 kt and 8 kt, respectively. The UK also reported a decrease (8 kt) in riverine inputs of nitrogen, whereas the riverine inputs reported by Spain were higher (20 kt) than the inputs in 2005.

The increased total inputs of nitrogen in 2006 reported by Belgium, Netherlands, Norway and Sweden were mainly due to increased riverine inputs.

The inputs of total phosphorus in 2006 reported by Norway increased by 50% compared to the corresponding inputs in 2005, were due to an increase in direct discharges.

The UK reported decreased inputs of phosphorus, caused by slight decreases in riverine inputs and direct discharges, 2 kt and 1 kt, respectively. Furthermore, the UK reported on higher SPM inputs in 2006 compared to the 2005 inputs. There was a decrease in the reported direct discharges of SPM, whereas the riverine inputs increased significantly, from 1685 kt in 2005 to 2412 kt in 2006.

Germany and Spain reported a decrease in SPM inputs. For Germany, this is due to a slight decrease in riverine inputs, whereas for Spain the decrease in total SPM inputs is due to a significant decrease in direct discharges, from 424 kt in 2005 to 203 kt in 2006.

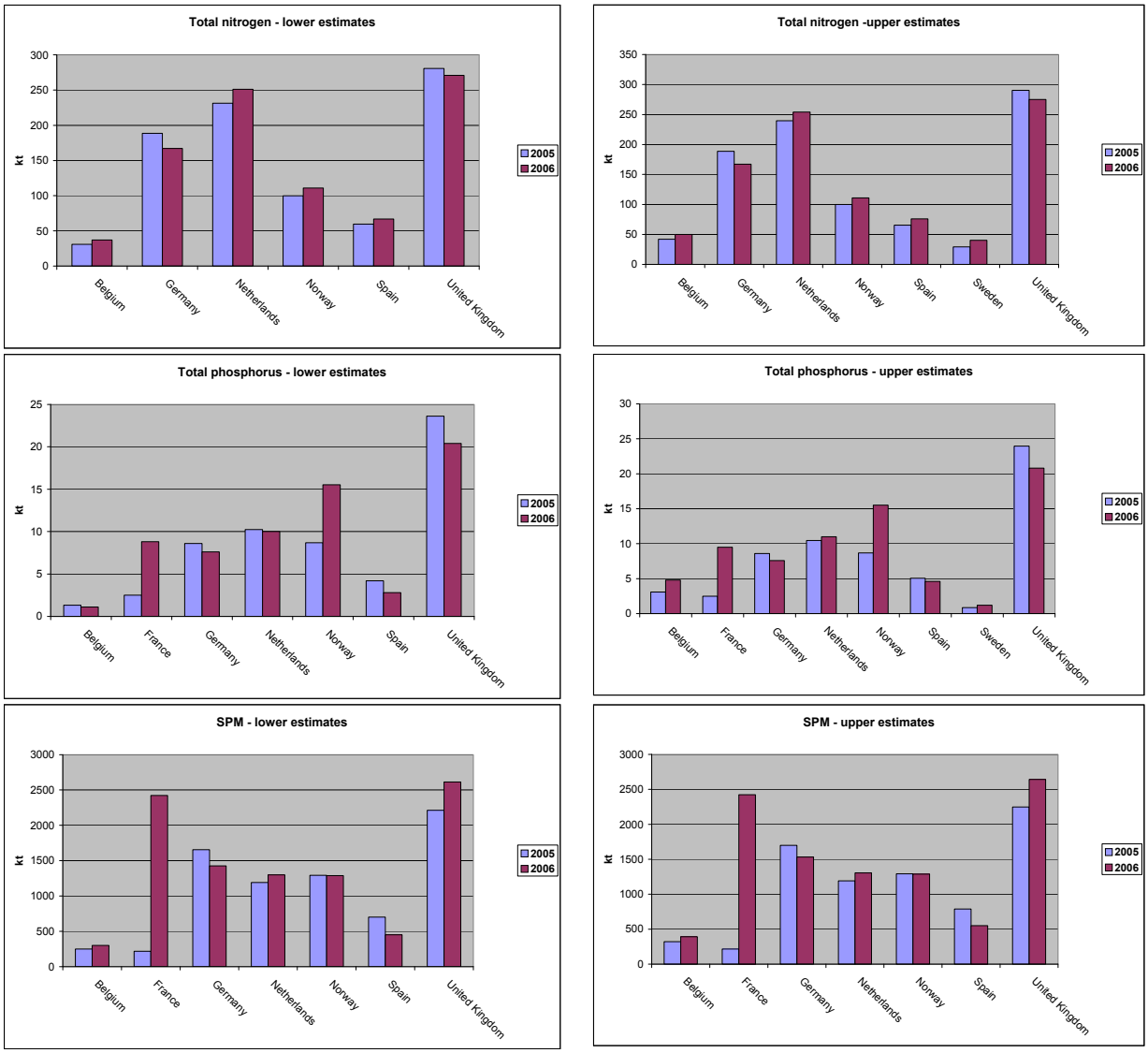


Figure 21: Illustration of total inputs (in tonnes) of total nitrogen, total phosphorus and suspended particulate matter (SPM) reported by Contracting Parties in 2005 and 2006 as lower and upper estimates. Sweden does not report lower estimates and not SPM inputs. France did not report inputs of total nitrogen in 2005. No data reported by Denmark in 2006. Data of Ireland and Portugal for 2006 were not available in time for inclusion.

6. General conclusions and recommendations

The ”visualising” of the reported RID 2006 data in figures and charts presented in Section 4 identified important features of the data and the data reliability. In particular, the differences between the upper and lower estimates for some substances were significant, as were some of the differences between riverine and direct discharges both between countries and substances. A closer look at the detection limits (section 3.8), 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 upper estimates may give too high input values when the detection limits are high and especially when quantification limits are used;
- with similarly high detection limits, the lower estimates may give too low input values, and often equal to zero if all samples analysed are below the detection limit; and
- whenever comparisons of the loads reported by Contracting Parties are made, it should be clear for the reader and the public in general that there are differences between countries in calculating upper estimates when observed values are below LOD or LOQ.

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

The question of whether to use LOD (limit of detection) or LOQ (limit of quantification) is therefore still valid. Since countries have such differences in detection limits, and since different laboratories use different practices related to LODs and LOQs, it is difficult to recommend which approach to apply. It can only be concluded that it is of utmost importance that Contracting Parties report which detection method is used and whether they vary amongst laboratories.

The fact that many Contracting Parties use different laboratories, or that laboratories change over time, represents a challenge for future reporting. It may mean that the detection limits (and analytical methods) also vary. It is therefore important that Contracting Parties have a good overview of which samples are analysed in which laboratory, and which detection limits and analytical methods that are used. 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 important to take account of in the ongoing 2009 RID assessment.

This report also shows that several concepts within the RID Study are differently understood by Contracting Parties.

It is recommended that the proposed definitions in Annex VII on approaches such as “tributary rivers” and “unmonitored areas” are further developed and agreed upon by Contracting Parties.

A first rough outline of quality assurance aspects is given in section 3.12. Only Belgium has provided comments on the RID QA suggestions from Skarbøvik and Borgvang, (2007) that could be further developed into the RID Principles.

One of the factors that may need clarification in such a quality assessment is the sampling procedures, as many countries use different institutions for the sampling. Another factor is the load calculation practices, which seem to vary between Contracting Parties.

Another issue for consideration is the varying sampling frequencies amongst Contracting Parties, 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*. Few Contracting Parties report on procedures for additional sampling during floods. For this reason the annual inputs reported by Contracting Parties may be 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 accounted for in the Contracting Parties’ annual RID data reports. Some Contracting Parties report on direct discharges from sewage treatment plants, industries and fish farming, others do not report any direct discharges at all. In many countries, large cities are located along the shores of the marine coastline. Direct discharges appear to be relatively less important than riverine inputs (see Section 4). This may be reasonable for areas where large cities are located upstream and along major rivers, but *the issue of whether discharges from coastal urban areas are sufficiently accounted for should be raised.*

It is expected that one important outcome of this report may be increased confidence that figures to be assessed within the ongoing 2009 RID Assessment are reasonably reliable, accurate and comparable between Contracting Parties. It is also hoped that some of the conclusions of the present report will facilitate the 2009 RID Assessment.

It should 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.

7. References

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OSPAR Commission, 2005. 2005 Assessment of data collected under the OSPAR Comprehensive Study on Riverine Inputs and Direct Discharges for the period 1990 – 2002. Assessment and Monitoring Series. OSPAR Commission, London. Publication number: 233/2005. 41 pp.

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ANNEXES

Presentation and Assessment of the OSPAR Contracting Parties' RID 2006 Data

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

Norwegian Institute for
Agricultural and Environmental
Research

Annexes

Annex I: RID 2006 Data Overview Tables

Annex II: Questionnaire for the 2006 Assessment

Annex III: Overview of submitted replies to Questionnaire for the 2006 Assessment

Annex IV: Co-ordinates and maps of RID sampling sites

Annex V: Overview of areas downstream sampling points per RID catchment

Annex VI: Changes in the laboratory detection limits as reported by the Contracting Parties

Annex VII: Suggestions for clarifying the use of the concepts of “unmonitored area” and “tributary river” under the RID Principles

Annex VIII: Comments and observations on “Example for steps in quality assurance”, Belgium

Annex I. RID 2006 Data Overview Tables

Table 1a. Information Received on Inputs to the Maritime Area of the OSPAR Convention in 2006.

Country	Direct Discharges			Riverine Inputs	
	Sewage Effluents	Industrial Effluents	Coastal Areas (1)	Main Rivers	Tributary Rivers (2)
Belgium	NA	NA	(3)	+	+
Denmark					
- Kattegat					
- Skagerrak					
- North Sea					
France(12)					
- Channel/North Sea	NI	NI	+	+	+
- Atlantic	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	+	+	+ (9)	+	+
- North Sea	+	+	+ (9)	+	+
- Norwegian Sea	+	+	+ (9)	+	+
- Barents Sea	+	+	+ (9)	+	+
Portugal	NI	NI		+	NI
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)
(12) Data for direct discharges in 2006 are not yet available and will be updated with RID report 2007. France does not submit totals for inputs if any input values are lacking in the total, so data are partially available (nutrients OK).

Table 1b. Determinands Reported by Contracting Parties in 2006.

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 (4)	R (4)	R (4)	R (3)	R (4)	R (4)	R (3)	R (3)	R (3)	R (3)	R (4)	R (3)	
Denmark														
- direct inputs														
- riverine inputs														
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	+ (3)(4)	+ (3)	+ (3)(4)	NI	+ (3)(4)	+ (3)	
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)	+ (4)	+	+ (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	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
- main riv. Inputs (7)	+	+	+	+	+	NI	NI	+	+	+	+	+	+	
- tributary rivers	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
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.
* Data for direct discharges in 2006 are not yet available and will be updated with RID report 2007. France does not submit totals for inputs if any input values are lacking in the total, so data are partially available (nutrients OK). The major part of rivers have 70% of measurements above detection limits.

Table 2^. Direct Discharges to the Maritime Area of the OSPAR Convention in 2006 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														
	Skagerrak														
	Kattegat														
France	Channel/North Sea		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Atlantic		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Germany	North Sea	(lower estimate)	0.02	0.02	1.8	0.9	10	0.02	0.04	1.7	1.7	0.08	3.5	0.4	1.9
		(upper estimate)	0.05	0.06	2.5	1.5	15	0.3	2.9	1.7	1.7	0.08	3.5	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)	0.17	0.02	3.6	2.0	20	NI	NI	NI	1.2	NI	6	0.40	3
Norway (3)	Skagerrak	(lower average)		0.05	0.08	16.00	13			0.01	4	0.28	0.1	5.48	
		(upper average)		0.05	0.08	16.00	13			0.01	4	0.28	0.1	5.48	
	North Sea	(lower average)	0.00	0.00	76	0.14	3			12	1.5	1.86	15	2.7	15
		(upper average)	0.00	0.00	76	0.14	3			12	1.5	1.87	15	2.7	15
	Norwegian Sea	(lower average)	0.04	0.00	132	1	2			20	2.8	3.4	25	5.0	460
		(upper average)	0.04	0.00	132	1	2			20	2.8	3.4	25	5.0	460
	Barents Sea	(lower average)			15					1.4	0.20	0.24	1.8	0.36	
		(upper average)			15					1.4	0.20	0.24	1.8	0.36	
Portugal	Atlantic	(lower estimate)	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Spain	Atlantic	(lower estimate)	2.8	0.57	14	2	73	1.8	0	8	1.8	0.9	14	1.7	191
		(upper estimate)	14.3	1.3	29	53	86	12	17	9	1.8	1.2	14	1.9	203
Sweden	Kattegat		0.05	0.01	2.4	0.19	7.0	NI	NI	1.1	NI	NI	2.0	0.1	NI
	Skagerrak		0.01	0.00	0.32	0.18	0.8	NI	NI	0.1	NI	NI	0.4	0.0	NI
United Kingdom	North Sea North	(lower estimate)	0.04	0.01	11	2	31	2	0	10	3	1.6	15	2.2	28
		(upper estimate)	0.05	0.01	11	2	31	2	5	10	3	1.6	15	2.2	28
	North Sea South	(lower estimate)	0.08	0.08	23	6	68	3	0	7	10	2.9	15	2.9	137
		(upper estimate)	0.16	0.09	23	7	69	10	1.9	7	10	2.9	17	2.9	137
	North Sea (Channel)	(lower estimate)	0.01	0.04	4	1.1	14	0.4	0	7.4	2.3	0.9	10	0.9	17
		(upper estimate)	0.02	0.04	4	1.5	14	3.1	6.2	7.4	2.5	1.0	10	1.0	17
	Total North Sea	*(lower estimate)*	*0.13*	*0.13*	*38*	*9*	*112*	*4.6*	*0*	*24*	*15*	*5.4*	*41*	*6.1*	*182*
		(upper estimate)	*0.23*	*0.14*	*38*	*11*	*113*	*16*	*13*	*24*	*15*	*5.5*	*43*	*6*	*182*
	Celtic Sea	(lower estimate)	0.08	0	2	2	29	0	1.2	3.6	0.76	0.76	3.8	0.76	10
		(upper estimate)	0.09	0.01	2	2	29	1.04	1.3	3.6	0.80	0.78	3.8	0.78	10
	Irish Sea	(lower estimate)	0.01	0.01	1	4	16	0.01	0	4.6	1.5	0.6	7	1	9
		(upper estimate)	0.48	0.14	6	12	49	3.1	0.4	4.6	1.5	0.6	7	0.7	9
	Atlantic	(lower estimate)	0.02	0.02	2	0.8	20	1.90	0	3.7	2.6	1.1	9.1	1.6	24
		(upper estimate)	0.14	0.07	3	1.1	20	2.12	0.00	3.7	2.6	1.1	9.1	1.6	25
	Total Non-North	*(lower estimate)*	*0.11*	*0.03*	*6*	*6.2*	*65*	*2*	*1.18*	*12*	*5*	*2.5*	*20*	*3.0*	*44*
	Sea	*(upper estimate)*	*0.71*	*0.22*	*11*	*14.6*	*98*	*6.3*	*1.7*	*12*	*5*	*2.5*	*20*	*3*	*44*

^ 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

Table 3^. Riverine Inputs to the Maritime Area of the OSPAR Convention in 2006 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)	1.0	0.4	37	14	190	1	0.0	4.7	30	1.3	37	1.1	300
		(upper estimate)	1.8	0.6	51	22	241	21	84	5.4	36	1.6	50	4.8	393
Denmark	North Sea														
	Skagerrak														
	Kattegat														
France	Channel/North Sea	(lower estimate)								14.0	133.2	2.3	125.3	3.5	668.1
		(upper estimate)								14.1	133.2	2.3	153.2	3.6	668.3
	Atlantic	(lower estimate)								3.9	244.6	2.4		5.3	1754.3
		(upper estimate)								4.4	244.6	2.5		5.9	1755.3
Germany	North Sea	(lower estimate)	4.4	2.6	208	128	986	24	0.5	7.4	136	1.8	163	7.2	1424
		(upper estimate)	4.7	2.6	208	128	992	25	21	7.4	136	2.0	163	7.2	1531
Iceland	Atlantic														
Ireland	Irish Sea	(lower estimate)	0.3	NI	20	10	110	NI	NI	0.3		0.2			
		(upper estimate)	0.8	NI	22	15	111	NI	NI	0.3	19	0.2	26	0.5	117
	Celtic Sea	(lower estimate)	0.0	NI	30	7	151	NI	NI	1.3		1.1			
		(upper estimate)	3.3	NI	52	38	157	NI	NI	1.3	72	1.1	103	2.6	460
	Atlantic	(lower estimate)	0.0	NI	19	0	52	NI	NI	0.4		0.3			
		(upper estimate)	1.9	NI	30	19	58	NI	NI	0.4	15	0.3	28	1.1	312
Netherlands	North Sea	(lower estimate)	8.1	3.6	225	119	816	3	68	8	191	5.5	245	10	1296
		(upper estimate)	8.9	3.6	226	122	823	79	73	8	193	5.7	248	11	1303
Norway	Skagerrak	(lower estimate)	1	0.06	94	18	305	3	0.00	1.4	22	0.33	37	0.79	333
		(upper estimate)	1	0.10	94	18	305	10	103.7	1.4	22	0.34	37	0.79	333
	North Sea	(lower estimate)	0.62	0.06	28	11	123	0.00	0.0	0.77	11	0.18	17	0.42	175
		(upper estimate)	0.66	0.08	28	11	123	0.80	4.6	0.78	11	0.19	17	0.42	175
	Norwegian Sea	(lower estimate)	0.47	0.07	59	6	127	0	0.0	0.4	4	0.18	11	0.44	275
		(upper estimate)	0.57	0.09	59	6	127	1.4	27.3	0.4	4	0.19	11	0.44	275
	Barents Sea	(lower estimate)	0.19	0.02	38	1.0	22	0	0	0.33	0.38	0.05	4	0.17	31
		(upper estimate)	0.21	0.02	38	1.0	22	0.57	10.8	0.33	0.38	0.05	4	0.17	31
Portugal	Atlantic	(lower estimate)	0.79	0.52	29	8	110	NI	NI	0.49	12	1.7	4	1.8	172
		(upper estimate)	0.79	0.52	29	8	110	NI	NI	0.49	12	1.7	4	1.8	172
Spain	Atlantic	(lower estimate)	0.2	0.00	7	2.2	342	0	0	4	28	1	53	1	259
		(upper estimate)	85	4	200	173	709	198	687	6	57	2	61	3	348
Sweden	Kattegat	(estimate)	0.45	0.08	42	15	144	NI	NI	1.3	20	0.32	34	0.97	NI
	Skagerrak	(estimate)	0.07	0.02	5.3	1.8	19	NI	NI	0.22	1.74	0.06	3.7	0.14	NI
United Kingdom	North Sea North	(lower estimate)	3.4	0.17	60	376	1002	10	2	1.0	33	1	43	1	715
		(upper estimate)	3.5	0.29	61	376	1018	29	81.8	1.1	33	1	43	1	719
	North Sea South	(lower estimate)	0.7	0.07	41	43	194	0	0.35	1.3	60	4	56	4	158
		(upper estimate)	1.0	0.13	41	45	196	23	45	1.4	60	4	57	4	159
	North Sea (Channel)	(lower estimate)	0.38	0.05	33	9	110	0.00	0	0.39	22	0.63	16	0.63	183
		(upper estimate)	0.46	0.09	34	16	114	11.0	7.2	0.44	22	0.65	16	0.65	184
	Total North Sea	*(lower estimate)*	*4.5*	*0.29*	*134*	*428*	*1306*	*10*	*2.06*	*2.7*	*115*	*5.0*	*114*	*5.4*	*1056*
		(upper estimate)	*4.9*	*0.51*	*136*	*437*	*1328*	*64*	*134*	*2.9*	*115*	*5.1*	*116*	*5.5*	*1063*
	Celtic Sea	(lower estimate)	0.78	0.06	55	47	268	0	0	0.80	45	1.4	36	1.4	669
		(upper estimate)	1.5	0.16	55	59	273	29	0.0	0.99	45	1.4	36	1.4	672
	Irish Sea	(lower estimate)	1.7	0.17	165	157	489	2.8	0.07	3	41	2.2	43	2.3	446
		(upper estimate)	2.4	0.30	165	163	498	35	76	4	41	2.3	43	2.41	459
	Atlantic	(lower estimate)	0.25	0.01	85	20	155	9	0	1.2	13	0.82	17	1.8	217
		(upper estimate)	1.7	0.09	86	21	165	19	0.0	1.4	13	0.86	18	1.8	222
	Total non-North Sea	*(lower estimate)*	*3*	*0.24*	*304*	*225*	*913*	*12.1*	*0.07*	*5.1*	*99*	*4.4*	*97*	*5.5*	*1332*
		(upper estimate)	*5.6*	*0.55*	*306*	*244*	*936*	*83*	*76*	*5.9*	*99*	*5*	*97*	*5.7*	*1354*

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

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

(2) Suspended particulate matter

Table 4a. Sum of Direct (Table 2) and Riverine (Table 3) Inputs to the Maritime Area of the OSPAR Convention in 2006 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)	1.0	0.4	37	14	190	1.2	0.00	4.7	30	1.3	37	1.1	300
		(upper estimate)	2	0.6	51	22	241	21	84	5.4	36	1.6	50	4.8	393
Denmark	North Sea		NI	NI	NI	NI	NI	NI	NI	0.00	0.00	0.00	0.00	0.00	NI
	Skagerrak		NI	NI	NI	NI	NI	NI	NI	0.00	0.00	0.00	0.00	0.00	NI
	Kattegat		NI	NI	NI	NI	NI	NI	NI	0.00	0.00	0.00	0.00	0.00	NI
France	Channel/North Sea	(lower estimate)	NI	NI	NI	NI	NI	NI	NI	14.0	133	2.3	125.3	3.48	668
		(upper estimate)	NI	NI	NI	NI	NI	NI	NI	14.1	133	2.3	153.2	3.58	668
	Atlantic	(lower estimate)	NI	NI	NI	NI	NI	NI	NI	3.9	245	2.4	NI	5.29	1754
		(upper estimate)	NI	NI	NI	NI	NI	NI	NI	4.4	245	2.5	NI	5.89	1755
Germany	North Sea	(lower estimate)	4.4	2.6	210	129	996	24	0.5	9.1	138	1.9	167	7.6	1426
		(upper estimate)	4.8	2.7	211	130	1007	25	24	9.1	138	2.1	167	7.6	1533
Iceland	Atlantic														
Ireland (2)	Irish Sea	(lower estimate)	0.37	0.00	28	13	173	NI	NI	0.25	0	0.16	7	1.6	38
		(upper estimate)	0.89	0.00	30	18	174	NI	NI	0.25	19	0.16	33	2.1	155
	Celtic Sea	(lower estimate)	0.02	0.00	33	11	173	NI	NI	1.27	0	1.10	3	0.7	19
		(upper estimate)	3.29	0.00	55	42	178	NI	NI	1.30	72	1.11	106	3.3	479
	Atlantic	(lower estimate)	0.01	0.00	19	0	59	NI	NI	0.35	0	0.27	1	0.2	4
		(upper estimate)	1.91	0.00	31	19	66	NI	NI	0.41	15	0.30	28	1.3	316
Netherlands (3) (4)	North Sea	(lower estimate)	8.3	3.6	229	121	836	3	68	8	192	5.5	251	10	1299
		(upper estimate)	9.1	3.6	230	124	843	79	73	8	194	5.7	254	11	1306
Norway	Skagerrak	(lower estimate)	1.3	0.11	94	34	318	3	0	1.4	26	0.61	37	6.3	333
		(upper estimate)	1.3	0.15	94	34	318	10	104	1	26	0.62	37	6.3	333
	North Sea	(lower estimate)	0.62	0.06	104	11	126	0.00	0	12.5	12.5	2	32	3.2	190
		(upper estimate)	0.66	0.08	104	11	126	0.80	5	12.5	12.5	2	32	3.2	190
	Norwegian Sea	(lower estimate)	0.51	0.07	191	7	129	0.00	0	20	7.2	4	36	5.5	735
		(upper estimate)	0.61	0.09	191	7	129	1.35	27	20	7.2	4	36	5.5	735
	Barents Sea	(lower estimate)	0.19	0.02	52	0.95	22	0.00	0	1.73	0.58	0.29	6.0	0.52	31
		(upper estimate)	0.21	0.02	52	1.0	22	0.57	11	1.73	0.58	0.29	6.0	0.52	31
Portugal	Atlantic		0.8	0.52	29	7.9	110	NI	NI	0.49	12	1.7	4	1.8	172
			0.8	0.52	29	7.9	110	NI	NI	0.49	12	1.7	4	1.8	172

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)	3.0	0.6	21	4	415	2.0	0.1	12	30	1.6	67	2.8	450
		(upper estimate)	99	5	230	226	795	210	704	15	59	3.3	76	4.6	552
Sweden	Kattegat	(lower estimate)	0.50	0.08	44	15.6	151	NI	NI	2.4	20	0.32	36	1.05	NI
	Skagerrak	(lower estimate)	0.08	0.02	5.6	2.0	19.3	NI	NI	0.37	1.7	0.06	4.1	0.15	NI
United Kingdom	North Sea North	(lower estimate)	3.5	0.2	70	378	1033	12	2	11	36	2.4	58	3.4	743
		(upper estimate)	3.5	0.3	72	378	1049	32	87	11	36	2.5	58	3.5	747
	North Sea South	(lower estimate)	0.8	0.15	64	49	261	2.9	0.35	8	70	7	71	7	295
		(upper estimate)	1.1	0.22	64	52	264	33	47	8	70	7	74	7	296
	North Sea Channel	(lower estimate)	0.39	0.09	38	10	124	0.4	0.00	7.8	24	1.5	26	1.5	200
		(upper estimate)	0.48	0.13	38	17	128	14	13	7.8	24	1.6	26	1.6	201
	North Sea	*(lower estimate)*	*4.7*	*0.4*	*172*	*437*	*1418*	*15*	*2.19*	*26*	*130*	*10*	*155*	*11*	*1238*
		(upper estimate)	*5.1*	*0.7*	*173*	*448*	*1441*	*79*	*147*	*27*	*130*	*11*	*159*	*12*	*1245*
	Celtic Sea	(lower estimate)	0.9	0.06	57	49	297	0.2	1.2	4.4	46	2.1	40	2.1	679
		(upper estimate)	1.6	0.17	58	61	302	30	1	4.6	46	2.2	40	2.2	683
	Irish Sea	(lower estimate)	1.7	0.18	166	161	506	2.8	0.07	8	42	2.8	50	3.0	455
		(upper estimate)	2.9	0.44	171	175	547	38	77	8	43	2.9	50	3.1	469
	Atlantic	(lower estimate)	0.27	0.03	87	21	175	11.1	0.00	4.9	15	1.9	26	3.4	241
		(upper estimate)	1.8	0.2	88	22	185	22	0.0	5.0	16	2.0	27	3.4	247
	non-North Sea	*(lower estimate)*	*2.9*	*0.27*	*310*	*231*	*978*	*14.0*	*1.3*	*17*	*104*	*6.8*	*116*	*9*	*1375*
		(upper estimate)	*6*	*0.8*	*317*	*258*	*1034*	*90*	*78*	*18*	*104*	*7*	*117*	*9*	*1398*
Total reported:		(lower estimate)	**29**	**9**	**1579**	**1038**	**6114**	**62**	**72**	**136**	**1081**	**42**	**1083**	**72**	**10034**
		(upper estimate)	**136**	**14**	**1847**	**1365**	**6654**	**517**	**1256**	**142**	**1224**	**45**	**1297**	**83**	**11262**

(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

(4) For direct inputs the upper estimate is used since there is no lower estimate.

Table 4b. Sum of Direct and Riverine Inputs to the Maritime Area of the OSPAR Convention in 2006 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 Atlantic Ocean	***Arctic Ocean*** Barents Sea	(lower estimate)	0.19	0.02	52	0.95	22	0.00	0.0	1.73	0.58	0.29	6.0	0.52	31
		(upper estimate)	0.21	0.02	52	1.0	22	0.57	10.8	1.73	0.58	0.29	6.0	0.52	31
	Atlantic Ocean (main body)	(lower estimate)	0.28	0.03	107	21	234	11.1	0.00	5.2	15	2.2	27	3.6	246
		(upper estimate)	3.7	0.2	119	42	250	22	0.0	5.5	30	2.3	55	4.7	563
	Bay of Biscay and Iberian Coast	(lower estimate)	3.8	1.09	50	12	525	2.0	0.1	16	287	5.7	71	9.9	2377
		(upper estimate)	100	5	259	234	905	210	704	20	316	7.5	80	12.3	2479
North Sea	Kattegat	(lower estimate)	0.50	0.08	44	16	151	NI	NI	2.4	20	0.32	36	1.1	NI
		(upper estimate)	0.50	0.08	44	16	151	NI	NI	2.4	20	0.32	36	1.1	NI
	Skagerrak	(lower estimate)	1.4	0.13	99	36	337	3	0	1.8	28	0.66	41	6.4	333
		(upper estimate)	1.4	0.2	99	36	337	10	104	1.8	28	0.68	41	6.4	333
	North Sea (main body)	(lower estimate)	19	7.0	714	702	3442	43	70.7	53	478	20	616	32	4253
		(upper estimate)	21	7.5	731	717	3530	191	319	54	486	20	635	37	4466
	Channel	(lower estimate)	0.39	0.09	38	10	124	0.4	0.00	21.8	157	3.8	151	5.0	868
		(upper estimate)	0.48	0.13	38	17	128	14	13	22.0	158	3.9	179	5.2	870
Norwegian Sea		(lower estimate)	0.51	0.07	191	6.8	129	0.00	0.0	20	7.2	3.62	36	5.5	735
		(upper estimate)	0.61	0.09	191	6.8	129	1.4	27	20	7.2	3.63	36	5.5	735
Irish Sea		(lower estimate)	2.1	0.18	194	174	679	2.8	0.07	8	42	3.0	57	4.6	493
		(upper estimate)	3.7	0.44	201	193	722	38	77	8	62	3.1	83	5.2	624
Celtic Sea		(lower estimate)	0.9	0.06	90	60	470	0.2	1.2	5.6	46	3.2	43	2.8	698
		(upper estimate)	4.9	0.17	113	103	480	30	1	5.9	118	3.3	146	5.5	1161

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.

Annex II. Questionnaire for the 2006 Assessment

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** (***This question was answered incompletely by most Contracting Parties last year***)			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	o , ,,

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			
	or are composite samples taken, i.e. several samples from across the river section?			
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			
	or further down in the water masses (depth integrated sampling)?			
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		
	If yes, which year(s) and for which parameters?		
	If the detection limits of the laboratory (-ies) have changed over time?		
	If yes, for which parameters and years?		
	Changed in (year)	Parameter	Detection limit (from-to)

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	

e	**Transboundary rivers**	
	Is the river transboundary?	
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country (e.g. in terms of sampling frequency, sampling dates, parameters)?	

2. Direct discharges and losses

a	**Direct discharges are defined in 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".**	
	Describe how industrial discharges of RID parameters are quantified	
	Describe how discharges from waste water treatment plants are quantified	
	Describe how discharges from fish farming (inland and marine) are quantified	
	Other point sources (please specify) how any other point sources (please specify) are quantified	
	Describe how diffuse losses are quantified	

3. Completeness of monitoring, and reporting on unmonitored areas

a	**According to the RID Principles, 90% of the land area draining into the Maritime Area shall be monitored.**	
	Is your country monitoring more than 90% of the land area draining into the Maritime Area?	
	If no, how are the inputs from the remaining areas estimated?	
	Have these estimation methods changed over time?	
	If yes, please indicate if these changes in methods have resulted in changes in previously reported input data.	

4. Use of the RID data

a	**Are the RID Data used for other purposes than the OSPAR reporting? If so, please indicate which and how:**			
	Type of use:	Yes	No	Comments
	General national watershed planning			
	Used for setting environmental goals			
	Used in connection with the implementation of the EU Water Framework Directive			
	Regional and local watershed planning			
	Other international reporting			
	Research and development:			
	Other (please specify):			
	If you are aware of any papers or reports that have used the national (or international) RID data in your country, please provide the references of these papers/reports below:			

Annex III. Overview of submitted replies to Questionnaire for the 2006 Assessment

1. Questions related to riverine transport:

a	**Distance of sampling stations from the sea and co-ordinates of stations.** **(*This question was answered incompletely by most Contracting Parties last year*)**			
	Country	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
	Belgium (Scheldt)	Unknown	52 km. For other rivers, see Annex III continued.	51° 21'14" N 4° 14' 31" E For other rivers, see Annex III continued.
	Denmark	NI	NI	NI
	France	See Annex V.	See Annex V.	See Annex V.
	Germany	NI	NI	NI
	Iceland	NI	NI	NI
	Ireland	NI	NI	NI
	Netherlands	0 km^2	Maassluis 15 km; Noordzeekanaal and Haringvlietsluizen 2 km; Ijsselmeer 0 km	Reported last year.
	Norway	See Annex V.	NI	See Annex IV.
	Spain	NI	NI	See Annex IV.
a	**Distance of sampling stations from the sea and co-ordinates of stations.** **(*This question was answered incompletely by most Contracting Parties last year*)**			
	Country	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
	Sweden	See Annex V.	See Annex V.	See Annex IV.
	UK	Not available. Reports by sampling region.	Not available. Reports by sampling region.	Not available. Reports by sampling region.

b	Sampling procedures and choice of location of sampling stations in larger rivers.			
	Country	Samples collected at only one point of the river cross section or are composite samples taken, i.e. several samples from across the river section?	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water or further down in the water masses (depth integrated sampling)?	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme?
	Belgium	Unknown	Unknown	Unknown
	Denmark	NI	NI	NI
	France	Samples collected at only one point. In general, for analysis based on water and not on sediments, a station corresponds to one measurement site. If several sites are used they have to be coherent and representative of the station.	The samples are in this case collected at mid-depth. The samples have to be representative of the situation.	They are part of the sampling program but the hydrological situation during the sampling has to be indicated and the sample has to be the more representative as possible.
	Germany	NI	NI	NI
	Iceland	NI	NI	NI
	Ireland	NI	NI	NI
	Netherlands	Samples collected at only one point.	Always 1 m below surface level.	No
	Norway	Samples collected at only one point.	The samplers are instructed to find sampling sites with turbulent waters, in order to ensure relative homogeneous conditions.	During extreme floods additional sampling has been done in some of the main rivers. For tributary rivers, the samples should preferably be event samples, taken 4 times a year during snowmelt floods, summer low flow, autumn rains and winter low flow.
	Spain	Samples collected at only one point.	Representative samples collected from the surface.	No
	Sweden	Samples collected at only one point.	0.5 m depth.	No
	UK	Samples collected at only one point.	Aim for 25 cm below river surface.	No. Sampling done on pre-determined days selected by statistics to give random sampling.

c	Changes in laboratories or detection limits over time. By checking previous RID reports, please indicate:		
	Country	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990? If yes, which year(s) and for which parameters?	If the detection limits of the laboratory (-ies) have changed over time? If yes, for which parameters and years?
	Belgium	Changes for all parameters in 1993. It is not known whether there have been any changes after that.	See Annex III continued.
	Denmark	NI	NI
	France	We use data from the national program of water monitoring to achieve our RID calculations. This program is carrying out by different Water Agencies that may call on different laboratories (local laboratories). But the labs are chosen among the labs recognized by the Ministry of the Environment. One of the criteria is accreditation. For these reasons, there have been changes since 1990, but it is difficult to detail them because of the number of labs involved. But the approval guarantees, to some extent, the coherence of the analyses.	The limits of quantification (the only information we have) have changed and, as different labs are involved, may be different from one lab to another. They have been improving since the beginning. To give an historic of the changes is too difficult and nearly impossible. However, these last years, the percentage of quantified analyses exceeds most of the time 70%, particularly for the macro-pollutants.
	Germany	NI	NI
	Iceland	NI	NI
	Ireland	NI	NI
	Netherlands	Change in laboratory for main river analyses of PCB (2006). No information on analysis of samples from tributary rivers.	No
	Norway	Two different laboratories have been used in the RID-programme in Norway: In the period 1990-1998, and from 2004 onwards, the NIVA Laboratory has been used. In the 5-year-period 1999-2003, the Analycen laboratory has been used. This change has an impact on the trend analyses.	Yes, but there is per date no comprehensive overview of this.
	Spain	Different labs perform the analysis for the different regional authorities in charge of RID data. Possible changes every 2-4 years. Not possible to answer for which parameters, but under study.	NI

c	Changes in laboratories or detection limits over time. By checking previous RID reports, please indicate:		
	Country	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990? If yes, which year(s) and for which parameters?	If the detection limits of the laboratory (-ies) have changed over time? If yes, for which parameters and years?
	Sweden	No	See Annex 6.
	UK	NI	NI

d	Hydrological data		
	Country	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.
	Belgium	Varies between rivers. See Annex III continued.	Varies between rivers. See Annex III continued.
	Denmark	NI	NI
	France	Continuous monitoring (C), but use of daily data for the calculations.	Our input calculations are based on the RID principles and the software RTrend is used.
	Germany	C	NI
	Iceland	NI	NI
	Ireland	NI	NI
	Netherlands	D	Yes, flow weighed concentration method.
	Norway	C: Continuous monitoring in 10 rivers, modelled water discharge in 36 tributaries.	Yes, flow weighted concentration method.
	Spain	Cannot give a general answer because it depends on the authority performing the analysis.	Yes – See questionnaire Rid_06 for further details. Expressions 1, 2 and 3 used
	Sweden	C	Generally by monitoring at dams of hydro electrical power plants, weirs etc.
	UK	Depends: see UK national report and answer to Norwegian questions last year. Generally daily	Yes

e	Transboundary rivers		
	Country	Is the river transboundary?	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).
	Belgium	3 transboundary rivers	Unknown
	Denmark	NI	NI
	France	No	NA
	Germany	NI	NI
	Iceland	NI	NI
	Ireland	NI	NI
	Netherlands	Yes	Not harmonised
	Norway	To all practical purposes – No.	-
	Spain	Limia and Duero rivers monitored by Portugal	NI
	Sweden	Two transboundary rivers (Göta älv and Enningdalsälven).	Not harmonized. It is only the upper stretches of each river that are transboundary.
	UK	No transboundary rivers	-

2. Direct discharges and losses

a	**Direct discharges are defined in 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".**					
	Country	Describe how industrial discharges of RID parameters are quantified	Describe how discharges from waste water treatment plants are quantified	Describe how discharges from fish farming (inland and marine) are quantified	Other point sources (please specify) how any other point sources (please specify) are quantified	Describe how diffuse losses are quantified
	Belgium	NA	NA	NA	NA	NA
	Denmark	NI	NI	NI	NI	NI
	France	The data used to estimate industrial discharges for OSPAR are extracted from the French database collected for EPER/E-PRTR. All the industrial facilities declared for EPER and located downstream the monitoring station of the zone are counted. For the unmonitored zones, only the discharges located at the outlet are counted.	The wastewater treatment plants located downstream the monitoring stations are taken into account. For the unmonitored zones, only the discharges located at the outlet are counted. We use the efficiency data of the wastewater treatment plant. The efficiency is calculated each year thanks to regular measurements made by the operator of the treatment plant.	Not estimated	None	The French register collected for EPER should take into account the diffuse losses with estimation methods.
	Germany	NI	NI	NI	NI	NI
	Iceland	NI	NI	NI	NI	NI
	Ireland	NI	NI	NI	NI	NI
	Netherlands	Quantified as the product of annual flow and flow weighted concentrations	An annual questionnaire sent out by the Netherlands Central Bureau of Statistics to the administrators of Sewage treatment plants for annual	Not quantified	Environmental annual reports of (larger) industries in which discharges are reported.	NI

a	**Direct discharges are defined in 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".**					
	Country	Describe how industrial discharges of RID parameters are quantified	Describe how discharges from waste water treatment plants are quantified	Describe how discharges from fish farming (inland and marine) are quantified	Other point sources (please specify) how any other point sources (please specify) are quantified	Describe how diffuse losses are quantified
			loads.		Annual questionnaire to administrators of rivers on annual direct and indirect loads from smaller industries.	
	Norway	The estimates of industrial discharges are based on the discharges reported by industries. Only industries required to report such losses are registered. Sampling frequency for industrial wastewater varies from weekly composite samples to random grab samples, at least twice a year. Total nitrogen and total phosphorus loads from industry not connected to municipal treatment plants are modelled (TEOTIL).	The annual discharges of nutrients from municipal wastewater effluents are usually estimated as the product of annual flow and flow-weighted concentrations. For plants with no reporting requirements, as well as for population not connected to public treatment systems, the discharges are estimated by multiplying the number of people with standard Norwegian per capita load figures reduced by the removal efficiency of the treatment plants.	Discharges from fish farming (nitrogen and phosphorus) are calculated according to the HARP Guidelines. The basis for the estimates are mass balance equations, i.e. feed used (based on P or N content in feed), and fish production (based on P or N content in produced fish). Lately, also copper losses have been estimated theoretically, as this metal is used to avoid algae growth on the nets.	None	For nutrients, a model (TEOTIL) is used to assess nitrogen and phosphorus loads. The model's inputs comprise 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.
	Spain	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	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	Marine culture discharges are calculated through the maximum authorized difference in concentration from input water and discharges.	No other point sources are quantified.	Diffuse losses are not quantified.

a	**Direct discharges are defined in 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".**					
	Country	Describe how industrial discharges of RID parameters are quantified	Describe how discharges from waste water treatment plants are quantified	Describe how discharges from fish farming (inland and marine) are quantified	Other point sources (please specify) how any other point sources (please specify) are quantified	Describe how diffuse losses are quantified
		effluents were similar and data were not available, and fixed values when measurements were below detection limits. In general, flow values are the sum of authorised discharges, whereas concentration values are calculated through sampling. Load calculations are therefore obtained multiplying the volume of discharges authorized and the concentrations obtained in lab tests.	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 include; 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.			
	Sweden	Quantity out of reported content and discharge.	Quantity out of reported content and discharge.	Inland fish farms are included in the river transport. Marine fish farms are not included.	NI	Are included in the river transport.
	UK	RID principles guidance.	RID principles guidance.	Estimated	NI	Not quantified

3. Completeness of monitoring, and reporting on unmonitored areas

a	According to the RID Principles, 90% of the land area draining into the Maritime Area shall be monitored.				
	Country	Is your country monitoring more than 90% of the land area draining into the Maritime Area?	If no, how are the inputs from the remaining areas estimated?	Have these estimation methods changed over time?	If yes, please indicate if these changes in methods have resulted in changes in previously reported input data.
	Belgium	Yes	-	No	-
	Denmark	NI	NI	NI	NI
	France	No, 84 % of the land area draining into the Maritime Area is monitored.	Remaining areas are estimated with a reference monitored area. The reference area is determined based on geographical criteria (land cover etc.). The final estimation is balanced with the ratio of drainage areas.	No	
	Germany	40 % of the German catchment share is drained via the rivers Rhine and Meuse that discharge at the coast of the Netherlands. The remainder (60 %) is covered as follows: Ems: The monitoring station (Herbrum) covers 70 % of the German catchment share. The remaining 30 % are based on measurements of direct inputs and estimates. Jade: Discharges to the Jade Bay, which is situated between the Ems and Weser catchments and is counted to the Weser catchment, are provided as estimates of sewage effluents and industrial discharges. Weser:	-	NI	NI

a	According to the RID Principles, 90% of the land area draining into the Maritime Area shall be monitored.				
	Country	Is your country monitoring more than 90% of the land area draining into the Maritime Area?	If no, how are the inputs from the remaining areas estimated?	Have these estimation methods changed over time?	If yes, please indicate if these changes in methods have resulted in changes in previously reported input data.
		The monitoring station (Farge) covers 90 % of the catchment area. It is complimented by estimates of sewage effluents and industrial effluents downstream of Farge. Elbe: The monitoring station (Seemannshöft; ca 100 km upstream) covers approximately 95 % of the total input (i.e. including inputs from countries upstream of the German catchment). To this is added the input of the tributary rivers downstream of Seemannshöft as well as direct inputs downstream of Seemannshöft that are not covered by the tributaries. Eider: The monitoring stations Nordfeld (Eider) and Friedrichstadt (Treene; tributary) cover 85 % of the Eider/Treene catchment. The remaining 15 % are extrapolated to provide 100 % coverage of the catchment area.			
	Iceland	NI	NI	NI	NI
	Ireland	NI	NI	NI	NI
	Netherlands	Yes	-	No	-
	Norway	No. The total drainage area of the monitored rivers is about 180 000 km^2, which constitutes about 50% of the total land area draining into the convention seas. This involves that 46 rivers are monitored, whereas 201 rivers are not presently monitored in the RID Programme.	Of the 201 rivers not monitored, 109 were monitored once a year in the period 1990-2003, for these the calculation of loads was done as follows: For nutrients, S.P.M, Silica and TOC, the modelled average water discharge is multiplied with average concentration for the period	Yes	The change from sampling 109 rivers once a year to sampling 36 rivers 4 times a year have given some changes in the 36 rivers, as some substances have increased due to the fact that flood samples are now taken. This has for instance been observed in rivers

a	According to the RID Principles, 90% of the land area draining into the Maritime Area shall be monitored.				
	Country	Is your country monitoring more than 90% of the land area draining into the Maritime Area?	If no, how are the inputs from the remaining areas estimated?	Have these estimation methods changed over time?	If yes, please indicate if these changes in methods have resulted in changes in previously reported input data.
			1990-2003. For metals, the modelled average water discharge is multiplied with average concentration for the period 2000-2003 (earlier data were not used due to high detection limits). The remaining 92 rivers have never been included in the RID Programme, as well as areas downstream of the sampling pointsm the nutrient loads were modelled (the TEOTIL model). For metals, all direct discharges of metals in these areas were considered to be direct discharges to the sea.		with mining activities, and has therefore resulted in increased loads of some metals.
	Spain	Under study	No estimations are made.	NI	NI
	Sweden	No, 88.7% is monitored.	Estimated based on area specific loss from monitored reference areas.	No	-
	UK	No	Not estimated	NI	NI

4. Use of the RID data

a	Are the RID Data used for other purposes than the OSPAR reporting? If so, please indicate which and how:								
	Country	General national watershed planning	Used for setting environmental goals	Used in connection with the implementation of the EU Water Framework Directive	Regional and local watershed planning	Other international reporting	Research and development:	Other (please specify):	If you are aware of any papers or reports that have used the national (or international) RID data in your country, please provide the references of these papers/reports below:
	Belgium	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	NI
	Denmark	NI	NI	NI	NI	NI	NI	NI	NI
	France	No	No	The OSPAR recommendations have been taken into account for the selection of monitoring stations in the monitoring program.	Planned, some Water Agencies integrate the results obtained with RID to program measurements.	EIONET Water data flows by the European Environment Agency.	In progress with the French institute Ifremer, involved in another OSPAR program (EUC).	No	A cooperation is in progress with Ifremer to highlight the RID data.
	Germany	NI	NI	NI	NI	NI	NI	NI	NI
	Iceland	NI	NI	NI	NI	NI	NI	NI	NI
	Ireland	NI	NI	NI	NI	NI	NI	NI	NI
	Netherlands	No	No	Riverine input data are used for WFD, but as WFD has defined	No	No	No	No	NI

a	Are the RID Data used for other purposes than the OSPAR reporting? If so, please indicate which and how:								
	Country	General national watershed planning	Used for setting environmental goals	Used in connection with the implementation of the EU Water Framework Directive	Regional and local watershed planning	Other international reporting	Research and development:	Other (please specify):	If you are aware of any papers or reports that have used the national (or international) RID data in your country, please provide the references of these papers/reports below:
				waterbodies, calculations are made using raw data, not the compiled RID data					
	Norway	NI	NI	NI	NI	EEA-reporting	NI	RID data are used within other monitoring programmes in Norway to complement and/or assess results, e.g. Outer Oslofjord, coastal monitoring programme, as well as within the SOA linked to the TEOTIL estimates.	NI
	Spain	National sewage treatment plan.	In application of Directive 2006/11 EC on Hazardous Substances.	Used for the analyses of pressures on coastal and transitional waters.	Taken into account in drafting river basin management	No	No	No	Medio ambiente en España 2006 – Annual report from the Spanish Environmental

a	**Are the RID Data used for other purposes than the OSPAR reporting? If so, please indicate which and how:**								
	Country	General national watershed planning	Used for setting environmental goals	Used in connection with the implementation of the EU Water Framework Directive	Regional and local watershed planning	Other international reporting	Research and development:	Other (please specify):	If you are aware of any papers or reports that have used the national (or international) RID data in your country, please provide the references of these papers/reports below:
					plans.				Ministry.
	Sweden	Yes	Yes	Yes	Yes	HELCOM, EEA (EIONET)	Yes	Yes	NI
	UK	Yes	NI	Yes	NI	NI	Yes	NI	NI

Annex III continued – individual answers for the Belgian catchments.

Questionnaire for the 2006 Assessment: Scheldt river, main river (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** (***This question was answered incompletely by most CPs in 2006***)			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	Km	o , ,,
	Scheldt	unknown	52	51° 21'14" N 4° 14' 31" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		yes
	If yes, which year(s) and for which parameters?		1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?		yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often from and even within almost every series of measurements for every parameter. Nevertheless, they were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1993	Cd	0,1 to 1 µg/l
	1993	Hg	0,01 to 1 µg/l
	1993	Cu	0,1 to 40 µg/l
	1993	Pb	0,1 to 10 µg/l
	1993	Zn	1 to ? µg/l
	1993	γ-HCH	1 to 10 ng/l
	1993	PCB's	1<=DL<=7 to 10<=DL<=70 ng/l[1]
	1993	NH4-N	0,001 to 0,05 mg/l
	1993	total N	0,1 to 2 mg/l
	1993	total P	0,01 to 0,2 mg/l
	1994	Zn	? to 10 µg/l
	1994	NH4-N	0,05 to 0,1 mg/l
	1994	PO4-P	0,005 to 0,2 mg/l
	1994	total P	0,2 to 0,1 mg/l
	1995	Cu	40 to 15 µg/l

[1] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the serie would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

	1995	Pb	10 to 5 µg/l
	1995	Zn	10 to ? µg/l
	1995	γ-HCH	10 to ? ng/l
	1995	PCB's	10<=DL<=70 to 2<=DL<=14 µg/l
	1995	NO3-N	0,1 to ? mg/l
	1995	PO4-P	0,2 to 0,1 mg/l
	1995	total N	2 to ? mg/l
	1995	total P	0,1 to 0,2 mg/l
	1996	Cu	15 to 10 µg/l
	1996	Pb	5 to 20 µg/l
	1996	Zn	? to 10 µg/l
	1996	NH4-N	0,1 to 0,5 mg/l
	1996	NO3-N	? to 0,1 mg/l
	1996	PO4-P	0,1 to 0,5 mg/l
	1997	Hg	0,01 to 0,03 µg/l
	1997	Pb	20 to 10 µg/l
	1997	Zn	10 to ? µg/l
	1997	PCB's	2<=DL<=14 to 5<=DL<=35 ng/l
	1997	total N	2 to 1 mg/l
	1997	total P	0,2 to 1 mg/l
	1998	Cd	1 to 0,06 µg/l
	1998	Hg	0,03 to 0,2 µg/l
	1998	Cu	10 to 0,6 µg/l
	1998	Pb	10 to 0,35 µg/l
	1998	Zn	? to 5 µg/l
	1998	PO4-P	0,5 to 0,1 mg/l
	1999	γ-HCH	? to 6 ng/l
	1999	PCB's	5<=DL<=35 to 21<=DL<=64 ng/l
	2000	Cd	0,06 to 1,2 µg/l
	2000	Hg	0,2 to 0,03 µg/l

	2000	Pb	0,35 to 6 µg/l
	2000	PCB's	21<=DL<=64 to 1<=DL<=11 ng/l
	2000	NH4-N	0,5 to 0,04 mg/l
	2000	total P	1 to 0,5 mg/l
	2001	Hg	0,03 to 0,01 µg/l
	2001	Pb	6 to 0,35 µg/l
	2001	PCB's	11 to 12 ng/l
	2001	NH4-N	0,04 to 1 mg/l
	2001	total P	0,5 to 0,48 mg/l
	2002	Hg	0,01 to ? µg/l
	2002	total P	0,48 to 0,94 mg/l
	2003	Hg	? to 0,08 µg/l
	2003	Cu	0,6 to 3 µg/l
	2003	Pb	0,35 to 6 µg/l
	2003	PO4-P	0,1 to 0,15 mg/l
	2004	Hg	0,08 to 0,03 µg/l
	2004	Pb	6 to 11 µg/l
	2004	total P	0,94 to 0,7 mg/l
	2005	Cd	1,2 to 0,6 µg/l
	2005	Cu	3 to 5 µg/l
	2005	NH4-N	1 to 0,5 mg/l
	2005	total P	0,7 to 1 mg/l

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	M
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Discharge values are compounded from averages over ten day measurements at an upstream dam and 7 dammed tributaries and from a monthly water balance of the Antwerp harbour.

e	**Transboundary rivers**	
	Is the river transboundary?	Yes
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	unknown

Questionnaire for the 2006 Assessment: Beverdijkvaart, tributary river in the Western Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** (***This question was answered incompletely by most CPs in 2006***)			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	Km	o ' "
	Beverdijkvaart	unknown	1,3	51° 07' 33" N 2° 46' 08" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		yes
	If yes, which year(s) and for which parameters?		1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?		yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often even within almost every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH_4-N	0,001 to ? mg/l
	1994	NO_3-N	0,1 to ? mg/l
	1994	PO_4-P	0,005 ? mg/l
	1994	Total N	0,1 to ? mg/l
	1994	Total P	0,01 to ? mg/l
	1997	Cd	0,14 to 0,138 µg/l
	1997	Cu	1,06 to 1,22 µg/l
	1997	Pb	1,58 to ? µg/l
	1997	Zn	10,3 to ? µg/l
	1997	NH_4-N	? to 0,1 mg/l
	1997	NO_3-N	? to 0,2 mg/l
	1997	PO_4-P	? to 0,1 mg/l
	1998	Cd	0,138 to 0,130 µg/l
	1998	Cu	1,22 to 2,52 µg/l
	1998	Pb	? to 0,35 µg/l
	1998	Zn	? to 5 µg/l
	1998	NH_4-N	0,1 to 0,5 mg/l
	1998	Total P	? to 1 mg/l

	1999	Cd	0,130 to 5 µg/l
	1999	Cu	2,52 to 5,59 µg/l
	1999	Pb	0,35 to 5 µg/l
	1999	PCB's	5<=DL<=35 to 3<=DL<=28 ng/l[2]
	2000	Cd	5 to 1,2 µg/l
	2000	Cu	5,59 to 1,5 µg/l
	2000	Pb	5 to 1,3 µg/l
	2000	PCBs	3<=DL<=28 to 1<=DL<=11 ng/l
	2000	NH_4-N	0,5 to 0,03 mg/l
	2000	NO_3-N	0,2 to 0,02 mg/l
	2001	Cd	1,2 to 0,7 µg/l
	2001	Cu	1,5 to 0,6 µg/l
	2001	γ-HCH	? to 6 ng/l
	2001	PCBs	1<=DL<=11 to 1<=DL<=12 ng/l
	2001	NH_4-N	0,03 to 1,03 mg/l
	2001	NO_3-N	0,02 to 0,48 mg/l
	2001	Total P	1 to 0,94 mg/l
	2002	Cu	0,6 to 0,3 µg/l
	2002	Pb	1,3 to 1,7 µg/l
	2002	NH_4-N	1,03 to 1 mg/l
	2002	NO_3-N	0,48 to 0,94 mg/l
	2003	Cd	0,7 to 0,1 µg/l
	2003	Cu	0,3 to 3 µg/l
	2003	NH_4-N	1 to 0,52 mg/l
	2004	Cd	0,1 to 0,12 µg/l
	2004	Cu	3 to 4 µg/l
	2004	Pb	1,7 to 2 µg/l

[2] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC series of the RID Principles, the highest value belongs to a situation where all congeners of the series would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

	2004	Zn	7 to 13 µg/l
	2004	NH_4-N	0,52 to 0,27 mg/l
	2004	NO_3-N	0,94 to 0,77 mg/l
	2005	Cu	4 to 3 µg/l
	2005	NH_4-N	0,27 to 0,5 mg/l
	2005	Total P	0,94 to 1 mg/l
	2006	Cd	0,12 to 0,1 µg/l
	2006	Pb	2 to 1,7 µg/l
	2006	Zn	13 to 7 µg/l
	2006	NH_4-N	0,5 to 0,27 mg/l
	2006	Total P	1 to 0,86 mg/l

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	neither
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Flow value was estimated in 1993 at 0,8 m³/s and since then used as a yearly mean value.

e	**Transboundary rivers**	
	Is the river transboundary?	No
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	

Questionnaire for the 2006 Assessment: Blankenbergsevaart, tributary river in the Eastern Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** **(*This question was answered incompletely by most CPs last year*)**			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	° ' "
	Blankenbergsevaart	unknown	2,5	51° 17' 35" N 3° 07' 12" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		yes
	If yes, which year(s) and for which parameters?		1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?		yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often even within almost every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH_4-N	0,001 to ? mg/l
	1994	NO_3-N	0,1 to ? mg/l
	1994	PO_4-P	0,005 ? mg/l
	1994	Total N	0,1 to ? mg/l
	1994	Total P	0,01 to ? mg/l
	1997	Cd	0,14 to 0,136 µg/l
	1997	Cu	1,05 to ? µg/l
	1997	Pb	? to 0,475 µg/l
	1997	Zn	0,74 to ? µg/l
	1997	NH_4-N	? to 0,1 mg/l
	1997	NO_3-N	? to 0,2 mg/l
	1998	Cd	0,136 to 0,132 µg/l
	1998	Cu	? to 0,6 µg/l
	1998	Pb	0,475 to 0,524 µg/l
	1998	Zn	? to 5 µg/l
	1998	PCBs	2<=DL<=35 to 5<=DL<=35 ng/l[3]

[3] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the series would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was

	1998	Zn	? to 5 µg/l
	1998	PCB's	2<=DL<=35 to 5<=DL<=35 ng/l[4]
	1998	NH_4-N	0,1 to 0,5 mg/l
	1998	PO_4-P	? to 0,1 mg/l
	1998	Total P	? to 1 mg/l
	2000	Cd	0,132 to 1,2 µg/l
	2000	Pb	0,52 to 1,3 µg/l
	2000	PCBs	5<=DL<=35 to 1<=DL<=11 ng/l
	2000	NH_4-N	0,5 to 0,03 mg/l
	2001	γ-HCH	3 to 2 ng/l
	2001	PCB's	1<=DL<=11 to 1<=DL<=12 ng/l
	2001	NH_4-N	0,03 to 1 mg/l
	2001	NO_3-N	0,02 to 0,94 mg/l
	2002	Cd	01,2 to 0,7 µg/l
	2002	Pb	1,3 to 1,7 µg/l
	2002	Zn	5 to 7 µg/l
	2002	NH_4-N	1,03 to 1 mg/l
	2002	NO_3-N	0,48 to 0,94 mg/l
	2002	Total P	1 to 0,94 mg/l
	2003	Cd	0,7 to 0,3 µg/l
	2003	Cu	0,6 to 3 µg/l
	2003	Pb	1,7 to 0,6 µg/l
	2003	NH_4-N	1 to 0,52 mg/l
	2003	NO_3-N	0,94 to 1 mg/l
	2003	PO_4-P	0,09 to 0,1 mg/l
	2004	Cd	0,3 to 0,12 µg/l

comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

[4] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the series would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

	2004	Cu	3 to 4 µg/l
	2004	Pb	0,6 to 2 µg/l
	2004	Zn	7 to 13 µg/l
	2004	γ-HCH	2 to 6 ng/l
	2004	NO_3-N	1 to 0,77 mg/l
	2005	Pb	2 to 1,7 µg/l
	2005	NH_4-N	1 to 0,5 mg/l
	2005	Total P	0,94 to 1 mg/l
	2006	Cd	0,12 to 0,1 µg/l
	2006	Cu	4 to 3 µg/l
	2006	Zn	13 to 7 µg/l
	2006	γ-HCH	6 to 2 ng/l
	2006	NH_4-N	0,5 to 0,27 mg/l
	2006	Total P	1 to 0,86 mg/l

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	neither
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Flow value was estimated in 1993 at 0,4 m³/s and since then used as a yearly mean value.

e	**Transboundary rivers**	
	Is the river transboundary?	No
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	

Questionnaire for the 2006 Assessment: Gent-Oostende canal, tributary river in the Middle Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** **(*This question was answered incompletely by most CPs last year*)**			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	o ' "
	Kanaal Gent-Oostende	unknown	0,2	51° 13' 23" N 2° 57' 03" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			Unknown
	or are composite samples taken, i.e. several samples from across the river section?			Unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			Unknown
	or further down in the water masses (depth integrated sampling)?			Unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			Unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		Yes
	If yes, which year(s) and for which parameters?		1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?		Yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often even within almost every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH4-N	0,001 to ? mg/l
	1994	NO3-N	0,1 to ? mg/l
	1994	PO4-P	0,005 ? mg/l
	1994	Total N	0,1 to ? mg/l
	1994	Total P	0,01 to ? mg/l
	1997	Cd	0,14 to 0,116 µg/l
	1998	Cd	0,116 to 0,130 µg/l
	1998	Cu	? to 0,6 µg/l
	1998	Pb	? to 0,35 µg/l
	1998	Zn	? to 5 µg/l
	1998	PCB's	4<=DL<=56 to 5<=DL<=35 ng/l[5]
	1998	NH_4-N	? to 0,5 mg/l
	1998	NO_3-N	? to 0,1 mg/l
	1998	PO_4-P	? to 0,1 mg/l
	1998	Total P	? to 1 mg/l

[5] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the serie would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

	1999	Cd	0,130 to 5 µg/l
	1999	Cu	0,6 to 5,59 µg/l
	1999	Pb	0,35 to 5 µg/l
	1999	PCBs	5<=DL<=35 to 3<=DL<=24 ng/l
	2000	Cd	5 to 1,2 µg/l
	2000	Cu	5,59 to 1,5 µg/l
	2000	Pb	5 to 1,3 µg/l
	2000	γ-HCH	? to 3 ng/l
	2000	PCB's	3<=DL<=24 to 1<=DL<=11 ng/l
	2000	NH_4-N	0,5 to 0,03 mg/l
	2001	Cd	1,2 to ? µg/l
	2001	Hg	0,03 to ? µg/l
	2001	Cu	1,5 to 0,6 µg/l
	2001	γ-HCH	3 to 6 ng/l
	2001	PCBs	1<=DL<=11 to 1<=DL<=12 ng/l
	2001	NH_4-N	0,03 to 0,52 mg/l
	2001	total P	1 to 0,94 mg/l
	2002	Cd	? to 0,7 µg/l
	2002	Hg	? to 0,03 µg/l
	2002	Cu	0,6 to 1,5 µg/l
	2002	Pb	1,3 to 1,7 µg/l
	2003	Cd	0,7 to 0,1 µg/l
	2003	Cu	1,5 to 3 µg/l
	2004	Cd	0,1 to 0,12 µg/l
	2004	Cu	3 to 4 µg/l
	2004	Pb	1,7 to 2 µg/l
	2004	Zn	5 to 13 µg/l
	2004	NH_4-N	0,52 to 0,27 mg/l
	2004	NO_3-N	0,1 to ? mg/l
	2005	Zn	13 to 5 µg/l

	2005	NH_4-N	0,27 to 0,5 mg/l
	2005	NO_3-N	? to 0,1 mg/l
	2005	Total P	0,94 to 1 mg/l
	2006	Cd	0,12 to 0,1 µg/l
	2006	Hg	0,03 to 0,1 µg/l
	2006	Cu	4 to 3 µg/l
	2006	Pb	2 to 1,7 µg/l
	2006	Zn	5 to 7 µg/l
	2006	NH_4-N	0,5 to 0,27 mg/l
	2006	Total P	1 to 0,86 mg/l

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	neither
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Flow value was estimated in 1993 at 5 m³/s and since then used as a yearly mean value.

e	**Transboundary rivers**	
	Is the river transboundary?	No
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	

Questionnaire for the 2006 Assessment: Gent-Terneuzen canal, tributary of the Scheldt river (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** (***This question was answered incompletely by most CPs last year***)			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	° ' "
	Kanaal Gent-Terneuzen	unknown	16	51° 12' 30" N 3° 48' 16" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**	
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?	yes
	If yes, which year(s) and for which parameters?	1993 all parameters, later on unknown

	If the detection limits of the laboratory (-ies) have changed over time?		yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often even within almost every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1995	Cd	? to 0,1 µg/l
	1995	Cu	? to 3 µg/l
	1995	Pb	? to 6 µg/l
	1996	Cd	0,1 to 1 µg/l
	1996	Cu	3 to 10 µg/l
	1996	Pb	6 to 10 µ/l
	1996	Zn	? to 2 µ/l
	1996	PCBs	? to 1<=DL<=28 ng/l[6] (1)
	1996	NH_4-N	? to 0,5 mg/l
	1996	NO_3-N	? to 0,1 mg/l
	1997	Zn	2 to 20 µg/l
	1997	γ-HCH	? to 5 ng/l
	1997	PCBs	1<=DL<=28 to 4<=DL<=35 ng/l
	1997	NH_4-N	0,5 to ? mg/l
	1997	NO_3-N	0,1 to ? mg/l
	1997	PO_4-P	? to 0,5 mg/l
	1997	total P	? to 1 mg/l
	1998	Cd	1 to 0,06 µg/l
	1998	Hg	? to 0,2 µg/l

[6] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the series would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

	1998	Cu	10 to 0,6 µg/l
	1998	Pb	10 to 0,35 µg/l
	1998	Zn	20 to 5 µg/l
	1998	PCBs	4<=DL<=35 to 5<=DL<=35 ng/l
	1998	NH_4-N	? to 0,5 mg/l
	1998	NO_3-N	? to 0,1 mg/l
	1998	PO_4-P	0,5 to 0,1 mg/l
	1999	γ-HCH	5 to ? ng/l
	1999	PCB's	5<=DL<=35 to 4<=DL<=20 ng/l
	1999	NH_4-N	0,5 to 2,3 mg/l
	2000	Cd	0,06 to 1,2 µg/l
	2000	Hg	0,2 to 0,1 µg/l
	2000	Cu	0,6 to 5 µg/l
	2000	Pb	0,35 to 5 µg/l
	2000	PCBs	4<=DL<=20 to 1<=DL<=11 ng/l
	2000	NH_4-N	2,3 to 0,4 mg/l
	2001	Cd	1,2 to 0,7 µg/l
	2001	γ-HCH	? to 6 ng/l
	2001	PCBs	1<=DL<=11 to 1<=DL<=12 ng/l
	2002	Hg	0,1 to 0,03 µg/l
	2002	Zn	5 to 2 µg/l
	2002	NH_4-N	0,4 to 1 mg/l
	2002	Total P	1 to 0,94 mg/l
	2003	Cd	0,7 to 0,3 µg/l
	2003	Zn	2 to 5 µg/l
	2004	Cd	0,3 to 0,25 µg/l
	2004	Hg	0,03 to 0,04 µg/l
	2004	NH_4-N	1 to 0,4 mg/l
	2004	Total P	0,94 to 1 mg/l
	2005	Cd	0,25 to 0,13 µg/l

	2005	Hg	0,04 to 0,01 µg/l
	2005	Pb	5 to 2 µg/l
	2005	NH_4-N	0,4 to 0,5 mg/l
	2006	Cd	0,13 to 0,3 µg/l
	2006	Hg	0,01 to 0,1 µg/l
	2006	Cu	5 to 3 µg/l
	2006	Pb	2 to 1,7 µg/l
	2006	NH_4-N	0,5 to 0,27 mg/l
	2006	Total P	1 to 0,86 mg/l

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	D
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Flow is measured daily at two feeding dams.

e	**Transboundary rivers**	
	Is the river transboundary?	Yes
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	unknown

Questionnaire for the 2006 Assessment: IJzer river, main river in the Western Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** (***This question was answered incompletely by most CPs last year***)			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	o ' "
	IJzer	Unknown	2,3	51° 07' 40" N 2° 48' 12" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		yes
	If yes, which year(s) and for which parameters?		1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?		yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often even within almost every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH_4-N	0,01 to ? mg/l
	1994	NO_3-N	0,1 to ? mg/l
	1994	PO4-P	0,005 to ? mg/l
	1994	total N	0,1 to ? mg/l
	1994	total P	0,01 to ? mg/l
	1996	Cd	0,1 to 0,14 µg/l
	1996	Cu	0,1 to ? µg/l
	1996	Pb	0,1 to 0,73 µg/l
	1996	Zn	1 to ? µg/l
	1997	Cd	0,14 to 0,119 µg/l
	1997	Zn	0,73 to 0,623 µg/l
	1997	NH4-N	? to 0,1 mg/l
	1998	γ-HCH	1 to ? ng/l
	1998	PCB's	1<=DL<=7 to 5<=DL<=35 ng/l[7]
	1998	NH4-N	0,1 to 5 mg/l

[7] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the serie would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

	1998	NO3-N	? to 0,1 mg/l
	1998	PO4-P	? to 0,1 mg/l
	1998	Total P	? to 1 mg/l
	1999	Cd	0,119 to 5 µg/l
	1999	Cu	? to 5 µg/l
	1999	Pb	0,623 to 5 µg/l
	1999	Zn	? to 13,75 µg/l
	1999	PCB	1<=DL<=35 to 5<=DL<=21 ng/l
	2000	Cd	5 to 1,2 µg/l
	2000	Hg	0,01 to 0,03 µg/l
	2000	Cu	5 to 0,6 µg/l
	2000	Pb	5 to 1,3 µg/l
	2000	Zn	13,75 to 5 µg/l
	2000	γ-HCH	? to 1 ng/l
	2000	PCB	1<=DL<=21 to 5<=DL<=11 ng/l
	2001	Hg	0,03 to ? µg/l
	2001	γ-HCH	1 to 6 ng/l
	2001	PCB	1<=DL<=11 to 5<=DL<=12 ng/l
	2001	NH4-N	0,5 to 1 mg/l
	2001	total P	1 to 0,94 mg/l
	2002	Cd	1,2 to 0,7 µg/l
	2002	Cu	0,6 to 1,5 µg/l
	2002	Pb	1,3 to 1,7 µg/l
	2002	γ-HCH	6 to ? ng/l
	2003	Cd	0,7 to 0,1 µg/l
	2003	Hg	? to 0,09 µg/l
	2003	Cu	1,5 to 3 µg/l
	2003	Pb	1,7 to 0,7 µg/l
	2003	Zn	5 to 7 µg/l
	2003	γ-HCH	? to 6 ng/l

	2003	NO3-N	0,1 to 0,94 mg/l
	2004	Cd	0,1 to 0,12 µg/l
	2004	Hg	0,09 to 0,03 µg/l
	2004	Cu	3 to 4 µg/l
	2004	Pb	0,7 to 2 µg/l
	2004	Zn	7 to 2 µg/l
	2004	NH4-N	1 to 0,27 mg/l
	2004	NO3-N	0,94 to 0,77 mg/l
	2005	Cd	0,12 to 0,3 µg/l
	2005	Cu	4 to 3 µg/l
	2005	Zn	2 to 13 µg/l
	2005	NH4-N	0,27 to 0,5 mg/l
	2005	NO3-N	0,77 to 0,1 mg/l
	2005	Total P	0,94 to 1 mg/l
	2006	Cd	0,3 to 0,1 µg/l
	2006	Hg	0,03 to 0,1 µg/l
	2006	Pb	2 to 1,7 µg/l
	2006	Zn	13 to 5 µg/l
	2006	NH4-N	0,5 to 0,27 mg/l
	2006	total P	1 to 0,86 mg/l

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	C
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Mean daily discharge values are calculated from hourly measurements.

e	**Transboundary rivers**	
	Is the river transboundary?	Yes
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	unknown

Questionnaire for the 2006 Assessment: Langeleed, tributary river in the Western Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** (***This question was answered incompletely by most CPs last year***)			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	° ' "
	Langeleed	Unknown	1,7	51° 07' 20" N 2° 44' 53" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		yes
	If yes, which year(s) and for which parameters?		1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?		yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often even within almost every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH_4-N	0,001 to ? mg/l
	1994	NO_3-N	0,1 to ? mg/l
	1994	PO4-P	0,005 ? mg/l
	1997	Cd	0,13 to 0,137 µg/l
	1997	NO3-N	? to 0,2 mg/l
	1998	Cd	0,137 to 0,129 µg/l
	1998	Cu	? to 2,734 µg/l
	1998	Pb	? to 0,746 µg/l
	1998	Zn	? to 5 µg/l
	1998	NH_4-N	? to 0,5 mg/l
	1998	NO_3-N	? to 0,1 mg/l
	1998	Total P	? to 1 mg/l
	1999	Cd	0,129 to 5 µg/l
	1999	Cu	2,734 to 5 µg/l
	1999	Pb	0,746 to 5 µg/l
	2000	Cd	5 to 1,2 µg/l
	2000	Cu	5 to 1,5 µg/l
	2000	Pb	5 to 1,3 µg/l

	2000	NH_4-N	0,5 to 0,03 mg/l
	2000	NO_3-N	0,2 to 0,02 mg/l
	2001	Cd	1,2 to 0,7 µg/l
	2001	NH_4-N	0,03 to 1,03 mg/l
	2001	NO_3-N	0,02 to 0,94 mg/l
	2001	total P	1 to 0,94 mg/l
	2002	Pb	1,3 to 1,7 µg/l
	2002	NH4-N	1,03 to 0,52 mg/l
	2002	PO4-P	0,1 to 0,09 mg/l
	2003	Cd	0,7 to 0,1 µg/l
	2003	Cu	1,5 to 3 µg/l
	2003	Zn	5 to 7 µg/l
	2003	NH4-N	0,52 to 1 mg/l
	2003	PO4-P	0,09 to 1 mg/l
	2004	Cd	0,1 to 0,12 µg/l
	2004	Cu	3 to 4 µg/l
	2004	Pb	1,7 to 2 µg/l
	2004	Zn	7 to 13 µg/l
	2004	NO3-N	0,94 to 0,77 mg/l
	2005	Cd	0,12 to 0,3 µg/l
	2005	NH4-N	1 to 0,5 mg/l
	2005	Total P	0,94 to 1 mg/l
	2006	Cd	0,12 to 0,1 µg/l
	2006	Cu	4 to 3 µg/l
	2006	Pb	2 to 1,7 µg/l
	2006	Zn	13 to 7 µg/l
	2006	NH4-N	0,5 to 0,27 mg/l
	2006	Total P	1 to 0,86 mg/l

d	**Hydrological data**

	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	neither
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Flow value was estimated in 1993 at 0,3 m³/s and since then used as a yearly mean value.

e	**Transboundary rivers**	
	Is the river transboundary?	No
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	

Questionnaire for the 2006 Assessment: Leopold canal, tributary river in the Eastern Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** **(*This question was answered incompletely by most CPs last year*)**			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	° ' "
	Leopoldkanaal	Unknown	1,7	51° 19' 35" N 3° 13' 51" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		yes
	If yes, which year(s) and for which parameters?		1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?		yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often even within almost every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH_4-N	0,001 to ? mg/l
	1994	NO_3-N	0,1 to ? mg/l
	1994	PO4-P	0,005 ? mg/l
	1994	Total N	0,1 to ? mg/l
	1994	Total P	0,01 to ? mg/l
	1996	Cd	0,7 to 0,14 µg/l
	1996	Cu	0,1 to ? µg/l
	1996	Pb	0,1 to 0,73 µg/l
	1996	Zn	1 to ? µg/l
	1997	Cd	0,14 to 0,136 µg/l
	1997	Cu	? to 1,017 µg/l
	1997	Pb	0,73 to 0,47 µg/l
	1997	PCBs	1<=DL<=7 to 2<=DL<=35 ng/l[8]
	1998	Cd	0,136 to 0,130 5 µg/l
	1998	Cu	1,017 to 0,6 µg/l

[8] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the serie would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

	1998	Pb	0,47 to 0,35 5 µg/l
	1998	Zn	? to 5 µg/l
	1998	PCB's	2<=DL<=35 to 5<=DL<=35 ng/l
	1998	NH_4-N	? to 0,5 mg/l
	1998	NO_3-N	? to 0,1 mg/l
	1998	PO4-P	? to 0,1 mg/l
	1998	Total P	? to 1 mg/l
	1999	Cd	0,130 to 5 µg/l
	1999	Cu	0,6 to 1,89 µg/l
	1999	Pb	0,35 to 5 µg/l
	1999	Zn	5 to 13,68 µg/l
	1999	γ-HCH	5 to ? ng/l
	1999	PCB's	5<=DL<=35 to 2<=DL<=22 ng/l
	2000	Cd	5 to 1,2 µg/l
	2000	Hg	0,01 to 0,03 µg/l
	2000	Cu	1,89 to 1,5 µg/l
	2000	Pb	5 to 1,3 µg/l
	2000	Zn	13,68 to 5 µg/l
	2000	γ-HCH	? to 1 ng/l
	2000	PCB's	2<=DL<=22 to 1<=DL<=11 ng/l
	2000	NH4-N	0,5 to 0,03 mg/l
	2001	Cd	1,2 to 0,7 µg/l
	2001	Hg	0,03 to ? µg/l
	2001	Cu	1,5 to 0,6 µg/l
	2001	γ-HCH	1 to 6 ng/l
	2001	PCB's	1<=DL<=11 to 1<=DL<=12 ng/l
	2001	NH4-N	0,03 to 1 mg/l
	2001	NO3-N	0,1 to 0,48 mg/l
	2001	total P	1 to 0,94 mg/l
	2002	Hg	? to 0,03 µg/l

	2002	Cu	0,6 to 0,3 µg/l
	2002	Pb	1,3 to 1,7 µg/l
	2002	NO3-N	0,48 to 0,94 mg/l
	2002	total P	0,94 to 1 mg/l
	2003	Cd	0,7 to 0,1 µg/l
	2003	Cu	0,3 to 3 µg/l
	2003	total P	1 to 0,94 mg/l
	2004	Cd	0,1 to 0,12 µg/l
	2004	Cu	3 to 4 µg/l
	2004	Pb	1,7 to 2 µg/l
	2004	Zn	5 to 13 µg/l
	2004	NH4-N	1 to 0,27 mg/l
	2004	NO3-N	0,94 to 0,77 mg/l
	2005	Cd	0,12 to 0,3 µg/l
	2005	NH4-N	0,27 to 0,5 mg/l
	2005	NO3-N	0,77 to 0,1 mg/l
	2005	Total P	0,94 to 1 mg/l
	2006	Cd	0,3 to 0,1 µg/l
	2006	Hg	0,03 to 0,1 µg/l
	2006	Cu	4 to 3 µg/l
	2006	Pb	2 to 1,7 µg/l
	2006	Zn	13 to 7 µg/l
	2006	γ-HCH	6 to 2 ng/l
	2006	NH4-N	0,5 to 0,27 mg/l
	2006	NO3-N	0,1 to 0,77 mg/l
	2006	Total P	1 to 0,86 mg/l

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	neither
	Do you use the RID Principles for your estimations? Describe how the water	Yes. Flow value was

	discharge is estimated.	estimated in 1993 at 3,5 m³/s and since then used as a yearly mean value.

e	**Transboundary rivers**	
	Is the river transboundary?	No
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	

Questionnaire for the 2006 Assessment: Lissewegevaart, tributary river in the Eastern Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** **(*This question was answered incompletely by most CPs last year*)**			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	° ' "
	Lissewegevaart.	Unknown	2,6	51° 18' 19" N 3° 11' 52" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		yes
	If yes, which year(s) and for which parameters?		1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?		yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often even within almost every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this tributary. After 2000 this tributary was no longer monitored. This was probably due to its deviation to other waterways as a consequence of the extension of the port of Zeebrugge.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH4-N	0,001 to ? mg/l
	1994	NO3-N	0,1 to ? mg/l
	1994	PO4-P	0,005 ? mg/l
	1998	Cd	? to 0,06 µg/l
	1998	Cu	? to 0,6 µg/l
	1998	Pb	? to 0,35 µg/l
	1998	Zn	? to 0,5 µg/l
	1998	Total P	? to 1 mg/l
	1999	Cd	0,06 to ? µg/l
	1999	Cu	0,6 to ? µg/l
	1999	Pb	0,35 to ? µg/l
	1999	Zn	5 to ? µg/l
	1999	Total P	1 to ? mg/l
	2000	NH4-N	? to 0,03 mg/l
	2000	NO3-N	? to 0,1 mg/l
	2000	PO4-P	? to 0,1 mg/l

	2000	Total P	? to 1 mg/l

d	Hydrological data	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	neither
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Flow value was estimated in 1993 at 0,2 m^3/s and then until 2000 used as a yearly mean value.

e	Transboundary rivers	
	Is the river transboundary?	No
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	

Questionnaire for the 2006 Assessment: Noordede, tributary river in the Middle Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** (***This question was answered incompletely by most CPs last year***)			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	o ' "
	Noordede	Unknown	1,2	51° 13' 29" N 2° 57' 45" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**		
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?		yes
	If yes, which year(s) and for which parameters?		1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?		yes
	If yes, for which parameters and years?		After 1993 detection limits have changed often even within almost every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH4-N	0,001 to ? mg/l
	1994	NO3-N	0,1 to ? mg/l
	1994	PO4-P	0,005 ? mg/l
	1994	Total N	0,1 to ? mg/l
	1994	Total P	0,01 to ? mg/l
	1998	Cd	0,14 to 0,12 µg/l
	1998	Cu	1,06 to 0,6 µg/l
	1998	Pb	? to 0,35 µg/l
	1998	Zn	? to 5 µg/l
	1998	NH4-N	? to 0,5 mg/l
	1998	NO3-N	? to 0,2 mg/l
	1998	PO4-P	? to 0,1 mg/l
	1998	Total P	? to 1 mg/l
	1999	Cd	0,12 to 5 µg/l
	1999	Cu	0,6 to 5,65 µg/l
	1999	Pb	0,35 to 5 µg/l
	2000	Cd	5 to 1,2 µg/l
	2000	Cu	5,65 to 0,6 µg/l

	2000	Pb	5 to 1,3 µg/l
	2000	γ-HCH	6 to 3 ng/l
	2000	PCB's	3<=DL<=21 to 1<=DL<=11 ng/l[9]
	2000	NH_4-N	0,5 to 0,03 mg/l
	2000	NO_3-N	0,2 to 0,02 mg/l
	2001	Cu	0,6 to 1,5 µg/l
	2001	γ-HCH	3 to 2 ng/l
	2001	PCB's	1<=DL<=11 to 1<=DL<=12 ng/l
	2001	NH4-N	0,03 to 1 mg/l
	2001	NO3-N	0,02 to 0,48 mg/l
	2001	total P	1 to 0,48 mg/l
	2002	Cd	1,2 to 0,7 µg/l
	2002	Cu	1,5 to 0,3 µg/l
	2002	Pb	1,3 to 1,7 µg/l
	2002	γ-HCH	2 to 6 ng/l
	2002	PO4-P	0,1 to 0,05 mg/l
	2002	total P	0,48 to 0,94 mg/l
	2003	Cd	0,7 to 0,1 µg/l
	2003	Cu	0,3 to 3 µg/l
	2004	Cd	0,1 to 0,12 µg/l
	2004	Cu	3 to 4 µg/l
	2004	Pb	1,7 to 0,6 µg/l
	2004	Zn	5 to 13 µg/l
	2004	NH4-N	1 to 0,27 mg/l
	2004	NO3-N	0,48 to 0,77 mg/l
	2004	PO4-P	0,05 to 0,1 mg/l
	2005	Cd	0,12 to 0,3 µg/l

[9] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the serie would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l

	2005	Pb	0,6 to 2 µg/l
	2005	NH4-N	0,27 to 0,5 mg/l
	2005	Total P	0,94 to 1 mg/l
	2006	Cd	0,3 to 0,1 µg/l
	2006	Cu	4 to 3 µg/l
	2006	Pb	2 to 1,7 µg/l
	2006	Zn	13 to 7 µg/l
	2006	NH4-N	0,5 to 0,08 mg/l
	2006	Total P	1 to 0,86 mg/l

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	neither
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Flow value was estimated in 1993 at 0,8 m³/s and since then used as a yearly mean value.

e	**Transboundary rivers**	
	Is the river transboundary?	No
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	

Questionnaire for the 2006 Assessment: Schipdonk canal, tributary river in the Eastern Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** **(*This question was answered incompletely by most CPs last year*)**			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	o , ,,
	Schipdonkkanaal	Unknown	3,2	51° 18' 55" N 3° 14' 30" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:	
	Whether there have been changes in the laboratory (-ies) that has (have) performed the RID analyses since 1990?	yes
	If yes, which year(s) and for which parameters?	1993 all parameters, later on unknown
	If the detection limits of the laboratory (-ies) have changed over time?	yes
	If yes, for which parameters and years?	After 1993 detection limits have changed often even within almost

			every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH4-N	0,001 to ? mg/l
	1994	NO3-N	0,1 to ? mg/l
	1994	PO4-P	0,005 ? mg/l
	1994	Total N	0,1 to ? mg/l
	1994	Total P	0,01 to ? mg/l
	1996	Cd	0,1 to ? µg/l
	1996	Cu	0,1 to ? µg/l
	1996	Pb	0,1 to ? µg/l
	1996	Zn	1 to ? µg/l
	1998	NH4-N	? to 0,5 mg/l
	1998	NO3-N	? to 0,1 mg/l
	1998	PO4-P	? to 0,1 mg/l
	1998	Total P	? to 1 mg/l
	1999	Cd	? to 5 µg/l
	1999	Cu	? to 1,83 µg/l
	1999	Pb	? to 0,68 µg/l
	1999	Zn	? to 5 µg/l
	2000	Cd	5 to 1,2 µg/l
	2000	Hg	0,01 to 0,03 µg/l
	2000	Cu	1,83 to 1,5 µg/l
	2000	Pb	0,68 to 1,3 µg/l
	2000	PCB's	2<=DL<=35 to 1<=DL<=11 ng/l[10]
	2001	Hg	0,03 to ? µg/l

[10] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the serie would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

	2001	Cu	1,5 to 0,6 µg/l
	2001	γ-HCH	1 to 6 ng/l
	2001	PCB's	1<=DL<=11 to 1<=DL<=12 ng/l
	2001	NH4-N	0,5 to 1 mg/l
	2002	Cd	1,2 to 0,7 µg/l
	2002	Hg	? to 0,03 µg/l
	2002	Cu	0,6 to 1 µg/l
	2002	Pb	1,3 to 1,7 µg/l
	2002	NH4-N	1 to 0,52 mg/l
	2002	NO3-N	0,1 to 0,94 mg/l
	2002	total P	1 to 0,94 mg/l
	2003	Cd	0,7 to 0,1 µg/l
	2003	Cu	1 to 3 µg/l
	2003	NH4-N	0,52 to 1 mg/l
	2003	NO3-N	0,94 to 0,48 mg/l
	2004	Cd	0,1 to 0,12 µg/l
	2004	Cu	3 to 4 µg/l
	2004	Pb	1,7 to 2 µg/l
	2004	Zn	5 to 13 µg/l
	2004	NH4-N	1 to 0,27 mg/l
	2004	NO3-N	0,48 to 0,77 mg/l
	2005	Zn	13 to 5 µg/l
	2005	NH4-N	0,27 to 0,5 mg/l
	2005	NO3-N	0,77 to 0,1 mg/l
	2005	Total P	0,94 to 1 mg/l
	2006	Cd	0,12 to 0,1 µg/l
	2006	Hg	0,03 to 0,1 µg/l
	2006	Cu	4 to 3 µg/l
	2006	Pb	2 to 1,7 µg/l
	2006	Zn	5 to 2 µg/l
	2006	NH4-N	0,5 to 0,27 mg/l

	2006	NO3-N	0,1 to 0,77 mg/l
	2006	Total P	1 to 0,86 mg/l

d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	neither
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Flow value was estimated in 1993 at 9,5 m^3/s and since then used as a yearly mean value.

e	**Transboundary rivers**	
	Is the river transboundary?	No
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	

Questionnaire for the 2006 Assessment: Vladslovaart, tributary river in the Western Coastal Area (BE)

1. Questions related to riverine transport:

You are invited to fill in tables 1 a-1 e for each single river, unless procedures are equal for all rivers

a	**Distance of sampling stations from the sea and co-ordinates of stations.** (***This question was answered incompletely by most CPs last year***)			
	River name	Drainage area (in km^2) downstream of sampling point.	Distance (in km) from sampling point to the sea as measured in a straight line from sampling point to river outlet.	Co-ordinates of the sampling station (degrees, minutes, seconds)
		km^2	km	o , ,,
	Vladslovaart	Unknown	6	51° 07' 51" N 2° 50' 16" E

b	**Sampling procedures and choice of location of sampling stations**	**YES**	**NO**	**Comments**
	In larger rivers: Are samples collected at only one point of the river cross section?			unknown
	or are composite samples taken, i.e. several samples from across the river section?			unknown
	If the river water usually is slow-flowing at the station: Are samples collected from the surface of the river water?			unknown
	or further down in the water masses (depth integrated sampling)?			unknown
	Are flood or event samples collected and reported, either outside the regular sampling programme, or as part of the sampling programme? (Ireland and Germany have earlier indicated that this is done).			unknown

c	**Changes in laboratories or detection limits over time. (This question is also highly relevant for the RID Assessment Panel and the QSR). By checking previous RID reports, please indicate:**	
	Whether there have been changes in the laboratory(ies) that has (have) performed the RID analyses since 1990?	yes
	If yes, which year(s) and for which parameters?	1993 all parameters, later on unknown
	If the detection limits of the laboratory(ies) have changed over time?	yes
	If yes, for which parameters and years?	After 1993 detection limits have changed often even within almost

			every series of measurements for every parameter. Those changes were reported as such every year. Changes given here for the years after 1993 only bear on the maximum values found in the data series for every parameter for this river.
	Changed in (year)	**Parameter**	**Detection limit (from-to)**
	1994	NH4-N	0,001 to ? mg/l
	1994	NO3-N	0,1 to ? mg/l
	1994	PO4-P	0,005 ? mg/l
	1994	Total N	0,1 to ? mg/l
	1998	NH4-N	? to 0,5 mg/l
	1998	NO3-N	? to 0,2 mg/l
	1998	PO4-P	? to 0,1 mg/l
	1998	Total P	? to 0,1 mg/l
	1999	Total P	0,1 to 1 mg/l
	2000	Cd	5 to 1,2 µg/l
	2000	Cu	5,72 to 0,6 µg/l
	2000	Pb	5 to 1,3 µg/l
	2000	NH4-N	0,5 to 0,03 mg/l
	2000	NO3-N	0,2 to 0,1 mg/l
	2001	NH4-N	0,03 to 1 mg/l
	2001	NO3-N	0,1 to 0,48 mg/l
	2001	total P	1 to 0,94 mg/l
	2002	Cd	1,2 to 0,7 µg/l
	2002	Cu	0,6 to 0,3 µg/l
	2002	PCB's	1<=DL<=28 to 4<=DL<=35 ng/l[11]
	2002	Pb	1,3 to 1,7 µg/l
	2002	Zn	5 to 7 µg/l
	2003	Cd	0,7 to 0,1 µg/l

[11] Detection limits depend on the considered congener mixture. The lowest value belongs to the congener with the lowest DL in the IUPAC serie of the RID Principles, the highest value belongs to a situation where all congeners of the serie would be present at their DL. Example: 1<=DL<=7 to 5<=DL<=35 ng/l means: detection limit was comprised between 1 ng/l (if only the most sensitive congener was considered) and a maximum of 7 ng/l (if all congeners together were considered) and changed that year to a minimum of 5 ng/l and a maximum of 35 ng/l.

	2003	Cu	0,3 to 3 µg/l
	2003	Zn	7 to 2 µg/l
	2003	NO3-N	0,48 to 0,94 mg/l
	2004	Cd	0,1 to 0,12 µg/l
	2004	Cu	3 to 4 µg/l
	2004	Pb	1,7 to 2 µg/l
	2004	Zn	2 to 13 µg/l
	2004	NO3-N	0,94 to 0,77 mg/l
	2005	Cd	0,12 to 0,3 µg/l
	2005	NH4-N	1 to 0,5 mg/l
	2005	Total P	0,94 to 1 mg/l
	2006	Cd	0,3 to 0,1 µg/l
	2006	Cu	4 to 3 µg/l
	2006	Pb	2 to 1,7 µg/l
	2006	Zn	13 to 7 µg/l
	2006	NH4-N	0,5 to 0,27 mg/l
	2006	Total P	1 to 0,86 mg/l

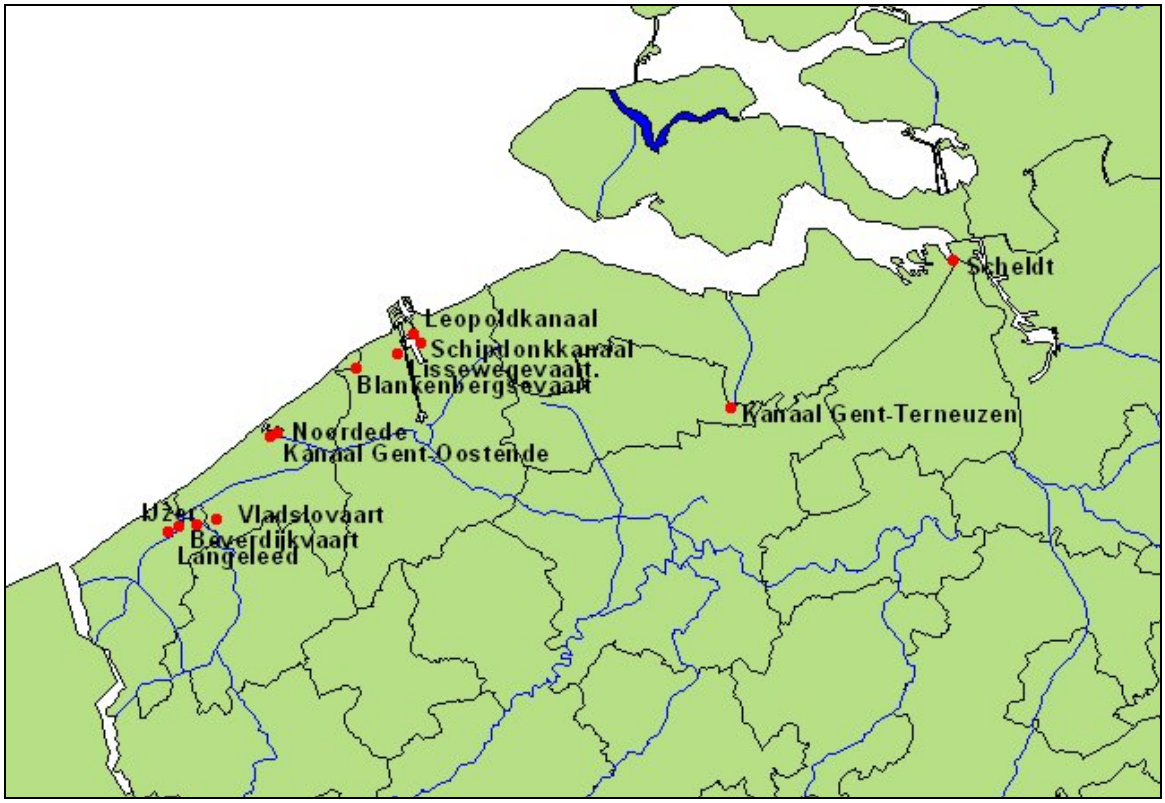
d	**Hydrological data**	
	Is the monitoring of water flow continuous-C, daily-D, weekly-W or monthly-M?	neither
	Do you use the RID Principles for your estimations? Describe how the water discharge is estimated.	Yes. Flow value was estimated in 1993 at 0,6 m³/s and since then used as a yearly mean value.

e	**Transboundary rivers**	
	Is the river transboundary?	No
	If yes, to which extent is the monitoring programme in this river harmonised with the neighbour country? (e.g. in terms of sampling frequency, sampling dates, parameters).	

Annex IV. Co-ordinates and maps of RID sampling sites.

1. Belgium

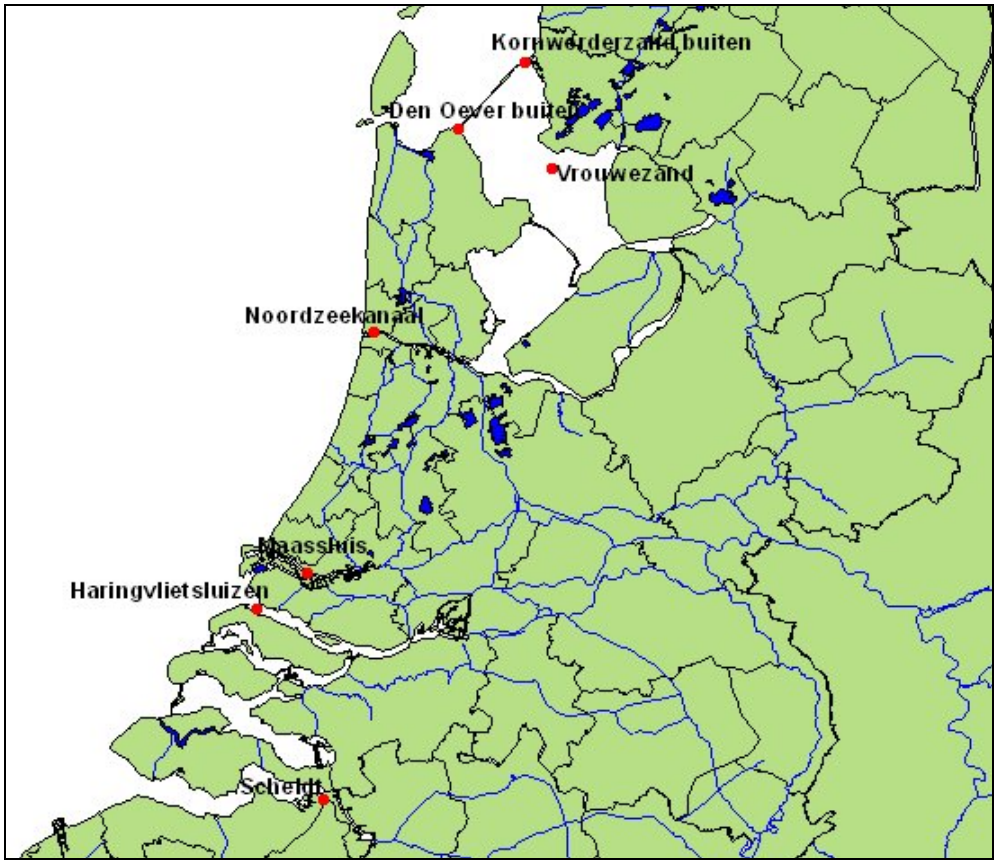
River name	Latitude	Longitude
Scheldt	51.35388889	4.241944444
Kanaal Gent-Terneuzen	51.20833333	3.804444444
IJzer	51.12777778	2.803333333
Langeleed	51.12222222	2.748055556
Leopoldkanaal	51.32638889	3.230833333
Lissewegevaart.	51.30527778	3.197777778
Noordede	51.22472222	2.9625
Beverdijkvaart	51.12583333	2.768888889
Blankenbergsevaart	51.29305556	3.12
Kanaal Gent-Oostende	51.22305556	2.950833333
Schipdonkkanaal	51.31527778	3.241666667
Vladslovaart	51.13083333	2.837777778



RID Sampling sites in Belgium.

2. The Netherlands

River name	Latitude	Longitude	Type
Den Oever buiten	52.93166667	5.045555556	Quantity
Kornwerderzand buiten	53.06972222	5.336388889	Quantity
Vrouwezand	52.81027778	5.393055556	Quality
Noordzeekanaal	52.46583333	4.621944444	Quality
Haringvlietsluizen	51.82944444	4.0525	Quality
Maassluis	51.90444444	4.263888889	Quality

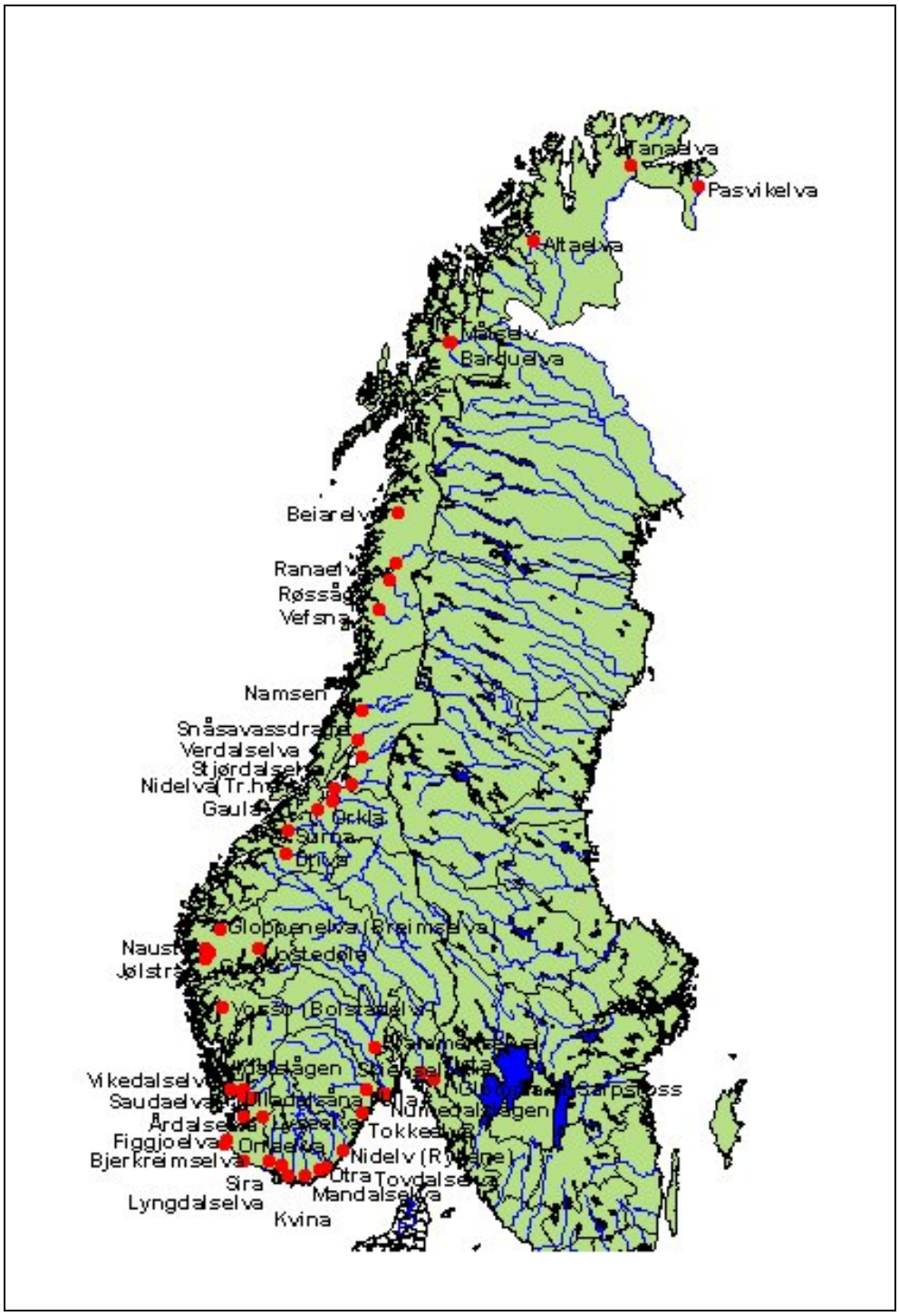


RID Sampling sites in the Netherlands (map also includes the Scheldt sampling site in Belgium).

3. Norway

Regine No	River name	Latitude	Longitude	RID-Region
002.Z-2	Glomma	59.278	11.134	Skagerak
012.Z-2	Drammenselva	59.75399	10.00903	Skagerak
015.Z-2	Numedalslågen	59.08627	10.06962	Skagerak
016.Z-2	Skienselva	59.199	9.611	Skagerak
021.Z-1	Otra	58.18742	7.95411	Skagerak
028.0-4	Orreelva	58.73143	5.52936	North Sea
036.Z-1	Suldalslågen	59.482	6.26	North Sea
121.-3	Orkla	63.201	9.773	Norwegian Sea
151.Z-2	Vefsna	65.749	13.239	Norwegian Sea
212.Z-2	Altaelva	69.901	23.287	Barents Sea
001.-2	Tista	59.12783	11.44436	Skagerak
017.Z-1	Tokkeelva	58.876	9.354	Skagerak
019.Z-1	Nidelv (Rykene)	58.401	8.642	Skagerak
020.Z-1	Tovdalselva	58.21559	8.11668	Skagerak
022.-4	Mandalselva	58.143	7.54604	Skagerak
024.Z-1	Lyngdalselva	58.163	7.08798	North Sea
025.Z-1	Kvina	58.3202	6.97023	North Sea
026.Z-1	Sira	58.41367	6.65669	North Sea
027.Z-1	Bjerkreimselva	58.47894	5.9953	North Sea
028.Z-0	Figgjoelva	58.79168	5.5978	North Sea
031.Z-0	Lyseelva	59.05696	6.65835	North Sea
33	Årdalselva	59.081	6.125	North Sea
035.-3	Ulladalsåna (Ulla)	59.33	6.45	North Sea
37	Saudaelva	59.389	6.218	North Sea
038.-2	Vikedalselva	59.49958	5.9103	North Sea
062.-1	Vosso (Bolstadelvi)	60.648	6	North Sea
076.-1	Jostedøla	61.41333	7.28025	North Sea
083.Z-0	Gaular	61.37	5.688	North Sea
084.-3	Jølstra	61.4517	5.85766	North Sea
084.7Z-0	Nausta	61.51681	5.72318	North Sea
087.-1	Gloppenelva (Breimselva)	61.765	6.213	North Sea
109.Z-1	Driva	62.669	8.571	Norwegian Sea
112.Z-1	Surna	62.98	8.726	Norwegian Sea
122.-4	Gaula	63.286	10.27	Norwegian Sea
123.-1	Nidelva (Tr.heim)	63.433	10.407	Norwegian Sea
124.Z-1	Stjørdalselva	63.449	10.993	Norwegian Sea
127.Z-1	Verdalselva	63.792	11.478	Norwegian Sea
128.-2	Snåsavassdraget	64.019	11.507	Norwegian Sea
139.Z-1	Namsen	64.441	11.819	Norwegian Sea
155.Z-1	Røssåga	66.109	13.807	Norwegian Sea

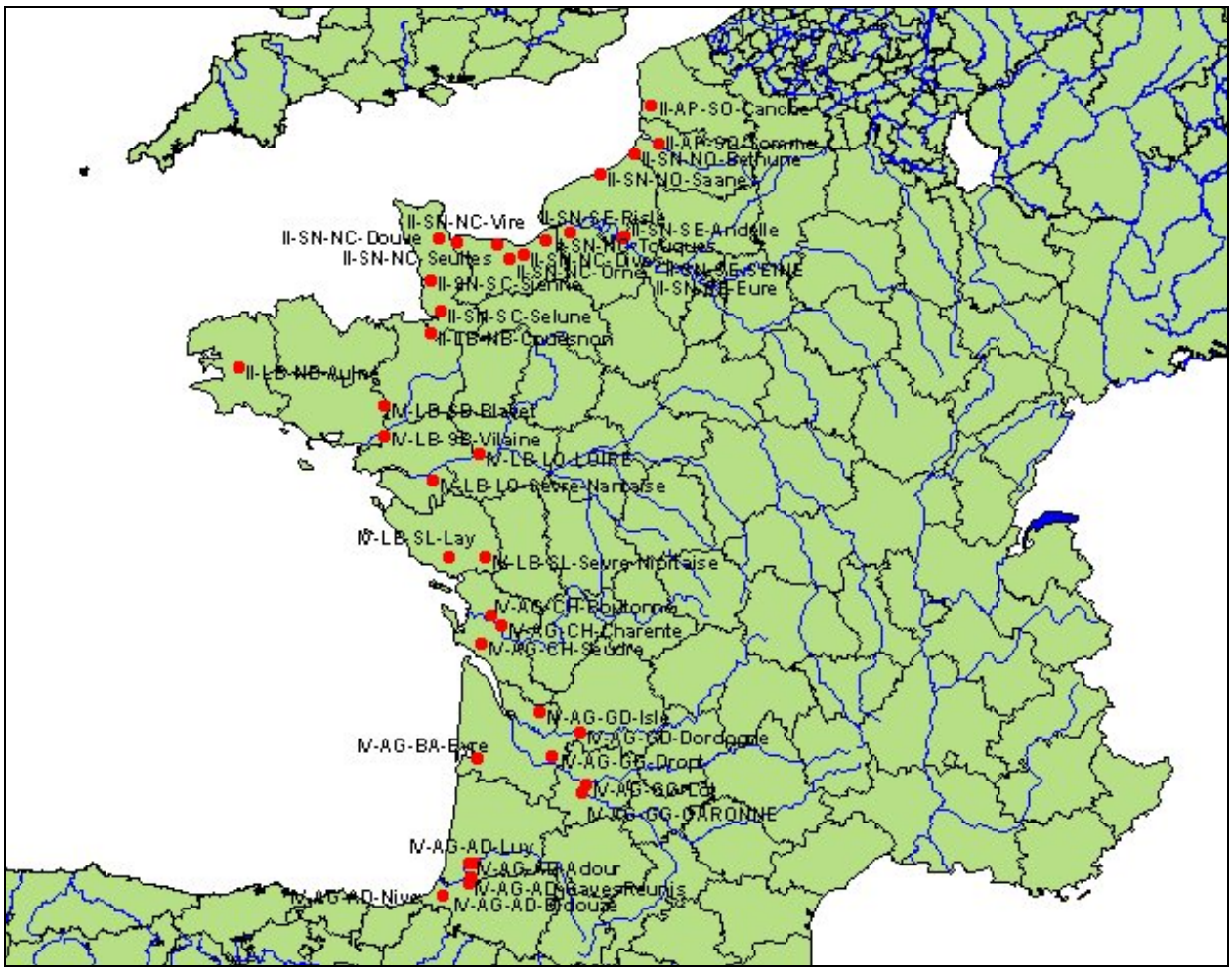
Regine No	River name	Latitude	Longitude	RID-Region
156.Z-1	Ranaelva	66.323	14.177	Norwegian Sea
161.Z-0	Beiarelva	66.991	14.75	Norwegian Sea
196.Z-2	Målselv	69.036	18.666	Norwegian Sea
196.AZ-1	Barduelva	69.043	18.595	Norwegian Sea
234.Z-1	Tanaelva	70.23	28.174	Barents Sea
246.-1	Pasvikelva	69.501	30.116	Barents Sea



RID Sampling sites in Norway.

4. France

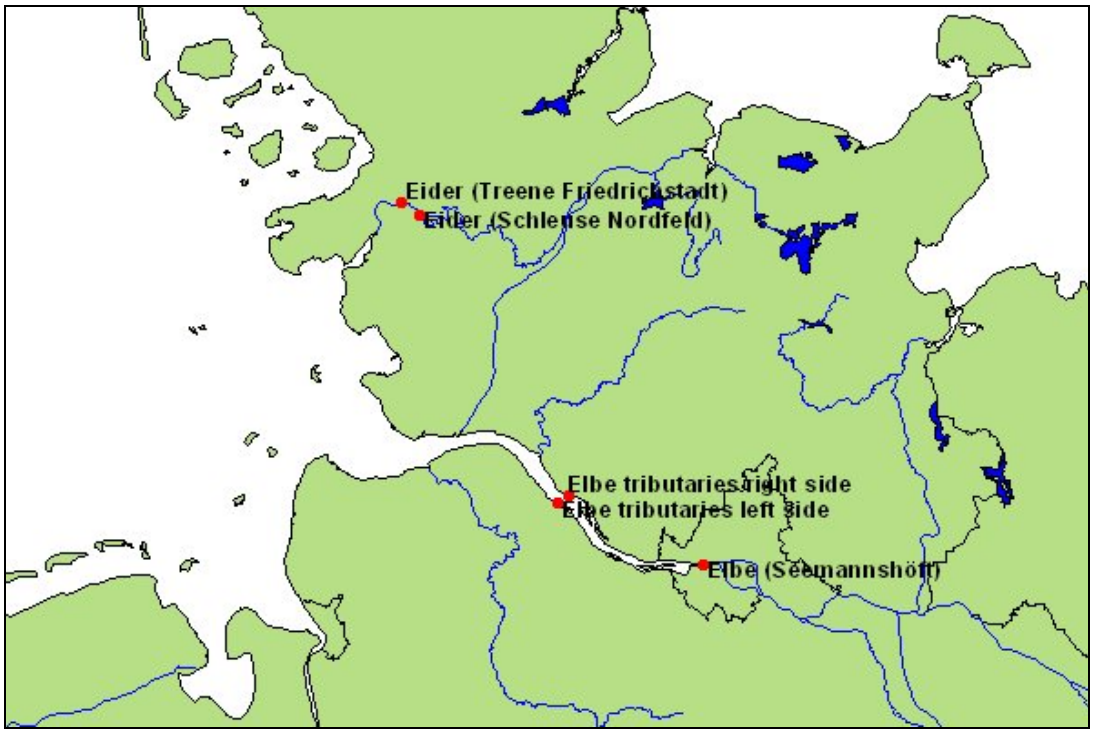
River name	Latitude	Longitude
II-AP-SO-Canche	50.49018915	1.72392848
II-AP-SO-Somme	50.12252885	1.78018909
II-SN-NO-Bethune	50.0462542	1.44695534
II-SN-NO-Saane	49.88272274	0.95301851
II-SN-SE-SEINE	49.30986116	1.23587258
II-SN-SE-Andelle	49.31610251	1.2306538
II-SN-SE-Eure	49.28714615	1.20861348
II-SN-SE-Risle	49.36367411	0.49389961
II-SN-NC-Dives	49.18278931	-0.16477569
II-SN-NC-Douve	49.35218177	-1.33897482
II-SN-NC-Orne	49.15105269	-0.38348137
II-SN-NC-Seulles	49.28965269	-0.53141474
II-SN-NC-Touques	49.30302986	0.14659294
II-SN-NC-Vire	49.31806579	-1.09373081
II-SN-SC-Selune	48.6961547	-1.34613357
II-SN-SC-Sienne	48.9830952	-1.46335296
II-LB-NB-Aulne	48.1913984	-4.07679844
II-LB-NB-Couesnon	48.4911703	-1.49061843
IV-LB-SB-Blavet	47.8393414	-3.39213421
IV-LB-SB-Vilaine	47.5803162	-2.12598256
IV-LB-LO-LOIRE	47.3933857	-0.86293931
IV-LB-LO-Sevre-Nantaise	47.164928	-1.48225625
IV-LB-SL-Lay	46.4688648	-1.28967575
IV-LB-SL-Sevre-Niortaise	46.4529447	-0.82300731
IV-AG-CH-Boutonne	45.9213663	-0.77341482
IV-AG-CH-Charente	45.8319525	-0.6491478
IV-AG-CH-Seudre	45.6654508	-0.91208658
IV-AG-BA-Eyre	44.6263713	-0.99623586
IV-AG-GD-Dordogne	44.8396363	0.33201447
IV-AG-GD-Isle	45.0370601	-0.1920559
IV-AG-GG-Dropt	44.6319284	-0.03338034
IV-AG-GG-GARONNE	44.2888104	0.32044855
IV-AG-GG-Lot	44.3581099	0.38151124
IV-AG-AD-Adour	43.6750574	-1.13365178
IV-AG-AD-Bidouze	43.4894032	-1.13931226
IV-AG-AD-GavesReunis	43.543192	-1.10501352
IV-AG-AD-Luy	43.6766528	-1.04201927
IV-AG-AD-Nive	43.3917375	-1.45090683



RID sampling sites in France.

5. Germany

	Gauss-Krüger GK3		UTM30	
River name	**RW**	**HW**	**E**	**N**
Eider (Schleuse Nordfeld)	3495410	6001240	1287304	6089396
Eider (Treene Friedrichstadt)	3505600	6026820	1283186	6092323
Ems (Herbrum)	3387007	5879011		
Weser (Farge)	3467015	5897528		
Elbe (Seemannshöft)	3558401	5934877	1351434	6010139
Elbe tributaries right side	3531335	5955279	1320972	6025770
Elbe tributaries left side	3528666	5953964	1318545	6024008



RID sampling sites in Germany. The Ems and Weser sampling sites in Germany are not included in the map.

6. Spain

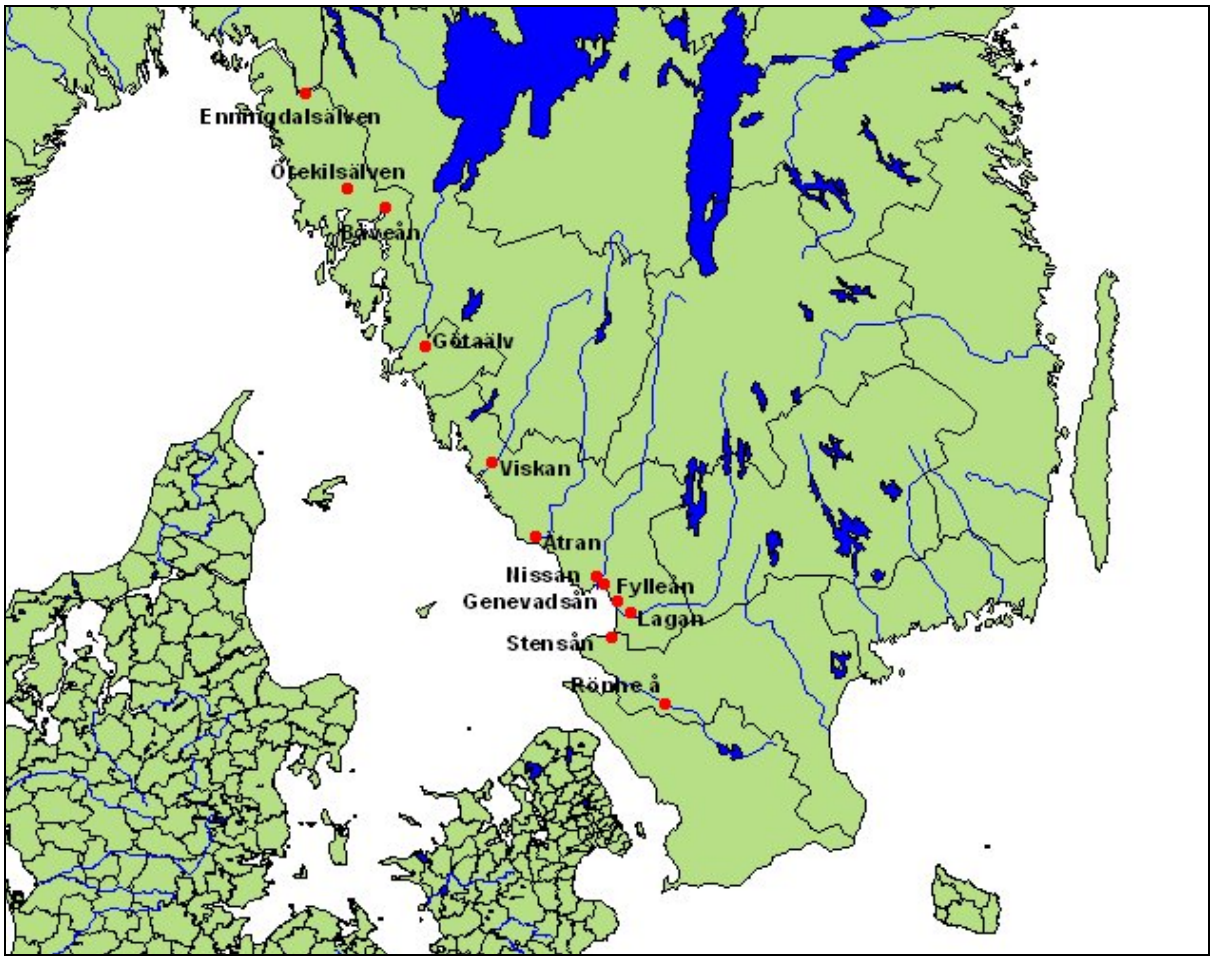
River name	UTM X	UTM Y	UTM
Oyarzun	590515	4795320	30
Urumea	584835	4792305	30
Oria	578670	4784730	30
Urola	562170	4789410	30
Deva	549271	4788470	30
Artibay	544383	4796473	30
Lea	540110	4799215	30
Oca	526526	4795202	30
Butron	510850	4802050	30
Barbadun	490280	4795790	30
Cadagua	500390	4787845	30
Ibaizabal	512320	4786565	30
Galindo	500670	4792090	30
Nervion	509775	4787085	30
Asua	505175	4793460	30
Miño	45314	4673405	30
Louro	33729	4672734	30
Saja	415330	4803373	30
Nalón	249062	4820244	30
Eo	168306	4816895	30
Pas	422205	4801925	30
Sella	328245	4809000	30
Miera	441957	4806362	30
Nervión	506762	4788025	30
Mera	587900	4832700	29
Forcadas	576600	4827800	29
Grande de Jubia	574600	4820600	29
Belelle	568600	4817400	29
Eume	572400	4808200	29
Mandeo	576700	4789100	29
Mero	554300	4793100	29
Anllons	509400	4786400	29
Grande	491200	4776100	29
Castro	489100	4765900	29
Jallas	498700	4758800	29
Tambre	529800	4756600	29
Traba	511100	4737100	29
Ulla	530400	4731200	29
Umia	529300	4716700	29
Lerez	538100	4708200	29
Verdugo	536500	4688600	29

River name	UTM X	UTM Y	UTM
Furelos	580100	4745700	29
Deza	554300	4736500	29
Piedras	127379	4138004	30
Odiel	147763	4144350	30
Tinto	174589	4141671	30
Guadiana	105025	4156431	30
Guadalquivir	237080	4156797	30
Guadiamar	215654	4148352	30
Guadaira	237425	4137388	30
Masma	154108	4826868	30
Ouro	146490	4832234	30
Landro	129680	4839977	30
Sor	120234	4848193	30

RID sampling sites in Spain.

7. Sweden

River name	Latitude	Longitude
Rönne å	56.12169444	13.14527778
Stensån	56.43197222	12.87308333
Lagan	56.51566667	13.05158333
Genevadsån	56.57144444	12.97816667
Fylleån	56.65213889	12.90852778
Nissan	56.69147222	12.87366667
Ätran	56.90313889	12.49463889
Viskan	57.23938889	12.30905556
Götaälv	57.76386111	12.00238889
Bäveån	58.34711111	11.93927778
Örekilsälven	58.46036111	11.68586111
Enningdalsälven	58.87716667	11.53738889



RID Sampling sites in Sweden.

Annex V. Overview of areas downstream sampling points per RID catchment.

1. 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
IJzer (main river)	4 km	situated in fresh water reach; distance to sluice complex at the receiving IJzer 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

2. France:

OSPAR zone name	Drainage area of the zone (km^2)	Drainage area upstream of sampling point (km^2)	Drainage area downstream of sampling point (km^2)
II-AP-SO-Canche	3895	1316	2579
II-AP-SO-Somme	5916	5913	3
II-SN-NO-Bethune	2153	1800	353
II-SN-NO-Saane	1718	301	1417
II-SN-SE-SEINE	64953	64953	0
II-SN-SE-Andelle	789	757	32
II-SN-SE-Eure	6023	6023	0
II-SN-SE-Risle	2545	2199	346
II-SN-NC-Dives	1815	1400	415
II-SN-NC-Douve	1474	830	644
II-SN-NC-Orne	2976	2493	483
II-SN-NC-Seulles	547	267	280
II-SN-NC-Touques	1311	1210	101

OSPAR zone name	Drainage area of the zone (km^2)	Drainage area upstream of sampling point (km^2)	Drainage area downstream of sampling point (km^2)
II-SN-NC-Vire	2077	1946	131
II-SN-SC-Selune	1623	1148	475
II-SN-SC-Sienne	1135	535	600
II-LB-NB-Aulne	4312	1516	2796
II-LB-NB-Couesnon	2848	1121	1727
IV-LB-SB-Blavet	4649	2398	2251
IV-LB-SB-Vilaine	10144	10144	0
IV-LB-LO-LOIRE	110178	108767	1411
IV-LB-LO-Sevre-Nantaise	4664	2356	2308
IV-LB-SL-Lay	4522	1277	3245
IV-LB-SL-Sevre-Niortaise	4363	1361	3002
IV-AG-CH-Boutonne	2141	1327	814
IV-AG-CH-Charente	7526	7526	0
IV-AG-CH-Seudre	988	378	610
IV-AG-BA-Eyre	2036	1829	207
IV-AG-GD-Dordogne	14605	14605	0
IV-AG-GD-Isle	8472	6978	1494
IV-AG-GG-Dropt	2672	1222	1450
IV-AG-GG-GARONNE	38227	38227	0
IV-AG-GG-Lot	11541	11541	0
IV-AG-AD-Adour	7977	7977	0
IV-AG-AD-Bidouze	1041	712	329
IV-AG-AD-GavesReunis	5504	5434	70
IV-AG-AD-Luy	1367	1168	199
IV-AG-AD-Nive	1153	906	247

3. Norway:

River	Basin area (km^2)	Area upstream sampling site (km^2)
Glomma	41918	41218
Drammenselva	17034	17028
Numedalslågen	5577	5513
Skienselva	10772	10348
Otra	3738	3730
Orreelva	105	105
Suldalslågen	1457	1457
Orkla	3053	2872
Vefsna	4122	4113
Alta	7373	7367
Tista	1588	1582
Tokkeelva	1238	1200
Nidelva	4025	4020
Tovdalselva	1856	1854
Mandalselva	1809	1800
Lygna	664	660
Kvina	1445	1140
Sira	1916	1872
Bjerkreimselva	705	704
Figgjo	229	218
Lyseelv	182	182
Årdalselv	519	516
Ulla	393	393
Saudaelv	353	353
Vikedalselv	118	117
Vosso	1492	1465
Jostedøla	865	864
Gaular	627	625
Jølstra	714	709
Nausta	277	273
Breimselv	636	634
Driva	2487	2435
Surna	1200	1200
Gaula	3659	3650
Nidelva	3110	3100
Stjørdalsvassdraget	2117	2117
Verdalsvassdraget	1472	1472
Snåsavassdraget	1095	1088
Namsen	1124	1118
Røssåga	2092	2087

River	Basin area (km^2)	Area upstream sampling site (km^2)
Ranavassdraget	3847	3846
Beiaren	1064	875
Målselv	3239	3200
Barduelv	2906	2906
Tanavassdraget	16389	15713
Passvikelv	18404	18400

4. Sweden:

River name	Drainage area downstream of sampling point (km^2)	Distance from sampling point to the sea as measured in a straight line from sampling point to river outlet (km)
Rönne å	880	26
Stensån	1	1
Lagan	318	8
Genevadsån	11	4
Fylleån	4	4
Nissan	8	4
Ätran	2	2
Viskan	42	7
Göta älv	1809	10
Bäveån	9	2
Örekilsälven	5	3
Enningdalsälven	158	12

Annex VI. Changes in the laboratory detection limits as reported by the Contracting Parties

1. Belgium (Scheldt River):

Changed in (year)	Parameter	Detection limit (from-to)
1993	Cd	0,1 to 1 µg/l
1993	Hg	0,01 to 1 µg/l
1993	Cu	0,1 to 40 µg/l
1993	Pb	0,1 to 10 µg/l
1993	Zn	1 to ? µg/l
1993	PCB's	1 to 10 ng/l
1993	γ-HCH	1 to 10 ng/l
1993	NH4-N	0.001 to 0.05 mg/l
1993	total N	0.1 to 2 mg/l
1993	total P	0.01 to 0.2 mg/l
1994	Zn	? to 10 µg/l
1994	NH4-N	0.05 to 0.1 mg/l
1994	PO4-P	0.005 to 0.2 mg/l
1994	total P	0.2 to 0.1 mg/l
1995	Cu	40 to 15 µg/l
1995	Pb	10 to 5 µg/l
1995	Zn	10 to ? µg/l
1995	PCB's	10 to 2 µg/l
1995	γ-HCH	10 to ? ng/l
1995	NO3-N	0.1 to ? mg/l
1995	PO4-P	0.2 to 0.1 mg/l
1995	total N	2 to ? mg/l
1995	total P	0.1 to 0.2 mg/l
1996	Cu	15 to 10 µg/l
1996	Pb	5 to 20 µg/l
1996	Zn	? to 10 µg/l
1996	NH4-N	0.1 to 0.5 mg/l
1996	NO3-N	? to 0.1 mg/l
1996	PO4-P	0.1 to 0.5 mg/l
1997	Hg	0.01 to 0.03 µg/l
1997	Pb	20 to 10 µg/l
1997	Zn	10 to ? µg/l
1997	PCB's	2 to 5 ng/l
1997	total N	2 to 1 mg/l
1997	total P	0.2 to 1 mg/l
1998	Cd	1 to 0.06 µg/l

Changed in (year)	Parameter	Detection limit (from-to)
1998	Hg	0.03 to 0.2 µg/l
1998	Cu	10 to 0.6 µg/l
1998	Pb	10 to 0.35 µg/l
1998	Zn	? to 5 µg/l
1998	PO4-P	0.5 to 0.1 mg/l
1999	γ-HCH	? to 6 ng/l
1999	PCB's	5 to 21 ng/l
2000	Cd	0.06 to 1.2 µg/l
2000	Hg	0.2 to 0.03 µg/l
2000	Pb	0.35 to 6 µg/l
2000	PCB's	21 to 11 ng/l
2000	NH4-N	0.5 to 0.04 mg/l
2000	total P	1 to 0.5 mg/l
2001	Hg	0.03 to 0.01 µg/l
2001	Pb	6 to 0.35 µg/l
2001	PCB's	11 to 12 ng/l
2001	NH4-N	0.04 to 1 mg/l
2001	total P	0.5 to 0.48 mg/l
2002	Hg	0.01 to ? µg/l
2002	total P	0.48 to 0.94 mg/l
2003	Hg	? to 0.08 µg/l
2003	Cu	0.6 to 3 µg/l
2003	Pb	0.35 to 6 µg/l
2003	PO4-P	0.1 to 0.15 mg/l
2004	Hg	0.08 to 0.03 µg/l
2004	Pb	6 to 11 µg/l
2004	total P	0.94 to 0.7 mg/l
2005	Cd	1.2 to 0.6 µg/l
2005	Cu	3 to 5 µg/l
2005	NH4-N	1 to 0.5 mg/l
2005	total P	0.7 to 1 mg/l

2. Sweden:

Changed in (year)	Parameter	Detection limit (from-to)
1995	Total P	1 – 5 µg/l
1996	Total P	5 – 2 µg/l
2007	Total P	2 – 1 µg/l
1996	Cu	0.2 – 0.04 µg/l
1996	Pb	0.1 – 0.02 µg/l
1996	Cd	0.03 – 0.003 µg/l
1997	Cd	0.003 – 0.005 µg/l

Annex VII. 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.

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.

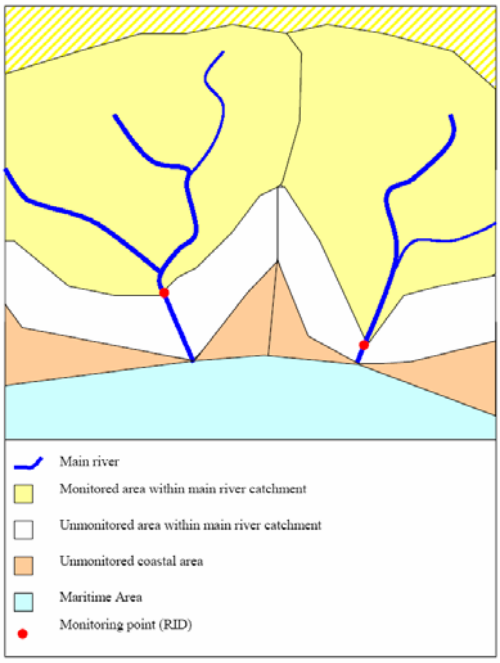


Figure __. Illustration of two of the different types of unmonitored areas (illustration from the HARP-NUT Guideline 1 (reference number 2004-2)) In addition to this, the catchments of unmonitored rivers are included in the overall concept of unmonitored areas.

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 VIII Comments and observations on "Example for steps in quality assurance" - Belgium

General

Comments in this contribution are generally about the Belgian situation unless stated otherwise.

The RID Principles should contain elaborated and very specific QA rules in order to set firm standards and narrow limits on data gathering and reporting practices for all CP's. Taking existing practices as a starting point to achieve this is not a sufficiently adequate strategy. In Belgium, as no doubt in other countries to, there is no longer a direct administrational relationship between sampling/analyzing activities and data reporting. Outsourcing practices and shift of matters to regional authorities have made that third party laboratories have often taken the role and place of official or traditional institutions. The RID Principles should account for this development and contain guidance, rules or stipulations facilitating the assessment of QA practices of the sampling/analyzing laboratories. This is also related to the assessment of uncertainty.

Conceivably, OSPAR aims at a much lower degree of uncertainty than do the countries and water managers. This aim is necessary to maintain a constant incentive to pull down the overall level of QA uncertainty.

Issues important in QA and uncertainty frameworks

Selection of rivers

All river basins draining to convention waters are monitored for quality, but not adequately so for flow. For most of the coastal area rivers, flow is inferred as a LTA from basin areas and precipitation. There is no information as to what degree of uncertainty is introduced here. It may be expected that better results will in time be available as an extensive flow monitoring network is being put in place by the regional authorities.

Sampling Strategy

Importance of agreed sampling protocol

See comments under General. It would be a giant step forward if there were such an agreed protocol or if the deviations or derogations of such protocol could be clearly stated.

Trained workers

No information is available about the level of training of the sampling workers. It would be helpful if a minimal scheme for training evaluation could be drafted for use towards sampling instances.

Quick and safe transfer of samples to laboratory

Sampling Frequency

Sampling frequency is generally at a satisfying level of +/- once per month. This frequency is rather low for good quality assessment in the biggest river, the Scheldt.

Site selection

Measuring the yearly loads of the Scheldt, carrying some 70% of the Belgian loads to the North Sea, would be a daunting task if it were to be done in strict accordance with the OSPAR treaty. Not only would it then be necessary to sample the river at the junction dams with at least seven tributaries in order to work in freshwater and unidirectional conditions, but apart form that, hundreds of outlets of plants bordering the tidal part of the river would have to be sampled and considered as a direct inputs.

This issue was solved in a pragmatic way in the earliest days of INPUT. A sampling point at the Belgian-Netherlands border[12] was adopted and used ever since, combined with a monthly mean flow

[12] The Scheldt river mouth is on Netherlands territory, the distance from the Belgian-Netherlands border to the mouth is approximately 50 km along the river coarse.

taking into account the water balance of the Antwerp harbor. Besides from a reduction of the sampling and analyzing workload, this approach has the advantage not to allow for unmonitored areas. To mention here is that the Scheldt estuary is hydrologically considered to be a well mixed water body.

For the main tributary of the Scheldt, the Gent-Terneuzen canal, sampling is done in the fresh water reach but salinity is mainly due to groundwater seepage.

Other rivers and tributaries in the coastal area are all sampled in their freshwater reaches.

Chemical parameters – detection limits and analytical methods

Appropriate analytical method

Analytical methods are not up to the needs of the RID Principles and on the average only 6 out of the 13 compulsory parameters are measured at the +70% detection limit level. Moreover, detection limits vary throughout the year even for the same watercourse and parameter. Taking into account the duration of this kind of problems, it can be doubted if they will ever be solved to get at a sufficiently low, steady and unique LOD for longer periods. Rather it seems that the solution must come from the use that could be made from the data (assessments) and from incentives that could be given.

Selection of laboratory

The federal authority that reports to INPUT has no bearing on the choice of laboratories and has no information on these matters. Throughout the suite of yearly reports it is very clear that the transfer of competence for the choice of laboratory from the federal to the regional level marked a step up in LOD's. No intercomparison has ever been done.

QA of data

There is little doubt about the technical aspects of analysis as a core part of the sampling/analyzing authority staff has a long standing experience in the field. Nevertheless, these aspects are nowhere explicited.
The historical QA is also not explicited and because the data are transferred once a year, re-sampling or re-analyzing is no option.

It is not known to the reporting authority if trend analysis QA is done on the analysis results.

Matters of QA of data could be a point for OSPAR to address in general.

Load Calculations

Rivers

Load calculations are done everywhere according to the Principles. Additional calculations are done for two sampling points under saline influence (Scheldt river and Gent-Terneuzen canal) in order to level out the sea water influence. The method used is clearly described in the yearly submission text documents and consists of calculating and applying a dilution factor for seawater on the basis of salt content. These calculations lead to upper and lower values for the loads, respectively when salinity is taken into account or not. The modulation of the values obtained by applying this normalization is generally less than the one obtained by applying zero and the nominal value of the LOD's for load calculation. The latter method givs often rise to huge differences between upper and lower estimates of loads, the former method does not. For clarity, the value represented by half the DL is only used to calculate standard deviations of series that comprise values below LOD, thus not for calculating loads.

Areas below RID sampling point and unmonitored catchments

Except for the Scheldt, as described before, monitoring is performed in fresh water reaches just upstream the junctions with convention waters which implies that no unmonitored areas are left over.

In Belgium, there are no longer direct inputs of WWTPs or industrial plants in convention waters.

Losses from urban areas

These losses are in general non existent as all cities and communities along convention waters are connected to WWTPs that do not give in convention waters.

Addendum 1: National Reports on Riverine Inputs and Direct Discharges to Convention Waters during 2006

1. Belgium
2. Denmark (not attached as the data submission is delayed)
3. France
4. Germany
5. Iceland
6. Ireland (the report consists of excel tables only, no accompanying text report has been received)
7. Netherlands
8. Norway
9. Portugal
10. Spain
11. Sweden
12. United Kingdom

Appendix 1: Statistical information on river catchment areas

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 2006 by Belgium

Table 4b Total riverine inputs and direct discharges to the maritime area in 2006 by Belgium

Table 6a Main riverine inputs to the maritime area in 2006 by Belgium

Table 6b Tributary riverine inputs to the maritime area in 2006 by Belgium

Table 7 Contaminant concentrations discharging to the maritime area

Table 8 Detection limits for contaminant concentrations

Table 9 Catchment dependent information

Annual report on riverine inputs and direct discharges by Belgium to Convention waters during the year 2006

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: 2006

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 2006 total flow rate is close to the LTA, hence nutrient discharges also are at the average level. Cadmium, lead and zinc show a downward trend, whereas mercury and copper inputs slightly increased. Lindane inputs are fitting back into the since 2000 steadily dropping input level. Suspended matter continues to closely follow the flow rate trend.

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

C. Direct discharges for the year: 2006

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:

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):

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: 2006

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 then 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 third 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 2006

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. 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 2006

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:

11CEa, 1234CBz, 1235CBz, 123CBz, 1245CBz, 124CBz, 124MyBz, 12CBz, 12CEa, 12CPa, 135CBz, 135MyBz, 13CBz, 14CBz, 2356CNiBz, 24-D, 24-DB, 24-DP, 24CFol, 24DDD, 24DDE, 24DDT, 24NiFol, 2CFol, 2CTol, 2hAtraz, 3CFol, 44DDD, 44DDE, 44DDT, 4C35MyFol, 4C3MyFol, 4CFol, 4nNyFol, 4nOyFol, 4tOyFol, Acenaft, Acenaftyl, aEndo, Ag t, aHCH, Al t, Alachloor, Aldrin, AMPA, Ant, As o, As t, Atraz, AzinfosMy, B t, B(a)A, B(a)P, B(b)Flu, B(e)P, B(ghi)Pe, B(k)Flu, Ba t, BBz, BDCMa, bEndo, Bentazone, Benzene, bHCH, BI, Bromoxyn, BZV5, c12CEe, Ca t, Carbdzim, CBz, cCdaan, cCfvinfos, Cd o, Cdazon, cHpCEpx, Chr, Clfyl a, Co t, CpfosEy, CpfosMy, Cprofam, Cr o, Cr t, Ctoluron, Cu o, Cyanaz, Cyfluthrin, CZV, DBCMa, DBMa, DBySn, dBz(ah)An, DCMa, DCvos, DEyatraz, DFySn, dHCH, Diazinon, Dieldrin, DiPyatraz, Diuron, Dmetoat, DNOC, EC 20, EndoS, Endrin, Ethopfos, EyBz, F-, Fe t, Fen, Fenithion, Flu, Fluoreen, gHCH, Glyfosaat, H t, HCBdn, HCBz, Hg o HpC, Ioxynil, IP, Iproturon, iPyBz, Isodrin, K t, KjN, Linuron, Malathion, Mbromuron, mBthiaz, MBySn, MCPA, MCPB, MCPP, Metaza, Metola, Metoxur, Mevinfos, MFySn, Mg t, Mlinuron, Mn t, mpXyl, MxyC, MytByEt, Na t, Naft, Ni o, Ni t, NO2-, NVTOC, O2, O2 sat, oPO4, oXyl, P t, PathionEy, Pb o, PCB 169, PCB 170, PCB 31, PCB 49, PCB 52, PCBz, PCFol, Perylene, pH, Picarb, piPyTol, PirfosMy, Prochloor, Propanil, PyBz, Pyr, Pyrazofos, Se t, Simaz, SO4=, Styrene, T, t12CEe, TBMa, TBySn, tCdane, TCEe, tCfvinfos, TclofosMy, TCMa, Te t, Telodrin, Tfluralin, TFySn, Ti t, Toluene, TPP, TrByaz, TtBySn, TtCEe, TtCMa, V t, Zn o.

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

11CEa, 1234CBz, 1235CBz, 123CBz, 1245CBz, 124CBz, 124MyBz, 12CBz, 12CEa, 12CPa, 135CBz, 135MyBz, 13CBz, 14CBz, 17aEOestradiol, 17aOestradiol, 17bOestradiol, 2356CNiBz, 24-D, 24-DB, 24-DP, 24CFol, 24DDD, 24DDE, 24DDT, 24NiFol, 2CFol, 2CTol, 2hAtraz, 3CFol, 44DDD, 44DDE, 44DDT, 4C35MyFol, 4C3MyFol, 4CFol, 4nNyFol, 4nOyFol, 4tOyFol, Acenaft, Acenaftyl, aEndo, Ag t, aHCH, Al t, Alachloor, Aldrin, AMPA, Ant, As o, As t, Atraz, AzinfosMy, B t, B(a)A, B(a)P, B(b)Flu, B(e)P, B(ghi)Pe, B(k)Flu, Ba t, BBz, BDCMa, bEndo, Bentazone, Benzeen, bHCH, Bromoxyn, BZV5, c12CEe, Ca t, Carbdzim, CBz, cCdaan, cCfvinfos, Cd o, Cdazon, cHpCEpx, Chr, Clfyl a, Co t, CpfosEy, CpfosMy, Cprofam, Cr o, Cr t, Ctoluron, Cu o, Cyanaz, Cyfluthrin, COD, DBCMa, DBMa, DBySn, dBz(ah)An, DCMa, DCvos, DEyatraz, DFySn, dHCH, Diazinon, Dieldrin, DiPyatraz, Diuron, Dmetoat, DNOC, EC 20, EndoS, Endrin, Ethopfos, EyBz, F-, FColi, Fe t, Fen, Fenithion, Flu, Fluorene, FStrep, gHCH, Glyfosate, H t, HCBdn, HCBz, Hg o, HpC, Ioxynil, IP, Iproturon, iPyBz, Isodrin, K t, KjN, Linuron, Malathion, Mbromuron, mBthiaz, MBySn, MCPA, MCPB, MCPP, Mestranol, Metaza, Metola, Metoxur, Mevinfos, MFySn, Mg t, Mlinuron, Mn t, mpXyl, MxyC, MytByEt, Na t, Naft, Ni o, Ni t, NO2-, NVTOC, O2, O2 sat, Oestriol, Oestron, oXyl, PathionEy, Pb o, PCB 169, PCB 170, PCB 31 PCB 52, PCBz, PCFol, Perylene, pH, Picarb, piPyTol, PirfosMy, Prochlor, Propanil, PyBz, Pyr, Pyrazofos, Salm, Se t, Simaz, SO4=, Styrene, T, t12CEe, TBMa, TBySn, tCdane, TCEe, tCfvinfos, TclofosMy, TCMa, TColi, Te t, Telodrin, Tfluralin, TFySn, Ti t, Toluene, TPP, TrByaz, TtBySn, TtCEe, TtCMa, V t, Zn o.

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 150% of the LTA and 280% of it's value for 2005. The inputs for Cd, Cu and P are difficult to compare with 2005 as these metals mostly occur at concentrations lower than DL. Zn increased by 15% compared to 2005. gHCH stayed beneath DL in contrast to former years. Total N increased with about 300% compared to 2005. Higher DL-levels for 2006 however masks the total P-input behaviour. SPM-input is grossly equal to the 2005 level.

Scheldt river

The mean flow rate for 2006 is close to the LTA and slightly above the 2005 level. Hg and Cu show a slight increase compared to last year. Pb and Zn exhibit a slight decrease. Suspended matter load increased by 30%. Total N inputs are not significantly different, total P inputs increased by 40%. Neither gHCH nor PCBs were at any measurement above DL.

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 then 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 2006

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 2006, 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**:**

11CEa, 1234CBz, 1235CBz, 123CBz, 1245CBz, 124CBz, 124MyBz, 12CBz, 12CEa, 12CPa, 135CBz, 135MyBz, 13CBz, 14CBz, 17aEOestradiol, 17aOestradiol, 17bOestradiol, 2356CNiBz, 24-D, 24-DB, 24-DP, 24CFol, 24DDD, 24DDE, 24DDT, 24NiFol, 2CFol, 2CTol, 2hAtraz, 3CFol, 44DDD, 44DDE, 44DDT, 4C35MyFol, 4C3MyFol, 4CFol, 4nNyFol, 4nOyFol, 4tOyFol, Acenaft, Acenaftyl, aEndo, Ag t, aHCH, Al t, Alachloor, Aldrin, AMPA, Ant, As o, As t, Atraz, AzinfosMy, B t, B(a)A, B(a)P, B(b)Flu, B(e)P, B(ghi)Pe, B(k)Flu, Ba t, BBz, BDCMa, bEndo, Bentazone, Benzeen, bHCH, BI, Bromoxyn, BZV5, c12CEe, Ca t, Carbdzim, CBz, cCdane, cCfvinfos, Cd o, Cdazon, cHpCEpx, Chr, Co t, CpfosEy, CpfosMy, Cprofam, Cr o, Cr t, Ctoluron, Cu o, Cyanaz, Cyfluthrin, COD, DBCMa, DBMa, DBySn, dBz(ah)An, DCMa, DCvos, DEyatraz, DFySn, dHCH, Diazinon, Dieldrin, DiPyatraz, Diuron, Dmetoat, DNOC, EC 20, EndoS, Endrin, Ethopfos, EyBz, F-, FColi, Fe t, Fen, Fenithion, Flu, Fluorene, FStrep, gHCH, Glyfosate, H t, HCBdn, HCBz, Hg o, Hg t, HpC, Ioxynil, IP, Iproturon, iPyBz, Isodrin, K t, KjN, Linuron, Malathion, Mbromuron, mBthiaz, MBySn, MCPA, MCPB, MCPP, Mestranol, Metaza, Metola, Metoxur, Mevinfos, MFySn, Mg t, Mlinuron, Mn t, mpXyl, MxyC, MytByEt, Na t, Naft, Ni o, Ni t, NO2-, NVTOC, O2, O2 sat, Oestriol, Oestron, oPO4, oXyl, P t, PathionEy, Pb o, Pb t, PCB 101, PCB 118, PCB 138, PCB 153, PCB 169, PCB 170, PCB 180, PCB 31, PCB 49, PCBz, PCFol, Perylene, pH, Picarb, piPyTol, PirfosMy, Prochlor, Propanil, PyBz, Pyr, Pyrazofos, Se t, Secchi, Simaz, SO4=, Styrene, T, t12CEe, TBMa, TBySn, tCdaan, TCEe, tCfvinfos, TclofosMy, TCMa, TColi, Te t, Telodrin, Tfluralin, TFySn, Ti t, Tolueen, TPP, TrByaz, TtBySn, TtCEe, TtCMa, V t, Zn o .

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

24-D, 24-DB, 24-DP, 24NiFol, 2hAtraz, aEndo, Ag t, Al t, Alachlor, AMPA, As t, Atraz, AzinfosMy, B t, Ba t, bEndo, Bentazone, Bromoxyn, BOD5, Ca t, Carbdzim, cCfvinfos, Cdazon, Cl-, Co t, CpfosEy, CpfosMy, Cprofam, Cr t, Ctoluron, Cyanaz, Cyfluthrin, COD, DCvos, DEyatraz, Diazinon, DiPyatraz, Diuron, Dmetoat, DNOC, EC 20, EndoS, Ethopfos, Fe t, Fenithion, Glyfosaat, Ioxynil, Iproturon, K t, KjN, Linuron, Malathion, Mbromuron, mBthiaz, MCPA, MCPB, MCPP, Metaza, Metola, Metoxur, Mevinfos, Mg t, Mlinuron, Mn t, Na t, Ni t, NO2-, O2, O2 sat, PathionEy, pH, Picarb, PirfosMy, Prochloor, Propanil, Pyrazofos, Se t, Simaz, T, tCfvinfos, TclofosMy, Te t, Tfluralin, Ti t, TPP, TrByaz, V t.

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 the reports.

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

No monitored flow rates are available for the tributaries in the coastal zone except for the Ghent-Oostende canal. Flow for this canal was grossly the same as in 2005. The Ghent-Terneuzen canal had a 50% higher flow rate compared to 2005.

For the coastal zone, a slight increase in Cu and a slight decrease in Cd, Lindane and suspended matter inputs is to be noted compared to 2005.

For the Ghent-Terneuzen canal, a noticeable increase in Zn and total N and an even noticeable decrease in Cu and suspended matter can be noted, compared to 2005.

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 two figures, the minimum and the maximum detection limits, in one field in text format.

Another fact to be stated is that in general detection limits largely exceed the recommended values. Consequently, very often more than 30% of the measurements are beneath 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 third time since reporting. As the inputs for these rivers were formerly calculated on the basis of the LTAs, these actual flow data surely mark the time series. It is as yet not perceivable to what amount or extent these data will be of influence on trends to be calculated in the future.

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2006 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		0.9	0.3	30	12	145	0.2	0.0	1.8	20	0.5	22	0.3	280
	upper	10806	1.5	0.5	42	18	194	13	63	2.5	25	0.7	33	3.3	372
Tributary Rivers	lower		0.1	0.1	6.5	2.0	45	1.0	0.0	2.9	10.5	0.8	16	0.7	21
	upper	5125	0.3	0.1	9.3	4.1	47	7.8	22	3.0	10.8	0.9	16	1.5	22
Total Riverine Inputs	**lower**		1.0	0.4	37	14	190	1.2	0.0	4.7	30	1.3	37	1.1	300
	upper	15931	1.8	0.6	51	22	241	21	84	5.4	36	1.6	50	4.8	393
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	**15931**													

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 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	0.022	0.010	1.2	0.000	4.6	0.169	0.000	0.285	3.5	0.002	3.8	0.007	6
		upper	0.047	0.019	1.2	0.217	4.6	1.3	3.6	0.289	3.5	0.068	4.0	0.190	6
		comment													
238	Coastal Area	lower	0.022	0.010	1.2	0.000	4.6	0.169	0.000	0.285	3.5	0.002	3.8	0.007	6
		upper	0.047	0.019	1.2	0.217	4.6	1.3	3.6	0.289	3.5	0.068	4.0	0.190	6
		comment													
102	Schelde	lower	0.866	0.306	29	12	140	0.000	0.000	1.5	16	0.458	18	0.295	274
		upper	1.5	0.487	41	18	190	12	59	2.2	21	0.620	29	3.1	366
		comment													
245	Schelde Basin	lower	0.866	0.306	29	12	140	0.000	0.000	1.5	16	0.458	18	0.295	274
		upper	1.5	0.487	41	18	190	12	59	2.2	21	0.620	29	3.1	366
		comment													
79	North Sea (BE)	lower	0.888	0.316	30	12	145	0.169	0.000	1.8	20	0.460	22	0.302	280
		upper	1.5	0.506	42	18	194	13	63	2.5	25	0.689	33	3.3	372
		comment													

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 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	0.001		0.009	0.004	0.201	0.050		0.013	0.093	0.014	0.165	0.014	0.602
		upper	0.003		0.057	0.024	0.253	0.112		0.015	0.096	0.014	0.168	0.023	0.602
		comment													
246	Langeleed	lower	0.000		0.005	0.000	0.091			0.006	0.017	0.005	0.033	0.003	0.209
		upper	0.001		0.025	0.007	0.102			0.006	0.018	0.005	0.036	0.008	0.209
		comment													
248	Vladslovaart	lower	0.000		0.021	0.009	0.144			0.013	0.128	0.017	0.184	0.018	0.684
		upper	0.002		0.055	0.022	0.183			0.015	0.131	0.017	0.187	0.024	0.684
		comment													
239	Western Coastal Area	lower	**0.001**		**0.034**	**0.012**	**0.435**	**0.050**		**0.031**	**0.238**	**0.036**	**0.382**	**0.036**	**1.5**
		upper	**0.006**		**0.138**	**0.053**	**0.538**	**0.112**		**0.037**	**0.245**	**0.036**	**0.392**	**0.054**	**1.5**
		comment													
255	Blankenbergse vaart	lower	0.000		0.066	0.003	0.155	0.000	0.000	0.009	0.012	0.006	0.044	0.008	0.454
		upper	0.001		0.086	0.011	0.164	0.025	0.151	0.010	0.016	0.006	0.048	0.011	0.454
		comment													
252	Leopold canal	lower	0.018	0.005	0.482	0.067	1.794	0.221	0.000	0.121	0.318	0.051	0.636	0.055	1.7
		upper	0.029	0.009	0.574	0.137	2.0	0.417	1.3	0.126	0.332	0.051	0.650	0.095	1.7
		comment													
254	Schipdonk canal	lower	0.072	0.014	3.428	0.801	11.2	0.766	0.000	0.518	1.2	0.135	2.2	0.165	4.9
		upper	0.099	0.024	3.6	1.046	11.3	1.6	3.6	0.531	1.2	0.135	2.3	0.251	5.1
		comment													
242	Eastern Coastal Area	lower	**0.090**	**0.019**	**4.0**	**0.872**	**13.2**	**0.986**	**0.000**	**0.648**	**1.5**	**0.191**	**2.9**	**0.228**	**7.0**
		upper	**0.129**	**0.033**	**4.2**	**1.194**	**13.4**	**2.1**	**5.1**	**0.667**	**1.6**	**0.191**	**3.0**	**0.357**	**7.2**
		comment													
249	Gent-Oostende canal	lower	0.000	0.009	0.144	0.021	5.2	0.000	0.000	0.310	1.6	0.091	2.2	0.114	2.3
		upper	0.025	0.019	0.7	0.350	5.3	1.1	3.0	0.311	1.6	0.091	2.2	0.229	2.3
		comment													
250	Noordede	lower	0.000		0.166	0.003	0.220	0.000		0.021	0.045	0.009	0.138	0.018	0.8
		upper	0.003		0.210	0.017	0.258	0.062		0.021	0.051	0.009	0.144	0.024	0.8
		comment													
241	Middle Coastal Area	lower	**0.000**	**0.009**	**0.310**	**0.024**	**5.4**	**0.000**	**0.000**	**0.330**	**1.6**	**0.100**	**2.4**	**0.132**	**3.1**
		upper	**0.028**	**0.019**	**0.9**	**0.367**	**5.6**	**1.2**	**3.0**	**0.332**	**1.7**	**0.100**	**2.4**	**0.253**	**3.1**
		comment													
238	Coastal Area	lower	**0.091**	**0.028**	**4.3**	**0.9**	**19**	**1.037**	**0.000**	**1.0**	**3.4**	**0.328**	**5.6**	**0.396**	**12**
		upper	**0.163**	**0.052**	**5.3**	**1.6**	**20**	**3.4**	**8.1**	**1.0**	**3.4**	**0.328**	**5.7**	**0.664**	**12**
		comment													
244	Gent-Terneuzen Canal	lower	0.000	0.034	2.152	1.1	26	0.000	0.000	1.860	7.1	0.519	9.9	0.354	9.1
		upper	0.150	0.072	4.0	2.5	27	4.4	13.4	1.928	7.3	0.539	10.5	0.838	9.7
		comment													
245	Schelde Basin	lower	**0.000**	**0.034**	**2.152**	**1.1**	**26**	**0.000**	**0.000**	**1.860**	**7.1**	**0.519**	**9.9**	**0.354**	**9.1**
		upper	**0.150**	**0.072**	**4.0**	**2.5**	**27**	**4.4**	**13.4**	**1.928**	**7.3**	**0.539**	**10.5**	**0.838**	**9.7**
		comment													
79	North Sea (BE)	lower	**0.091**	**0.061**	**6.5**	**2.0**	**45**	**1.0**	**0.000**	**2.9**	**10.5**	**0.846**	**16**	**0.750**	**21**
		upper	**0.313**	**0.124**	**9.3**	**4.1**	**47**	**7.8**	**22**	**3.0**	**10.8**	**0.866**	**16**	**1.5**	**22**
		comment													

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2006 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	0.05	2.1	ND	8.4
		maximum	0.31		4.3	1.7	38	12		1.3	9	1.1	11.93	1.7	47
		more than 70% > D.L.	no		no	no	no	no		no	no	yes	yes	no	yes
		n	12		12	12	12	9		12	12	12	12	12	12
		info													
		st.Dev.	NI		NI	NI	NI	NI		NI	NI	0.31	3.44	NI	10.02
243	Ijzer	lower													
		upper													
		minimum	ND	ND	ND	ND	8.9	ND	ND	ND	1.1	ND	4.66	ND	7.8
		maximum	0.51	0.14	7	2.1	23	6	ND	2.1	18	0.53	18.33	0.75	45
		more than 70% > D.L.	no	no	yes	no	yes	no	no	no	yes	yes	yes	no	yes
		n	12	12	12	12	10	9	9	12	12	12	12	12	12
		info													
		st.Dev.	NI	NI	1.38	NI	6.55	NI	NI	NI	4.74	0.15	4.05	NI	10.76
246	Langeleed	lower													
		upper													
		minimum	ND		ND	ND	ND			ND	ND	0.09	0.02	ND	9.4
		maximum	ND		3	ND	24			1.6	8.8	1.8	11.93	1.9	41
		more than 70% > D.L.	no		no	no	yes			no	no	yes	yes	no	yes
		n	6		6	6	6			12	12	12	12	12	12
		info													
		st.Dev.	NI		NI	NI	NI			NI	NI	0.53	2.90	NI	10.32
248	Vladslovaart	lower													
		upper													
		minimum	ND		ND	ND	ND			ND	ND	0.22	1.82	ND	19
		maximum	ND		4.6	2.1	17			2.6	17	2.3	20.04	2.4	57
		more than 70% > D.L.	no		no	no	no			no	no	yes	yes	no	yes
		n	11		11	11	11			12	12	12	12	12	12
		info													
		st.Dev.	NI		NI	NI	NI			NI	NI	0.78	6.71	0.76	12.43
239	Western Coastal Area	lower													
		upper													
		minimum	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**0.02**	**ND**	**7.8**
		maximum	**ND**	**0.14**	**7**	**ND**	**38**	**12**	**ND**	**2.6**	**18**	**2.3**	**20.04**	**2.4**	**57**
		more than 70% > D.L.	**no**	**no**	**no**	**no**	**yes**	**no**	**no**	**no**	**yes**	**yes**	**yes**	**no**	**yes**
		n	**41**	**12**	**41**	**41**	**39**	**18**	**18**	**48**	**48**	**48**	**48**	**48**	**48**
		info													
		st.Dev.	**NI**	**NI**	**NI**	**NI**	**7.50**	**NI**	**NI**	**NI**	**5.43**	**0.55**	**5.43**	**NI**	**12.10**
255	Blankenbergse vaart	lower													
		upper													
		minimum	ND		ND	ND	ND	ND	ND	ND	ND	0.03	2.23	ND	17
		maximum	ND		49	2.4	42	ND	ND	2	2.8	0.99	5.95	1.5	56
		more than 70% > D.L.	no		no	no	yes	no	no	no	no	yes	yes	no	yes
		n	10		10	10	10	7	7	10	10	10	10	10	10
		info													
		st.Dev.	NI		NI	NI	NI	NI	NI	NI	NI	0.27	1.24	NI	13.54

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2006 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	ND	ND	0.21	2.4	ND	6
		maximum	2	0.2	23	2.6	35	18	ND	1.8	5.6	1.1	8.76	1.5	40
		more than 70% > D.L.	no	no	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	NI	NI	NI	11.05	NI	NI	0.58	1.99	0.27	2.14	NI	9.13
254	Schipdonk canal	lower													
		upper													
		minimum	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	1.68	ND	ND
		maximum	1.4	0.22	77	15	119	17	ND	3.4	8.4	0.97	11.81	1.2	82
		more than 70% > D.L.	no	no	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	NI	NI	NI	37.87	NI	NI	1.20	2.59	0.19	3.35	NI	22.70
242	Eastern Coastal Area	lower													
		upper													
		minimum	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**0.03**	**1.68**	**ND**	**ND**
		maximum	**ND**	**0.22**	**77**	**ND**	**119**	**18**	**ND**	**3.4**	**8.4**	**1.1**	**11.81**	**1.5**	**82**
		more than 70% > D.L.	**no**	**no**	**no**	**no**	**yes**	**no**	**no**	**yes**	**yes**	**yes**	**yes**	**no**	**yes**
		n	**34**	**24**	**34**	**34**	**34**	**25**	**25**	**34**	**34**	**34**	**34**	**34**	**34**
		info													
		st.Dev.	**NI**	**NI**	**NI**	**NI**	**25.71**	**NI**	**NI**	**0.95**	**2.28**	**0.24**	**2.84**	**NI**	**18.30**
249	Gent-Oostende canal	lower													
		upper													
		minimum	ND	ND	ND	ND	ND	ND	ND	ND	2.4	0.1	2.54	ND	ND
		maximum	ND	0.15	6.2	2	30	ND	ND	2.9	8.6	0.75	11	3.2	21
		more than 70% > D.L.	no	no	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	NI	NI	NI	9.52	NI	NI	0.83	2.30	0.20	2.69	NI	5.56
250	Noordende	lower													
		upper													
		minimum	ND		ND	ND	ND	ND	ND	ND	ND	ND	2.1	ND	8
		maximum	ND		67	0.6	23	ND	ND	2.2	7	0.78	9.93	2	71
		more than 70% > D.L.	no		no	no	no	no	no	yes	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	0.76	NI	0.27	2.26	NI	18.44
241	Middle Coastal Area	lower													
		upper													
		minimum	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2.1**	**ND**	**ND**
		maximum	**ND**	**0.15**	**67**	**2**	**30**	**ND**	**ND**	**2.9**	**8.6**	**0.78**	**11**	**3.2**	**71**
		more than 70% > D.L.	**no**	**no**	**no**	**no**	**yes**	**no**	**no**	**yes**	**yes**	**yes**	**yes**	**no**	**yes**
		n	**24**	**12**	**24**	**24**	**24**	**18**	**18**	**24**	**24**	**24**	**24**	**24**	**24**
		info													
		st.Dev.	**NI**	**NI**	**NI**	**NI**	**8.78**	**NI**	**NI**	**NI**	**2.94**	**0.23**	**2.61**	**NI**	**17.43**

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2006 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]
238 Coastal Area	lower													
	upper													
	minimum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	ND	ND
	maximum	ND	0.22	77	ND	119	ND	ND	3.4	18	2.3	20.04	3.2	82
	more than 70% > D.L.	no	no	no	no	yes	no	no	yes	yes	yes	yes	no	yes
	n	99	48	99	99	97	61	61	106	106	106	106	106	106
	info													
	st.Dev.	NI	NI	NI	NI	17.32	NI	NI	0.81	4.28	0.41	4.27	NI	15.71
244 Gent-Terneuzen Canal	lower													
	upper													
	minimum	ND	ND	ND	ND	12	ND	ND	ND	4.4	0.28	4.68	ND	ND
	maximum	ND	0.09	4.9	4.5	33	ND	ND	2.8	7.2	0.68	10.91	0.7	16
	more than 70% > D.L.	no	no	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	NI	NI	NI	7.86	NI	NI	0.99	0.90	0.12	1.77	NI	3.59
102 Schelde	lower													
	upper													
	minimum	ND	ND	4.1	ND	19	ND	ND	ND	2.6	0.07	2.71	ND	31
	maximum	1	0.29	42	12	83	ND	ND	1	5.7	0.2	7.05	0.53	159
	more than 70% > D.L.	no	no	yes	yes	yes	no	no	no	yes	yes	yes	no	yes
	n	11	12	12	12	12	10	10	14	14	14	14	14	13
	info													
	st.Dev.	NI	NI	10.64	4.40	19.47	NI	NI	NI	0.94	0.04	1.30	NI	44.48
245 Schelde Basin	lower													
	upper													
	minimum	ND	ND	ND	ND	12	ND	ND	ND	2.6	0.07	2.71	ND	ND
	maximum	ND	0.29	42	12	83	7	ND	2.8	7.2	0.68	10.91	0.7	159
	more than 70% > D.L.	no	no	yes	no	yes	no	no	yes	yes	yes	yes	no	yes
	n	23	24	24	24	24	19	19	26	26	26	26	26	25
	info													
	st.Dev.	NI	NI	8.75	NI	18.84	NI	NI	0.86	1.27	0.20	2.16	NI	47.40
79 North Sea (BE)	lower													
	upper													
	minimum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	ND	ND
	maximum	ND	0.29	77	ND	119	ND	ND	3.4	18	2.3	20.04	3.2	159
	more than 70% > D.L.	no	no	no	no	yes	no	no	yes	yes	yes	yes	no	yes
	n	122	72	123	123	121	80	80	132	132	132	132	132	131
	info													
	st.Dev.	NI	NI	NI	NI	18.57	NI	NI	0.82	3.90	0.38	3.95	NI	26.03

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 2006 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	0.1		1 - 3	0,6 - 1,7	2 - 7	2 - 6	1 - 12	0,08 - 0,27	0,23 - 0,77	0.1	NI	0,47 - 0,86	NI
243	Ijzer	Sewage													
		Industrial													
		Riverine	0.1	0,03 - 0,1	3	0,6 - 1,7	5	2 - 6	1 - 12	0,08 - 0,27	0.1	0,02 - 0,1	NI	0,47 - 0,86	NI
246	Langeleed	Sewage													
		Industrial													
		Riverine	0.1		3	0,6 - 1,7	7			0.27	0,23 - 0,77	0.1	NI	0,47 - 0,86	NI
248	Vladslovaart	Sewage													
		Industrial													
		Riverine	0.1		1 - 3	0,6 - 1,7	7			0,08 - 0,27	0,23 - 0,77	0.1	NI	0.86	NI
239	Western Coastal Area	Sewage													
		Industrial													
		Riverine	**0.1**	**0,03 0,1**	**1 - 3**	**0,6 - 1,7**	**2 - 7**	**2 - 6**	**1 - 12**	**0,08 - 0,27**	**0,1 - 0,77**	**0,02 - 0,1**	**NI**	**0,47 - 0,86**	**NI**
255	Blankenbergse vaart	Sewage													
		Industrial													
		Riverine	0.1		1 - 3	0,6 - 1,7	7	2	1 - 12	0,08 - 0,27	0,23 - 0,77	0.1	NI	0,47 - 0,86	NI
252	Leopold canal	Sewage													
		Industrial													
		Riverine	0.1	0,05 - 0,1	1 - 3	0,6 - 1,7	7	2	1 - 12	0.27	0.77	0.1	NI	0.86	NI
254	Schipdonk canal	Sewage													
		Industrial													
		Riverine	0.1	0,05 - 0,1	1 - 3	0,6 - 1,7	2	2 - 6	1 - 12	0.27	0.77	0.1	NI	0.86	2.4
242	Eastern Coastal Area	Sewage													
		Industrial													
		Riverine	**0.1**	**0,05 - 0,1**	**1 - 3**	**0,6 - 1,7**	**2 - 7**	**2 - 6**	**1 - 12**	**0,08 - 0,27**	**0,23 - 0,77**	**0.1**	**NI**	**0,47 - 0,86**	**NI**
249	Gent-Oostende canal	Sewage													
		Industrial													
		Riverine	0.1	0,05 - 0,1	1 - 3	0,6 - 1,7	7	2 - 6	1 - 12	0,08 - 0,27	0.1	0.1	NI	0,47 - 0,86	4.73
250	Noordende	Sewage													
		Industrial													
		Riverine	0.1		1 - 3	0,6 - 1,7	7	2 - 6	1 - 12	0.08	0,23 - 0,77	0.1	NI	0,26 - 0,86	NI
241	Middle Coastal Area	Sewage													
		Industrial													
		Riverine	**0.1**	**0,05 - 0,1**	**1 - 3**	**0,6 - 1,7**	**7**	**2 - 6**	**1 - 12**	**0,08 - 0,27**	**0,1 - 0,77**	**0.1**	**NI**	**0,26 - 0,86**	**NI**
238	Coastal Area	Sewage													
		Industrial													
		Riverine	**0.1**	**0,03 - 0,1**	**1 - 3**	**0,6 - 1,7**	**2 - 7**	**2 - 6**	**1 - 12**	**0,08 - 0,27**	**0,1 - 0,77**	**0,02 - 0,1**	**NI**	**0,26 - 0,86**	**NI**
244	Gent-Terneuzen Canal	Sewage													
		Industrial													
		Riverine	0,1 - 0,3	0,05 - 0,1	3	0,6 - 1,7	5	2 - 6	1 - 12	0.27	0.1	0.1	NI	0.86	4.8
102	Schelde	Sewage													
		Industrial													
		Riverine	0,1 - 0,3	0,05 - 0,1	0,6	1,7	5	2 - 6	1 - 12	0,08 - 0,27	0.1	0.1	NI	0,47 - 0,86	NI
245	Schelde Basin	Sewage													
		Industrial													
		Riverine	**0,1 - 0,3**	**0,05 - 0,1**	**0,6- 3**	**0,6 - 1,7**	**5**	**2 - 6**	**1 - 12**	**0,08 - 0,27**	**0.1**	**0.1**	**NI**	**0,47 - 0,86**	**NI**
79	North Sea (BE)	Sewage													
		Industrial													
		Riverine	**0,1 - 0,3**	**0,03 - 0,1**	**0,6 - 3**	**0,6 - 1,7**	**2 - 7**	**2 - 6**	**1 - 12**	**0,08 - 0,27**	**0,1 - 0,77**	**0,02 - 0,1**	**NI**	**0,26 - 0,86**	**NI**

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 2006 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	798	561.6	0	4136	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	685	432	0	3642	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	3067	1885	0	13262	1991-2006	1	Mean
102	Schelde	10008	11139	3888	17280	1949-2006	1	Mean
245	Schelde Basin	13075	13024	3888	30542	NI	2	Mean
79	North Sea (BE)	NI	15391	NI	NI	NI	11	Mean

3. France

Annual report on riverine inputs and direct discharges to Convention waters during the year 2006 by France

Table 4a	Total riverine inputs and direct discharges to each OSPAR region reported in 2006 by France
Table 4b	Total riverine inputs and direct discharges reported in 2006 by France
Table 6a	Main riverine inputs to the maritime area of the OSPAR Convention in 2006 by France
Table 6a	Tributary riverine inputs to the maritime area of the OSPAR Convention in 2006 by France
Table 6c	Unmonitored areas inputs to the maritime area of the OSPAR Convention in 2006 by France
Table 7	Contaminant concentrations in French rivers discharging to the maritime area of the OSPAR Convention
Table 8	Detection limits for contaminant concentrations of French inputs to the maritime area
Table 9	Catchment dependent information in the maritime area

Annual report on riverine inputs and direct discharges by FRANCE to Convention waters during the year 2006
English version

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

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A. General information

France is concerned with the OSPAR regions II (Channel) and IV (Bay of Biscay).

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).

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 (km^2)	LTA ($1000\ m^3/d$)
OSPAR II	Artois-Picardie	Pas de Calais	II-AP-PC-Aa	1	unmonitored area	2308	
		Somme	II-AP-SO-Canche	2	tributary river	3895	4579
			II-AP-SO-Somme	3	tributary 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	
			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	
			II-SN-NC-Orne	13	tributary river	2976	2506
			II-SN-NC-Seulles	14	tributary river	547	346
			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	
			II-SN-SC-Selune	18	tributary river	1623	1987
			II-SN-SC-Sienne	19	tributary river	1135	
	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	
OSPAR IV	Loire-Bretagne	Sud Bretagne	IV-LB-SB-Blavet	23	tributary river	4649	5702
			IV-LB-SB-J4	24	unmonitored area	2868	
			IV-LB-SB-Vilaine	25	Tributary river	10144	5443
		Loire	IV-LB-LO-Erdre	26	unmonitored area	3636	
			IV-LB-LO-LOIRE	27	Main River	110178	73526
			IV-LB-LO-Sevre-Nantaise	28	tributary river	4664	4234
		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	
			IV-AG-CH-Boutonne	32	tributary river	2141	
			IV-AG-CH-Charente	33	tributary river	7526	5357
			IV-AG-CH-Livenne	34	unmonitored area	1172	
			IV-AG-CH-Seudre	35	tributary river	988	432
		Bassin d'Arcachon	IV-AG-BA-Eyre	36	tributary river	2036	1814
			IV-AG-BA-S1	37	unmonitored area	2810	
		Gironde côté Dordogne	IV-AG-GD-Dordogne	38	tributary river	14605	21859
			IV-AG-GD-Isle	39	tributary river	8472	6912
			IV-AG-GD-P9	40	unmonitored area	870	
		Gironde côté Garonne	IV-AG-GG-Dropt	41	tributary river	2672	
			IV-AG-GG-GARONNE	42	Main River	38227	40003
			IV-AG-GG-Lot	43	tributary river	11541	12614
			IV-AG-GG-O9	44	unmonitored area	3875	
		Côte Landaise	IV-AG-CL-S3S4	45	unmonitored area	3105	
		Adour	IV-AG-AD-Adour	46	tributary river	7977	7690
			IV-AG-AD-Bidouze	47	tributary river	1041	
			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	

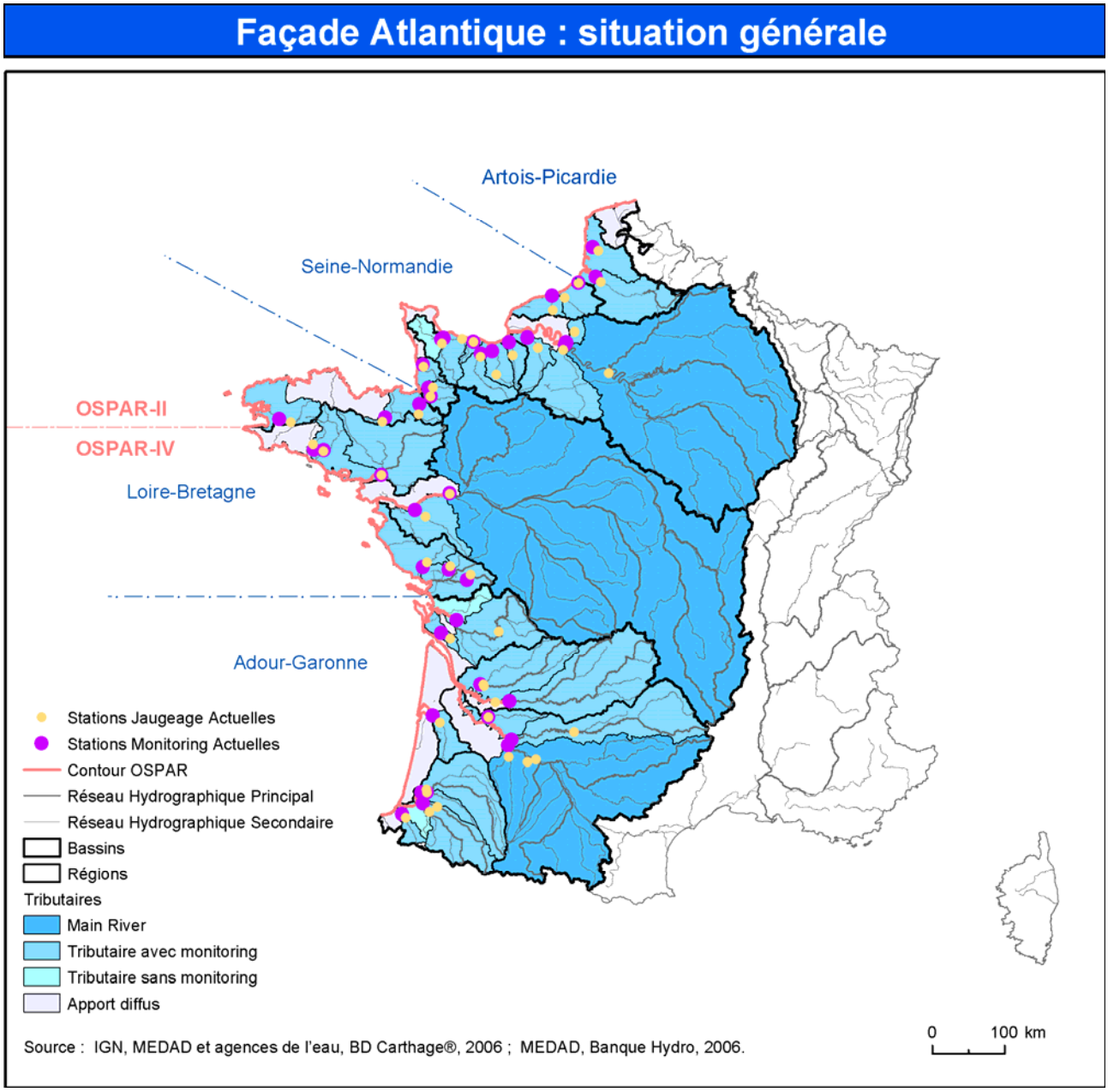
n°	Area (km^2)	Monitored area (km^2)	Population	monitored percentage (%)	Artificial areas (km^2)	Agricultural areas (km^2)	Forest (km^2)	Wetlands (km^2)	Nature of the receiving water	Tidal range (m)	
										coef 95	coef 45
1	2308	0	606932	0	255	1876	156	12	Coastal		
2	3895	1316	382876	34	190	3232	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 (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
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.

Considering our previous results about run-offs and load borne, 3 are declared as main rivers: Loire, Seine and Garonne. The 3 corresponding areas represent more than 50% of the total surface.

This map indicates the global system of the 2 OSPAR regions II and IV.



Nb : Translation of some words of the caption

Stations Jaugeage actuelles : stations measuring flow

Stations Monitoring actuelles : stations measuring water quality

Contour Ospar : Ospar Contour line

Réseau Hydrographique principal : Main hydrographic network

Réseau Hydrographique secondaire : Secondary hydrographic network

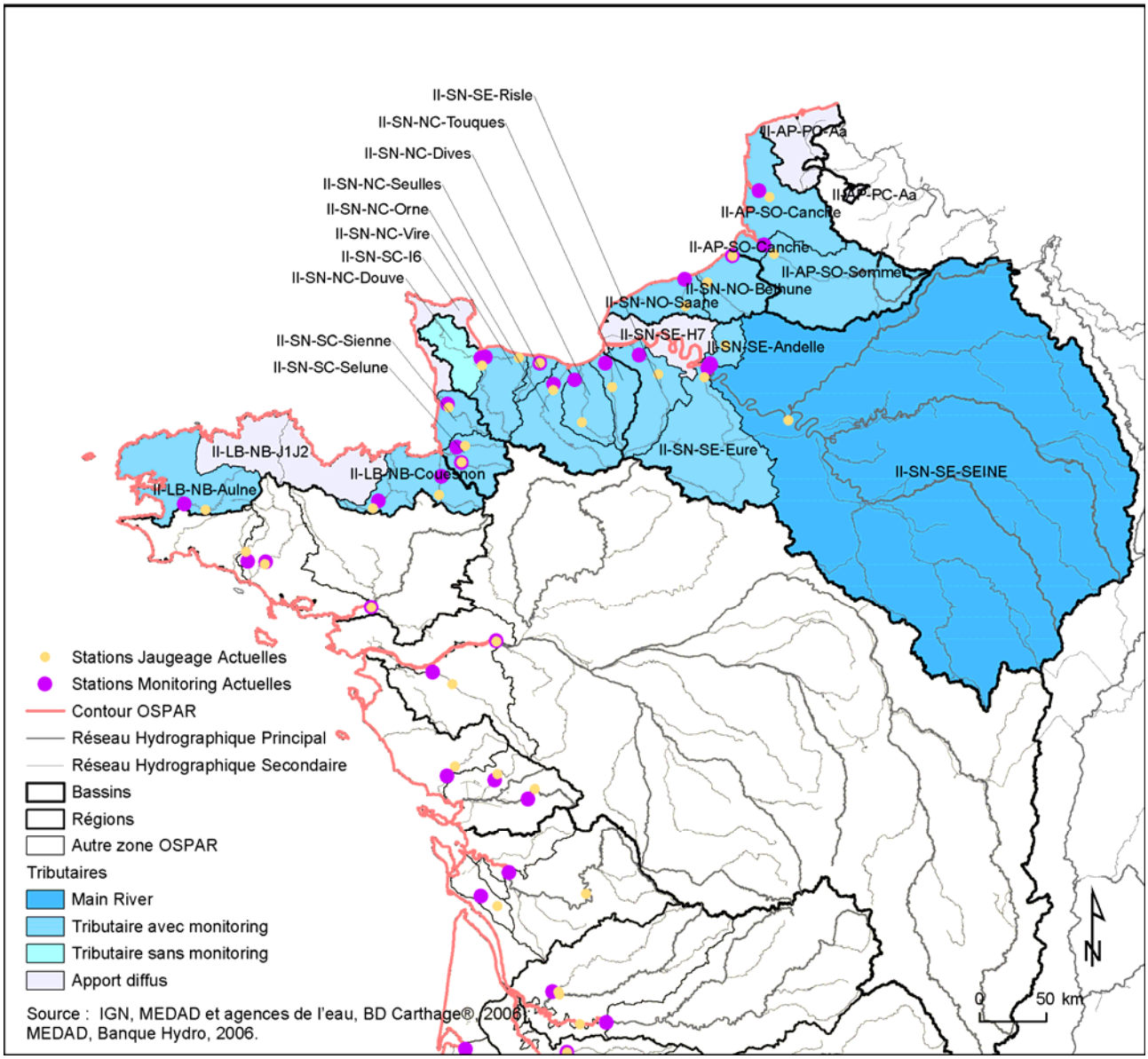
Tributaire avec monitoring : Tributary with monitoring (flow and water quality)

Tributaire sans monitoring : Tributary without monitoring (flow or quality)

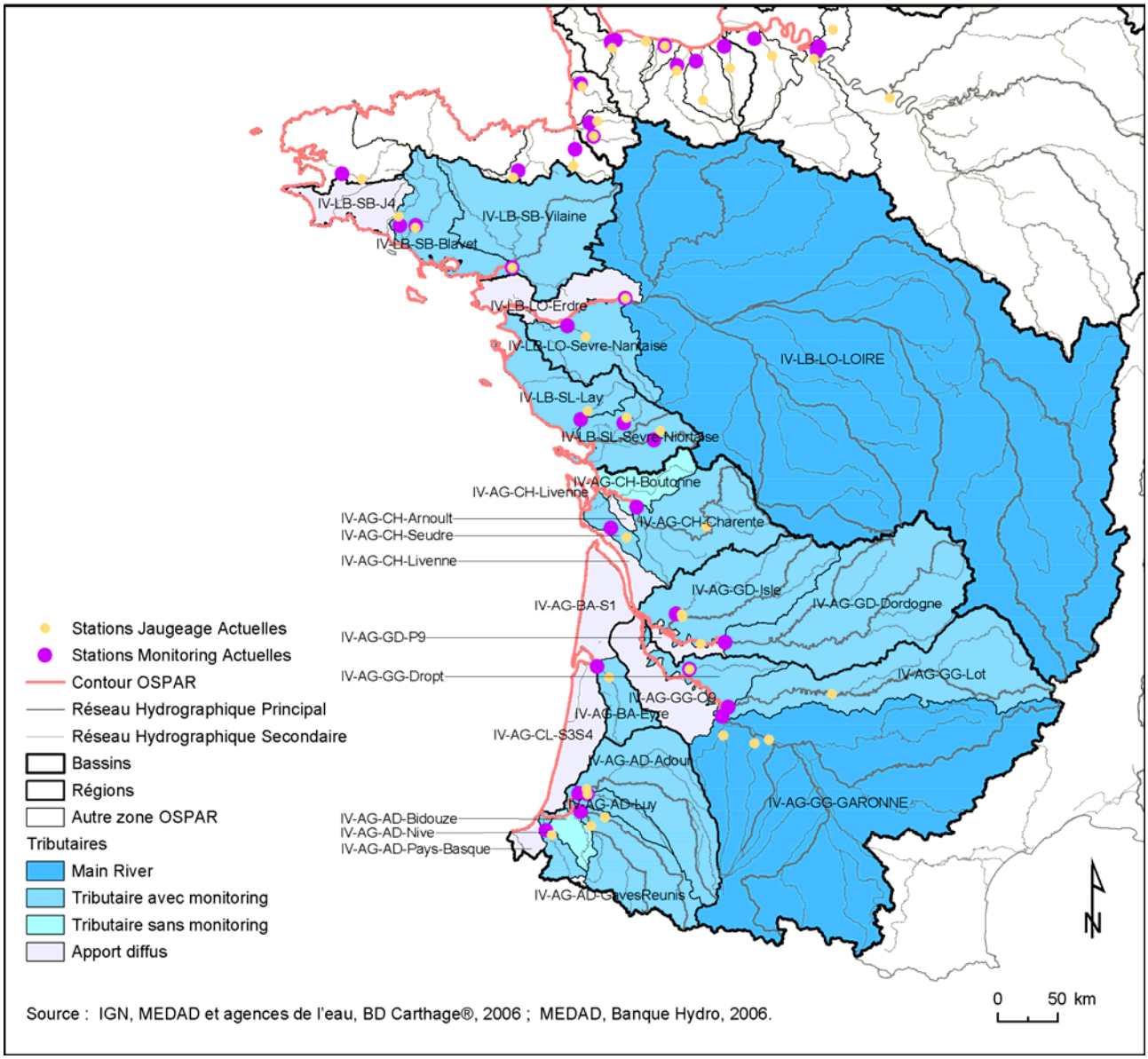
Apport diffus : area with diffuse inputs

These two maps detail the different zones of the 2 OSPAR regions: one map for each.

Zone OSPAR-II



Zone OSPAR-IV



B. Total riverine inputs and direct discharges (Tables 4a and 4b) for the year: 2006

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.):

France achieved this year some estimations about directs discharges. According to the available data, the complete estimations dealt with the determinand N, P and SPM for the years 2003 to 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 7 of the RID Principles), including for those under voluntary reporting:

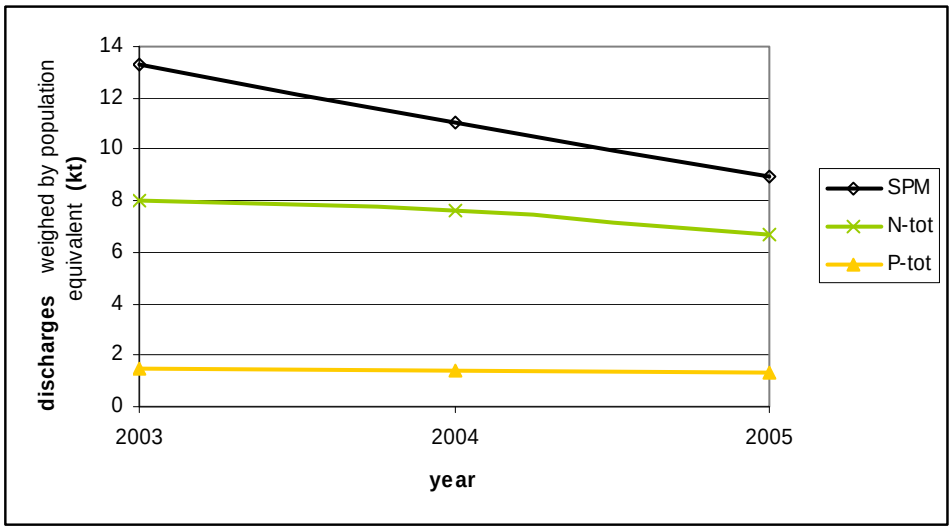
The wastewater treatment plants that are upstream the monitoring stations are taken into account. For the unmonitored areas, the plants located in the outlet were taken into account.

The direct discharges due to urban wastewater treatment plants (some industries can be connected with) were estimated with the 'self-monitoring' data. In fact, the operator is bound to make regular measurement of the efficiency of his system, the frequency of the measurements depending on the size of the system. The determinands N, P and SPM are currently monitored, sometimes data about metals are available. The results obtained with the 'self-monitoring' are controlled each year by the Water Agencies, that guarantee their validity.

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):

No additional determinand.

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):



Evolution of the sewage effluents

More or less 700 wastewater treatment plants are counted for the estimation of direct discharges (740 in 2003, 766 in 2004 and 776 in 2005). The number of plants counted changed because some new stations have been created and the Water Agencies have improved their data base. Consequently, it is difficult to draw a tendency with an unstable information. The discharges presented here are weighed by the population equivalent taken into account for direct discharges. The decreasing tendency has to be confirmed with the future data.

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 industrial effluents that are upstream the monitoring stations were taken into account according the same method as for the sewage effluents. Data are extracted from the French pollutant emission register (in French IREP) that provides data to support EPER. To avoid double counting, since the industrial effluents from the wastewater treatment plants have been taken into account in the preceding part, only the direct discharges have been extracted from the register and counted here.

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

According to EPER, the French register does not count all the industrial facilities (use of thresholds to declare, deals only with facilities bound to be authorised).

Determinand	Threshold
N-total	50 000 kg/year
P-total	5000 kg/year
SPM	300 000 kg/year

Thresholds of declaration in IREP

The register provides some information about metals but the number of declaring industries is not complete. So the results have not been presented in this report. The discharges have to be analysed with more precision before.

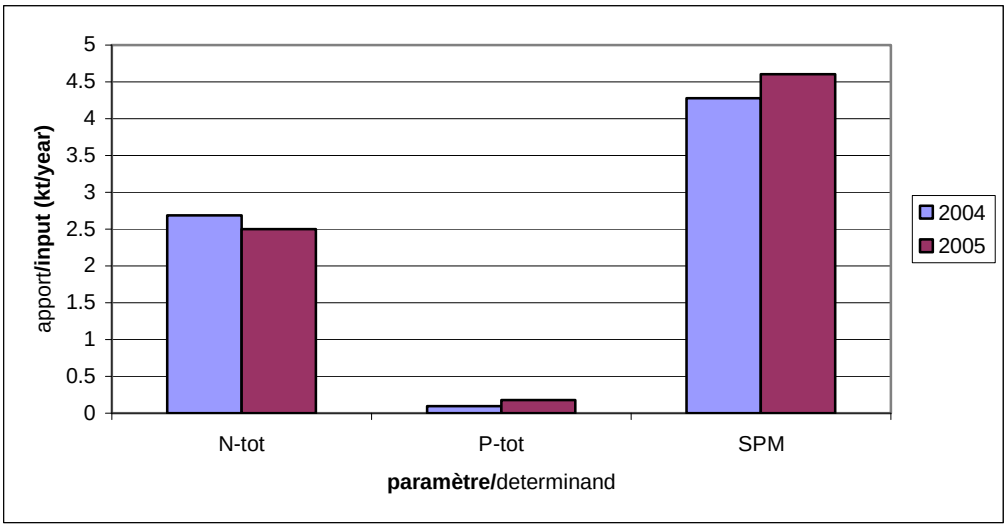
C.6 Give any available information on other discharges directly to Convention Waters - through e.g. urban run-off and stormwater overflows - that are not covered by the data in Tables 5a and 5b:

No available information

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):

According to the determinands monitored by EPER, others are available (especially other metals). But the number of contributing industries is partial.

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



Evolution of the direct discharges of mandatory macropollutants from industrial effluents

The French register of pollutants emission is relatively recent. 2003 was the first year of declaration that's why it is not represented here. 2 years are not enough to draw a trend and the network being evolving, it is necessary to wait for the future data.

Total direct discharges

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

The direct discharges (sewage and industrial effluents) were calculated only for 3 years (2003, 2004 and 2005): so it is difficult to draw a trend. Nevertheless, this first estimation enables to estimate the part of the direct discharges in regards with the riverine input: the part of industrial and sewage effluents represented less than 4% for the nitrogen, 8% for the phosphorus and 0.5% for the SPM in 2004. Data are lacking for the fish farming to make a complete study (in regards with the OSPAR principles) of direct discharges.

D. Riverine inputs for the year: 2006

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 network of monitoring and gauging stations, that were chosen according to the RID principles, is quite stable from the beginning of the study. The monitoring stations are under the responsibility of Water Agencies, that carry out the monitoring program on a delimited basin. Our cutting in sub-regions is based on this organisation: Artois-Picardie, Seine-Normandie, Loire-Bretagne and Adour-Garonne are the four Water Agencies concerned by OSPAR. The analyses are performed by registered laboratories (by French ministry for Ecology and Sustainable Development), one of the condition is to be accredited.

The frequency of the analyses varies from a station to another: the table 7 indicates, for each monitored area, the number of measurements that were used for the input calculation.

For the calculation itself, the software Rtrendis used with its interface of conventional load calculation. All the methods CM1 to CM6 are tested but for the final calculation, the results obtained with CM4 are reported for the main rivers or the bigger tributaries if the number of measurements is enough (>12 per year). Otherwise, the method CM2 that adjusts the flows to limit over or underestimations, is used.

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

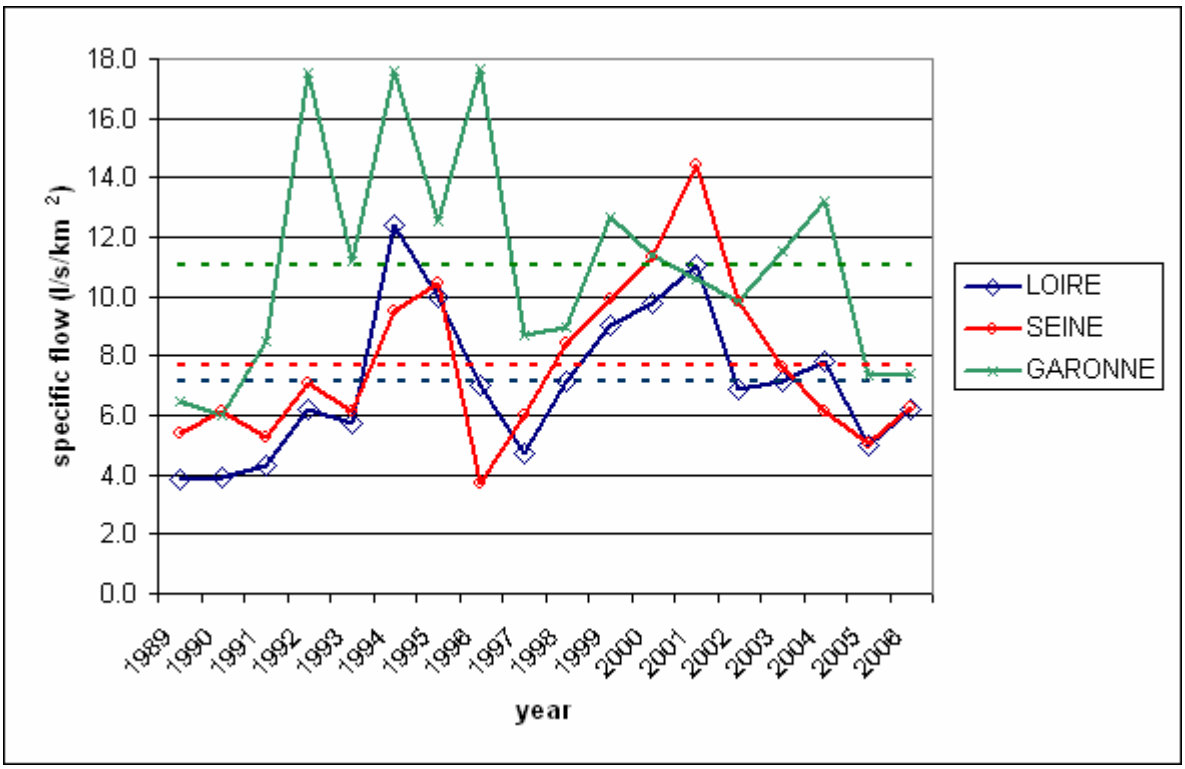
No available information

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):

There is not a lot of available information for the micro-pollutants. Calculations for PCB and atrazine are added this year.

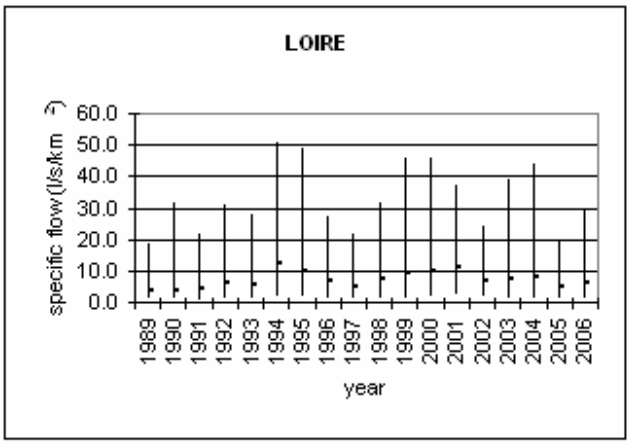
D.4 Give general comments on the inputs from main rivers (e.g. significant changes in inputs, concentrations and flows compared to previous years):

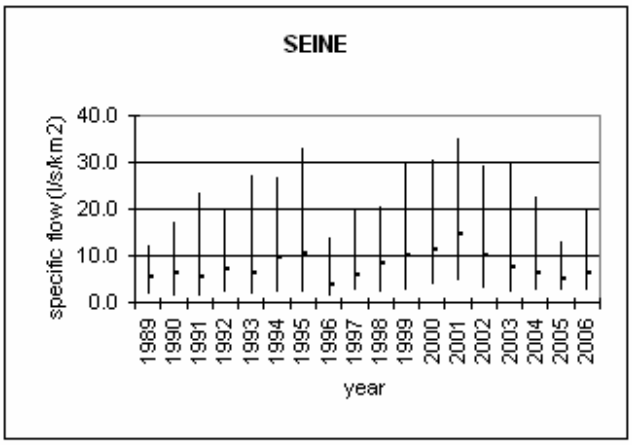
The study of inputs has to be related to the flows that suffered from weak precipitation these last 3 years.

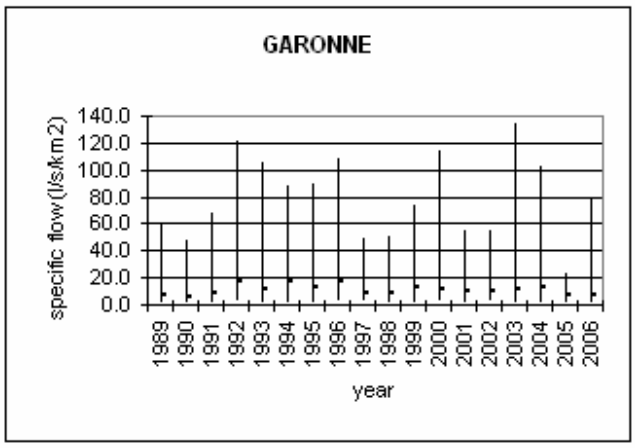


Evolution of the main river specific flow

The specific flow of the main rivers in 2006 are quite stable compared to the previous years (slight increase with regard to 2005). They remain lower than the average.



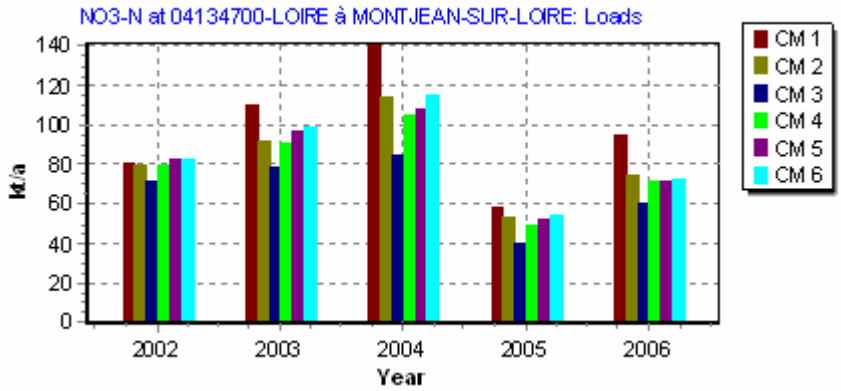
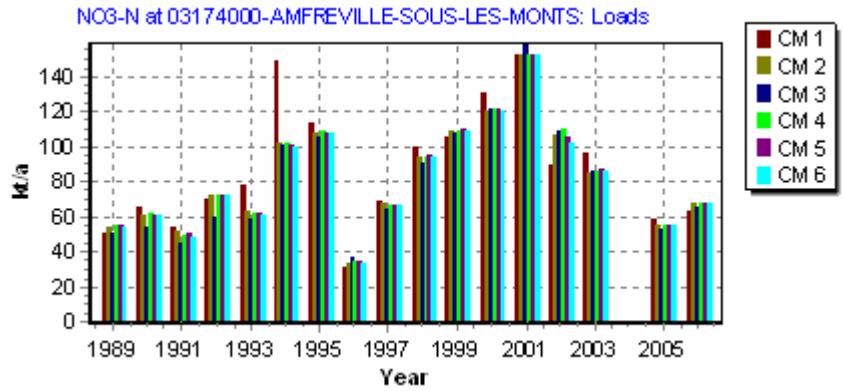
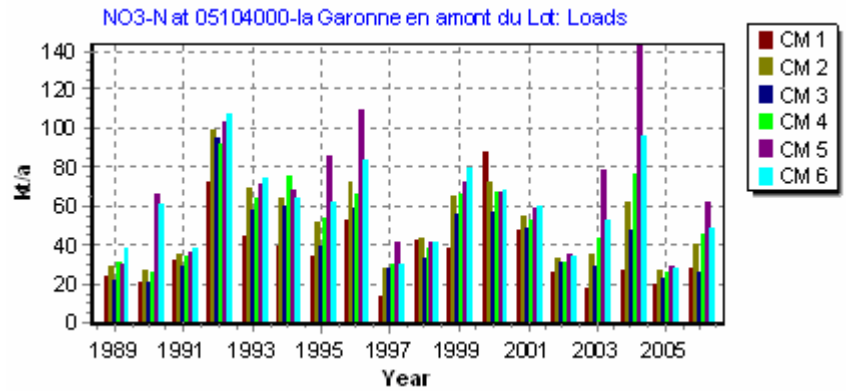




Variation (minimum/maximum) of the main river specific flow

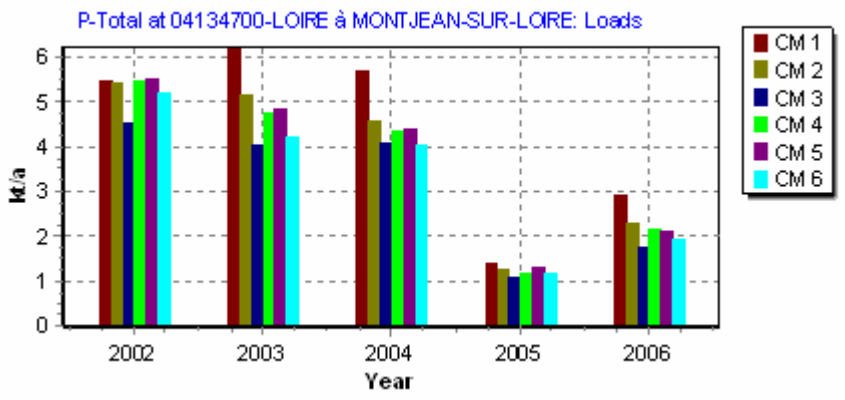
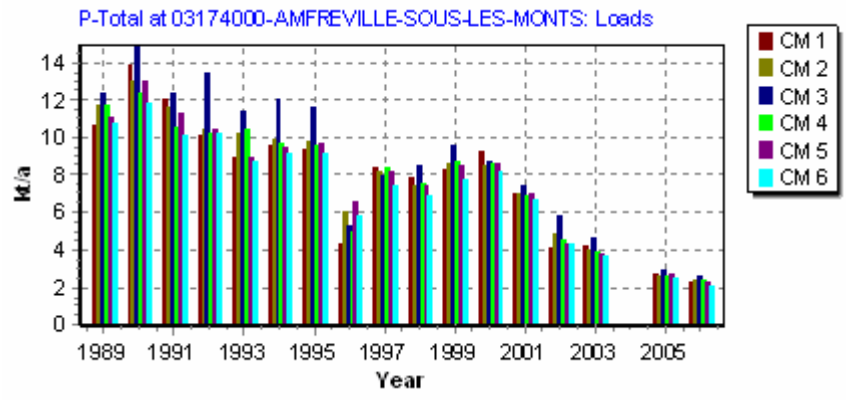
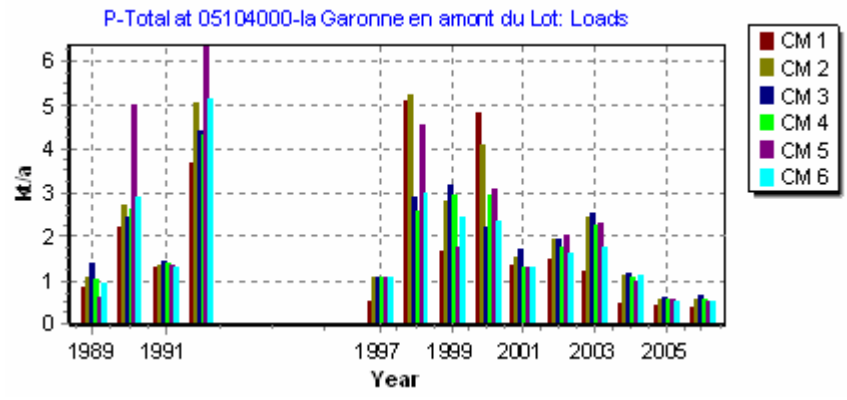
The specific flow in average is quite stable but the variation between maximum and minimum is larger in 2006 than in 2005.

During the calculations, the different methods proposed by Rtrend (CM1…CM6) have been tested and are reported here. Nevertheless, there is not a lot of difference between them.

LOIRE	
	The data begins in 2002 because of a change of monitoring station.
SEINE	
	Because of a change in gauging station, the 2004 data are lacking here.
GARONNE	
	The number of measurements being lower than 12, the method CM2 has been used for this main river.

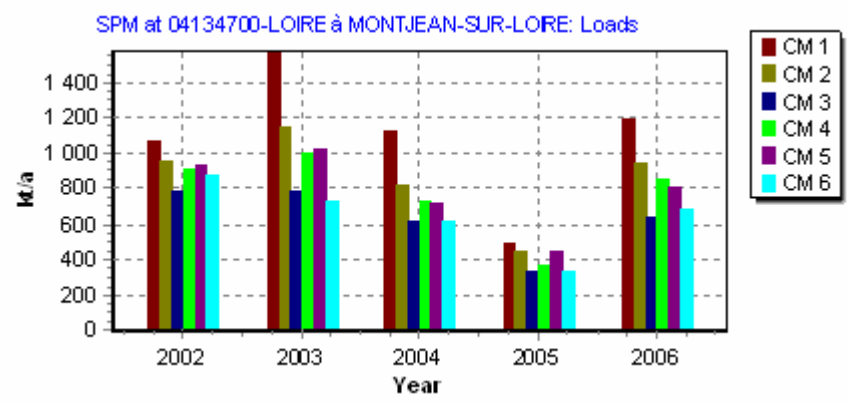
Upper estimation of nitrates inputs of the main rivers

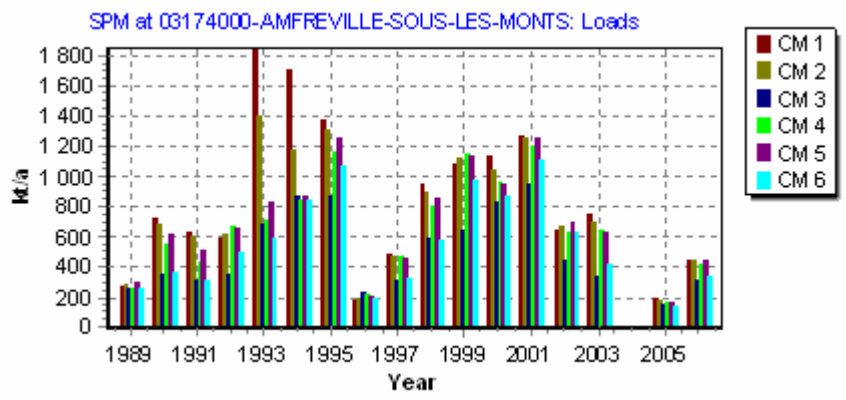
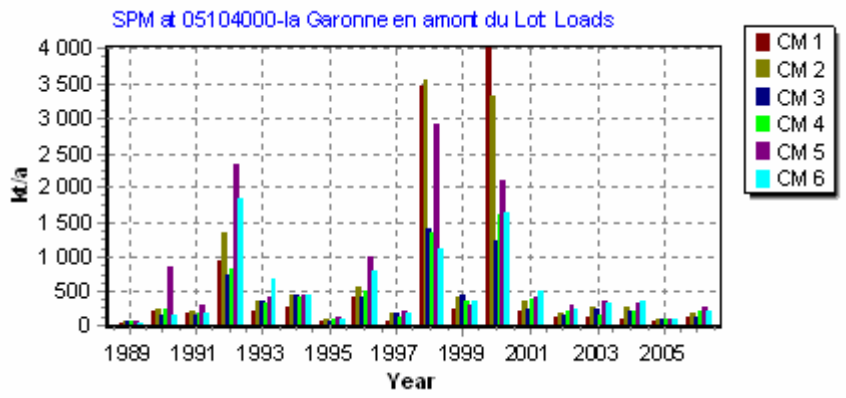
In spite of a general downward trend, 2006 shows a slight increase of the input of nitrates for the main rivers. The concentrations and the flows are in fact more dispersed. However, the maximal concentrations for Seine and Loire in 2006 are lower than in 2004 and previous years.

LOIRE	
SEINE	
GARONNE	

Upper estimation of the phosphorus inputs of the main rivers

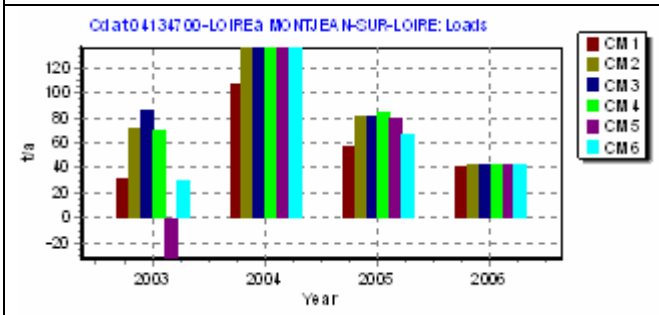
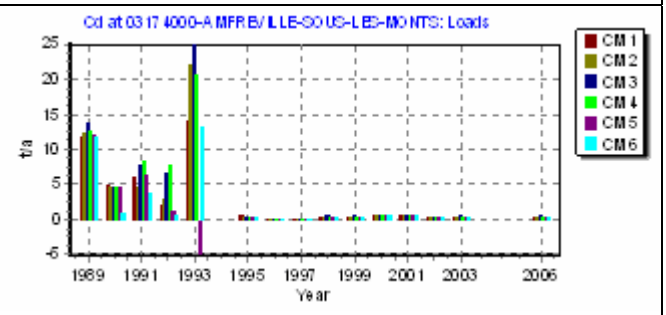
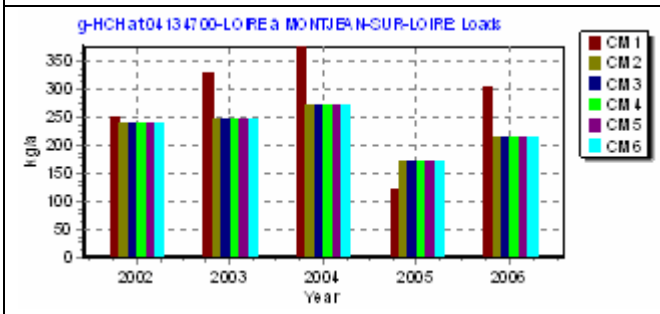
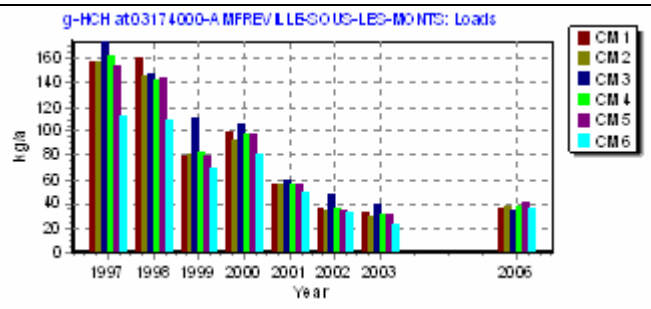
The 3 main rivers have a general downward trend over the whole period.

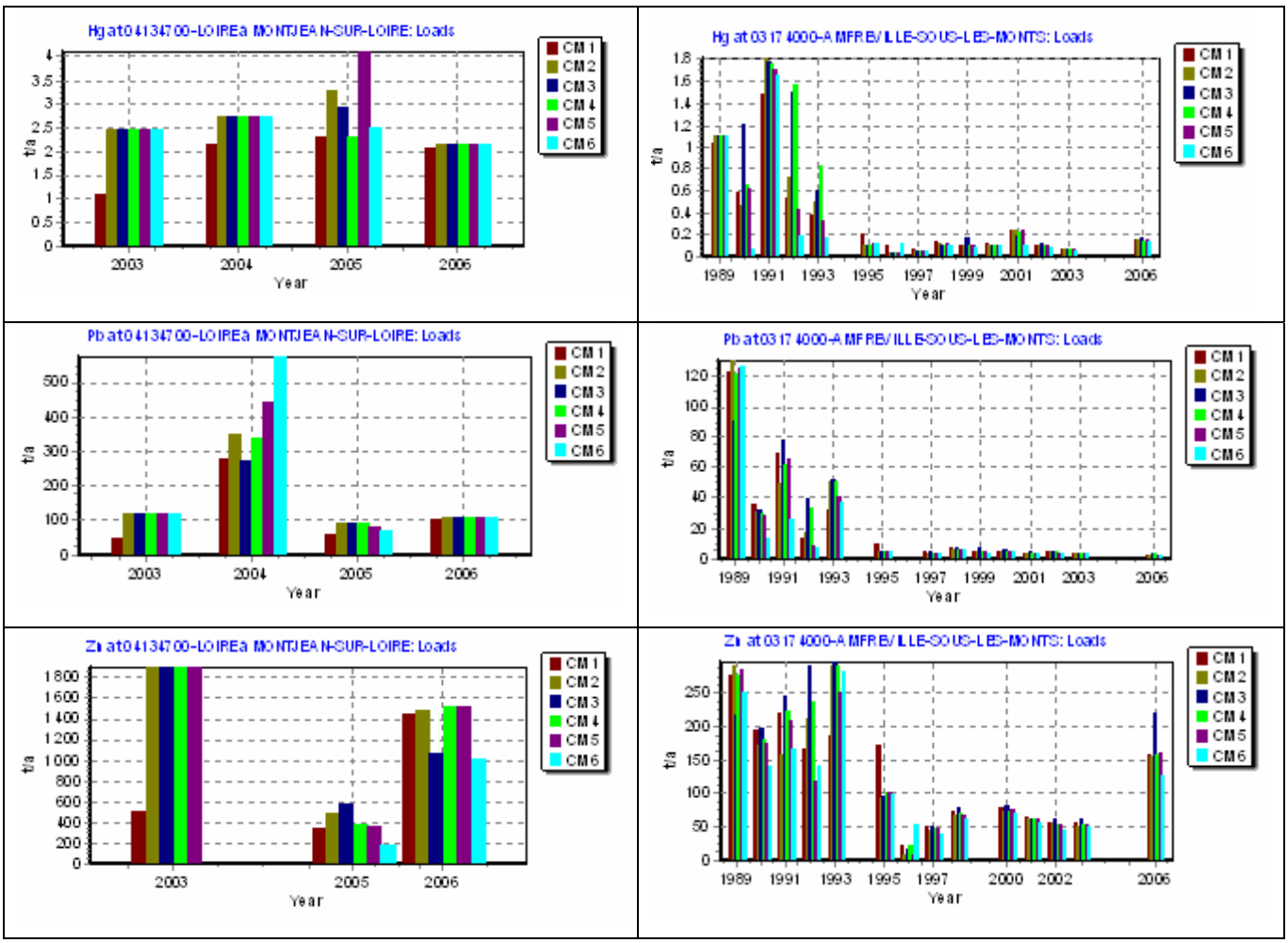
LOIRE	

SEINE	
GARONNE	

Upper estimation of the SPM inputs of the main rivers

After a big decrease, the inputs of SPM seem to stabilize these last 4 years.

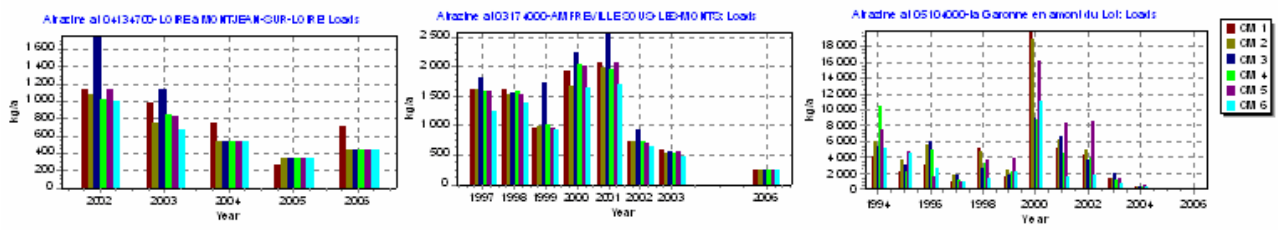
LOIRE	SEINE
	
	



Upper estimation of some micro-pollutants of the main rivers Seine and Loire

Especially in the beginning of the period, the detection/quantification limits of the micropollutants can be high and different from a station to an other, that makes the trend analysis difficult. However, the inputs of cadmium, g-HCH, mercury and lead of the main river Seine seem to stabilize at a low level. The inputs for the same determinands for the main river Loire are more important but stable too. The evolution of the zinc input has to be confirmed or not in the future.

For the voluntary determinand, the main rivers have quite complete series of atrazine data.



Upper estimation of atrazine input of the main rivers

The atrazine inputs have been decreasing since 2001/2002, which is logical with its interdiction in 2002.

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 methods and calculations are quite the same as for the main rivers: when 12 measurements are available, the method CM4 is reported, otherwise, method CM2. The number of the measurements for the macro-pollutants (N, P, SPM) are rather satisfactory since we have at least 4 available measurements per year. But the data for the micro-pollutants remain incomplete.

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

No available information

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):

As for main rivers, some calculations have been made for PCB and atrazine but data were not complete.

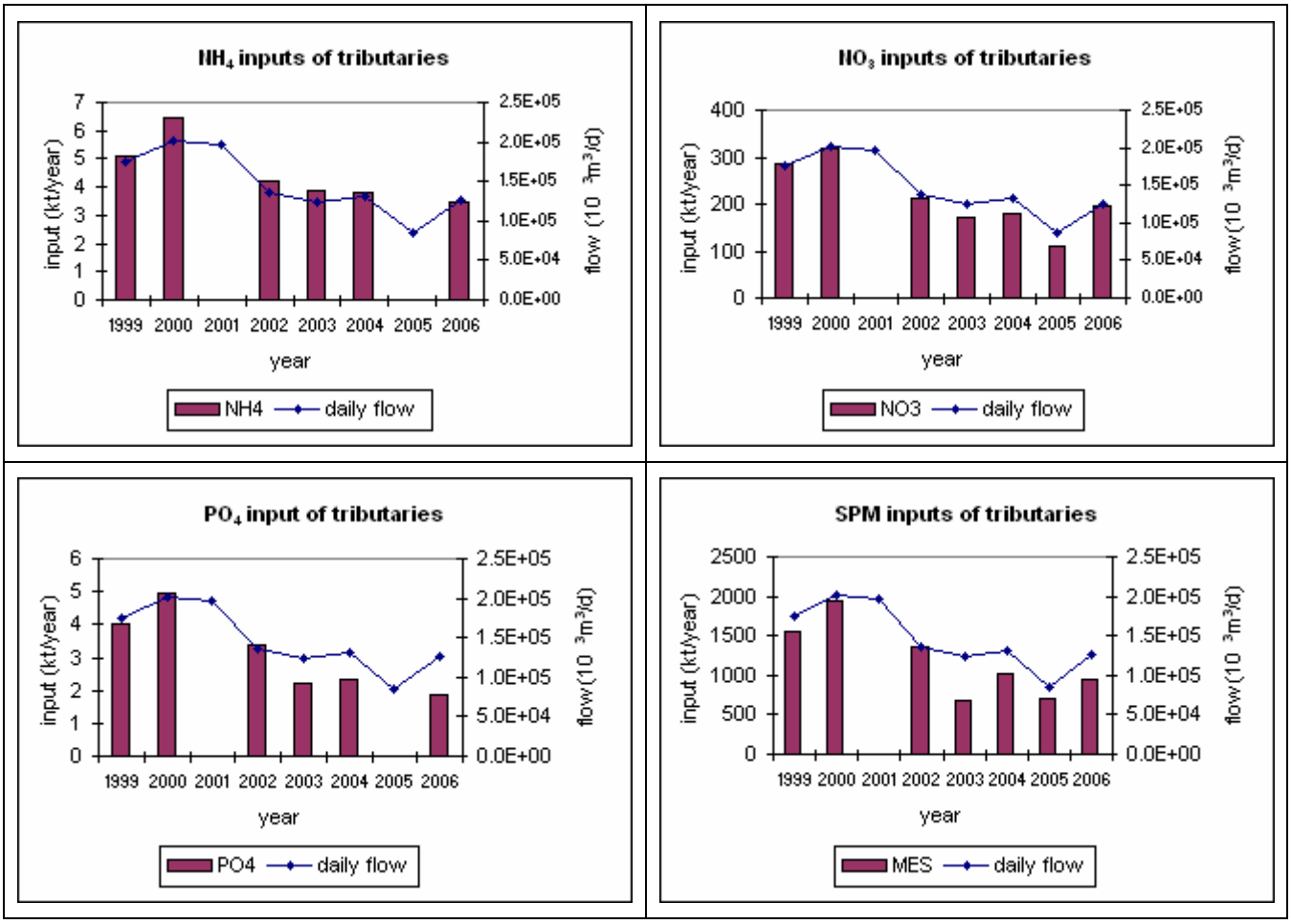
D.8 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in Tables 6b and 7b:

No available information

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 main rivers, the flows are more important in 2006 than in 2005, with greater variations. Like in 2005, the inputs of nitrates of the tributaries are equivalent to the inputs of the main rivers. Those of phosphorus remain lower. In 2005 the SPM inputs of the tributaries were exceptionally more important than those of main rivers. In 2006, the ratio between the two inputs get back a more usual value.

The tributaries have complete series of data only over some determinands (N-NH_4, N-NO_3, P-PO_4, SPM) and some years. 2001 are lacking for all, 2005 for NH_4 and PO_4.

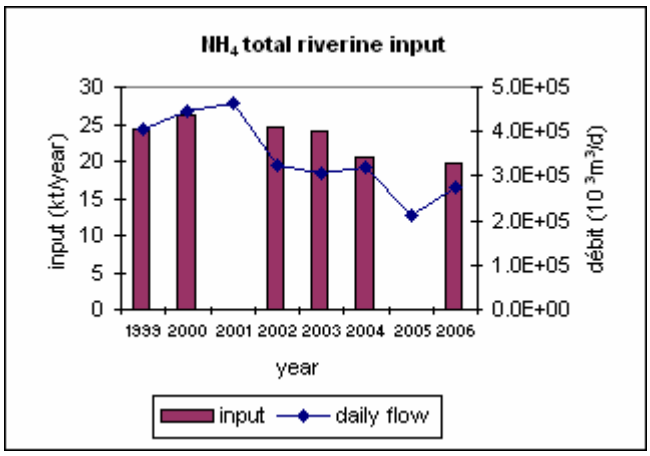


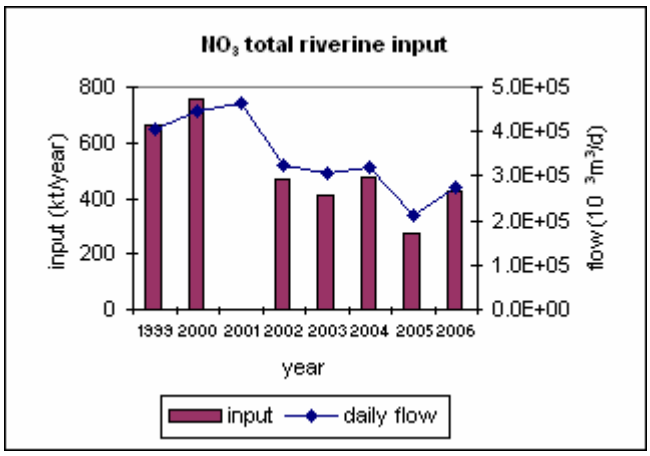
Upper estimations of the inputs of the tributaries of some macro-pollutants comparing to the average of the daily flow

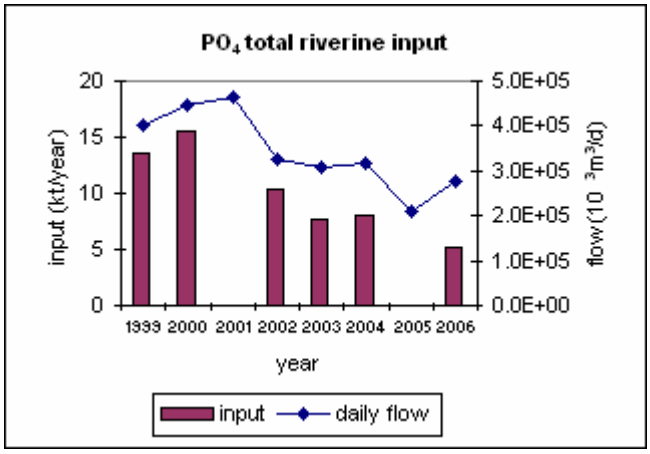
Only the years with complete data have been represented here. Since 2002, the flows seems to maintain at a low-level (as for main rivers), the inputs are consequently lower. However, at an equivalent level of flow, the inputs are stable for the orthophosphates and ammonium.

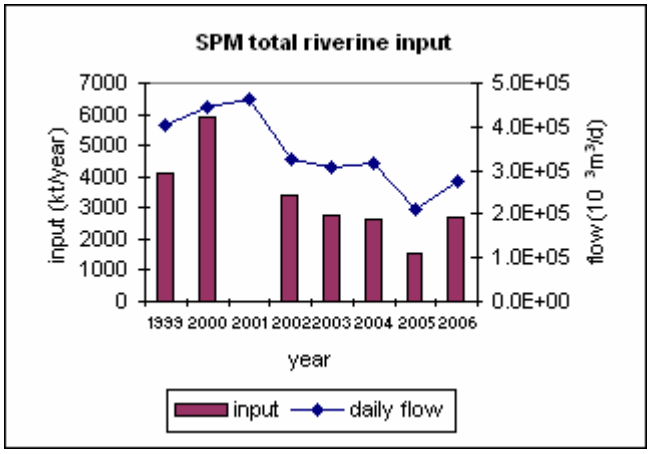
Total riverine inputs (Table 6c)

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









Upper estimations of the total riverine inputs of some macro-pollutants comparing to the average daily flow

For the total riverine inputs (main rivers, tributaries and unmonitored areas), the comments are the same as made before : complete series of data are available only for some years (in 2001 all determinands are lacking ; in 2005 NH_4 and PO_4 are lacking). The flows have been maintaining to a low-level since 2002 and the inputs are consequently less important. But at equivalent flows, the inputs tend to stabilize and even decrease.

E. Unmonitored areas

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

In regard with geographical criteria (land cover…), a reference monitored tributary is determined for each unmonitored area to achieve an estimation of the input.

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:

The limits are always limits of quantification and not so different from 2005. They are upper than those recommended but it is difficult to compare detection and quantification limits. We hope that the recent formation (in 2007) of a reference laboratory will improve the situation by giving a technical and methodological help to the laboratories that carry out the analyses.

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;*

Minor changes of gauging stations have been achieved but with no consequence for the historic.

- *incomplete or distorted data*

For each parameter with incomplete or distorted data, inputs were not calculated, like for previous years. As far as possible, estimations have been made to complete the series, at least for the macro-pollutants : in this case they appear in red in the tables.

2006 data for direct discharges are not yet available and will be completed next year. But the riverine inputs are transmitted in their final version.

Table 4a. Total Riverine Inputs and Direct Discharges to each OSPAR Region
Reported Maritime Area of the OSPAR Convention by France 2006

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	35116	0.394	0.137	53.014	3.253	159.834	37.297		13.271	68.291	1.701	74.458	2.329	426.214
	upper		0.394	0.142	53.014	3.253	159.834	38.771		13.275	68.291	1.701	92.149	2.344	426.214
Tributary Rivers	lower	30613								0.771	64.880	0.603	50.799	1.153	241.890
	upper									0.865	64.880	0.627	61.023	1.236	242.121
Total Riverine Inputs	**lower**	65729								14.042	133.171	2.304	125.257	3.482	668.104
	upper									14.140	133.171	2.328	153.172	3.580	668.335
DIRECT DISCHARGES															
Sewage Effluents	lower														
	upper														
Industrial Effluents	lower														
	upper														
Fish Farming	lower														
	upper														
Total Direct Inputs	**lower**														
	upper														
UNMONITORED AREAS															
Unmonitored Areas	lower	8318								0.642	20.296	0.189		0.391	75.990
	upper									0.664	20.296	0.195		0.424	76.150
REGION II TOTAL	**lower**														
	upper														
INPUTS TO OSPAR IV															
RIVERINE INPUTS															
Main Rivers	lower	83852						0		1.802	113.885	1.226	98.661	2.553	1055.045
	upper							261.462		1.840	113.885	1.243	98.661	2.769	1055.045
Tributary Rivers	lower	178394								2.144	130.729	1.176		2.736	699.260
	upper									2.584	130.734	1.214		3.119	700.247
Total Riverine Inputs	**lower**									3.946	244.614	2.402		5.289	1754.305
	upper									4.424	244.619	2.457		5.888	1755.292
DIRECT DISCHARGES															
Sewage Effluents	lower														
	upper														
Industrial Effluents	lower														
	upper														
Fish Farming	lower														
	upper														
Total Direct Inputs	**lower**														
	upper														
UNMONITORED AREAS															
Unmonitored Areas	lower	22135						0		0.362	28.525	0.152		0.439	183.632
	upper							54.618		0.455	28.525	0.190		0.574	183.759
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 2006

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	118969						37.297		15.073	182.176	2.927		4.882	1481.259
	upper							300.233		15.115	182.176	2.944		5.113	1481.259
Tributary Rivers	lower	209007								2.915	195.609	1.779		3.889	941.150
	upper									3.449	195.614	1.841		4.355	942.368
Total Riverine Inputs	**lower**									17.988	377.785	4.706		8.771	2422.409
	upper									18.564	377.790	4.785		9.468	2423.627
DIRECT DISCHARGES															
Sewage Effluents	lower														
	upper														
Industrial Effluents	lower														
	upper														
Fish Farming	lower														
	upper														
Total Direct Inputs	**lower**														
	upper														
UNMONITORED AREAS															
Unmonitored Areas	lower	30453								1.004	48.821	0.341		0.83	259.622
	upper									1.119	48.821	0.385		0.998	259.909
REGIONS II and IV TOTAL	**lower**														
	upper														

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention by France 2006

			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-Saane	lower													
		upper													
		comment													
6	II-SN-SE-SEINE	lower													
		upper													
		comment													
7	II-SN-SE-Andelle	lower													
		upper													
		comment													
8	II-SN-SE-Eure	lower													
		upper													
		comment													
9	II-SN-SE-H7	lower													
		upper													
		comment													
10	II-SN-SE-Risle	lower													
		upper													
		comment													
11	II-SN-NC-Dives	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													

Data for the year 2006 are not yet available

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 8. Detection Limits
Reported Maritime Area of the OSPAR Convention by France 2006

			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	5.934	0.1	
3	II-AP-SO-Somme	Sewage													
		Industrial													
		Riverine								0.023			5.974		
4	II-SN-NO-Bethune	Sewage													
		Industrial													
		Riverine						1						0.07	
5	II-SN-NO-Saane	Sewage													
		Industrial													
		Riverine						1		0.007				0.07	
6	II-SN-SE-SEINE	Sewage													
		Industrial													
		Riverine		0.005				1		0.038			7.568	0.02	
7	II-SN-SE-Andelle	Sewage													
		Industrial													
		Riverine						1		0.007				0.07	
8	II-SN-SE-Eure	Sewage													
		Industrial													
		Riverine						1		0.007					
9	II-SN-SE-H7	Sewage													
		Industrial													
		Riverine													
10	II-SN-SE-Risle	Sewage													
		Industrial													
		Riverine						1							
11	II-SN-NC-Dives	Sewage													
		Industrial													
		Riverine						1						0.07	
12	II-SN-NC-Douve	Sewage													
		Industrial													
		Riverine						1						0.07	
13	II-SN-NC-Orne	Sewage													
		Industrial													
		Riverine						1				0.009		0.07	
14	II-SN-NC-Seulles	Sewage													
		Industrial													
		Riverine						1						0.07	
15	II-SN-NC-Touques	Sewage													
		Industrial													
		Riverine						1		0.007					
16	II-SN-NC-Vire	Sewage													
		Industrial													
		Riverine								0.007					
		Sewage													

17	II-SN-SC-I6	Industrial													
		Riverine													
18	II-SN-SC-Selune	Sewage													
		Industrial													
		Riverine						1		0.007		0.009		0.07	
19	II-SN-SC-Sienne	Sewage													
		Industrial													
		Riverine										0.009		0.07	
20	II-LB-NB-Aulne	Sewage													
		Industrial													
		Riverine	2	0.1	2	5		10		0.031		0.013	8.535		2
21	II-LB-NB-Couesnon	Sewage													
		Industrial													
		Riverine								0.031		0.013			2
22	II-LB-NB-J1J2	Sewage													
		Industrial													
		Riverine													
23	IV-LB-SB-Blavet	Sewage													
		Industrial													
		Riverine						10		0.031		0.013			2
24	IV-LB-SB-J4	Sewage													
		Industrial													
		Riverine													
25	IV-LB-SB-Vilaine	Sewage													
		Industrial													
		Riverine	2	0.1	2	5	2	10		0.031	0.225	0.003			
26	IV-LB-LO-Erdre	Sewage													
		Industrial													
		Riverine													
27	IV-LB-LO-LOIRE	Sewage													
		Industrial													
		Riverine	2	0.1	2	5		10				0.009		0.05	
28	IV-LB-LO-Sevre-Nantaise	Sewage													
		Industrial													
		Riverine						10			0.135		1.44		
29	IV-LB-SL-Lay	Sewage													
		Industrial													
		Riverine						10			0.135	0.009	1.65	0.05	
30	IV-LB-SL-Sevre-Niortaise	Sewage													
		Industrial													
		Riverine						10					14.29		
31	IV-AG-CH-Arnoult	Sewage													
		Industrial													
		Riverine													
32	IV-AG-CH-Boutonne	Sewage													
		Industrial													
		Riverine						5		0.038		0.016			
33	IV-AG-CH-Charente	Sewage													
		Industrial													
		Riverine						5					8.699		
34	IV-AG-CH-Livenne	Sewage													
		Industrial													
		Riverine													
35	IV-AG-CH-Seudre	Sewage													
		Industrial													
		Riverine						5		0.038		0.016		0.05	2

36	IV-AG-BA-Eyre	Sewage													
		Industrial													
		Riverine						5				0.016	3.626	0.05	
37	IV-AG-BA-S1	Sewage													
		Industrial													
		Riverine													
38	IV-AG-GD-Dordogne	Sewage													
		Industrial													
		Riverine								0.038			3.505		
39	IV-AG-GD-Isle	Sewage													
		Industrial													
		Riverine						5					5.299	0.05	
40	IV-AG-GD-P9	Sewage													
		Industrial													
		Riverine													
41	IV-AG-GG-Dropt	Sewage													
		Industrial													
		Riverine						5			0.677	0.016		0.05	
42	IV-AG-GG-GARONNE	Sewage													
		Industrial													
		Riverine						5		0.038					
43	IV-AG-GG-Lot	Sewage													
		Industrial													
		Riverine	0.5	0.5	2	4	20	5		0.038		0.016	2.341	0.05	
44	IV-AG-GG-O9	Sewage													
		Industrial													
		Riverine													
45	IV-AG-CL-S3S4	Sewage													
		Industrial													
		Riverine													
46	IV-AG-AD-Adour	Sewage													
		Industrial													
		Riverine						5		0.038			5.616		
47	IV-AG-AD-Bidouze	Sewage													
		Industrial													
		Riverine													
48	IV-AG-AD-GavesReunis	Sewage													
		Industrial													
		Riverine						5		0.038		0.016	2.909	0.05	
49	IV-AG-AD-Luy	Sewage													
		Industrial													
		Riverine													
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 2006

		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	2526					0	Mean
2	II-AP-SO-Canche	4262	4579	3399	8620	1961 - 2006	1	Mean
3	II-AP-SO-Somme	2398	3197	1527	3514	1963 - 2006	1	Mean
4	II-SN-NO-Bethune	1406	2074	820	6218	1998 - 2006	1	Mean
5	II-SN-NO-Saane	950	2938	719	5239	1996 - 2006	1	Mean
6	II-SN-SE-SEINE	35116	44842	13072	108934	1974 - 2006	1	Mean
7	II-SN-SE-Andelle	523	691	380	1202	1972 - 2006	1	Mean
8	II-SN-SE-Eure	1743	2246	1190	3727	1971 - 2006	1	Mean
9	II-SN-SE-H7	1319					0	Mean
10	II-SN-SE-Risle	1057	1642	698	3501	1976 - 2006	1	Mean
11	II-SN-NC-Dives	470	1296	171	3327	1968 - 2006	1	Mean
12	II-SN-NC-Douve	382					1	Mean
13	II-SN-NC-Orne	3224	2506	2571	17177	1984 - 2006	1	Mean
14	II-SN-NC-Seulles	386	346	41	3498	1970 - 2006	1	Mean
15	II-SN-NC-Touques	725	1037	511	2277	1981 - 2006	1	Mean
16	II-SN-NC-Vire	1834	2246	204	12619	1993 - 2006	2	Mean
17	II-SN-SC-I6	1411					0	Mean
18	II-SN-SC-Selune	2311	1987	1711	4893	1994 - 2006	2	Mean
19	II-SN-SC-Sienne	0					1	Mean
20	II-LB-NB-Aulne	7182	6653	609	54501	1969 - 2006	1	Mean
21	II-LB-NB-Couesnon	1758	2160	173	15225	1983 - 2006	2	Mean
22	II-LB-NB-J1J2	3063					0	Mean
23	IV-LB-SB-Blavet	5239	5702	575	36393	1982 - 2006	2	Mean
24	IV-LB-SB-J4	4777					0	Mean
25	IV-LB-SB-Vilaine	5762	5443	215	37920	2001 - 2006	1	Mean
26	IV-LB-LO-Erdre	2994					0	Mean
27	IV-LB-LO-LOIRE	59316	73526	10305	277105	1868 - 2006	1	Mean
28	IV-LB-LO-Sevre-Nantaise	3756	4234	78	39418	1993 - 2006	1	Mean
29	IV-LB-SL-Lay	3723	3456	3	58362	1971 - 2006	1	Mean
30	IV-LB-SL-Sevre-Niortaise	4586	4752	272	58649	1992 - 2006	2	Mean
31	IV-AG-CH-Arnoult	203					0	Mean
32	IV-AG-CH-Boutonne	1494					1	Mean
33	IV-AG-CH-Charente	5253	5357	444	38151	1979 - 2006	1	Mean
34	IV-AG-CH-Livenne	234					0	Mean
35	IV-AG-CH-Seudre	197	432	6	1272	1971 - 2006	1	Mean
36	IV-AG-BA-Eyre	1135	1814	363	4668	1967 - 2006	1	Mean
37	IV-AG-BA-S1	1567					0	Mean
38	IV-AG-GD-Dordogne	24089	21859	4770	106103	1997 - 2006	1	Mean
39	IV-AG-GD-Isle	6786	6912	1616	49897	1971 - 2006	2	Mean
40	IV-AG-GD-P9	697					0	Mean
41	IV-AG-GG-Dropt	633		37	11434		1	Mean
42	IV-AG-GG-GARONNE	24536	40003	3931	264526	1966 - 2006	3	Mean
43	IV-AG-GG-Lot	11686	12614	1250	77419	2000 - 2006	1	Mean
44	IV-AG-GG-O9	8517					0	Mean
45	IV-AG-CL-S3S4	1731					0	Mean
46	IV-AG-AD-Adour	4213	7690	1039	39608	1920 - 2006	1	Mean
47	IV-AG-AD-Bidouze	550					1	Mean
48	IV-AG-AD-GavesReunis	12097	17453	3233	148308	1925 - 2006	2	Mean
49	IV-AG-AD-Luy	1039	1814	42	36864	1966 - 2006	1	Mean
50	IV-AG-AD-Nive	2303	3197	613	38965	1968 - 2006	1	Mean
51	IV-AG-AD-Pays-Basque	1415					0	Mean

4. Germany

Annual report on riverine inputs and direct discharges to Convention waters during the year 2006 by Germany

Table 4b Total riverine inputs and direct discharges to the maritime area in 2006 by Germany
Table 5a Direct discharges to the maritime area in 2006 by Germany (sewage effluents)
Table 5b Direct discharges to the maritime area in 2006 by Germany (industrial effluents)
Table 5c Direct discharges to the maritime area in 2006 by Germany (total direct discharges)
Table 6a Riverine inputs to the maritime area in 2006 by Germany (main riverine inputs)
Table 7a Contaminant concentrations of German rivers discharging to the maritime area (main rivers)
Table 7b Contaminant concentrations of German rivers discharging to the maritime area (tributaries)
Table 8 Detection limits for contaminant concentrations of German inputs to the maritime area

Annual report on riverine inputs and direct discharges by Germany to Convention waters during the year 2006

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

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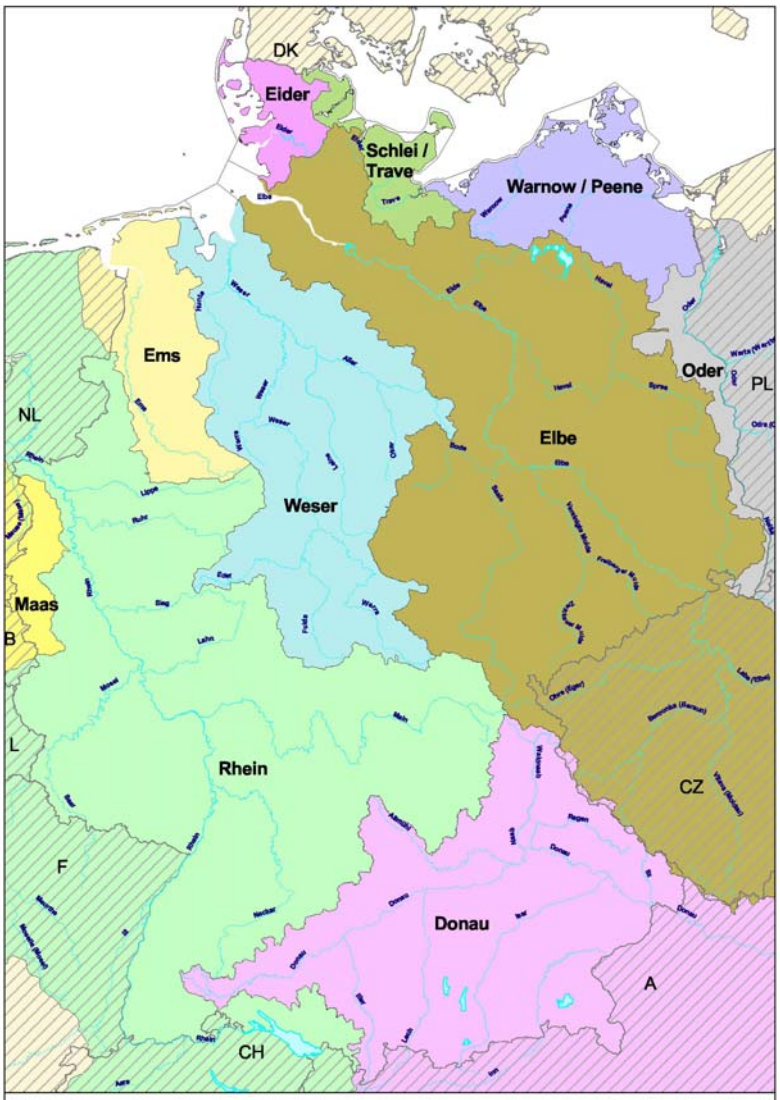
A. General information

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 are slightly lower due to a decreased flow rate. There are no significant changes in the concentrations and inputs of direct discharges during the year 2006 - compared to previous years - except 2002 with an extreme flood event in summer.

C. Direct discharges for the year 2006

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):

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 nearly 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):

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):

There is nearly 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):

In the Weser, Ems and Elbe there have been nearly no changes compared to previous years.

D. Riverine inputs for the year 2006

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 approximately 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 measured loads 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): 25 measurements per year for all parameters to be monitored.

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):

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

The total riverine inputs are slightly lower due to a decreased flow rate in 2006 compared to 2005.

In 2006 the average flow of the Elbe was close to the long-term average flow. A spring flood after a snowy winter showed high discharges like the summer flood in August 2002. But the nutrient loads in 2006 are lower then in 2002.

The river Ems shows a significantly lower discharge, so that in 2006 loads have decreased whereas estimated concentrations are in the same range 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 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):

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):

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:

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 2006 the flow rate of the Elbe tributaries was slightly less than in 2005 and so a bit lower than the Long Term average. The Stör, the biggest tributary on the right bank, showed a high concentration of suspended solids in July (137 mg/l), that influenced the concentrations of the total metals, especially Lead.

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 2006 the average flow of the Elbe was close to the long-term average flow. A spring flood after a snowy winter brought high discharges like the summer flood in August 2002. But the nutrient load in 2006 is lower than in 2002. In 2006 the flow of the river Weser was significantly lower than the long-term average flow and approximately comparable to the dry year 1997. (For more information see D4 because there are no measurements carried out for the Weser tributaries).

Again in the river Eider the flow rate was about 20% lower than the LTA and comparable to the flow in the year 2003. Apart from a significant increase in lindane to a concentration of more than 1 ng/l as last seen in 1999 and a slight increase in copper, zinc and lead, there is not much variation in concentrations and inputs compared to previous years.

For the Ems see information under D4.

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

No measurements for PCBs (in water) were carried out in the river Elbe and its tributaries and in the river Eider, 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 2006 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 II North Sea															
RIVERINE INPUTS															
	lower		4.1	2.5	197	119	921	24	0.5	6.8	127	1.7	151	6.6	1310
Main Rivers	upper	106812	4.4	2.6	197	119	927	25	21	6.8	127	1.8	151	6.6	1417
	lower		0.3	0.04	11.1	9.1	65	NI	NI	0.6	9.1	0.1	12	0.6	114
Tributary Rivers	upper	4000	0.3	0.04	11.1	9.1	66	NI	NI	0.6	9.1	0.1	12	0.6	114
	lower		4.4	2.6	208	128	986	24	0.5	7.4	136	1.8	163	7.2	1424
Total Riverine Inp	**upper**	110812	4.7	2.6	208	128	992	25	21	7.4	136	2.0	163	7.2	1531
DIRECT DISCHARGES															
	lower		0.015	0.015	1.8	0.9	10	0.02	0.04	1.7	1.2	0.07	2.7	0.3	1.9
Sewage Effluents	upper	384	0.04	0.04	2.3	1.0	15	0.3	1.9	1.7	1.2	0.07	2.7	0.3	1.9
	lower		0.001	0.002	0.03	0.01	0.1	NI	0	0.02	0.5	0.01	0.8	0.05	NI
Industrial Effluents	upper	141	0.01	0.02	0.20	0.50	0.10	NI	1.0	0.02	0.5	0.01	0.8	0.05	NI
	lower														
Fish Farming	upper														
	lower		0.02	0.02	1.8	0.9	10	0.02	0.04	1.7	1.7	0.08	3.5	0.4	1.9
Total Direct Inpu	**upper**	525	0.05	0.06	2.5	1.5	15	0.3	2.9	1.7	1.7	0.08	3.5	0.4	1.9
UNMONITORED AREAS															
	lower														
Unmonitored Areas	upper														
	lower		**4.4**	**2.6**	**210**	**129**	**996**	**24**	**0.5**	**9.1**	**138**	**1.9**	**167**	**7.6**	**1426**
REGION TOTAL	**upper**	**111337**	**4.8**	**2.7**	**211**	**130**	**1007**	**25**	**24**	**9.1**	**138**	**2.0**	**167**	**7.6**	**1533**

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 2006 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	1.4	0.7	7.5	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	7.5	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**	**0.015**	**0.015**	**1.8**	**0.9**	**10**	**0.02**	**0.04**	**1.7**	**1.2**	**0.07**	**2.7**	**0.3**	**1.9**
				0.040	**0.04**	**2.3**	**1.0**	**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 2006 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)	43	NI	0.0	0	0.01	0.01	NI	NI	0.004	0.009	NI	0.01	0.004	NI
(area Nordenham)		(upper estimate)		NI	0.002	0.1	0.01	0.01	NI	NI	0.004	0.009	NI	0.01	0.004	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:	**141**	**0.001**	**0.002**	**0.03**	**0.01**	**0.1**	**NI**	**0**	**0.02**	**0.5**	**0.01**	**0.8**	**0.05**	NI
				0.01	**0.02**	**0.2**	**0.5**	**0.1**	**NI**	**1**	**0.02**	**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 2006 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)	273	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
		(upper estimate)		0.01	0.01	1.6	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:	**525**	**0.02**	**0.02**	**1.8**	**0.9**	**10**	**0.02**	**0.04**	**1.7**	**1.7**	**0.08**	**3.5**	**0.4**	**1.9**
				0.05	**0.05**	**2.5**	**1.5**	**15**	**0.3**	**2.9**	**1.7**	**1.7**	**0.08**	**3.5**	**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 2006 by Germany

Main riverine inputs				Quantities --->												
Discharge area	Flow rate [1000 m³/d]			Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
	2006		LTA	[t]	[t]	[t]	[t]	[t]	[kg]	[kg]	[kt]	[kt]	[kt]	[kt]	[kt]	[kt]
Ems	5890		7690 (5)	0.12	0.01	7.0	2.1	26	0.6	0.02	0.6	12	0.06	15	0.5	31
(Herbrum: 70 %)				0.12	0.02	7.0	2.2	26	0.6	4.0	0.6	12	0.07	15	0.5	63
Weser	25024		31541(6)	1.1	0.5	38	39	189	3.1	0.4	1.4	34	0.6	42	1.8	267
(Farge: 90%)				1.1	0.5	38	39	195	3.1	17	1.4	34	0.6	42	1.8	343
Elbe Estuary	73900		74500 (7)	2.8	2.0	150	77	700	19	NI	4.6	79	0.97	91	4.2	1000
				3.1	2.0	150	77	700	20	NI	4.6	79	1.1	91	4.2	1000
Elbe tributaries (3)	1800		2200 (8)	0.03	0.02	2.4	3.7	18	NI	NI	0.16	2.2	0.05	2.6	0.23	58
				0.03	0.02	2.4	3.7	18	NI	NI	0.16	2.2	0.05	2.6	0.23	58
Elbe tributaries (4)	2200		2500 (9)	0.3	0.01	8.7	5.4	47	NI	NI	0.46	6.9	0.10	9.9	0.41	56
				0.3	0.01	8.7	5.4	47	NI	NI	0.46	6.9	0.10	9.9	0.41	56
Eider	1998		2391 (10)	0.02	0.003	1.80	0.63	6.0	0.96	NI	0.21	2.27	0.06	3.5	0.1	11.6
				0.02	0.003	1.80	0.63	6.0	0.96	NI	0.21	2.27	0.06	3.5	0.1	11.6
Total	**110812**			**4.4**	**2.6**	**208**	**128**	**986**	**24**	**0.5**	**7.4**	**136**	**1.8**	**163**	**7.2**	**1424**
				4.7	**2.6**	**208**	**128**	**992**	**25**	**21**	**7.4**	**136**	**2.0**	**163**	**7.2**	**1531**

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180; Elbe, Weser and Ems also No 31
(2) Suspended particulate matte
(3) Left side tributaries: Este, Lühe, Schwinge, Ost
(4) Right side tributaries: Pinnau, Krückau, Stö
ND: Not detected
LTA: Long-term average flow (5) 1941 - 2006
(6) 1941 - 2003
(7) 1926 - 2003
(8) 1961 - 2003
(9) 1971 - 2000
(10) 1974 - 2006

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

Main river Ems				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 (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 2006 (Herbrum: 70 %)	5890	7690	Mean	0.05	0.002	2.9	0.9	8.9	0.25	0.02	0.21	4.2	0.03	5.2	0.14	7.0
			upper	0.05	0.006	2.9	1.0	8.9	0.26	1.8	0.22	4.2	0.03	5.2	0.14	24
Minimum	1910			0.02	< 0.005	1.7	< 0.2	2.8	< 0.08	< 1.8	< 0.05	2.4	< 0.02	2.9	0.06	< 20
Maximum	18100			0.14	0.013	5.0	4.8	20	0.7	2.0	0.43	8.2	0.08	10.0	0.43	55
> 70 % > d.l. ?			yes/no	yes	no	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

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flo Ems: 1941 - 2006
(2) Suspended particulate matt
ND: Not detectec > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. T

Main river Weser				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 (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 2006 (Farge: 90%)	25024	31541	Mean	0.1	0.04	4.3	4.0	19	0.3	0.1	0.2	3.3	0.06	4.0	0.2	39
			upper	0.1	0.04	4.3	4.0	20	0.3	1.9	0.2	3.3	0.06	4.0	0.2	32
Minimum	12882			< 0.03	< 0.01	2.6	0.4	< 10	0.2	< 0.2	0.06	1.6	0.02	2.6	0.1	< 20
Maximum	61404			0.2	0.17	7.4	8.3	34	0.6	2.2	0.3	4.9	0.09	6.6	0.3	87
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
n				12	12	12	12	12	12	12	12	12	12	12	12	12

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flo Weser: 1941 - 2003
(2) Suspended particulate matt
ND: Not detectec > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. T

Main river Eider				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 (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 2006	1998	2391	Mean	0.033	0.004	2.51	1.05	8.10	1.06	NI	0.21	2.5	0.069	4.1	0.18	21
			upper	0.03	0.004	2.20	0.65	7.30	1.06	NI	0.17	2.5	0.064	4.2	0.19	15
Minimum	-5893			< 0.02	< 0.001	1.1	0.3	2.9	0.1		0.02	< 0.05	0.136	1	0.09	4.0
Maximum	11278			0.06	0.01	7.3	3.4	30	4.7		0.68	6.6	< 0.005	8.2	0.3	62
> 70 % > d.l. ?			yes/no	no	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes
n				26	26	26	26	26	6		26	26	26	26	26	26

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flo Eider: 1974 - 2006
(2) Suspended particulate matt
ND: Not detectec > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. T

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

Main river Elbe				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d] 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 2006	73900	74500	Median	0.11	0.059	6.2	3.3	26	0.7	NI	0.20	2.7	0.05	3.0	0.19	42
			upper	0.11	0.059	6.2	3.3	26	0.7	NI	0.20	2.7	0.05	3.0	0.19	42
Minimum	24000			< 0.07	0.038	4.6	1.6	18	< 0.5		0.08	0.87	< 0.03	1.9	0.10	21
Maximum	376000			0.25	0.18	9.1	5.1	46	1		0.45	4.9	0.08	5.3	0.24	95
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes
n				25	25	25	25	25	26		25	25	25	25	25	25

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flo Elbe: 1926 - 2003
(2) Suspended particulate matt
NI: No informatio > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. T

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

Left side tributaries of the Elbe				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d] 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 2006	1800	2200	Median	0.06	0.05	3.3	5.2	22	NI	NI	0.19	2.9	0.07	3.4	0.23	43
			upper	0.06	0.05	3.3	5.2	22	NI	NI	0.19	2.9	0.07	3.4	0.23	43
Minimum	480			< 0.05	0.01	0.5	2.0	< 10			< 0.05	1.1	< 0.03	1.8	0.11	9.0
Maximum	7200			0.10	0.07	6.7	11	63			0.87	6.5	0.15	7.7	0.60	194
> 70 % > d.l. ?			yes/no	no	yes	yes	yes	yes			no	yes	yes	yes	yes	yes
n				2	2	13	2	13			13	13	13	13	13	13

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flo Oste only: 1961 - 1987
(2) Suspended particulate matt Este, Lühe, Schwinge, Oste: 1961 - 200
(3) Left side tributaries: Este, Lühe, Schwinge, C
NI: No informatio > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. T

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

Right side tributaries of the Elbe				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d] 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 2006	2200	2500	Median	0.10	0.0041	3.8	1.6	18	NI	NI	0.19	2.7	0.025	3.9	0.15	43
			upper	0.10	0.0041	3.8	1.6	18	NI	NI	0.19	2.7	0.025	3.9	0.15	13
Minimum	980			0.02	0.0005	1.5	0.4	7.4			0.03	0.52	0.006	1.5	0.058	1.0
Maximum	3300			0.25	0.013	14	7.2	69			0.51	5.4	0.09	7.4	0.4	137
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	yes
n				12	12	12	12	12			12	12	12	12	12	12

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flo Stör only: 1971 - 1987
(2) Suspended particulate matt Pinnau, Krückau, Stör: 1971 - 200
(3) Right side tributaries: Pinnau, Krückau, S
NI: No informatio > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. T

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	0.2	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			0.07	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. Iceland

Annual report on riverine inputs and direct discharges by Iceland to Convention waters for the years 1997-2006.

Annual report on riverine inputs and direct discharges by Iceland to Convention waters during the period 1997 - 2006

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: 1997-2006

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 catchment 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):

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 - 2006

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):

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

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):

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:

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):

E. Unmonitored areas

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

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:

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 from sewage and industrial discharges. The riverine inputs in Icelandic rivers are thus mostly natural background values. Anthropogenic inputs to rivers are low because of low population density.

Explanatory text with data from two Icelandic rivers, monitored during 1997-2006

Attached are the RID tables but they are only partially filled, because of lack of information.

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 (point sources, inhabitants and fish- and slaughter industry) from Iceland. Most discharges are at the coast:
Table. Estimated antrophogenic discharge of Nitrogen (Tot N) and Phosphorous (Tot P) from inhabitants and industries (fish and slaughter) in 2006.

	Year 2006
Total N tonnes	4024
Total P tonnes	723

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 2006
Process to be carried out as follows:

1. The 'Full text report'[1] that is submitted annually together with the RID tables (**deadline 30 October 2007**) 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

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. 4 samplings in 2006. 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

[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.

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

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)

[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

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“ 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.

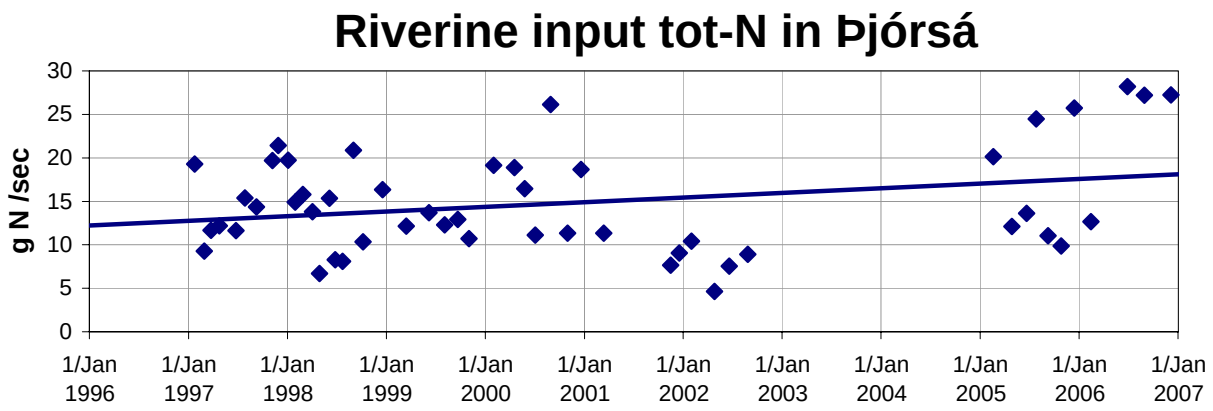
Uppleyst efni

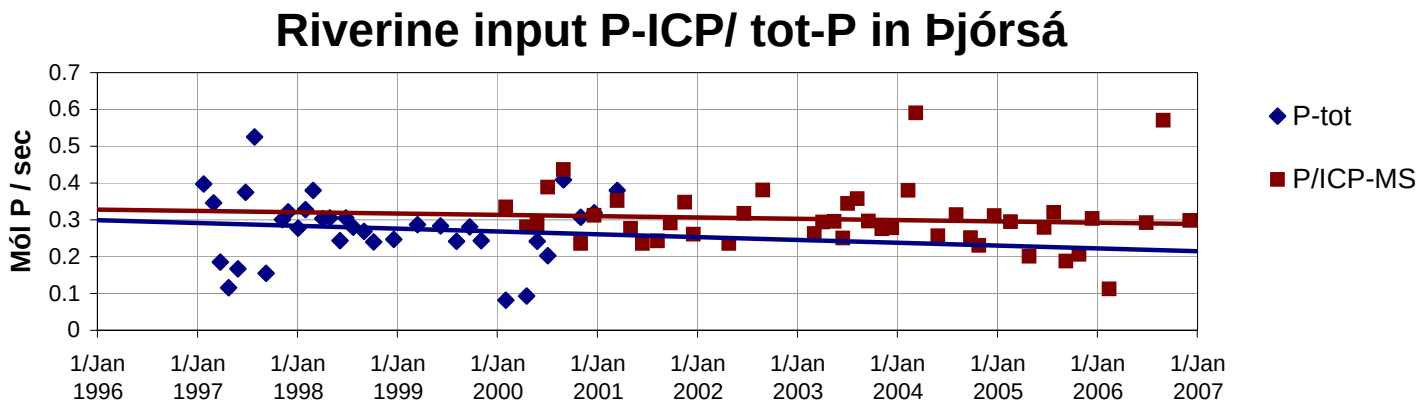
Basavirkni („alkalinity“), leiðni og pH var mælt með títrun, rafskautiog leiðnimæli á Raunvísindastofnun að loknum sýnatökuleiðangri. Endapunktur títrunar var ákvarðaður með Gran-falli (Stumm og Morgan, 1996). Aðalefni og snefilefni voru mæld af SGAB Analytica með ICP-AES, ICP-MS (Mass Spectrometry with 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).

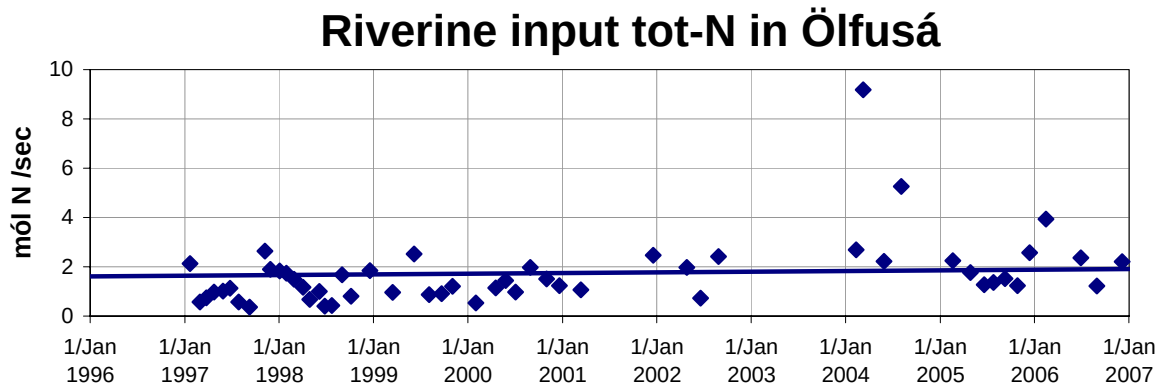
Svifaur.

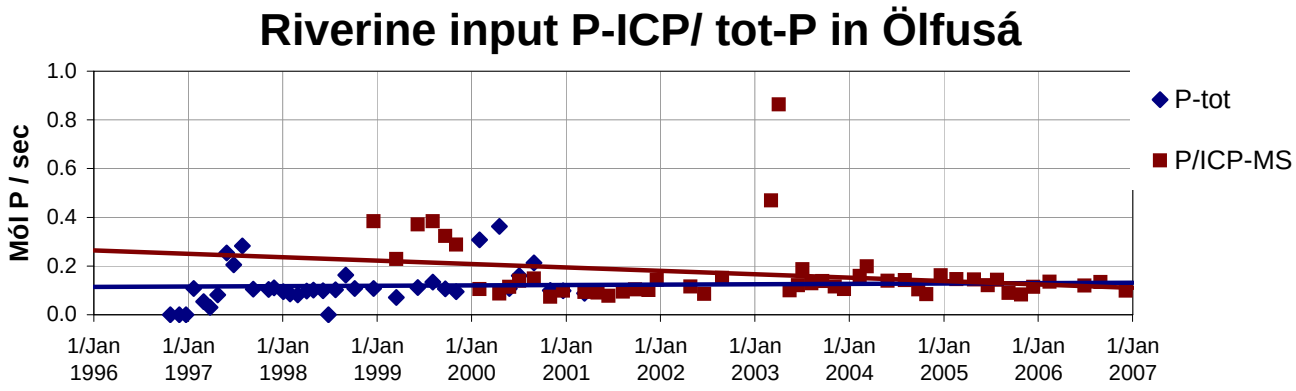
Magn svifaurs og heildarmagn uppleystra efna (TDSmælt) var mælt á Orkustofnun samkvæmt staðlaðri aðferð (Svanur Pálsson og Guðmundur Vigfússon 2000). Sýni til mælinga á lífrænum aurburði (POC, Particle Organic Carbon og PON, Particle Organic Nitrogen) sem tekin voru í sýruþvegnu aurburðarflöskurnar voru 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. November 9, 2007
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
1/Jan 2007


Riverine input P-ICP/ tot-P in Þjórsá
Mól P / sec
0.7
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
1/Jan 2007
P-tot
P/ICP-MS


Riverine input tot-N in Ölfusá
mól N /sec
10
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
1/Jan 2007


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
1/Jan 2007
P-tot
P/ICP-MS

Riverine input with some rivers in Iceland, 1997 - 2006
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	NO3-N tons/yr	PO4-P tons/yr	Cd tons/yr	Pb tons/yr	Hg tons/yr
Ölfusá / Selfoss	**1997**	12,405	393	5678	581.0	117.0	298.0	148.0	0.1	0.4	0.0
Þjórsá / Urriðafoss		11,656	370	7380	483.0	253.0	268.0	233.0	0.1	0.3	0.03
Ytri Rangá / Árbæjarfoss		1,387	40	572	82.1	64.4					
Ölfusá / Selfoss	**1998**	10,282	326	5678	512.0	96.0	294.0	153.0	0.1	0.3	0.0
Þjórsá / Urriðafoss		9,935	315	7380	420.0	266.0	214.0	224.0	0.03	0.4	0.02
Ölfusá / Selfoss	**1999**	11,828	375	5678	645.0	111.0	104.0	82.0	0.0	0.6	0.0
Þjórsá / Urriðafoss		10,818	343	7380	415.0	269.0	68.0	93.0	0.03	0.3	0.02
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	154.0	110.0	0.1	0.4	0.0
Þjórsá / Urriðafoss		11,257	356	7380	525.0	214.0	109.0	176.0	0.04	0.2	0.01
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	224.0	120.0	0.0	0.1	0.0
Þjórsá / Urriðafoss		10,314	327	7380	296.0	277.0	145.0	148.0	0.01	0.1	0.01
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							
Ölfusá / Selfoss	**2002**	12,204	387	5678	672	100	118		0.02	0.1	0.01
Þjórsá / Urriðafoss		11,794	374	7380	202	180	116	129	0.03	0.1	0.01
Ölfusá / Selfoss	**2003**	12,930	410	5678		252	227	306	0.03	0.6	0.02
Þjórsá / Urriðafoss		12,614	400	7380		313	220	229	0.03	0.2	0.01
Ölfusá / Selfoss	**2004**	13,592	431	5678	1385	108	241	103	0.02	0.2	0.02
Þjórsá / Urriðafoss		11,700	371	7380		284	234	192	0.01	0.1	0.01
Ölfusá / Selfoss	**2005**	12,299	390	5678	803	120	162	136	0.01	0.2	0.01
Þjórsá / Urriðafoss		11,101	352	7380	605	278	112	118	0.01	0.1	0.01
Ölfusá / Selfoss	**2006**	13,024	413	5678	1085	117	101	57	0.005		
Þjórsá / Urriðafoss		10,848	344	7380	492	197	37	61			

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. 2003.
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	NO3-N tons/yr	PO4-P 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**	<	<	<	
Ölfusá / Selfoss			<		
Jökulsá á Fjöllum					
Jökulsá á Dal / Brú					
Jökulsá á Dal / Hjarðarhaga					
Jökulsá í Fljótsdal					
Fellsá					
Grímsá					
Lagarfljót / Lagarfossvirkjun					
Fjarðará / Fjarðarselsvirkjun					
Ölfusá / Selfoss	**2003**	<	<		
Þjórsá / Urriðafoss		<	<	<	<
Ölfusá / Selfoss	**2004**	<	<		
Þjórsá / Urriðafoss		<	<	<	
Ölfusá / Selfoss	**2005**	<	<		
Þjórsá / Urriðafoss		<	<	<	
Ölfusá / Selfoss	**2006**	<			
Þjórsá / Urriðafoss		<	<	<	<
Ölfusá / Selfoss	**2007**				
Þjórsá / Urriðafoss					

Þjórsá við Urriðafoss Long time discharge: 350 m3/sec

Dato	Water temp °C	P tot mól/sec	Riv input P tot tons/yr	P/ICP-MS mól/sec	Riv input P/ICP-MS tons/yr	N tot g/sec	Riv input N tot tons/yr	Riv input NO3-N g/sec	NO3-N tons/yr	Riv input Po4-P mól/sec	PO4-P tons/yr
22/10/1996 11:30	3.0							10.139409		0.2692706	
26/11/1996 12:05								11.497095		0.3459457	
22/12/1996 11:00								18.207152		0.4751737	
23/01/1997 12:00	0.1	0.3978031				19.278413		13.751935		0.3737819	
28/02/1997 10:05		0.3465027				9.2611984		4.3263027		0.3142149	
25/03/1997 10:55	0.6	0.1854014				11.68045		0.8176315		0.194826	
24/04/1997 11:00	1.2	0.1160009				12.180261		3.3252112		0.1209309	
28/05/1997 13:15	5.0	0.1672383						10.36		0.1842614	
25/06/1997 11:30	9.8	0.3744029				11.648249		11.124078		0.3958271	
28/07/1997 10:40	12.2	0.5250896				15.40063		12.661367		0.4072452	
08/09/1997 12:30	7.6	0.1545825				14.357129		1.1619129		0.0787366	
30/09/1997 11:15	4.2							13.583537		0.3687192	
06/11/1997 11:30	1.4	0.3008745				19.69331		10.687154		0.1243399	
27/11/1997 11:10	3.3	0.3216072	**252.99385**			21.437682	**483.269447**	14.119712	**268.10423**	0.2152389	**232.95515**
03/01/1998 11:05	1.3	0.2776175				19.732671		13.323073		0.3101029	
29/01/1998 11:00		0.32816				14.925127		12.505115		0.1570289	
27/02/1998 11:20		0.379635				15.799224		11.294513		0.2775423	
03/04/1998 11:10	0.9	0.3036945				13.807332		7.1791663		0.2342251	
29/04/1998 09:45	3.1	0.3051125				6.7096546		0.8738678		0.2736963	
05/06/1998 10:15	8.3	0.243397				15.336988		2.6716224		0.2117903	
26/06/1998 10:35	9.3	0.3048695				8.278589		4.8949134		0.2750141	
23/07/1998 09:30	8.5	0.279618				8.1044449		4.0393909		0.2531393	
01/09/1998 10:00	1.8	0.26904				20.859417		7.2373364		0.2339716	
06/10/1998 09:50	6.2	0.2397831				10.335867		3.8814764		0.1938715	
18/12/1998 11:10	0.0	0.2466614	**266.45178**			16.354611	**419.949104**	8.534344	**213.64414**	0.254163	**224.26987**
15/03/1999 11:15	0.5	0.2865935				12.151713		7.0054981		0.293343	
07/06/1999 11:40	7.7	0.2837181				13.68864		0.4932968		0.254184	
04/08/1999 10:30	12.1	0.2417823				12.311124		5.483783		0.244419	
21/09/1999 11:00	7.6	0.2812223				12.90219		5.1170687		0.316374	
02/11/1999 11:45	0.2	0.2430532	**269.18629**		0	10.698653	**414.627845**	6.1489012	**67.777488**	0	**92.936468**
01/02/2000 13:30	0.0	0.0814303		0.3343978		19.140184		9.5772008		0.273991	
17/04/2000 16:30	-0.1	0.0932996		0.2811753		18.878944		3.1638203		0.2433575	
25/05/2000 13:30	5.9	0.241447		0.2883371		16.466912		1.7646367		0.2686427	
03/07/2000 12:30	11.7	0.2023402		0.3888182		11.11264		1.4981859		0.3672087	
29/08/2000 11:00	11.3	0.4089063		0.4368744		26.1415		8.5453638		0.4173593	
31/10/2000 12:30	2.1	0.3072881		0.2352309		11.346083		6.6416652		0.2412762	
19/12/2000 14:15	0.2	0.3189193	**213.88259**	0.3120891	294.49993	18.675048	**524.958462**	7.8101024	**109.01222**	0.2845512	**175.78927**
13/03/2001 12:00	0.5	0.3797287		0.3525993		11.3204		9.6824		0.3796114	
02/05/2001 11:40	6.8			0.2764223				3.06516		0.2405093	
14/06/2001 10:40	9.5			0.2355731				1.7075125		0.1790609	
08/08/2001 10:40	10.1			0.2425315				4.871561		0.182837	
24/09/2001 10:40	7.2			0.291411				6.5454354		0.2534581	
15/11/2001 11:50	2.4			0.3480788		7.6395961		10.978058		0.3072239	
17/12/2001 11:05	2.0			0.2604714	**276.95315**	9.0453826	**295.9007**	15.058729	**145.09124**	0.216574	**147.52126**
31/01/2002 11:20	0.0					10.407516		15.874241		0.3529137	
26/04/2002 12:05	0.3			0.2356991		4.6200413		4.7286311		0.3222465	
19/06/2002 12:45	7.8			0.3175527		7.5465759		10.313217		0.3414239	
27/08/2002 15:35	9.6			0.3810128	**180.24781**	8.8974866	**202.394159**	10.550729	**115.90454**	0.517446	**128.63374**
04/03/2003 14:15	1.6			0.2630301				20.038807		0.2842774	
03/04/2003 12:40	3.6			0.2938681				11.509447		0.3154914	
15/05/2003 11:45	5.9			0.2953211				2.8172417		0.2929079	
16/06/2003 12:57	9.7			0.2501681				0.9071206		0.2661769	
04/07/2003 12:20	11.8			0.3443222				5.3415559		0.3273447	
08/08/2003 12:35	12.6			0.3576188				9.5294432		0.3603785	
18/09/2003 12:10	5.5			0.2967216				8.0737493		0.298043	
06/11/2003 12:20	1.2			0.2756939				8.94469		0.291931	
12/12/2003 11:10	2.7			0.2779417	**313.51206**			11.533565	**219.96333**	0.2893706	**228.57794**
10/02/2004 11:40	0.0			0.3797828				14.029318		0.4982283	
09/03/2004 12:15	3.9			0.590177				26.019514		0.4088322	
28/05/2004 12:05	9.4			0.2567657				3.8496612		0.1722105	
03/08/2004 17:05	11.4			0.3138657				12.875036		0.4341792	
24/09/2004 11:45	6.6			0.2513192				5.9048502		0.2537973	
25/10/2004 12:35	0.4			0.2306533				7.8842201		0.2062535	
20/12/2004 13:14	-0.6			0.3115637	**284.46827**			13.026858	**233.64218**	0.3115547	**191.60983**
18/02/2005 12:00	-0.2			0.2945824		20.140076		11.411504		0.1294869	
27/04/2005 11:45	4.3			0.2005246		12.109214		2.9455668		0.132809	
20/06/2005 12:30	10.6			0.2794577		13.616616		1.6706296		0.2377275	
26/07/2005 12:27	13.6			0.3199086		24.480612		5.9157711		0.2767142	
08/09/2005 11:32	5.3			0.1877357		11.060781		2.7035411		0.1795599	
26/10/2005 12:41	0.0			0.2063895		9.8783024		4.9721731		0.1971387	
13/12/2005 12:22	1.7			0.3031002	**277.78016**	25.744375	**604.800459**	10.63465	**112.51412**	0.2560753	**118.19242**
13/02/2006 12:25	1.9			0.111928		12.6616		4.518192		0.087856	
28/06/2006 12:20	11.3			0.29192		28.20944		0.3738		0.231756	
29/08/2006 12:45	8.6			0.570375		27.1908		1.37592		0.16146	
05/12/2006 12:30	0			0.29866	**197.34437**	27.2356	**492.488652**	7.050568	**37.226688**	0.244408	**60.834009**

Ölfusá við Selfoss Long time discharge: 376 m3/sec

Dato	Water-temp °C	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	PO4-P mól/sec	PO4-P tons/yr	NO3-N mól/sec	NO3-N tons/yr
22/10/1996 10:15	4.8	0						0.0800806		0.5063348	
26/11/1996 10:15		0						0.0485104		0.7294296	
22/12/1996 18:00		0						0.0691695		0.9134186	
21/01/1997 11:00		0.1080008				2.1240455		0.1004408		1.0368222	
28/02/1997 18:00		0.0540004				0.5670121		0.0471154		0.2442202	
25/03/1997 09:20	0.2	0.0308002				0.7392158		0.0495884		0.308	
24/04/1997 18:00	3.4	0.0810006				0.9720208		0.0348303		0.1545108	
28/05/1997 20:40	6.2	0.253602				1.0144217		0.1020748		0.1537483	
25/06/1997 10:30	9.3	0.2046016				1.1253241		0.2121036		1.2276263	
28/07/1997 09:30	12.6	0.2820452				0.5717264		0.2264098		0.5503798	
08/09/1997 11:10	7.1	0.1047968				0.3649682		0.1047968		0.426	
30/09/1967 09:50	4.0	0.1066705				3.2502535		0.1191065		1.3493922	
06/11/1997 10:00	1.9	0.103684				2.635416		0.0889732		1.3241303	
27/11/1997 10:00	4.1	0.110825	**117.4050007**			1.9005635	**580.78926**	0.066146	**148.08296**	1.0475622	**297.62012**
03/01/1998 09:00	1.1	0.094302				1.83489		0.0621165		1.1455838	
29/01/1998 09:45	0.4	0.0853775				1.739855		0.0473867		1.2067775	
27/02/1998 10:00		0.0811679				1.487268		0.0513178		0.8064161	
03/04/1998 09:50	1.8	0.097194				1.1661825		0.0936906		0.7200259	
29/04/1998 08:35	2.0	0.1009195				0.6760022		0.0651466		0.1322672	
05/06/1998 09:00	8.1	0.098172				1.0023586		0.0892227		0.1016079	
26/06/1998 09:20	1.4	0				0.3995517		0.0956309		0.0264523	
23/07/1998 08:30	1.1	0.103092				0.4329898		0.0776066		0.0211099	
01/09/1998 08:50	11.4	0.163586				1.6787256		0.1220172		0.5278514	
06/10/1998 08:40	7.8	0.10728				0.8024897		0.0677868		0.3420893	
18/12/1998 09:50	-0.2	0.108204	**96.18809426**	0.3836212		1.83985	**512.26241**	0.109585	**153.15033**	1.21644	**294.1668**
15/03/1999 10:30	0.2	0.0707391		0.2286878		0.9658		0.08052		0.507369	
07/06/1999 10:20	-	0.1122739		0.3711672		2.52434		0.125944		0.2277625	
04/08/1999 09:30	12.4	0.1346437		0.3841162		0.863882		0.13289		0.3694367	
21/09/1999 10:45	9.7	0.1064563		0.3231625		0.9145305		0.1153035		0.3007068	
02/11/1999 09:30	1.8	0.0945462	**110.5997261**	0.2877902	340.1041293	1.211896	**644.88724**	0	**82.249938**	0.8297277	**104.25059**
01/02/2000 10:30	-0.1	0.3076877		0.1053923		0.53744		0.064		0.8795045	
17/04/2000 15:00	0.0	0.3632239		0.0863158		1.140511		0.078566		0.6846409	
25/05/2000 11:30	6.7	0.1080434		0.1145334		1.438596		0.1218934		0.2528319	
03/07/2000 11:00	13.3	0.1605492		0.1393736		0.970992		0.140681		0.0512424	
29/08/2000 10:30	9.5	0.2123242		0.1478592		1.979444		0.1092076		0.2748739	
31/10/2000 10:30	2.2	0.0998394		0.0732709		1.5062425		0.0769973		0.5523489	
19/12/2000 12:20	0.7	0.0989245	193.6784966	0.0991572	**109.8324329**	1.236683	**589.5699**	0.0841972	**109.87614**	0.8284772	**153.88146**
13/03/2001 10:00	0.7	0.0882594		0.0939135		1.064511		0.0642612		0.7156295	
02/05/2001 10:00	5.9			0.0911576				0.0674781		0.213411	
14/06/2001 09:00	9.1			0.0779077				0.0681198		0.1685109	
08/08/2001 08:50	10.1			0.0941053				0.1306104		0.174777	
24/09/2001 09:20	4.3			0.1037339				0.1106227		0.4891438	
15/11/2001 10:10	3.3			0.1016164				0.0984737		1.2956388	
17/12/2001 09:55	1.4			0.1430555	**87.87909549**	2.4699232	**615.87432**	0.1897975	**120.11534**	2.0212533	**224.32715**
31/01/2002 10:05	0.0							0		0	
26/04/2002 10:40	1.5			0.1156971		1.967732		0.1810313		0.9401604	
19/06/2002 11:00	7.1			0.0859721		0.7218518		0.2017057		0.3524931	
27/08/2002 14:20	9.7			0.1510956	**99.50605019**	2.4178055	**672.31048**	0.2239556	**93.423434**	1.2925166	**117.64446**
04/03/2003 11:35	1.8			0.4695078				0.4213742		1.81227	
03/04/2003 11:15	2.8			0.8628238				0.79147		0	
15/05/2003 10:30	7.2			0.1001353				0.1147782		0.0864804	
16/06/2003 11:53	8.7			0.1202468				0.1261748		0.1726739	
04/07/2003 11:00	11.4			0.1863797				0.1199373		0.1041747	
08/08/2003 11:25	12.9			0.1291582				0.1161832		0.2188927	
18/09/2003 10:40	5.9			0.1383784				0.115384		0.6090859	
06/11/2003 10:46	1.5			0.116005				0.0727908		1.1125829	
12/12/2003 10:00	0.7			0.1045563	**251.7892228**			0.063514	**306.4037**	1.4213339	**226.70248**
10/02/2004 10:00	0.0			0.1593913		2.6909953		0.2344716		1.3554855	
09/03/2004 10:45	4.4			0.198424		9.1794898		0.1244655		2.5414069	
28/05/2004 11:00	9.4			0.1394445		2.2267057		0.1304769		0.3772004	
03/08/2004 12:40	10.3			0.1415022		5.2648058		0.0498497		0.4101545	
24/09/2004 13:50	6.7			0.1039967				0.1816007		0.560184	
25/10/2004 11:10	0.7			0.084168				0.090756		0.775611	
20/12/2004 11:05	-0.7			0.1612001	**107.7559862**		**1384.827**	0.1324079	**102.94702**	1.3875776	**240.85399**
18/02/2005 10:20	-0.4			0.1455312		2.2416841		0.2001227		1.1788993	
27/04/2005 09:57	5.7			0.1443029		1.7670391		0.1329812		0.2868744	
20/06/2005 10:50	10.6			0.1209321		1.2770615		0.1091366		0.2066773	
26/07/2005 10:40	13.8			0.1426498		1.3670214		0.140588		0.2453494	
08/09/2005 10:05	5.7			0.0895264		1.5228745		0.0755813		0.1882125	
26/10/2005 10:39	-0.1			0.0829228		1.2276379		0.0849796		0.5516925	
13/12/2005 10:35	2.7			0.1140842	**120.7613733**	2.5653191	**803.02006**	0.1121479	**135.93348**	1.1772701	**161.80607**
13/02/2006 12:25	2.2			0.135516		3.93782		0.170377		1.396895	
28/06/2006 12:20	11			0.11907		2.3625		0.109242		0.131166	
29/08/2006 12:45	8.7			0.134688		1.22244		0.028548		0.0549	
05/12/2006 12:30	0.5			0.099189	**116.728484**	2.20626	**1084.9783**	0.04326	**56.875136**	0.841098	**101.28557**

6. Ireland

Annual report on riverine inputs and direct discharges to Convention waters during the year 2006 by Ireland

Table 5a Direct inputs to the maritime area in 2006 by Ireland (Sewage effluents)

Table 5b Direct inputs to the maritime area in 2006 by Ireland (Industrial effluents)

Table 5c Direct inputs to the maritime area in 2006 by Ireland (Total direct discharges)

Table 6a Riverine inputs to the maritime area in 2006 by Ireland (Main riverine inputs)

Table 6b Riverine inputs to the maritime area in 2006 by Ireland (Inputs of tributary rivers)

Table 6c Riverine inputs to the maritime area in 2006 by Ireland (Total riverine inputs)

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

Table 5a. Direct inputs to the maritime area in 2006 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	32.59

Table 5b. Direct inputs to the maritime area in 2006 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	28.45

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 2006 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	61.04

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 2006 by Ireland

Main riverine inputs				Quantities --->													
Discharge area	Flow rate [1000 m3/d]			Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	TKN (2)	PO4-P	Total N	Total P	SPM (3)
	2005		LTA	[t]	[t]	[t]	[t]	[t]	[kg]	[kg]	[kt]	[kt]	[t]	[kt]	[kt]	[kt]	[kt]
Irish Sea: Boyne	4179		3280	0.15	0.23	3.70	1.80	10.29	NM	NM	0.04	4.27	NM	0.04	7.49	0.12	18.43
				0.00	0.00	3.46	0.40	10.16			0.04			0.04			
Irish Sea: Liffey	1399		1459	0.05	0.08	0.79	0.53	3.94	NM	NM	0.03	1.23	NM	0.02	1.83	0.07	5.49
				0.00	0.00	0.55	0.03	3.92			0.03			0.02			
Irish Sea: Avoca	1696		1562	0.19	0.09	6.86	3.24	63.42	NM	NM	0.05	1.24	NM	0.00	1.52	0.05	6.19
				0.19	0.00	6.86	3.24	63.42			0.05			0.00			
Irish Sea: Slaney	3174		3208	0.12	0.17	1.76	1.16	5.32	NM	NM	0.03	5.23	NM	0.03	4.94	0.08	14.67
				0.00	0.00	0.94	0.00	5.06			0.03			0.03			
Total Irish Sea:	**10448**		**9509**	**0.51**	**0.57**	**13.11**	**6.73**	**82.97**			**0.15**	**11.98**		**0.10**	**15.78**	**0.32**	**44.77**
				0.19	**0.09**	**11.81**	**3.68**	**82.56**			**0.15**			**0.09**			
Celtic Sea: Barrow	3679		3784	0.13	0.20	4.42	1.34	7.01	NM	NM	0.04	4.71	NM	0.06	5.78	0.11	27.30
				0.00	0.00	4.07	0.00	6.72			0.04			0.06			
Celtic Sea: Nore	3556		3602	0.13	0.19	2.53	1.53	8.14	NM	NM	0.05	3.43	NM	0.06	6.03	0.14	35.65
				0.00	0.00	1.82	0.47	7.92			0.05			0.06			
Celtic Sea: Suir	6151		5889	0.22	0.34	2.25	2.25	10.11	NM	NM	0.10	5.54	NM	0.08	7.87	0.13	29.11
				0.00	0.00	0.00	0.00	9.77			0.10			0.08			
Celtic Sea: Blackwater	7467		7522	0.27	0.41	5.20	4.06	17.48	NM	NM	0.19	7.79	NM	0.12	10.95	0.26	54.04
				0.00	0.00	4.50	1.69	17.10			0.18			0.12			
Celtic Sea: Lee	9236		3435	0.34	0.51	3.50	3.54	10.67	NM	NM	0.13	8.15	NM	0.10	10.79	0.25	33.71
				0.00	0.00	0.19	0.26	10.18			0.12			0.10			
Celtic Sea: Bandon	1831		1845	0.07	0.10	1.14	0.79	2.68	NM	NM	0.03	1.90	NM	0.03	2.48	0.10	9.90
				0.00	0.00	0.92	0.16	2.61			0.03			0.03			
Celtic Sea: Deel	666		625	0.02	0.04	0.85	0.54	1.29	NM	NM	0.01	0.59	NM	0.02	0.96	0.04	4.51
				0.00	0.00	0.83	0.43	1.23			0.01			0.02			
Celtic Sea: Maigue	1208		1514	0.04	0.07	1.36	0.44	1.54	NM	NM	0.02	1.04	NM	0.03	1.47	0.08	6.12
				0.00	0.00	1.27	0.00	1.43			0.02			0.03			
Celtic Sea: Shannon	4730	combined	NA	0.17	0.26	4.59	1.73	15.13	NM	NM	0.05	2.11	NM	0.05	3.65	0.22	28.11
(old channel)		21869	18061	0.00	0.00	4.16	0.00	14.93			0.04			0.05			
Celtic Sea: Shannon	17139		NA	0.63	0.94	8.92	6.26	30.79	NM	NM	0.09	6.86	NM	0.07	11.65	0.24	62.56
(tailrace)				0.00	0.00	3.20	0.00	29.28			0.07			0.06			
Celtic Sea: Fergus	1777		1598	0.06	0.10	0.67	0.65	1.50	NM	NM	0.03	0.52	NM	0.01	0.97	0.04	6.48
				0.00	0.00	0.03	0.00	1.34			0.03			0.01			
Total Celtic Sea:	**57439.94**		**47875**	**2.10**	**3.14**	**35.42**	**23.13**	**106.34**			**0.73**	**42.65**		**0.66**	**62.62**	**1.60**	**297.49**
				0.00	**0.00**	**20.99**	**3.01**	**102.52**			**0.71**			**0.65**			

Table 6a. Continued

Main riverine inputs				Quantities --->													
Discharge area	Flow rate [1000 m3/d]			Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	TKN (2)	PO4-P	Total N	Total P	SPM (3)
	2005		LTA	[t]	[t]	[t]	[t]	[t]	[kg]	[kg]	[kt]	[kt]	[t]	[kt]	[kt]	[kt]	[kt]
Atlantic: Corrib	9846		9012	0.36	0.54	3.59	3.59	6.71	NM	NM	0.11	3.12	NM	0.03	4.84	0.13	41.42
				0.00	0.00	0.00	0.00	5.06			0.10			0.01			
Atlantic: Moy	5038		5405	0.18	0.28	3.72	1.84	9.38	NM	NM	0.03	1.45	NM	0.01	2.93	0.07	52.31
				0.00	0.00	2.84	0.00	8.98			0.02			0.01			
Atlantic : Erne	9793		7333	0.36	0.54	6.68	3.57	8.17	NM	NM	0.04	2.30	NM	0.12	4.98	0.33	36.58
				0.00	0.00	5.92	0.00	7.06			0.02			0.12			
Total Atlantic:	**24677.07**		**21749**	**0.90**	**1.35**	**13.99**	**9.01**	**24.26**			**0.18**	**6.88**		**0.16**	**12.74**	**0.53**	**130.32**
				0.00	**0.00**	**8.76**	**0.00**	**21.10**			**0.15**			**0.14**			
Grand total:				**3.50**	**5.07**	**62.51**	**38.86**	**213.57**			**1.06**	**61.51**		**0.91**	**91.14**	**2.45**	**472.58**
				0.19	**0.09**	**41.56**	**6.69**	**206.18**			**1.00**			**0.88**			

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 2006 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	0.32	0.36	8.93	8.19	28.17	NM	NM	0.10	7.29	NM	0.07	10.31	0.18	72.57
		0.12	0.03	8.31	6.29	27.89			0.10			0.07			
Celtic Sea	100 minor catchment areas: 9800 km2	1.18	1.77	16.85	14.42	50.65	NM	NM	0.57	29.58	NM	0.45	40.52	1.03	162.42
		0.00	0.00	8.89	3.51	48.92			0.56			0.45			
Atlantic	180 minor catchment areas: 11498 km2	1.00	1.50	16.04	10.03	33.57	NM	NM	0.23	7.86	NM	0.14	14.81	0.52	181.38
		0.00	0.00	9.80	0.00	30.57			0.20			0.13			
Total:		**2.50**	**3.63**	**41.83**	**32.64**	**112.39**			**0.90**	**44.73**		**0.67**	**65.64**	**1.73**	**416.38**
		0.12	**0.03**	**27.62**	**11.70**	**107.66**			**0.87**			**0.65**			

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 2006 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)	**0.83**	**0.93**	**22.04**	**14.92**	**111.14**			**0.25**	**19.27**		**0.16**	**26.09**	**0.50**	**117.34**
	(lower estimate)	**0.31**	**0.12**	**20.13**	**9.97**	**110.45**			**0.25**			**0.16**			
Celtic Sea	(upper estimate)	**3.27**	**4.91**	**52.27**	**37.55**	**156.98**			**1.30**	**72.23**		**1.11**	**103.14**	**2.63**	**459.91**
	(lower estimate)	**0.00**	**0.00**	**29.88**	**6.52**	**151.43**			**1.27**			**1.10**			
Atlantic	(upper estimate)	**1.90**	**2.86**	**30.03**	**19.04**	**57.83**			**0.41**	**14.74**		**0.30**	**27.56**	**1.05**	**311.70**
	(lower estimate)	**0.00**	**0.00**	**18.56**	**0.00**	**51.67**			**0.35**			**0.27**			
Total:	(upr est)	**6.01**	**8.70**	**104.34**	**71.50**	**325.96**			**1.97**	**106.24**		**1.57**	**156.78**	**4.18**	**888.96**
	(lr est)	**0.31**	**0.12**	**68.56**	**16.49**	**313.55**			**1.87**			**1.53**			

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 2006

Main riverine inputs				Contaminant Concentrations --->													
Discharge area	Flow rate [1000 m³/d] annual 2006	Flow rate [1000 m³/d] LTA 2005	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 - 2006	4179	3280															
			Median	0.1	NM	2.0	1.0	0.007	NM	NM	0.02	2.52	NM	0.025	3.85	0.061	10
Minimum				0.1		1.0	1.0	0.001			0.01	1.68		0.005	2.99	0.03	10
Maximum				0.1		3.0	5.0	0.018			0.05	3.91		0.065	5.59	0.11	15
> 70 % > d.l. ?			**yes/no**	no		yes	no	yes			yes	yes		yes	yes	yes	no
n				21		21	21	21			21	21		21	15	21	21
Irish Sea: Liffey - 2006	1399	1459															
			Median	0.1	NM	1.0	1.0	0.007	NM	NM	0.05	2.21	NM	0.056	3.08	0.089	10
Minimum				0.1		1.0	1.0	0.001			0.02	1.87		0.005	2.72	0.038	10
Maximum				0.1		2.0	2.0	0.013			0.13	3.28		0.092	4.64	0.39	13
> 70 % > d.l. ?			**yes/no**	no		no	no	yes			yes	yes		yes	yes	yes	no
n				21		21	21	21			21	21		21	15	21	21
Irish Sea: Avoca - 2006	1696	1562															
			Median	0.4	NM	13.0	5.0	0.14	NM	NM	0.13	2.14	NM	0.005	2.425	0.05	10
Minimum				0.2		7.0	4.0	0.01			0.04	1.49		0.005	1.88	0.015	10
Maximum				0.5		17.0	6.0	0.19			0.24	2.56		0.023	3.48	0.31	10
> 70 % > d.l. ?			**yes/no**	yes		yes	yes	yes			yes	yes		no	yes	yes	no
n				21		21	21	21			21	21		21	18	21	21
Irish Sea: Slaney - 2006	3174	3208															
			Median	0.1	NM	1.0	1.0	0.0035	NM	NM	0.02	4.645	NM	0.022	4.875	0.055	10
Minimum				0.1		1.0	1.0	0.001			0.01	3.44		0.0063	2.99	0.023	10
Maximum				0.1		3.0	1.0	0.008			0.03	4.89		0.036	6.28	0.11	17
> 70 % > d.l. ?			**yes/no**	no		no	no	no			yes	yes		yes	yes	yes	no
n				14		14	14	14			14	14		14	12	14	14
Celtic Sea: Barrow - 2006	3679	3784															
			Median	0.1	NM	1	1	0.0045	NM	NM	0.02	3.15	NM	0.042	4.96	0.082	10
Minimum				0.1		1	1	0.001			0.01	2.1		0.02	2.84	0.036	10
Maximum				0.1		12	1	0.009			0.05	6.18		0.081	9.26	0.1	48
> 70 % > d.l. ?			**yes/no**	no		no	no	no			yes	yes		yes	yes	yes	no
n				14		14	14	14			14	14		14	12	14	14
Celtic Sea: Nore - 2006	3556	3602															
			Median	0.1	NM	1	1	0.003	NM	NM	0.03	2.48	NM	0.048	4.455	0.086	10
Minimum				0.1		1	1	0.001			0.01	1.63		0.014	3.23	0.022	10
Maximum				0.1		4	2	0.014			0.07	5.16		0.062	7.94	0.25	77
> 70 % > d.l. ?			**yes/no**	yes		no	no	no			yes	yes		yes	yes	yes	no
n				21		21	21	21			21	21		21	18	21	21
Celtic Sea: Suir - 2006	6151	5889															
			Median	0.1	NM	1	1	0.004	NM	NM	0.03	2.52	NM	0.033	3.385	0.053	10
Minimum				0.1		1	1	0.001			0.01	1.49		0.0074	2.83	0.027	10
Maximum				0.1		1	1	0.008			0.2	4.08		0.044	4.53	0.11	28
> 70 % > d.l. ?			**yes/no**	no		no	no	yes			yes	yes		yes	yes	yes	no
n				21		21	21	21			21	21		21	18	21	21
Celtic Sea: Blackwater - 2006	7467	7522															
			Median	0.1	NM	1	1	0.006	NM	NM	0.02	2.86	NM	0.036	3.865	0.076	10
Minimum				0.1		1	1	0.001			0.01	1.99		0.011	3.38	0.035	10
Maximum				0.1		4	6	0.013			0.11	4.69		0.06	5.31	0.19	28
> 70 % > d.l. ?			**yes/no**	no		no	no	yes			yes	yes		yes	yes	yes	no
n				21		21	21	21			21	21		21	18	21	21
Celtic Sea: Lee - 2006	**9236**	3435															
			Median	0.1	NM	1	1	0.003	NM	NM	0.02	2.68	NM	0.024	3.3	0.057	10
Minimum				0.1		1	1	0.001			0.01	1.56		0.005	2.77	0.026	10
Maximum				0.1		3	3	0.01			0.05	3.56		0.043	4.91	0.089	10
> 70 % > d.l. ?			**yes/no**	no		no	no	no			yes	yes		yes	yes	yes	no
n				21		21	21	21			21	21		21	18	21	21
Celtic Sea: Bandon - 2006	1831	1845															
			Median	0.1	NM	1	1	0.003	NM	NM	0.02	3.42	NM	0.036	4.1	0.07	10
Minimum				0.1		1	1	0.001			0.01	1.89		0.005	3.23	0.033	10
Maximum				0.1		3	7	0.007			0.07	5.37		0.068	5.63	0.43	19
> 70 % > d.l. ?			**yes/no**	no		no	no	yes			yes	yes		yes	yes	yes	no
n				21		21	21	21			21	21		21	18	20	21
Celtic Sea: Deel - 2006	666	625															
			Median	0.1	NM	2.5	1	0.003	NM	NM	0.025	2.49	NM	0.0855	4.04	0.093	10
Minimum				0.1		1	1	0.001			0.01	0.91		0.027	2.5	0.06	10
Maximum				0.1		6	5	0.01			0.07	3.53		0.12	4.76	0.25	27
> 70 % > d.l. ?			**yes/no**	no		no	no	yes			yes	yes		yes	yes	yes	no
n				14		14	14	14			12	12		12	12	11	14

Celtic Sea: Maigue - 2006	1208	1514															
			Median	0.1	NM	2	1	0.003	NM	NM	0.01	2.28	NM	0.0685	3.355	0.089	10
Minimum				0.1		1	1	0.001			0.01	0.92		0.017	2.38	0.055	10
Maximum				0.1		33	1	0.006			0.06	3.35		0.11	4.23	0.26	21
> 70 % > d.l. ?			**yes/no**	no		no	no	yes			yes	yes		yes	yes	yes	no
n				14		14	14	14			12	12		12	12	12	14
Celtic Sea: Shannon** - 2006 (old channel)	4730	4500															
			Median	0.1	NM	1	1	0.005	NM	NM	0.02	1.25	NM	0.0265	2.04	0.049	10
Minimum				0.1		1	1	0.001			0.01	0.87		0.005	1.67	0.027	10
Maximum				0.1		31	1	0.013			0.03	1.86		0.04	5.27	0.34	25
> 70 % > d.l. ?			**yes/no**	no		no	no	yes			yes	yes		yes	yes	yes	no
n				21		21	21	21			18	18		18	18	18	21
Celtic Sea: Shannon** - 2006 (tailrace)	17139	13307															
			Median	0.1	NM	1	1	0.002	NM	NM	0.01	1.12	NM	0.0094	1.785	0.032	10
Minimum				0.1		1	1	0.001			0.01	0.66		0.005	1.36	0.014	10
Maximum				0.1		6	1	0.049			0.02	1.77		0.018	2.64	0.083	10
> 70 % > d.l. ?			**yes/no**	no		no	no	no			yes	yes		no	yes	yes	no
n				21		21	21	21			18	18		18	18	18	21
Celtic Sea: Fergus - 2006	1777	1598															
			Median	0.1	NM	1	1	0.002	NM	NM	0.055	0.8	NM	0.023	1.425	0.05	10
Minimum				0.1		1	1	0.001			0.03	0.49		0.005	1.2	0.034	10
Maximum				0.1		2	1	0.004			0.17	1.27		0.037	2.13	0.19	10
> 70 % > d.l. ?			**yes/no**	no		no	no	yes			yes	yes		yes	yes	yes	no
n				14		14	14	14			12	12		12	12	12	14
Atlantic: Corrib - 2006	9846	9012															
			Median	0.1	NM	1	1	0.002	NM	NM	0.02	0.86	NM	0.005	1.335	0.033	10
Minimum				0.1		1	1	0.00			0.01	0.6		0.005	0.78	0.015	10
Maximum				0.1		1	1	0.007			0.06	1.36		0.022	1.89	0.08	18
> 70 % > d.l. ?			**yes/no**	no		no	no	no			yes	yes		no	yes	yes	no
n				21		21	21	21			21	21		21	18	21	21
Atlantic: Moy - 2006	5038	5405															
			Median	0.1	NM	1	1	0.004	NM	NM	0.01	0.71	NM	0.0055	1.43	0.034	10
Minimum				0.1		1	1	0.001			0.01	0.42		0.005	0.85	0.012	10
Maximum				0.1		12	1	0.013			0.02	1.17		0.013	2.14	0.061	79
> 70 % > d.l. ?			**yes/no**	no		no	no	yes			yes	yes		no	yes	yes	no
n				21		21	21	21			21	21		21	18	21	21
Atlantic : Erne - 2006	9793	7333															
			Median	0.1	NM	2	1	0.002	NM	NM	0.01	0.65	NM	0.034	1.325	0.063	10
Minimum				0.1		1	1	0.001			0.01	0.54		0.017	1.06	0.04	10
Maximum				0.1		3	1	0.005			0.08	0.95		0.056	1.87	0.25	13
> 70 % > d.l. ?			**yes/no**	no		yes	no	no			yes	yes		yes	yes	yes	no
n				21		21	21	21			21	21		21	18	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.

7. The Netherlands

Annual report on riverine inputs and direct discharges to Convention waters during the year 2006 by the Netherlands

Table 5a	Sewage effluents (direct discharges) to the maritime area in 2006 by the Netherlands
Table 5b	Industrial effluents (direct discharges) to the maritime area in 2006 by the Netherlands
Table 6a	Main riverine inputs to the maritime area in 2006 by the Netherlands
Table 6b	Tributary riverine inputs to the maritime area in 2006 by the Netherlands
Table 7a	Contaminant concentrations of rivers in the Netherlands discharging to the maritime area in 2006 (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 2006 by the Netherlands.

Annual report on riverine inputs and direct discharges by the Netherlands to Convention waters during the year: 2006

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

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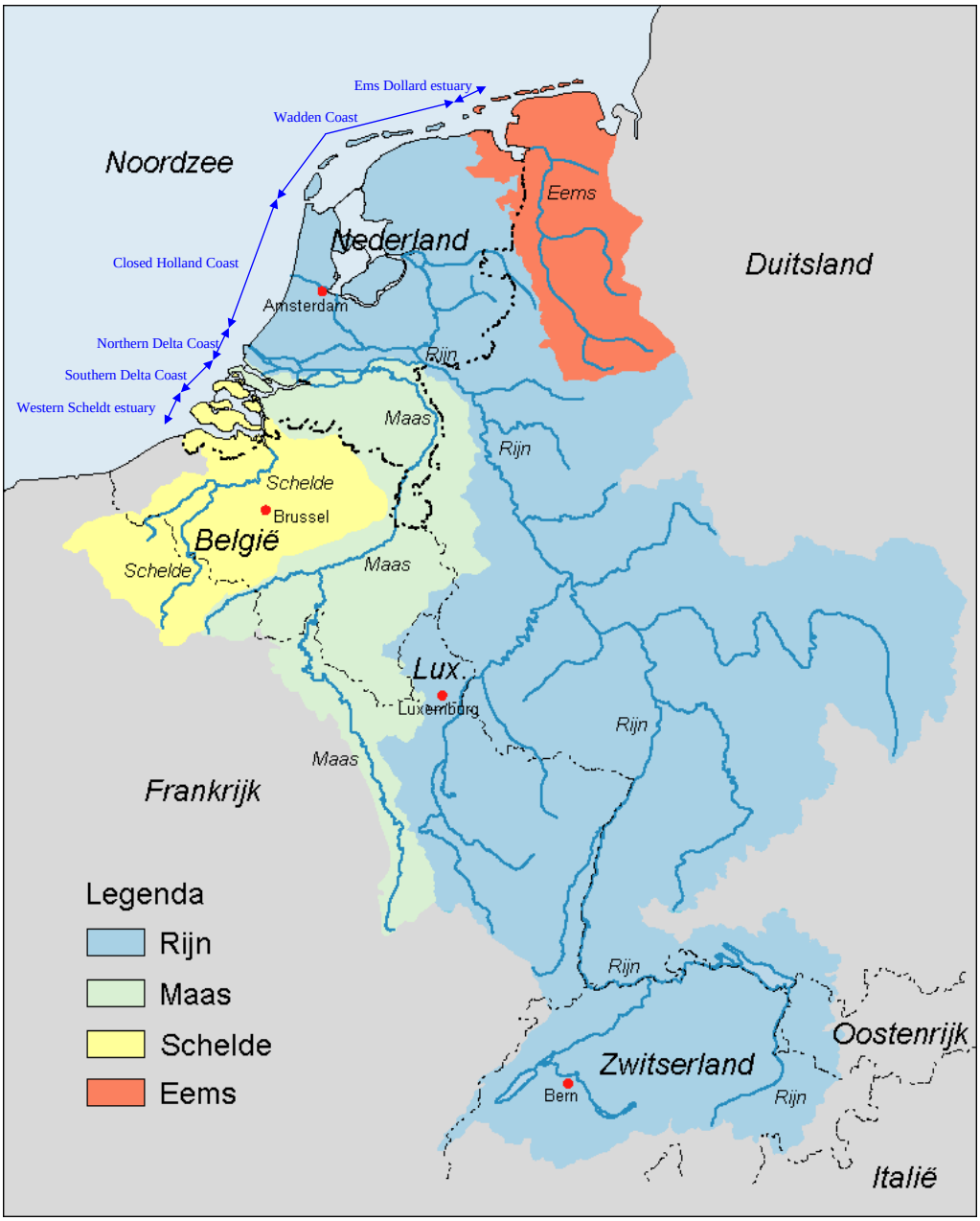
A. General information

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

Country: 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

In figure 1 shows the Dutch coast 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.



B. Total riverine inputs and direct discharges (Tables 4a and 4b) for the year: 2006

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.):

Riverine input data: including loads from countries upstream (Germany and Belgium)

C. Direct discharges for the year: 2006

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:

- *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.

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 data of discharges of sewage effluents of Cd and Hg to the Closed Holland Coast are the same as last year, as new collected data are not reliable.

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:

Method: see paragraph C.1

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

There are no measurements of SPM in industrial effluents 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 information available. The expectation is that this attribution is low for the Netherlands.

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):

See section C.3

D. Riverine inputs for the year: 2006

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:

- *For Noordzeekanaal, IJsselmeer and Haringvlietsluizen 12-13 samples per year. For Maassluis 26 samples per year. Loads calculated following each flow weighed concentration method. Not all calculations for PCBs are available, as samples from Ijmuiden could not be used: sampling for PCBs and for suspended matter determinations were not collected during the same cruise.*
- *Loads are calculated using a new version of BEVER: version 3.5.0; for loads version: 1.7.2.*
- *2005 data are recalculated using this new method and no differences were found*
- *In table 7, we have reported in row: 70% > DL the number of data <DL in brackets*

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

Loads from countries upstream are included.

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

None

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

Riverine inputs of Hg and Cd were rather high in 2006 compared to the last two years. Concentrations of Cd and Hg were rather high, not the water flow.

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):

Reported loads are average annual flows multiplied by average annual concentrations. Most often samples are taken monthly (n=12.) Detailed information on number of samples from all locations and individual sites is available but not reported here.

Some location names are changed or corrected and two new locations are inserted (marked red in the tables):

- *Zuiderdiep (drainage sluice) : load is calculated from the loads of 7 pumping engines on Goeree Overflakkee*
- *Grevelingen: load is calculated from the loads of 5 pumping engines*

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:

Diffuse contribution like atmospheric deposition and groundwater influence are not taken into account

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):

See D4

E. Unmonitored areas

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

No relevance in the Netherlands

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:

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.

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

None

Table 4b. Total Riverine Inputs and Direct Discharges to the Maritime Area in 2006 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 [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															
	lower		7.9727	3.5877	220.573	117.052	796.362	2.6	68.2	7.2596	185.091	5.0992	236.373	9.807	1284.585
Main Rivers	upper		8.7619	3.5908	220.573	117.174	796.562	78.8	73.0	7.2762	185.091	5.1009	236.373	9.991	1285.691
	lower		0.0778	0.0097	4.297	2.186	19.501			0.9449	5.838	0.4499	8.519	0.537	11.384
Tributary Rivers	upper		0.1808	0.0335	5.634	4.831	26.059			1.0868	7.749	0.5863	11.867	0.921	17.251
	lower		8.1	3.6	225	119	816	3	68	8	191	5.5	245	10	1296
Total Riverine Inputs	**upper**		8.9	3.6	226	122	823	79	73	8	193	5.7	248	11	1303
DIRECT DISCHARGES															
	lower														
Sewage Effluents	upper		0.0226	0.0117	0.723	0.321	4.052				0.464		4.180	0.218	2.631
	lower														
Industrial Effluents	upper		0.1503	0.0114	2.860	1.682	15.488				0.696		1.591	0.185	0.000
	lower														
Fish Farming	upper														
	lower														
Total Direct Inputs	**upper**		0.17	0.02	3.6	2.0	20				1.2		5.8	0.40	3
UNMONITORED AREAS															
	lower														
Unmonitored Areas	upper														
	lower		8.1	3.6	225	119	816	3	68	8	191	5.5	245	10	1296
REGION II TOTAL	**upper**		9.1	3.6	230	124	842	79	73	8	194	5.7	254	11	1306

Table 4a.
Reported Maritime Area of the OSPAR Convention in 2006 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													
		upper	0.1100	0.0005	2.162	1.000	8.910				0.152		0.294	0.002	0.000
		comment													
225	Wadden Coast	lower	0.1535	0.0907	30.047	9.386	77.712	0.0	3.9	0.4537	20.525	0.0784	35.311	0.824	329.133
		upper	0.7726	0.0918	30.070	9.513	77.897	14.6	7.0	0.4702	20.540	0.0801	35.340	1.031	329.150
		comment													
224	Closed Holland Coast	lower	0.5116	0.0149	7.726	1.942	35.549	0.3	0.0	1.1415	5.233	0.5980	8.153	0.774	25.555
		upper	0.5625	0.0372	8.433	2.656	39.912	3.2	0.0	1.1434	5.720	0.5980	12.571	0.959	27.813
		comment													
153	Northern Delta Coast	lower	7.3096	3.4841	183.731	106.055	688.084	2.4	64.2	5.7727	159.685	4.5279	193.775	8.321	933.091
		upper	7.4793	3.4889	183.951	106.419	689.639	61.2	66.0	5.7727	159.808	4.5279	194.123	8.386	934.262
		comment													
223	Southern Delta Coast	lower	0.0000	0.0010	0.691	0.103	1.084			0.0277	0.734	0.0135	1.035	0.025	1.696
		upper	0.0147	0.0020	1.419	1.064	3.798			0.0280	1.609	0.0136	2.519	0.198	1.792
		comment													
222	Western Schelde	lower	0.0758	0.0066	2.676	1.753	13.435			0.8088	4.752	0.3312	6.618	0.400	6.496
		upper	0.1765	0.0269	3.755	3.354	22.004			0.9487	6.171	0.4676	9.164	0.740	12.557
		comment													
82	North Sea (NL)	lower	8.0504	3.5974	224.870	119.238	815.863	2.7	68.2	8.2045	190.929	5.5491	244.892	10.344	1295.969
		upper	9.1156	3.6473	229.789	124.007	842.160	79.1	73.0	8.3630	194.000	5.6872	254.011	11.315	1305.573
		comment													

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 2006 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	0.0155	0.0096	0.507	0.147	2.400				0.175		3.652	0.115	2.121
		comment													
225	Wadden Coast	lower													
		upper	0.0004	0.0003	0.015	0.019	0.081				0.006		0.016	0.003	0.017
		comment													
222	Western Schelde	lower													
		upper	0.0052	0.0013	0.140	0.116	0.934				0.236		0.414	0.071	0.398
		comment													
153	Northern Delta Coast	lower													
		upper	0.0013	0.0004	0.032	0.030	0.458				0.031		0.070	0.021	0.065
		comment													
223	Southern Delta Coast	lower													
		upper	0.0002	0.0001	0.029	0.009	0.179				0.016		0.028	0.008	0.030
		comment													
82	North Sea (NL)	lower													
		upper	0.0226	0.0117	0.723	0.321	4.052				0.464		4.180	0.218	2.631
		comment													

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 2006 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	0.0039	0.0040	0.200	0.342	1.860				0.312		0.766	0.053		0.390	0.000	
		comment																
226	Ems Dollard Estuary	lower																
		upper	0.1100	0.0005	2.162	1.000	8.910				0.152		0.294	0.002		0.110	0.036	
		comment																
225	Wadden Coast	lower																
		upper			0.008		0.008				0.009		0.013	0.020		0.000		
		comment																
222	Western Schelde	lower																
		upper	0.0270	0.0063	0.322	0.034	3.730				0.131		0.240	0.066		2.810	0.005	0.052
		comment																
153	Northern Delta Coast	lower																
		upper	0.0094	0.0005	0.168	0.306	0.980				0.092		0.278	0.044		7.640	0.056	
		comment																
82	North Sea (NL)	lower																
		upper	0.1503	0.0114	2.860	1.682	15.488		0		0.696		1.591	0.185	0.000	10.950	0.097	0.052
		comment																

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 by the Netherlands

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9.0 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	0.5103	0.0149	6.812	1.616	30.674	0.2	0.0	1.0332	4.881	0.4928	7.286	0.662	22.857
		upper	0.5219	0.0153	6.812	1.628	30.777	3.0	0.0	1.0332	4.881	0.4928	7.286	0.662	22.857
		comment													
224	Closed Holland Coast	lower	0.5103	0.0149	6.812	1.616	30.674	0.2	0.0	1.0332	4.881	0.4928	7.286	0.662	22.857
		upper	0.5219	0.0153	6.812	1.628	30.777	3.0	0.0	1.0332	4.881	0.4928	7.286	0.662	22.857
		comment													
157	IJsselmeer	lower	0.1535	0.0907	30.047	9.386	77.712	0.0	3.9	0.4537	20.525	0.0784	35.311	0.824	329.133
		upper	0.7722	0.0915	30.047	9.494	77.808	14.6	7.0	0.4702	20.525	0.0801	35.311	1.008	329.133
		comment													
225	Wadden Coast	lower	0.1535	0.0907	30.047	9.386	77.712	0.0	3.9	0.4537	20.525	0.0784	35.311	0.824	329.133
		upper	0.7722	0.0915	30.047	9.494	77.808	14.6	7.0	0.4702	20.525	0.0801	35.311	1.008	329.133
		comment													
154	Haringvlietsluizen	lower	1.6513	0.2270	38.967	15.214	132.788	2.4	11.2	1.5983	43.230	1.1615	53.888	2.027	98.855
		upper	1.6601	0.2272	38.967	15.214	132.788	17.2	11.3	1.5983	43.230	1.1615	53.888	2.027	99.961
		comment													
155	Maasluis	lower	5.6576	3.2551	144.747	90.837	555.188	0.0	53.1	4.1744	116.455	3.366397	139.887	6.294	833.741
		upper	5.8077	3.2568	144.747	90.837	555.188	44.0	54.7	4.1744	116.455	3.3664	139.887	6.294	833.741
		comment													
153	Northern Delta Coast	lower	7.3089	3.4821	183.714	106.051	687.977	2.4	64.2	5.7727	159.685	4.5279	193.775	8.321	932.596
		upper	7.4678	3.4839	183.714	106.051	687.977	61.2	66.0	5.7727	159.685	4.5279	193.775	8.321	933.702
		comment													
82	North Sea (NL)	lower	7.9727	3.5877	220.573	117.052	796.362	2.6	68.2	7.2596	185.091	5.0992	236.373	9.807	1284.585
		upper	8.7619	3.5908	220.573	117.174	796.562	78.8	73.0	7.2762	185.091	5.1009	236.373	9.991	1285.691
		comment													

* no data, as sampling for PCB analysis and for suspended matter determination were not at the same day

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 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	0.0000	0.0000	0.758	0.209	3.555	0.2		0.0991	0.308	0.0797	0.679	0.080	2.144
		upper	0.0197	0.0039	0.758	0.422	3.555	0.3		0.0998	0.308	0.0797	0.679	0.097	2.263
		comment													
258	Scheveningen	lower	0.0007	0.0000	0.105	0.068	0.555			0.0061	0.0439	0.0144	0.083	0.017	0.191
		upper	0.0008	0.0028	0.105	0.068	0.555			0.0068	0.0439	0.0144	0.083	0.017	0.210
		comment													
257	Vlotwatering	lower	0.0007	0.0000	0.052	0.049	0.765			0.0030		0.0110	0.104	0.015	0.363
		upper	0.0007	0.0015	0.052	0.049	0.765			0.0035		0.0110	0.104	0.015	0.363
		comment													
224	Closed Holland Coast	lower	0.0013	0.0000	0.914	0.327	4.875	0.2		0.1083	0.352	0.1052	0.866	0.111	2.698
		upper	0.0212	0.0083	0.914	0.539	4.875	0.3		0.1102	0.352	0.1052	0.866	0.129	2.836
		comment													
280	Damsterdiep	lower	0	0.00035	0.22726	0.0193	0			0.01231	0.10566	0.01824		0.02774	1.10755
		upper	0.00362	0.00136	0.22726	0.05957	0.67124			0.01454	0.106	0.01824		0.02774	1.10755
		comment													
266	Duurswold	lower	0.00195	0.00043	0.11995	0.06484	0			0.02544	0.21492	0.0007	0.36472	0.00703	1.20417
		upper	0.00411	0.0013	0.11995	0.08213	0.6484			0.02743	0.21492	0.0009	0.36472	0.00703	1.20417
		comment													
267	Eemskanaal	lower	0	0.00594	0.65613	0.21145	0			0.10568	0.72903	0.01565	1.11963	0.03291	2.32754
		upper	0.00803	0.00626	0.65613	0.23121	1.6052			0.11103	0.72903	0.01592	1.11963	0.03291	2.32754
		comment													
268	Nieuwe Statenzijl	lower	0.00895	0.00031	0.37448	0.202	0			0.10625	0.35678	0.00315	0.81422	0.02623	3.39615
		upper	0.00895	0.00341	0.37448	0.22299	1.70518			0.1128	0.35756	0.00354	0.81422	0.02623	3.39615
		comment													
281	Termunterzijl	lower	0.00432	0	0.20008	0.13731	0			0.0304	0.31605	0.00868	0.6326	0.02874	2.02038
		upper	0.00726	0.00235	0.20008	0.16869	1.17692			0.03482	0.31679	0.00892	0.6326	0.02874	2.17731
		comment													
226	Ems Dollard Estuary	lower													
		upper													
		comment													
261	Den Helder / De Helsdeur	lower	0.08658	0.00201	1.63088	0	3.9262			0.12702			0.80747	0.18797	5.31547
		upper	0.11074	0.00463	1.63088	1.20806	3.9262			0.12702			0.80747	0.18797	5.31547
		comment													
265	Harlingen/Van Harinxmakanaal	lower	0.01698	0	0.46685	0.37591	0.30315			0.02957	0.14729	0.0402	0.35072	0.05373	2.86617
		upper	0.01698	0.00243	0.46685	0.37591	0.6063			0.03237	0.14729	0.0402	0.35072	0.05373	2.86617
		comment													
263	Texel	lower	0.0332	0.00015	0.36978	0	0.46789			0.04947	0.00604	0.00894	0.24616	0.0334	1.77897
		upper	0.03924	0.00075	0.36978	0.30186	0.46789			0.04947	0.01006	0.00894	0.29707	0.03353	1.77897
		comment													
264	Lauwersmeer	lower	0.02275	0.00748	4.5492	1.77606	4.05065			0.21811	1.00228	0.1828	4.08181	0.35625	19.0069
		upper	0.07322	0.02617	4.5492	2.02533	13.3983			0.29082	1.01474	0.1828	4.08181	0.35625	19.0069
		comment													
287	Roptazijl	lower	0.00407	0	0.13218	0.05649	0			0.00549	0.02854	0.01199	0.06692	0.01507	0.80213
		upper	0.00407	0.00045	0.13218	0.05649	0.11298			0.00671	0.02868	0.01199	0.06692	0.01507	0.80213
		comment													
262	Spuisluis Oostoever	lower	0.01146	4.4E-05	0.24457	0	0.43626			0.00899			0.12141	0.02729	1.11047
		upper	0.01675	0.00062	0.24457	0.2644	0.44948			0.00922			0.12744	0.02729	1.11047
		comment													
285	Wieringermeer	lower	0.04341	0	2.15366	0	1.20204			0.17177			0.61938	0.065	2.93276
		upper	0.05676	0.00167	2.15366	0.6678	1.23543			0.17177			0.63358	0.065	2.97728
		comment													
286	Zwarte Haan	lower	0.00735	0	0.10201	0.08401	0			0.01244	0.03416	0.01498	0.09139	0.02183	0.58506
		upper	0.00735	0.0006	0.10201	0.08401	0.15001			0.01313	0.0342	0.01498	0.09139	0.02183	0.58506
		comment													
225	Wadden Coast	lower													
		upper													
		comment													
290	Polder Effluents Westerschelde	lower													
		upper	0.0491	0.0127	0.617	1.451	3.906			0.1385	1.052	0.1363	1.892	0.201	5.574
		comment													
289	Kanaal Gent - Terneuzen	lower	0.0758	0.0053	1.740	1.614	11.966			0.7712	3.758	0.3129	5.215	0.366	4.198
		upper	0.0758	0.0053	1.740	1.614	11.966			0.7722	3.758	0.3129	5.215	0.366	4.198
		comment													
288	Spuikanaal Bath	lower	0.0000	0.0014	0.936	0.139	1.469			0.0376	0.994	0.0184	1.403	0.034	2.298
		upper	0.0194	0.0014	0.936	0.139	1.469			0.0379	0.994	0.0184	1.403	0.036	2.387
		comment													
222	Western Schelde	lower	0.0758	0.0066	2.676	1.753	13.435			0.8088	4.752	0.3312	6.618	0.400	6.496
		upper	0.1443	0.0193	3.293	3.204	17.340			0.9487	5.804	0.4676	8.510	0.603	12.159
		comment													
2??	Zuiderdiep	lower	0.0007	0.0020	0.017	0.004	0.107			0.0000	0	0.0000	0.000	0.000	0.494
		upper	0.0008	0.0041	0.037	0.032	0.225			0.0000	0	0.0000	0.000	0.000	0.494
		comment													
2??	Grevelingenmeer	lower	0.0001	0.0005	0.004	0.001	0.028			0.0130	0.049	0.0061	0.088	0.009	0.581
		upper	0.0002	0.0011	0.059	0.069	0.220			0.0136	0.08654	0.0063	0.170	0.017	0.581
		comment													
153	Northern Delta Coast	lower	0.0007	0.0026	0.021	0.005	0.136			0.0130	0.049	0.0061	0.088	0.009	1.076
		upper	0.0010	0.0051	0.096	0.101	0.445			0.0136	0.087	0.0063	0.170	0.017	1.076
		comment													
260	Oosterschelde (Krammersluizen)	lower	0.0000	0.0010	0.691	0.103	1.084			0.0277	0.734	0.0135	1.035	0.025	1.696
		upper	0.0143	0.0010	0.691	0.103	1.084			0.0280	0.734	0.0136	1.035	0.026	1.762
		comment													
283	Polder Effluents Oosterschelde	lower													
		upper	0.0001	0.0008	0.699	0.953	2.535				0.859		1.456	0.163	
		comment													
223	Southern Delta Coast	lower	0.0000	0.0010	0.691	0.103	1.084			0.0277	0.734	0.0135	1.035	0.025	1.696
		upper	0.0145	0.0019	1.390	1.055	3.619			0.0280	1.593	0.0136	2.491	0.190	1.762
		comment													
82	North Sea (NL)	lower	0.0778	0.0097	4.297	2.186	19.501			0.9449	5.838	0.4499	8.519	0.537	11.384
		upper	0.1808	0.0335	5.634	4.831	26.059			1.0868	7.749	0.5863	11.867	0.921	17.251
		comment													

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2006 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 [ug/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	0.11	0.002	2.7	0.22	1.0	0.001	53.4	0.06	0.80	0.044	1.27	0.07	3
		maximum	0.89	0.036	4.3	2.65	15.0	0.001	127.4	1.27	3.12	0.280	4.23	0.37	13
		more than 70%>dl	Yes (1*)	Yes (2*)	Yes (0*)	Yes (1*)	Yes (1*)	No (12*)	?	Yes (0*)	Yes (1*)	Yes (0*)	Yes (0*)	Yes (0*)	Yes (0*)
		n	13	13	13	13	13	13	12	19	13	13	19	13	13
		info													
		st.Dev.	0.27	0.010	0.4	0.79	3.6	0	19.8	0.28	0.66	0.073	0.85	0.08	3
157	IJsselmeer	lower													
		upper													
		minimum	0.02	0.001	0.9	0.22	1.0	0.001	8.0	0.01	0.04	0.001	1.15	0.05	7
		maximum	0.15	0.015	4.0	2.03	10	0.001	117.9	0.12	2.91	0.041	3.93	0.14	82
		more than 70%>dl	No (11*)	Yes (1*)	Yes (0*)	Yes (1*)	Yes (1*)	No (13*)	Yes (7*)	Yes (3*)	Yes (0*)	Yes (2*)	Yes (0*)	Yes (3*)	Yes (0*)
		n	13	13	13	13	13	13	13	13	13	13	13	13	13
		info													
		st.Dev.	0.01	0.006	0.4	0.59	2.8	0	28.8	0.03	1.00	0.011	0.94	0.10	20
154	Haringvlietsluizen	lower													
		upper													
		minimum	0.11	0.002	3.3	0.60	2.8	0.001	74.2	0.02	1.50	0.027	2.12	0.08	2
		maximum	0.97	0.138	5.7	7.37	19	0.002	148.4	0.26	4.30	0.130	5.54	0.34	9
		more than 70%>dl	Yes (1*)	Yes (1*)	Yes (0*)	Yes (0*)	Yes (1*)	No (12*)	Yes (0*)	Yes (0*)	Yes (0*)	Yes (0*)	Yes (0*)	Yes (0*)	Yes (2*)
		n	13	13	13	13	13	13	13	13	13	13	13	13	13
		info													
		st.Dev.	0.23	0.036	0.7	1.87	4.8	0	21.0	0.07	0.90	0.035	1.09	0.07	2
155	Maasluis	lower													
		upper													
		minimum	0.05	0.002	2.9	1.84	3.4	0.001	42.3	0.04	1.22	0.028	1.59	0.05	8
		maximum	0.60	0.879	5.8	5.73	34	0.001	99.1	0.24	4.17	0.110	4.96	0.21	39
		more than 70%>dl	Yes (2*)	Yes (1*)	Yes (0*)	Yes (0*)	Yes (0*)	No (13*)	Yes (1*)	Yes (0*)	Yes (0*)	Yes (0*)	Yes (0*)	Yes (0*)	Yes (0*)
		n	26	26	26	26	26	13	26	26	26	26	26	26	26
		info													
		st.Dev.	0.13	0.168	0.8	1.01	6.2	0	13.4	0.06	0.85	0.022	0.93	0.04	10

*** n samples < D.L.**

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 2006 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 [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]
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	1	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	0.05	0.1	0.1	0.1	1	10	3)	0.1	0.01	0.005	0.1	0.1	2
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	0.05	0.1	0.1	0.1	1	10	3)	0.1	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	0.05	0.05	0.1	0.8	10	0.001	3)	0.1	0.03	0.3	0.1	0.1	5
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	0.05	0.02	0.1	0.8	10	0.001	3)	0.1	0.01	0.01	0.1	0.1	5
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	0.05	0.02	0.1	0.8	10	0.001	3)	0.1	0.01	0.01	0.1	0.1	5
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	0.05	0.02	0.1	0.8	1	0.001	3)	0.1	0.03	0.01	0.1	0.1	5
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	0.05	0.02	0.1	0.8	10	0.001	3)	0.1	0.03	0.01	0.1	0.1	8
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	0.01	0.1	5	1	50	3)	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	0.01	0.02	0.1	0.1	5	50	3)	0.1	0.01	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	0.01	0.001	0.1	0.1	1	1	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	0.01	5	1	10	3)	0.01	0.01	0.005	0.1	0.05	5
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	0.05	0.02	0.1	0.8	10	50	3)	0.1	0.03	0.005	0.1	0.1	5
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	0.01	0.02	0.1	0.1	5	50	3)	0.1	0.01	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	0.1	2	50	3)	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	2	10	3)	0.01	0.01	0.005	0.15	0.1	8
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	0.01	0.02	0.1	0.1	5	1	3)	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	0.2	0.05	1	5	10	1	3)	0.1	0.04	0.005	0.1	0.1	10
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	0.05	0.001	0.1	0.1	1	1	3)	0.01	0.01	0.001	0.1	0.05	3
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	0.01	0.001	0.1	0.1	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	1	1	3)	0.01	0.01	0.005	0.1	0.1	5
2??	Zuiderdiep	Sewage													
		Industrial													
		Riverine	0.01	0.1	1	1	5			0.1	0.1	0.05	0.1	0.1	5
2??	Grevelingenmeer	Sewage													
		Industrial													
		Riverine	0.01	0.1	1	1	5			0.1	0.1	0.05	0.1	0.1	5
153	Northern Delta Coast	Sewage													
		Industrial													
		Riverine													
260	Oosterschelde (Krammersluizen)	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	1	1	3)	0.01	0.01	0.001	0.1	0.05	3
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 solid matter-phase. Detection limits are: PCB28, PCB52 and PCB101 = 0.5 ug/kg; PCB118, PCB138, PCB153 and PCB180 = 1 ug/kg

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 2006 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	578	587	393	925	1995-2006	1	Mean
282		Noordzeekanaal	8097	8200	1123	22810			
258		Scheveningen	78	76	26	140	1987-2006	1	Mean
257		Vlotwatering	42	23	6	42	1987-2006	1	Mean
224	Closed Holland Coast		*8794*						
280		Damsterdiep	184	200	99	341	1985-2006	1	Mean
266		Duurswold	178	246	132	392	1985-2006	1	Mean
267		Eemskanaal	440	733	433	1332	1985-2006	1	Mean
268		Nieuwe Statenzijl	467	689	356	929	1985-2006	1	Mean
281		Termunterzijl	322	220	129	326	1985-2006	2	Mean
226	Ems Dollard Estuary		*1591*						
261		Den Helder / De Helsdeur	662	740	430	1064	1985-2006	1	Mean
265		Harlingen/Van Harinxmakanaal	332	464	332	605	1985-2006	1	Mean
157		IJsselmeer	57286	43200	0	163382			
263		Texel	165	168	93	239	1985-2006	6	Mean
264		Lauwersmeer	3415	3764	2137	5625	1985-2006	1	Mean
287		Roptazijl	62	65	41	99	1985-2006	1	Mean
262		Spuisluis Oostoever	145	376	126	923	1985-2006	1	Mean
285		Wieringermeer	366	400	292	466	1998-2006	1	Mean
286		Zwarte Haan	82	88	41	126	1985-2006	1	Mean
225	Wadden Coast		*62515*						
290		Polder Effluents Westerschelde	971	1010	249	1833	1985-2006	20	Mean
289		Kanaal Gent - Terneuzen	1739	1796	1200	2394	1987-2006	1	Mean
288		Spuikanaal Bath	1063	1021	364	1699	1990-2006	1	Mean
222	Western Schelde		*3772*						
154		Haringvlietsluizen	43884	67800	0	319162			
155		Maasluis	120534	115300	-108778	266976			
???		Zuiderdiep	89	94	58	149	1995-2006	7	Mean
???		Grevelingenmeer	78	94	39	181	1985-2006	5	Mean
153	Northern Delta Coast		*164585*	*183288*					
260		Oosterschelde (Krammersluizen)	784	779	760	793	2000-2006	1	Mean
283		Polder Effluents Oosterschelde	495	583	232	1178	1985-2006	28	Mean
223	Southern Delta Coast		*1279*						
82	North Sea (NL)		242536						

8. Norway

Annual report on riverine inputs and direct discharges to Convention waters during the year 2006 by Norway

Table 4b Total riverine inputs and direct discharges to the maritime area in 2006 by Norway
Table 5a Sewage effluents. Reported Maritime Area of the OSPAR Convention in 2006 by Norway
Table 5b Industrial effluents. Reported Maritime Area of the OSPAR Convention in 2006 by Norway
Table 6a Main riverine inputs. Reported Maritime Area of the OSPAR Convention in 2006 by Norway
Table 6b Tributary inputs. Reported Maritime Area of the OSPAR Convention in 2006 by Norway
Table 7 Contaminant concentrations. Reported Maritime Area of the OSPAR Convention in 2006 by Norway
Table 8 Detection limits
Table 9 Catchment dependent information
Table 10 Fish farming effluents reported Maritime Area of the OSPAR Convention in 2006 by Norway
Table 11 Unmonitored, reported Maritime Area of the OSPAR Convention in 2006 by Norway

Annual report on riverine inputs and direct discharges by Norway to Convention waters during the year 2006

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.

Table 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

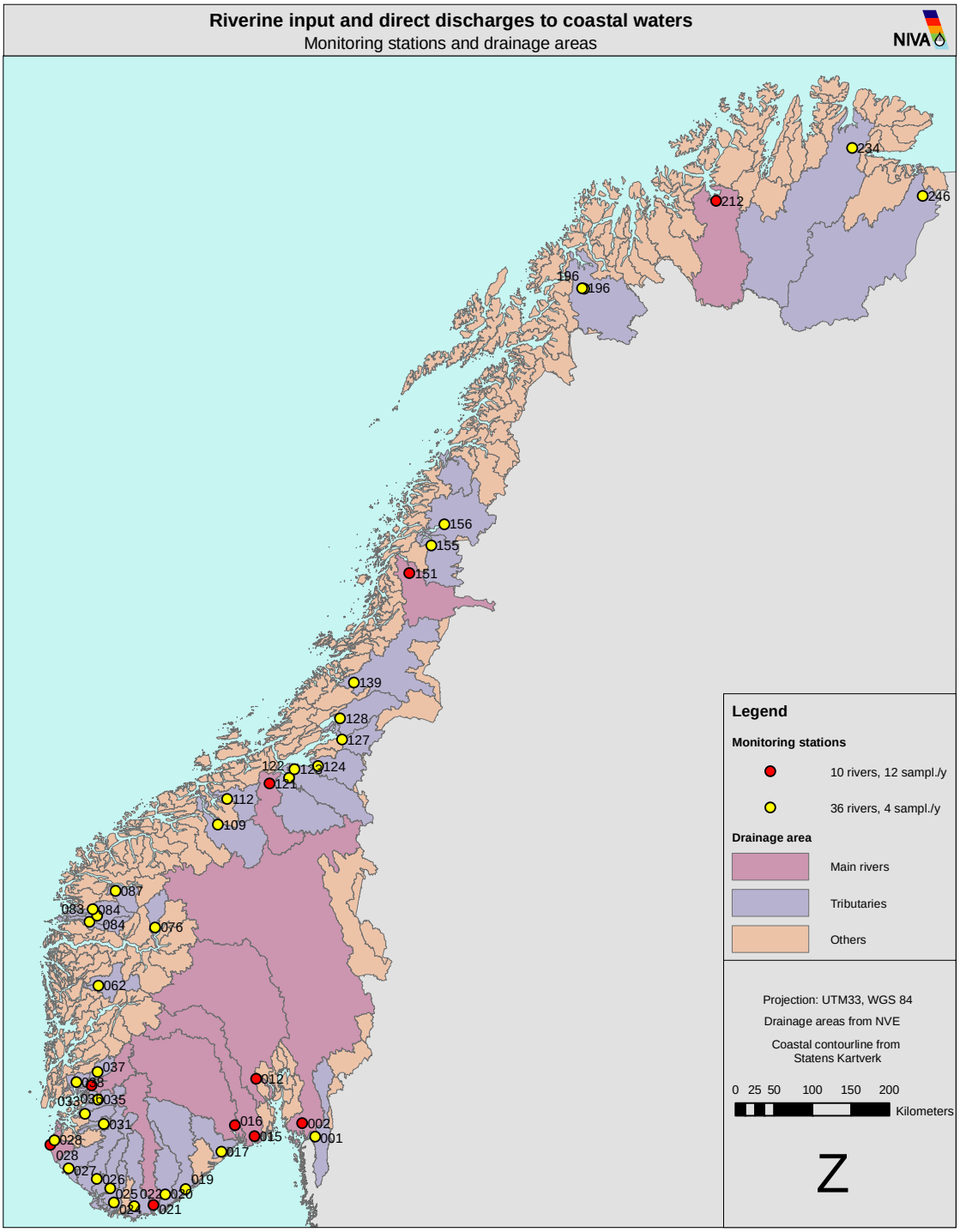


Figure 1. Map of the sampling sites and drainage basins included in the Norwegian RID-programme

B. Total riverine inputs and direct discharges (Tables 4a and 4b) for the year: 2006

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 Norwegian results for 2006 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 sampling methodology and the selection of rivers were the same as for 2005 (see Table 2). The 36 tributary rivers in this report are those minor rivers with the largest catchments and most important inputs of the previous 126 (145) used until 2004. All of these 36 rivers have

a separate outlet to the ocean from the ten main 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 the fish farming industry, 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. These estimates are 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 highest population, most intensive agriculture and largest rivers. The coastline is classified as an OSPAR problem area with regard to eutrophication. There is no fish farming industry on the Skagerrak coast.

According to the results of the 2006 monitoring, total annual nutrient loads to coastal waters from land-based sources and fish farming in Norway are estimated at approximately 10 800 tonnes of phosphorus and 142 200 tonnes of nitrogen. For the first time, estimates for unmonitored rivers are added (Table 11) to the total annual nutrient loads. Compared to 2005 (estimates from unmonitored rivers are not included) there is an increase of 15% for phosphorous and a decrease of 8% for the total input of nitrogen. The discharges from fish farming contribute about 70% of the total phosphorous loading and 20% of the total nitrogen inputs. Riverine inputs of metals range from approximately 0.5 tonnes for mercury to 599 tonnes for zinc. Total loads of lindane from main rivers were estimated at between 3 kg (lower estimate) and 13 kg (higher estimate).

Inputs of cadmium were estimated at about 2.8 tonnes, mercury 0.5 tonnes, arsenic 29 tonnes, chromium 54 tonnes, lead 38 tonnes and nickel 258 tonnes. Copper and zinc comprised the largest inputs of heavy metals, which in 2006 amounted to 454 tonnes and 599 tonnes respectively. Fish farming is a major contributor to inputs of copper due to leakage from the net cages.

Totally for Norway, there were in general small changes in riverine loads for all substances between 2005 and 2006, but there are some large regional and interregional differences between the two years. This is closely related to changes in water flow or sampling methodology. This is explained in more detail below.

There was an overall decrease in total water flow of 10% between 2006 and 2005, but there were regional differences. The water discharge was higher than normal in the south and east of Norway. The main decrease was therefore in the central and northern parts. These regional differences in water flow resulted in a decrease in water discharge of about 20% in rivers draining to the North Sea region (SW Norway), Norwegian Sea and the Barents Sea (N Norway) and an increase of about 15% in rivers draining to Skagerrak.

In the North, Vefsna and Alta River, the spring flood was lower than earlier than usual (may instead of June) reflecting higher temperatures and early snowmelt. In addition Vefsna had high discharges in December.

In general, riverine inputs of most heavy metals were at the same level in 2006 as in 2005. One main exception was a decrease in zinc and an increase in nickel. The decrease in zink is explained by a decrease in zink concentrations in the River Orkla and the increase in nickel is explained by a peak of nickel during snowmelt and high water discharge in Pasvik River.

There were also some significant variations for specific rivers. In Drammenselva there was an increase in copper of 57% due to an increase (16%) in water discharges combined with increased copper concentrations. In Suldalslågen there was a decrease in lead due to a concentration peak in January 2005. In the Barents Sea,the loads of several nutrient fractions decreased compared to 2005. This decrease is a result of lower water discharge in this region. In 2005, 10- and 30 years floods were reported in the two northernmost counties, whereas the water discharge in 2006 was lower than normal.

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 on fixed dates. This means that little or no account is taken of the water flow variations. This implies that in some years and some rivers we could have hit or missed concentration peaks.

It should also be pointed out that modelled water discharge was used for the tributary rivers in both 2005 and 2006.

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

In 2004 - 2006, 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: 2006

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:

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 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):

A number of heavy metals and POPs are included in a new regulation from 2005 for monitoring outputs 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. Sewage treatment plants >20 000 pe must monitor heavy metals and plants > 50 000 pe must in addition monitor the organic substances. 2006 is the second year this regulation has been in force.

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):

Generally there is a decrease in discharges of heavy metals, like Hg, Zn, and total nitrogen and total phosphorus and an increase in discharge of Cd, Cu and Ni from 2005 to 2006.

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 discharges of metals through sewerage systems from 2005-2006 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 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:

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.

In 2006 there has been some database problems and data from industrial effluents were reported too late to be included in this report, therefore data from 2005 had to be used (Table 5b). In 2007, real data from 2006 will be used.

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

No available information

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:

Nutrient discharges (Tot-N, NH_4, Tot-P and PO_4) from fish farming effluents in 2006 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 2005 to 2006. 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 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

No other determinants included.

C8 Give 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.

In 2006, reporting of industrial wastewater was delayed due to changes in the database (see C4).

Total direct discharges (Table 5c)

C.9 Give 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 from sewerage systems decrease slightly each year.

Direct nutrient discharges from industry are in general low.

D. Riverine inputs for the year: 2006

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:

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 the RID sampling sites.

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 2006. 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 2006

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 2006, 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 measured 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*
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 1961-90 is shown in Table 9. 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.

D.2 Give 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.

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):

Chromium, arsenic and nickel. These metals are monitored with the same frequency as the mandatory determinants and reported in the RID tables.

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

Compared to 2005, generally there is a reduction in input of several heavy metals like copper, lead and zinc to the Barents Sea, Norwegian Sea and the North Sea due to reduction in discharge in 2006. The levels of nutrient load in the Norwegian Sea and North Sea are not remarkably changed. The nutrient load in the Barents Sea has decreased significantly. In Skagerrak there is an increase in loads of nutrients and some heavy metals like copper and zinc.

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):

In 2006, 36 minor rivers were sampled four times each. 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 2006 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 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

No detailed information. See D 2.

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):

Chromium, arsenic and nickel.

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 additional data

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

There are some small variations in most determinands compared to 2005, but basically they are in the same order of magnitude as 2005. Exceptions are nickel in the Barents Sea that has increased significantly compared with 2005. This is due to some high single measurements in some rivers (e.g. Tana river, Pasvik river) and high volume of discharge at the time of sampling. Also SPM values from Skagerrak have increased noticeably compared to 2005.

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):

See D 4

E. Unmonitored areas

E.1 Describe 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 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 concerning limits of detection is given in Table 3.

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

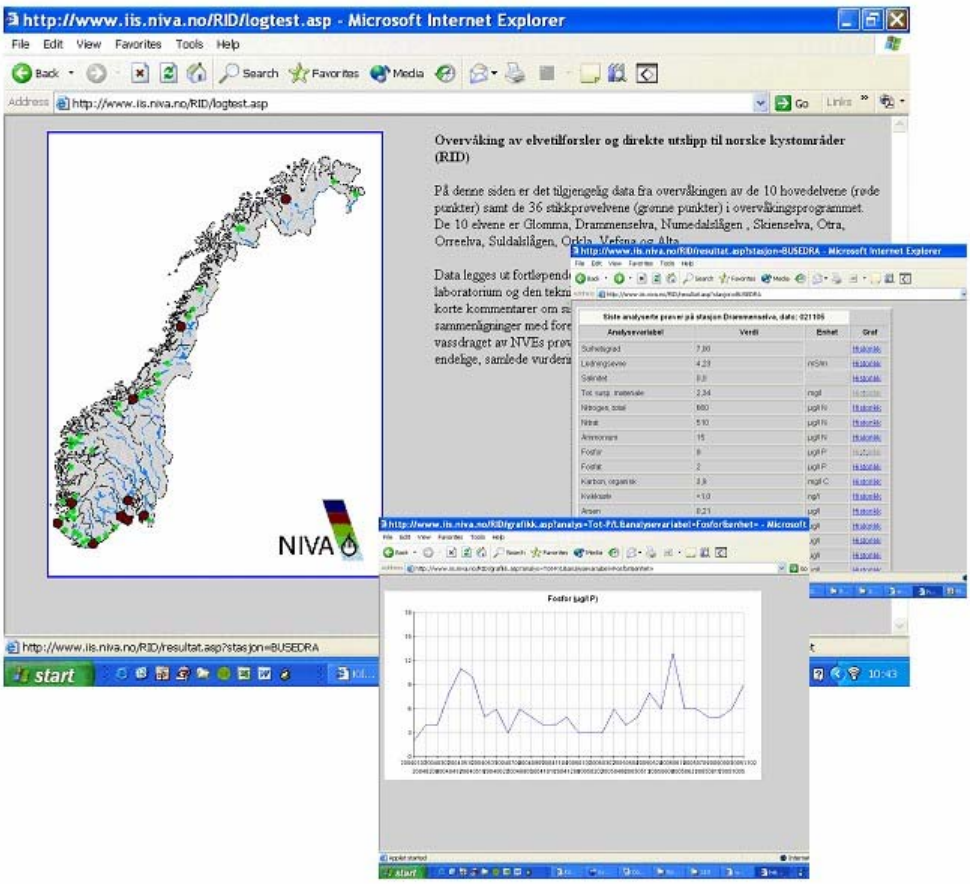
The numbers of monitored tributaries have since 2004 been reduced from 126 to 36 rivers. The 36 tributaries have been monitored four times during the year 2006, instead of once a year previously.

In 2006, 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 2006 (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 10 main rivers in Norway, 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 36 tributary rivers 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), the calculation of loads was done as follows:

§ For nutrients, S.P.M, Silica and TOC, the modelled average water discharge in 2006 was multiplied with average concentration for the period 1990-2003.

§ For metals, the modelled average water discharge in 2006 was multiplied with average concentration for the period 2000-2003 (due to high detection limits, data from earlier years were not included).

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 2006 by Norway

TOTAL INPUTS																				
Discharge region	Estimate	Flow rate (1000 m^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	low avg.		0,94	0,05	98,0	265,8	13,5	10,4	16,9	41,8	815	16 816	284	29 231	666	25 979	320 785	233 086	0	3
	upp avg.	177 895	0,97	0,09	98,0	265,8	13,5	10,4	17,9	41,8	823	16 816	295	29 231	666	25 979	320 801	233 086	146	13
Tributary Rivers (36)	low avg.		0,93	0,05	89,8	227,1	15,4	10,4	19,7	181,3	1 448	13 326	332	26 763	742	109 277	397 461	222 545		
	upp avg.	230 137	1,06	0,10	89,8	227,1	15,4	11,0	22,3	181,4	1 453	13 328	359	26 763	742	109 277	397 461	222 545		
Tributary Rivers (109)	low avg.		0,69	0,10	30,2	84,0	7,2	6,6	10,9	23,3	641	7 376	110	12 918	412	29 073	96 761	94 174		
	upp avg.	158 931	0,69	0,09	30,2	84,0	7,2	6,6	10,9	23,3	641	7 376	110	12 918	412	29 073	96 761	94 174		
Total Riverine Inputs	**low avg.**		**2,56**	**0,20**	**218,0**	**577**	**36,051**	**27,4**	**47,4**	**246,4**	**2 904**	**37 518**	**726**	**68 912**	**1 820**	**164 330**	**815 007**	**549 805**	**0**	**3**
	upp avg.	**566 962**	**2,71**	**0,29**	**218,0**	**577**	**36,055**	**28,0**	**51,1**	**246,5**	**2 916**	**37 521**	**764**	**68 912**	**1 820**	**164 330**	**815 023**	**549 805**	**146**	**13**
DIRECT DISCHARGES																				
Sewage Effluents	low avg.		0,03	0,08	5,02	15,35	0,40	0,17	0,44	3,26	8 279	552	503	11 038	838		10 818			
	upp avg.		0,03	0,08	5,02	15,35	0,40	0,17	0,44	3,26	8 279	552	504	11 038	838		10 818			
Industrial Effluents	low avg.		0,06	0,01	9,66	6,48	1,43	0,44	2,40	8,34	1 276	85	111	1 701	186	0,02	468 518			
	upp avg.		0,06	0,01	9,66	6,48	1,43	0,44	2,40	8,34	1 276	85	111	1 701	186	0,02	468 518			
Fish Farming	low avg.				220,86						27 700	4 155	5 050	34 625	7 318					
	upp avg.				220,86						27 700	4 155	5 062	34 625	7 318					
Total Direct Inputs	**low avg.**		**0,09**	**0,09**	**235,5**	**22**	**1,83**	**0,6**	**2,8**	**11,6**	**37 255**	**4 792**	**5 663**	**47 365**	**8 342**	**0,02**	**479 336**			
	upp avg.		**0,09**	**0,09**	**235,5**	**22**	**1,83**	**0,6**	**2,8**	**11,6**	**37 255**	**4 792**	**5 677**	**47 365**	**8 342**	**0,02**	**479 336**			
UNMONITORED AREAS																				
Unmonitored Areas	low avg.		0	0	0	0	0	0	0	0	1 544	16 779	172	25 888	657					
	upp avg.	348 312	0	0	0	0	0	0	0	0	1 544	16 779	172	25 888	657					
REGION TOTAL	**low avg.**		**2,65**	**0,29**	**454**	**599**	**37,9**	**28,0**	**50,3**	**258**	**41 703**	**59 089**	**6 561**	**142 165**	**10 819**	**164 330**	**1294343**	**549 805**	**0**	**3**
	upp avg.	**566 962**	**2,80**	**0,37**	**454**	**599**	**37,9**	**28,6**	**53,9**	**258**	**41 715**	**59 091**	**6 613**	**142 165**	**10 819**	**164 330**	**1294359**	**549 805**	**146**	**13**

TOTAL INPUTS																				
Discharge region	Estimate	Flow rate (1000 m^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																				
Main Rivers	low avg.	141 158	0,79	0,05	78,4	219	12	9	14	36	758	15 548	254	26 408	579	153	281 677	202033	0	2,75
	upp avg.		0,79	0,08	78,4	219	12	9	15	36	761	15 548	260	26 408	579	153	281 677	202033	103,7	10,36
Tributary Rivers (36)	low avg.	31 555	0,36	0,01	9,3	67	5	3	1	4	471	4 156	51	7 096	127	28	30 692	53 568		
	upp avg.		0,36	0,01	9,3	67	5	3	2	4	471	4 156	54	7 096	127	28	30 692	53 568		
Tributary Rivers (109)	low avg.	9 805	0,13	0,01	5,7	19	1	2	2	3	166	2 047	25	3 191	84	9	20 975	17 070		
	upp avg.		0,13	0,01	5,7	19	1	2	2	3	166	2 047	25	3 191	84	9	20 975	17 070		
Total Riverine Inputs	**low avg.**	**182 518**	**1,28**	**0,06**	**93,5**	**305**	**18**	**13**	**17**	**43**	**1 395**	**21 751**	**329**	**36 694**	**791**	**190**	**333 344**	**272 671**	**0**	**2,75**
	upp avg.		**1,28**	**0,10**	**93,5**	**305**	**18**	**13**	**18**	**43**	**1 398**	**21 751**	**340**	**36 694**	**791**	**190**	**333 344**	**272 671**	**103,7**	**10,36**
DIRECT DISCHARGES																				
Sewage Effluents	low avg.		0	0,025	0,07	3,2	12	0	0	0	3	3 288	219	64	4 383	107				
	upp avg.		0	0,025	0,07	3,2	12	0	0	0	3	3 288	219	64	4 383	107				
Industrial Effluents	low avg.		0	0,02	0,01	9,2	4	0	0	1	4	800	53	53	1 067	88				
	upp avg.		0	0,02	0,01	9,2	4	0	0	1	4	800	53	53	1 067	88				
Fish Farming	low avg.		0	0	0,00	0,3	0	0	0	0	0	27	4	5	33	7				
	upp avg.		0	0	0,00	0,3	0	0	0	0	0	27	4	5	33	7				
Total Direct Inputs	**low avg.**			**0,05**	**0,08**	**12,7**	**16**	**0,7**	**0,6**	**1,7**	**7,1**	**4 114**	**276**	**122**	**5 484**	**202**				
	upp avg.			**0,05**	**0,08**	**12,7**	**16**	**0,7**	**0,6**	**1,7**	**7,1**	**4 114**	**276**	**122**	**5 484**	**202**				
UNMONITORED AREAS																				
Unmonitored Areas	low avg.	8976	0	0	0	0	0	0	0	0	160	1703	19	2573	69					
	upp avg.		0	0	0	0	0	0	0	0	160	1703	19	2573	69					
REGION TOTAL	**low avg.**	**191 494**	**1,32**	**0,15**	**106,1**	**322**	**18,9**	**13,9**	**18,9**	**50,3**	**5 670**	**23 730**	**471**	**44 751**	**1 061**	**190**	**337 790**	**272 671**	**0**	**2,75**
	upp avg.		**1,32**	**0,18**	**106,1**	**322**	**18,9**	**13,9**	**20,1**	**50,3**	**5 673**	**23 731**	**481**	**44 751**	**1 061**	**190**	**337 790**	**272 671**	**103,7**	**10,36**

TOTAL INPUTS																				
Discharge region	Estimate	Flow rate (1000 m^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	low avg.	10 556	0,05	0	1,6	12	0,8	0,4	0,4	1,4	17	785	13	1 210	31	4	9 678	5 314	0,0	0,0
	upp avg.		0,06	0,00	1,6	12	0,8	0,4	0,6	1,4	20	785	14	1 210	31	4	9 678	5 314	4,6	0,8
Tributary Rivers (36)	low avg.	73 177	0,25	0,02	15,4	67	6,2	2,9	4,7	6,5	514	6 286	122	9 986	220	37	137 009	44 293		
	upp avg.		0,29	0,04	15,4	67	6,2	3,1	6,4	6,5	518	6 287	135	9 986	220	37	137 009	44 293		
Tributary Rivers (109)	low avg.	74 207	0,32	0,04	10,9	44	4,1	2,4	4,6	8,5	242	3 890	41	6 118	172	28	28 408	30 340		
	upp avg.		0,32	0,04	10,9	44	4,1	2,4	4,6	8,5	242	3 890	41	6 118	172	28	28 408	30 340		
Total Riverine Inputs	**low avg.**	**157 940**	**0,62**	**0,06**	**27,9**	**123**	**11,1**	**5,7**	**9,8**	**16,4**	**773**	**10 961**	**176**	**17 314**	**424**	**70**	**175 096**	**79 946**	**0**	**0**
	upp avg.		**0,66**	**0,08**	**27,9**	**123**	**11,1**	**6,0**	**11,6**	**16,4**	**780**	**10 962**	**190**	**17 314**	**424**	**70**	**175 096**	**79 946**	**4,6**	**0,8**
Sewage Effluents	low avg.		0,000	0,002	1,9	3,0	0,14	0,04	0,2	0,1	2 423	162	190	3 230	316		4 294			
	upp avg.		0,004	0,002	1,9	3,0	0,14	0,04	0,2	0,1	2 423	162	190	3 230	316		4 294			
Industrial Effluents	low avg.		0		0,2	0,4	0,00	0,00	0,5	3,9	336	22	40	448	66		10 803			
	upp avg.		0		0,2	0,4	0,00	0,00	0,5	3,9	336	22	40	448	66		10 803			
Fish Farming	low avg.		0	0	74,3	0,0	0,00	0,00	0,0	0,0	8 944	1 342	1 631	11 180	2 363					
	upp avg.		0	0	74,3	0,0	0,00	0,00	0,0	0,0	8 944	1 342	1 643	11 180	2 363					
Total Direct Inputs	**low avg.**		**0,00**		**76,3**	**3,4**	**0,14**	**0,04**	**0,6**	**4,0**	**11 703**	**1 525**	**1 860**	**14 859**	**2 746**		**15 097**			
	upp avg.		**0,00**	**0,00**	**76,3**	**3,4**	**0,14**	**0,04**	**0,6**	**4,0**	**11 703**	**1 525**	**1 873**	**14 859**	**2 746**		**15 097**			
Unmonitored Areas	low avg.	117 811	0	0	0	0	0	0	0	0	600	6 604	48	10 299	181					
	upp avg.		0	0	0	0	0	0	0	0	600	6 604	48	10 299	181					
REGION TOTAL	**low avg.**	**275 751**	**0,62**	**0,06**	**104,3**	**126**	**11,219**	**5,7**	**10,4**	**20,4**	**13 076**	**19 090**	**2 084**	**42 471**	**3 350**	**70**	**190 193**	**79 946**	**0**	**0**
	upp avg.		**0,66**	**0,08**	**104,3**	**126**	**11,219**	**6,0**	**12,2**	**20,5**	**13 083**	**19 091**	**2 111**	**42 471**	**3 350**	**70**	**190 193**	**79 946**	**4,6**	**0,8**

TOTAL INPUTS																				
Discharge region	Estimate	Flow rate (1000 m^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: Norwegian Sea																				
RIVERINE INPUTS																				
Main Rivers	low avg.	18 421	0,09	0,00	16,3	34	0,48	0,8	1,6	3,6	30	421	12	1 178	38	11	25 274	16 437	0	0
	upp avg.		0,10	0,01	16,3	34	0,48	0,8	1,7	3,6	32	421	14	1 178	38	11	25 290	16 437	27,29	1,35
Tributary Rivers (36)	low avg.	93 282	0,18	0,02	33,0	76	3,80	3,0	10,9	21,9	196	2 677	127	6 550	269	65	208 620	74 494		
	upp avg.		0,27	0,04	33,0	76	3,80	3,3	11,4	22,0	196	2 677	137	6 550	269	65	208 620	74 494		
Tributary Rivers (109)	low avg.	59 440	0,20	0,04	9,9	17	1,54	1,9	3,1	8,1	180	1 330	37	2 939	131	31	41 186	34 282		
	upp avg.		0,20	0,04	9,9	17	1,54	1,9	3,1	8,1	180	1 330	37	2 939	131	31	41 186	34 282		
Total Riverine Inputs	**low avg.**	**171 143**	**0,47**	**0,07**	**59,2**	**127**	**5,82**	**5,7**	**15,6**	**33,7**	**406**	**4 428**	**176**	**10 667**	**438**	**108**	**275 081**	**125 213**	**0**	**0**
	upp avg.		**0,57**	**0,09**	**59,2**	**127**	**5,82**	**6,0**	**16,2**	**33,7**	**408**	**4 428**	**189**	**10 667**	**438**	**108**	**275 096**	**125 213**	**27,3**	**1,35**
Sewage Effluents	low avg.		0	0	0	0	0	0	0	0	2 402	160	232	3 202	386		3 707			
	upp avg.		0	0	0	0	0	0	0	0	2 402	160	233	3 202	386		3 707			
Industrial Effluents	low avg.		0,04		0,3	1,9	0,97	0,02	0,5	0,5	140	9	19	186	31		456 086			
	upp avg.		0,04		0,3	1,9	0,97	0,02	0,5	0,5	140	9	19	186	31		456 086			
Fish Farming	low avg.		0	0	131,45	0	0	0	0	0	17 492	2 624	3 189	21 865	4 621					
	upp avg.		0	0	131,45	0	0	0	0	0	17 492	2 624	3 189	21 865	4 621					
Total Direct Inputs	**low avg.**		**0,04**	**0,00**	**131,8**	**1,9**	**0,97**	**0,0**	**0,5**	**0,5**	**20 034**	**2 793**	**3 439**	**25 253**	**5 038**		**459 793**			
	upp avg.		**0,04**	**0,00**	**131,8**	**1,9**	**0,97**	**0,0**	**0,5**	**0,5**	**20 034**	**2 793**	**3 440**	**25 253**	**5 038**		**459 793**			
Unmonitored Areas	low avg.	184 429	0	0	0	0	0	0	0	0	702	7 508	97	11 417	372					
	upp avg.		0	0	0	0	0	0	0	0	702	7 508	97	11 417	372					
REGION TOTAL	**low avg.**	**355 572**	**0,51**	**0,07**	**190,9**	**129**	**6,785**	**5,7**	**16,1**	**34,1**	**21 142**	**14 729**	**3 712**	**47 338**	**5 849**	**108**	**734 874**	**125 213**	**0**	**0**
	upp avg.		**0,61**	**0,09**	**190,9**	**129**	**6,788**	**6,1**	**16,7**	**34,2**	**21 144**	**14 729**	**3 726**	**47 338**	**5 849**	**108**	**734 889**	**125 213**	**27,3**	**1,35**

TOTAL INPUTS																				
Discharge region	Estimate	Flow rate (1000 m^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: Barents Sea																				
RIVERINE INPUTS																				
Main Rivers	low avg.		0,00	0,00	1,6	1	0,05	0,3	0,6	1	10	62	5	436	16	25 810	4 156	9 302	0,0	0,0
	upp avg.	7 759	0,01	0,00	1,6	1	0,05	0,3	0,6	1	10	62	6	436	16	25 810	4 156	9 302	10,8	0,57
Tributary Rivers (36)	low avg.		0,15	0,01	32,2	18	0,73	1,9	2,9	149	267	207	33	3 131	125	109 147	21 139	50 190		
	upp avg.	32 123	0,15	0,01	32,2	18	0,73	1,9	2,9	149	267	208	33	3 131	125	109 147	21 139	50 190		
Tributary Rivers (109)	low avg.		0,05	0,01	3,6	4	0,17	0,4	1,4	3	52	109	7	670	26	29 005	6 192	12 483		
	upp avg.	15 478	0,05	0,00	3,6	4	0,17	0,4	1,4	3	52	109	7	670	26	29 005	6 192	12 483		
Total Riverine Inputs	**low avg.**		**0,19**	**0,02**	**37,5**	**22**	**0,95**	**2,6**	**4,9**	**153**	**329**	**378**	**45**	**4 238**	**167**	**163 962**	**31 487**	**71 975**	**0,0**	**0,0**
	upp avg.	**55 360**	**0,21**	**0,02**	**37,5**	**22**	**0,95**	**2,6**	**4,9**	**153**	**330**	**379**	**46**	**4 238**	**167**	**163 962**	**31 487**	**71 975**	**10,8**	**0,57**
Sewage Effluents	low avg.		0	0	0	0	0	0	0	0	167	11	17	222	29					
	upp avg.		0	0	0	0	0	0	0	0	167	11	17	222	29					
Industrial Effluents	low avg.																			
	upp avg.																			
Fish Farming	low avg.		0	0	14,8	0	0	0	0	0	1 237	186	226	1 547	327					
	upp avg.		0	0	14,8	0	0	0	0	0	1 237	186	226	1 547	327					
Total Direct Inputs	**low avg.**				**14,8**						**1 404**	**197**	**243**	**1 769**	**355**					
	upp avg.				**14,8**						**1 404**	**197**	**243**	**1 769**	**355**					
Unmonitored Areas	low avg.		0	0	0	0	0	0	0	0	81	964	7	1 599	35					
	upp avg.	37 096	0	0	0	0	0	0	0	0	81	964	7	1 599	35					
REGION TOTAL	**low avg.**		**0,19**	**0,02**	**52,3**	**22**	**0,95**	**2,6**	**4,9**	**153**	**1 814**	**1 540**	**295**	**7 605**	**558**	**163 962**	**31 487**	**71 975**	**0,0**	**0,0**
	upp avg.	**92 457**	**0,21**	**0,02**	**52,3**	**22**	**0,95**	**2,6**	**4,9**	**153**	**1 815**	**1 540**	**296**	**7 605**	**558**	**163 962**	**31 487**	**71 975**	**10,8**	**0,57**

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 2006 by Norway

		1 Cd [t]	5 Hg [t]	6 Cu [t]	7 Zn [t]	2 Pb [t]	15 As [t]	16 Cr [t]	17 Ni [t]	10 NH4-N [t]	11 NO3-N [t]	12 PO4-P [t]	13 TOT-N [t]	14 TOT-P [t]	3 SPM [t]	18 TOC [t]	9 PCB [kg]	8 g-HCH [kg]	20 AOX (t)
73 Barents Sea (NO)	lower	0	0	0	0	0	0	0	0	167	11	17	222	29	0	0	0		
	upper	0	0	0	0	0	0	0	0	167	11	17	222	29	0	0	0		
	comment									75% of TOT-N	5% of TOT-N	60% of Tot-P							
75 Skagerrak (NO)	lower	0.025	0.0733	3.156	12.4	0.261	0.137	0.286	3.145	3288	219	64	4383	107	2817	2517	21.6		
	upper	0.025	0.0733	3.156	12.4	0.261	0.137	0.286	3.145	3288	219	64	4383	107	2817	2517	21.6		
	comment									75% of TOT-N	5% of TOT-N	60% of Tot-P							
83 North Sea (NO)	lower	0.004	0.0023	1.861	2.951	0.138	0.036	0.152	0.117	2423	162	190	3230	316	4294	0	0.4		
	upper	0.004	0.0023	1.861	2.951	0.138	0.036	0.152	0.117	2423	162	190	3230	316	4294	0	0.4		
	comment									75% of TOT-N	5% of TOT-N	60% of Tot-P							
72 Norwegian Sea (NO	lower	0	0	0	0	0	0	0	0	2402	160	232	3202	386	3707	847	0		
	upper	0	0	0	0	0	0	0	0	2402	160	233	3202	386	3707	847	0		
	comment									75% of TOT-N	5% of TOT-N	60% of Tot-P							

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 2006 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	9.2	0.457	4.1			800	53	53	1067	88	1629	0.418		1.40	4.0	
	upper	0.016	0.005	9.2	0.457	4.1			800	53	53	1067	88	1629	0.418		1.40	4.0	
	comment																		
83 North Sea (NO)	lower	0.001		0.2	0.004	0.4			336	22	40	448	66	10803	0.001		0.47	3.9	
	upper	0.001		0.2	0.004	0.4			336	22	40	448	66	10803	0.001		0.47	3.9	
	comment																		
72 Norwegian Sea (NO)	lower	0.039		0.3	0.968	1.9			140	9	19	186	31	456086	0.019		0.53	0.5	
	upper	0.039		0.3	0.968	1.9			140	9	19	186	31	456086	0.019		0.53	0.5	
	comment																		

Same values reported as for 2005 due to non-available data

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 by Norway

			1.000 Cd [t]	5.000 Hg [t]	6.0 Cu [t]	7.0 Zn [t]	2.0 Pb [t]	15.0 As [t]	16.0 Cr [t]	17.0 Ni [t]	10 NH4-N [t]	11 NO3-N [t]	12 PO4-P [t]	12 TOT-N [t]	14 TOT-P [t]	3.0 SPM [kt]	18.0 TOC [kt]	9.0 PCB [kg]	8.0 g-HCH [kg]
168	Alta	lower	0.000	0.002	1.6	0.8	0.0	0.3	0.6	0.7	10	62	5	436	16	4.2	9.3	0.0	0.0
		upper	0.014	0.003	1.6	0.8	0.0	0.3	0.6	0.7	10	62	6	436	16	4.2	9.3	10.8	0.6
		comment																	
73	Barents Sea (NO)	lower	0.000	0.002	1.6	0.8	0.0	0.3	0.6	0.7	10	62	5	436	16	4.2	9.3	0.0	0.0
		upper	0.014	0.003	1.6	0.8	0.0	0.3	0.6	0.7	10	62	6	436	16	4.2	9.3	10.8	0.6
		comment																	
160	Drammenselva	lower	0.099	0.003	11.6	51.8	1.2	1.5	1.7	7.9	101	3444	16	5390	57	20.9	35.2	0.0	0.0
		upper	0.099	0.011	11.6	51.8	1.2	1.5	1.7	7.9	101	3444	18	5390	57	20.9	35.2	25.1	2.0
		comment																	
159	Glomma	lower	0.420	0.027	54.3	104.3	7.7	5.1	10.5	20.7	417	9143	204	15456	425	220.1	109.2	0.0	2.0
		upper	0.420	0.039	54.3	104.3	7.7	5.1	10.6	20.7	419	9143	204	15456	425	220.1	109.2	28.1	4.8
		comment																	
161	Numedalslågen	lower	0.074	0.007	4.0	18.5	1.2	0.8	0.8	1.7	83	1057	21	1898	44	24.6	18.7	0.0	0.0
		upper	0.074	0.010	4.0	18.5	1.2	0.8	0.9	1.7	83	1057	21	1898	44	24.6	18.7	12.6	0.8
		comment																	
163	Otra	lower	0.111	0.002	4.3	21.9	1.5	0.7	0.4	3.6	72	436	4	1151	19	8.1	13.4	0.0	0.0
		upper	0.111	0.005	4.3	21.9	1.5	0.7	0.6	3.6	72	436	6	1151	19	8.1	13.4	11.2	0.9
		comment																	
162	Skienselva	lower	0.087	0.009	4.4	22.8	0.5	0.8	0.8	2.1	85	1468	7	2512	34	7.9	25.6	0.0	0.7
		upper	0.087	0.015	4.4	22.8	0.5	0.8	1.3	2.1	85	1468	11	2512	34	7.9	25.6	26.7	1.9
		comment																	
75	Skagerrak (NO)	lower	0.791	0.048	78.4	219.3	12.2	8.9	14.3	36.1	758	15548	254	26408	579	281.7	202.0	0.0	2.8
		upper	0.791	0.079	78.4	219.3	12.2	8.9	15.1	36.1	761	15548	260	26408	579	281.7	202.0	103.7	10.4
		comment																	

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 by Norway

			1.000 Cd [t]	5.000 Hg [t]	6.0 Cu [t]	7.0 Zn [t]	2.0 Pb [t]	15.0 As [t]	16.0 Cr [t]	17.0 Ni [t]	10 NH4-N [t]	11 NO3-N [t]	12 PO4-P [t]	12 TOT-N [t]	14 TOT-P [t]	3.0 SPM [kt]	18.0 TOC [kt]	9.0 PCB [kg]	8.0 g-HCH [kg]
164	Orreelva	lower	0.002	0.000	0.3	0.5	0.1	0.1	0.0	0.2	8	216	6	363	17	2.3	1.0	0.0	0.0
		upper	0.002	0.000	0.3	0.5	0.1	0.1	0.0	0.2	8	216	6	363	17	2.3	1.0	0.2	0.0
		comment																	
165	Suldalslågen	lower	0.053	0.000	1.3	11.3	0.7	0.4	0.4	1.2	9	569	7	848	15	7.4	4.3	0.0	0.0
		upper	0.053	0.004	1.3	11.3	0.7	0.4	0.5	1.2	12	569	8	848	15	7.4	4.3	4.4	0.7
		comment																	
83	North Sea (NO)	lower	0.055	0.000	1.6	11.8	0.8	0.4	0.4	1.4	17	785	13	1210	31	9.7	5.3	0.0	0.0
		upper	0.055	0.004	1.6	11.8	0.8	0.4	0.6	1.4	20	785	14	1210	31	9.7	5.3	4.6	0.8
		comment																	
166	Orkla	lower	0.082	0.002	14.9	31.0	0.2	0.3	1.1	2.7	15	229	5	670	23	14.1	10.4	0.0	0.0
		upper	0.082	0.003	14.9	31.0	0.2	0.3	1.1	2.7	15	229	6	670	23	14.1	10.4	11.5	0.5
		comment																	
167	Vefsna	lower	0.010	0.001	1.4	2.9	0.3	0.5	0.6	1.0	15	192	6	508	16	11.1	6.1	0.0	0.0
		upper	0.023	0.004	1.4	2.9	0.3	0.5	0.6	1.0	16	193	8	508	16	11.2	6.1	15.8	0.8
		comment																	
72	Norwegian Sea (NO)	lower	0.092	0.003	16.3	33.8	0.5	0.8	1.6	3.6	30	421	12	1178	38	25.3	16.4	0.0	0.0
		upper	0.105	0.007	16.3	33.8	0.5	0.8	1.7	3.6	32	421	14	1178	38	25.3	16.4	27.3	1.3
		comment																	

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 by Norway

		1 Cd [t]	5 Hg [t]	6 Cu [t]	7 Zn [t]	2 Pb [t]	15 As [t]	16 Cr [t]	17 Ni [t]	10 NH4-N [t]	11 NO3-N [t]	12 PO4-P [t]	12 TOT-N [t]	14 TOT-P [t]	3 SPM [t]	18 TOC [kt]	9 PCB [kg]	8 g-HCH [kg]	20 AOX (t)
73 Barents Sea (NO)	lower	0.19	0.015	35.8	21.4	0.90	2.30	4.32	152.4	319	317	40	3802	151	27331	63			
	upper	0.20	0.021	35.8	21.4	0.90	2.32	4.32	152.4	319	317	40	3802	151	27331	63			
	comment																		
75 Skagerrak (NO)	lower	0.49	0.013	15.0	85.8	6.04	4.46	2.90	7.1	638	6203	76	10286	212	51667	71			
	upper	0.49	0.021	15.0	85.8	6.04	4.46	3.32	7.1	638	6203	79	10286	212	51667	71			
	comment																		
83 North Sea (NO)	lower	0.57	0.061	26.3	110.9	10.28	5.28	9.33	15.0	757	10176	163	16103	392	165417	75			
	upper	0.60	0.076	26.3	110.9	10.28	5.55	11.03	15.0	760	10177	176	16103	392	165417	75			
	comment																		
72 Norwegian Sea (NO)	lower	0.38	0.063	42.9	92.9	5.34	4.91	13.96	30.0	376	4007	164	9489	400	249807	109			
	upper	0.46	0.083	42.9	93.0	5.34	5.24	14.47	30.1	377	4007	174	9489	400	249807	109			
	comment																		

Tributary rivers compris 145 rivers where 36 are monitored or water quality 4 times in 2006 and 109 estimated from concentration data 1990-2003 and water discharg

Table 7, Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2006 by Norway

			3.0 SPM [mg/l]	18.0 TOC [mg/l]	12.0 PO4_P [µg/l]	14.0 TOT_P [µg/l]	11.0 NO3_N [µg/l]	10.0 NH4_N [µg/l]	13.0 TOT_N [µg/l]	15.000 As [µg/l	2.000 Pb [µg/l]	1.000 Cd [µg/l]	6.000 Cu [µg/l]	7.000 Zn [µg/l]	17.000 Ni [µg/l]	16.000 Total Cr [µg/l]	5.0000 Hg [µg/l]	8.00 HCHG [ng/l]	9.00 PCBS [ng/l]
168	Alta	lower	0.9	3.1	1.3	4.6	25.5	3.3	152.2	0.092	0.014	0.000	0.609	0.192	0.188	0.192	0.0005	0.00	2.20
		upper	0.9	3.1	1.7	4.6	25.6	3.7	152.2	0.100	0.015	0.005	0.609	0.204	0.188	0.192	0.0012	0.20	2.20
		minimum	0.4	2.6	1.0	2.0	1.0	2.0	114.0	0.050	0.005	0.005	0.472	0.050	0.080	0.100	0.0010	0.20	1.20
		maximum	3.3	3.7	4.0	9.0	56.0	6.0	180.0	0.200	0.032	0.005	0.826	0.430	0.390	0.200	0.0025	0.20	5.20
		more than 70% > D,L,	yes	yes	no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	no	no	yes
		n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
		info																	
		st,Dev,	0.8	0.3	1.0	1.8	19.9	1.2	21.7	0.037	0.009	0.000	0.108	0.130	0.098	0.029	0.0004	0.00	2.00
73	Barents Sea (NO)	lower																	
		upper																	
		minimum																	
		maximum																	
		more than 70% > D,L,																	
		n																	
		info																	
		st,Dev,																	
160	Drammenselva	lower	2.4	3.5	1.9	6.3	321.6	10.9	509.4	0.167	0.141	0.011	1.121	5.553	0.808	0.163	0.0003	0.00	2.20
		upper	2.4	3.5	2.1	6.3	321.6	10.9	509.4	0.167	0.141	0.011	1.121	5.553	0.808	0.163	0.0011	0.20	2.20
		minimum	0.7	2.4	1.0	4.0	125.0	5.0	285.0	0.050	0.044	0.006	0.680	2.410	0.350	0.100	0.0010	0.20	1.20
		maximum	11.8	4.7	9.0	18.0	605.0	24.0	825.0	0.270	0.638	0.028	1.770	27.700	1.300	0.200	0.0015	0.20	5.20
		more than 70% > D,L,	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	yes
		n	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	4	4
		info																	
		st,Dev,	2.9	0.6	1.9	3.4	143.8	5.1	161.1	0.067	0.147	0.006	0.358	6.168	0.282	0.050	0.0002	0.00	2.00
159	Glomma	lower	8.1	4.3	7.7	16.1	372.8	18.4	622.8	0.200	0.286	0.017	2.151	3.969	0.824	0.388	0.0010	0.11	1.20
		upper	8.1	4.3	7.7	16.1	372.8	18.5	622.8	0.200	0.286	0.017	2.151	3.969	0.824	0.394	0.0016	0.21	1.20
		minimum	1.2	2.4	2.0	6.0	167.0	2.0	375.0	0.050	0.080	0.006	1.200	1.200	0.400	0.100	0.0010	0.20	1.20
		maximum	18.7	7.5	20.0	33.0	620.0	50.0	950.0	0.480	0.608	0.031	3.100	7.070	1.500	1.500	0.0030	0.21	1.20
		more than 70% > D,L,	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	yes
		n	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	2	2
		info																	
		st,Dev,	6.2	1.5	6.0	9.2	138.0	12.8	196.5	0.107	0.183	0.008	0.612	1.881	0.362	0.354	0.0008	0.01	0.00

Table 7, Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2006 by Norway

			3.0 SPM [mg/l]	18.0 TOC [mg/l]	12.0 PO4_P [µg/l]	14.0 TOT_P [µg/l]	11.0 NO3_N [µg/l]	10.0 NH4_N [µg/l]	13.0 TOT_N [µg/l]	15.000 As [µg/l	2.000 Pb [µg/l]	1.000 Cd [µg/l]	6.000 Cu [µg/l]	7.000 Zn [µg/l]	17.000 Ni [µg/l]	16.000 Total Cr [µg/l]	5.0000 Hg [µg/l]	8.00 HCHG [ng/l]	9.00 PCBS [ng/l]
161	Numedalslågen	lower	5.6	4.1	4.8	9.9	266.9	24.2	470.0	0.185	0.255	0.015	0.972	4.158	0.414	0.190	0.0022	0.00	2.53
		upper	5.6	4.1	4.8	9.9	266.9	24.2	470.0	0.185	0.255	0.015	0.972	4.158	0.414	0.223	0.0028	0.20	2.53
		minimum	1.0	2.0	1.0	4.0	69.0	7.0	230.0	0.090	0.086	0.006	0.461	1.800	0.200	0.100	0.0010	0.20	1.20
		maximum	18.4	7.2	17.0	26.0	1150.0	43.0	1400.0	0.260	0.629	0.032	1.560	8.110	0.690	0.470	0.0145	0.20	5.20
		more than 70% > D,L,	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no	yes
		n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	3
		info																	
		st,Dev,	5.3	1.8	4.8	6.9	294.5	10.2	326.5	0.058	0.184	0.010	0.385	2.119	0.148	0.138	0.0039	0.00	2.31
163	Otra	lower	1.1	2.7	1.3	4.1	95.9	16.1	246.3	0.138	0.253	0.021	0.905	4.488	0.688	0.112	0.0006	0.00	2.20
		upper	1.1	2.7	1.3	4.1	95.9	16.1	246.3	0.138	0.253	0.021	0.905	4.488	0.688	0.162	0.0012	0.20	2.20
		minimum	0.3	1.8	1.0	2.0	61.0	5.0	195.0	0.090	0.130	0.010	0.365	2.450	0.280	0.100	0.0010		1.20
		maximum	3.4	4.3	2.0	7.0	205.0	30.0	355.0	0.260	0.528	0.033	2.160	10.300	1.200	0.610	0.0020		5.20
		more than 70% > D,L,	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no	yes
		n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
		info																	
		st,Dev,	0.9	1.4	0.5	1.9	42.7	9.8	65.3	0.086	0.158	0.009	0.463	2.131	0.289	0.150	0.0005	0.00	2.00
162	Skienselva	lower	0.8	2.8	0.7	3.8	155.8	10.1	275.8	0.092	0.057	0.010	0.515	2.578	0.242	0.095	0.0006	0.12	2.20
		upper	0.8	2.8	1.2	3.8	155.8	10.1	275.8	0.092	0.057	0.010	0.515	2.578	0.242	0.145	0.0014	0.22	2.20
		minimum	0.3	1.9	1.0	3.0	86.0	5.0	235.0	0.060	0.031	0.008	0.296	1.600	0.100	0.100	0.0010	0.20	1.20
		maximum	1.7	7.1	2.0	6.0	205.0	17.0	325.0	0.100	0.110	0.010	1.370	5.040	0.460	0.340	0.0050	0.24	5.20
		more than 70% > D,L,	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no	yes
		n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
		info																	
		st,Dev,	0.4	1.4	0.4	0.9	40.7	3.8	29.3	0.015	0.023	0.001	0.282	0.926	0.097	0.076	0.0012	0.02	2.00
75	Skagerrak (NO)	lower																	
		upper																	
		minimum																	
		maximum																	
		more than 70% > D,L,																	
		n																	
		info																	
		st,Dev,																	
164	Orreelva	lower	9.2	5.8	19.7	64.9	869.3	62.0	1541.3	0.293	0.246	0.011	1.579	2.747	1.093	0.245	0.0005	0.00	1.20
		upper	9.2	5.8	19.7	64.9	870.3	62.0	1541.3	0.293	0.246	0.011	1.579	2.747	1.093	0.255	0.0011	0.20	1.20
		minimum	2.9	4.8	3.0	32.0	1.0	12.0	210.0	0.190	0.090	0.005	0.720	0.250	0.710	0.100	0.0010	0.20	1.20
		maximum	23.3	6.5	60.0	136.0	1900.0	100.0	2910.0	0.420	0.676	0.022	3.530	8.700	1.500	0.510	0.0020	0.20	1.20
		more than 70% > D,L,	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	yes
		n	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	4	4
		info																	

Table 7, Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2006 by Norway

			3.0 SPM [mg/l]	18.0 TOC [mg/l]	12.0 PO4_P [µg/l]	14.0 TOT_P [µg/l]	11.0 NO3_N [µg/l]	10.0 NH4_N [µg/l]	13.0 TOT_N [µg/l]	15.000 As [µg/l	2.000 Pb [µg/l]	1.000 Cd [µg/l]	6.000 Cu [µg/l]	7.000 Zn [µg/l]	17.000 Ni [µg/l]	16.000 Total Cr [µg/l]	5.0000 Hg [µg/l]	8.00 HCHG [ng/l]	9.00 PCBS [ng/l]
165	Suldalslågen	lower	1.5	1.0	1.3	3.7	180.0	5.1	245.9	0.098	0.118	0.010	0.300	2.136	0.219	0.036	0.0001	0.00	1.20
		upper	1.5	1.0	1.7	3.7	180.0	5.3	245.9	0.103	0.118	0.010	0.300	2.136	0.219	0.109	0.0010	0.20	1.20
		minimum	0.3	0.5	1.0	1.0	110.0	2.0	170.0	0.050	0.030	0.005	0.180	1.100	0.090	0.100	0.0010	0.20	1.20
		maximum	5.8	1.6	4.0	8.0	270.0	18.0	370.0	0.310	0.380	0.020	0.440	4.040	0.550	0.200	0.0010	0.20	1.20
		more than 70% > D,L,	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no	yes
		n	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	4	4
		info																	
		st,Dev,	1.6	0.4	1.1	2.3	56.8	4.6	67.0	0.071	0.118	0.004	0.088	0.826	0.129	0.030	0.0000	0.00	0.00
83	North Sea (NO)	lower																	
		upper																	
		minimum																	
		maximum																	
		more than 70% > D,L,																	
		n																	
		info																	
		st,Dev,																	
166	Orkla	lower	2.9	3.4	1.5	6.0	139.7	5.5	297.5	0.127	0.056	0.036	5.838	13.549	0.867	0.326	0.0005	0.00	2.20
		upper	2.9	3.4	2.0	6.0	139.7	5.5	297.5	0.127	0.056	0.036	5.838	13.549	0.867	0.326	0.0012	0.20	2.20
		minimum	0.5	1.7	1.0	3.0	39.0	4.0	175.0	0.070	0.020	0.010	3.300	6.280	0.500	0.100	0.0010	0.20	1.20
		maximum	9.3	7.6	5.0	14.0	265.0	8.0	425.0	0.250	0.168	0.093	11.300	35.500	1.600	0.730	0.0025	0.20	5.20
		more than 70% > D,L,	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	yes
		n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
		info																	
		st,Dev,	3.3	2.0	1.3	4.2	74.8	1.6	74.7	0.058	0.054	0.021	2.236	7.801	0.326	0.199	0.0005	0.00	2.00
167	Vefsna	lower	1.5	1.4	0.8	3.0	73.1	3.7	154.3	0.140	0.048	0.001	0.348	0.510	0.192	0.148	0.0001	0.00	2.20
		upper	1.5	1.4	1.3	3.0	73.2	4.0	154.3	0.140	0.049	0.005	0.348	0.514	0.196	0.165	0.0010	0.20	2.20
		minimum	0.1	0.6	1.0	1.0	1.0	2.0	62.0	0.070	0.005	0.005	0.250	0.050	0.050	0.100	0.0010	0.20	1.20
		maximum	6.2	2.4	4.0	7.0	280.0	7.0	345.0	0.220	0.200	0.007	0.466	1.000	0.350	0.480	0.0010	0.20	5.20
		more than 70% > D,L,	yes	yes	no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	no	no	yes
		n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4	4
		info																	
		st,Dev,	2.0	0.6	0.9	1.8	78.1	1.7	79.9	0.057	0.052	0.001	0.054	0.341	0.102	0.110	0.0000	0.00	2.00
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 2006 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]
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																	
164	Orreelva	Sewage																	
		Industrial																	

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 2006 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]
		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																	

Same detection limits as in 2005.

PCB LOD refer to the individual LoD for ea

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 2006 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	7759	7495	2177	23082	1961-90	1	mean
73	Barents Sea (NO)							
160	Drammenselva	27094	28850	7439	85867	1961-90	1	mean
159	Glomma	64085	61350	19911	134952	1961-90	1	mean
170	Inner Oslofjord							
161	Numedalslågen	10696	10200	3433	27318	1961-90	1	mean
163	Otra	12684	12870	4754	21292	1961-90	1	mean
162	Skienselva	26599	23535	6353	56647	1961-90	1	mean
75	Skagerrak (NO)							
164	Orreelva	472	335	35	1354	1961-90	1	mean
165	Suldalslågen	10084	7420	1148	12547	1961-90	1	mean
83	North Sea (NO)							
166	Orkla	7119	5710	943	67561	1961-90	1	mean
167	Vefsna	11302	15655	2179	49052	1961-90	1	mean
72	Norwegian Sea (NO)							

Flow rate refers to the water discharge estimated at the site for water quality sampling

Table 10. Fish Farming Effluents
Reported Maritime Area of the OSPAR Convention in 2006 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]	12.0000 PO4-P [t]	13 Total N [t]	14 Total P [t]	6 Cu (t)
73 Barents Sea (NO)	lower								1237	186	226	1547	327	14.8
	upper								1237	186	226	1547	327	14.8
	comment													Not reported before 2005
75 Skagerrak (NO)	lower								27	4	5	33	7	0.3
	upper								27	4	5	33	7	0.3
	comment													Not reported before 2005
83 North Sea (NO)	lower								8944	1342	1631	11180	2363	74.3
	upper								8944	1342	1643	11180	2363	74.3
	comment													Not reported before 2005
72 Norwegian Sea (NO)	lower								17492	2624	3189	21865	4621	131.5
	upper								17492	2624	3189	21865	4621	131.5
	comment													Not reported before 2005

Table 11 (extra). Unmonitored (Estimated with the Teotil model)
Reported Maritime Area of the OSPAR Convention in 2006 by Norway

		1 Cd [t]	5 Hg [t]	6 Cu [t]	7 Zn [t]	2 Pb [t]	15 As [t]	16 Cr [t]	17 Ni [t]	10 NH4-N [t]	11 NO3-N [t]	12 PO4-P [t]	12 TOT-N [t]	14 TOT-P [t]	3 SPM [t]	18 TOC [kt]	9 PCB [kg]	8 g-HC [kg]
73 Barents Sea (NO)	lower									81	964	7	1599	35				
	upper									81	964	7	1599	35				
	comment									Estimated	Estimated	Estimated	Estimated	Estimated				
75 Skagerrak (NO)	lower									160	1703	19	2573	69				
	upper									160	1703	19	2573	69				
	comment									Estimated	Estimated	Estimated	Estimated	Estimated				
83 North Sea (NO)	lower									600	6604	48	10299	181				
	upper									600	6604	48	10299	181				
	comment									Estimated	Estimated	Estimated	Estimated	Estimated				
72 Norwegian Sea (NO)	lower									702	7508	97	11417	372				
	upper									702	7508	97	11417	372				
	comment									Estimated	Estimated	Estimated	Estimated	Estimated				

9. Portugal

Annual report on riverine inputs and direct discharges to Convention waters during the year 2006 by Portugal

Table 5a Sewage effluents (direct discharges) to the maritime area in 2006 by Portugal

Table 5b Industrial effluents (direct discharges) to the maritime area in 2006 by Portugal

Table 6a Main riverine inputs to the maritime area in 2006 by Portugal

Table 6b Tributary riverine inputs to the maritime area in 2006 by Portugal

Table 7a Contaminant concentrations of rivers in Portugal discharging to the maritime area in 2006

Table 8 Detection limits for contaminant concentrations of inputs from Portugal to the maritime area

Table 9 Catchment-dependent information (flow rates, long term average flow rates) in 2006 by Portugal

Annex A

1.

2. Sampling is carried out every month.

DATE	PARAMETERS
11.01.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total N, Total P and SPM
08.02.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total P and SPM
15.03.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total P and SPM
11.04.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total N, Total P and SPM
09.05.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total N, Total P and SPM
19.06.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total P and SPM
11.07.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total N, Total P and SPM
02.08.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total P and SPM
12.09.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total N, Total P and SPM
09.10.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total P and SPM
15.11.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5 and SPM
11.12.06	Cd, Hg, Cu, Pb, Zn, NH_4-N, NO_3-N, P_2O_5, Total P and SPM

3. The analysis for RID area carried out in the laboratory of de Commission for Coordination and Regional Development of Lisbon and Tagus River Region.

7. The surface covered by Tejo (Tagus) River catchment area is about 28% of Portugal total area.

8. Percentage of land area draining into convention Area is 100%

10. Quantification and Detection limits

Parameter	LQ	LD
Amonnia, mg NH4/l	0.020	-
Cadmium, ug/l	0.10	0.03
Lead, ug/l	1.5	0.41
Copper, ug/l	1.0	0.34
Phosphates, mg P/l	0.050	-
Total P, mg P/l	0.025	-
Nitrates, mg N (NO3+NO2)/l	0.16	-
Nitrites, mg N/l	0.003	-
SPM	-	-
Zinc, ug/l	18	4.7

11. The water flow is calculated based on the continuous recording of water flow.

12. The Quality Assurance procedures include interlaboratory exercises and certified materials.

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 2006 by Portugal

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
229	Douro	lower													
		upper													
		comment													
230	Minho	lower													
		upper													
		comment													
228	Tejo	lower													
		upper													
		comment	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
93	Bay of Biscay and Iberian Coast (PO)	lower													
		upper													
		comment													

The data reported by Portugal were submitted to confirmation

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 2006 by Portugal

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
229	Douro	lower													
		upper													
		comment													
230	Minho	lower													
		upper													
		comment													
228	Tejo	lower													
		upper													
		comment	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
93	Bay of Biscay and Iberian Coast (PO)	lower													
		upper													
		comment													

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 by Portugal

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
229	Douro	lower													
		upper													
		comment													
230	Minho	lower													
		upper													
		comment													
228	Tejo	lower	0.79	0.52	29.3	7.86	110.1			0.49	12.3	1.7	3.8	1.8	172
		upper	0.79	0.52	29.3	7.86	110.1			0.49	12.3	1.7	3.8	1.8	172
		comment	Average	Average	Average	Average	Average	NI	NI	Average	Average	Average	Average	Average	Average
93	Bay of Biscay and Iberian Coast (PO)	lower													
		upper													
		comment													

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 by Portugal

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
229	Douro	lower													
		upper													
		comment													
230	Minho	lower													
		upper													
		comment													
228	Tejo	lower													
		upper													
		comment													
93	Bay of Biscay and Iberian Coast (PO)	lower													
		upper													
		comment													

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 2000 by Portugal

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]
229	Douro	lower													
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
		n													
		info													
		st.Dev.													
230	Minho	lower													
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
		n													
		info													
		st.Dev.													
228	Tejo	lower													
		upper													
		minimum	0.05	0.05	0.5	0.75	9			0.01	0.71	0.07	0.5	0.12	4.4
		maximum	0.34	0.05	3.7	0.75	24			0.12	1.43	0.36	2.1	0.41	24.0
		more than 70% > D.L.													
		n	12	12	12	12	12			12	12	12	5	11	12
		info						NI	NI						
		st.Dev.													
93	Bay of Biscay and Iberian Coast (PO)	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 2006 by Portugal

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]
229	Douro	Sewage													
		Industrial													
		Riverine													
230	Minho	Sewage													
		Industrial													
		Riverine													
228	Tejo	Sewage	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
		Industrial	NI		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
		Riverine	0.03	NI	0.34	0.41	4.7	NI	NI	NI	NI	NI	NI	NI	NI
93	Bay of Biscay and Iberian Coast (PO)	Sewage													
		Industrial													
		Riverine													

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 2006 by Portugal

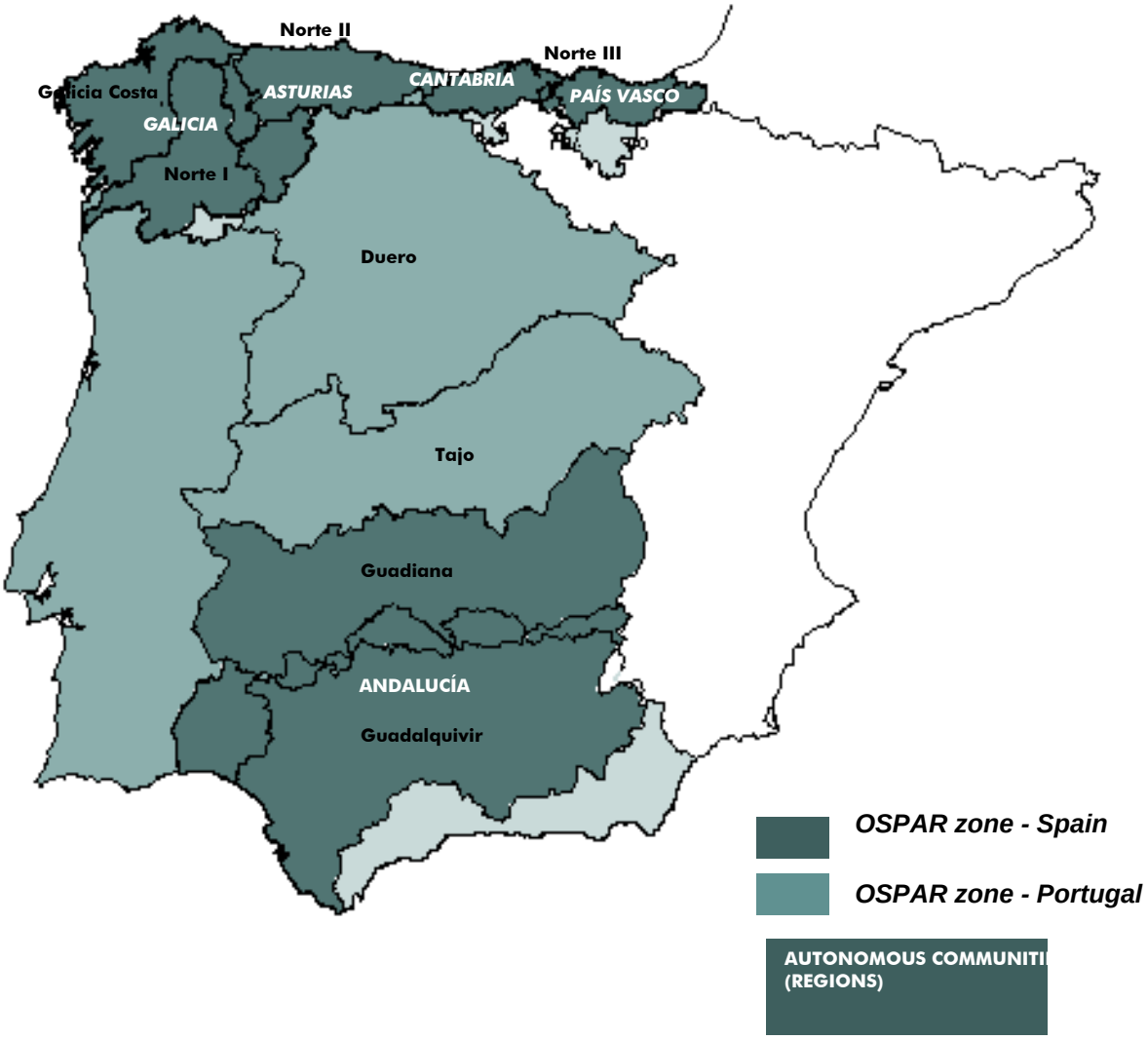
		Flow Rate [1000m³/d	LTA 1000m³/d	nimum 1000m³/d	aximum 1000m³/d	LTA info (years)	Number of sites	Mean or Median
229	Douro							
230	Minho							
228	Tejo	332						
93	Bay of Biscay and Iberian Coast (PO)							

10. SPAIN

Annual report on riverine inputs and direct discharges to Convention waters during the year 2006 by Spain

Table 4a	Total Direct discharges and Riverine inputs to the maritime area in 2006 by Spain.
Table 5a	Direct discharges to the maritime area in 2006 by Spain (sewage effluents)
Table 5b	Direct discharges to the maritime area in 2006 by Spain (industrial effluents)
Table 5c	Direct discharges to the maritime area in 2006 by Spain (total direct discharges)
Table 6a	Riverine inputs to the maritime area in 2006 by Spain (main riverine inputs)
Table 6b	Riverine inputs to the maritime area in 2006 by Spain (tributary riverine inputs)
Table 6c	Riverine inputs to the maritime area in 2006 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 2006



Annual report on riverine inputs and direct discharges by Spain to Convention waters during the year 2006

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

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A. General information

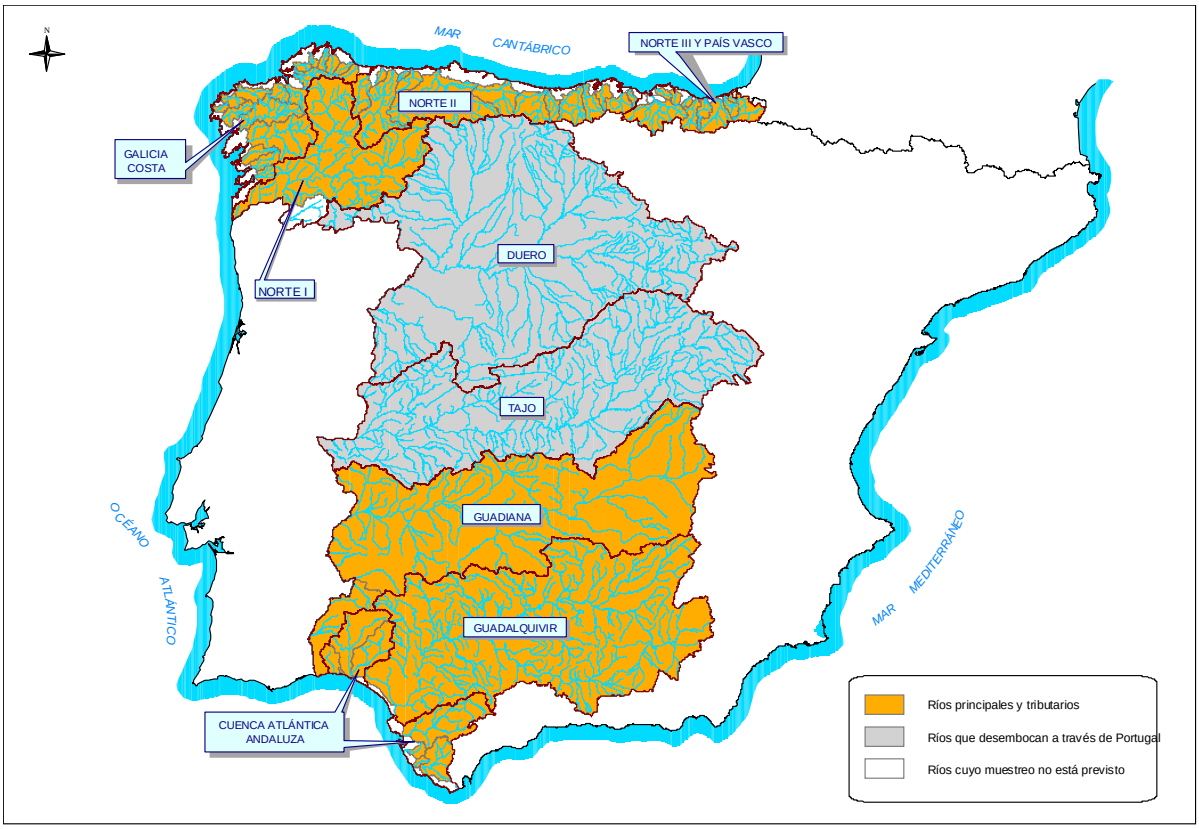
Table 1: General overview of river systems (for riverine inputs) and direct discharge areas (for direct discharges) included in the data report

Country: SPAIN			
Name of river, subarea and discharge area[1]		**Nature of the receiving water[2]**	**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
	Pas	coastal water	
	Eo	coastal water	
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

[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 2006

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		2004		2005		2006	
Estimate		lower	upper	lower	upper	lower	upper
Flow rate (1000 m^3/d)		50,358.9		41,264.3		45,518.32	
Cd	[10^3 kg]	2.372	92.030	1.584	82.450	3.028	99.065
Hg	[10^3 kg]	1.438	4.675	0.225	5.136	0.572	4.909
Cu	[10^3 kg]	64.708	218.272	15.338	162.401	21.080	229.548
Pb	[10^3 kg]	3.147	356.161	7.314	187.299	4.001	225.708
Zn	[10^3 kg]	452.302	686.849	279.706	520.897	414.901	795.055
g-HCH	[kg]	0.983	108.926	2.587	76.203	1.966	209.993
PCBs	[kg]	17.639	333.894	0.003	237.557	0.084	704.226
NH_4-N	[10^6 kg]	18.977	20.298	15.415	17.970	11.759	15.174
NO_3-N	[10^6 kg]	40.290	40.382	17.596	32.285	29.909	58.724
PO_4-P	[10^6 kg]	1.745	2.763	2.731	4.114	1.573	3.336
Total N	[10^6 kg]	64.066	64.672	59.725	65.522	67.272	75.796

Year	2004		2005		2006	
Estimate	lower	upper	lower	upper	lower	upper
Total P [10^6 kg]	3.728	4.391	4.189	5.058	2.794	4.613
SPM [10^6 kg]	764.860	782.106	701.050	788.927	450.476	551.642

C. Direct discharges for the year 2006

Explanatory note: The discharge areas named "Norte I" and "Norte III" only correspond to riverine inputs, not existing there any direct discharges. For this reason these areas are not included in 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), and COT and PAHs (Andalucía).

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):

Sewage networks only are only used for industrial effluents that comply with urban discharge regulations and limits.

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.

In general, flow values are the sum of authorised discharges, whereas concentration values are calculated through sampling. Load calculations are therefore obtained multiplying the volume of discharges authorized and the concentrations obtained in lab tests.

In Galicia, loads for Cd, Hg, Cu, Pb and Zn are calculated with expression 5 of the RID principles. Also in this region, marine culture discharges are calculated through the maximum authorized difference in concentration from input water and discharges. Therefore, only upper estimates are provided.

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 (92% of total flow), but parameter measurements only reflect the analyses of water from industrial processes, which only represents 8% 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 overflow 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:

	DQO [10^3 kg]	**DBO5 [10^3 kg]**
Coastal	7.01	1.75
Estuary	2,106.51	526.97

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 2006				
Province	**Cádiz**	**Huelva**	**Sevilla**	**Total**
Flow rate (10^3 m^3/year)	5,808.7	304,554.5	87.6	310,450.8
Fats and Oils		18.1	16.3	34.5
DQO		6,555.7	160.4	6,716.1
COT	22.7	2,020.7	64.4	2,107.8
Arsenic (As)	0.00004	1.3		1.3
Chromo (Cr)	0.007	0.2		0.2
Nickel (Ni)	0.004	0.3		0.3
PAHs (kg/year)		8.6		8.6
1,2 dichloroethane		0.1		0.1
AOX – Organochlorates	0.002	76.2		76.2
Phenols		0.8		0.8
Chlorides		7,457.3		7,457.3
Cyanides	0.006	0.2		0.2
Fluorides		6.8		6.8
Non polar HC		4.8		4.8
Cl_3CH.		0.2		0.2

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

Flow increases generally correspond to new authorizations.

In Andalucia, industrial effluents flow has decreased because power plants have reduced their operation hours and there is therefore less refrigeration water discharged.

In Asturias, industrial effluents flow and contaminant load to estuaries has decreased significantly because a company has ceased to discharge directly and is now functioning in closed circuit.

Total direct discharges (Table 5c)

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

Total direct discharges to the maritime area 2004-2006

Year		2004		2005		2006	
Estimate		lower	upper	lower	upper	lower	upper
Flow rate (1000 m^3/d)		4,282.25		5,020.20		6,526.67	
Cd	[10^3 kg]	1.354	9.153	1.480	10.601	2.843	14.276
Hg	[10^3 kg]	0.963	1.652	0.203	1.046	0.572	1.335
Cu	[10^3 kg]	6.921	18.792	11.276	28.783	14.148	29.412
Pb	[10^3 kg]	2.057	46.052	3.560	52.691	1.832	53.043
Zn	[10^3 kg]	36.803	44.939	83.700	95.156	73.213	85.807
g-HCH	[kg]	0.15	18.43	2.575	12.472	1.820	12.056
PCBs	[kg]	0	23.7	0.000	13.482	0.084	16.866
NH_4-N	[10^6 kg]	11.671	12.705	12.821	13.905	7.903	8.940
NO_3-N	[10^6 kg]	1.567	1.626	1.855	2.082	1.770	1.804
PO_4-P	[10^6 kg]	0.855	0.91	2.224	2.338	0.921	1.153
Total N	[10^6 kg]	20.388	20.995	23.982	24.734	13.995	14.435
Total P	[10^6 kg]	2.399	2.575	3.216	3.449	1.744	1.932
SPM	[10^6 kg]	334.43	341.603	414.848	424.244	191.100	203.444

The increase in total effluent flow is mainly due to an increase in flow from marine culture factories in Galicia, most probably because more factories have been included in the monitoring program. Pollutant loads have generally decreased or stayed stable, except for Cadmium, which increase is due to more information availability on pollutant loads from sewage plants in Cantabria.

D. Riverine inputs for the year 2006

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. These are some particular comments regarding each discharge area.

Pais Vasco discharge area

Total N determined as the sum of N, nitrites, nitrates and NTK. Nitrates, nitrites and orthophosphates determined by liquid and ion chromatography (HPLC /IEC) following UNE –EN ISO 10304-1:1995.

NTK determined using Kjeldahl method. SM 4500-Norg

SPM determined by filtration and later gravimetry SM 2540/D.

In the following table the different methods used in País Vasco are presented:

Parameter	***Measurement method***	***Limits of detection***
Cd	*Espectrometría de emisión atómica por plasma (ICP/AES), SM 3120 B*	*1 µg/l*
Hg	*Espectrometría de Absorción Atómica con accesorio Vapor Frío*	*1µg/l*
Cu	*Espectrometría de emisión atómica por plasma (ICP/AES), SM 3120 B*	*5 µg/l*
Pb	*Espectrometría de emisión atómica por plasma (ICP/AES), SM 3120 B*	*10 µg/l*
Zn	*Espectrometría de emisión atómica por plasma (ICP/AES), SM 3120 B*	*5 µg/l*
γ - HCH	*Extracción sólido-líquido en cartucho de relleno C18 y posterior elución con solvente apolar, siguiendo el método EPA 525.1. El extracto obtenido se analiza mediante método basado en la norma EPA 8081B, utilizando un cromatógrafo de gases, con detector de captura de electrones (GC/ECD)*	*10 ng/l*
PCBs		*10 ng/l*
NH_4 - N	*Colorimetría. Método Azul de Indofenol*	*0.039 mg NH4-N /l*
NO_3 - N	*Reducción a nitrito. Colorimetría*	*0.023 NO3-N mg/l*
PO_4 - P	*Colorimetría. Método ácido ascórbico*	*0.013 PO4-P mg/l*
Total N	*Oxidación a nitrato. Colorimetría // Kjeldahl*	*0.2 mg/l*
SPM	*Filtración, gravimetría*	*1mg/l*

Apart from g-HCH and PCBs, 8 samples have been taken (except Oria with only 2). In case of relevant basins and for metals 12 samples have been taken.

Flow values come from monthly average measured values obtained from flow measurement stations managed by Diputación Foral de Bizkaia *and* Diputación Foral de Gipuzkoa*.*

Guadiana discharge area

Measurement methods used by Guadiana River Basin District are presented in the following table:

Parameter	***Measurement method***	***Reference method***
Cd	*Espectrofotometría de emisión óptica por plasma de acoplamiento inductivo*	*UNE-EN-ISO-17294/2:2005*
Hg	*Espectrofotometría de absorción atómica. Técnica de Vapor frío – Trampa de oro*	*Método 1631, Revisión B EPA 821-R-99-005*
Cu	*Espectrofotometría de emisión óptica por plasma de acoplamiento inductivo*	*UNE-EN-ISO-17294/2:2005*
Pb	*Espectrofotometría de emisión óptica por plasma de acoplamiento inductivo*	*UNE-EN-ISO-17294/2:2005*
Zn	*Espectrofotometría de emisión óptica por plasma de acoplamiento inductivo*	*UNE-EN-ISO-17294/2:2005*
γ - HCH	*Cromatografía de gases (Detector de Masas)*	*EPA 600/4 – 88/039*
PCBs	*Cromatografía de gases (Detector de Masas)*	*EPA 600/4 – 88/039*
NH_4 - N	*Espectrofotometría de absorción molecular*	*S.M.1 - 4500 – NH_3G (Ed. 20)*

[1] S.M.: *"Standard Methods for determination of water and wastewater."*

NO_3 - N	*Cromatografía iónica*	*S.M. - 4110 C (Ed. 20)*
PO_4 - P	*Espectrofotometría de absorción molecular*	*S.M. - 4500 – PF (Ed. 20)*
Total N	*Autoanalizador (Detector de quimioluminiscencia)*	*EPA 415-1; EPA 9060 A; ASTM D2575; S.M. 5310B (Ed. 20)*
Total P	*Espectrofotometría de plasma*	*S.M. 3120B (Ed. 20)*
SPM	*Gravimetría*	*S.M 2540D*

Sampling and analyses are conducted monthly.

Guadalquivir discharge area

Measurement methods used by Guadalquivir River Basin District are presented in the following table:

Parameter	***Method***
Cd	*Espectrofotometria de Plasma*
Hg	*Espectrofotometria de Absorción Atómica*
Cu	*Espectrofotometria de Plasma*
Pb	*Cromatografía Liquida*
Zn	*Espectrofotometria de Plasma*
g-HCH	*Cromatografía Gases-Masas*
PCBs	*Cromatografía Gases-Masas*
NH4 - N	*Espectrofotometria de Absorción Molecular*
NO3 - N	*Espectrofotometria de Absorción Molecular*
PO4 - P	*Espectrofotometria de Absorción Molecular*
Total N	*Suma de NO3-N, NO2-N y N.Kjeldahl*
Total P	*Espectrofotometria de Absorción Molecular*
SPM	*Gravimetría*
Flow	*Estación de aforo*

Norte discharge area

12 samples taken, one each month. Measurements were done using the methods presented in the following table:

Parameter	***Reference method***	***Analysis method***	***Unit***
Cd	*EPA 6010B* *EPA 6020A*	*Espectrometría de emisión de plasma de acoplamiento inductivo* *Espectrometría de masas con plasma acoplado inductivamente.*	*mg Cd/l*
Hg	*UNE 77-057-83*	*Fluorescencia atómica*	*mg Hg/l*
Cu	*EPA 6010B* *EPA 6020A*	*Espectrometría de emisión de plasma de acoplamiento inductivo* *Espectrometría de masas con plasma acoplado inductivamente.*	*mg Cu/l*
Pb	*EPA 6010B* *EPA 6020A*	*Espectrometría de emisión de plasma de acoplamiento inductivo* *Espectrometría de masas con plasma acoplado inductivamente.*	*mg Pb/l*
Zn	*EPA 6010B* *EPA 6020A*	*Espectrometría de emisión de plasma de acoplamiento inductivo* *Espectrometría de masas con plasma acoplado inductivamente.*	*mg Zn/l*
NH_4 - N	*ASTM D 1426-93*	*Espectrofotometría UV/vis.*	*mg N/l*
NO_3 - N	*AOAC Official Method 973.50*	*Espectrofotometría UV/vis.* *Cromatografía iónica*	*mg NO3-/l*
Total N	*ISO 5663-1984*	*Digestión, destilación y titulación potenciométrica.*	*mg N/l*
NO_2 - N	*UNE 77-026-82*	*Espectrofotometría UV/vis.*	*mg NO2/l*
PO_4 - P	*UNE 77-029-83*	*Espectrofotometría UV/vis.*	*mg P2O5/l*
Total P	*UNE 77-029-83*	*Espectrofotometría UV/vis.*	*mg P/l*
SPM	*UNE-EN 77-033-082:1982*	*Gravimetría*	*mg/l*
$CaCO_3$	*EPA 6010B*	*Espectroscopia de emisión de plasma de acoplamiento inductivo con espectrofotómetro de emisión óptica.*	*mg CaCO3/l*
Organochlorides (19 compounds)	*ASTM D 5812-96*	*Extracción y cromatografía de gases con detectores de captura electrónica.*	*ng/l*
Mineral oils	*UNE 77038:1983*	*Extracción y medida de absorbancia con método IR.*	*mg/l*
PAH's (11 compounds)	*EPA METHOD 550.1*	*Extracción cromatografía líquida de alta resolución con detector de fluorescencia.*	*ng/l*
PCB's (7 congeners)	*ASTM D 3534-85*	*Extracción y cromatografía de gases-masas con detector de captura electrónica.*	*ng/l*

Flow values are monthly averages obtained by stations (Saja-Besaya, Nalón-Narcea, Sella, Miera, Miño-Tea, Pas and Eo) or limnograph (Nervión y Miño).

Loads obtained using "expresión 1" or obtained from monthly averages.

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

Norte discharge area

Cd measurements are always below the quantification limit associated with the method used.

Mercury has not been detected in any river

Cu only detected at: Saja (September), Nervión (October), Louro (August and September) and Sella (October).

Zn is detected in almost every sample with highest values at Nervión and Saja rivers.

SPM obtained values present differences between rivers. In the case of (Nervión, Nalón, Sella, Miera, Louro) high increases are detected in some months in comparison with others. These increases correspond to high raining episodes.

Lindane is not detected in mains rivers.

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 discharge area

During 2006 optional parameters were analysed: PAHs and PCBs detected at Nervión, Saja, Louro, Nalón and Miño 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):

		INPUTS FROM MAIN RIVERS 2005 - 2006												
		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
2006	lower	0.126	0.000	3.641	1.667	301.110	0.000	0.000	2.911	26.832	0.514	50.350	0.791	238.450
	upper	83.754	2.869	191.162	161.780	661.973	195.477	677.594	5.164	53.665	2.001	57.902	2.412	321.263

Pais Vasco

In comparison with flow values obtained for main rivers for the year 2005, in 2006 values are lower from 7,524.64 m^3/d to 4,761.38 m^3/d.

Guadiana

Cu and Zn loads detected at Odiel and Tinto rivers are lower than previous years.

In the following table a comparison between 2005 and 2006 values is presented:

		Cu	*Zn*
TINTO	*Load (t/year) en 2005*	*1943.63*	*3076.55*
	Load (t/year) en 2006	*1076.02*	*1057.65*
ODIEL	*Load (t/year) en 2005*	*3154.70*	*7981.46*
	Carga contaminante (t/año) en 2006	*1516.64*	*4101.27*

Guadalquivir

Obtained flow values for 2006 are much higher than the ones obtained for 2005. Metal concentrations are in most of the cases bellow LOQs. Nutrients and SPM present higher concentrations than in 2005. Lindane and PCBs are not detected

Norte

Values obtained from 12 monthly samples.

Load estimation has been done using expression number 1 of the RID principles.

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 particular comments can be extracted.

Norte

Metals at Louro River are below LOQs. Cu detected only in August and September with values from 0.0051 to 0.0054 mg/l. Zn detected trough the whole year with values from 0.014 to 0.053 mg/l.

Dissolved oxygen present low values in August and October. Highest temperature and conductivity values are obtained in summer.

P compounds present highest concentrations during summer months. Ammonia concentrations are high especially in summer. Nitrates concentrations do not exceed 10 mg/l any month. Nitrites do not exceed 0.040 mg/l any month.

Lindane is only detected above LOQ during July but other HCH compounds are detected with routine monitoring, specially β-HCH and α-HCH.

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

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):

During 2006 voluntary parameters were analyzed every three months at Louro River: Mineral oil, PAHs and PCBs.

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:

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

País Vasco

Flow values obtained in 2006 for tributary rivers are lower than values obtained in 2005. (from 2,710.357 m^3/d to 1,833.512 m^3/d)

The following table represents differences between total Spanish riverine inputs from tributary rivers in 2005 and 2006

		INPUTS FROM TRIBUTARY RIVERS 2005 - 2006												
		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
2006	lower	0.060	0.000	3.291	0.501	40.578	0.146	0.000	0.945	1.307	0.138	2.928	0.259	20.926
	upper	1.035	0.704	8.974	10.885	47.275	2.459	9.766	1.071	3.254	0.182	3.459	0.269	27.235

Guadalquivir

Flow values obtained in 2006 are much higher than the ones obtained in 2005 (Guadiamar and Guadaira rivers).

Cd concentrations in Guadiamar River are much lower than in 2005.

Cu concentrations are a little higher but annual load is much higher than in 2005.

Guadaira river present higher values of Cu and Zn compared with 2005.

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):

Pais Vasco

Total flow values for 2006 are lower than in 2005 (from 36,244.06 m^3/d to 38,991.65 m^3/d).

Guadalquivir

During 2006 flow values are much higher than the ones obtained in 2005.

Total riverine inputs in comparison with previous years are presented in the following table

TOTAL RIVERINE INPUTS 2002 - 2005										
Year	**2002**		**2003**		**2004**		**2005**		**2006**	
Estimate	**lower**	**upper**	**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		38,991.65	
Cd [10^3 kg]	1.27	9.173	0.608	71.185	1.018	82.877	0.104	71.848	0.186	84.789
Hg [10^3 kg]	0.093	11.769	0.01	12.214	0.475	3.023	0.021	4.0903	0.000	3.574
Cu [10^3 kg]	10.29	116.723	17.815	185.005	57.787	199.48	4.0621	133.618	6.932	200.136
Pb [10^3 kg]	5.402	68.164	19.302	162.667	1.09	310.109	3.7537	134.608	2.169	172.665
Zn [10^3 kg]	849.918	855.228	459.777	543.977	15.5	641.911	196.006	425.741	341.688	709.248
g-HCH [kg]	9.25	24.947	7.428	33.866	0.833	90.496	0.011	63.731	0.146	197.936
PCBs [kg]	19.863	34.917	8.306	190.135	17.639	310.194	0.003	224.075	0.000	687.360
NH_4-N [10^6 kg]	10.91	11.054	10.587	10.681	7.306	7.594	2.593	4.0654	3.856	6.235
NO_3-N [10^6 kg]	108.806	109.231	68.899	68.796	38.723	38.756	15.741	30.203	28.139	56.919
PO_4-P [10^6 kg]	1.635	2.308	1.414	2.293	0.89	1.853	0.506	1.776	0.652	2.183
Total N [10^6 kg]	57.079	57.122	66.909	66.915	43.677	43.677	35.743	40.787	53.278	61.361
Total P [10^6 kg]	3.354	3.357	2.411	2.459	1.329	1.816	0.9721	1.609	1.050	2.681
SPM [10^6 kg]	228.482	229.74	486.826	487.54	430.429	440.503	286.201	364.683	259.376	348.498

E. Unmonitored areas

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

Spanish RID Data report for 2006 does not include any information about unmonitored 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.

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.

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. In general most of authorities

work with quantification limits so for these authorities the values given in table 8 correspond to the LOQs. This should be kept in mind in case comparisons are carried out. We recommend dividing these values by 3 in order to get an approximation to LODs.

Limit of Quantification (LOQ) = 10 s

Limit of Detection (LOD) = 3s

s= standard deviation from measurements taken at low concentration samples

LOD = 3 x LOQ / 10 = 0.3 LOQ

- *Guadiana reports LOQs*
- *Norte reports LOQs*
- *Galicia reports LOQs*
- *País Vasco reports LODs*
- *Guadalquivir reports LODs*

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 trend.

Guadiana

It was not possible to reach monitoring stations at Odiel and Tinto rivers for the sampling of October so only 11 samples are considered.

No flow values could be obtained for the Piedras River.

Table 4a. Total Direct discharges and Riverine inputs to the maritime area in 2006 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	7,336.87	0.378	0.023	15.519	2.507	90.633	0.000	0.000	2.087	4.029	0.612	10.170	1.181	80.653
	upper		5.030	2.486	30.188	52.021	97.228	0.013	0.000	2.110	4.029	0.614	10.170	1.203	80.808
NORTE III	lower	730.94	0.000	0.000	0.050	0.000	16.354	0.000	0.000	0.061	0.528	0.006	0.835	0.024	2.773
	upper		0.267	0.013	1.347	0.800	16.354	2.668	6.227	0.061	0.528	0.020	0.835	0.030	2.773
NORTE II	lower	9,528.81	1.924	0.362	1.882	0.639	83.659	0.000	0.000	2.816	2.787	0.234	9.393	0.675	136.761
	upper		11.806	1.008	20.971	25.775	92.214	21.226	31.842	2.836	2.798	0.294	9.393	0.783	140.082
GALICIA COSTA	lower	18,910.94	0.000	0.000	0.097	0.000	0.045	0.000	0.000	0.000	0.000	0.000	0.064	0.017	1.290
	upper		0.029	0.099	17.812	0.023	17.491	0.000	0.000	3.067	28.745	0.532	8.587	0.298	88.425
NORTE I (Miño)	lower	5,098.37	0.000	0.000	0.008	0.000	187.204	0.146	0.000	1.546	16.718	0.007	33.392	0.050	89.215
	upper		16.458	0.823	82.293	49.375	288.437	164.650	526.159	1.669	16.718	1.126	33.392	1.188	100.069
GUADIANA	lower	920.65	0.474	0.101	0.441	0.833	2.381	0.000	0.084	0.675	1.737	0.235	4.158	0.159	90.123
	upper		63.120	0.151	63.261	64.192	159.506	12.677	128.189	0.845	1.773	0.235	4.158	0.420	90.123
GUADALQUIVIR	lower	2,991.74	0.253	0.086	3.083	0.022	34.626	1.820	0.000	4.574	4.111	0.480	9.260	0.688	49.661
	upper		2.356	0.328	13.677	33.521	123.825	8.759	11.809	4.586	4.132	0.516	9.260	0.691	49.661
TOTAL	**lower**	**45,518.32**	**3.028**	**0.572**	**21.080**	**4.001**	**414.901**	**1.966**	**0.084**	**11.759**	**29.909**	**1.573**	**67.272**	**2.794**	**450.476**
	upper		**99.065**	**4.909**	**229.548**	**225.708**	**795.055**	**209.993**	**704.226**	**15.174**	**58.724**	**3.336**	**75.796**	**4.613**	**551.942**

Table 5a. Sewage direct discharges to the maritime area in 2006 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	221.35	lower	0.251	0.023	7.618	0.324	36.025	NI	NI	1.135	0.014	0.023	2.666	0.416	50.676
			upper	1.603	0.074	8.183	14.305	36.592	NI	NI	1.135	0.014	0.023	2.666	0.418	50.676
	Estuary	351.19	lower	0.000	NI	3.864	0.000	16.811	NI	NI	0.187	0.983	0.307	1.330	0.133	1.481
			upper	0.876	NI	7.787	12.758	17.189	NI	NI	0.188	0.983	0.307	1.330	0.154	1.487
Norte II (Cantabria)	Coastal	203.95	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.804	0.428	NI	0.841	0.220	5.854
			upper	2.851	0.057	2.875	5.749	5.749	NI	NI	0.804	0.428	NI	0.841	0.220	5.854
	Estuary	19.13	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.016	0.032	NI	0.166	0.040	0.652
			upper	0.231	0.005	0.231	0.462	0.462	NI	NI	0.016	0.032	NI	0.166	0.040	0.652
Norte II (Asturias)	Coastal	126.56	lower	0.000	0.000	0.218	0.000	2.915	NI	0.000	1.304	0.077	0.115	1.471	0.181	4.548
			upper	2.023	0.262	2.902	7.191	3.632	NI	1.798	1.304	0.077	0.115	1.471	0.181	4.548
	Estuary	52.59	lower	0.000	0.000	0.000	0.000	1.920	NI	NI	0.218	0.007	0.036	0.344	0.036	1.103
			upper	1.152	0.115	1.536	4.223	1.920	NI	NI	0.218	0.007	0.036	0.344	0.036	1.103
SUBTOTAL NORTE II	Coastal	330.51	lower	0.000	0.000	0.218	0.000	2.915	0.000	0.000	2.108	0.505	0.115	2.312	0.401	10.401
			upper	4.873	0.320	5.776	12.940	9.382	0.000	1.798	2.108	0.505	0.115	2.312	0.401	10.401
	Estuary	71.72	lower	0.000	0.000	0.000	0.000	1.920	0.000	0.000	0.234	0.039	0.036	0.509	0.076	1.755
			upper	1.383	0.120	1.767	4.685	2.381	0.000	0.000	0.234	0.039	0.036	0.509	0.076	1.755
GALICIA COSTA	Coastal	9.17	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.067
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.067
	Estuary	203.77	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.064	0.016	1.223
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.064	0.016	1.223
GUADIANA (Andalucía)	Coastal	26.58	lower	0.308	0.071	0.015	0.553	0.789	0.000	0.084	0.124	0.000	0.003	0.318	0.013	0.534
			upper	0.308	0.071	0.114	0.553	0.789	0.970	0.989	0.124	0.003	0.003	0.318	0.013	0.534
	Estuary	59.68	lower	0.145	0.024	0.000	0.241	0.456	0.000	0.000	0.442	0.000	0.058	0.606	0.075	0.854
			upper	0.246	0.041	0.240	0.716	1.406	1.330	1.330	0.442	0.008	0.058	0.606	0.075	0.854
GUADALQUIVIR (Andalucía)	Coastal	83.34	lower	0.000	0.041	0.079	0.022	0.725	0.000	0.000	0.799	0.095	0.139	1.057	0.176	2.262
			upper	0.387	0.050	0.670	1.368	1.543	1.521	2.167	0.799	0.097	0.139	1.057	0.176	2.262
	Estuary	250.79	lower	0.193	0.045	0.536	0.000	3.504	1.820	0.000	2.622	0.041	0.208	3.360	0.318	3.226
			upper	0.987	0.085	1.483	3.225	5.489	7.227	9.632	2.622	0.053	0.208	3.360	0.318	3.226
TOTAL	**Coastal**	**670.94**	**lower**	**0.559**	**0.134**	**7.929**	**0.899**	**40.454**	**0.000**	**0.084**	**4.166**	**0.614**	**0.280**	**6.352**	**1.006**	**63.941**
			upper	**7.172**	**0.515**	**14.744**	**29.167**	**48.304**	**2.491**	**4.954**	**4.166**	**0.620**	**0.280**	**6.352**	**1.007**	**63.941**
	Estuary	**937.15**	**lower**	**0.338**	**0.070**	**4.399**	**0.241**	**22.691**	**1.820**	**0.000**	**3.484**	**1.063**	**0.610**	**5.870**	**0.618**	**8.540**
			upper	**3.492**	**0.246**	**11.276**	**21.383**	**26.465**	**8.557**	**10.963**	**3.485**	**1.082**	**0.610**	**5.870**	**0.638**	**8.545**
OVERALL TOTAL:		**1,608.09**	**lower**	**0.897**	**0.204**	**12.329**	**1.141**	**63.144**	**1.820**	**0.084**	**7.650**	**1.677**	**0.890**	**12.222**	**1.624**	**72.480**
			upper	**10.663**	**0.760**	**26.020**	**50.550**	**74.769**	**11.048**	**15.917**	**7.651**	**1.702**	**0.890**	**12.222**	**1.645**	**72.486**

Table 5b. Industrial direct discharges to the maritime area in 2006 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	11.53	lower	0.000	0.000	0.000	0.000	0.197	NI	NI	0.032	0.008	0.004	0.000	0.000	0.073
			upper	0.042	0.004	0.042	0.210	0.209	NI	NI	0.032	0.008	0.004	0.000	0.000	0.073
	Estuary	11.50	lower	0.001	0.000	0.001	0.014	0.044	NI	NI	0.001	0.000	0.000	0.000	0.000	0.114
			upper	0.009	0.001	0.157	0.018	0.052	NI	NI	0.001	0.000	0.000	0.000	0.000	0.114
Norte II (Cantabria)	Coastal	87.10	lower	1.215	0.317	0.707	0.341	4.412	NI	NI	NI	0.000	0.000	0.753	0.060	113.871
			upper	1.324	0.328	0.707	0.341	4.412	NI	NI	NI	0.000	0.000	0.753	0.060	113.871
	Estuary	54.21	lower	0.354	0.031	0.628	0.125	0.003	NI	NI	NI	0.004	0.001	0.545	0.010	1.977
			upper	0.912	0.032	0.646	0.155	0.033	NI	NI	NI	0.004	0.001	0.545	0.010	1.977
Norte II (Asturias)	Coastal	39.79	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.004	0.007	0.036	0.014	0.649
			upper	0.726	0.073	1.162	0.726	0.726	NI	NI	0.015	0.005	0.007	0.036	0.014	0.649
	Estuary	12.14	lower	0.356	0.014	0.057	0.173	4.273	NI	NI	0.106	0.053	0.005	0.241	0.008	0.155
			upper	0.465	0.030	0.217	0.561	4.331	NI	NI	0.106	0.055	0.005	0.241	0.008	0.155
SUBTOTAL NORTE II	Coastal	126.89	lower	1.215	0.317	0.707	0.341	4.412	0.000	0.000	0.000	0.004	0.007	0.789	0.073	114.520
			upper	2.050	0.401	1.868	1.067	5.138	0.000	0.000	0.015	0.005	0.007	0.789	0.073	114.520
	Estuary	66.35	lower	0.709	0.045	0.685	0.298	4.276	0.000	0.000	0.106	0.057	0.006	0.786	0.017	2.132
			upper	1.377	0.062	0.863	0.716	4.364	0.000	0.000	0.106	0.059	0.006	0.786	0.017	2.132
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	462.68	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	0.028	0.011	0.013	0.016	0.109	NI	NI	0.533	NI	NI	0.437	0.158	4.956
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	815.46	lower	0.021	0.006	0.426	0.039	1.136	0.000	0.000	0.090	0.007	0.013	0.193	0.022	1.549
			upper	0.105	0.018	0.447	0.463	1.162	1.007	0.949	0.090	0.012	0.013	0.193	0.022	1.549
GUADALQUIVIR (Andalucía)	Coastal	0.09	lower	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001
			upper	0.001	0.000	0.002	0.004	0.004	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.001
	Estuary	12.28	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.039
			upper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.039
TOTAL	**Coastal**	**173.64**	**lower**	**1.215**	**0.317**	**0.707**	**0.341**	**4.612**	**0.000**	**0.000**	**0.032**	**0.012**	**0.012**	**0.789**	**0.073**	**114.594**
			upper	**2.094**	**0.482**	**1.912**	**1.280**	**5.351**	**0.002**	**0.000**	**0.535**	**0.013**	**0.012**	**0.792**	**0.081**	**116.787**
	Estuary	**1,368.28**	**lower**	**0.731**	**0.051**	**1.112**	**0.351**	**5.457**	**0.000**	**0.000**	**0.197**	**0.064**	**0.019**	**0.983**	**0.041**	**3.834**
			upper	**1.518**	**0.093**	**1.480**	**1.213**	**5.687**	**1.007**	**0.949**	**0.730**	**0.072**	**0.019**	**1.420**	**0.199**	**8.790**
OVERALL TOTAL:		**1,541.91**	**lower**	**1.946**	**0.368**	**1.819**	**0.692**	**10.069**	**0.000**	**0.000**	**0.229**	**0.076**	**0.031**	**1.772**	**0.114**	**118.428**
			upper	**3.612**	**0.574**	**3.392**	**2.493**	**11.038**	**1.009**	**0.949**	**1.265**	**0.084**	**0.031**	**2.212**	**0.280**	**125.577**

Table 5b1. Marine culture factories discharges to the maritime area in 2006 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	0.023	0.017	NI	NI	0.005	0.173
			upper	NI	NI	NI	NI	NI	NI	NI	0.023	0.017	NI	NI	0.005	0.173
	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	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
Norte II (Asturias)	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
SUBTOTAL NORTE II	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
GALICIA COSTA	Coastal	2,430.04	lower	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
			upper	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.177	0.001	0.000	3.438
	Estuary	777.51	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	0.054	NI	NI	1.751
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	18.93	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	0.006
			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	0.006
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	3.78	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	0.013
			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	0.013
TOTAL	**Coastal**	**2,576.44**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.023**	**0.017**	**0.000**	**0.000**	**0.005**	**0.173**
			upper	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.023**	**0.017**	**0.177**	**0.001**	**0.006**	**3.611**
	Estuary	**800.22**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.019**
			upper	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	**0.000**	**0.054**	**0.001**	**0.001**	**1.770**
OVERALL TOTAL:		**3,376.66**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.023**	**0.017**	**0.000**	**0.001**	**0.006**	**0.192**
			upper	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.024**	**0.017**	**0.231**	**0.001**	**0.006**	**5.381**

Table 5c. Total direct discharges to the maritime area in 2006 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	379.29	lower	0.251	0.023	7.618	0.324	36.222	0.000	0.000	1.190	0.039	0.027	2.666	0.422	50.923
			upper	1.645	0.078	8.225	14.515	36.801	0.000	0.000	1.190	0.039	0.027	2.666	0.423	50.923
	Estuary	362.69	lower	0.001	0.000	3.865	0.014	16.855	0.000	0.000	0.188	0.983	0.307	1.330	0.133	1.595
			upper	0.884	0.001	7.944	12.776	17.240	0.000	0.000	0.189	0.983	0.307	1.330	0.154	1.601
Norte II (Cantabria)	Coastal	291.05	lower	1.215	0.317	0.707	0.341	4.412	0.000	0.000	0.804	0.428	0.000	1.593	0.280	119.724
			upper	4.175	0.386	3.581	6.090	10.161	0.000	0.000	0.804	0.428	0.000	1.594	0.280	119.724
	Estuary	73.34	lower	0.354	0.031	0.628	0.125	0.003	0.000	0.000	0.016	0.036	0.001	0.711	0.050	2.629
			upper	1.142	0.036	0.877	0.617	0.495	0.000	0.000	0.016	0.036	0.001	0.711	0.050	2.629
Norte II (Asturias)	Coastal	166.35	lower	0.000	0.000	0.218	0.000	2.915	0.000	0.000	1.304	0.081	0.123	1.507	0.195	5.197
			upper	2.749	0.335	4.063	7.917	4.358	0.000	1.798	1.319	0.082	0.123	1.507	0.195	5.197
	Estuary	64.73	lower	0.356	0.014	0.057	0.173	6.193	0.000	0.000	0.324	0.060	0.041	0.585	0.043	1.258
			upper	1.617	0.145	1.752	4.784	6.251	0.000	0.000	0.324	0.062	0.041	0.585	0.043	1.258
SUBTOTAL NORTE II	Coastal	457.40	lower	1.215	0.317	0.925	0.341	7.327	0.000	0.000	2.108	0.509	0.123	3.101	0.475	124.921
			upper	6.924	0.720	7.645	14.007	14.520	0.000	1.798	2.123	0.510	0.123	3.101	0.475	124.921
	Estuary	138.08	lower	0.709	0.045	0.685	0.298	6.196	0.000	0.000	0.339	0.096	0.042	1.296	0.093	3.887
			upper	2.760	0.182	2.630	5.401	6.745	0.000	0.000	0.339	0.098	0.042	1.296	0.093	3.887
GALICIA COSTA	Coastal	2,474.33	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	0.067
			upper	0.000	0.077	0.000	0.000	0.000	0.000	0.000	0.488	0.000	0.177	0.004	0.008	5.698
	Estuary	1,443.96	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.064	0.016	1.223
			upper	0.028	0.011	0.013	0.016	0.109	0.000	0.000	0.534	0.000	0.054	0.501	0.174	7.930
GUADIANA (ANDALUCIA)	Coastal	26.58	lower	0.308	0.071	0.015	0.553	0.789	0.000	0.084	0.124	0.000	0.003	0.318	0.013	0.534
			upper	0.308	0.071	0.114	0.553	0.789	0.970	0.989	0.124	0.003	0.003	0.318	0.013	0.534
	Estuary	894.07	lower	0.165	0.030	0.426	0.280	1.592	0.000	0.000	0.532	0.007	0.072	0.800	0.097	2.409
			upper	0.351	0.060	0.687	1.179	2.568	2.337	2.280	0.532	0.020	0.072	0.800	0.097	2.409
GUADALQUIVIR (ANDALUCIA)	Coastal	83.43	lower	0.000	0.041	0.079	0.022	0.729	0.000	0.000	0.800	0.095	0.139	1.057	0.176	2.263
			upper	0.388	0.050	0.672	1.372	1.547	1.523	2.167	0.800	0.098	0.139	1.057	0.176	2.263
	Estuary	266.86	lower	0.193	0.045	0.536	0.000	3.504	1.820	0.000	2.622	0.041	0.208	3.364	0.320	3.278
			upper	0.987	0.085	1.483	3.225	5.489	7.227	9.632	2.622	0.053	0.208	3.364	0.320	3.278
TOTAL	**Coastal**	3,421.02	lower	**1.774**	**0.452**	**8.637**	**1.240**	**45.066**	**0.000**	**0.084**	**4.221**	**0.644**	**0.292**	**7.141**	**1.085**	**178.708**
			upper	**9.266**	**0.996**	**16.656**	**30.447**	**53.655**	**2.493**	**4.954**	**4.724**	**0.650**	**0.469**	**7.145**	**1.095**	**184.339**
	Estuary	3,105.65	lower	**1.069**	**0.120**	**5.512**	**0.592**	**28.147**	**1.820**	**0.000**	**3.682**	**1.127**	**0.629**	**6.853**	**0.659**	**12.393**
			upper	**5.010**	**0.338**	**12.756**	**22.596**	**32.152**	**9.564**	**11.912**	**4.215**	**1.154**	**0.684**	**7.290**	**0.837**	**19.105**
OVERALL TOTAL:		**6,526.67**	**lower**	**2.843**	**0.572**	**14.148**	**1.832**	**73.213**	**1.820**	**0.084**	**7.903**	**1.770**	**0.921**	**13.995**	**1.744**	**191.100**
			upper	**14.276**	**1.335**	**29.412**	**53.043**	**85.807**	**12.056**	**16.866**	**8.940**	**1.804**	**1.153**	**14.435**	**1.932**	**203.444**

Table 6a. Main riverine inputs to the maritime area in 2006 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]
Oyazun	216.39		lower	0.026	0.000	0.079	0.072	6.891	0.000	NI	0.002	0.087	0.003	0.194	0.012	0.242
			upper	0.099	0.079	0.441	0.796	6.924	0.001	NI	0.004	0.087	0.003	0.194	0.012	0.262
Urumea	693.83		lower	0.084	0.000	0.211	0.274	5.149	0.000	NI	0.018	0.126	0.007	0.458	0.027	0.785
			upper	0.317	0.253	1.372	2.596	5.782	0.003	NI	0.023	0.126	0.009	0.458	0.027	0.848
Oria	1,412.85		lower	0.000	0.000	0.000	0.000	1.547	NI	NI	0.124	0.880	0.050	1.673	0.054	12.583
			upper	0.516	0.516	2.578	5.157	2.836	NI	NI	0.124	0.880	0.050	1.673	0.054	12.583
Urola	581.03		lower	0.000	0.000	0.308	0.270	0.829	0.000	NI	0.018	0.302	0.014	0.389	0.040	1.254
			upper	0.212	0.212	1.176	2.198	1.504	0.002	NI	0.022	0.302	0.014	0.389	0.040	1.285
Deva	742.73		lower	0.000	0.000	1.423	0.474	15.859	NI	NI	0.282	0.249	0.063	0.885	0.143	4.674
			upper	0.271	0.271	2.101	2.847	15.859	NI	NI	0.282	0.249	0.063	0.885	0.143	4.674
Artibay	149.66		lower	0.015	0.000	0.050	0.074	0.119	0.000	NI	0.012	0.040	0.003	0.065	0.009	0.300
			upper	0.065	0.055	0.298	0.571	0.318	0.001	NI	0.013	0.040	0.003	0.065	0.009	0.307
Lea	246.51		lower	0.000	0.000	0.376	0.123	0.065	0.000	NI	0.001	0.068	0.001	0.155	0.010	0.541
			upper	0.090	0.090	0.744	0.941	0.474	0.001	NI	0.004	0.068	0.002	0.155	0.010	0.554
Oca	301.09		lower	0.000	0.000	0.460	0.160	0.320	0.000	NI	0.148	0.134	0.013	0.441	0.112	0.471
			upper	0.110	0.110	0.759	1.159	0.669	0.001	NI	0.148	0.134	0.013	0.441	0.112	0.471
Butron	250.41		lower	0.000	0.000	0.274	0.133	0.748	0.000	NI	0.037	0.185	0.037	0.339	0.060	0.722
			upper	0.091	0.091	0.565	0.964	0.956	0.001	NI	0.037	0.185	0.037	0.339	0.060	0.722
Barbadun	166.89		lower	0.000	0.000	0.046	0.086	0.162	0.000	NI	0.001	0.061	0.003	0.085	0.009	0.182
			upper	0.061	0.061	0.325	0.645	0.416	0.001	NI	0.003	0.061	0.003	0.085	0.009	0.197
PAÍS VASCO SUBTOTAL	**4,761.39**		**lower**	**0.126**	**0.000**	**3.227**	**1.667**	**31.690**	**0.000**	**NI**	**0.644**	**2.132**	**0.195**	**4.685**	**0.476**	**21.754**
			upper	**1.831**	**1.738**	**10.360**	**17.873**	**35.739**	**0.010**	**NI**	**0.660**	**2.132**	**0.197**	**4.685**	**0.476**	**21.903**
Nervión	730.94	730.94	lower	0.000	0.000	0.050	0.000	16.354	0.000	0.000	0.061	0.528	0.006	0.835	0.024	2.773
			upper	0.267	0.013	1.347	0.800	16.354	2.668	6.227	0.061	0.528	0.020	0.835	0.030	2.773
NORTE III SUBTOTAL	**730.94**	**730.94**	**lower**	**0.000**	**0.000**	**0.050**	**0.000**	**16.354**	**0.000**	**0.000**	**0.061**	**0.528**	**0.006**	**0.835**	**0.024**	**2.773**
			upper	**0.267**	**0.013**	**1.347**	**0.800**	**16.354**	**2.668**	**6.227**	**0.061**	**0.528**	**0.020**	**0.835**	**0.030**	**2.773**
Saja	1,300.75	1,300.75	lower	0.000	0.000	0.272	0.000	31.466	0.000	0.000	0.198	0.414	0.006	1.175	0.027	3.864
			upper	0.475	0.024	2.457	1.424	31.466	4.748	16.247	0.198	0.414	0.020	1.175	0.054	3.864
Pas	1,300.75	1,300.75	lower	0.000	0.000	0.000	0.000	3.709	0.000	NI	0.030	0.209	0.013	0.387	0.015	1.287
			upper	0.108	0.005	0.538	0.323	3.709	1.077	NI	0.030	0.210	0.013	0.387	0.015	1.348
Eo	2,489.76	2,489.76	lower	0.000	0.000	0.000	0.000	1.382	0.000	NI	0.009	0.152	0.000	0.452	0.005	0.752
			upper	0.138	0.007	0.689	0.413	2.165	1.378	NI	0.009	0.152	0.009	0.452	0.011	0.922
Sella	1,090.37	1,090.37	lower	0.000	0.000	0.000	0.000	13.079	0.000	NI	0.028	0.314	0.000	0.721	0.006	0.737
			upper	0.398	0.020	1.990	1.194	13.079	3.980	NI	0.034	0.322	0.027	0.721	0.033	1.323
Miera	261.95	261.95	lower	0.000	0.000	0.000	0.000	4.345	0.000	NI	0.017	0.149	0.010	0.255	0.005	1.035
			upper	0.096	0.005	0.478	0.287	4.374	0.956	NI	0.017	0.149	0.012	0.255	0.010	1.090
Nalón	2,489.76	2,489.76	lower	0.000	0.000	0.000	0.000	16.155	0.000	0.000	0.086	0.945	0.041	2.005	0.049	0.278
			upper	0.909	0.045	4.544	2.726	16.155	9.088	13.797	0.086	0.945	0.049	2.005	0.093	2.726
NORTE II SUBTOTAL	**8,933.34**	**8,933.34**	**lower**	**0.000**	**0.000**	**0.272**	**0.000**	**70.136**	**0.000**	**0.000**	**0.368**	**2.182**	**0.069**	**4.997**	**0.107**	**7.952**
			upper	**2.123**	**0.106**	**10.696**	**6.368**	**70.949**	**21.226**	**30.044**	**0.374**	**2.191**	**0.129**	**4.997**	**0.215**	**11.273**

Table 6a. Main riverine inputs to the maritime area in 2006 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	0.000	0.000	0.001	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.001	0.293	0.000	1.246	NI	NI	0.022	0.438	0.006	0.116	0.002	5.269
Oro	212.92	370.05	lower	0.000	0.000	0.001	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.093	0.000	1.168	NI	NI	0.029	0.200	0.003	0.068	0.001	0.803
Landro	385.61	592.88	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.235	0.000	1.677	NI	NI	0.059	0.357	0.008	0.128	0.002	5.326
Sor	875.20	527.77	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.001	0.428	0.000	0.364	NI	NI	0.066	0.579	0.009	0.178	0.003	2.894
Mera	205.93	418.03	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.001	0.000
			upper	0.000	0.000	0.068	0.000	0.613	NI	NI	0.015	0.230	0.002	0.064	0.001	0.877
Grande de Jubia	163.37	311.67	lower	0.000	0.000	0.001	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.054	0.000	0.169	NI	NI	0.021	0.212	0.002	0.064	0.001	1.323
Forcadas	99.80	140.70	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.831	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
Belelle	156.10	220.07	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.925	0.000	0.198	NI	NI	0.016	0.258	0.002	0.071	0.001	0.989
Eume	829.95	1,695.65	lower	0.000	0.000	0.003	0.000	0.002	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.001	0.000	0.001	0.002	NI	NI	0.112	0.715	0.009	0.249	0.003	2.884
Mandeo	290.38	771.01	lower	0.000	0.000	0.002	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.092	0.000	0.349	NI	NI	0.031	0.494	0.004	0.135	0.001	0.523
Mero	513.46	456.19	lower	0.000	0.000	0.002	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.506	0.000	0.327	NI	NI	0.076	1.530	0.007	0.407	0.003	1.979
Allones	557.78	942.19	lower	0.000	0.000	0.002	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.338	0.000	1.545	NI	NI	0.072	1.590	0.012	0.416	0.005	2.761
Grande	782.66	647.05	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	1.928	0.000	0.438	NI	NI	0.091	1.367	0.016	0.376	0.006	1.550
Castro	201.89	166.91	lower	0.000	0.000	0.000	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.497	0.000	0.018	NI	NI	0.018	0.214	0.014	0.062	0.006	0.248
Jallas	893.28	738.51	lower	0.000	0.000	0.002	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.481	0.000	0.661	NI	NI	0.133	2.047	0.014	0.568	0.006	1.321
Tambre	2,871.76	3,828.06	lower	0.000	0.000	0.006	0.000	0.003	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.001	2.574	0.001	2.800	NI	NI	0.598	8.361	0.072	2.353	0.027	20.898
Traba	2,383.01	315.61	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	0.000	5.175	0.000	0.801	NI	NI	0.347	5.376	0.070	1.481	0.029	5.720
Ulla	734.40	1,337.48	lower	0.000	0.000	0.057	0.000	0.023	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.004	1.227	0.002	4.195	NI	NI	0.093	1.520	0.014	0.418	0.005	9.354
Umia	523.49	846.27	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	0.000	0.080	0.000	0.269	NI	NI	0.065	0.474	0.008	0.158	0.003	1.583
Lérez	662.12	1,248.93	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.235	0.000	0.317	NI	NI	0.035	0.495	0.006	0.139	0.002	1.640
Verdugo	472.56	483.92	lower	0.000	0.000	0.001	0.000	0.000	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.601	0.000	0.142	NI	NI	0.029	0.349	0.005	0.102	0.002	0.598
GALICIA COSTA SUBTOTAL	**14,113.65**	**16,456.57**	**lower**	**0.000**	**0.000**	**0.091**	**0.000**	**0.042**	**NI**	**NI**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	**0.000**
			upper	**0.000**	**0.010**	**16.663**	**0.007**	**17.300**	**NI**	**NI**	**1.927**	**26.805**	**0.282**	**7.552**	**0.109**	**68.541**

Table 6a. Main riverine inputs to the maritime area in 2006 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 [10⁶ kg]	NO3-N [10⁶ kg]	PO4-P [10⁶ kg]	Total N [10⁶ kg]	Total P [10⁶ kg]	SPM [10⁶ kg]
Miño	4,443.60	4,443.60	lower	0.000	0.000	0.000	0.000	178.146	0.000	0.000	1.396	16.385	0.000	32.673	0.000	84.988
			upper	16.219	0.811	81.097	48.658	279.379	162.195	516.394	1.518	16.385	1.104	32.673	1.135	95.790
NORTE I SUBTOTAL	**4,443.60**	**4,443.60**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**178.146**	**0.000**	**0.000**	**1.396**	**16.385**	**0.000**	**32.673**	**0.000**	**84.988**
			upper	**16.219**	**0.811**	**81.097**	**48.658**	**279.379**	**162.195**	**516.394**	**1.518**	**16.385**	**1.104**	**32.673**	**1.135**	**95.790**
Guadiana		8,556.00	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	1.730	0.160	3.040	0.050	87.180
			upper	62.460	0.020	62.460	62.460	156.150	9.370	124.920	0.190	1.750	0.160	3.040	0.310	87.180
Piedras		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	*11.950*	*0.000*	*1,516.670*	*18.710*	*4,101.270*	*0.000*	*0.000*	*0.080*	*0.220*	*0.000*	*0.350*	*0.000*	*1.870*
			upper	*13.540*	*0.000*	*1,516.670*	*21.100*	*4,101.270*	*1.310*	*17.520*	*0.080*	*0.220*	*0.000*	*0.350*	*0.040*	*1.870*
*Tinto **		*178.00*	lower	*5.260*	*0.000*	*1,076.020*	*16.300*	*1,057.650*	*0.000*	*0.000*	*0.060*	*0.050*	*0.000*	*0.120*	*0.000*	*0.790*
			upper	*5.260*	*0.000*	*1,076.020*	*16.300*	*1,057.650*	*0.190*	*2.600*	*0.060*	*0.050*	*0.000*	*0.120*	*0.010*	*0.790*
GUADIANA SUBTOTAL	**0.00**	**9,934.00**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.020**	**1.730**	**0.160**	**3.040**	**0.050**	**87.180**
			upper	**62.460**	**0.020**	**62.460**	**62.460**	**156.150**	**9.370**	**124.920**	**0.190**	**1.750**	**0.160**	**3.040**	**0.310**	**87.180**
Guadalquivir	2,339.14	19,808.00	lower	0.000	0.000	0.000	0.000	4.741	0.000	0.000	0.422	3.875	0.084	4.120	0.133	33.802
			upper	0.854	0.171	8.538	25.614	86.102	0.009	0.009	0.433	3.875	0.109	4.120	0.136	33.802
GUADALQUIVIR SUBTOTAL	**2,339.14**	**19,808.00**	**lower**	**0.000**	**0.000**	**0.000**	**0.000**	**4.741**	**0.000**	**0.000**	**0.422**	**3.875**	**0.084**	**4.120**	**0.133**	**33.802**
			upper	**0.854**	**0.171**	**8.538**	**25.614**	**86.102**	**0.009**	**0.009**	**0.433**	**3.875**	**0.109**	**4.120**	**0.136**	**33.802**
TOTAL	**35,322.05**	**60,306.45**	**lower**	**0.126**	**0.000**	**3.641**	**1.667**	**301.110**	**0.000**	**0.000**	**2.911**	**26.832**	**0.514**	**50.350**	**0.791**	**238.450**
			upper	**83.754**	**2.869**	**191.162**	**161.780**	**661.973**	**195.477**	**677.594**	**5.164**	**53.665**	**2.001**	**57.902**	**2.412**	**321.263**

*** 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 2006 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 [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]
Asúa	28.73		lower	0.000	0.000	0.023	0.014	0.058	0.000	NI	0.001	0.012	0.001	0.017	0.001	0.159
			upper	0.010	0.010	0.061	0.110	0.087	0.000	NI	0.001	0.012	0.001	0.017	0.001	0.159
Ibaizabal	816.64		lower	0.000	0.000	0.373	0.000	4.285	NI	NI	0.052	0.527	0.045	0.877	0.080	2.988
			upper	0.298	0.298	1.677	2.981	4.657	NI	NI	0.052	0.527	0.045	0.877	0.080	2.988
Cadagua	970.87		lower	0.000	0.000	0.413	0.443	1.447	0.000	NI	0.011	0.328	0.036	0.584	0.069	3.154
			upper	0.354	0.354	1.890	3.691	2.628	0.004	NI	0.018	0.328	0.036	0.584	0.069	3.154
Galindo	17.28		lower	0.000	0.000	0.000	0.044	0.076	NI	NI	0.000	0.007	0.000	0.011	0.000	0.080
			upper	0.006	0.006	0.032	0.076	0.076	NI	NI	0.000	0.007	0.000	0.011	0.000	0.080
PAÍS VASCO SUBTOTAL	**1,833.51**	**NI**	**lower**	**0.000**	**0.000**	**0.809**	**0.501**	**5.866**	**0.000**	**NI**	**0.064**	**0.875**	**0.082**	**1.489**	**0.151**	**6.382**
			upper	**0.669**	**0.669**	**3.659**	**6.857**	**7.448**	**0.004**	**NI**	**0.071**	**0.875**	**0.083**	**1.489**	**0.151**	**6.382**
NORTE III SUBTOTAL			**lower**													
			upper													
NORTE II SUBTOTAL			**lower**													
			upper													
Furelos	294.44	512.25	lower	0.000	0.000	0.001	0.000	0.001	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.000	0.083	0.000	0.077	NI	NI	0.033	0.538	0.006	0.148	0.002	0.951
Deza	584.56	1,509.70	lower	0.000	0.000	0.005	0.000	0.002	NI	NI	0.000	0.000	0.000	0.000	0.000	0.000
			upper	0.000	0.001	1.053	0.001	0.004	NI	NI	0.085	1.403	0.013	0.383	0.005	5.306
GALICIA COSTA SUBTOTAL	**879.00**	**2,021.95**	**lower**	**0.000**	**0.000**	**0.006**	**0.000**	**0.003**	**NI**	**NI**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
			upper	**0.000**	**0.001**	**1.136**	**0.001**	**0.081**	**NI**	**NI**	**0.118**	**1.940**	**0.019**	**0.530**	**0.007**	**6.256**
Louro	654.77	654.77	lower	0.000	0.000	0.008	0.000	9.058	0.146	0.000	0.150	0.333	0.007	0.719	0.050	4.226
			upper	0.239	0.012	1.195	0.717	9.058	2.455	9.765	0.150	0.333	0.022	0.719	0.053	4.279
NORTE I SUBTOTAL	**654.77**	**654.77**	**lower**	**0.000**	**0.000**	**0.008**	**0.000**	**9.058**	**0.146**	**0.000**	**0.150**	**0.333**	**0.007**	**0.719**	**0.050**	**4.226**
			upper	**0.239**	**0.012**	**1.195**	**0.717**	**9.058**	**2.455**	**9.765**	**0.150**	**0.333**	**0.022**	**0.719**	**0.053**	**4.279**
GUADIANA SUBTOTAL			**lower**													
			upper													
Guadaira	140.75	1,515.00	lower	0.003	0.000	0.316	0.000	1.992	0.000	0.000	0.719	0.019	0.048	0.636	0.056	5.336
			upper	0.054	0.010	0.819	1.541	7.028	0.001	0.001	0.719	0.026	0.048	0.636	0.056	5.336
Guadiamar	161.57	611.00	lower	0.056	0.000	2.152	0.000	23.659	0.000	0.000	0.012	0.080	0.000	0.084	0.003	4.982
			upper	0.073	0.012	2.164	1.769	23.659	0.001	0.001	0.012	0.080	0.011	0.084	0.003	4.982
GUADALQUIVIR SUBTOTAL	**302.32**	**2,126.00**	**lower**	**0.060**	**0.000**	**2.468**	**0.000**	**25.651**	**0.000**	**0.000**	**0.731**	**0.099**	**0.048**	**0.720**	**0.059**	**10.318**
			upper	**0.127**	**0.022**	**2.984**	**3.310**	**30.688**	**0.001**	**0.001**	**0.731**	**0.106**	**0.059**	**0.720**	**0.059**	**10.318**
TOTAL	**3,669.60**	**4,802.72**	**lower**	**0.060**	**0.000**	**3.291**	**0.501**	**40.578**	**0.146**	**0.000**	**0.945**	**1.307**	**0.138**	**2.928**	**0.259**	**20.926**
			upper	**1.035**	**0.704**	**8.974**	**10.885**	**47.275**	**2.459**	**9.766**	**1.071**	**3.254**	**0.182**	**3.459**	**0.269**	**27.235**

Table 6c. Total riverine inputs to the maritime area in 2006 by Spain

Total 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]
PAÍS VASCO SUBTOTAL	**6,594.90**	**NI**	lower	0.126	0.000	4.036	2.169	37.556	0.000	0.000	0.708	3.007	0.277	6.174	0.627	28.135
			upper	2.500	2.407	14.019	24.730	43.187	0.013	0.000	0.731	3.007	0.280	6.174	0.627	28.285
NORTE III SUBTOTAL	**730.94**	**730.94**	lower	0.000	0.000	0.050	0.000	16.354	0.000	0.000	0.061	0.528	0.006	0.835	0.024	2.773
			upper	0.267	0.013	1.347	0.800	16.354	2.668	6.227	0.061	0.528	0.020	0.835	0.030	2.773
NORTE II SUBTOTAL	**8,933.34**	**8,933.34**	lower	0.000	0.000	0.272	0.000	70.136	0.000	0.000	0.368	2.182	0.069	4.997	0.107	7.952
			upper	2.123	0.106	10.696	6.368	70.949	21.226	30.044	0.374	2.191	0.129	4.997	0.215	11.273
GALICIA COSTA SUBTOTAL	**14,992.65**	**18,478.52**	lower	0.000	0.000	0.097	0.000	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
			upper	0.000	0.011	17.799	0.007	17.381	0.000	0.000	2.045	28.745	0.300	8.083	0.116	74.797
NORTE I SUBTOTAL	**5,098.37**	**5,098.37**	lower	0.000	0.000	0.008	0.000	187.204	0.146	0.000	1.546	16.718	0.007	33.392	0.050	89.215
			upper	16.458	0.823	82.293	49.375	288.437	164.650	526.159	1.669	16.718	1.126	33.392	1.188	100.069
GUADIANA SUBTOTAL	**NI**	**9,934.00**	lower	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	1.730	0.160	3.040	0.050	87.180
			upper	62.460	0.020	62.460	62.460	156.150	9.370	124.920	0.190	1.750	0.160	3.040	0.310	87.180
GUADALQUIVIR SUBTOTAL	**2,641.46**	**21,934.00**	lower	0.060	0.000	2.468	0.000	30.393	0.000	0.000	1.152	3.974	0.132	4.840	0.192	44.120
			upper	0.981	0.193	11.522	28.924	116.789	0.010	0.010	1.164	3.981	0.168	4.840	0.195	44.120
TOTAL	**38,991.65**	**65,109.17**	**lower**	**0.186**	**0.000**	**6.932**	**2.169**	**341.688**	**0.146**	**0.000**	**3.856**	**28.139**	**0.652**	**53.278**	**1.050**	**259.376**
			upper	**84.789**	**3.574**	**200.136**	**172.665**	**709.248**	**197.936**	**687.360**	**6.235**	**56.919**	**2.183**	**61.361**	**2.681**	**348.498**

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2006

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]
OYARZUN (País Vasco)	216.39															
Lower estimate			MEAN	0.333	0.000	1.000	0.917	87.250	0.000	NI	0.025	1.102	0.033	2.451	0.154	3.063
Upper estimate			MEAN	1.250	1.000	5.583	10.083	87.667	10.000	NI	0.048	1.102	0.033	2.451	0.154	3.313
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.039	0.944	0.020	1.160	0.011	1.000
Maximum				4.000	1.000	12.000	11.000	307.000	10.000	NI	0.078	1.253	0.059	3.610	0.586	7.100
> 70 % > d.l. ?				NO	NO	NO	NO	yes	NO		NO	NO	NO	NO	NO	NO
n				***12***	***6***	***12***	***12***	***12***	4		***12***	***8***	***8***	***8***	***8***	***8***
URUMEA (País Vasco)	693.83															
Lower estimate				0.333	0.000	0.833	1.083	20.333	10.000	NI	0.073	0.499	0.029	1.808	0.105	3.100
Upper estimate				1.250	1.000	5.417	10.250	22.833	10.000	NI	0.092	0.499	0.035	1.808	0.107	3.350
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.039	0.361	0.013	0.710	0.010	1.000
Maximum				4.000	1.000	10.000	13.000	92.000	10.000	NI	0.327	0.675	0.082	3.120	0.311	9.200
> 70 % > d.l. ?				NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO
n				***12***	***6***	***12***	***12***	***12***	4		***12***	***8***	***8***	***8***	***8***	***8***
ORIA (País Vasco)	1412.85															
Lower estimate				0.000	0.000	0.000	0.000	3.000	NI	NI	0.241	1.707	0.098	3.245	0.104	24.400
Upper estimate				1.000	1.000	5.000	10.000	5.500	NI	NI	0.241	1.707	0.098	3.245	0.104	24.400
Minimum				1.000	1.000	5.000	10.000	5.000	NI	NI	0.101	1.617	0.094	2.680	0.078	20.500
Maximum				1.000	1.000	5.000	10.000	6.000	NI	NI	0.381	1.797	0.101	3.810	0.130	28.300
> 70 % > d.l. ?				NO	NO	NO	NO	NO			NO	NO	NO	NO	NO	NO
n				***2***	***2***	***2***	***2***	***2***			***2***	***2***	***2***	***2***	***2***	***2***
UROLA (País Vasco)	581.03															
Lower estimate				0.000	0.000	1.333	1.167	4.333	0.000	NI	0.082	1.682	0.099	2.080	0.208	6.088
Upper estimate				1.000	1.000	5.500	10.333	7.250	10.000	NI	0.098	1.682	0.099	2.080	0.208	6.213
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.039	1.176	0.026	1.390	0.063	1.000
Maximum				1.000	1.000	9.000	14.000	18.000	10.000	NI	0.342	3.500	0.317	3.800	0.687	21.500
> 70 % > d.l. ?				NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO
n				***12***	***6***	***12***	***12***	***12***	4		***12***	***8***	***8***	***8***	***8***	***8***
DEVA (País Vasco)	742.73															
Lower estimate			MEAN	0.000	0.000	4.417	1.167	48.333	NI	NI	1.509	1.003	0.341	4.426	0.559	13.613
Upper estimate			MEAN	1.000	1.000	7.333	10.333	48.750	NI	NI	1.509	1.003	0.341	4.426	0.559	13.613
Minimum				1.000	1.000	5.000	10.000	5.000	NI	NI	0.202	0.510	0.069	1.620	0.181	2.500
Maximum				1.000	1.000	14.000	14.000	232.000	NI	NI	4.838	1.881	0.969	8.300	1.195	44.400
> 70 % > d.l. ?				NO	NO	NO	NO	yes			yes	NO	NO	NO	NO	NO
n				***12***	***6***	***12***	***12***	***12***			***12***	***8***	***8***	***8***	***8***	***8***
ARTIBAY (País Vasco)	149.66															
Lower estimate			MEAN	0.250	0.000	0.833	1.250	2.750	0.000	NI	0.225	0.751	0.073	1.171	0.168	5.163
Upper estimate			MEAN	1.167	1.000	5.417	10.417	6.083	10.000	NI	0.231	0.751	0.075	1.171	0.168	5.288

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2006

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]
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.039	0.440	0.013	0.740	0.040	1.000
Maximum				3.000	1.000	10.000	15.000	9.000	10.000	NI	0.957	1.395	0.241	1.850	0.373	7.700
> 70 % > d.l. ?				NO	NO	NO	NO	NO	NO		yes	NO	NO	NO	NO	NO
n				***12***	***6***	***12***	***12***	***12***	4		***12***	***8***	***8***	***8***	***8***	***8***
LEA (País Vasco)	246.51															
Lower estimate			MEAN	0.000	0.000	3.833	1.250	1.167	0.000	NI	0.013	0.762	0.013	1.671	0.111	6.188
Upper estimate			MEAN	1.000	1.000	8.000	10.417	5.333	10.000	NI	0.045	0.762	0.020	1.671	0.111	6.313
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.039	0.535	0.013	0.860	0.020	1.000
Maximum				1.000	1.000	37.000	15.000	8.000	10.000	NI	0.101	1.143	0.033	5.430	0.235	29.500
> 70 % > d.l. ?				NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO
n				***12***	***6***	***12***	***12***	***12***	4		***12***	***8***	***8***	***8***	***8***	***8***
OCA (País Vasco)	301.09															
Lower estimate				0.000	0.000	5.167	1.333	3.417	0.000	NI	1.388	1.316	0.238	4.128	1.188	5.325
Upper estimate				1.000	1.000	7.667	10.500	6.333	10.000	NI	1.388	1.316	0.238	4.128	1.188	5.325
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.062	0.727	0.026	1.440	0.119	1.800
Maximum				1.000	1.000	16.000	16.000	9.000	10.000	NI	3.500	2.050	1.051	8.220	2.537	12.600
> 70 % > d.l. ?				NO	NO	NO	NO	NO	NO		yes	NO	NO	NO	NO	NO
n				***12***	***6***	***12***	***12***	***12***	4		***12***	***8***	***8***	***8***	***8***	***8***
BUTRON (País Vasco)																
Lower estimate			MEAN	0.000	0.000	2.750	1.333	8.000	0.000	NI	0.446	2.038	0.430	3.713	0.649	7.913
Upper estimate			MEAN	1.000	1.000	6.083	10.500	10.083	10.000	NI	0.449	2.038	0.430	3.713	0.649	7.913
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.039	1.364	0.065	1.580	0.292	4.000
Maximum				1.000	1.000	10.000	16.000	37.000	10.000	NI	0.996	3.179	0.819	5.920	1.170	12.100
> 70 % > d.l. ?				NO	NO	NO	NO	NO	NO		yes	NO	NO	NO	NO	NO
n				***12.000***	***6.000***	***12.000***	***12.000***	***12.000***	4.000		***12.000***	***8.000***	***8.000***	***8.000***	***8.000***	***8.000***
BARBADUN (País Vasco)	166.89															
Lower estimate			MEAN	0.000	0.000	0.750	1.417	2.667	0.000	NI	0.014	0.994	0.051	1.400	0.141	2.988
Upper estimate			MEAN	1.000	1.000	5.333	10.583	6.833	10.000	NI	0.043	0.994	0.051	1.400	0.141	3.238
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.039	0.637	0.016	0.850	0.057	1.000
Maximum				1.000	1.000	9.000	17.000	22.000	10.000	NI	0.070	1.152	0.095	2.100	0.306	11.300
> 70 % > d.l. ?				NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO
n				***12.000***	***6.000***	***12.000***	***12.000***	***12.000***	4.000		***12.000***	***8.000***	***8.000***	***8.000***	***8.000***	***8.000***
NERVION (Norte III)	730.94	730.94														
Lower estimate				0.000	0.000	0.567	0.000	47.583	0.000	0.000	0.280	1.942	0.044	3.269	0.151	11.200
Upper estimate				1.000	0.050	5.150	3.000	47.583	10.000	70.000	0.280	1.942	0.084	3.269	0.157	11.200
Minimum				1.000	0.050	5.000	3.000	22.000	10.000	70.000	0.080	0.684	0.066	2.042	0.070	3.800
Maximum				1.000	0.050	6.800	3.000	78.000	10.000	70.000	0.528	3.014	0.186	4.584	0.290	25.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***SI***	***NO***	***NO***	***SI***	***SI***	***NO***	***SI***	***SI***	***SI***
n				12.000	12.000	12.000	12.000	12.000	12.000	4.000	12.000	12.000	12.000	12.000	12.000	12.000

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2006

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]
SAJA (Norte II)	1300.75	1300.75														
Lower estimate			MEAN	0.000	0.000	0.600	0.000	82.417	0.000	0.000	0.630	0.739	0.017	2.963	0.076	9.333
Upper estimate				1.000	0.050	5.183	3.000	82.417	10.000	70.000	0.630	0.748	0.053	2.963	0.128	9.333
Minimum				1.000	0.050	5.000	3.000	37.000	10.000	70.000	0.086	0.110	0.023	1.871	0.070	3.000
Maximum				1.000	0.050	7.200	3.000	136.000	10.000	70.000	1.631	1.386	0.076	6.239	0.470	38.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***SI***	***NO***	***NO***	***SI***	***SI***	***NO***	***SI***	***NO***	***SI***
n				12.000	12.000	12.000	12.000	12.000	12.000	4.000	12.000	12.000	12.000	12.000	12.000	12.000
MIERA (Norte II)	261.95	261.95														
Lower estimate			MEAN	0.000	0.000	0.000	0.000	36.417	0.000	0.000	0.340	1.645	0.184	3.114	0.201	6.292
Upper estimate				1.000	0.050	5.000	3.000	36.500	10.000	0.000	0.340	1.645	0.195	3.114	0.212	7.542
Minimum				1.000	0.050	5.000	3.000	1.000	10.000	0.000	0.055	0.605	0.066	1.805	0.070	3.000
Maximum				1.000	0.050	5.000	3.000	71.000	10.000	0.000	0.959	4.292	0.424	5.311	0.490	30.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***SI***	***NO***	***NO***	***SI***	***SI***	***SI***	***SI***	***SI***	***NO***
n				12.000	12.000	12.000	12.000	12.000	12.000	0.000	12.000	12.000	12.000	12.000	12.000	12.000
SELLA (Norte II)	1090.37	1090.37														
Lower estimate			MEAN	0.000	0.000	0.433	0.000	35.333	0.000	0.000	0.106	0.765	0.000	1.773	0.029	3.792
Upper estimate				1.000	0.050	5.017	3.000	35.333	10.000	0.000	0.112	0.839	0.068	1.894	0.088	5.792
Minimum				1.000	0.050	5.000	3.000	15.000	10.000	0.000	0.039	0.440	0.066	1.455	0.070	3.000
Maximum				1.000	0.050	5.200	3.000	82.000	10.000	0.000	0.195	2.937	0.069	3.940	0.279	34.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***SI***	***NO***	***NO***	***SI***	***SI***	***NO***	***SI***	***NO***	***NO***
n				12.000	12.000	12.000	12.000	12.000	12.000	0.000	12.000	12.000	12.000	12.000	12.000	12.000
NALÓN (Norte II)	2489.76	2489.76														
Lower estimate				0.000	0.000	0.000	0.000	22.333	0.000	0.000	0.140	1.069	0.057	2.392	0.066	3.083
Upper estimate				1.000	0.050	5.000	3.000	22.333	10.000	70.000	0.143	1.069	0.068	2.392	0.113	4.833
Minimum				1.000	0.050	5.000	3.000	5.000	10.000	0.000	0.039	0.748	0.026	1.661	0.070	3.000
Maximum				1.000	0.050	5.000	3.000	5.000	10.000	70.000	0.601	1.408	0.142	4.410	0.320	11.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***	***NO***	***NO***	***SI***	***SI***	***SI***	***SI***	***NO***	***NO***
n				12.000	12.000	12.000	12.000	12.000	12.000	4.000	12.000	12.000	12.000	12.000	12.000	12.000
MASMA (Galicia Costa)	297.98	397.62														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.025	0.500
Upper estimate				0.200	6.800	8.740	4.400	18.000	NI	NI	0.167	4.606	0.068	1.177	0.025	17.267
Minimum				0.200	6.800	3.280	4.400	1.000	NI	NI	0.024	2.098	0.022	0.606	0.010	0.400
Maximum				0.200	6.800	14.200	4.400	43.000	NI	NI	0.329	5.654	0.164	1.437	0.056	150.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
ORO (Galicia Costa)	212.92	370.05														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.017	0.500
Upper estimate				0.200	6.800	7.005	4.400	16.825	NI	NI	0.250	2.831	0.046	0.844	0.017	6.733

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2006

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]
Minimum				0.200	6.800	1.410	4.400	1.300	NI	NI	0.104	0.000	0.010	0.558	0.004	2.000
Maximum				0.200	6.800	12.600	4.400	28.000	NI	NI	0.711	3.988	0.120	1.043	0.041	30.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
LANDRO (Galicia Costa)	385.61	592.88														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.015	0.500
Upper estimate				0.200	6.800	12.300	4.400	13.850	NI	NI	0.291	2.489	0.049	0.807	0.015	13.833
Minimum				0.200	6.800	12.300	4.400	1.400	NI	NI	0.106	1.294	0.000	0.609	0.000	0.800
Maximum				0.200	6.800	12.300	4.400	25.000	NI	NI	0.905	3.575	0.085	1.007	0.029	126.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
SOR (Galicia Costa)	875.2	527.77														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.005	0.500
Upper estimate				0.200	6.800	13.400	4.400	13.775	NI	NI	0.182	1.945	0.013	0.557	0.005	3.700
Minimum				0.200	6.800	13.400	4.400	1.100	NI	NI	0.089	1.356	0.000	0.391	0.000	0.400
Maximum				0.200	6.800	13.400	4.400	25.000	NI	NI	0.314	2.852	0.039	0.736	0.013	15.200
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	1.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
MERA (Galicia Costa)	205.93	418.03														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.007	0.500
Upper estimate				0.200	6.800	13.000	4.400	9.190	NI	NI	0.157	2.853	0.017	0.776	0.007	6.267
Minimum				0.200	6.800	13.000	4.400	0.760	NI	NI	0.043	2.310	0.001	0.596	0.001	0.400
Maximum				0.200	6.800	13.000	4.400	14.000	NI	NI	0.336	3.869	0.044	0.960	0.015	34.800
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
GRANDE DE JUBIA (Galicia Costa)	163.37	311.67														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.010	0.500
Upper estimate				0.200	6.800	13.200	4.400	11.933	NI	NI	0.236	3.991	0.026	1.084	0.010	11.033
Minimum				0.200	6.800	13.200	4.400	1.800	NI	NI	0.115	2.743	0.006	0.899	0.002	0.800
Maximum				0.200	6.800	13.200	4.400	21.000	NI	NI	0.487	4.698	0.055	1.278	0.019	37.600
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
FORCADAS (Galicia Costa)	99.80	140.70														
				0.000	0.000	0.400	0.000	0.000	NI	NI	0.020	0.100	0.001	0.020	0.008	0.500
				0.200	6.800	7.380	4.400	0.290	NI	NI	0.234	3.317	0.021	0.970	0.008	4.000
				0.200	6.800	2.360	4.400	0.290	NI	NI	0.093	0.000	0.004	0.123	0.002	0.000
				0.200	6.800	12.400	4.400	0.290	NI	NI	0.406	7.116	0.047	1.859	0.016	16.400
				NO	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2006

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]
BELELLE (Galicia Costa)	156.10	220.07														
				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.008	0.500
				0.200	6.800	7.125	4.400	1.000	NI	NI	0.179	4.473	0.021	1.157	0.008	6.000
				0.200	6.800	1.650	4.400	1.000	NI	NI	0.019	2.851	0.000	0.731	0.000	0.400
				0.200	6.800	12.600	4.400	1.000	NI	NI	0.385	6.087	0.039	1.486	0.015	32.000
				NO	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
EUME (Galicia Costa)	829.95	1,695.7														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.008	0.500
Upper estimate				0.200	6.800	12.700	4.400	12.767	NI	NI	0.250	2.410	0.020	0.750	0.008	5.267
Minimum				0.200	6.800	12.700	4.400	2.300	NI	NI	0.000	2.020	0.000	0.579	0.000	0.000
Maximum				0.200	6.800	12.700	4.400	18.000	NI	NI	0.486	2.974	0.095	0.993	0.033	15.600
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
MANDEO (Galicia Costa)	290.38	771														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.010	0.500
Upper estimate				0.200	6.800	12.400	4.400	11.250	NI	NI	0.311	4.837	0.026	1.348	0.010	3.767
Minimum				0.200	6.800	12.400	4.400	0.750	NI	NI	0.146	3.682	0.004	1.026	0.002	2.000
Maximum				0.200	6.800	12.400	4.400	25.000	NI	NI	0.898	6.533	0.052	2.051	0.018	6.400
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
MERO (Galicia Costa)	513	456.19														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.010	0.500
Upper estimate				0.200	6.800	7.480	4.400	18.333	NI	NI	0.352	6.432	0.028	1.758	0.011	10.233
Minimum				0.200	6.800	2.760	4.400	8.000	NI	NI	0.170	0.864	0.001	0.331	0.001	3.200
Maximum				0.200	6.800	12.200	4.400	36.000	NI	NI	0.554	9.902	0.057	2.475	0.020	23.600
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				2.000	2.000	2.000	2.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
ALLONES (Galicia Costa)	557.78	942.19														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.042	0.500
Upper estimate				0.200	6.800	6.980	4.400	20.497	NI	NI	0.294	7.633	0.115	1.958	0.042	8.967
Minimum				0.200	6.800	1.660	4.400	0.490	NI	NI	0.145	5.445	0.039	1.589	0.017	1.200
Maximum				0.200	6.800	12.300	4.400	43.000	NI	NI	0.586	9.852	0.337	2.392	0.116	20.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
GRANDE (Galicia Costa)	782.66	647.05														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.035	0.500
Upper estimate				0.200	6.800	13.500	4.400	7.600	NI	NI	0.282	5.824	0.094	1.513	0.035	4.033

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2006

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]
Minimum				0.200	6.800	13.500	4.400	0.290	NI	NI	0.177	3.180	0.022	1.110	0.009	0.400
Maximum				0.200	6.800	13.500	4.400	14.000	NI	NI	0.518	8.140	0.222	2.040	0.087	10.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000		5.000			12.000	12.000	12.000	11.000	11.000	12.000
CASTRO (Galicia Costa)	201.89	166.91														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.091	0.500
Upper estimate				0.200	6.800	13.500	4.400	1.200	NI	NI	0.213	2.922	0.213	0.822	0.091	3.100
Minimum				0.200	6.800	13.500	4.400	1.200	NI	NI	0.008	1.680	0.079	0.631	0.032	0.800
Maximum				0.200	6.800	13.500	4.400	1.200	NI	NI	0.442	3.971	0.671	1.071	0.293	10.400
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
JALLAS (Galicia Costa)	893.28	738.5														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.012	0.500
Upper estimate				0.200	6.800	13.700	4.400	9.550	NI	NI	0.371	5.718	0.031	1.601	0.012	3.733
Minimum				0.200	6.800	13.700	4.400	1.100	NI	NI	0.021	2.870	0.009	0.793	0.004	1.600
Maximum				0.200	6.800	13.700	4.400	18.000	NI	NI	1.032	8.277	0.083	2.506	0.036	6.800
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000		5.000			12.000	12.000	12.000	11.000	11.000	12.000
TAMBRE (Galicia Costa)	2,871.8	3,828.1														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.010	0.500
Upper estimate				0.200	6.800	6.680	4.400	12.805	NI	NI	0.442	7.057	0.047	1.907	0.018	11.567
Minimum				0.200	6.800	1.860	4.400	0.610	NI	NI	0.046	5.060	0.010	1.330	0.004	2.000
Maximum				0.200	6.800	11.500	4.400	25.000	NI	NI	1.070	9.706	0.166	2.972	0.057	55.200
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				2.000	2.000	2.000		5.000			12.000	12.000	12.000	11.000	11.000	12.000
TRABA (Galicia Costa)	2,383.0	315.6														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.112	0.500
Upper estimate				0.200	6.800	11.900	4.400	7.550	NI	NI	0.647	6.508	0.304	1.894	0.112	3.933
Minimum				0.200	6.800	11.900	4.400	1.100	NI	NI	0.175	5.416	0.032	1.451	0.011	1.600
Maximum				0.200	6.800	11.900	4.400	14.000	NI	NI	1.892	8.093	0.870	2.395	0.298	9.200
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000		5.000			12.000	12.000	12.000	11.000	11.000	12.000
ULLA (Galicia Costa)	734.4	1,337.5														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.018	0.500
Upper estimate				0.200	6.800	8.560	4.400	32.253	NI	NI	0.233	5.431	0.046	1.428	0.018	13.833
Minimum				0.200	6.800	4.420	4.400	0.760	NI	NI	0.066	4.000	0.008	1.041	0.003	0.800
Maximum				0.200	6.800	12.700	4.400	82.000	NI	NI	0.394	6.809	0.100	1.805	0.034	55.200
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000		5.000			12.000	12.000	12.000	11.000	11.000	12.000

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2006

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]
UMIA (Galicia Costa)	523.5	846.3														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.010	0.500
Upper estimate				0.200	6.800	12.300	4.400	9.600	NI	NI	0.244	2.366	0.048	0.722	0.018	9.600
Minimum				0.200	6.800	12.300	4.400	1.200	NI	NI	0.103	0.482	0.012	0.189	0.005	2.000
Maximum				0.200	6.800	12.300	4.400	18.000	NI	NI	0.434	4.131	0.112	1.069	0.038	62.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				2.000	2.000	2.000	2.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
LÉREZ (Galicia Costa)	662.12	1,248.9														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.008	0.500
Upper estimate				0.200	6.800	11.900	4.400	9.505	NI	NI	0.160	1.931	0.021	0.574	0.008	5.333
Minimum				0.200	6.800	11.900	4.400	1.010	NI	NI	0.009	1.444	0.003	0.394	0.001	0.800
Maximum				0.200	6.800	11.900	4.400	18.000	NI	NI	0.455	2.884	0.054	0.733	0.018	15.600
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
VERDUGO (Galicia Costa)	472.56	483.9														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.013	0.500
Upper estimate				0.200	6.800	7.365	4.400	6.100	NI	NI	0.150	2.013	0.030	0.582	0.013	3.800
Minimum				0.200	6.800	2.730	4.400	1.200	NI	NI	0.008	1.051	0.009	0.305	0.004	0.400
Maximum				0.200	6.800	12.000	4.400	11.000	NI	NI	0.273	3.124	0.088	0.763	0.039	21.600
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***			***YES***	***YES***	***YES***	***YES***	***YES***	***YES***
n				1.000	1.000	2.000	1.000	5.000			12.000	12.000	12.000	11.000	11.000	12.000
MIÑO (NOrte I)	4443.6	4443.6														
Lower estimate				0.000	0.000	0.000	0.000	14.000	0.000	0.000	0.088	0.991	0.000	1.995	0.000	4.708
Upper estimate				1.000	0.050	5.000	3.000	19.000	10.000	70.000	0.095	0.991	0.068	1.995	0.070	5.458
Minimum				1.000	0.050	5.000	3.000	10.000	10.000	70.000	0.039	0.649	0.066	1.652	0.070	3.000
Maximum				1.000	0.050	5.000	3.000	52.000	10.000	70.000	0.148	1.491	0.069	2.494	0.070	10.000
> 70 % > d.l. ?				***NO***	***NO***	***NO***	***NO***	***NO***	***NO***	***NO***	***SI***	***SI***	***NO***	***SI***	***NO***	***SI***
n				12.000	12.000	12.000	12.000	6.000	12.000	4.000	12.000	12.000	12.000	12.000	12.000	12.000
GUADIANA (Guadiana)	0	8,556														
Lower estimate				0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.005	0.554	0.052	0.975	0.017	27.917
Upper estimate				20.000	0.005	20.000	20.000	50.000	3.000	40.000	0.060	0.561	0.052	0.975	0.100	27.917
Minimum				20.000	0.005	20.000	20.000	50.000	3.000	40.000	0.060	0.090	0.026	0.600	0.100	7.000
Maximum				20.000	0.008	20.000	20.000	50.000	3.000	40.000	0.062	2.417	0.088	2.800	0.100	49.000
> 70 % > d.l. ?				NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES
n				12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000
PIEDRAS (Guadiana)	0	s.d.														
Lower estimate				0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.009	0.482	0.016	0.867	0.000	18.667
Upper estimate				20.000	0.005	20.000	20.000	50.000	3.000	40.000	0.064	0.504	0.017	0.867	0.100	18.667

Table 7a. Contaminant concentrations of Spanish main rivers discharging to the maritime area. 2006

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]
Minimum				20.000	0.005	20.000	20.000	50.000	3.000	40.000	0.060	0.090	0.004	0.400	0.100	8.000
Maximum				20.000	0.007	20.000	20.000	50.000	3.000	40.000	0.101	1.175	0.049	1.500	0.100	43.000
> 70 % > d.l. ?				NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	YES
n				12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000
ODIEL (Guadiana)	0	1,200														
Lower estimate				27.273	0.002	3462.727	42.727	9363.636	0.000	0.000	0.176	0.505	0.002	0.791	0.000	4.273
Upper estimate				30.909	0.007	3462.727	48.182	9363.636	3.000	40.000	0.181	0.513	0.005	0.809	0.100	4.273
Minimum				20.000	0.005	1500.000	20.000	4430.000	3.000	40.000	0.060	0.090	0.004	0.200	0.100	1.000
Maximum				40.000	0.021	5350.000	110.000	14520.000	3.000	40.000	0.515	1.310	0.007	1.400	0.100	11.000
> 70 % > d.l. ?				YES	NO	YES	YES	YES	NO	NO	YES	YES	NO	YES	NO	YES
n				11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000

Table 7b. Contaminant concentrations of Spanish tributary rivers discharging to the maritime area. 2006

Tributary 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]
Furelos (Galicia Costa)	294.44	512.25														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.025	0.500
Upper estimate				0.200	6.800	13.600	4.400	7.260	NI	NI	0.264	5.484	0.148	1.450	0.025	6.033
Minimum				0.200	6.800	13.600	4.400	0.520	NI	NI	0.100	3.843	0.021	1.055	0.010	1.600
Maximum				0.200	6.800	13.600	4.400	14.000	NI	NI	0.500	7.660	0.484	1.996	0.056	16.400
> 70 % > d.l. ?				no	no	no	no	no			si	si	si	si	si	si
n				***1***	***1***	***2***	***1***	***5***			***12***	***12***	***12***	***11***	***11***	***12***
Deza (Galicia Costa)	584.56	1509.7														
Lower estimate				0.000	0.000	0.400	0.000	0.290	NI	NI	0.020	0.100	0.001	0.020	0.017	0.500
Upper estimate				0.200	6.800	8.775	4.400	0.610	NI	NI	0.259	7.272	0.087	1.825	0.017	10.600
Minimum				0.200	6.800	4.450	4.400	0.610	NI	NI	0.010	4.605	0.030	1.557	0.004	0.800
Maximum				0.200	6.800	13.100	4.400	0.610	NI	NI	0.653	10.231	0.184	2.556	0.041	42.800
> 70 % > d.l. ?				no	no	no	no	no			si	si	si	si	si	si
n				***1***	***1***	***2***	***1***	***5***			***12***	***12***	***12***	***11***	***11***	***12***
ASUA (País Vasco)	28.728															
Lower estimate			mean	0.000	0.000	2.500	1.250	5.833	0.000	NI	0.081	1.186	0.069	1.683	0.114	16.675
Upper estimate			mean	1.000	1.000	5.833	10.417	8.333	10.000	NI	0.091	1.186	0.069	1.683	0.114	16.675
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.039	0.867	0.016	1.080	0.060	2.600
Maximum				1.000	1.000	10.000	15.000	25.000	10.000	NI	0.202	1.450	0.127	2.350	0.219	75.000
> 70 % > d.l. ?				no	no	no	no	no	no		yes	no	no	no	no	no
n				***12***	***6***	***12***	***12***	***12***	4		***12***	***8***	***8***	***8***	***8***	***8***
CADAGUA (País Vasco)	970.865															
Lower estimate			mean	0.000	0.000	1.167	1.250	4.083	0.000	NI	0.032	0.926	0.102	1.648	0.194	8.900
Upper estimate			mean	1.000	1.000	5.333	10.417	7.417	10.000	NI	0.052	0.926	0.102	1.648	0.194	8.900
Minimum				1.000	1.000	5.000	10.000	5.000	10.000	NI	0.039	0.732	0.020	1.040	0.062	2.400
Maximum				1.000	1.000	8.000	15.000	17.000	10.000	NI	0.101	1.330	0.196	2.100	0.358	21.400
> 70 % > d.l. ?				no	no	no	no	no	no		no	no	no	no	no	no
n				***12***	***6***	***12***	***12***	***12***	4		***12***	***8***	***8***	***8***	***8***	***8***
Ibaizabal	816.638															
			mean	0.000	0.000	1.250	0.000	14.375	NI	NI	0.173	1.767	0.153	2.943	0.270	10.025
			mean	1.000	1.000	5.625	10.000	15.625	NI	NI	0.173	1.767	0.153	2.943	0.270	10.025
				1.000	1.000	5.000	10.000	5.000	NI	NI	0.062	0.964	0.016	1.260	0.074	3.400
				1.000	1.000	10.000	10.000	27.000	NI	NI	0.311	2.710	0.310	4.820	0.446	13.800
				no	no	no	no	no			no	no	no	no	no	no
				8	***2***	***8***	***8***	***8***			***8***	***8***	***8***	***8***	***8***	***8***
GALINDO (País Vasco)	17.28															
Lower estimate			mean	0.000	0.000	0.000	7.000	12.000	NI	NI	0.078	1.183	0.036	1.770	0.036	12.750
Upper estimate			mean	1.000	1.000	5.000	12.000	12.000	NI	NI	0.078	1.183	0.042	1.770	0.036	12.750
Minimum				1.000	1.000	5.000	10.000	9.000	NI	NI	0.078	0.896	0.013	1.710	0.021	1.500
Maximum				1.000	1.000	5.000	14.000	15.000	NI	NI	0.078	1.470	0.072	1.830	0.050	24.000
> 70 % > d.l. ?				no	no	no	no	no			no	no	no	no	no	no
n				***2***	***2***	***2***	***2***	***2***			***2***	***2***	***2***	***2***	***2***	***2***

Table 8. Detection/Quantification limits for contaminant concentrations of Spanish inputs to the maritime area 2006

Sampling point	Type		Detection limits for contaminant concentrations -->												
			Cd	Hg	Cu	Pb	Zn	g-HCH	PCB's	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
			[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	R	(all sampling points)	1.000	1.000	5.000	10.000	5.000	10.000	10.000	0.039	0.023	0.013	0.200	0.010	1.000
Norte II (Asturias)	S	-	60.000	60.000	80.000	200.000	50.000	NI	NI	-	-	-	-	-	-
Norte II (Asturias)	I	-	50.000	5.000	80.000	200.000	50.000	NI	NI	1.000	0.100	0.050	-	0.050	-
Norte II (Cantabria)	S (lab. 1)	-	<10	<1	<10	<10	<10	NI	NI	<0,02	<0,1	S.D	<5	<0,02	<5
Norte II (Cantabria)	I (lab. 1)		<10	<1	<10	<10	<10	NI	NI	<0,02	<0,1	S.D	<6	<0,03	<5
Norte II (Cantabria)	S & I (lab. 2)		<50	<1	<50	<10	<10	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	10.000	10.000	70 (sum) 10 (individual)	0.004	0.113	0.023	1.455	0.070	3.000
Galicia Costa	S	-	100.000	0.100	100.000	100.000	100.000								
Galicia Costa	R	(all sampling points)	0.200	6.800	0.400	4.400	0.290			0.020	0.100	0.001	0.020	0.010	0.500
Guadiana & Guadalquivir (Andalucía)	S & I (lab. 1)	-	6.000	1.000	11.000	28.000	56.000	50.000	50.000	0.100	1.330	0.200	0.500	0.200	2.500
Guadiana & Guadalquivir (Andalucía)	S & I (lab. 2)	-	44.000	0.100	55.000	111.000	55.000	50.000	50.000	0.130	6.000	0.100	2.000	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.Alcalá del Río (Guadalquivir)	R	(all sampling points)	1.000	0.200	10.000	30.000	100.000	0.010	0.010	0.090	0.300	0.180	0.050	0.030	5.000

11. Sweden

Annual report on riverine inputs and direct discharges to Convention waters during the year 2006 by Sweden

Table 4b	Total riverine inputs and direct discharges to the Maritime Area in 2006 by Sweden
Table 5a	Direct discharges (sewage effluents) to the Maritime Area of the OSPAR Convention in 2006 by Sweden
Table 5b	Direct discharges (industrial effluents) to the Maritime Area of the OSPAR Convention in 2006 by Sweden
Table 5c	Total direct discharges to the Maritime area in 2006 by Sweden
Table 6a	Main riverine inputs to the Maritime Area of the OSPAR Convention in 2006 by Sweden
Table 6b	Tributary riverine inputs to the Maritime Area of the OSPAR Convention in 2006 by Sweden
Table 6c	Total riverine inputs to the maritime area in 2006 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 2006

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, sub-area 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: 2006

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 metals from point sources, especially Hg and Cd.

C. Direct discharges for the year: 2006

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 at plants larger than 2 000 pe. Total N, Total P, BOD7 and CODCr are sampled (in proportion to flow) 12 – 52 times annually. For plants larger than 20 000 pe, 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):

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:

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. Moreover, they may or may not include cooling water. A few facilities are believed to discharge large (unreported) amounts of cooling water.

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:

Direct discharges from municipal waste water treatment plants smaller than 2 000 pe have been estimated. Total N was estimated to 53 tonnes to Skagerrak and 3 tonnes to Kattegat. Total P was estimated to 1,3 tonnes to Skagerrak and 0,2 tonnes to Kattegat. In order not to disturb the time series, these contributions have not been included in Table 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):

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

The increase in industrial flow rate to Skagerrak between 2005 and 2006 is caused by a single plant, reporting cooling water in 2006 and not in 2005. Because of cooling water, industrial flow rates are not very meaningful, cf. C4.

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: 2006

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):

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 riverine input estimates for River Rönne å are comparatively less certain this year due to lack of water chemical data for August, September and October 2006. The lack of data has forced us to accept a linear interpolation of the prevailing data to fill in the gaps.

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):

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):

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:

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):

The total riverine inputs are largely on the same levels as previous years. However, see note on D.4 regarding the estimates for River Rönne å.

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:

For point sources, limits of detection differ and are generally unknown

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 2006 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	70330	0,392	0,068	37,8	13,54	133,1	NI	NI	1,123	14,56	0,259	27,1	0,829	NI
	upper		0,392	0,068	37,8	13,54	133,1	NI	NI	1,123	14,56	0,259	27,1	0,829	NI
Tributary Rivers	lower	8484	0,056	0,008	3,8	1,83	10,8	NI	NI	0,178	4,95	0,058	7,3	0,136	NI
	upper		0,056	0,008	3,8	1,83	10,8	NI	NI	0,178	4,95	0,058	7,3	0,136	NI
Total Riverine Inputs	**lower**	78814	0,448	0,076	41,6	15,37	143,9	NI	NI	1,301	19,51	0,317	34,4	0,965	NI
	upper		0,448	0,076	41,6	15,37	143,9	NI	NI	1,301	19,51	0,317	34,4	0,965	NI
DIRECT DISCHARGES															
Sewage Effluents	lower	479	0,0039	0,0049	2,243	0,102	4,762	NI	NI	1,135	NI	NI	1,781	0,075	NI
	upper		0,0039	0,0049	2,243	0,102	4,762	NI	NI	1,135	NI	NI	1,781	0,075	NI
Industrial Effluents	lower	107	0,0460	0,0006	0,112	0,086	2,254	NI	NI	NI	NI	NI	0,193	0,014	NI
	upper		0,0460	0,0006	0,112	0,086	2,254	NI	NI	NI	NI	NI	0,193	0,014	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**	586	0,0499	0,0055	2,355	0,188	7,016	NI	NI	1,135	NI	NI	1,974	0,089	NI
	upper		0,0499	0,0055	2,355	0,188	7,016	NI	NI	1,135	NI	NI	1,974	0,089	NI
UNMONITORED AREAS															
Unmonitored Areas	lower														
	upper														
REGION TOTAL	**lower**	79400	0,4979	0,0815	43,955	15,558	150,916	NI	NI	2,436	19,51	0,317	36,374	1,054	NI
	upper		0,4979	0,0815	43,955	15,558	150,916	NI	NI	2,436	19,51	0,317	36,374	1,054	NI

INPUTS TO OSPAR REGION SKAGERRAK															
RIVERINE INPUTS															
Main Rivers	lower	5132	0,037	0,007	2,4	0,82	8,8	NI	NI	0,091	0,79	0,025	1,7	0,058	NI
	upper		0,037	0,007	2,4	0,82	8,8	NI	NI	0,091	0,79	0,025	1,7	0,058	NI
Tributary Rivers	lower	5184	0,037	0,008	2,9	0,97	9,7	NI	NI	0,127	0,95	0,034	2	0,077	NI
	upper		0,037	0,008	2,9	0,97	9,7	NI	NI	0,127	0,95	0,034	2	0,077	NI
Total Riverine Inputs	**lower**	10316	0,074	0,015	5,3	1,79	18,5	NI	NI	0,218	1,74	0,059	3,7	0,135	NI
	upper		0,074	0,015	5,3	1,79	18,5	NI	NI	0,218	1,74	0,059	3,7	0,135	NI
DIRECT DISCHARGES															
Sewage Effluents	lower	64	0,0004	0,0006	0,115	0,007	0,229	NI	NI	0,147	NI	NI	0,320	0,008	NI
	upper		0,0004	0,0006	0,115	0,007	0,229	NI	NI	0,147	NI	NI	0,320	0,008	NI
Industrial Effluents	lower	181	0,0066	0,0008	0,208	0,169	0,563	NI	NI	NI	NI	NI	0,042	0,003	NI
	upper		0,0066	0,0008	0,208	0,169	0,563	NI	NI	NI	NI	NI	0,042	0,003	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**	245	0,007	0,0014	0,323	0,176	0,792	NI	NI	0,147	NI	NI	0,362	0,011	NI
	upper		0,007	0,0014	0,323	0,176	0,792	NI	NI	0,147	NI	NI	0,362	0,011	NI
UNMONITORED AREAS															
Unmonitored Areas	lower														
	upper														
REGION TOTAL	**lower**	10561	0,081	0,0164	5,623	1,966	19,292	NI	NI	0,365	1,74	0,059	4,062	0,146	NI
	upper		0,081	0,0164	5,623	1,966	19,292	NI	NI	0,365	1,74	0,059	4,062	0,146	NI
TOTAL INPUTS TO OSPAR REGIONS															
RIVERINE INPUTS															
Main Rivers	lower	75462	0,429	0,075	40,2	14,36	141,9	NI	NI	1,214	15,35	0,284	28,8	0,887	NI
	upper		0,429	0,075	40,2	14,36	141,9	NI	NI	1,214	15,35	0,284	28,8	0,887	NI
Tributary Rivers	lower	13668	0,093	0,016	6,7	2,8	20,5	NI	NI	0,305	5,9	0,092	9,3	0,213	NI
	upper		0,093	0,016	6,7	2,8	20,5	NI	NI	0,305	5,9	0,092	9,3	0,213	NI
Total Riverine Inputs	**lower**	89130	0,522	0,091	46,9	17,16	162,4	NI	NI	1,519	21,25	0,376	38,1	1,1	NI
	upper		0,522	0,091	46,9	17,16	162,4	NI	NI	1,519	21,25	0,376	38,1	1,1	NI

DIRECT DISCHARGES															
Sewage Effluents	lower	543	0,0043	0,0055	2,358	0,109	4,991	NI	NI	1,282	NI	NI	2,101	0,083	NI
	upper		0,0043	0,0055	2,358	0,109	4,991	NI	NI	1,282	NI	NI	2,101	0,083	NI
Industrial Effluents	lower	288	0,0526	0,0014	0,32	0,255	2,817	NI	NI	NI	NI	NI	0,235	0,017	NI
	upper		0,0526	0,0014	0,32	0,255	2,817	NI	NI	NI	NI	NI	0,235	0,017	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**	831	0,0569	0,0069	2,678	0,364	7,808	NI	NI	1,282	NI	NI	2,336	0,1	NI
	upper		0,0569	0,0069	2,678	0,364	7,808	NI	NI	1,282	NI	NI	2,336	0,1	NI
UNMONITORED AREAS															
Unmonitored Areas	lower														
	upper														
REGION TOTAL	**lower**	89961	0,5789	0,0979	49,578	17,524	170,208	NI	NI	2,801	21,25	0,376	40,436	1,2	NI
	upper		0,5789	0,0979	49,578	17,524	170,208	NI	NI	2,801	21,25	0,376	40,436	1,2	NI

Table 5a. Direct discharges to the maritime area in 2006 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	479	0.0039	0.0049	2.243	0.102	4.762	NI	NI	1.135	NI	NI	1.781	0.075	NI
Skagerrak	21	64	0.0004	0.0006	0.115	0.007	0.229	NI	NI	0.147	NI	NI	0.320	0.008	NI
Total:	36	544	0.0042	0.0055	2.359	0.109	4.991	NI	NI	1.281	NI	NI	2.102	0.083	NI

Table 5b. Direct discharges to the maritime area in 2006 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	107	0.0460	0.0006	0.112	0.086	2.254	NI	NI	NI	NI	NI	0.193	0.014	NI
Skagerrak	7	181	0.0066	0.0008	0.208	0.169	0.563	NI	NI	NI	NI	NI	0.042	0.003	NI
Total:	11	288	0.0526	0.0014	0.320	0.255	2.817	NI	NI	NI	NI	NI	0.235	0.017	NI

Table 5c. Direct discharges to the maritime area in 2006 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	587	0.0499	0.0055	2.355	0.188	7.016	NI	NI	1.135	NI	NI	1.975	0.089	NI
Skagerrak	28	246	0.0070	0.0014	0.323	0.176	0.792	NI	NI	0.147	NI	NI	0.362	0.011	NI
Overall total:	47	832	0.0569	0.0069	2.679	0.364	7.808	NI	NI	1.281	NI	NI	2.337	0.101	NI

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matter
(#) alternatively: Nature of receiving water
NI: No information

Table 6a. Riverine inputs to the maritime area in 2006 by Sweden

Main riverine inputs			Quantities --->												
Discharge area Kattegat, Skagerrak	Flow rate [1000 m³/d] 2006	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	1901	2030	0.026	0.0028	1.3	0.37	5.7	NI	NI	0.046	2.04	0.025	2.8	0.054	NI
Lagan	7171	7410	0.059	0.008	3.4	1.37	13.9	NI	NI	0.096	1.34	0.019	3	0.063	NI
Nissan	4320	3690	0.06	0.0078	3.1	1.3	17.6	NI	NI	0.124	0.63	0.012	1.6	0.04	NI
Ätran	4061	5070	0.049	0.0053	2.4	0.86	9.7	NI	NI	0.076	0.91	0.014	1.8	0.049	NI
Viskan	4147	3450	*0.013*	*0.0023*	*1.3*	*0.45*	*4.6*	NI	NI	0.153	1.04	0.034	2	0.101	NI
Göta älv	48730	50530	0.185	0.0418	26.3	9.19	81.6	NI	NI	0.628	8.6	0.155	15.9	0.522	NI
Bäveån	570	350	0.005	0.0009	0.3	0.13	1.3	NI	NI	0.009	0.08	0.003	0.2	0.007	NI
Örekilsälven	2592	2050	0.019	0.0041	1.4	0.49	4.9	NI	NI	0.063	0.47	0.017	1	0.038	NI
Strömsån	501	390	0.004	0.0008	0.3	0.09	0.9	NI	NI	0.012	0.09	0.003	0.2	0.007	NI
Enningdalsälven	1469	1360	0.009	0.0012	0.4	0.11	1.7	NI	NI	0.007	0.15	0.002	0.3	0.006	NI
Total:	75462	76330	0.429	0.075	40.2	14.36	141.9	NI	NI	1.214	15.35	0.286	28.9	0.886	NI

Table 6b. Riverine inputs to the maritime area in 2006 by Sweden (smaller rivers and coastal areas)

Tributary riverine inputs			Quantities --->												
Discharge area Kattegat, Skagerrak	Flow rate [1000 m³/d] 2006	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	8484		0.056	0.0076	3.8	1.83	10.8	NI	NI	0.178	4.95	0.058	7.3	0.136	NI
smaller rivers and coastal areas in Skagerrak	5184		0.037	0.0081	2.9	0.97	9.7	NI	NI	0.127	0.95	0.034	2	0.077	NI
Total:	13668		0.093	0.0157	6.7	2.8	20.5	NI	NI	0.305	5.9	0.092	9.3	0.213	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 2006 by Sweden

Total Riverine Inputs			Quantities --->												
Discharge area	Flow rate [1000 m³/d] 2006	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	78814		0.448	0.0756	41.6	15.37	143.9	NI	NI	1.301	19.51	0.317	34.4	0.965	NI
Skagerrak	10316		0.074	0.0151	5.3	1.79	18.5	NI	NI	0.218	1.74	0.059	3.7	0.135	NI
Overall total:	89130		0.522	0.0907	46.9	17.16	162.4	NI	NI	1.519	21.25	0.376	38.1	1.1	NI

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

Table 7a. Contaminant concentrations of Swedish rivers discharging to the maritime area 2006

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	1901	2,030	mean	0.031		1.52	0.353	7.41	ni	ni	0.061	1.49	0.0114	2.55	0.044	ni
Minimum				0.015		1.1	0.2	3.4			0.03	0.55	0.005	1.72	0.029	
Maximum				0.059		2.3	0.52	12			0.099	2.43	0.017	3.49	0.064	
> 70 % > d.l. ?			*yes*													
n				9	0	9	9	9			9	9	9	9	9	0
Lagan	7171	7,410	mean	0.025	0.0028	1.48	0.546	6.81	ni	ni	0.038	0.33	0.0058	0.92	0.022	ni
Minimum				0.013	0.0016	1	0.37	3.1			0.016	0.17	0.005	0.78	0.015	
Maximum				0.076	0.0038	3.5	1.2	29			0.078	0.58	0.008	1.24	0.031	
> 70 % > d.l. ?			*yes*													
n				12	12	12	12	12			12	12	12	12	12	0
Nissan	4320	3,690	mean	0.033	0.0041	2.2	0.751	12.65	ni	ni	0.098	0.41	0.0084	1.04	0.025	ni
Minimum				0.012	0.0022	0.9	0.41	4.2			0.037	0.25	0.005	0.91	0.02	
Maximum				0.079	0.0067	9.2	1.7	53			0.297	0.59	0.012	1.27	0.034	
> 70 % > d.l. ?			*yes*													
n				12	12	12	12	12			12	12	12	12	12	0
Ätran	4061	5,070	mean	0.028	0.0029	1.53	0.435	5.64	ni	ni	0.051	0.57	0.0078	1.16	0.026	
Minimum				0.008	0.0012	0.76	0.16	1.8			0.008	0.4	0.003	0.89	0.015	
Maximum				0.07	0.0069	3.1	1.6	12			0.123	0.84	0.026	1.63	0.094	
> 70 % > d.l. ?			*yes*													
n				12	12	12	12	12			12	12	12	12	12	
Viskan	4147	3,450	mean						ni	ni	0.117	0.69	0.0135	1.3	0.041	ni
Minimum											0.017	0.35	0.006	0.8	0.021	
Maximum											0.326	1.04	0.046	1.77	0.145	
> 70 % > d.l. ?			*yes*													
n				0	0	0	0	0	0		12	12	12	12	12	0
Göta älv	48730	50,530	mean	0.01	0.0021	1.42	0.433	4.18	ni	ni	0.034	0.47	0.0081	0.88	0.026	
Minimum				0.005	0.0011	1	0.2	2.3			0.014	0.34	0.004	0.66	0.013	
Maximum				0.022	0.0058	2.4	1.6	10			0.054	0.7	0.018	1.1	0.079	
> 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 detected > 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 2006

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	570	350	mean	0.019	0.0036	1.62	0.585	5.85	ni	ni	0.053	0.35	0.0132	0.96	0.035	ni
Minimum				0.011	0.0022	1.2	0.28	3.2			0.03	0.14	0.009	0.77	0.024	
Maximum				0.031	0.0057	3.7	1.2	9.9			0.104	0.56	0.019	1.13	0.069	
> 70 % > d.l. ?			*yes*													
n				11	11	11	11	11			11	11	11	11	11	0
Örekilsälven	2592	2,050	mean	0.018	0.0037	1.48	0.457	4.38	ni	ni	0.092	0.45	0.0138	1.09	0.041	
Minimum				0.01	0.0021	1.2	0.32	2.3			0.02	0.21	0.004	0.9	0.025	
Maximum				0.023	0.0056	2.1	0.79	6.6			0.271	0.72	0.027	1.29	0.095	
> 70 % > d.l. ?			*yes*													
n				12	12	12	12	12			12	12	12	12	12	
Enningdalsälven	1469	1,360	mean	0.016	0.002	0.8	0.159	2.74	ni	ni	0.016	0.24	0.0038	0.6	0.011	ni
Minimum				0.013	0.0012	0.68	0.08	1.7			0.009	0.15	0.002	0.46	0.007	
Maximum				0.021	0.0026	1.3	0.31	3.9			0.026	0.33	0.006	0.75	0.017	
> 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

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

12. United Kingdom

Annual report on riverine inputs and direct discharges to Convention waters during the year 2006 by the United Kingdom

Text report, including Tables A-E

Table 5a Sewage Effluents. Reported Maritime Area of the OSPAR Convention in 2006 by the United Kingdom

Table 5b Industrial effluents. Reported Maritime Area of the OSPAR Convention in 2006 by the United Kingdom

Table 6c Riverine inputs. Reported Maritime Area of the OSPAR Convention in 2006 by the United Kingdom

Annual Report on Riverine Inputs and Direct Discharges by The United Kingdom to Convention Waters during the year 2006

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 2006. These are included to show how inputs of the various determinands 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 2006

Table B gives the annual estimates of UK **Riverine** Inputs from 1990 to 2006

Table C gives the annual estimates of UK **Total** Inputs (direct plus riverine) from 1990 to 2006

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 2006 was a year with slightly higher rainfall and river flows than in 2005, particularly in the south and western areas of the UK. This has resulted in the total loadings (particularly riverine) to tidal waters being slightly higher, particularly into the Channel, Celtic Seas and Irish Sea. All values except for lead are well below the average value for 1990 to 2005.

C. Direct discharges for the year: 2006

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 based on modern techniques used widely in analytical laboratories and 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 determinands 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).

Where previous monitoring over a number of years has shown that levels are consistently below the detection limit, a decision may be taken to reduce sampling frequency or stop sampling altogether.

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 are expected to cover some 80% of the landmass. As direct inputs account for most significant inputs downstream of the riverine monitoring stations, it is considered that for most regions, the 90% coverage target has probably been met. However some work is currently underway to check coverage in some less populated areas of the UK where the estimates of coverage are less certain.

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 2006, and some are higher but the reasons for this are not clear. There appears to be no discernable trend between the 2005 and 2006 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 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):

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 2006 compared to 2005 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):

All values for 2006 are lower than the average value between 1990 and 2006. Levels of cadmium, mercury and zinc are slightly higher than the values for 2005, but the reasons are not clear. Generally, levels of most determinands are falling.

D. Riverine inputs for the year: 2006

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 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):

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 in 2006 was around 7% higher than in 2005, although there were significantly higher flows in the Channel (14%) the Celtic Seas (18%) and the Irish Sea (26%). The flow from the Irish Sea significantly exceeded the Long Term Average Flow.

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):

Generally speaking 2006 was a year with slightly higher rainfall and river flows than in 2005, particularly in the south and western areas of the UK. This has resulted in the total loadings (particularly riverine) to tidal waters being slightly higher, particularly into the Channel, Celtic Seas and Irish Sea.

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 quantitation 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.

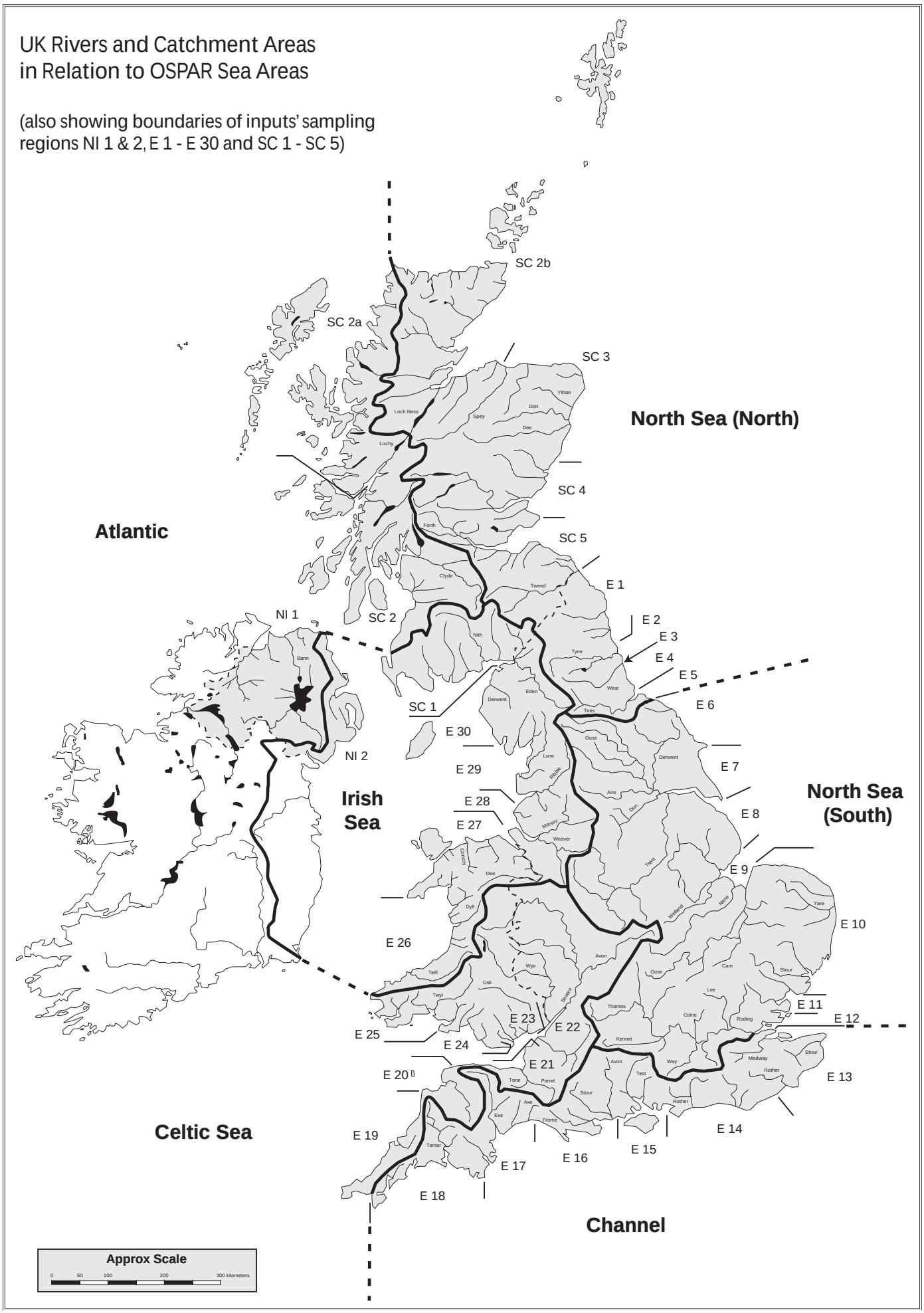
UK Rivers and Catchment Areas
in Relation to OSPAR Sea Areas
(also showing boundaries of inputs' sampling
regions NI 1 & 2, E 1 - E 30 and SC 1 - SC 5)
SC 2b
SC 2a
SC 3
SC 4
SC 5
SC 2
SC 1
NI 1
NI 2
E 1
E 2
E 3
E 4
E 5
E 6
E 7
E 8
E 9
E 10
E 11
E 12
E 13
E 14
E 15
E 16
E 17
E 18
E 19
E 20
E 21
E 22
E 23
E 24
E 25
E 26
E 27
E 28
E 29
E 30
North Sea (North)
North Sea
(South)
Atlantic
Irish
Sea
Celtic Sea
Channel
Loch Ness
Lochy
Spey
Don
Ythan
Dee
Forth
Clyde
Tweed
Nith
Tyne
Wear
Tees
Eden
Derwent
Ouse
Derwent
Lune
Ribble
Aire
Don
Mersey
Weaver
Conwy
Dee
Dyfi
Trent
Welland
Nene
Yare
Wye
Avon
Ouse
Cam
Stour
Teifi
Usk
Twyi
Severn
Thames
Lee
Colne
Roding
Kennet
Avon
Test
Way
Medway
Stour
Rother
Tone
Parret
Stour
Axe
Exe
Frome
Rother
Tamar
Bann
Approx Scale
0
50
100
200
300 kilometers

Table A: Annual Estimates of UK Direct Inputs (Sewage plus Industrial) to the OSPAR Maritime Area from 1990 to 2006

23.11.07 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	6	28	8	58	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	16	38	2	47	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	0.25	0.95	0.17	0.36	43.7	49.1	15.6	25.3	177	211	7	22	1	15	35.6	35.7	19.6	19.9	7.9	8.0	60.2	62.7	9.1	9.2	226	226
Ave UK Direct	**6.8**	**8.2**	**1.0**	**1.2**	**154.9**	**159.8**	**80.8**	**90.5**	**745.3**	**748.9**	**77.6**	**106.7**	**60.2**	**187.5**	**45.0**	**45.1**	**20.0**	**20.1**	**14.2**	**14.3**	**82.8**	**83.4**	**16.0**	**16.1**	**625.4**	**625.8**

Table B: Annual Estimates of UK Riverine Inputs to the OSPAR Maritime Area from 1990 to 2006

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	149	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		7.29	10.50	0.54	1.06	438.5	441.8	652.2	680.5	2218	2264	22	147	2	210	7.8	8.7	214.1	214.3	9.4	9.7	210.9	212.7	10.9	11.1	2388	2417
Ave UK River	279188	**7.9**	**19.4**	**1.7**	**4.2**	**411.8**	**431.4**	**374.8**	**415.6**	**1893.7**	**1944.7**	**150.2**	**355.7**	**30.5**	**1172.0**	**12.5**	**13.0**	**231.1**	**232.6**	**16.8**	**17.2**	**266.8**	**270.4**	**18.3**	**18.6**	**2046.1**	**2076.4**
LTA Flow Rate	273080																										

Table C: Annual Estimates of Total UK (Direct plus Riverine) Inputs to the OSPAR Maritime Area from 1990 to 2006

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	7.54	11.44	0.70	1.42	482.2	490.8	667.7	705.8	2396	2475	29	169	3	224	43.5	44.5	233.7	234.1	17.3	17.7	271.1	275.4	20.0	20.4	2613	2643
Ave UK Total Inputs	**14.6**	**27.6**	**2.7**	**5.4**	**566.7**	**591.2**	**455.6**	**506.1**	**2639.0**	**2693.6**	**227.8**	**462.5**	**90.7**	**1359.5**	**57.5**	**58.1**	**251.0**	**252.8**	**31.0**	**31.5**	**349.5**	**353.8**	**34.3**	**34.7**	**2671.5**	**2702.2**

Table D: Total UK (Direct plus Riverine) Inputs to the OSPAR Maritime Area in 2006 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)	3.45	3.52	0.18	0.30	70.4	71.6	377.8	378.4	1033	1049	12	32	1.8	87	10.8	11.0	35.9	35.9	2.4	2.5	58.2	58.4	3.4	3.5	743	747
North Sea (S)	0.81	1.14	0.16	0.22	63.9	63.9	49.0	51.8	261	264	3	33	0.3	47	7.9	7.9	69.9	69.9	6.5	6.5	70.9	74.3	6.5	6.5	295	296
Channel	0.39	0.48	0.08	0.13	37.6	37.9	10.1	17.3	124	128	0	14	0.0	13	7.8	7.8	24.2	24.3	1.5	1.6	25.9	25.9	1.5	1.6	200	201
RTT II Total	**4.66**	**5.15**	**0.42**	**0.64**	**172**	**173**	**437**	**448**	**1418**	**1441**	**15**	**79**	**2.2**	**147**	**26.5**	**26.8**	**130**	**130**	**10.5**	**10.6**	**155**	**159**	**11.4**	**11.6**	**1238**	**1245**
Celtic Sea	0.86	1.64	0.06	0.17	56.9	57.8	48.9	61.5	297	302	0	30	1.2	1	4.4	4.6	45.8	45.8	2.1	2.2	40.0	40.0	2.1	2.2	679	683
Irish Sea	1.74	2.85	0.18	0.45	165.9	171.4	160.8	174.7	506	547	3	38	0.1	77	7.8	8.1	42.4	42.6	2.8	2.9	50.0	50.2	3.0	3.1	455	469
Atlantic	0.28	1.80	0.04	0.16	87.4	88.3	21.1	22.1	175	185	11	22			4.9	5.0	15.5	15.5	1.9	2.0	26.1	26.6	3.4	3.4	241	247
RTT III Total	**2.88**	**6.30**	**0.28**	**0.77**	**310**	**317**	**231**	**258**	**978**	**1034**	**14**	**90**	**1.2**	**78**	**17.0**	**17.7**	**104**	**104**	**6.8**	**7.1**	**116**	**117**	**8.5**	**8.8**	**1375**	**1398**
All Sea Areas	**7.5**	**11.4**	**0.7**	**1.4**	**482.2**	**490.8**	**667.7**	**705.8**	**2395.7**	**2475.0**	**28.9**	**168.8**	**3.4**	**224.4**	**43.5**	**44.5**	**233.7**	**234.1**	**17.3**	**17.7**	**271.1**	**275.4**	**20.0**	**20.4**	**2613.3**	**2643.0**

Table DF: Total UK (Direct, including sea fish farms plus Riverine) Inputs to the OSPAR Maritime Area in 2006 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)	3.45	3.52	0.18	0.30	93.1	94.3	377.8	378.4	1036	1052	12	32	1.8	87	10.8	11.0	35.9	35.9	2.4	2.5	61.6	61.8	3.9	4.0	743	747
North Sea (S)	0.81	1.14	0.16	0.22	63.9	63.9	49.0	51.8	261	264	3	33	0.3	47	7.9	7.9	69.9	69.9	6.5	6.5	70.9	74.3	6.5	6.5	295	296
Channel	0.39	0.48	0.08	0.13	37.6	37.9	10.1	17.3	124	128	0	14	0.0	13	7.8	7.8	24.2	24.3	1.5	1.6	25.9	25.9	1.5	1.6	200	201
RTT II Total	**4.66**	**5.15**	**0.42**	**0.64**	**195**	**196**	**437**	**448**	**1421**	**1444**	**15**	**79**	**2.2**	**147**	**26.5**	**26.8**	**130**	**130**	**10.5**	**10.6**	**158**	**162**	**11.9**	**12.1**	**1238**	**1245**
Celtic Sea	0.86	1.64	0.06	0.17	56.9	57.8	48.9	61.5	297	302	0	30	1.2	1	4.4	4.6	45.8	45.8	2.1	2.2	40.0	40.0	2.1	2.2	679	683
Irish Sea	1.74	2.85	0.18	0.45	165.9	171.4	160.8	174.7	506	547	3	38	0.1	77	7.8	8.1	42.4	42.6	2.8	2.9	50.0	50.2	3.0	3.1	455	469
Atlantic	0.28	1.80	0.04	0.16	127.4	128.3	21.1	22.1	181	191	11	22			4.9	5.0	15.5	15.5	1.9	2.0	32.2	32.7	4.2	4.3	241	247
RTT III Total	**2.88**	**6.30**	**0.28**	**0.77**	**350**	**357**	**231**	**258**	**984**	**1040**	**14**	**90**	**1.2**	**78**	**17.0**	**17.7**	**104**	**104**	**6.8**	**7.1**	**122**	**123**	**9.4**	**9.6**	**1375**	**1398**
All Sea Areas	**7.5**	**11.4**	**0.7**	**1.4**	**544.9**	**553.5**	**667.7**	**705.8**	**2405.0**	**2484.3**	**28.9**	**168.8**	**3.4**	**224.4**	**43.5**	**44.5**	**233.7**	**234.1**	**17.3**	**17.7**	**280.5**	**284.9**	**21.3**	**21.7**	**2613.3**	**2643.0**

Note for the NH4-N value in tables table A, B and C, the average was calculated on base of 15 rather than 17 due to fact that 2 years early data is missing

Table E. UK Riverine Flows

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**	**2006**	**Ave 90-06**
SC2b	24	31547	34332	31547	31547	31142	31547	31547	31547	31547	31547	31574	30048	26526	29253	21617	34016	32275	31737	**30785**
SC3	8	14050	13724	17107	12503	12061	14647	15114	14050	14171	15311	14263	19616	15630	15112	15803	17311	15809	13175	**15024**
SC4	7	20766	24041	21081	20176	23820	24752	21809	18732	19954	24151	20665	26229	18653	20989	20676	22886	23212	22435	**22015**
SC5	14	8691	9385	8000	10212	11319	10434	7982	7626	7772	10254	8460	9288	6045	9481	8312	8406	8314	8429	**8807**
E1	3	8052	6476	5576	8052	7170	10024	6588	4496	8549	9716	12925	12655	10121	13603	4171	6814	9346	6777	**8415**
E2	3	3833	3610	3166	3833	4840	3480	3162	2927	3731	4233	3771	7186	2818	3528	2361	5434	3357	6650	**4005**
E3	1	908	1041	1314	908	1237	1984	919	1259	1126	1281	995	4183	2095	1560	1027	2060	1250	1337	**1505**
E4																				
E5	1	1490	348	2217	1490	2762	2170	3834	904	954	1743	3069	2184	1630	1141	975	2431	1747	2362	**1880**
N Sea (N)		**89337**	**92957**	**90008**	**88721**	**94351**	**99038**	**90955**	**81541**	**87805**	**98237**	**95722**	**111389**	**83518**	**94667**	**74942**	**97288**	**95310**	**92902**	**92315**
E6	1	533	533	533	533	533	533	533	533	533	533	150	592	777	467	248	533.1816	523.8864	228	**489**
E7	0																			
E8	9	20040	14506	15785	17351	21326	20723	14586	9843	15164	20210	25742	35228	27300	23823	22502	17526	15967	15217	**19576**
E9	9	2870	1225	1741	4464	4627	5624	4547	2711	1192	3761	6714	7574	9352	6191	4006	5822	2766	3380	**4453**
E10	8	1210	628	959	1185	3034	2415	2187	1286	976	2088	2198	3119	3284	2835	1729	2948	2292	1651	**2048**
E11	3	350	127	286	420	611	474	459	233	95	318	639	543	1090	961	464	283	138	181	**431**
E12	11	7750	4390	2658	4097	6464	5960	8195	3339	2013	6995	7730	10425	13510	10108	7464	5482	2549	4615	**6235**
N Sea (S)		**32753**	**21409**	**21962**	**28050**	**36595**	**35729**	**30507**	**17945**	**19972**	**33904**	**43174**	**57481**	**55313**	**44385**	**36413**	**32594**	**24236**	**25272**	**33232**
E13	3	1410	506	756	1125	1172	2386	2287	782	610	1370	745	2349	1756	2106	852	1437	756	1251	**1309**
E14	4	970	663	718	837	1502	1030	1751	760	914	829	1695	2350	2172	2225	934	633	545	674	**1190**
E15	2	1510	463	681	770	1993	1561	1282	944	718	1207	1162	1504	2000	1498	1512	1118	745	771	**1172**
E16	4	3020	1250	2654	2554	3253	4112	3866	2916	2538	3967	3354	2842	4042	5533	1507	2953	2611	2780	**3102**
E17	5	4450	3534	3608	5380	4227	6400	4066	3025	2786	4929	3487	5024	4014	3604	3424	3106	4147	3943	**4041**
E18	13	5098	3849	3970	5098	5698	5193	3520	3459	3280	4420	5708	6364	3832	6256	4056	4360	3346	4379	**4517**
Channel		**16458**	**10265**	**12387**	**15764**	**17845**	**20682**	**16772**	**11886**	**10845**	**16723**	**16150**	**20433**	**17816**	**21222**	**12285**	**13609**	**12151**	**13799**	**15331**
E19	2	650	774	829	999	917	786	582	784	534	819	652	1234	474	827	394	480	661	524	**722**
E20	3	2890	2883	3055	2803	3460	4372	3161	1848	2273	4556	2775	4955	2283	3161	1732	2150	2016	2645	**2949**
E21	3	865	288	1006	729	863	544	1182	194	851	1526	1383	1970	1241	1484	1014	806	1243	2211	**1090**
E22	2	11450	7082	9652	10003	10913	11533	12848	6920	6748	13731	13402	15961	15029	12806	13545	11251	10575	8585	**11211**
E23	7	12370	11131	11570	12502	9741	17221	10760	9238	9370	17190	14439	15827	11957	11297	7530	13826	9632	11867	**12065**
E24	6	2610	2348	2228	3182	3329	3137	1859	2359	2869	2878	2726	4787	3955	3208	1803	2142	2465	3927	**2894**
E25	8	5630	3068	4198	4934	7153	4849	3137	4855	5096	7576	5662	8016	8841	6322	3853	4955	5282	7801	**5623**
Celtic Sea		**36465**	**27574**	**32538**	**35152**	**36376**	**42442**	**33529**	**26198**	**27742**	**48276**	**41039**	**52750**	**43780**	**39105**	**29871**	**35299**	**31876**	**37560**	**36536**
E26	7	6190	4130	5613	5926	10300	8591	4321	5812	5564	10648	7733	9912	9419	10477	5199	8356	8764	8371	**7596**
E27	6	5500	4053	4422	5037	4220	7269	3785	3880	3952	5874	7630	8386	7086	5634	3584	5635	5946	5650	**5414**
E28	3	4840	4614	3045	5636	3633	5589	3910	3750	4062	5943	5436	7413	5934	6183	3828	6572	5195	5628	**5081**
E29	7	9920	9832	8162	8865	6950	9168	6139	4682	7387	13097	11059	10435	11067	12781	5678	7882	7385	13409	**9058**
E30	2	6580	6526	5953	7734	6113	7494	5310	4536	5552	6596	7865	10000	5459	5609	4559	5550	5205	9777	**6461**
NI2	3	1490	1490	1490	1490	1120	1490	1320	1441	2479	2033	1819	1814	994	1600	935	1303	1610	1610	**1532**
SC1	11	13880	17432	15088	34290	13880	18040	16851	14107	13880	17054	18593	20295	10468	13643	14247	15004	12550	14351	**16457**
Irish Sea		**48400**	**48077**	**43773**	**68978**	**46216**	**57641**	**41636**	**38208**	**42875**	**61245**	**60135**	**68255**	**50427**	**55927**	**38030**	**50301**	**46654**	**58795**	**51599**
NI1	7	16710	16710	16710	16710	14170	16710	16782	16539	15566	22126	20530	18547	11078	21906	11454	15370	17223	17223	**16786**
SC2	13	14640	18282	16313	18343	16632	15439	15818	13170	14420	16183	13738	18019	12842	16016	9409	16705	14017	16107	**15380**
SC2a	11	18317	20514	18317	18317	16967	18317	15772	18317	18317	18317	18317	18203	15355	20515	11370	21007	20728	19315	**18116**
Atlantic		**49667**	**55506**	**51340**	**53370**	**47769**	**50466**	**48372**	**48026**	**48303**	**56626**	**52585**	**54769**	**39275**	**58437**	**32233**	**53082**	**51968**	**52645**	**50281**
																				0
Total UK		**273080**	**255788**	**252008**	**290035**	**279152**	**305998**	**261771**	**223804**	**237542**	**315011**	**308806**	**365077**	**290129**	**313743**	**223774**	**282173**	**262195**	**280974**	**279293**

Table 4b: Total UK Riverine Inputs and Direct Discharges (including sea fish farms) to the OSPAR Maritime Area in 2006

(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	3.24	1.42	18.50	1.55	0.13	8.86	2.27	0.94	12.68	1.19	11.41
		upper	0.02	0.01	3.24	1.44	18.50	2.49	4.78	8.86	2.28	0.94	12.68	1.19	11.42
		comment													
North Sea North	**industrial**	lower	0.03	0.01	7.43	0.63	12.29	0.00	0.00	1.03	0.35	0.65	2.78	1.03	16.80
		upper	0.03	0.01	7.43	0.63	12.29	0.01	0.00	1.03	0.36	0.65	2.78	1.03	16.81
		comment													
North Sea North	**riverine**	lower	3.41	0.17	59.71	375.72	1002.03	9.97	1.71	0.95	33.28	0.83	42.74	1.17	714.78
		upper	3.47	0.29	60.89	376.38	1018.11	29.06	81.75	1.09	33.30	0.92	42.95	1.26	718.99
		comment													
North Sea North	**fish farms**	lower			22.72		3.33						3.42	0.48	
		upper			22.72		3.33						3.42	0.48	
		comment													
North Sea North		lower	3.45	0.18	93.10	377.77	1036.15	11.53	1.85	10.83	35.91	2.42	61.62	3.87	742.98
TOTAL	**sewage + industrial**	upper	3.52	0.30	94.28	378.44	1052.23	31.55	86.53	10.97	35.93	2.52	61.82	3.96	747.22
	riverine and farms	comment													
North Sea South	sewage	lower	0.05	0.02	11.27	3.79	39.69	2.62	0.00	6.10	9.80	2.91	14.86	2.91	42.82
		upper	0.09	0.03	11.27	4.16	39.69	9.96	1.87	6.13	9.83	2.92	17.17	2.92	42.94
		comment													
North Sea South	**industrial**	lower	0.04	0.06	11.47	2.26	27.91	0.01	0.00	0.44	0.03	0.02	0.25	0.02	93.99
		upper	0.06	0.06	11.47	3.04	28.82	0.02	0.04	0.44	0.03	0.02	0.25	0.02	93.99
		comment													
North Sea South	**riverine**	lower	0.73	0.07	41.15	42.97	193.55	0.23	0.35	1.33	60.02	3.57	55.78	3.57	158.34
		upper	0.98	0.13	41.16	44.60	195.60	23.49	44.63	1.37	60.02	3.57	56.92	3.57	159.45
		comment													
North Sea South	**fish farms**	lower													
		upper													
		comment													
North Sea South		lower	0.81	0.16	63.89	49.01	261.15	2.86	0.35	7.87	69.86	6.50	70.88	6.50	295.15
TOTAL	**sewage + industrial**	upper	1.14	0.22	63.90	51.80	264.11	33.47	46.54	7.94	69.88	6.51	74.33	6.51	296.39
	riverine and farms	comment													
Channel	**sewage**	lower	0.01	0.04	4.28	1.30	13.14	0.41	0.00	7.36	2.32	0.91	10.01	0.91	16.66
		upper	0.02	0.04	4.28	1.46	13.14	2.96	6.23	7.37	2.43	0.94	10.01	0.94	16.69
		comment													
Channel	**industrial**	lower	0.00	0.00	0.06	0.00	0.46	0.02	0.00	0.01	0.00	0.00	0.05	0.00	0.29
		upper	0.00	0.00	0.06	0.00	0.46	0.15	0.00	0.02	0.02	0.01	0.05	0.01	0.29
		comment													
Channel	**riverine**	lower	0.38	0.05	33.31	8.82	110.10	0.00	0.00	0.39	21.89	0.63	15.81	0.63	182.90
		upper	0.46	0.09	33.55	15.88	114.37	10.99	7.21	0.44	21.89	0.65	15.83	0.65	184.36
		comment													
Channel	**fish farms**	lower													
		upper													
		comment													
Channel		lower	0.39	0.08	37.65	10.13	123.69	0.43	0.00	7.76	24.21	1.54	25.87	1.54	199.84
TOTAL	**sewage + industrial**	upper	0.48	0.13	37.88	17.34	127.97	14.10	13.45	7.83	24.34	1.59	25.89	1.59	201.33
	riverine and farms	comment													
RTT 11		lower	4.66	0.42	194.64	436.91	1420.98	14.82	2.19	26.46	129.98	10.45	158.37	11.90	1237.98
TOTAL	**sewage + industrial**	upper	5.15	0.64	196.06	447.58	1444.30	79.11	146.51	26.75	130.15	10.62	162.04	12.07	1244.94
	riverine and farms	comment													
Celtic Sea	**sewage**	lower	0.02	0.00	1.99	0.77	13.48	0.01	0.00	3.40	0.75	0.76	3.76	0.76	7.53
		upper	0.03	0.00	1.99	1.03	13.49	1.04	0.00	3.44	0.80	0.77	3.76	0.77	7.56
		comment													
Celtic Sea	**industrial**	lower	0.06	0.00	0.40	0.94	15.36	0.00	1.18	0.15	0.00	0.00	0.01	0.00	2.72
		upper	0.06	0.00	0.40	0.95	15.36	0.00	1.25	0.15	0.00	0.00	0.01	0.00	2.72
		comment													
Celtic Sea	**riverine**	lower	0.78	0.06	54.54	47.21	268.26	0.16	0.00	0.80	45.04	1.37	36.20	1.37	669.22
		upper	1.54	0.16	55.41	59.48	272.94	28.81	0.00	0.99	45.05	1.43	36.20	1.43	672.45
		comment													
Celtic Sea	**fish farms**	lower													
		upper													
		comment													
Celtic Sea		lower	0.86	0.06	56.93	48.92	297.10	0.17	1.18	4.36	45.80	2.14	39.96	2.14	679.47
TOTAL	**sewage + industrial**	upper	1.64	0.17	57.80	61.45	301.80	29.85	1.25	4.58	45.85	2.21	39.96	2.21	682.73
	riverine and farms	comment													
Irish Sea	**sewage**	lower	0.01	0.00	1.36	0.61	16.36	0.01	0.00	4.60	1.47	0.60	6.44	0.65	8.50
		upper	0.48	0.14	6.27	8.47	49.16	3.09	0.34	4.61	1.48	0.62	6.58	0.69	8.66
		comment													
Irish Sea	**industrial**	lower	0.00	0.00	0.02	3.05	0.07	0.00	0.00	0.00	0.00	0.01	0.36	0.03	0.43
		upper	0.00	0.00	0.02	3.05	0.07	0.00	0.07	0.00	0.00	0.01	0.36	0.03	0.43
		comment													
Irish Sea	**riverine**	lower	1.73	0.17	164.53	157.17	489.39	2.76	0.07	3.15	40.97	2.19	43.25	2.34	445.77
		upper	2.37	0.30	165.13	163.13	498.26	35.21	76.19	3.51	41.13	2.27	43.25	2.41	459.41
		comment													
Irish Sea	**fish farms**	lower													
		upper													
		comment													
Irish Sea		lower	1.74	0.18	165.91	160.83	505.81	2.77	0.07	7.75	42.44	2.80	50.04	3.02	454.70
TOTAL	**sewage + industrial**	upper	2.85	0.45	171.41	174.66	547.48	38.30	76.60	8.13	42.61	2.90	50.19	3.13	468.50
	riverine & farms	comment													
Atlantic	**sewage**	lower	0.01	0.00	1.83	0.71	18.15	1.90		3.24	1.16	0.94	6.71	1.28	11.87
		upper	0.12	0.04	2.29	0.98	18.20	2.11		3.24	1.17	0.94	6.76	1.29	11.94
		comment													
Atlantic	**industrial**	lower	0.01	0.02	0.32	0.09	1.94	0.00		0.45	1.47	0.15	2.35	0.32	12.57
		upper	0.02	0.03	0.34	0.12	1.95	0.01		0.45	1.47	0.15	2.35	0.32	12.57
		comment													
Atlantic	**riverine**	lower	0.25	0.01	85.25	20.28	155.00	9.20		1.19	12.85	0.82	17.08	1.79	216.75
		upper	1.67	0.09	85.64	21.03	164.57	19.43		1.35	12.88	0.86	17.53	1.82	222.32
		comment													
Atlantic	**fish farms**	lower			40.01		6.00						6.03	0.83	
		upper			40.01		6.00						6.03	0.83	
		comment													
Atlantic		lower	0.28	0.04	127.41	21.09	181.09	11.10		4.88	15.48	1.91	32.18	4.22	241.19
TOTAL	**sewage + industrial**	upper	1.80	0.16	128.28	22.13	190.72	21.54		5.03	15.51	1.95	32.66	4.25	246.83
	riverine and farms	comment													
RTT 111		lower	2.88	0.28	350.25	230.84	984.01	14.04	1.25	16.99	103.72	6.85	122.18	9.37	1375.36
TOTAL	**sewage + industrial**	upper	6.30	0.77	357.49	258.24	1040.00	89.69	77.85	17.74	103.97	7.06	122.82	9.59	1398.06
	riverine and farms	comment													
All Sea Areas		lower	7.54	0.70	544.89	667.75	2404.99	28.85	3.44	43.46	233.70	17.30	280.55	21.28	2613.34
TOTAL	**sewage + industrial**	upper	11.44	1.42	553.55	705.82	2484.30	168.80	224.36	44.50	234.12	17.68	284.86	21.66	2643.00
	riverine and farms	comment													

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 2006 by United Kingdom

OSPAR RID data 2006 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	0.29	0.09	1.23	0.14		0.51	0.08	0.09	0.69	0.12	1.46
		upper	0.00	0.00	0.29	0.09	1.23	0.15		0.51	0.08	0.09	0.69	0.12	1.46
		comment													
182	SC3	lower	0.00	0.00	0.22	0.06	1.36	0.02		1.12	0.20	0.13	1.59	0.19	1.65
		upper	0.00	0.00	0.22	0.06	1.36	0.02		1.12	0.20	0.13	1.59	0.19	1.65
		comment													
183	SC4	lower	0.01	0.00	0.37	0.32	2.57	0.46		1.02	0.14	0.10	1.59	0.15	1.13
		upper	0.01	0.00	0.37	0.32	2.57	0.48		1.02	0.15	0.10	1.59	0.15	1.13
		comment													
184	SC5	lower	0.01	0.00	1.24	0.69	5.96	0.72		2.23	0.75	0.27	4.36	0.39	3.30
		upper	0.01	0.00	1.24	0.69	5.96	0.72		2.23	0.75	0.27	4.36	0.39	3.30
		comment													
185	E1	lower	0.00	0.00	0.05	0.00	0.61	0.00	0.00	0.10	0.05	0.02	0.10	0.02	0.05
		upper	0.00	0.00	0.05	0.00	0.61	0.02	0.13	0.10	0.05	0.02	0.10	0.02	0.05
		comment													
186	E2	lower	0.00	0.00	0.57	0.14	4.23	0.00	0.00	2.15	0.11	0.17	2.19	0.17	1.96
		upper	0.00	0.00	0.57	0.15	4.23	0.54	2.65	2.15	0.11	0.17	2.19	0.17	1.96
		comment													
187	E3	lower	0.00	0.00	0.04	0.01	0.23	0.00	0.00	0.21	0.00	0.02	0.21	0.02	0.14
		upper	0.00	0.00	0.04	0.01	0.23	0.04	0.21	0.21	0.00	0.02	0.21	0.02	0.14
		comment													
188	E4	lower			0.06	0.02	0.42			0.08	0.15				0.05
		upper			0.06	0.02	0.42			0.08	0.15				0.05
189	E5	lower	0.00	0.00	0.40	0.09	1.89	0.21	0.13	1.44	0.77	0.13	1.96	0.13	1.67
		upper	0.00	0.00	0.40	0.10	1.89	0.51	1.78	1.44	0.77	0.13	1.96	0.13	1.67
		comment													
84a	North Sea North (UK)		**0.02**	**0.01**	**3.24**	**1.42**	**18.50**	**1.55**	**0.13**	**8.86**	**2.27**	**0.94**	**12.68**	**1.19**	**11.41**
			0.02	**0.01**	**3.24**	**1.44**	**18.50**	**2.49**	**4.78**	**8.86**	**2.28**	**0.94**	**12.68**	**1.19**	**11.42**
OSPAR RID data 2006 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	0.05	0.37	0.00	0.00	0.28	0.02	0.03	0.19	0.03	0.41
		upper	0.00	0.00	0.11	0.05	0.37	0.04	0.20	0.28	0.02	0.03	0.19	0.03	0.41
		comment													
191	E7	lower	0.00		0.04	0.02	0.16	0.00	0.00	0.17	0.00	0.01	0.17	0.01	0.11
		upper	0.00		0.04	0.02	0.16	0.03	0.16	0.17	0.00	0.01	0.17	0.01	0.11
		comment											estimate		
192	E8	lower	0.00	0.00	0.55	0.08	2.05	0.00	0.00	1.52	0.07	0.11	2.13	0.11	1.98
		upper	0.00	0.00	0.55	0.09	2.05	0.17	1.50	1.52	0.08	0.11	2.13	0.11	1.98
		comment													
193	E9	lower	0.00	0.00	0.27	0.03	1.60	0.15		0.19	0.53	0.15	0.77	0.15	0.65
		upper	0.00	0.00	0.27	0.07	1.60	0.30		0.20	0.53	0.15	0.77	0.15	0.65
		comment													
194	E10	lower	0.00	0.00	0.29	0.09	1.49	0.00		0.69	0.40	0.08	1.08	0.08	0.80
		upper	0.00	0.00	0.29	0.09	1.49	0.09		0.70	0.41	0.09	1.08	0.09	0.81
		comment													
195	E11	lower	0.00	0.00	0.33	0.08	1.25	0.04		0.36	0.42	0.20	0.82	0.20	0.63
		upper	0.00	0.00	0.33	0.08	1.25	0.14		0.36	0.42	0.20	0.82	0.20	0.63
		comment													
196	E12	lower	0.04	0.02	9.68	3.44	32.76	2.42		2.89	8.37	2.32	9.70	2.32	38.24
		upper	0.08	0.02	9.68	3.76	32.76	9.19		2.90	8.37	2.32	12.01	2.32	38.34
		comment													
84b	North Sea South (UK)	lower	**0.05**	**0.02**	**11.27**	**3.79**	**39.69**	**2.62**	**0.00**	**6.10**	**9.80**	**2.91**	**14.86**	**2.91**	**42.82**
		upper	**0.09**	**0.03**	**11.27**	**4.16**	**39.69**	**9.96**	**1.87**	**6.13**	**9.83**	**2.92**	**17.17**	**2.92**	**42.94**
		comment													
OSPAR RID data 2006 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	1.09	0.18	3.18	0.18	0.00	0.89	0.67	0.23	1.69	0.23	3.98
		upper	0.00	0.00	1.09	0.21	3.18	0.70	1.30	0.89	0.67	0.24	1.69	0.24	3.98
		comment													
198	E14	lower	0.01	0.03	2.35	0.94	6.79	0.06	0.00	2.62	0.10	0.22	2.83	0.22	9.10
		upper	0.01	0.04	2.35	0.95	6.79	0.97	3.37	2.62	0.14	0.23	2.83	0.23	9.10
		comment													
199	E15	lower	0.00	0.00	0.42	0.11	1.75	0.04	0.00	1.97	0.07	0.20	2.07	0.20	1.14
		upper	0.00	0.00	0.42	0.15	1.75	0.39	1.56	1.97	0.11	0.20	2.07	0.20	1.14
		comment													
200	E16	lower	0.00		0.09	0.02	0.38	0.00		0.46	0.48	0.11	0.96	0.11	0.64
		upper	0.00		0.09	0.03	0.38	0.17		0.46	0.49	0.11	0.96	0.11	0.64
		comment													
201	E17	lower	0.00	0.00	0.28	0.04	0.74	0.11		0.84	0.57	0.07	1.42	0.07	0.84
		upper	0.00	0.00	0.28	0.11	0.74	0.51		0.84	0.58	0.08	1.42	0.08	0.85
		comment													
202	E18	lower	0.00		0.04	0.01	0.30	0.03		0.58	0.43	0.08	1.04	0.08	0.96
		upper	0.00		0.04	0.02	0.30	0.21		0.58	0.44	0.09	1.04	0.09	0.98
		comment													
86	Channel (UK)	lower	**0.01**	**0.04**	**4.28**	**1.30**	**13.14**	**0.41**	**0.00**	**7.36**	**2.32**	**0.91**	**10.01**	**0.91**	**16.66**
		upper	**0.02**	**0.04**	**4.28**	**1.46**	**13.14**	**2.96**	**6.23**	**7.37**	**2.43**	**0.94**	**10.01**	**0.94**	**16.69**
		comment												Gaps were filled by using PO4-P Data	

OSPAR RID data 2006 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		0.12	0.00	0.00	0.12	0.00	0.04
		upper	0.00	0.00	0.07	0.02	0.08	0.06		0.12	0.00	0.00	0.12	0.00	0.04
		comment													
204	E20	lower		0.00	0.04	0.01	0.41	0.00		0.01					0.40
		upper		0.00	0.04	0.03	0.41	0.08		0.01					0.40
		comment													
205	E21	lower	0.00	0.00	0.22	0.04	0.86	0.00		0.41	0.02	0.04	0.45	0.04	0.84
		upper	0.00	0.00	0.22	0.08	0.86	0.13		0.41	0.03	0.04	0.45	0.04	0.84
		comment													
206	E22	lower	0.02	0.00	1.03	0.60	6.93	0.00		2.18	0.35	0.39	2.59	0.39	4.22
		upper	0.02	0.00	1.03	0.60	6.93	0.77		2.19	0.36	0.39	2.59	0.39	4.23
		comment													
207	E23	lower	0.00	0.00	0.40	0.08	2.41			0.10		0.20		0.20	0.87
		upper	0.01	0.00	0.40	0.18	2.42			0.12		0.20		0.20	0.88
		comment													
208	E24	lower	0.00	0.00	0.14	0.02	2.55			0.55	0.30	0.09	0.45	0.09	0.63
		upper	0.00	0.00	0.14	0.09	2.55			0.56	0.32	0.09	0.45	0.09	0.63
		comment	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00
209	E25	lower	0.00		0.09	0.02	0.25			0.03	0.08	0.04	0.14	0.04	0.53
		upper	0.00		0.09	0.03	0.25			0.03	0.08	0.04	0.14	0.04	0.53
		comment													
90	Celtic Sea (UK)	lower	**0.02**	**0.00**	**1.99**	**0.77**	**13.48**	**0.01**	**0.00**	**3.40**	**0.75**	**0.76**	**3.76**	**0.76**	**7.53**
		upper	**0.03**	**0.00**	**1.99**	**1.03**	**13.49**	**1.04**	**0.00**	**3.44**	**0.80**	**0.77**	**3.76**	**0.77**	**7.56**
		comment													
OSPAR RID data 2006 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					0.20			0.00	0.04	0.01	0.06	0.01	0.03
		upper					0.20			0.00	0.04	0.01	0.06	0.01	0.03
		comment													
211	E27	lower	0.00	0.00	0.09	0.06	0.30		0.00	0.03		0.02	0.27	0.02	0.89
		upper	0.00	0.00	0.09	0.07	0.30		0.34	0.04		0.02	0.27	0.02	0.89
		comment													
212	E28	lower	0.00	0.00	0.94	0.48	10.54	0.00		4.07	0.84	0.27	4.97	0.27	5.29
		upper	0.02	0.00	0.94	0.49	10.54	2.40		4.07	0.84	0.29	4.97	0.29	5.31
		comment													
213	E29	lower	0.00	0.00	0.09	0.04	1.54			0.04	0.19	0.08	0.24	0.08	0.21
		upper	0.00	0.00	0.09	0.04	1.54			0.05	0.19	0.08	0.24	0.08	0.23
		comment													
219	E30	lower													
		upper													
		comment													
215	NI2	lower	0.01	0.00	0.16	0.00	3.43	0.01		0.33	0.35	0.20	0.61	0.24	1.82
		upper	0.46	0.14	5.06	7.85	36.23	0.68		0.33	0.35	0.20	0.76	0.26	1.93
		comment													
214	SC1	lower	0.00	0.00	0.08	0.03	0.35	0.00		0.13	0.05	0.02	0.29	0.03	0.26
		upper	0.00	0.00	0.08	0.03	0.35	0.00		0.13	0.05	0.02	0.29	0.03	0.27
		comment													
88	Irish Sea (UK)	lower	**0.01**	**0.00**	**1.36**	**0.61**	**16.36**	**0.01**	**0.00**	**4.60**	**1.47**	**0.60**	**6.44**	**0.65**	**8.50**
		upper	**0.48**	**0.14**	**6.27**	**8.47**	**49.16**	**3.09**	**0.34**	**4.61**	**1.48**	**0.62**	**6.58**	**0.69**	**8.66**
		comment													
OSPAR RID data 2006 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	0.00	0.00	0.62	0.00		0.04	0.12	0.22	0.15	0.24	0.24
		upper	0.09	0.03	0.44	0.26	0.67	0.07		0.04	0.12	0.22	0.19	0.25	0.28
		comment													
216	SC2	lower	0.01	0.00	1.78	0.70	17.33	1.88		3.16	1.02	0.71	6.50	1.03	11.56
		upper	0.03	0.00	1.80	0.70	17.33	2.03		3.16	1.03	0.71	6.50	1.03	11.59
		comment													
217	SC2a	lower	0.00	0.00	0.06	0.01	0.19	0.01		0.04	0.02	0.01	0.06	0.01	0.07
		upper	0.00	0.00	0.06	0.01	0.19	0.01		0.04	0.02	0.01	0.06	0.01	0.07
		comment													
92	Atlantic (UK)	lower	**0.01**	**0.00**	**1.83**	**0.71**	**18.15**	**1.90**		**3.24**	**1.16**	**0.94**	**6.71**	**1.28**	**11.87**
		upper	**0.12**	**0.04**	**2.29**	**0.98**	**18.20**	**2.11**		**3.24**	**1.17**	**0.94**	**6.76**	**1.29**	**11.94**
		comment													

UK Totals	lower	**0.12**	**0.07**	**23.97**	**8.61**	**119.32**	**6.50**	**0.13**	**33.56**	**17.79**	**7.05**	**54.46**	**7.70**	**98.77**
SEWAGE	upper	**0.77**	**0.26**	**29.33**	**17.53**	**152.18**	**21.65**	**13.23**	**33.66**	**17.98**	**7.13**	**56.96**	**7.81**	**99.20**

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 2006 by United Kingdom

OSPAR RID data 2006 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	4.09	0.03	0.92			0.06	0.00	0.09	0.19	0.11	2.00
		upper	0.00	0.00	4.09	0.03	0.92			0.06	0.00	0.09	0.19	0.11	2.00
		comment													
182	SC3	lower													
		upper													
		comment													
183	SC4	lower	0.00	0.00	0.03	0.00	0.07			0.02	0.01	0.01	0.04	0.02	0.03
		upper	0.00	0.00	0.03	0.00	0.07			0.02	0.01	0.01	0.04	0.02	0.03
		comment													
184	SC5	lower	0.01	0.00	2.42	0.08	6.36	0.00		0.20	0.06	0.41	1.52	0.77	11.36
		upper	0.01	0.00	2.42	0.08	6.36	0.01		0.20	0.06	0.41	1.52	0.77	11.36
		comment													
185	E1	lower													
		upper													
		comment													
186	E2	lower													
		upper													
		comment													
187	E3	lower													
		upper													
		comment													
188	E4	lower													
		upper													
		comment													
189	E5	lower	0.01	0.00	0.89	0.51	4.93			0.75	0.28	0.14	1.03	0.14	3.41
		upper	0.02	0.00	0.89	0.51	4.93			0.75	0.28	0.14	1.03	0.14	3.41
North Sea North (UK)			**0.03**	**0.01**	**7.43**	**0.63**	**12.29**	**0.00**		**1.03**	**0.35**	**0.65**	**2.78**	**1.03**	**16.80**
			0.03	**0.01**	**7.43**	**0.63**	**12.29**	**0.01**		**1.03**	**0.36**	**0.65**	**2.78**	**1.03**	**16.81**
														= Gaps were filled by using PO4-P Data	
OSPAR RID data 2006 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	0.05	10.22	0.66	4.25			0.08	0.00	0.00	0.08	0.00	84.41
		upper	0.04	0.05	10.22	1.43	5.16			0.08	0.00	0.00	0.08	0.00	84.41
		comment													
191	E7	lower													
		upper													
		comment													
192	E8	lower	0.01	0.01	1.25	1.18	15.85	0.00	0.00	0.34	0.03	0.01	0.10	0.01	9.42
		upper	0.01	0.01	1.25	1.20	15.86	0.01	0.04	0.35	0.03	0.01	0.10	0.01	9.42
		comment													
193	E9	lower	0.01	0.01	0.01	0.42	7.80	0.01		0.02		0.01	0.06	0.01	0.16
		upper	0.01	0.01	0.01	0.42	7.80	0.01		0.02		0.01	0.06	0.01	0.16
		comment													
194	E10	lower													
		upper													
		comment													
195	E11	lower													
		upper													
		comment													
196	E12	lower													
		upper													
		comment													
84	North Sea South (UK)	lower	**0.04**	**0.06**	**11.47**	**2.26**	**27.91**	**0.01**	**0.00**	**0.44**	**0.03**	**0.02**	**0.25**	**0.02**	**93.99**
		upper	**0.06**	**0.06**	**11.47**	**3.04**	**28.82**	**0.02**	**0.04**	**0.44**	**0.03**	**0.02**	**0.25**	**0.02**	**93.99**
		comment												= Gaps were filled by using PO4-P Data	
OSPAR RID data 2006 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	0.05		0.31	0.02		0.01	0.00	0.00	0.05	0.00	0.27
		upper	0.00	0.00	0.05		0.31	0.15		0.02	0.02	0.01	0.05	0.01	0.27
		comment													
198	E14	lower													
		upper													
		comment													
199	E15	lower	0.00		0.01	0.00	0.01								
		upper	0.00		0.01	0.00	0.01								
		comment													
200	E16	lower					0.13								0.02
		upper					0.13								0.02
		comment													
201	E17	lower													
		upper													
		comment													
202	E18	lower													
		upper													
		comment													
86	Channel (UK)	lower	**0.00**	**0.00**	**0.06**	**0.00**	**0.46**	**0.02**		**0.01**	**0.00**	**0.00**	**0.05**	**0.00**	**0.29**
		upper	**0.00**	**0.00**	**0.06**	**0.00**	**0.46**	**0.15**		**0.02**	**0.02**	**0.01**	**0.05**	**0.01**	**0.29**
		comment													

OSPAR RID data 2006 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	0.04	0.00	0.00	0.06	0.45			0.00	0.00	0.00	0.01	0.00	0.02
		upper	0.04	0.00	0.00	0.06	0.45			0.00	0.00	0.00	0.01	0.00	0.02
		comment													
207	E23	lower	0.00		0.25	0.17	1.11		1.18						2.61
		upper	0.01		0.25	0.17	1.11		1.25						2.61
		comment													
208	E24	lower	0.01	0.00	0.16	0.71	13.81			0.15		0.00		0.00	0.10
		upper	0.01	0.00	0.16	0.72	13.81			0.15		0.00		0.00	0.10
		comment													
209	E25	lower													
		upper													
		comment													
90	Celtic Sea (UK)	lower	**0.06**	**0.00**	**0.40**	**0.94**	**15.36**		**1.18**	**0.15**	**0.00**	**0.00**	**0.01**	**0.00**	**2.72**
		upper	**0.06**	**0.00**	**0.40**	**0.95**	**15.36**		**1.25**	**0.15**	**0.00**	**0.00**	**0.01**	**0.00**	**2.72**
		comment													
OSPAR RID data 2006 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							0.06						
		comment													
212	E28	lower		0.00		3.05							0.35		
		upper		0.00		3.05							0.35		
		comment													
213	E29	lower		0.00											
		upper		0.00											
		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	0.01	0.00	0.00	0.00	0.00	0.00	0.00
		comment													
214	SC1	lower	0.00	0.00	0.02	0.00	0.06			0.00	0.00	0.01	0.01	0.03	0.43
		upper	0.00	0.00	0.02	0.00	0.06			0.00	0.00	0.01	0.01	0.03	0.43
		comment													
88	Irish Sea (UK)	lower	**0.00**	**0.00**	**0.02**	**3.05**	**0.07**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.36**	**0.03**	**0.43**
		upper	**0.00**	**0.00**	**0.02**	**3.05**	**0.07**	**0.00**	**0.07**	**0.00**	**0.00**	**0.01**	**0.36**	**0.03**	**0.43**
		comment													
OSPAR RID data 2006 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	0.02	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.02
		upper	0.01	0.03	0.02	0.03	0.01	0.01		0.00	0.00	0.00	0.00	0.00	0.02
		comment													
216	SC2	lower	0.01	0.00	0.32	0.09	1.94			0.45	1.47	0.15	2.35	0.32	12.54
		upper	0.01	0.00	0.32	0.09	1.94			0.45	1.47	0.15	2.35	0.32	12.54
		comment													
217	SC2a	lower													
		upper													
		comment													
92	Atlantic (UK)	lower	0.01	0.02	0.32	0.09	1.94	0.00		0.45	1.47	0.15	2.35	0.32	12.57
		upper	0.02	0.03	0.34	0.12	1.95	0.01		0.45	1.47	0.15	2.35	0.32	12.57
		comment													

UK Totals	lower	**0.13**	**0.09**	**19.70**	**6.97**	**58.02**	**0.03**	**1.18**	**2.08**	**1.86**	**0.84**	**5.79**	**1.41**	126.80
INDUSTRIAL	upper	**0.18**	**0.11**	**19.72**	**7.79**	**58.94**	**0.18**	**1.35**	**2.09**	**1.88**	**0.85**	**5.79**	**1.42**	**126.81**

UK Totals	lower	**0.25**	**0.17**	**43.67**	**15.58**	**177.34**	**6.53**	**1.31**	**35.64**	**19.65**	**7.90**	**60.25**	**9.11**	**225.57**
DIRECT (Sew + Ind)	upper	**0.95**	**0.36**	**49.05**	**25.32**	**211.12**	**21.82**	**14.58**	**35.75**	**19.85**	**7.98**	**62.75**	**9.22**	**226.01**

Table 6c. Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 2006 by United Kingdom

OSPAR RID data 2006 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	0.07	0.01	6.69	2.32	32.07	4.45		0.07	1.88	0.13	2.84	0.17	32.40
		upper	0.09	0.04	6.79	2.53	41.37	8.05		0.10	1.90	0.18	3.05	0.22	35.23
		comment													
182	SC3	lower	0.12	0.01	8.56	3.00	33.65	2.03		0.21	7.68	0.17	9.13	0.09	22.29
		upper	0.12	0.01	9.51	3.01	34.80	3.05		0.22	7.68	0.18	9.13	0.10	22.70
		comment													
183	SC4	lower	0.06	0.02	11.43	4.43	38.50	2.52		0.14	8.69	0.07	11.02	0.26	50.95
		upper	0.10	0.06	11.55	4.43	38.50	2.61		0.14	8.69	0.08	11.02	0.26	51.20
		comment													
184	SC5	lower	0.07	0.01	6.65	3.64	25.74	0.94		0.19	4.32	0.13	5.79	0.32	45.00
		upper	0.08	0.02	6.65	3.64	25.74	1.00		0.19	4.32	0.13	5.79	0.32	45.00
		comment													
185	E1	lower	0.04	0.02	5.93	1.63	15.50	0.00	1.71	0.10	3.94	0.03	5.34	0.03	23.32
		upper	0.04	0.03	5.93	2.01	21.12	6.02	35.86	0.14	3.94	0.06	5.34	0.06	23.56
		comment													
186	E2	lower	2.88	0.09	15.20	327.68	812.48	0.02	0.01	0.08	3.04	0.14	3.91	0.14	494.62
		upper	2.88	0.10	15.20	327.73	812.48	5.31	21.29	0.14	3.04	0.14	3.91	0.14	494.99
		comment													
187	E3	lower	0.09	0.00	2.48	12.33	22.31	0.00	0.00	0.08	1.71	0.08	2.20	0.08	26.80
		upper	0.09	0.01	2.48	12.33	22.31	1.04	10.82	0.09	1.71	0.08	2.20	0.08	26.85
		comment													
188	E4	lower													
		upper													
		comment													
189	E5	lower	0.08	0.01	2.78	20.70	21.76	0.00	0.00	0.06	2.02	0.08	2.50	0.08	19.38
		upper	0.08	0.01	2.78	20.70	21.76	1.99	13.78	0.07	2.02	0.08	2.50	0.08	19.44
		comment													
84a	North Sea North (UK)		3.41	0.17	59.71	375.72	1002.03	9.97	1.71	0.95	33.28	0.83	42.74	1.17	714.78
			3.47	0.29	60.89	376.38	1018.11	29.06	81.75	1.09	33.30	0.92	42.95	1.26	718.99
OSPAR RID data 2006 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	0.01	0.00	0.20	0.09	1.06	0.00	0.00	0.01	0.10	0.00	0.15	0.00	1.49
		upper	0.01	0.00	0.20	0.10	1.08	0.17	1.05	0.01	0.10	0.00	0.15	0.00	1.49
		comment													
191	E7	lower													
		upper													
		comment													
192	E8	lower	0.62	0.04	23.00	32.42	138.78	0.01	0.35	0.92	32.01	2.30	29.06	2.30	69.28
		upper	0.68	0.08	23.00	32.64	140.13	14.48	26.39	0.94	32.01	2.30	29.06	2.30	69.78
		comment													
193	E9	lower	0.01	0.00	4.26	2.46	13.84	0.05	0.00	0.14	10.61	0.30	10.84	0.30	11.07
		upper	0.09	0.01	4.26	2.95	14.06	3.15	11.32	0.15	10.61	0.30	10.84	0.30	11.50
		comment													
194	E10	lower	0.01	0.00	1.42	0.53	4.27	0.00	0.00	0.04	4.16	0.09	4.25	0.09	7.70
		upper	0.02	0.01	1.43	0.69	4.71	1.47	5.31	0.04	4.16	0.09	4.25	0.09	7.86
		comment													
195	E11	lower	0.00	0.00	0.26	0.14	0.73	0.00	0.00	0.01	0.50	0.02	0.52	0.02	1.62
		upper	0.00	0.00	0.26	0.19	0.75	0.16	0.50	0.01	0.50	0.02	0.52	0.02	1.64
		comment													
196	E12	lower	0.08	0.02	12.01	7.34	34.86	0.17	0.00	0.23	12.64	0.85	10.96	0.85	67.17
		upper	0.18	0.03	12.01	8.04	34.86	4.06	0.06	0.23	12.64	0.85	12.10	0.85	67.17
		comment													
84b	North Sea South (UK)	lower	0.73	0.07	41.15	42.97	193.55	0.23	0.35	1.33	60.02	3.57	55.78	3.57	158.34
		upper	0.98	0.13	41.16	44.60	195.60	23.49	44.63	1.37	60.02	3.57	56.92	3.57	159.45
		comment													
OSPAR RID data 2006 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	0.05	0.03	5.50	4.01	16.92	0.00	0.00	0.11	2.66	0.16	4.24	0.16	55.42
		upper	0.07	0.03	5.50	4.34	16.95	1.07	3.50	0.11	2.66	0.16	4.24	0.16	55.44
		comment													
198	E14	lower	0.00	0.00	1.05	0.42	3.49	0.00	0.00	0.02	1.15	0.07	1.59	0.07	8.81
		upper	0.02	0.00	1.05	0.63	3.52	0.54	1.73	0.02	1.15	0.07	1.59	0.07	8.81
		comment													
199	E15	lower	0.00	0.01	0.51	0.06	2.14	0.00	0.00	0.03	1.76	0.03	1.80	0.03	2.84
		upper	0.03	0.01	0.53	0.55	2.53	0.66	1.98	0.03	1.76	0.03	1.80	0.03	2.92
		comment													
200	E16	lower	0.04	0.00	2.54	0.26	11.81	0.00		0.05	6.56	0.19	3.48	0.19	12.73
		upper	0.04	0.01	2.60	2.22	12.47	2.39		0.06	6.56	0.20	3.48	0.20	12.87
		comment													
201	E17	lower	0.06	0.00	3.36	1.02	10.16	0.00		0.07	4.55	0.12	4.62	0.12	19.84
		upper	0.06	0.02	3.47	3.18	12.84	3.50		0.08	4.55	0.12	4.64	0.12	20.52
		comment													
202	E18	lower	0.22	0.01	20.35	3.06	65.57	0.00		0.11	5.20	0.05	0.08	0.05	83.26
		upper	0.23	0.02	20.41	4.95	66.04	2.83		0.13	5.20	0.06	0.08	0.06	83.79
		comment													

86 Channel (UK)	lower	0.38	0.05	33.31	8.82	110.10	0.00	0.00	0.39	21.89	0.63	15.81	0.63	182.90
	upper	0.46	0.09	33.55	15.88	114.37	10.99	7.21	0.44	21.89	0.65	15.83	0.65	184.36
	comment													
OSPAR RID data 2006		1.00	5.00	6.00	2.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	3.00
UK Riverine Inputs		Cd	Hg	Cu	Pb	Zn	g-HCH	PCB	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
Table 6c		[t]	[t]	[t]	[t]	[t]	[kg]	[kg]	[kt]	[kt]	[kt]	[kt]	[kt]	[kt]
203 E19	lower	0.04	0.00	2.57	0.28	18.94	0.00		0.01	0.76	0.01	0.77	0.01	4.08
	upper	0.04	0.00	2.57	0.32	18.94	0.05		0.01	0.76	0.01	0.77	0.01	4.18
	comment													
204 E20	lower	0.05	0.00	2.74	0.66	7.23	0.12		0.04	3.53	0.04	3.59	0.04	27.19
	upper	0.05	0.01	2.77	1.99	8.49	2.29		0.05	3.53	0.04	3.59	0.04	27.29
	comment													
205 E21	lower	0.04	0.00	3.88	1.10	9.17	0.00		0.14	5.42	0.29	5.56	0.29	26.62
	upper	0.05	0.01	3.88	1.96	9.22	1.78		0.14	5.42	0.29	5.56	0.29	26.63
	comment													
206 E22	lower	0.20	0.04	18.82	17.47	76.68	0.00		0.37	20.50	0.74	11.22	0.74	186.68
	upper	0.34	0.06	18.82	17.93	76.68	9.83		0.38	20.50	0.74	11.22	0.74	186.98
	comment													
207 E23	lower	0.28	0.01	17.12	19.96	73.15	0.04		0.09	8.90	0.21	9.15	0.21	276.86
	upper	0.59	0.04	17.71	24.77	76.08	8.46		0.20	8.90	0.23	9.15	0.23	278.35
	comment													
208 E24	lower	0.16	0.00	3.87	0.96	42.51	0.00		0.05	0.80	0.02	0.73	0.02	19.77
	upper	0.21	0.01	3.89	2.68	42.56	2.13		0.07	0.80	0.03	0.73	0.03	20.20
	comment													
209 E25	lower	0.02	0.00	5.53	6.79	40.59	0.00		0.10	5.12	0.06	5.17	0.06	128.02
	upper	0.26	0.02	5.77	9.82	40.98	4.27		0.14	5.13	0.08	5.17	0.08	128.82
	comment													
90 Celtic Sea (UK)	lower	0.78	0.06	54.54	47.21	268.26	0.16		0.80	45.04	1.37	36.20	1.37	669.22
	upper	1.54	0.16	55.41	59.48	272.94	28.81		0.99	45.05	1.43	36.20	1.43	672.45
	comment													
OSPAR RID data 2006		1.00	5.00	6.00	2.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	3.00
UK Riverine Inputs		Cd	Hg	Cu	Pb	Zn	g-HCH	PCB	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
Table 6c		[t]	[t]	[t]	[t]	[t]	[kg]	[kg]	[kt]	[kt]	[kt]	[kt]	[kt]	[kt]
210 E26	lower	0.41	0.01	7.58	101.55	175.81	0.00		0.06	4.23	0.04	3.88	0.04	115.12
	upper	0.59	0.03	7.97	105.20	175.87	5.36		0.11	4.32	0.08	3.88	0.08	119.30
	comment													
211 E27	lower	0.19	0.00	31.13	6.88	88.05	0.01		0.13	3.76	0.17	1.00	0.17	50.23
	upper	0.37	0.02	31.32	8.72	88.08	3.85		0.14	3.79	0.17	1.00	0.17	51.73
	comment													
212 E28	lower	0.36	0.07	14.81	12.40	52.82	0.15	0.06	2.09	12.37	1.03	14.84	1.03	41.85
	upper	0.42	0.07	14.81	12.42	52.82	3.87	15.14	2.09	12.37	1.03	14.84	1.03	41.86
	comment													
213 E29	lower	0.58	0.07	24.14	20.77	80.42	0.00	0.01	0.69	9.03	0.70	10.16	0.70	154.32
	upper	0.61	0.09	24.14	21.09	87.04	10.32	36.50	0.73	9.03	0.72	10.16	0.72	156.82
	comment													
219 E30	lower	0.11	0.02	5.84	9.89	31.54	0.00	0.00	0.08	4.47	0.10	4.63	0.10	52.10
	upper	0.11	0.03	5.84	10.02	33.50	6.64	24.55	0.13	4.48	0.10	4.63	0.10	54.29
	comment													
215 NI2	lower	0.00	0.00	71.01	2.39	26.91	0.16		0.09	1.96	0.12	2.08	0.19	9.37
	upper	0.14	0.00	71.01	2.39	26.91	0.54		0.09	1.96	0.12	2.08	0.19	9.38
	comment													
214 SC1	lower	0.08	0.00	10.03	3.28	33.83	2.45		0.02	5.15	0.03	6.66	0.12	22.79
	upper	0.13	0.05	10.03	3.29	34.03	4.64		0.22	5.19	0.04	6.66	0.12	26.04
	comment													
88 Irish Sea (UK)	lower	1.73	0.17	164.53	157.17	489.39	2.76	0.07	3.15	40.97	2.19	43.25	2.34	445.77
	upper	2.37	0.30	165.13	163.13	498.26	35.21	76.19	3.51	41.13	2.27	43.25	2.41	459.41
	comment													
OSPAR RID data 2006		1.00	5.00	6.00	2.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	3.00
UK Riverine Inputs		Cd	Hg	Cu	Pb	Zn	g-HCH	PCB	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM
Table 6c		[t]	[t]	[t]	[t]	[t]	[kg]	[kg]	[kt]	[kt]	[kt]	[kt]	[kt]	[kt]
218 NI1	lower	0.00	0.00	66.83	10.43	91.95	0.18		0.38	5.78	0.34	6.22	0.72	77.51
	upper	1.37	0.01	66.83	10.86	91.95	6.53		0.43	5.78	0.35	6.28	0.72	77.67
	comment													
216 SC2	lower	0.13	0.01	15.71	8.70	53.34	5.46		0.80	6.58	0.41	10.03	0.57	95.40
	upper	0.17	0.05	15.73	8.72	53.54	7.35		0.87	6.58	0.41	10.03	0.57	97.93
	comment													
217 SC2a	lower	0.12	0.01	2.70	1.15	9.72	3.57		0.02	0.49	0.07	0.83	0.49	43.85
	upper	0.13	0.02	3.07	1.44	19.08	5.55		0.04	0.51	0.10	1.22	0.52	46.71
	comment													
92 Atlantic (UK)	lower	0.25	0.01	85.25	20.28	155.00	9.20		1.19	12.85	0.82	17.08	1.79	216.75
	upper	1.67	0.09	85.64	21.03	164.57	19.43		1.35	12.88	0.86	17.53	1.82	222.32
	comment													

UK Totals	lower	**7.29**	**0.54**	**438.49**	**652.17**	**2218.32**	**22.32**	**2.13**	**7.82**	**214.05**	**9.40**	**210.86**	**10.86**	**2387.76**
RIVERINE	upper	**10.50**	**1.06**	**441.76**	**680.50**	**2263.85**	**146.98**	**209.78**	**8.75**	**214.27**	**9.70**	**212.67**	**11.13**	**2416.98**

UK Totals	lower	**7.54**	**0.70**	**482.16**	**667.75**	**2395.66**	**28.85**	**3.44**	**43.46**	**233.70**	**17.30**	**271.10**	**19.97**	**2613.34**
(Direct + Riverine)	upper	**11.44**	**1.42**	**490.81**	**705.82**	**2474.97**	**168.80**	**224.36**	**44.50**	**234.12**	**17.68**	**275.41**	**20.36**	**2643.00**

Table 8: Limits of Detection and Limits of Quantitation 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	1.39	0.13	5.77	variable		0.04	0.1	0	0.1	0	2
	Industrial effluent	0.1	0.009	1.39	0.13	5.77	variable		0.04	0.1	0	0.1	0	2
	Riverine input	0.02	0.009	0.05	0.05	0.79	variable		0.04	0.1	0	0.1	0	2
SC2A, SC2B, SC3	S	0.003	0.0024	0.4 / 4.0 *	0.09	1.5 / 4.0 *	variable		0.005	0.0034	0.008	0.095	0	1.1
	I	0.003	0.0024	0.4 / 4.0 *	0.09	1.5 / 4.0 *	variable		0.005	0.0034	0.008	0.095	0	1.1
	R	0.003	0.0024	0.4 / 4.0 *	0.09	1.5 / 4.0 *	variable		0.005	0.0034	0.008	0.095	0	1.1
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 Quantitation (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	0.25	0.25	3	4	3.0	2	3.0	2

		Limit of Quantitation												
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	10	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 quantitated under the stated conditions of the test.

- **Limit of quantitation / 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.

Appendix 1

Statistical information on river catchment areas

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**		**11139**	1949-2006
		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**						**1,885**	1991-2006
		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:								
Coastal area	2308	*France*		*100*	0.61	*100*	2764	1989 - 2006
Canche	3895	*France*		*100*	0.38	*100*	4579	1961 - 2006
Somme	5916	*France*		*100*	0.59	*100*	3197	1963 - 2006
Béthune et Bresle	2153	*France*		*100*	0.16	*100*	2074	1998 - 2006
Saane	1718	*France*		*100*	0.16	*100*	2938	1996 - 2006
Seine	64953	*France*		*100*	13.94	*100*	44842	1974 - 2006
Andelle	789	*France*		*100*	0.05	*100*	691	1972 - 2006
Eure	6023	*France*		*100*	0.60	*100*	2246	1971 - 2006
Coastal area	2439	*France*		*100*	0.93	*100*	1599	1989 - 2006
Risle	2545	*France*		*100*	0.16	*100*	1642	1976 - 2006
Dives	1815	*France*		*100*	0.11	*100*	1296	1968 - 2006
Douve	1474	*France*		*100*	0.08	*100*	625	1989 - 2006
Orne	2976	*France*		*100*	0.40	*100*	2506	1984 - 2006
Seulles	547	*France*		*100*	0.06	*100*	346	1970 - 2006
Touques	1311	*France*		*100*	0.10	*100*	1037	1981 - 2006
Vire	2077	*France*		*100*	0.15	*100*	2246	1993 - 2006
Coastal area	1302	*France*		*100*	0.16	*100*	1174	1989 - 2006

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]
Sélune et Sée	1623	*France*		*100*	0.09	*100*	1987	1994 - 2006
Sienne	1135	*France*		*100*	0.09	*100*	1328	1989 - 2006
Aulne	4312	*France*		*100*	0.52	*100*	6653	1969 - 2006
Rance et Couesnon	2848	*France*		*100*	0.27	*100*	2160	1983 - 2006
Coastal area	4961	*France*		*100*	0.49	*100*	3654	1989 - 2006
	119122	=Total of rivers discharging in ZONE II			20.10		91,582	
Blavet et Scorff	4649	*France*		*100*	0.50	*100*	5702	1982 - 2006
Coastal area	2868	*France*		*100*	0.32	*100*	4558	1989 - 2006
Vilaine	10144	*France*		*100*	0.90	*100*	5443	2001 - 2006
Coastal area	3636	*France*		*100*	0.82	*100*	2847	1989 - 2006
Loire	110178	*France*		*100*	6.67	*100*	73526	1868 - 2006
Sèvre Nantaise	4664	*France*		*100*	0.52	*100*	4234	1993 - 2006
Lay	4522	*France*		*100*	0.39	*100*	3456	1971 - 2006
Sèvre Niortaise	4363	*France*		*100*	0.42	*100*	4752	1992 - 2006
Coastal area	291	*France*		*100*	0.02	*100*	239	1989 - 2006
Boutonne	2141	*France*		*100*	0.14	*100*	1754	1989 - 2006
Charente	7526	*France*		*100*	0.43	*100*	5357	1979 - 2006
Coastal area	1172	*France*		*100*	0.09	*100*	446	1989 - 2006
Seudre	988	*France*		*100*	0.06	*100*	432	1971 - 2006
Eyre	2036	*France*		*100*	0.03	*100*	1814	1967 - 2006
Coastal area	2810	*France*		*100*	0.10	*100*	2264	1989 - 2006
Dordogne	14605	*France*		*100*	0.55	*100*	21859	1997 - 2006
Isle	8472	*France*		*100*	0.40	*100*	6912	1971 - 2006
Coastal area	870	*France*		*100*	0.09	*100*	647	1989 - 2006
Dropt	2672	*France*		*100*	0.21	*100*	1989	1989 - 2006
Garonne	38227	*France*		*100*	2.24	*100*	40003	1966 - 2006
Lot	11541	*France*		*100*	0.35	*100*	12614	2000 - 2006
Coastal area	3875	*France*		*100*	0.75	*100*	10983	1989 - 2006
Coastal area	3105	*France*		*100*	0.15	*100*	2501	1989 - 2006
Adour	7977	*France*		*100*	0.37	*100*	7690	1920 - 2006
Bidouze	1041	*France*		*100*	0.04	*100*	938	1989 - 2006
Gaves réunis	5504	*France*		*100*	0.32	*100*	17453	1925 - 2006
Luy	1367	*France*		*100*	0.10	*100*	1814	1966 - 2006
Nive	1153	*France*		*100*	0.12	*100*	3197	1968 - 2006
Coastal area	644	*France*		*100*	0.10	*100*	1825	1989 - 2006
	263040	=total of rivers discharging in ZONE IV			17.19		247,250	
Statistical Information provided by Germany:								
Ems	15552						7690	1941-2006
		Germany	13152	85.00	3.75	85		
		Netherlands	2400	15.00	0.6	15		
Weser	46306	*Germany*	-	-	9.0	-	31541	1941-2003
Elbe	148268		148268	100	25.11	-	74500	1926-2003
		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	-	2391	1974-2006
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

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]
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				
		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	1941-2006
		Germany	13152	85.00	3.75	85		
		Netherlands	2400	15.00	0.6	15		

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

Statistical Information provided by Norway:								
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:								
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:								

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]
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	
Cadagua		Spain						
Asua		Spain						
Galindo		Spain						
Ibaizabal		Spain						
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	
Pas	620	Spain	606	97				
Eo	818	Spain	715	87				
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
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
Furelos		Spain						
Deza		Spain						
Traba	122	Spain	122	100	0.004	100	316	1970-2005
Ulla	2803	Spain	2803	100	0.104	100	1337	1971-2005
	156	Spain	156	100				
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
Guadaira		Spain						
Tinto	1727	Spain	1727	100	0.090	100	178	1966-1995
Guadalquivir	63241	Spain	63241	100	4.966	100	3423	1942-88
Guadiamar								
Guadalete	3360	Spain	3360	100	0.555	100	413	
TOTAL	**356726**	**Spain**	**301093**	**84.4**	**20.907**	**NI**	**70553**	
		Portugal	**55515**	**15.6**	**NI**			
		TOTAL	**356608**	**100**				
Statistical Information provided by Sweden:					2005			
Vege å (95)	498	Sweden	498	100	0.0430	100	440	1961-1990
Rönne å (96)	1890	Sweden	1890	100	0.0903	100	2030	1961-1990
Stensån (97)	284	Sweden	284	100	0.0065	100	350	1961-1990

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]
Lagan (98)	6444	Sweden	6444	100	0.1181	100	7410	1961-1990
Genevadsån (99)	225	Sweden	225	100	0.0046	100	350	1961-1990
Fylleån (100)	359	Sweden	359	100	0.0092	100	650	1961-1990
Nissan (101)	2682	Sweden	2682	100	0.0834	100	3690	1961-1990
Suseån (102)	441	Sweden	441	100	0.0074	100	640	1961-1990
Ätran (103)	3343	Sweden	3343	100	0.0657	100	5070	1961-1990
Himleån (104)	214	Sweden	214	100	0.0127	100	330	1961-1990
Viskan (105)	2201	Sweden	2201	100	0.1236	100	2760	1961-1990
Rolfsån (106)	723	Sweden	723	100	0.0281	100	1030	1961-1990
Kungsbackaån (107)	310	Sweden	310	100	0.0404	100	410	1961-1990
Göta älv (108)	50230	Sweden	42780.00	85.20	0.8776	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	0.0226	100	350	1961-1990
Örekilsälven (110)	1327	Sweden	1327	100	0.0138	100	2050	1961-1990
Strömsån (111)	253	Sweden	253	100	0.0056	100	390	1961-1990
Enningsdalsälven (112)	704	Sweden	704	100	0.0029	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) (SC	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
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) (SC	NI	-	-	-	NI	-	NI	NI
South Esk (Tayside) (SC	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

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]
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
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

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]
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