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GUIDELINES FOR THE THIRD POLLUTION LOAD COMPILATION (PLC-3)

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GUIDELINES FOR THE THIRD POLLUTION LOAD COMPILATION

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PART A: GENERAL INFORMATION

I Objectives of the Pollution Load Compilations (PLCs)

According to Paragraph 1 of Article 6 of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1974 (Helsinki Convention) the Contracting Parties undertake to take all appropriate measures to control and minimize land-based pollution of the marine environment of the Baltic Sea Area.

In implementing the objectives of the Convention, the Helsinki Commission needs reliable data on inputs to the Baltic Sea from land-based sources in order to develop its environmental policy and to assess the effectiveness of measures taken to abate the pollution. Such data are also required for evaluation of the state of the open sea and coastal waters.

The objectives of periodic pollution load compilations (PLCs) of the Baltic Sea from land-based sources are defined as:

1. to compile the direct inputs of important pollutants entering the Baltic Sea from different sour ces on the basis of harmonized monitoring methods;

2. to follow-up the changes in the pollution load from various sources;

3. to determine the priority order of different sources and pollutants for the pollution of the Baltic Sea;

4. to assess the effectiveness of measures taken to reduce the pollution load; and

5. to provide information for assessment of the state of the marine environment in the open sea and coastal zones.

The task of PLC has been carried out in stages.

II The three stages of PLCs

The First Pollution Load Compilation (PLC-l)

The results of PLC-l were published in the Baltic Sea Environment Proceedings, BSEP, No 20 in 1987. It was a first attempt to compile very heterogenous data that had been submitted to the Commission on various occasions. Due to various sources of information there were differences in the reliability and age of data and also gaps in the data sets. Assuming that the values were often preliminary or based on very rough background information, PLC-l was recommended to be used with caution.

The Second Pollution Load Compilation (PLC-Z)

PLC-2 was exercised as a pilot programme aiming at a basic coverage of major direct sources of pollution. In order to improve the quality of compilation the Scientific-Technological Committee (STC) during 1988-1989 developed the Guidelines for PLC-2 that provided a harmonized methodological basis for collection and evaluation of data on national level. The Guidelines were adopted by the Commission within HELCOM Recommendation 10/4 and officially defined the aim of PLC, the measuring year (1990), pollution sources and parameters to be controlled as well as unified methodology for measurements, calculations and reporting.

The results of PLC-2 were published in the Baltic Sea Environment Proceedings, BSEP, No 45 in 1993. The Report contained the generalized data characterizing the major pollution sources and loads with respect to nine subregions of the Baltic Sea and the Baltic Sea as a whole. The initial national information and input data were written on floppy disks thus enabling the use of data in different model calculations.

Though the results of PLC-2 were still far from desirable, the second stage of the Project was a definite step forward as it provided more reliable data on total loads on the Baltic Sea than the first compilation. Moreover, due to political changes in the Baltic Region it became possible to improve the reporting in the course of the project and to collect more detailed data than originally intended.

PLC-2 also provided a valuable experience to be taken into account in preparation of the next stage of the Project – PLC-3 -as it revealed the causes of major uncertainties and weak points that should be avoided in the future. One of the main lessons from PLC-2 was an urgent need to establish a quality assurance system and to implement a data entry system with close relation to a data base before the next stage of the Project could start.

The Third Pollution Load Compilation (PLC-3)

The Guidelines for PLC-3 have been prepared by the Lead Countries – Estonia and Germany -with the assistance of experts from all Contracting Parties and are based on the advice of the Seminar on Monitoring of Pollution Load (14 – 16 April 1993, Gdansk) and informal expert meeting on PLC-3 (15 – 16 June 1993, Tallinn).

The Guidelines comprise the experience gained during PLC-2 and are aimed at preparation of the next Pollution Load Compilation that might serve to a wider extent the purposes of HELCOM Programme Implementation Task Force, Technological Committee and Environment Committee.

An important prerequisite for successful implementation of the PLC-3 project is that all Contracting Parties ensure the inclusion of agreed obligatory parameters of PLC-3 to their national pollution control programmes and exercise the agreed measuring and analysing procedures.

III Classification of the inputs to be considered in PLC-3

PLC-3 is dealing with direct discharges into the marine environment of the Baltic Sea. The main pollution sources to be included into the PLC-3 report are as follows.

1. Riverine Inputs into the Baltic Sea

. monitored rivers
. partly monitored rivers
. non-monitored rivers

2. Discharges from point sources into the Baltic Sea *)

. Municipal effluents
  . treated
  . untreated

. Industrial effluents
  . treated
  . untreated

. Aquaculture inputs
  . fish farming

3. Diffuse Inputs from the coastal zone into the Baltic Sea

. Agriculture
. Forestry
. Non-managed lands

Airborne pollution load is not to be dealt with in PLC-3. Information about airborne pollution load should be collected by EGAP and published simultaneously with the PLC-3 report.

IV Parameters to be reported

Parameters to be reported are divided into obligatory and voluntary ones correspondingly to their nature and also by taking into account the detection limits of substances in different water flows (Table 1).

Footnote:

*) Municipalities and industries discharging to the rivers down-stream the lowest water quality monitoring station should he considered as sources with direct discharges. Overflows and by-passes are to be included wherever information is available.

TABLE 1: PARAMETERS TO BE REPORTED

PARAMETERS	RIVERINE INPUTS	MUNICIPAL EFFLUENTS*)	INDUSTRIAL EFFLUENTS*)	AQUACULTURE	DIFFUSE INPUTS
BOD-7	+[1)]	+	+[3)]		
COD-Mn	v				
COD-Cr			+		
TOC	v	v	v		
s s	v	+[4)]	+[4)]		
AOX	v		+[3)]		
TOT-P	+	+	+	+	
PO4-P	+	v	v		
TOT-N	+	+	+	+	
NH4-N	+	v	v		
NO2-N	v	v	v		
NO3-N	+	v	v		
Hg	+	+	+		
Cd	+	+	+		
Zn	+	+	+		
cu	+ 1)	+ 2)	+ 3)		
Pb	+	+	+		
Ni	v	v	+		
Cr	v	v	+		

Footnote:

+ – obligatory; v – voluntary;

1) except for rivers where BOD, and heavy metal concentrations are below detection limit

2) heavy metals are obligatory for urban areas bigger than 10,000 PE

3) BOD,, AOX and heavy metals are obligatory parameters for relevant industries if these parameters are regulated by sector-wise HELCOM Recommendations

4) only for untreated municipal or industrial effluents

*) In those cases were the results recorded are less than the limits of quantitation, the load estimate should be supplied assuming that the real concentration is half of the limit of quantitation. This load estimate has to be marked with a "<".

V Reporting Format – Data handling

The Helsinki Commission decided to set up the Data Base for pollution load data without extra costs for the Commission within the HELCOM-data consultant, EDC in order to enable direct exchange between different HELCOM Data Bases (HELCOM 14/18, Paragraph 6.18). For this purpose the national data should be submitted using the reporting format on floppy disks.

Unified Data Entry System has to be developed by data manager on the basis of these Guidelines and provided to the Contracting Parties in the course of the year 1994.

VI Division of the Baltic Sea Drainage Area

Division of the Baltic Sea into sub-regions and relevant abbreviations are the following (Figure 1):

Bothnian Bay		BOB
Bothnian Sea	-	BOS
Archipelago Sea		ARC
Gulf of-Finland	-	GUF
Gulf of Riga	-	GUR
Baltic Proper	-	BAP
Western Baltic	-	WEB
The Sound	-	s o u
The Kattegat		KAT

For better comparison the load figures should be presented separately for each sub-region.

The borders between the different sub-regions are the following:

Bothnian Bay

The Bothnian Bay is the northern part of the Gulf of Bothnia. The southern border between the Bothnian Bay and the Bothnian Sea is on the imaginary line OSTNÄS-HELMÖN-VAASA.

Bothnian Sea

The Bothnian Sea is the southern part of the Gulf of Bothnia.
The southern border of the Bothnian Sea is on the imaginary line SIMPNÄS KLUBB – SÖDERARM – SVENSKA BJÖRN – KÖKARSÖREN – NYHAMN – SÄLSKÄR – UUSIKAUPUNKI.

Archipelago Sea

The Archipelago Sea is situated between the Bothnian Sea and the Baltic Proper. The border between the Archipelago Sea and the Baltic Proper is on the imaginary line NYHAMN – KÖKARSÖREN – HANKO.

Gulf of Finland

The Gulf of Finland is situated in the eastern part of the Baltic Sea. The border between the Baltic Proper and the Gulf of Finland is on the imaginary line HANKO – PÕÕSASPEA.

Gulf of Riga

The Gulf of Riga is situated in the eastern part of the Baltic Proper and has three separated border lines with the Baltic Proper. The western border is on the imaginary line OVISI – SÕRVE and PAMMANA – SÕRU, the northern border is on the imaginary line PÕÕSASPEA – TAHKUNA.

The Moonsund belongs to the Gulf of Riga.

Baltic Proper

The Baltic Proper is the central part of the Baltic Sea.

The Baltic proper borders are determined by the sub-region borders.

Western Baltic

The Western Baltic consists of the Bay of Mecklenburg, the Kiel Bight, the Little Belt and the Great Belt. The northern border of the Western Baltic is on the imaginary line HASSENSOR – GNIBEN and the southern border on the GEDSER – DARSSER ORT line.

The Sound

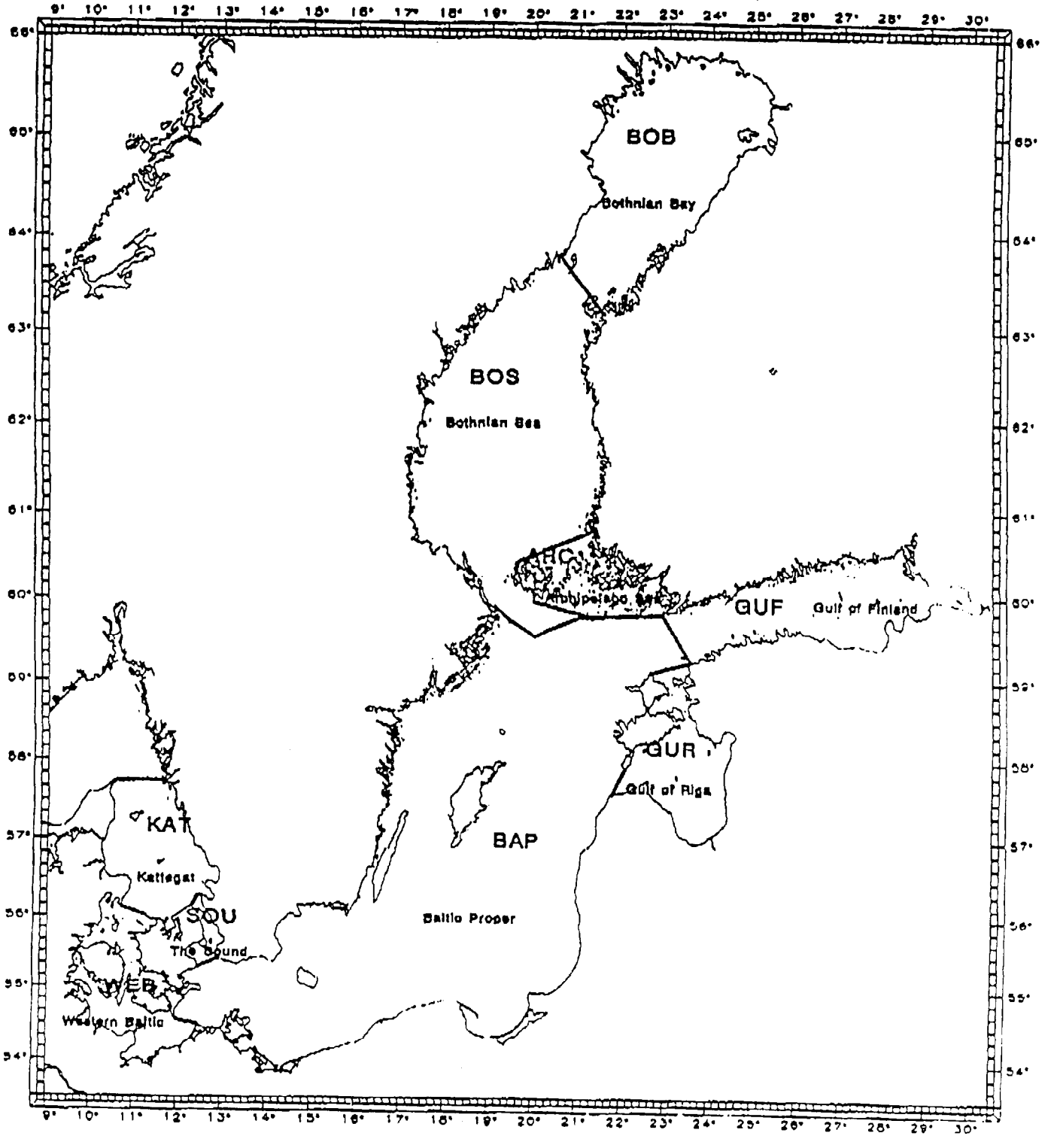
The borders of the Sound are determined by the imaginary lines STEVNS KLINT – FALSTERBO and GILLELEJE – KULLEN.

The Kattegat

The Kattegat comprises the waters between the Danish and Swedish coasts within the imaginary lines HASSENSOR - GNIBEN and GILLELEJE – KULLEN – SKAGEN – BJORKO – LILLEBY.

FIGURE 1

Division of the Baltic Sea for the Third Baltic Sea Pollution Load Compilation



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MUDAB (Meeresumwelt-Datenbank)
UBA-UMPLIB/BSH

PART B: METHODOLOGY FOR ASSESSING DIRECT DISCHARGES TO THE BALTIC SEA

I Riverine inputs

The objective is to obtain an estimate as precise as possible of the input load via rivers in terms of tonnes per annum. The calculation will be made on the basis of water quality monitoring data and hydrological observations. The load must be reported separately for every monitored and partly monitored river. The load from non-monitored rivers should be reported as a sum of them.

I.1 Flow measurement and calculation

For rivers with hydrological stations the location of hydrological stations, measurement equipment, frequency of level and flow measurement as well as methods for calculation of annual runoff are regulated by the WMO Guide to Hydrological Practices {1}.

For rivers without permanent hydrological stations the flow measurement, equipment and methods for measurement and calculations of annual runoff are also regulated by the WMO Guide {1}.

For determination of load the frequency of flow measurement should correspond to the sampling frequency and be carried out at least 12 times per year for rivers without permanent hydrological stations.

The measurements should cover low, mean and high river flow, i.e. the data need not to be collected at regular monthly intervals but should reflect more the annual river flow pattern. Continuously controlled equipment (e.g. current meters) and carefully performed measurements together with an accurate calculation can diminish errors.

I.2 Sampling strategy: site selection and sampling frequency

The sampling regime should be designed on the basis of historical records. The objective should be to cover the whole flow cycle (low, mean and high river flow) but should concentrate on periods of expected high river flow. Past experience has shown that there is a positive correlation between periods of high river flow and high input load, especially for heavy metals, suspended solids and nutrients.

For all rivers a minimum of 12 data sets should be available collected over a year in order to estimate the annual input load. The data sets have not to be collected at regular monthly intervals but at a frequency which appropriately reflects the expected river flow pattern.

The site should be in an area where the water is well mixed (such as at a weir or immediately downstream of a weir) and, therefore, of uniform quality.

The representativeness of the sampling points in the cross-section must be checked.
Standards IS0 5667-6{2} and IS0 5667-9{3} should be used.