JOINT FINAL REPORT

ON FINDINGS
OVER PARALLEL AUDITS OF IMPLEMENTATION
OF THE PROVISIONS OF THE CONVENTION
ON THE PROTECTION OF THE MARINE ENVIRONMENT
OF THE BALTIC SEA AREA
(HELSINKI CONVENTION)

conducted by

The National Audit Office of Denmark
The State Audit Office of Estonia
The State Audit Office of Finland
The State Audit Office of the Republic of Latvia
State Control of the Republic of Lithuania
The Supreme Chamber of Control of the Republic of Poland
Accounts Chamber of the Russian Federation
The Swedish National Audit Office

Warsaw, September 2001

CONTENTS

I. GENERAL PART

1. Audit description

The audits were conducted in parallel by the Supreme Audit Institutions (SAI) of the following Contracting Parties to the Helsinki Convention:

- The National Audit Office of Denmark
- The State Audit Office of Estonia
- The State Audit Office of Finland
- The State Audit Office of the Republic of Latvia
- State Control of the Republic of Lithuania
- The Supreme Chamber of Control of the Republic of Poland
- Accounts Chamber of the Russian Federation
- The National Audit Office of Sweden

on the basis of the Common Position on Co-operation and the Assumptions of the Audit Programme prepared by the experts representing the Parties in Warsaw, and signed in Stockholm in May 2000.

Because of a limited possibility of participation in the co-operation, the Federal Court of Audit of Germany declared to submit relevant information received from the Federal Environmental Agency.

The audits were undertaken on the initiative of the Supreme Chamber of Control of the Republic of Poland, with consideration of the INTOSAI and EUROSAI guidelines on initiating and conducting international and regional audits of the implementation of tasks arising from provisions of international agreements related to environment protection.

The objective of the audits were to assess the implementation of the provisions of the Helsinki Convention of 1992, previously encompassed by the 1974 Convention, related to the protection of the Baltic Sea against land-originating pollution, in particular:

- examining whether national legislation takes into account the provisions of the Helsinki Convention related to the protection of the Baltic Sea against pollution,

- examining whether control procedures and measures are in place in this respect,
- examining the use of public funds for the implementation of tasks related to the protection of the Baltic Sea waters,
- audit of the non-point sources of pollution, mainly from agriculture,
- audit of land-based point pollution sources, regarding mainly urban zones and municipal wastewater treatment plants.

The audits covered the period between 1996 and 1999.

The Co-operating Parties conducted the audits in accordance with their competencies and possibilities. Each SAI is responsible for its own audit and for how it is presented in the general part of the report. In the audits was examined whether there are systems to abate the environmental problems and, within stated and limited extent, whether these systems in practice are enough to solve the environmental problems.

Auditing was carried out during the second half of 2000 and the first quarter of 2001. The audit findings were presented in the second quarter of 2001 in the form of national reports. Summaries of these reports served as a basis for preparation of this Joint Final Report.

The audit co-operation on the Implementation of the Provisions of the Helsinki Convention is so far the most extensive in the field of co-operation between SAIs.

Individual national reports, including more details and audit findings, constitute an integral part of this report and are presented as items 1-8 of Chapter II.

The Federal Court of Audit of Germany sent information received from the Federal Environmental Agency concerning municipal wastewater treatment plants and industrial enterprises discharging sewage to the German part of the Baltic Sea catchment area. The information comprises reports submitted in 1999 and 2000 to the Helsinki Commission as part of reporting rounds on implementation of the HELCOM recommendations. Because the documents are very extensive and the information is already accessible in the HELCOM database, they were not included in this report.

2. Introduction

The Baltic Sea is one of the largest seas with brackish waters. Its average salinity amounts to 7.5 per mille. The total area of the Baltic Sea is 415 K km^2 and constitutes 0.4 per cent of the Atlantic Ocean area. Average depth of the Baltic is 55 m, while its total capacity totals 20 K km^3.

The Baltic Sea Area has been by agreement divided into regions: Baltic Interim (Baltic Straits – the Sund and the Belts, the Kiel Gulf, the Gulf of Meklenburg), Southern Baltic (the Depth of Arcona, the Depth of Bornholm, the Middle Shell, the Gully of Slupsk, the Depth of Gdansk), Baltic Proper (Basin of Gotland, the Depth of Landsort), Gulf of Riga, Gulf of Finland and Bothnian Bay (Annex 1).

The catchment area of the Baltic is four times greater than its water surface and amounts to 1,720.3 K km^2. It is the region with a number of rivers carrying large water volumes, such as: Neva, Vistula, Kemijoki, Daugava, Nemunas, Oder and others, which bring to the Baltic about 440 km^3 of water per annum.

The Baltic Sea catchment area is currently occupied by about 80 million people, out of which 16 million live in the coastal strip, nearby the seashores. [1]

The Baltic plays the role of a final pollution receptor for nine, highly industrialised countries. This poses a special danger to its waters in the light of adverse hydrological conditions, which are characterised by slow processes of exchange of waters with the North Sea.

In the past years, inflows of water from the North Sea into the Baltic occurred – on average – every 11 years. It is estimated that full exchange of the Baltic Sea waters can take place over the period of 25-30 years.[2]

Intensive economic development of the Baltic states – dynamic urban development, development of industry and agriculture in the region – caused tremendous production of waste, sewage, and gaseous pollutants, which contaminated water, soil and air, leading as a consequence to the pollution and degradation of the Baltic Sea environment.

During the last century the Baltic Sea changed its character from oligotrophic to eutrophic with high concentration of nutrients in the marine water. The following phenomena were noted: excessive amounts of algae and algal blooms, growth of primary production, serious oxygen deficit in deep water layers, serious changes in

[1] Assessment of pollutants discharge to the Baltic Sea (PLC – 3 Polish part), MEPNR&F – 1996, Fig. 2

[2] "Helsinki Convention versus the protection of the environment of the Baltic Sea", Helcom 1995

sea-floor biocenoses. In addition, growing concentration of toxic substances, mainly organic compounds of chlorine and heavy metal was noticed.

The distribution of impact that pollutants have on the Baltic Sea waters is uneven. The most exposed areas are those along the coast, especially in the vicinity of point, land-based pollution sources, such as outlets of municipal main sewers, river mouths, harbours, and other industrial facilities.

The highest degree of pollution in the Baltic Sea is recorded in its southern and eastern parts – in bays, lagoons, and river mouth, e.g. in Gulf of Riga, Kuron Lagoon, Vistula Lagoon, Gdansk Bay, Szczecin Lagoon.

Pollution of the Baltic Sea originates from various sources located both on land and sea:

- land-based point sources such as points of sewage discharge to surface waters, river mouths of tributary rivers, outlets of gaseous pollutants into the air,
- land-based non-point sources, such as surface run-offs of pollutants from agricultural or industrial land, wind-borne dispersion of gaseous pollutants that are carried to waters together with precipitation,
- sea-based sources, such as ships, dumping of waste or dredging spills from harbour and shipyard canals.

Assessment of the loads of organic pollutants, nutrients, and heavy metals brought into the Baltic Sea in 1995 by tributary river waters, and discharged from coastal areas and direct sources, shows that[3]:

- input of pollutants from tributary rivers and coastal areas was 1,140 K tonnes of BOD_7[4] load; the highest loads of organic pollutants were discharged to the Baltic Proper (426 KT) and to the Gulf of Finland (181 KT);
- the load of total nitrogen discharged to the Baltic Sea was 761 KT, 90% of which entered the sea from the tributaries and 10% directly from the coastal areas. The highest load of nitrogen was discharged to the Baltic Proper (277 KT) and to the Gulf of Finland (95 KT);
- the load of total phosphorus discharged to the Baltic Sea was 37.6 KT, 72% of which entered the sea from the tributary rivers and the remaining 28% directly from the coastal areas;
- the load of heavy metals discharged to the Baltic Sea was: mercury – 13,3 T, cadmium – 23,6 T, zinc – 4032 T, copper – 1595 T, and lead – 337 T.

[3] "Third Pollution Load Compilation of the Baltic Sea" (PLC-3), HELCOM 1998.
[4] Biochemical Oxygen Demand

Taking took into account hydrological and ecological characteristics of the Baltic Sea area and the sensitivity of its living resources caused by changes of the marine environment, countries located around the Baltic Sea, on the initiative of Finland, signed on 22 March 1974 the Convention on Protection of the Marine Environment of the Baltic Sea.

The scope of the Helsinki Convention covered the entire Baltic Sea, together with the Kattegat, but excluding the Skagerrak and marine internal waters of the Contracting Parties.

The text of the Convention consisted of 29 articles regulating forms and methods of co-operation of the Contracting Parties and 6 annexes specifying subject of co-operation, lists of hazardous substances, harmful substances and materials, provisions concerning prevention of pollution from land-based sources and ships, provisions on prohibition of dumping of waste and other matter in the sea, and co-operation over combating marine pollution.

The task of co-ordination of the implementation and compliance with the provisions of the Convention was given, on the basis of the Convention, to the special body – the Helsinki Commission (HELCOM).

Because of economic and social changes in the Central and Eastern Europe and because of the need for comprehensive system of rules concerning protection of the Baltic Sea, the Helsinki Convention of 1974 was amended and extended in 1992.

The Helsinki Convention of 1992 was signed in Helsinki on 9 April 1992 by Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, and Sweden, and on 24 September 1992 by the European Economic Community. All the Contracting Parties listed above ratified the Convention before the end of 1999. The Depository of ratification documents is, similarly as in the case of 1974 Convention, the Government of Finland.

The area encompassed by the Helsinki Convention was extended as to cover the Baltic Sea Area, comprising the Baltic Sea itself, internal marine waters of the Contracting Parties, and the entrance to the Baltic Sea bounded by the parallel of the Skaw in the Skagerrak at $57^{0}44'43"$ N. [5]

The convention consists of 38 articles and 7 annexes – the scope is wider than that of the previous document. New provisions address:

1) Inclusion of the internal waters of the Contracting Parties into the area covered by the Convention (Art. 1),

[5] Helsinki Convention of 1992 – Art.1

2) Use of Best Environmental Practice and Best Available Technology (Annex. II to the Convention),
3) Environmental impact assessment of proposed activities (art.7),
4) Prohibition of incineration in the Baltic Sea Area (Art.10),
5) Notification and consultation on pollution incidents (Art.13),
6) Nature conservation and biodiversity (Art.15),
7) Reporting and exchange of information (Art.16),
8) Information to the public (Art.17),
9) Prevention of pollution from offshore activities (Annex VI to the Convention).

The objective of the Convention is realised on the basis of jointly made decisions and agreements, joint declarations and guidelines and broad co-operation in environmental protection that includes also co-operation in science and technology.

The Baltic Marine Environment Protection Commission (HELCOM), established by the 1974 Helsinki Convention remains the Commission in the understanding of the new Convention. The Commission executes its role in the implementation of the Convention through specialised Committees, which appoint and supervise groups of experts.

Ministers of the Environment of the Baltic States adopted, at the Helsinki Conference in 1992, the Programme of the Protection of the Baltic Sea, thus expressing their will to actively implement the goals of the Convention.

The Joint Comprehensive Baltic Programme is a long-term programme, scheduled over 20 years and focused on activities and actions that should enable restoration of the state of environmental equilibrium in the Baltic Sea. Among its 6 main directions, the Programme includes investment projects aimed at the reduction of pollution caused by 132 “hot-spots” – point and non-point pollution sources, most dangerous to the Baltic Sea environment. (Annex 2).

Protection of the marine environment of the Baltic Sea requires significant expenditure by all countries of the region. The pace at which the restoration of natural values of the Baltic Sea takes place is dependent on the cost-effective use of those funds and environmental effects achieved.

3. Important audit findings

The auditing research encompassed activities undertaken by the parties to the Helsinki Convention towards an abatement of pollutants discharged to the Baltic Sea from land-based sources in the period 1996-1999, i.e. after the last "The Third Periodical Assessment of the State of the Marine Environment of the Baltic Sea, 1989-93" was completed in 1995.

In the following, we give some examples of the measures taken in the different countries. As stated in Chapter 1, each SAI is responsible for its own audit and for how it is presented. In the audits was examined whether there are systems to abate the environmental problems and, within stated and limited extent, whether these systems in practice are enough to solve the environmental problems.

Implementation of the provisions of the Helsinki Convention into national legislation

Maximum permissible values

In Denmark, the Action Plan for the Aquatic Environment was enacted in 1987. The Plan assumed that all sewage, prior to its discharge to surface waters, must be treated in a wastewater treatment plant to the highest degree possible. In 1996 new requirements concerning emission of pollutants were introduced, based on the EU Aquatic Environment Directive.

In Russia the law on the protection of waters against pollution is based on the provision of sufficient quality of water for drinking and fish breeding purposes. Therefore, standards set forth for wastewater discharged into surface waters are more restrictive than those required by the Helsinki Convention.

Quality requirements concerning sewage discharged into waters were also defined in Estonia, Finland, Lithuania, Latvia, Poland, and Sweden. In two countries standards for certain pollutants are temporarily less demanding than in those required by the Convention.

Fees for sewage discharges

In Estonia, fees for pollutant discharge into water were raised by 2-3 times from the 1996 levels. In the period audited, fees due for pollution emission to the environment, including waters, were paid to the Environmental Fund. Since the year 2000, they are paid to the state budget from where allocations are made to the Centre

of Environmental Investments. The amount of fees collected by the Fund in the period 1996-1999 grew from EEK 1.7 to 6.2 million.

In five audited voivodships in Poland, in the audited period, the Governors issued decisions to enterprises concerning fees for sewage discharge into surface waters amounting in total to PLN 2.2 million.

The agricultural sector

In Finland, an agri-environment programme has been implemented since about five years.

Between 1997 and 1999, Lithuanian Ministry of Agriculture adopted preventive recommendations concerning reduction of pollution from diffused sources, developed the project on Ecological Agriculture, elaborated standards for use of fertilisers as well as principles and recommendations on current methods of land cultivation.

In Poland, standardising of rules for use and trading of pesticides was initiated in 1995, and the principles of fertiliser application were introduced in 2000.

In Sweden, a regulation on environmental protection in agriculture is in force, which contains special provisions aiming at the reduction of nutrients entering waters from farmyard manure and plant production. Additional guidelines concerning the reduction of nutrient leakage are distributed under advisory and information programmes run by the Swedish Board of Agriculture and the agricultural units at the County Administrative Boards. Subsidies were introduced in 1995 for implementation of tasks aimed at the reduction of adverse impact of agriculture on the environment.

Priority tasks

In 1995-1999, the Estonian Ministry of the Environment was implementing the Water Protection Programme that set forth the tasks resulting from international agreements, including investment projects concerning, inter alia, the "hot-spots" of the HELCOM list. In addition, in 1996 Estonia adopted a procedure of preparation and implementation of the Public Investment Programme. Under this procedure, regional environmental protection departments submit 6-monthly reports on both physical and financial progress of investment projects.

In Finland, tasks related to the protection of the Baltic Sea were incorporated into many national programmes, mainly into the Water Protection Programme envisaged until 2005 and into, based on this, the Water Protection Action Plan. The latter directs activities in water protection towards the reduction of discharges from

the largest pollution sources in the Baltic Sea catchment area to the levels allowing the Finnish "hot-spots" to be withdrawn from the HELCOM list.

In Poland, measures have been adopted resulting from the National Environmental Policy and its Executive Programme. The documents identified priority directions for actions and resulting investment projects aiming towards, e.g. the reduction of pollutant loads discharged to the Baltic. Tasks focusing on the abatement of pollution loads that enter the Baltic Sea are the priority in financing of projects by the National Fund for Environmental Protection and Water Management.

Similar programmes and strategies were prepared and implemented in Denmark, Latvia and Lithuania. The draft Programme for Improvement of Environmental Conditions in the Baltic Sea Catchment Area was elaborated in the Russian Federation.

Supervision and control over compliance with the provisions of the Helsinki Convention concerning protection of the marine environment of the Baltic Sea against pollution from land-based sources.

In Denmark there is a double-stage supervision system, encompassing the governmental-level supervision exercised by the Danish Environmental Protection Agency, limited to a few areas, and the regional-level supervision carried out by regional and municipal authorities. Requirements in force on the relevant levels are agreed between the Minister of Environmental Protection and Energy and the National Association of Local Authorities of Denmark. Since 1996, regional authorities are requested to conduct annual inspection of 50% of enterprises included in the list and to submit to the DEPA reports from their activity. The Agency evaluates the reports received and prepares the annual report, entitled "Environmental Supervision".

In Estonia, correct functioning of the system of control of pollution discharges is ensured by its multi-layer structure and the fact that all sewage treatment plants are verified by well established and/or accredited independent laboratories.

In Latvia, the control over compliance with the environmental protection law is exercised by the Environmental State Inspectorate and Regional Environmental Boards. In the period 1996-1999, inspectors of the Environmental State Inspectorate carried out 14394 controls; average of irregularities was approximately 23% of the audited enterprises. As a result, fines were imposed in the total amount of EUR 55 355. The Latvian system of surface waters monitoring encompasses 57 sampling points on the inland waters, 21 points on the offshore waters and 21 on the open sea.

In Lithuania, the system of surface waters quality includes controls of the quality of rivers, lakes, and seawaters in the coastal zone and open sea.

In Finland, the study and monitoring of the marine environment is the responsibility of the Finnish Environment Institute, the Finnish Marine Research Institute and the Regional Environment Centres. The national discharge network consists of more than 260 stations, of which some 150 are operated by the Finnish Environment Institute and the Regional Environment Centres. Monitoring of compliance with permits for sewage discharges is mainly carried out by enterprises, holders of those permits.

In Poland supervision over compliance with environmental protection law falls under responsibility of the Environmental Protection Inspection. Voivodship environmental protection inspectorates submit annual reports to the Chief Inspector of Environmental Protection concerning scope and results of audits conducted. In 1999, in 6 audited voivodships, 800 fines were imposed on enterprises for breach of water protection law and non-compliance with conditions defined in sewage discharge licences, amounting in total to PLN 52.1 million. 34 of those fines were postponed due to the fact that the enterprises were in the process of implementing investments in water protection.
Monitoring of quality of surface waters – rivers, lakes and the Baltic Sea is the responsibility of the Chief Inspector of Environmental Protection. Current monitoring is carried out by the voivodship inspectorates of environmental protection and contractors under co-ordination of the Institute for Meteorology and Water Management in Warsaw. Testing of river quality is made in 361 sampling points. Monitoring of the Baltic Sea is based on 39 testing stations, including 6 stations located in the deep-water zone and 33 stations in the offshore waters.

In Russia the control of volumes and quality of wastewater discharged to waters in the Baltic Sea catchment area is conducted by ten specialized inspectors of the state ecological control under the nature conservation committees of regions: the Kalliningrad, Leningrad, Novgorod, Pskov, Karelia and St. Petersburg.

Legal regulations in Sweden define principles of supervision and control of wastewater discharges and stipulate bodies in charge of such supervision. Much of the work guaranteeing that the provisions of the Environmental Code are followed shall be performed by the wastewater treatment plants themselves through their own controls. The plants are obliged to submit an environmental report each year to the supervisory authority. The reports should include information on actions undertaken to fulfil the conditions stipulated in the sewage discharge permit. The supervisory authority may impose injunctions connected to penalties and restrictions if non-

compliance with law is found. The Swedish National Environment Protection Agency co-ordinates, follows up and evaluates the operative supervision and provides advice and support to the operative supervisory authorities.

In four countries supervision and control over compliance with legal regulations were found unsatisfactory and insufficient to ensure full compliance with the Convention's provisions.

In one country it was found that regulations concerning local environmental monitoring were not in place.

Financing activities towards water protection

In Denmark, construction and operation of wastewater treatment plants is the responsibility of local governments and is solely financed by users. In the period 1996-1999, the Danish Environmental Protection Agency granted support to 81 wastewater projects in the Baltic Sea Region, and the support totalled DKK 320 million, which constitutes about 24% of the Danish environmental support to Central and Eastern Europe.

In Estonia, EEK 2392,8 million were spent between 1996 and 1999 for implementation of water protection projects, including EEK 927,4 million in the "high risk areas".

In Finland, the public expenditure for environment protection in 1996-1998 was FIM 16.6 billion. The government accounted for approximately 53% and municipalities for approximately 47%. In the same period, funds spent on environment protection by the industry totalled FIM 9.8 billion. Financing from the state budget was directed mainly to the protection of waters against pollution from agriculture. In 1998, the government spent FIM 4.6 billion on the environment protection, 36% of which was given to the agri-environment support.

In Latvia, environmental expenditure in the period 1996-1999 amounted to EUR 129.5 million. 30% of this originated from the state budget, and nearly 27% from industry and local budgets. In 1999 about 90% of environmental expenditure was spent on projects in water management.

In Lithuania, the Agriculture Development Programme Funds assigned in 1996 nearly LTL 2.7 million on ecological agriculture production and elimination of pollution originating from point sources. One of the priority investment programme financed since 1997 from the Fund of Rural Development is project on Ecological Agriculture.

The audited Polish institutions spent in 1996-1999 the total of PLN 4.75 billion on financing and co-financing of water protection projects. Four voivodship authorities accounted for 7.1%, the National Fund for Environmental Protection and Water Management for 40.9%, foreign assistance funds for 6.5%, six voivodship funds for environmental protection and water management for 17.9%, 33 industrial enterprises for 12.6%, audited municipalities for 11.9%, and the EcoFund for 3.1% of this amount.

In Russia, in 1996-1999 the federal budget spent RUB 123.5 million for measures related to the reduction of pollution caused by "hot-spots" No. 18, 19, 20, 21, and 23. Over 80% of expenditure for the protection of the Baltic Sea in St. Petersburg and the Leningrad and Kaliningrad regions was covered from the regional and local budgets, the regional environmental funds, and industries' own funds. In addition, St. Petersburg and the Leningrad region received loans and grants from the European Union, Denmark, Sweden, and the European Bank for Reconstruction and Development.

In Sweden, total expenditures for the environmental agencies in 1996 – 1999 amounted to 5.5 billion SEK. And in addition, environmental subsidies for agriculture in 1997 totalled SEK 1.6 billion, 422 million of which was allocated for the reduction of nitrogen run-off from agricultural areas.

In two countries the audit shown irregularities in the management of public funds allocated for implementation of water protection measures.

Reduction of pollution from non-point land-based sources.

In Finland, agricultural areas, including most of the land under the cereal production, are located in the southern and south-western part of the country, which is reflected in discharge levels to the Baltic Sea. The agri-environment programme, implemented since about 5 years and encompassing about 90% of farmers, has as a target a 40% reduction of phosphorus and 30% reduction of nitrogen loads discharged to waterways by agriculture. Evaluating the efficacy and results of the EU agri-environmental programme can be expected to take quite a long time. The Programmes have been implemented in Finland for only ca five years, and there will be a time lag before their effects on the environment and water quality will show up.

In Lithuania, the number of organic farms grew by 3.5 times in 1996-1999 as a result of implementation of the project on Ecological Agriculture.

In the audited period, the Polish agriculture was characterised by low and controlled use of fertilisers and pesticides favouring quality of surface waters, but

also by problems with storage and application of liquid manure and poor state of wastewater infrastructure in rural areas. Measures aimed at the reduction of water pollution caused by non-point agricultural sources, undertaken in the areas of the six audited voivodships included: preparation and execution of voivodship environmental programmes, construction of rural wastewater treatment plants, slabs for storing manure, and tanks for liquid manure, creation of a soil monitoring system, and education of farmers in the issues of the best agricultural practice.

Agriculture is responsible for approximately 45% of the Swedish waterborne discharges of nitrogen into the Baltic Sea from human activity. Nitrogen leakage is the greatest in the intensive farming areas in the counties of Skane and Halland, in the south of Sweden. Waterborne discharges of nitrogen into the environment from human activity were reduced by 20% in the period 1985-1995.

Reduction of pollution from point land-based sources.

In Denmark, HELCOM "hot-spot" No. 123 was located in the Copenhagen area and included two wastewater treatment plants named "Lynetten" and "Damhusaaen", of the combined annual capacity of 75-100 million m^3. After the completion of a new biological facility at „Damhusaaen" plant in 1996 and the modernisation of „Lynetten", both treatment plants operate mechanical-biological-chemical processes and provide a degree of treatment that is compliant with national and international requirements. Therefore, the Danish Ministry of Environment and Energy applied for the decision that the "hot-spot" No. 123 is cancelled from the HELCOM list. The cancellation took place on 31 January 2001.

In Latvia, in 1996-1999 the following wastewater treatment plants were completed: Liepaji, Strenci, Cesis, and Ligatne. Other treatment plants (17) are under construction. In 1998, the volume of untreated effluent was almost 4 times lower than in 1990, while the volume of wastewater treated in accordance with legal requirements grew by 50%.

In 1999, Lithuania discharged 182 million m^3 of wastewater, out of which 8% was previously treated in mechanical plants, 66% in biological plants, and 14% in biological plants with improved nitrogen and phosphorus removal process. Between 1998 and 1999 the volume of wastewater requiring treatment dropped by 35 million m^3, and the volume of untreated wastewater discharged by 13 million m^3. In 1992-2000 the loads of BOD_7 in discharged sewage was reduced by 81%, nitrogen loads by 65%, and phosphorus loads by 55%.

In the audited period, investments in water treatment projects in Estonia resulted in the reduction of pollutant loads discharge to waters. BOD_7 was reduced by 49%, nitrogen by over 7%. In four Estonian cities included in the HELCOM "hot-spot" list, BOD_7 was reduced by 51%, and in three cities phosphorus loads dropped by about 34%.

In Finland, substantial reductions were noted of the loads of organic matter, phosphorus, and nitrogen discharged to the environment with industrial and municipal sewage, as well as loads of heavy metals in industrial sewage. In accordance with the HELCOM recommendations, the majority of Finnish industries initiated projects aimed at the reduction of pollutant loads discharged to waters. Significant reductions were achieved in the pulp industry, the iron and steel industry, oil refinery, and in the leather and textile industries.

In the area of 26 municipalities audited in Poland 14 wastewater treatment plants were constructed and further 4 extended in the period 1996-1999. They included 2 chemical treatment plants, 11 biological and 5 biological plants with an improved nutrient removal process. The number of treatment plants serving the said municipalities rose from 57 to 71.

In the period in question, 33 out of 48 audited enterprises were in the process of implementing water protection measures, such as the construction of 15 wastewater treatment plants, construction of sewerage systems, change of production technology into one with better water efficiency, and construction of closed cooling water circuits. 30 of those enterprises were located in 24 areas included in the HELCOM "hot-spot" list. Projects implemented by those enterprises included municipal wastewater treatment plants for large cities: Bydgoszcz, Gdańsk, Gdynia, Kraków, Łódź, Poznań, Toruń. As a result of the above measures, the enterprises achieved in 1996-1999 significant reductions of pollution loads discharged to waters: BOD_5 was reduced by 32%, COD by 19.3%, suspended matter – 54.5%, nitrogen – 20.6%, phosphorus – 5.3%, heavy metals – 76.3%. Environmental effects achieved by the completion of wastewater treatment plants in Gdańsk and Toruń allowed the former Minister of Environmental Protection, Natural Resources and Forestry to apply to HELCOM for the removal of those enterprises from the "hot-spot" list. The removal took place in January 2001.

19 "hot-spots" were identified in the Russian part of the Baltic Sea area, 10 of them located in the Kaliningrad region, and 9 in St. Petersburg and the Leningrad region. Activities undertaken in the period covered by the audit were focused on the "hot-spots" No. 18, 19, 20, and 21 and included construction, modernisation and extension of wastewater treatment plants and sewerage systems, modernisation of

wastewater pumping stations, and construction of sludge incinerators. As a result of these actions, percentage share of treated effluent grew from 60 to 78%, stored sludge volumes were reduced by 278 K tonnes, and the phosphorus loads discharged in the wastewater in St. Petersburg dropped by half. Having achieved such environmental effects, the National Environmental Protection Committee applied to the Helsinki Commission to remove the "hot-spot" No. 21 from the list.

Wastewater treatment plants account for approximately one third of the nitrogen that is discharged to the Baltic Sea in Sweden. In the Stockholm region there are five treatment plants, which are included in the "hot-spot" list as item 130. Since 1999, concentrations of pollutants in wastewater discharged by those treatment plants do not exceed maximum limits defined in the HELCOM recommendation 16/9. Therefore Sweden have applied for removal of the "hot-spot" n^{o} 130 from the list.

* * *

It is our hope that the audits will contribute to actions being taken to remove irregularities and to intensify measures towards the protection of the Baltic Sea against pollution.

Also, it is our hope that the audits will facilitate growth of effectiveness of the actions undertaken towards the protection of the marine environment of the Baltic Sea, and that the audit findings will also be helpful in the work of the Helsinki Commission.

The Joint Final Report was signed in Warsaw

on 20th of September 2001,

on behalf of:

The National Audit Office of Denmark	**Jens Mikkelsen** **Head of Division**	**(illegible signature)**
The State Audit Office of Estonia	**Eva Latti** **Audit Manager**	**(illegible signature)**
The State Audit Office of Finland	**Armi Jamsa** **Senior Auditor**	**(illegible signature)**
The State Audit Office of the Republic of Latvia	**Santa Siksna** **Auditor**	**(illegible signature)**
The State Control of the Republic of Lithuania	**Kestutis Sirvaitis** **Head of Division**	**(illegible signature)**
The Supreme Chamber of Control of the Republic of Poland	**Andrzej Głowacki** **Director of Department of Environmental Protection**	**(illegible signature)**
The Accounts Chamber of the Russian Federation	**Alexander Nicolaevich Semikolennykh** **Deputy Chairman of the Accounts Chamber**	**(illegible signature)**
The Swedish National Audit Office	**Rutger Banefelt** **Audit Director**	**(illegible signature)**

II. RESULTS OF THE NATIONAL AUDITS

The National Audit Office of Denmark

Report
on
parallel auditing of the implementation of the Helsinki Convention

May 2001

National Audit Office of Denmark

Table of Contents

Page

Introduction

In February 2000, the National Audit Offices of Denmark, Estonia, Finland, Latvia, Lithuania, Poland, Russia and Sweden initiated a joint effort for the purpose of auditing the implementation of the Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area. An agreement was signed in Warsaw on 28 February 2000 and further elaborated in a document entitled 'Common position on co-operation over parallel audits of implementation of the provisions of the convention on the protection of the marine environment of the Baltic sea (Helsinki Convention)' and in Appendix no. 1 to the document, both signed in Stockholm on 17 May 2000.

Objectives

Based on the above-mentioned agreement, the NAOD's study report addresses the following issues:

- The implementation in Danish legislation of selected provisions of the Helsinki Convention relating to wastewater discharge
- Governmental and regional supervision[1]
- Developments in wastewater discharge and treatment levels in the Copenhagen Area – Hot Spot no. 123 – in the period 1996-1999
- Danish support granted to efforts in Central and Eastern Europe to control pollution of and/or improve the Baltic marine environment in the period 1996-1999.

Methodology

The study is based on current environmental legislation, material obtained from the Danish Environmental Protection Agency (the Danish EPA)[2], and a review made by the NAOD of polluting enterprises and their supervision. The report was submitted to the Danish EPA before publication, and the Agency's comments are incorporated in the report.

Scope

The NAOD's study does not cover the measures taken to reduce the leaching of harmful substances from farm fields, the use of fertilisers etc. in agriculture and their

[1] Regional supervision covers supervision by county and municipal authorities.

[2] The Danish EPA is the government institution to which the county and municipal authorities report regional supervision data.

release into the marine environment, nor does it examine whether these measures have produced the desired effect.

Supervision at the regional level is dealt with only in relation to "Lynettefællesskabet I/S", a partnership organisation operating the two treatment plants "Lynetten" and "Damhusåen". Both plants are located in the Copenhagen Area, and both played a crucial role in the context of Hot Spot no. 123, cf. the section entitled 'Discharge of wastewater in the Copenhagen Area'.

The description of the Danish support granted to environmental enhancement efforts in the countries of Central and Eastern Europe does not include an evaluation of the effect of the support.

The Helsinki Convention and its implementation in Danish legislation

The objective of the Helsinki Convention is to protect the marine environment of the Baltic Sea Area, which comprises the water-body and the seabed including their living resources and other forms of marine life[3]. The Baltic Sea Area comprises the Baltic Sea plus the Gulf of Bothnia, the Gulf of Finland and the entrance to the Baltic Sea bounded by the parallel of the Skaw in the Skagerrak at 57° 44.8' N.
The Helsinki Convention on the protection of the marine environment of the Baltic Sea Area was signed in Helsinki on 22 March 1974. All the countries participating in the parallel audit programme have ratified the Convention. Denmark ratified the Convention in 1977.
Under the Convention, the signatory states must take all appropriate legislative, administrative or other relevant measures to prevent and eliminate pollution in order to protect and improve the marine environment of the Baltic Sea Area[4]. Care should be taken to ensure that the implementation of such measures does not raise the pollution level of the marine environment outside the Baltic Sea Area. Thus, the individual countries may not apply any resources for this purpose that were originally appropriated to pollution control in other areas, if this will have an adverse impact on the marine environment of such areas.

The two principal Danish statutes governing the protection of the aquatic environment are the Environmental Protection Act of 13 June 1973[5] and the Marine Environment Act of 9 April 1980[6]. The objective of the Environmental Protection Act is to prevent and combat pollution of air, water, soil and subsoil, and nuisances caused by vibration and noise. The purpose of the Marine Environment Act is to

[3] Cf. article 4.
[4] Cf. article 3.
[5] Most recent revision: Consolidation Act no. 698 of 22 September 1998, as amended by Act no. 447 of 31 May 2000.
[6] As amended by Act no. 474 of 31 May 2000.

prevent and control pollution and other impacts on the environment, especially the marine environment. The Environmental Protection Act governs the discharge of pollutants from land-based sources into recipient water bodies, which is dealt with in article 6 of the Convention, while the Marine Environment Act regulates pollution of the water body and surface of the sea, e.g. from ships, which is described in articles 7-9.
Since the Marine Environment Act does not apply to discharges from land-based sources, which is the key area of this study, it will not be further dealt with in the report.

The primary concern of the NAOD's study is the discharge of wastewater into the sea or, in law terminology, land-based marine pollution. This type of pollution is encompassed by the provisions of the Environmental Protection Act. The Environmental Protection Act regulates, *inter alia*, all activities which by emission of solid, liquid or gaseous substances, by release of microorganisms likely to harm health and the environment or by generation of waste may cause pollution of air, water, soil and subsoil.
Wastewater is defined as water-borne pollution from private households, industries, commercial enterprises and institutions. The definition also covers surface runoff (storm- and melting water) from roads, parking grounds and roofs.

Before the enactment of the Environmental Protection Act, it was permitted to discharge wastewater directly into large recipients, such as the sea, in which the pollutants were able to decompose. Otherwise, the wastewater had to be purified in a water treatment plant before being discharged. Since 1974, the municipal authorities have been under an obligation to draw up wastewater plans that comply with the objectives set by the regional (county) authorities for the quality of watercourses, lakes and coastal waters. The municipal authorities therefore extended public wastewater collecting systems and treatment plants in the period 1974-1987. The Action Plan for the Aquatic Environment was adopted in 1987, and it was decided that all wastewater must be treated to the highest possible purification level in a water treatment plant before being discharged into watercourses, lakes or the sea. Since 1987, the Action Plan for the Aquatic Environment has been updated on a regular basis and supplemented by national and international rules and guidelines. In 1996, new rules and regulations for the emission of environmentally incompatible substances were introduced[7], based on the EU Aquatic Environment Directive. The main focus of the new regulations was the establishment of maximum acceptable substance concentration levels for recipient water bodies.

The principles and obligations relating to pollution from land-based sources are outlined in the Helsinki Convention[8], under which the contracting parties are to take

[7] By Executive Order no. 921 of 8 October 1996.
[8] Article 6.

all suitable measures to control and strictly limit pollution from harmful substances and materials. In Denmark, these principles and obligations are implemented in the Environmental Protection Act[9], according to which substances likely to pollute water may not be discharged into watercourses, lakes or the sea or stored in a way that may cause water pollution, unless a licence authorising such discharges has been obtained from a regional authority[10].
One purpose of wastewater treatment is to ensure that the quantity of organic substances and nutrients discharged does not cause degradation of the Baltic marine environment, thus endangering the flora and fauna of the area. Another purpose is to ensure that the water at designated bathing beaches meets the national standards with regard to sanitary quality.

The establishment and operation of wastewater systems and water treatment plants are the responsibility of the municipal authorities and are completely user-financed. The introduction of user charges means that both private households and enterprises have had a financial interest in reducing the volume as well as the pollutant load of their wastewater. Wastewater contains mainly organic matter and the nutrient salts (nitrates and phosphates). Most of these substances must be removed in the treatment process to meet the requirements laid down in the Action Plan for the Aquatic Environment. Reducing effluent contents of organic matter and nutrient salts limits the growth of algae, and thus the risk of oxygen depletion that may cause fish death. In addition, the amount of heavy metals discharged is also reduced in the treatment process, since the heavy metals are incorporated into the sludge produced. Due to the requirements regarding the heavy metal content in sludge produced in treatment plants, the heavy metal load of wastewater is mainly reduced at source.

Industrial wastewater pollution control starts already in the production process. The amount of waste substances generated must be limited by using the least polluting technology, including the least polluting raw materials, processes and plants and the best practicable pollution control measures. In this evaluation special consideration must be given to preventive measures in the form of cleaner technology, e.g. recirculation and reuse of process water, development of water-saving techniques and improved water treatment processes. The Minister of Environment and Energy is empowered by national legislation to establish binding objectives for reductions in the use, discharge or disposal of specific substances, products or materials.
Where the operation of a sewage plant is not environmentally sound and violates the stipulated requirements, the regional council may require that the necessary improvement or renewal of the plant be carried out[11]. The regional council can also change the licence terms, if the original terms are considered insufficient or inappropriate.

[9] Section 27.
[10] County council or municipal council.
[11] Cf. section 30 of the Environmental Protection Act.

Summary

Denmark ratified the Helsinki Convention in 1977. In Denmark, matters relating to marine pollution are governed by the Environmental Protection Act from 1973 and the Marine Environment Act from 1980. Land-based pollution, which is the main focus of this report, is governed by the Environmental Protection Act. The Environmental Protection Act is frequently updated, and in the opinion of the NAOD, the provisions of the Helsinki Convention concerning pollution from land-based sources have been fully implemented in Danish legislation.

Governmental and regional supervision

The administrative supervision of wastewater discharge is also based on the Danish Environmental Protection Act, which defines the framework for monitoring polluting activities and for allocating responsibilities among the administrative authorities. Supervision is carried out at the governmental as well as the regional level.

Governmental level

The principal task of the Minister of Environment and Energy is the general administration of the Environmental Protection Act. In addition, the minister lays down rules governing the duties of the supervision authorities, including rules on the regional authorities' duty to submit reports on their supervisory activities and the results of measurements and examinations. The Minister of Environment and Energy may furthermore instruct the regional authorities to take up specific issues for consideration and decision. This ministerial power does not apply to specific cases only. The minister may also order a regional authority to consider issues of a more general nature as part of an active environmental effort. The Minister of Environment and Energy may further assume the powers of the regional authorities in matters that affect the statutory duties of other authorities, or are of general importance.
The Minister of Environment and Energy has delegated many of the powers conferred upon the minister under the Environmental Protection Act[12] to the Danish EPA.

Regional level

One of the duties of the regional authorities[13] under the Environmental Protection Act is to monitor compliance with the provisions of the Act[14], including compliance with enforcement or prohibition notices and with the terms stipulated in approvals and

[12] Cf. section 80(1) of the Environmental Protection Act.
[13] I.e. county and municipal authorities.
[14] Cf. sections 65-66.

permits issued for sewage plants. Since the Environmental Protection Act is a framework statute, its provisions are very general and do not give detailed directions for the manner in which supervision work is to be organised, but the principles of good supervisory practice are described in the supervision guidelines issued by the Danish EPA[15]. It is implied in the Act[16], however, that the supervisory authority is responsible for maintaining adequate supervisory control at all times. This means, *inter alia*, that the individual enterprises must be inspected as often as considered necessary by the supervisory authority in order to ensure that the enterprise in question complies with current rules and regulations.

There are various types of supervision, depending on the pollution risk associated with the activity to be supervised. The Danish EPA's Environmental Guidelines divide supervision activities into three categories: point supervision, topical supervision and overall supervision.

Point supervision focuses on conditions at a specific point in time at the enterprise being supervised. It may be limited, for example, to a certain stage of the production/process or to several processes/areas.
Topical supervision is carried out in cases where the supervisory authority wishes to highlight the performance of a number of enterprises in relation to a single environmental parameter.
Overall supervision involves supervision of all the activities of an enterprise, and thus provides an overall assessment of the environmental performance of a specific enterprise in which all relevant parameters are checked in one procedure.

The regional authorities are responsible for organising supervision visits and for carrying out active supervision on a regular basis. However, the procedure and scale according to which supervision visits are carried out are not specified in the Environmental Guidelines, but depends on the individual enterprise, the purpose of the inspection and the supervisory authority.

Since 1996, the frequency of municipal supervision visits has been governed by an agreement between the Minister of Environment and Energy and the National Association of Local Authorities in Denmark[17]. Under this agreement, the regional authorities must conduct on-site supervision of listed enterprises[18] at a minimum frequency of 50%. This means that the authority concerned must inspect at least half the number of listed enterprises in its district each year. The agreement does not

[15] E.g. Environmental Guidelines no. 3 from 1995 on supervision of industrial enterprises.
[16] Section 65 of the Environmental Protection Act.
[17] The National Association of Local Authorities in Denmark ("Kommunernes Landsforening") comprises 273 of Denmark's 275 municipal authorities and acts as their representative in dealings with the Danish Parliament, Government and Central Administration, as well as with EU authorities, NGOs and the public.
[18] Polluting enterprises that are subject to approval by the County Council.

specify any time frame within which all enterprises in a district must be inspected. This implies that there is no guarantee that all enterprises are inspected within a certain period of, say, two years. According to information made available to the NAOD, the Danish EPA intends to contact the National Association of Local Authorities in order to discuss the expediency of clarifying the existing agreement in this respect.

Enforcement measures

The following enforcement measures are available to the administrative authorities in their administration of the Environmental Protection Act[19]: Recommendations, enforcement notices, prohibition or stop notices[20], notices enjoining environmental compliance, or police notification.

A recommendation may be oral or written. It is the most lenient and most frequently used means of enforcement. As recommendations have no legal effect, they are used in cases where compliance is expected.

An enforcement notice may be used to impose new conditions on an enterprise or order it to reduce the pollution caused by its facilities or activities or the risk of such pollution. Where anti-pollution measures cannot be taken or pollution nuisances reduced, the supervisory authority may serve ***a prohibition notice*** on the enterprise, ordering it to discontinue its operations or remove the polluting activity or plant[21]. Unless otherwise provided for in the Act, the receiver of a prohibition notice must be given prior written notice.

A notice enjoining environmental compliance is a warning to the receiver to comply with applicable rules and regulations. If the notice is disregarded, the supervision authority may consider taking self-regulatory measures, such as removing or closing sources of pollution.

In cases where administrative measures have proved insufficient to stop an unlawful activity, or in cases of gross violation, the supervisory authority may notify the police. It is the duty of the supervisory authority to ensure that illegal activities are discontinued[22]. Enterprises failing to comply with administrative enforcement measures – e.g. enforcement or prohibition notices – should generally be reported to the police.

Supervision reports

Each year, all regional authorities must submit a supervision report to the Danish EPA on all inspections carried out during the past year[23]. The report must evaluate

[19] Cf. Environmental Guidelines no. 14012 of 1 October 1992 on the enforcement of the Environmental Protection Act.

[20] No distinction is made in the Environmental Protection Act between administrative rules applying to enforcement and prohibition notices, respectively.

[21] Cf. sections 41-42 of the Environmental Protection Act.

[22] Cf. section 68 of the Environmental Protection Act.

[23] Cf. Executive Order no. 788 of 21 November 1986 on supervision reports.

the quality of the supervision, and is to be accompanied by a diagram showing the individual authority's supervision effort in terms of man-years and number of inspection visits made, broken down by enterprise. In addition, the number of recommendations issued, enforcement, stop or prohibition notices served and police notifications made must be indicated.
The supervision diagrams are used in the Danish EPA's evaluation of the supervisory performance of the regional authorities.

Like the regional authorities, the Danish EPA must submit an annual report on its supervisory activities[24]. Entitled 'Environmental Supervision' ("Miljøtilsyn"), this report condenses the regional supervision reports into an overview of the supervisory activities implemented nationwide.

Under the Helsinki Convention, the supreme environmental supervision authority of the signatory states, *in casu* the Danish EPA, must inform HELCOM[25] about the volume, quality and method of discharge, if, for example, the authority finds that the sludge produced at a regional treatment plant contains significant amounts of mercury, or that effluent from the plant contains any of the substances and materials specified in Appendix 2 to the Helsinki Convention[26].

HELCOM is mandated to promote further measures to protect the marine environment of the Baltic Sea Area through cooperation with government bodies on scientific and technological research and with the necessary assistance from regional and international organisations. HELCOM must also consider, summarise and circulate scientific, technological and statistical information from relevant sources. Every third year, HELCOM draws up an overall report based on emission data from the contracting parties that show the concentrations of harmful substances discharged into the Baltic Sea Area. The next report is due in 2002.

Summary:

Denmark has a two-tier supervision system comprising governmental supervision by the Danish EPA, which is limited to a few specific areas, and regional supervision by county and municipal authorities. The requirements that apply at each level are not specified in the Environmental Protection Act or Danish EPA guidelines, but are agreed between the Minister of Environment and Energy and the National Association of Local Authorities in Denmark. Municipal and county authorities must submit annual reports on their supervisory activities to

[24] Cf. section 3 of Executive Order no. 788 of 21 November 1986 on supervision reports.
[25] HELCOM (the Helsinki Commission or the Baltic Marine Environment Protection Commission) is the governing body of the Convention, established under article 12 of the Convention.
[26] Article 6, par. iv.

the Danish EPA. The Danish EPA receives and evaluates supervision data submitted by the regional authorities, on the basis of which the Agency prepares an annual overview of the supervisory activities implemented nationwide. The actual on-site inspections are carried out at the regional level. Various enforcement measures ranging from recommendations to police notification are available to the supervisory authorities in their administration of environmental legislation

Discharge of wastewater in the Copenhagen Area

HELCOM 'Hot Spot' no. 123 was located in the Copenhagen Area and included the two water treatment plants named "Lynetten" and "Damhusåen".
A municipal wastewater catchment area is a 'hot spot', if it discharges, for example, significantly high concentrations of phosphate and nitrogen.

In response to an application from the Danish EPA, HELCOM's technological committee recommended in 1999 that Hot Spot no. 123 be cancelled from the list of 'hot spots' near the Baltic Sea. The recommendation was followed, and from 31 January 2001, 'Hot Spot' no. 123 was no longer to be found on the list.

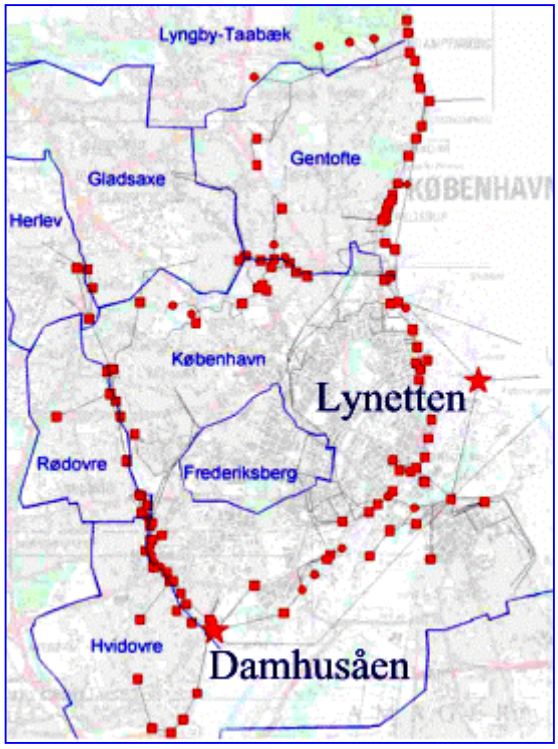


Illustration 1: Map showing the location of the water treatment plants "Lynetten" and "Damhusåen" in Copenhagen

Lynettefællesskabet I/S owns and operates the two largest water treatment plants in the Copenhagen Area, "Lynetten" and "Damhusåen". Here wastewater from the

eight partnership members (the municipalities of Frederiksberg, Gentofte, Gladsaxe, Herlev, Hvidovre, Copenhagen, Lyngby-Taarbæk and Rødovre) is processed. The two plants receive a combined wastewater inflow of 75-100 million m^3 from industrial enterprises and private households, which equals the pollution created by about 1,1 million people, or 20% of the Danish population.

Illustration 2: Aerial photo of "Lynetten"

Once every year, the City of Copenhagen's Agency of Environmental Protection, which is environmental supervision authority for Lynettefællesskabet I/S, submits data to the Danish EPA indicating, for example, the capacity of the plants operated by the partnership, inflow volumes received by the plants (load), values measured for inflow content of biological and chemical substances, and the number of measurements made for each parameter. In addition, in and outflow data are transmitted to the Danish EPA by computer. The Agency does not check the data received, for example, by having supplementary or verification samples taken at the treatment plants.

The NAOD has reviewed the Danish EPA's supervision data from the period 1996-1999 for the two inter-municipal water treatment plants ("Lynetten" and "Damhusåen") located in Copenhagen. By the end of the period, both plants had facilities for mechanical as well as biological treatment, removal of nitrogen and chemical precipitation of phosphorus, which means that they were able to handle wastewater at the so-called MBNDC treatment level (mechanical-biological-chemical with nitrogen removal).

Illustration 3: Aerial photo of "Damhusåen"

Table 1. Supervision data for Lynettefælleskabet I/S ("Lynetten" and "Damhusåen") 1996-1999

	1996	1997	1998	1999
	----- 1,000 units -----			
Capacity (PE)	2,230	1,100	1,100	1,100
Load (PE)	919	901	926	588
Water (m^3/year)	74,160	85,000	99,100	96,100
COD [27] (kg/year)	6,020	4,461	3,485	3,702
BOD_5 [28] (kg/year)	1,325	368	193	245
Total phosphorus – P (kg/year)	314	180	71	83
Total nitrogen – N (kg/year)	1,650	583	461	476

Source: Danish EPA's database
(PE = Population Equivalents. One PE indicates the pollutant load created by one person)

It appears from the table that over the period, the capacity of Lynettefælleskabet I/S has been adjusted to match the size of the population in the catchment area. Within the same time span, the pollutant load per person fell by about 30 %, while the volume of water discharged rose by about 23 %. The discharge of the individual pollutants was reduced by between 39 % and 82 %, the largest reduction being achieved from 1996 to 1997. This was due to the commissioning in 1996 of a new biological water treatment plant "Damhusåen" and to the completion of a modification of "Lynetten". From day one, "Damhusåen" was able to process inflows at the MBNDC level, whereas before the modification, "Lynetten" had only

[27] **COD** (Chemical Oxygen Demand). Test measuring the oxygen demand and thus indirectly the organic matter content of a water sample. COD is determined by chemical techniques exclusively, the organic matter being decomposed by means of the oxidation agent potassium dichromate ($K_2Cr_2O_7$). The COD value is expressed in mg O_2/L. The higher the COD value, the higher the organic content of the water sample. This value should be interpreted with some caution, since not all organic substances are decomposed by this method. The value is not directly comparable to BOD_5, which is reflected in the designations.

[28] **BOD_5** Five-day Biochemical Oxygen Demand. BOD_5 is an indirect measure of the rate at which organic matter decomposes. However, the value is subject to great uncertainties.

facilities for mechanical and biological wastewater treatment. Since 1997, both plants have been operating at the MBNDC level, which means that they are able to meet the requirements set out in the Action Plan for the Aquatic Environment.

In 1996, different requirements applied to "Lynetten" and "Damhusåen". Thus, the COD requirement for "Lynetten" was 300 mg/l in 1996, but 75 mg/l for "Damhusåen". Since 1997, the two plants have been subject to identical requirements.
The regional and national emission standards and the average discharges of COD, BOD_5, phosphorus and nitrogen from both water treatment plants are shown in the figures below.

Figure 1. Average emission, COD

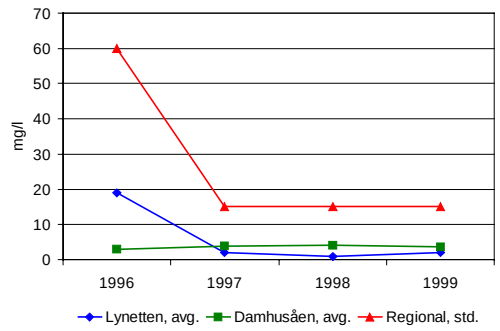


Figure 2. Average emission, BOD_5

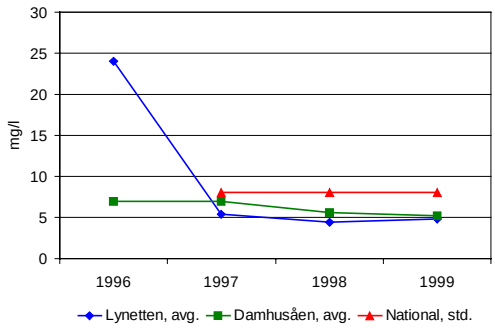


Figure 3. Average emission, Total P

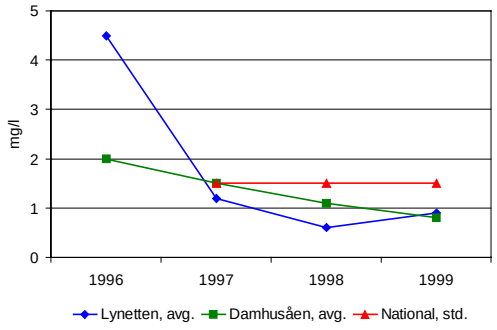
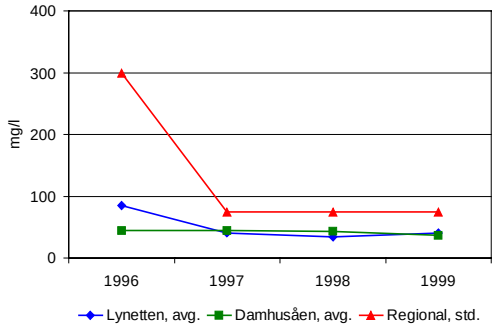


Figure 4. Average emission, Total N



Source: Danish EPA's database

As it appears from Figures 1-4, average emission values for both water treatment plants in the period were lower than the regional or national emission standards established for the plants. The regional and national standards are equal to or more stringent than the international standards.

With the adoption of the 1987 Action Plan for the Aquatic Environment it was decided that all water treatment plants with a capacity above 15,000 PE should be able to remove organic matter, nitrate and phosphorus by 1993. However, a few

plants, including "Lynetten" and "Damhusåen", were granted an extension of this time limit.

Summary:

The Agency of Environmental Protection, City of Copenhagen carries out the regional supervision of Lynettefællesskabet I/S and reports supervision data to the Danish EPA. According to the supervision data for 1996-1999, the average emission values in the Copenhagen Area are below the maximum levels fixed in national and international emission standards. Since 1996, the pollutant load of wastewater produced in the Copenhagen Area has been reduced. The Ministry of Environment and Energy has requested that HELCOM cancel 'Hot Spot' no. 123, located in the Copenhagen Area, from the Helsinki Convention list. The cancellation was effective from 31 January 2001.

Danish support to environmental efforts in other countries

In April 1991, the Danish Parliament adopted an act on financial support to environmental activities in Eastern Europe[29] and the Danish Environmental Support Fund for Eastern Europe (DESF) was established. In 1999, the name of the fund was changed to DANCEE[30]. Since 1994, Danish support to Central and Eastern Europe has been channelled through DESF/DANCEE and environmental programmes implemented in selected sectors, e.g. energy, nuclear safety, agriculture, etc. Since 1998, part of the support has been earmarked for the Baltic Sea Region.

The principal objectives of Danish environmental support to Central and Eastern Europe are to contribute to:

- Optimising the protection of nature and the environment in Central and Eastern Europe and reducing both regional and global pollution, including transboundary pollution in countries near Denmark
- Implementing the necessary preparatory measures for countries candidating for membership in the EU, and assisting them in their endeavours to comply with international conventions
- Ensuring that the development process in these countries is environmentally and politically sound and support democratic values in the transition to market economy, with the highest possible concern for the environment
- Promoting the transfer of environmental knowledge and technology from Denmark to Central and Eastern Europe, for the benefit of both the receiver countries and Denmark.

[29] Act no. 223 of 10 April 1991 as amended by Act no. 284 of 27 April 1994.
[30] Danish Cooperation for Environment in Eastern Europe.

Table 2. Environmental support commitments in Central and Eastern Europe 1996-1999

	1996	1997	1998	1999	Total
	----- DKK million -----				
Baltic Sea Region	-	-	217.1	201.1	418.2
Outside Baltic Sea Region	-	-	120.2	174.2	294.4
Total DESF/DANCEE facility	170.4	249.1	337.3	375.3	1,132.1
Sector programmes	42.4	42.7	55.9	64.2	205.2
Total Central and Eastern Europe	212.8	291.8	393.2	439.5	1,337.3
Source: The Danish Public Accounts 1996-1999.					

It appears from the table that Danish environmental support to Central and Eastern Europe more than doubled between 1996 and 1999, and that since 1998, about half the amount of total annual funding has been earmarked for the Baltic Sea Region.

In this period, the Danish EPA granted support to 81 wastewater projects in Estonia, Latvia, Lithuania, Poland and the Russian Federation, all directly concerned with reducing the waterborne pollution load to the Baltic Sea. The projects targeted both non-industrial wastewater (68 projects) and industrial wastewater treatment (13 projects), and the support totalled DKK 320 million, or about 24% of the Danish environmental support to Central and Eastern Europe. The waste projects are broken down as follows by type of activity:

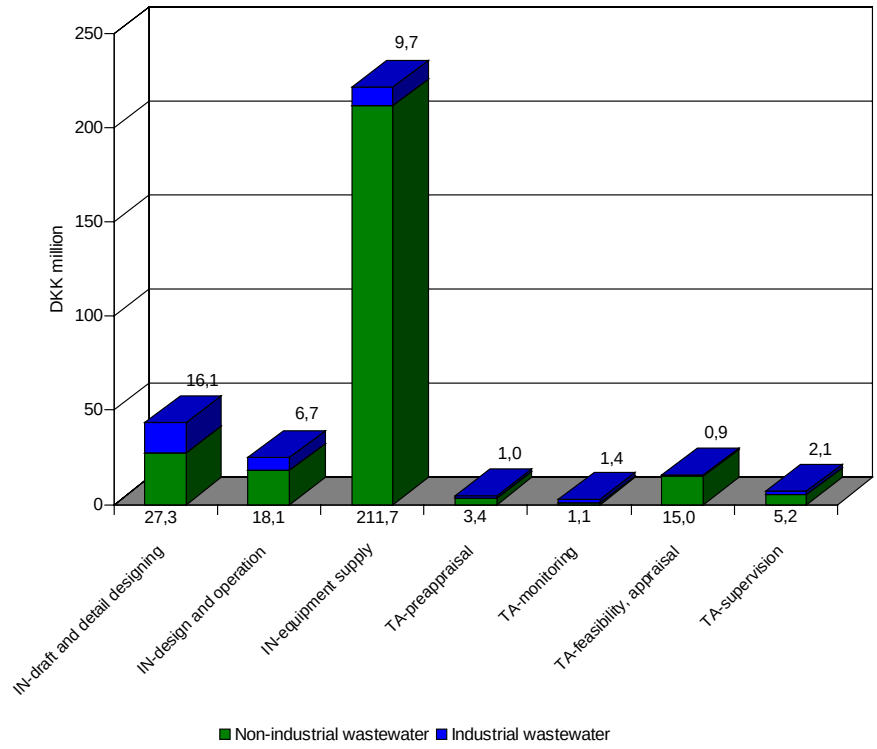
Investments (IN):

- draft and detail designing
- design and operation
- equipment supply

Technical assistance (TA):

- pre-appraisal (studies and plans)
- monitoring
- feasibility and appraisal studies
- supervision (training and education) .

Figure 5. Danish environmental support to Central and Eastern Europe 1996-1999 broken down by type of activity



Source: Danish EPA's database

As shown in Figure 5, funding for IN-equipment supply amounted to DKK 221,4 million, or 69 % of the total funding of DKK 320 million granted to the 81 projects. "IN-equipment supply" covers projects involving both equipment supplies and technical assistance for the same project.

After the adoption by the Danish Parliament in 1991 of the Act on financial support to environmental activities in Eastern Europe, the NAOD reviewed the financial support granted to East European countries in the period 1990-93, including the environmental support. The findings were submitted in a report to the Public Accounts Committee in January 1995. The NAOD's recommendations in this report included better coordination with the central coordinating units of the cooperating countries, more frequent inspection – and supervision – of projects, and more thorough checking of project accounts.

In March 1997, the NAOD submitted a memorandum to the Public Accounts Committee on the administration of, *inter alia,* the environmental support to Eastern Europe. The memorandum describes improvements made in the following areas:

- The administration of the scheme was considerably strengthened by the allocation of additional resources
- Programmes were drawn up for the individual countries describing action areas for environmental work; and

- Uniform guidelines were introduced for the drawing up of applications and for a score system for evaluating applications received.

Summary:

In the period 1996-1999, the Danish EPA granted financial support to 81 projects in the Baltic Sea Region, totalling about DKK 320 million, or about 24% of total Danish environmental support to Central and Eastern Europe. Equipment supplies accounted for the largest proportion (approx. 69 %) of the total funds appropriated. After the Danish Parliament's adoption in 1991 of the Act on financial support to environmental activities in Eastern Europe, the NAOD reviewed the Danish EPA's administration of the scheme in a report from 1995 and a memorandum from 1997.

Extract

The Helsinki Convention concerning the protection of the marine environment of the Baltic Sea Area was signed by Denmark in 1974 and ratified in 1977. Denmark's regulation of pollution of the marine environment is based on the Environmental Protection Act from 1973 and the Danish Marine Environment Act from 1980. Land-based pollution is governed by the Environmental Protection Act, which is updated on an ongoing basis. In the NAOD's judgment, the Helsinki Convention has been fully implemented in Danish legislation. Supervision is carried out at the regional and governmental level, and sustained efforts are made to improve both legislative and supervisory measures.
Compliance with the provisions of the Environmental Protection Act regarding the discharge of pollutants is ensured primarily through regional supervision of polluting enterprises. In addition, supervision is carried out at government level through the Danish EPA's monitoring of the supervisory activities of the regional authorities. The requirements applying to the organisation of supervision work are not specified in the Environmental Protection Act, but the principles of good supervisory practice are described in the Danish EPA's guidelines on supervision. An agreement specifying minimum frequencies for supervision contacts with the various categories of enterprise has been concluded between the Minister of Environment and Energy and the National Association of Local Authorities in Denmark.

The quality of the wastewater discharged in the Copenhagen Area has been improved in recent years. HELCOM 'Hot Spot' no. 123 was located in the Copenhagen Area and included Lynettefællesskabet I/S. With effect from 31 January 2001, 'Hot Spot' no. 123 was cancelled from HELCOM's list, in response to an application submitted by the Ministry of Environment and Energy and on the grounds that the average emission values for wastewater discharged in the Copenhagen Area are now considerably lower than the national emission standard values, which in turn are equal to or lower than the international standard values.

Danish environmental contribution in the period 1996-1999 included financial and technical support to 81 wastewater projects in the Baltic Sea Region at a total amount of approximately DKK 320 million, equalling about 24% of the environmental support granted to countries in Central and Eastern Europe.

The National Audit Office of Estonia

PEAKONTROLÖRI OTSUS

29.01. 2001. No.12-5/023

Audit of implementation of the provisions of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (the Helsinki Convention)

Compiled by:

Raivo Linnas
Chief Auditor of the Performance Audit Department

Tallinn
2001

Table of Contents

Executive Summary

On the proposal by the Supreme Chamber of Control of Poland, the Supreme Audit Institutions of the Baltic Sea countries decided to audit compliance with the requirements of the Convention on Marine Environment Protection in the Baltic Sea Region (Helsinki Convention). This performance audit shall be carried out as a parallel audits between the 3rd quarter of 2000 and the 1st quarter of 2001. The audit shall focus on the issues related to compliance with the requirements of the Convention in 1996–1999.

The SAO audit aimed to assess compliance with the Helsinki Convention requirements by analysing the measures implemented in the Ministry of Environment, the counties and local governments, that contribute to improved treatment of wastewater coming from the bigger Estonian cities and industrial plants. Since a lot of measures have been taken to implement the water protection policy and control and reduce the pollution load, only the more important ones were audited.

The Minister of Environment has adopted various measures to comply with the Helsinki Convention requirements, of which the SAO audited harmonisation of legislation with the provisions of the said Convention and pollution abatement.

The SAO maintains that the Estonian legislation has been aligned with the relevant provisions of the Helsinki Convention (see 4.1, 4.2 and 4.4):

- all the relevant HELCOM recommendations have been included in the Estonian legislation;
- the preparation, verification and reporting processes related to the water permits have been regulated in accordance with the provisions of the Convention and the Annexes thereto.

However, the legislation does not regulate reporting to the Helsinki Commission on the measures implemented.

During the years concerned the pollution in the hot spots has been reduced considerably. Investments in the wastewater treatment facilities of water companies certainly contributed to this. These investments were in accordance with the water protection programs drawn up by the Ministry of Environment. These programs set out the annual targets, which were not achieved in 1996 and 1997, as opposed to 1998 and 1999 (see 5.2 and 5.3).

Furthermore, the SAO maintains that the pollution control system functions properly owing to its multilevel structure and to the fact that all users of water for specific purposes are subject to verification by a recognised or accredited independent laboratory (see 4.3).

There were some deficiencies as regards the administrative work of the environmental departments of county governments (environmental services as from 2000) and the quality of completing the reporting forms of the Public Investments Program (PIP) (see 4.3).

The main proposals of the SAO (see 4.5 and 5.4) aimed to improve the quality of PIP forms, increase the efficiency of monitoring the hot spots and of supervising the environmental services, and to evaluate the effectiveness of investments.

The Minister of Environment informed the SAO about the measures taken and envisaged in order to comply with the proposals.[1] The Minister considers it essential to continue and to improve the efficiency of the work aimed at compliance with the principles of the Convention on Marine Environment Protection in the Baltic Sea Region and at the integration of its recommendation into the Estonian legal system.

The Minister's response shows the measures taken and envisaged (see 4.6 and 5.5), which implies that the Minister intends to implement the proposals. The SAO is of the opinion (see 4.7 and 5.6) that these measures are important and hopes that all the planned actions will be successful.

[1] Letter no. 11-2/89 of January 10, 2001 from the Minister of Environment.

1. Introduction

The objective of the audit performed by Riigikontroll was to assess the implementation of the provisions of the Helsinki Convention concerning measures undertaken on the central, regional and local levels aimed at improvement of the wastewater treatment of the biggest settlements and industries in Estonia.

The audit covers only point pollution from the municipal and industrial wastewater in the high risk areas, that are in this audit called hot-spots[2]. This scope was elected based on the actuality of the problems with the pollution and the hot-spots recognised. These towns and industries discharge more than half of the total pollution in Estonia. Also in these regions lives more than 1/3 of the Estonian population and most of the industries are also situated in these regions.

The auditees were:

- the Ministry of Environment – responsible for implementation of the policy;
- environmental services of the Ministry of Environment (Ida-Viru, Pärnu, Harju) – performers of different controlling tasks. These services were part of the county government during the years 1996-1999, so in the report they are referred to as county environmental departments;
- Water users – water companies and industrial enterprises in Tallinn, Narva, Kohtla-Järve, Pärnu:
  - Pärnu Vesi AS – water company of the town Pärnu;
  - Narva Power Stations;
  - The chemical factory of Kohtla-Järve (the name has changed couple of times during 1996-1999);
  - Narva Vesi AS – water company of the town Narva;
  - Tallinna Vesi AS – water company of the town Tallinn;
  - Viru Biopuhastus AS – water company of the town Kohtla-Järve;
  - Saku Brewery;
  - Kehra Pulp & Paper.

The report consists of the draft report sent to the minister of environment, his feedback and the positions of the SAO on the information presented bu the minister. The last two are presented in the end of the corresponding chapters. Also the executive summary has been added to present the quick overview of the audit. The fourth chapter of the report deals with the legislation and the system of the water permits. The fifth chapter gives an overview of the water protection programmes and investments into the wastewater treatment plant construction, also of the decrease in pollution levels as a result of using different measures.

[2] In 1997 Helsinki Commission determined 12 “hot spots” – i.e. the biggest polluters of the Baltic Sea for Estonia.

In this audit the norms are based on the provisions stated in the Annex 3 of the Convention and also on the Helsinki Commission (hereinafter the HELCOM) recommendations that establish the criteria for the pollution limits.

The audit was conducted from February to October, this was followed by the report writing and feedback from the Ministry. The audit team consisted of three persons – the audit manager Eva Reinula, audit specialist Leonid Paalandi and an independent expert Klea Vaher. The consultants were audit manager Jan Velthoven and senior auditor Fons Gloerich from the Netherlands Court of Audit. An opinion to the report of findings was given by the programme director Toomas Pallo and the programme leader Irje Lepik from the SEI Stockholm Institute

2. Overview of the audit subject

The Baltic Sea countries signed the Helsinki Convention in 1974 and it entered into force in 1980 after ratification. On April 9, 1992 a new text was adopted, taking account of the environmental protection and political developments. In addition, the European Community acceded to this revised Convention. The Parliament of the Republic of Estonia ratified the Helsinki Convention on April 19, 1995. In order to fulfil the requirements of different parts of the Convention the annexes state the provisions concerning the prevention of pollution from land-based sources (Annex 3).

The system that is related to the environmental protection and the implementation of the Helsinki Convention included the Ministry of Environment, the environmental departments of the county government, the environmental boards (in Tallinn and Narva) and local authorities. All of them received money directly from the state budget and also from the Environmental Fond, who received pollution tax.

Since 2000, the enviornmental departments of the county governments and environmental boards have been reorganised and they all are now environmental services and form a part of the Ministry of Environment. Also the Environmental Fond was liquidated and a new public fond called the Centre of Environmental Investments has been created in the area of government of the Ministry of Finance. The first of these changes was recommended also by the SAO during the audits performed in 1998-1999.

During 1999 also the legislation on the pollution tax was changed, instead of the Pollution Damage Compensation Act was made void with the new Pollution Charge Act. With that act the pollution charges were more than doubled, for some substances even tripled compared to 1996.

There have also been changes in the private companies that were part of the audit scope. For example in Kohtla-Järve, the chemical company has changed ownership many times, in one case the owner went into bankruptcy and the environmental damage was not paid for. This has resulted in the situation, where no-one is responsible for the old damages, the wastewater treatment plant is owned by private company who does not have enough money to renovate it and the people living in the area do not have enough money to pay higher water fees to cover some of the investments needed. Also 49% of the shares of the power stations in Narva were sold to the strategic investor who probably does not want to cover the costs for environmental damages made during the earlier years.

The provisions of the Convention covered by legal acts and the implementation of the acts.

2.1. Introduction

Legislation is one of the most important instruments for preventing the pollution, as it sets the limits on the pollution and creates a framework for the other instruments and activities.

In this chapter the information is presented on the legislative matters that fulfil the requirements stated in the provisions of the Convention and in the recommendations adopted thereunder. Also the chapter covers the fulfilment of these legal acts and matters related to the issue and control of the water permits. The requirements from the Convention:

- the national authority has to take all appropriate legislative, administrative or other relevant measures to prevent and eliminate pollution in order to promote the ecological restoration of the Baltic Sea Area and the preservation of its ecological balance. These measures include also regulations concerning emissions and inputs to water containing harmful substances (these should not be introduced directly or indirectly into the marine environment without a special permit, which may be periodically reviewed);
- the national authority should also report to the Helsinki Commission at regular intervals on different measures taken for the implementation of the provisions, the effectiveness of these measures and the problems encountered in the implementation of the provisions. On the request of the Commission the national authority should provide other information related to the emission data or data on environmental quality.

2.2. Findings on the harmonisation of the legislation with the provisions of the Convention

Coverage of Helcom recommendations

Currently is applicable over 130 HELCOM recommendations defining the pollution control criteria, objectives for the reduction of pollution. Six of these concern control of pollution from municipal wastewater and 17 from the industrial wastewater. Based on the audit scope the relevant recommendations for Estonia are the ones that regulate the development of the sewerage systems (7/3, 13/2), wastewater treatment (9/2, 16/9), stormwater treatment (5/1, 17/7) and industrial waste treatment (13/5, 9/8). There are four HELCOM recommendations (12/3, 17/9, 17/8, 20E/6) that have to be covered by the 01 January 2005.

The audit finding is that all the HELCOM recommendations relevant to scope of the audit are incorporated into the Estonian legislative acts. As some recommendations are more general, they are incorporated in several legislative acts.

There are some allowances made for specific factories and towns[3] In Ida-Viru County the issuer of the water permit can increase the maximum values of pollution indicators of wastewater until December 31, 2001.

[3] Government regulation 271 of September 14, 1999.

Regulations regarding water permits

The proceeding and termination of the water permit has been laid down in Section 9 of the Water Act. Subsection 9 thereof states that the Minister of Environment shall determine the issuer of the water permit and shall establish the Procedure for Issuing and Revoking of Water Permit. The last wording of the Water Act[4] provided that the water permit shall be issued by the environmental authority of the location of the used water body, intake of water or recipient[5]. The Minister of Environment introduced the relevant procedure and the form of the water permit in 1994[6] and renewed it in 1996[7].

The Procedure for Issuing and Revoking of Water Permits adopted in 1996 does not differ from the procedure established in 1994 in terms of indicators related to the water permit. The new procedure modifies the earlier one, providing for the issue of water permits in special cases and for the revoke thereof as well as for the principles of establishing the conditions and procedures of wastewater monitoring. In addition cases when the water permit is necessary has been given.

Pollution tax

According to the Pollution Damage Compensation Act valid until 1999 the Government[8] fixes the amounts of pollution damage compensation and the Minister of Environment adopts the Procedure for Calculation and Payment of Pollution Damage Compensation[9]. The Environmental Fund receives the pollution damage compensation[10]. In 1995 the Government fixed the amounts of pollution damage compensation[11] and the Minister of Environment established the Procedure for Calculation and Payment of Pollution Damage Compensation[12].

The Pollution Damage Compensation Act was made invalid with the Pollution Charge Act in 1999. Now the release of the different harmful substances into water bodies, groundwater or soil is subject to pollution charge[13].

Regulations on reporting

[4] 08.12.1999.

[5] Water Act § 9, subsection 8^1

[6] Regulation of the Minister of Environment No.2 from 28.02.1994.

[7] Regulation of the Minister of Environment No.63 from 24.12.1996.

[8] Pollution Damage Compensation Act § 4, subsection 1.

[9] Pollution Damage Compensation Act § 4, subsection 5.

[10] Pollution Damage Compensation Act § 8, subsection 2.

[11] Government Regulation No 142 from 29.03.1995.

[12] Regulation of the Minister of Environment No.27 from 31.05.1995.

[13] Pollution Charge Act § 4.

In 1996 the Minister of Finance adopted the procedure for the drawing-up and implementing the public investment programme (PIP) [14] stating that the responsibility for effective and purposeful usage of money allocated to the local authorities through PIP has been put to the county government where the project is situated.

In 1997 the Minister of Finance enhanced the aforementioned regulation[15]. The regulation sets the obligation to the ministries to present the overview of the physical situation of the project and the usage of money every half a year (PIP information card). This obligation concerns the projects that cost more than EEK 20 mln and for the co-financed projects (not depending on the cost).

The statistical reports concerning use of water and wastewater are governed by the Official Statistics Act, which provides for the Government's obligation to adopt the List of Official Statistical Surveys every year. According to the Act the Minister of Finance establishes the forms of statistical reports. The forms of the "Water Use" report are adopted on an annual basis[16].

There are no special legal regulations on the reporting for the Helsinki Commission, the Commission asks for the reports when necessary, presenting the forms to be filled in.

2.3. Findings on the implementation of the legislation

Water permits

The water permit was checked for the minimum important data that should be stated in the water permit – name of the user and issuer, validity, characteristics of the water user, water intake, permitted content of pollutant in wastewater discharge. Out of 15 checked permits all but one permit had the information required with the Helsinki Convention. On April 8, 1994 Eesti Energia AS submitted an application to the Environmental Department of Ida-Viru County Government to re-register the water permit issued to Eesti Elektrijaam because of the changes in the legal status. As of September 19, 2000 the above water permit was not re-registered.

The pollution limit on the 6 water permits (valid at the end of 1999) was completely in conformance with the Helcom recommendations . Three permits were partly in

[14] Regulation of the Minister of Finance No. 32 from 25.03.1996.

[15] Regulation of the Minister of Finance No 28 from 10.04.1997.

[16] For example, for 1999 Regulation 87 of the Ministry of Finance of October 30, 1998, for 2000 Regulation 89 of the Ministry of Finance of November 18, 1999.

conformance, these were regulated with the Government Regulations and the pollution limits have to be updated in the end of 2001.

The controlling system of water permits works on different levels. The holder of the water permit has to allow a certified, recognised or accredited laboratory to take samples and analyse wastewater at least once a quarter. They are monitored and controlled once in a quarter by the inspectors of the environmental authorities. The environmental departments of county governments do not usually plan inspections, the account keeping of the site inspections and drawing up the relevant reports differed in regions. The records of the inspections are in most cases existing, in some cases there were shortcomings in taking over of the documentation during the reorganisation of the county environmental departments.
The double-check on the controllers was made by the County Governors, there is no written information about the double-checks.

For example the inspections carried out by the inspectors of the Narva environmental authority were marked in the logbook. In the case if there were unclarities, usually a letter was sent to the relevant institutions with the explanation of the issue. There were no violations recorded of the water permits audited.

During the audited period industrial organisations paid increased pollution charge for exceeding the maximum pollutant concentration and amount indicated on the water pollution permit (in thousands of kroons):

Table 1. Amounts of increased pollution charge paid during 1996-1999.

	1996	**1997**	**1998**	**1999**	**Total**
Pärnu Vesi AS	47.8	54.2		9.7	**111.7**
Balti Elektrijaam	2.0		6598.6	5218.8	**11 819.4**
Eesti Elektrijaam	8.3				**8.3**
Kiviter AS	1678.8	2389.5			**4068.3**
AS Narva Vesi		0.8	5.8	18.8	**25.4**
Viru Keemia Grupp				458.1	**458.1**
Viru Biopuhastus AS				513.4	**513.4**
Total	**1736.9**	**2444.5**	**6604.4**	**6218.8**	**17 004.6**

Reporting

The reporting on the hot-spots and also on the pollution loads is based only on the statistical reports. HELCOM defines it's needs as regards to the contents of the reports, these are filled, gathered and sent there by the chief specialist of the HELCOM from the Ministry of Environment.

The Ministry receives also the reports on the PIP projects which cover the economic indicators. The Ministry has not defined any other forms of reports that it needs. Also

the Environmental Information Centre of the Ministry said that they do not present any more reports to the Ministry.

The state of the art of the projects are reported to the relevant parties (providers of funds) constantly. All the official public investment programme reports (PIP information cards) that are presented every half a year for the projects of the 5-year water protection program (18 cards) had many shortages in their fulfilment, i.e. many fields were not filled in.

The assignations from the state budget to the local authorities for constructing water protection facilities were given by the Ministry of Environment. Because of that the county governments presented the PIP information cards to the Ministry of Environment who sent it to the Ministry of Finance.

2.4. Conclusions

Harmonisation of the legislation with the provisions of the Convention has been done adequately.

All of the relevant recommendations are incorporated in the Estonian legal acts, there are some exceptions:

- there are four HELCOM recommendations (12/3, 17/9, 17/8, 20E/6) that have to be covered by the 01 January 2005;
- there are some allowances made for specific factories and towns with government regulation (valid until December 31, 2001).

The drawing-up, controlling and reporting on the water permits is also covered well in the legal acts and answers to the requirements stated in the Convention.

The reporting to the Commission about the implementation of the measures is not stated in the legal acts. There are Regulations of the Minister of Finance on the financial reporting of the projects financed from the state budget and foreign aid.

There was one shortcoming that is not directly related to the incorporation of the provisions – in the amendments of the Water Act, one of the paragraphs has not been changed to reflect the recent changes – closing down of the Environmental Fond. But new amendments of the Water Act taking this fact into account have already been presented to the Parliament.

The implementation of the legislation concerning water permits has been done almost adequately, there was one water permit, that was not updated to show accurate information about the water user. The pollution limits on the water permits match almost the Helcom recommendations, there are some exceptions made with

the Government regulations. Although there is no adequate planning of the inspections in the county environmental departments, the inspections were registered later. There are some administrative shortages in relation to the reorganisation of the county environmental departments and taking over of the documentation. However the controlling system works well thanks to its many levels and all the water users have to use the accredited or recognised independent laboratory.

The water users paid increased pollution charge in total of 17 million EEK, out of which ca 11 million was paid by the Balti Power stations. From the figures presented it can be seen, that after the new charges were introduced (in 1998) the payments have increased remarkably. An issue may be raised soon when potential strategic investors will not cover the expenses related to the damage on the environment made in the past.

The reporting is based on statistical reports on the use of water and on the PIP cards. The information required on the PIP cards is enough for analysing the state of the art of the projects but the fulfilment quality is low, necessary information is missing too often. It seems that noone is monitoring them and asking to improve their quality.

2.5. Recommendations

The Minister of Environment should:

- ask for the data on the pollution level with such an interval that it would be possible to monitor and analyse the situation of the hot-spots continuously;
- see to that the PIP cards are accurately filled;
- monitor the activities of the environmental services, ask them to plan their inspections and keep the records about them as these inspections are the essential elements of the controlling system;
- to keep in mind the issue about the Power stations and to find the solution to eliminate the hazards to the environment.

2.6. Feedback from the Minister of Environment

The Minister of Environment informed the SAO about the measures taken and envisaged to comply with the proposals in audit report no. 12-4/023.[17] The Minister considers it essential to continue and to improve the efficiency of the work aimed at compliance with the principles of the Convention on Marine Environment Protection in the Baltic Sea Region and at the integration of its recommendation into the Estonian legal system.

The following is a list of measures taken and envisaged in order to comply with the proposals included in this Chapter:

- in 2000 the Ministry of Finance updated the reporting forms of the PIP providing for improved accuracy and quality of the completion of the forms;
- supervision of the county environmental services of the Ministry of Environment will be strengthened;
- at the end of the last year the Parliament adopted the Act Amending the Water Act, which details the provisions concerning the water permits. The water permit can be used to subject the water user to the obligation to assess, on a regular basis, the created pollution load and monitor the water bodies receiving wastewater. The environmental services monitor the user of water for specific purposes. The environmental licences (water, air, waste) of the Narva power plants will be updated in the light of the new Integrated Pollution Prevention and Control Act, which should be adopted in 2001. After the adoption of the said Act the power stations have to apply for an integrated environmental licence, which allows systematic reduction of environmental pollution caused by these stations.

2.7. Positions of the SAO

The positions of the SAO on the measures communicated by the Minister of Environment are based on the structure of proposals in this Chapter and read as follows:

- the Minister of Environment has not provided any information on the measures envisaged for the purpose of continuous monitoring of hot spots, but the SAO hopes that the proposal will be discussed with the officers responsible and that a position will be adopted thereon. Environmental monitoring – especially the monitoring of the hot spots – is essential, since it allows the implementation of preventive measures;

[17] Letter no. 11-2/89 of January 10, 2001 from the Minister of Environment.

- PIP forms contain a lot of important information on the status of environmental projects. The SAO maintains that the correct completion of PIP forms and strict control over their quality allows improved assessment of the effectiveness of investments and verification of the expedient use of funds. Therefore the SAO recommends checking the quality of PIP forms submitted to the Ministry of the Environment. This should be facilitated by the fact that as from 2000 the reporting form is user-friendlier;
- information concerning the last two proposals indicates the Minister intends to implement the proposals. The SAO hopes that implementation will be successful.

3. National water protection programs and the decrease of pollution

3.1. Introduction

The aim of the Helsinki Convention is to unite the measures related to the protection of the marine environment of the Baltic Sea. With the Convention the Baltic Sea countries have taken the obligation to take all relevant measures to prevent and eliminate pollution going to the Baltic Sea. To implement the measures and procedures they should also develop and adopt specific programmes etc.

In Estonia the decrease of the pollution is regulated through different measures, the legislation and water permits were covered in the previous chapter. In this chapter an overview is presented on the financial measures taken, i.e. national water protection program and the public investments made into the wastewater treatment plans. Also the results of these programs are covered and the decrease in the pollution is shown.

3.2. Findings on the decrease of the pollution

The water protection program[18] was the policy (a set of measures) for 1995–1999, which was to be implemented to perform the water protection obligations taken with international agreements and also the national water protection functions. The annual water protection programs stemming therefrom are needed for the implementation of water protection policy. For compiling the annual water protection programs, there is a system of planning with the responsibilities to persons on different levels – national, county, local.

HELCOM has worked out specific recommendations to implement the provisions of the Helsinki Convention. These recommendations have been taken into account when compiling the annual water protection programs. One of the main objectives is the HELCOM recommendation stating that it must be ensured, by 1998 at the latest, the biological or an equally effective treatment of wastewater and the removal of phosphor (treated wastewater with BOD_7 below 15 mg/l; total phosphor content below 1.5 mg/l) in cities with a population exceeding 10 000. This objective was not met by set deadline in ten towns.

Table 2 presents the objectives and targets of the water protection activities, main focus is on the achievement of annual targets.

[18] Adopted with Directive no. 27 of February 7, 1995 of the Ministry of Environment.

Table 2. The objectives and achievement of targets of the annual plans

<table>
<tr><th colspan="4">Objectives of the Environmental Strategy</th></tr>
<tr><td colspan="4">A ecological balance of inland waterways and coastal waters and natural reproduction of fishery resources and aquatic biota;
B performance of obligations stemming from international agreements and conventions.</td></tr>
<tr><th colspan="4">Objectives of the Water Protection Program for 1996–1999</th></tr>
<tr><td colspan="4">A general objective: to protect the water resources from pollution and inadmissible reductions in their volume and ensure supply of quality water to consumers;
B specific objective: to preserve the earlier level achieved in protecting water resources in rural areas, ensure compliance with international obligations as regards reducing the impact of larger pollution sources and improve the quality of municipal drinking water.
C Targets:
- to prevent further deterioration of the condition of water bodies and groundwater and improving the condition of contaminated water bodies by reducing the pollution load and rehabilitating the water bodies;
- to reduce the release into water bodies of pollutants particularly hazardous to their ecosystems (heavy metals, biogenes, toxic compounds etc) at least 50% by 1996 as compared to 1987;
- to ensure compliance with requirements related to releasing wastewater into water bodies and soil. On the basis of HELCOM recommendations, to ensure, by 1998 at the latest, the biological or an equally effective treatment of wastewater and the removal of phosphor (treated wastewater with BOD_7 below 15 mg/l; total phosphor content below 1.5 mg/l) in cities with a population exceeding 5 000.</td></tr>
<tr><th colspan="4">Measurable targets of annual water protection programs</th></tr>
<tr><td>1996: to achieve 90% effectiveness of wastewater treatment in settlements with a population exceeding 5000, and reduce the content of organic matter BOD_7 below 15 mg/l and the total phosphor content below 1.5 mg/l.</td><td>1997: to reduce the pollution load coming from point sources of pollution by 30% compared to the preceding year.</td><td>1998: to reduce the pollution load coming from point sources of pollution by 9% compared to the preceding year.</td><td>1999: to reduce the pollution load coming from point sources of pollution by 4% compared to the preceding year.</td></tr>
<tr><th colspan="4">Achievement of measurable targets of annual water protection programs</th></tr>
<tr><td>In 1996: out of the 25 settlements with the population exceeding 5000 only in 9 settlements the wastewater was treated according to the norms set. The program target was not achieved.</td><td>In 1997 the organic pollution load (in terms of BOD_7) on water bodies was reduced by 8%. The program target was not achieved.</td><td>In 1998 the organic pollution load (in terms of BOD_7) on water bodies was reduced by 11%. The program target was achieved.</td><td>In 1999 the organic pollution load (in terms of BOD_7) on water bodies was reduced by 26%. The program target was achieved.</td></tr>
</table>

All 18 of the projects from the 5-year program were started in 1995. Also every year some new projects[19] were included, the possibility to finance these was set in the water protection program.

The ratio between the numbers of old and new projects has changed only slightly. But the ratio between the budgets for the old and new projects has changed over the years remarkably.

[19] New projects – projects started in addition to the 18 original projects during the period of 1996-1999.

Chart 1. Number of objects in the annual plans

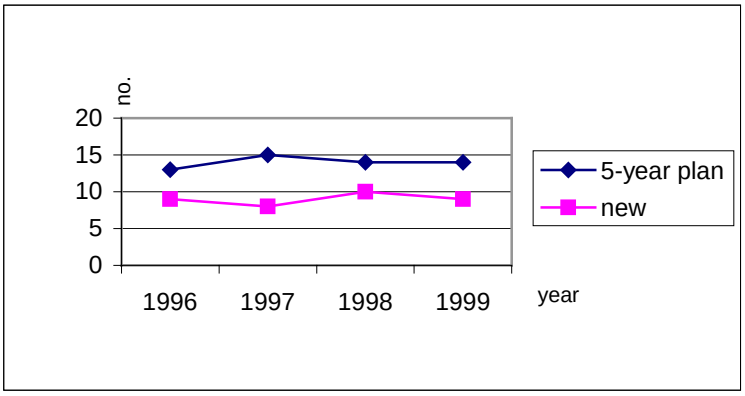
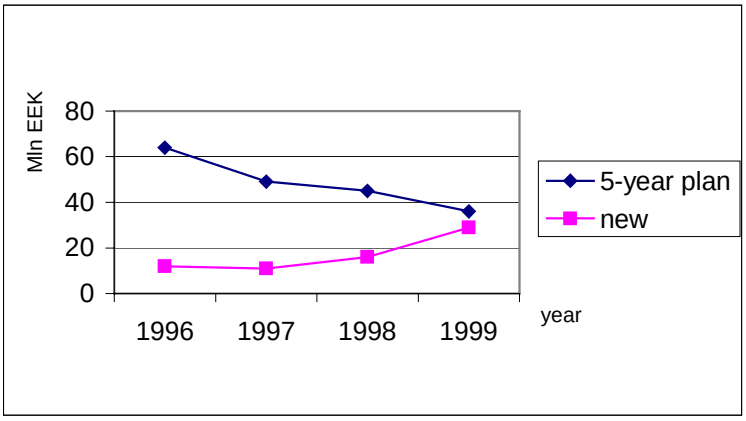


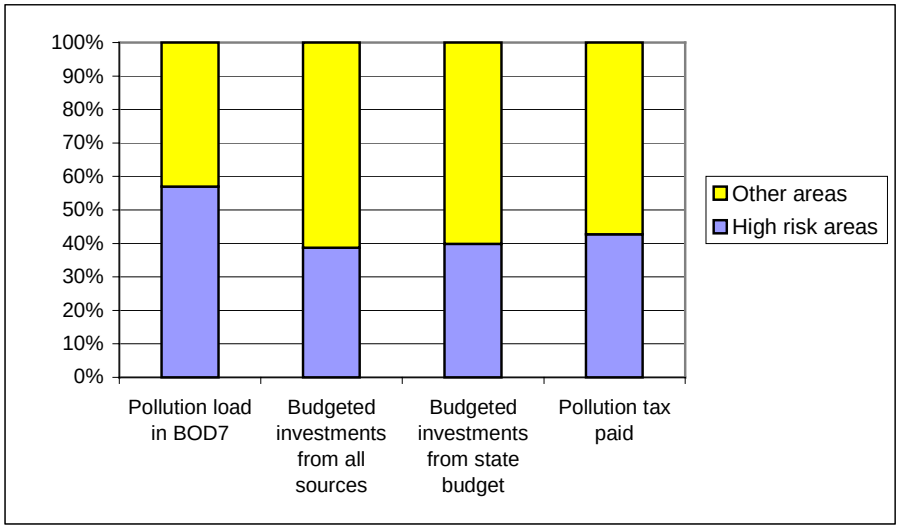
Chart 2. Money budgeted for the projects in the annual plans



The pollution load of the high risk areas form more than half of the total pollution load in Estonia. From the state budget little bit less than half is allocated for the high-risk areas. There are some hot spots which have received either nothing - Tallinn, or very little money, for example the biggest polluter – Kohtla-Järve. For Tallinn the reason for not receiving the investments is that the renovation of the wastewater treatment plant was done before the 1996. In Kohtla-Järve, the plant is owned by the private company and also as there are societal problems it is not possible to ask higher fees for water usage from the people to increase the investments.

From all sources the budgets for high-risk areas in 1996 – 1999 are up to 927.4 mln EEK and the republic in total 2392.8 mln EEK. The chart below presents the overview of the relations between the high-risk areas and other areas in different aspects – pollution load, money spent for investments and pollution tax paid. The comparative percentages of the pollution load, money spent for investments and pollution tax paid are almost the same for each aspect.

Chart 3. Comparison between high-risk areas and other areas during 1996-1999.



The planned decrease for each "hot spot" concerning the pollution load is not determined, the planned decrease is only for the pollution level that are set by the HELCOM recommendations.
The pollution level has decreased during these years. The following graph presents a comparison of the actual pollution level in the "hot spot" cities with the HELCOM recommendations.

Chart 4. The comparison of actual and recommended BOD_7 level in 4 cities.

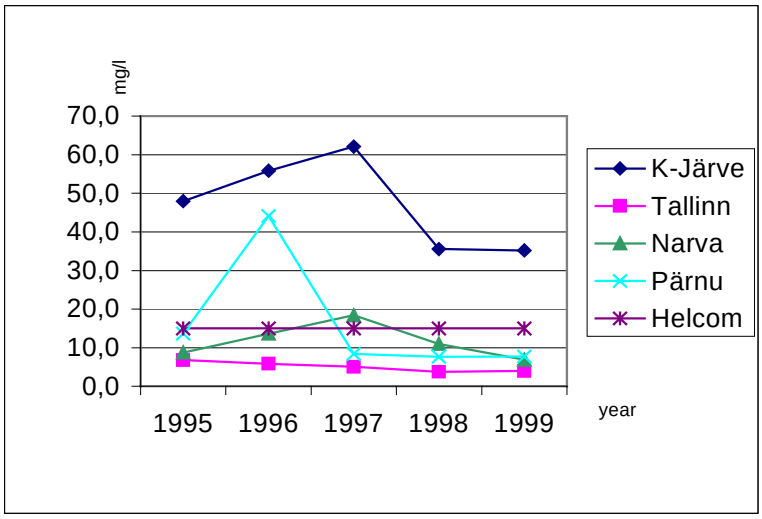
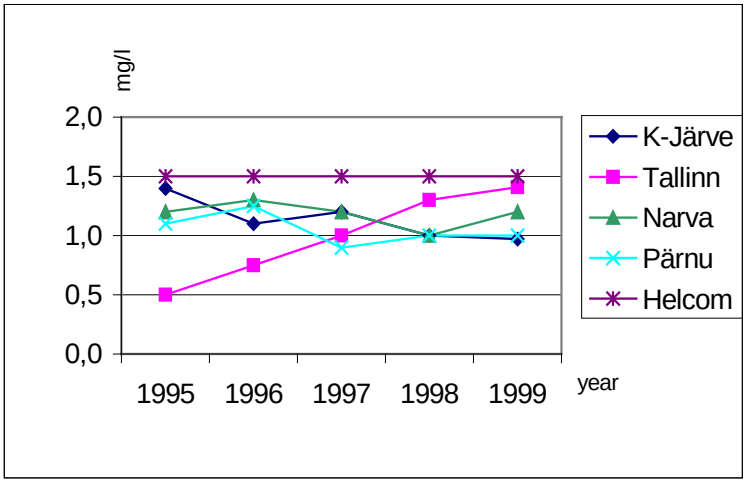


Chart 5. The comparison of actual and recommended P_{total} level in 4 cities.



The audit revealed that the actual pollution level of P_{total} in the "hot spot" cities has decreased over the years and is now below the recommended level. The actual BOD_7 level is still higher than recommended level in Kohtla-Järve, although it has decreased during these years as a result of the decrease in industrial processes.

Some of the industrial "hot spots" release their wastewater through the city's wastewater plant, the others that were audited – Saku and Kehra have their own systems. Saku Brewery's pollution level is almost zero and Kehra Pulp & Paper has also a pollution level below the HELCOM recommendations.

The outcome of the Kohtla-Järve, Tallinn, Narva and Pärnu projects can be assessed by comparing the amounts of individual pollutants given in the statistical reports on the use of water and the results are presented in the table below.

Table 3. Decrease in the pollution load in the "hot spot" cities

Pollution load in "hot spot" cities	Kohtla-Järve		Tallinn		Narva		Pärnu	
	BOD_7 t/year	P_{total} t/year	BOD_7 t/year	P_{total} t/year	BOD_7 t/year	P_{total} t/year	BOD_7 t/year	P_{total} t/year
1996	667.8	14.3	512.9	58.8	359.2	34.6	221.5*	6.4
1997	803.7**	16.1	340.4	69.3	507.5***	34.5	46.8	5.2
1998	773.5	14.5	292.7	88.9	213.5	23.9	40.3	5.2
1999	404.4****	11.4	263.3	80.1	160.7	20.1	40.6	5.1

* During the construction the working of the wastewater treatment plant had to be stopped for 1.5 months.

** Rainy year. Because of that amounts of the filtration water from the ash-hills increased.

*** In addition to the rainy year two factories increased their production, specially in the product lines that pollute much (leather processing). Now these processes are finished.

**** The decrease in pollution in Kohtla-Järve is mainly related to the decrease in the industrial processes.

3.3. Conclusions

The pollution has decreased remarkably during these years, one reason for that are the public investments made into the wastewater treatment plants. These investments are done according to the five-year water protection program and the annual water protection plans stemming therefrom.

The water protection programs also state the targets for each year. During 1996 and 1997 the targets were not achieved but in 1998 and 1999 the targets in the programs are achieved. It may mean that the targets set are now more realistic and the knowledge about planning has grown during the years.

Although the audit did not include analysis on the effectiveness of the money invested and the direct relation between the money spent and the decrease of the pollution, one conclusion can be made. In Kohtla-Järve, the decrease in the pollution results more from the decrease in the industrial processes than from the investments made, as these are very small.

The comparative percentages of the pollution load, money spent for investments and pollution tax paid are almost the same for each aspect. About 40% of investments are made in the high-risk areas. This is less than half, because some hot spots have received almost no investments during these years. Tallinn has not received investments at all, because the renovation of the wastewater treatment plant was finished there during earlier year. It seems, that the problem with Kohtla-Järve may be solved soon, as the discussions about widening the ownership circle of the water company are ongoing. Also most of the local governments in this region have agreed to cooperate and send in the joint application for ISPA funds. One of the local governments has not sent in the application yet.

The phospor content is below the Helcom recommendations in every case, but the trend shows that in Tallinn the pollution level of phosphor is increasing every year. The reason for that is the increase in the usage of different detergents and depending on the increases in consumption habits it may soon cross the allowed limit. The BOD_7 level is higher only in Kohtla-Järve.

3.4. Recommendations

The Minister of Environment should:

- analyse the effectiveness of the investments made to decrease the pollution;
- present to Helcom the application to update the Hot Spot list as some of them have been eliminated by now;

- keep Kohtla-Järve under close attention and find the best way to solve the situation in there;
- see to the trends in the change of the pollution levels to be able to act preventatively, e.g. limit the phospor content in Tallinn.

3.5. Feedback from the Minister of Environment

The Ministry of Environment has taken and envisaged the following measures to comply with the proposals in this Chapter:

- effectiveness of investments related to the prevention of pollution will be assessed annually. Last year OÜ Keskkonnauuringute Keskus[20] carried out this assessment. Assessments will continue throughout the current year as well. This year an analysis of the results of assessing the investments made in pollution prevention over the preceding years will be carried out;
- this year the Project Implementation Task Force of the Convention on Marine Environment Protection in the Baltic Sea Region (HELCOM PITF) shall meet in Tallinn. This meeting is a good opportunity for Estonia to give an overview of the current hot spots and make proposals to update the hot spots list of Estonia;
- problems with the treatment of wastewater in the Kohtla-Järve region will be solved in the next few years, since plans have been made to renovate the local wastewater treatment system. ISPA funds from the EU will be used to this end. The project and the financing application are being prepared. In the near future the circle of owners of AS Viru Biopuhasti[21] engaged in the treatment of wastewater is likely to be extended to the local governments in the region, which creates favourable conditions for wastewater treatment and the development of the relevant project in the region;
- the total phosphor content in the wastewater of Tallinn may not exceed 1.5 mg/l as from December 31, 2000. As from December 31, 2002 this content may not exceed 1.0 mg/l. This brings the phosphor removal capacity of the Tallinn wastewater treatment plant into conformity with the EU directive on urban wastewater treatment. Relevant changes will be made to the water permit.

3.6. Positions of the SAO

The positions of the SAO on the measures communicated by the Minister of Environment are based on the structure of proposals in this Chapter and read as follows:

[20] Private Limited Company Centre of Environmental Studies.

[21] Public Limited Company Viru Biological Treatment Facility.

- whereas this audit was not about assessing the effectiveness of investments, the information provided by the Minister of Environment implying that the investment projects are continuously assessed, is very positive. It is most welcome that an analysis of the results of assessing the investments made in pollution prevention over the preceding years will be carried out, since it will give a lot of necessary information for selecting the next investment targets;
- the SAO maintains that the measures taken or envisaged in order to implement the following three proposals are essential and hopes that the planned actions will be successful.

Table4. Amounts of investments

City	Amount of investments spent in 1996–1999 (in million EEK)	
	from all sources	**from the state budget**
Kohtla-Järve	42.7	3.0
Tartu	224.4	47.6
Tallinn	444.0	0
Narva	121.5	27.7
Pärnu	23.0	9.0
Haapsalu	71.8	29.4
Total high risk areas	927.4	116.7
Total republic	**2392.8**	**292,8**
In th. Euro	**153 384.6**	**18 769,2**

Raivo Linnas
Chief Auditor of the Performance Audit Department

Attachment 1

Table 1. Number of cities with a population exceeding 2 thousand, located in the country part of the Baltic Sea catchment area, equipped with waste water treatment plants and population (thousands people) served by waste water treatment plants.
Remark: All population numbers are for year 1999

No.	Cities with/without waste water treatment plants/population served by waste water treatment plants	Number of cities with a population exceeding 2 thousand, located in the country part of the Baltic Sea catchment area / population served by waste water treatment plants in the years:			
		1996	**1997**	**1998**	**1999**
1.	**Total number of cities / total population**	**31 / 830 000**	**31 / 830 000**	**31 / 830 000**	**31 / 830 000**
2.	**Number of cities equipped with waste water treatment plants/ population served by waste water treatment plants**				
	<u>total</u>,	**28 / 737 000**	**28 / 737 000**	**30 / 825 000**	**30 / 825 000**
	including:				
	a) mechanical[1] or	**3 / 20 000**	**3 / 20 000**	**1 / 4000**	**1 / 4000**
	b) mixed mechanical-biological or	**23 / 693 000**	**22 / 287 000**	**22 / 287 000**	**20 / 273 000**
	c) mixed mechanical-biological with intensive nutrient removal	**2 / 24 000**	**3 / 430 000**	**7 / 534 000**	**9 / 548 000**
3.	**Number of cities not equipped with waste water treatment plants/ population not served by waste water treatment plants**	**3 / 93 000**	**3 / 93 000**	**1 / 5000**	**1 / 5000**

[1] including mixed mechanical-chemical

Attachment 2

Table 2. Volume of treated waste water and population served by waste water treatment plants in cities with inhabitant number exceeding 300 000, located in the country part of the Baltic Sea catchment area [1].

Lp.	Name of the city / population / treatment level	Volume of waste water treated (in thousands m^3/a) in the years:			
		1996	**1997**	**1998**	**1999**
1.	**Tallinn /** **population 408 329/** **volume of waste water treated** **<u>total</u>,** **including those treated:** **a) mechanically or** **b) mixed mechanically and biologically** **c) biologically with intensive nutrient removal**	**76 758** **23** **77** **76 658**	**66 820** **31** **66** **66 723**	**64 718** **33** **51** **64 643**	**56 354** **20** **34** **56 300**
2.	**-**				

Attachment 3

Table 3. Industrial enterprises equipped with waste water treatment plants and volume of treated industrial waste waters (thousands m^3/a)

No.	Industrial enterprises with / without waste water treatment plants	Number of industrial enterprises discharging sewage into surface waters of the country part of the Baltic Sea catchment area / volume of industrial effluent treated in the years:			
		1996	**1997**	**1998**	**1999**
1.	**Number of industrial enterprises that require waste water treatment plants**	**In Estonian statistics the municipal and industrial waste water are summarised, because almost all industrial enterprises are discharging the municipal sewerage systems. Therefore there is no data only for industrial waste water.**			
2.	**Number of industrial enterprises equipped with waste water treatment plants, <u>total</u>, including:** **d) mechanical or** **e) mixed mechanical-biological or** **a) mixed mechanical-biological with intensive nutrient removal**				

Attachment 4

Table 4. Treatment of municipal and industrial waste waters discharged to surface waters of the country part of the Baltic Sea catchment area

No.	Type of sewage	Volume of waste waters (thousands m^3/a) discharged to surface waters of the country part of the Baltic Sea catchment area in the years:			
		1996	**1997**	**1998**	**1999**
1.	**Municipal waste waters <u>total</u>, Estonian total**	**187268**	**175922**	**159262**	**144854**
	including those treated:				
	a) mechanically or	**11556**	**12395**	**5208**	**5209**
	b) mechanically-biologically or	**84317**	**81814**	**73063**	**63918**
	c) biologically with intensive nutrient removal	**76784**	**72094**	**72749**	**69194**
2.	**Industrial waste waters <u>total</u>,**	**No data**			
	including those treated:				
	d) mechanically or				
	e) mechanically-biologically or				
	f) biologically with intensive nutrient removal				

Attachment 5

Table 5. Load of pollution discharged from land-based sources to the Baltic Sea from the country part of the Baltic Sea catchment area

No.	Pollution indicator	Load of pollution (t/a) discharged from land-based sources to the Baltic Sea from the country part of the Baltic Sea catchment area in the years:			
		1996	1997	1998	1999
1.	BOD_7	1292	1030	829	661
2.	Total Nitrogen	1608	1535	1743	1490
3.	Total Phosphorus	100	120	129	119
4.	Mercury	No data			
5.	Copper	No data			
6.	Lead	No data			

Attachment 6

Table 6. Volume of waste waters and load of pollution discharged to waters by the audited organisations

No.	Volume of waste waters and pollution indicators	Volume of waste waters (th. m^3/a) and load of pollution (tons/a) discharged to waters by the audited organisations			
		1996	1997	1998	1999
1.	Volume of waste waters	126855	112999	105291	89848
2.	BOD_7	1761	1698	1320	869
3.	Total Nitrogen,	1812	1702	1532	1245
4.	Total Phosphorus	114	124	132	116
5.	Mercury	No data	-	-	-
6.	Copper	No data	-	-	-
7.	Lead	No data	-	-	-

Attachment 7

Table 7. Volume of waste waters and load of pollution discharged to waters by the audited organisations included in the HELCOM "hot-spot" list

No. and name of the „hot-spot" in the HELCOM list	Volume of waste waters and pollution indicators	Volume of waste waters (th. m^3/a) and load of pollution (tons/a) discharged to waters by the audited organisations included in the "hot-spot" list			
		1996	1997	1998	1999
No. 25 Waste water Treatment Plant in NARVA	**Volume of waste waters**	**31471**	**27445**	**22571**	**17481**
	BOD_7	**359**	**507**	**213**	**161**
	Total Nitrogen,	**342**	**308**	**229**	**193**
	Total Phosphorus	**35**	**34**	**24**	**20**
	Mercury	**-**	**-**	**-**	**-**
	Copper	**-**	**-**	**-**	**-**
	Lead	**-**	**-**	**-**	**-**
3.6.1.1. No. 26 Waste Water Treatment Plant in **KOHTLA-JÄRVE**	**Volume of waste waters**	**13226**	**12953**	**12486**	**10646**
	BOD_7	**668**	**804**	**774**	**404**
	Total Nitrogen,	**396**	**417**	**358**	**234**
	Total Phosphorus	**14**	**16**	**14**	**11**
	Mercury	**-**	**-**	**-**	**-**
	Copper	**-**	**-**	**-**	**-**
	Lead	**-**	**-**	**-**	**-**
No. 28 Waste water Treatment Plant in TALLINN	**Volume of waste waters**	**77143**	**67108**	**65039**	**56597**
	BOD_7	**513**	**340**	**293**	**263**
	Total Nitrogen,	**1014**	**954**	**924**	**792**
	Total Phosphorus	**59**	**69**	**89**	**80**
	Mercury	**-**	**-**	**-**	**-**
	Copper	**-**	**-**	**-**	**-**
	Lead	**-**	**-**	**-**	**-**
No. 33 Waste water Treatment Plant in PÄRNU	**Volume of waste waters**	**5015**	**5493**	**5195**	**5124**
	BOD_7	**221**	**47**	**40**	**41**
	Total Nitrogen,	**60**	**23**	**21**	**26**
	Total Phosphorus	**6,4**	**5,2**	**5,2**	**5,1**
	Mercury	**-**	**-**	**-**	**-**
	Copper	**-**	**-**	**-**	**-**
	Lead	**-**	**-**	**-**	**-**

The National Audit Office of Finland

The State Audit Office of Finland
Senior Auditor Armi Jämsä

THE PARALLEL AUDIT ON THE IMPLEMENTATION OF THE HELSINKI CONVENTION

THE SUMMARY OF THE FINNISH AUDIT

Introduction

The State Audit Office has audited the implementation of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (The Helsinki Convention) in Finland. This is part of an international parallel audit ongoing in all the signatory member states except Germany. The chosen field of audit was implementation of the Helsinki Convention with regard to polluting discharges originating on land. Emphasis was placed on compliance with the conventions recommendations concerning agricultural, municipal, and industrial discharges. The time span considered was from 1996 to 1999. A longer period was used for discharges statistics, as trend predictions are generally not useful if based on short timeframes.

For Finland's part of the parallel audit it was studied how national legislation has taken account of the requirements of the Helsinki Convention, what kind of tools are being employed to follow up and monitor the implementation of the requirements, and what kind of economic incentives could be used for protection of the Baltic Sea, as well as how discharge levels have developed around the regions chosen for this study.

In addition to the studies concerning the parallel audit, an assessment was also made of the significance of the Helsinki Convention and its recommendations as a tool for water resource protection in Finland. This was done by examining the relationship of the Helsinki Convention and its recommendations with regard to other administrative instruments for water protection, assessing the efficacy of the Convention’s recommendations in terms of legal validity, and comparing the status of the recommendations with regard to national standards and statutes governing water protection. The State Audit Office also aimed at examining the regional effects of the Helsinki Convention, and assessing its implementation from a Regional Environment Centre's viewpoint. Southwest Finland Regional Environment Centre was chosen for the regional assessment because three of Finland's four so-called discharge hotspots are located within its jurisdiction. Fish farming is one of Finland's hotspots, and was included in the study because of its significant local effects. In addition to Southwest Finland, implementation was also assessed at the Uusimaa and Southeast Regional Environment Centres.

1. Carrying Out The Audit

The audit was largely based on the text of the Helsinki Convention itself, on assessments of its annexes and the Convention's recommendations regarding concurrent assessments, and on comparisons with Finnish national legislation and water protection-related programmes.
Finland maintains extensive scientific programmes on the conservation status of the Baltic Sea, the main researchers being The Finnish Environment Institute (SYKE), The Finnish Marine Research Institute (FMRI), Regional Environmental Centres, and various universities. This inspection has made wide use of such studies, and also of related statistics produced by the Finnish Environment Institute and Statistics Finland. The most important medium for assessing the practical implementation of the Helsinki Convention and its recommendations were interviews carried out at the Finnish Ministry of the Environment, The Finnish Union for Nature Conservation (SLL), The Finnish Environment Institute, and at the Regional Environment Centres of Southwest Finland, Uusimaa, and Southeast Finland. Twelve interviews were conducted in all.

2. The Legal Validity and Obligation of the Helsinki Convention

The Helsinki Convention, as with other international agreements ratified in Finland, is legally binding on e.g. law courts and other authorities. However, recommendations passed by the Helsinki Commission are not legally binding on e.g. licensing authorities, but they are regarded as carrying considerable political and moral weight. The Finnish Ministry of the Environment has stressed that the drawing up and honing of recommendations under HELCOM and its subcommittees is a useful process for all parties. During the procedure the representatives of the Member States are obliged to carefully assess their country's possibilities of implementing the recommendations and so to make realistic statements.

3. On the Effects of International Agreements on the Finnish Legislation

In Finland, an agreement entered into by the State is not automatically applied inside the country after the agreement has come into force internationally. In most cases the agreed obligations are ratified separately inside the State through passing of specific national legislation that makes them part of the Finnish legal system. The Finnish constitution stipulates that legal obligations contained in State agreements and other international undertakings are to be ratified by the passing of appropriate legislation. Other types of international obligations are ratified by presidential act.

4. Ratifying the Helsinki Convention

Finland signed the Helsinki Convention on 9 January 1992, with the President of Finland approving the General Agreement on 16 June 1995. The ratifying act of the Helsinki Convention was passed on 14 January 2000 and it came into force on 17 January 2000. Changes to the Convention's annexes 3 and 4 concerning agriculture and shipping waste came into force on 1 July 2000.

The National Finnish Committee on the ratification of the 1992 Helsinki Convention submitted its report on 3 January 1994. In preparation for the ratification and implementation of the Helsinki Convention, modifications were made to national legislation, including the Acts on Water, on the Prevention of Pollution from Ships, Waste, Nature Conservation, and The Limits of Finnish Territorial Waters. A new law on the Conservation of Marine Environments was also passed.

The basic preparations for bringing the Helsinki Convention into force have been finalised. Although recent new legislation on Environmental Protection has overturned some laws originally enacted to comply with the Helsinki Convention, the necessary provisions have been retained in the new environmental protection statutes. Key legislation, such as the Act on the Conservation of Marine Environments and certain parts of the Water Act, are still in force. The most recent new legislation connected with implementation of the Helsinki Commission recommendations is the Act on the Prevention of Pollution from Ships, which requires port authorities to make provision for handling waste from docking vessels.

5. Monitoring and Reporting Requirements in Finland

In Finland, the main responsibility for implementation and monitoring of the Helsinki Convention, and the co-ordination of these functions, rests with the Ministry of the Environment. Numerous Finnish authorities are involved with the Helsinki Convention from central to regional and local government. License-issuing authorities play a central role in the practical implementation of the convention, as do the Regional Environment Centres. Implementation of the Helsinki Convention at the level of central government is largely co-ordination, monitoring, and reporting both nationally and abroad. However, implementation affects numerous sectors of both administration and private enterprise. This complicates the monitoring of the overall process and the exchanges between the various involved parties (see appendix 1).

6. Monitoring and Reporting on the Condition of the Marine Environment

In Finland, the study and monitoring of the marine environment is the responsibility of the Finnish Environment Institute (coastal areas) and the Finnish Marine Research Institute
(open sea). Regional Environment Centres also have monitoring responsibilities. For example, the Finnish Environment Institute maintains an extensive network of coastal sampling points, from which data are gathered at regular intervals. Current monitoring emphasises measuring concentrations of various substances, but methods are being developed to help identify also discharge sources in more detail. The Finnish Marine Research Institute (FMRI) initiated monitoring of seawater quality already in the 1960s. The FMRI and the Finnish Environment Institute maintain a joint working group for the co-ordination of monitoring work along the coast and at sea. Results are combined and reported to HELCOM under the convention's COMBINE programme.
7. Measuring Discharges

The national discharge network consists of more than 260 stations, of which some 150 are operated by the Finnish Environment Institute and the Regional Environment Centres.
Besides the environmental administration, hydropower companies are important producers of discharge data. The discharge values given in the database are daily mean values. The database contains data from 550 sites.

The discharge stations of the environmental administration are mostly located at natural riverchannels. The records of these discharge stations are based on the water level records and the rating curve of the station. Stations operated by other discharge data producers are in most cases hydropower plants or regulating dams. Such discharge values are controlled by
calibration measurements.

8. Reporting on Implementation of the Recommendations

The Helsinki Convention requirements are binding on the signatory States, and these requirements form the basis of HELCOM's recommendations. In Finland, the Finnish Environment Institute is responsible for reporting on the implementation of HELCOM recommendations, where needed gathering its information in co-operation with Regional Environment Centres.

The latest submitted report from 1999 concerns implementation of the recommendations of the HELCOM Technology Committee in Finland in 1998. Its key source of information on discharges is the environmental administration's data

register on monitoring results and environmental loading. However, not all data needed for HELCOM is available from existing registers, so some are requested from Regional Environment Centres or directly from the affecting enterprises. Not all the necessary discharge data is currently available either, e.g. full details of discharges directly into municipal sewage systems do not reach environmental officials. It is hoped that the new environment protection legislation will improve on this.

Environment Ministry officials are not satisfied with current reporting requirements. These should be further harmonised and emphasis placed on the more significant issues.

9. The Helsinki Convention and National Policy Programmes

Protection of the Baltic Sea and implementation of the Helsinki Convention has been emphasised in numerous policy programmes. Also the themes chosen for the parallel audit, i.e. agricultural discharges, the detrimental environmental effects of fish farming, and the reduction in waterway discharges from industry and municipalities are included in most policy programmes. Some programmes also emphasise the importance of international environmental agreements. The most comprehensive from the point of view of Baltic Sea protection is the Water Protection Programme to 2005 ratified by the Finnish Government, and an accompanying Water Protection Action Plan based on the programme. Their goals are in many respects comparable with the corresponding HELCOM recommendations and limit values.

The Water Protection Programme has certain notable individual targets. The programme states that current water protection legislation should be applied in ways that support achieving water protection targets. Also proposed are improvements to Regional Environment Centres' evaluation procedures, which would further the harmonisation of application handling. Developing environmental officials' application evaluation procedures could have featured more prominently in the Water Protection Programme, including e.g. making reference to such HELCOM recommendations as are not covered by national legislation or are otherwise deficiently implemented. References to HELCOM recommendations would have emphasised their role and been an additional policy instrument.

The Baltic Sea Protection Programme and its Finnish hotspot sectors are also considered in the Water Protection Action Plan. The programme stipulates that water protection measures should primarily target the heaviest sources of pollution in the Baltic Sea catchment area. The programme requires decreasing discharges in such a way that Finland's hotspots can be removed from the HELCOM list.

Although the content of the Water Protection Programme and its accompanying Action Plan well support the implementation of the Helsinki Convention's goals, its true effect on protecting the Baltic Sea will only be assessable years from now, when the final reviews are published as to how well the programmes' targets have been reached.

The Baltic Sea and protection of its waters is mentioned separately in the programme of Finnish Prime Minister Paavo Lipponen's II government. This programme aims at creating a project for restoring the ecological balance of the Baltic Sea, and decreasing its eutrophication – especially in the Gulf of Finland and inland waters - and the accumulation of environmental toxins in food chains. Implementation of the Finnish governmental programme on the Baltic Sea is to be co-ordinated by the Ministry of the Environment in co-operation with other ministries. The preparation of the programme is currently being finalised in the Ministry of the Environment.

The Policy Programmes may prove an effective administrational instrument, and strong political support may help further practical implementation of the prescribed measures. For example, a ministerial declaration of 1988 initiated large-scale studies within the administration on identifying the more damaging sources of discharges to the Baltic Sea.

It was noted in the audit that there are a large number of and in part duplicative policy programmes concerning the Baltic Sea. One should strive to minimise the possible harmful effects of duplication. The Ministry of the Environment should also prioritise and delegate policy programmes measures in a way that allows Regional Environment Centres to work with their strengths.

10. Costs of Water Protection

In 1998, environmental protection expenditure in the public sector was over 5,6 billion Finnish Marks (FIM). The government accounted for ca. 53 % and municipalities for ca. 47 % of this figure. In the same period, industrial expenditure on the environment totalled ca. 3,1 billion FIM.

The most significant funds affecting water protection in the Finnish national budget are those for agri-environment support. The costs of the agriculture sector's environment programme under the jurisdiction of the Ministry for Agriculture and Forestry in the 2000 budget were ca. 1,2 billion FIM. The significance of agri-environment support is emphasised by the fact that it is the government's largest single environmental protection expense. For example, in 1998 the government's environmental expenditure was 4,6 billion FIM, of which agri-environment support received 1,6 billion FIM, or ca. 36%.

It is not possible to separate resources allocated to protection of the Baltic Sea from those allocated to environmental and water protection overall. It is also only partly possible to separate out resources allocated to water protection from those allocated to environmental protection in general. Water protection resources are illustrated best by industrial environmental investments and in municipal water treatment costs. The following table gives the total environmental protection expenditure (administration costs and investments) in 1994-1998 (Millions of FIM).

	1994	**1995**	**1996**	**1997**	**1998**
State	1311	2535	2873	2926	3012
Municipal	2319	2081	2447	2707	2640
Industry	2448	3052	3365	3259	3172

The emphasis of industrial environmental investment has varied: in 1998 40% of investments were in water protection; in 1995 it was 60%.

Fish farm profits have been relatively weak, which in turn has slowed progress with environmental initiatives and the application of new technology. Municipal wastewater services most need investment in improved nitrogen removal processes.

11. Trends in Discharges to Waterways

Environmental monitoring systems in Finland comprise monitoring both the condition of the environment as well those processes contributing to changes, i.e. discharges and emissions. Key monitoring bodies are the Ministry of the Environment, the Regional Environment Centres, and the Finnish Marine Research Institute.

Saved in the environmental administration's data register on monitoring results and environmental loading is information on discharges from permit holders. The longest time series are on municipal and industrial discharges from the 1960s and 70s.

Of industrial and municipal nutrient discharges, phosphorous has declined the most since the late 1980s (see appendix 2). Nitrogen discharges from similar point sources have declined more slowly, and indeed municipal loads have shown significant declines only since the mid 1990s (see appendix 2). This positive trend is explained by increased expenditure on nitrogen removal in municipal wastewater treatment in the capital city region. There have also been significant improvements in municipal waterway discharges overall, especially with regard to organic matter and phosphorous. Their cleansing rate is currently over 93% (appendices 3-4).

Among Finnish industries, pulp and paper is still the greatest single source of waterway discharges. Nutrient discharge cuts, as outlined in e.g. the Water Protection Programme, require increased efficacy of the cleansing processes as well as internal refinements to the processes themselves. Industrial discharges and emissions of heavy metals have declined steeply in recent decades, although reaching set targets for some metals has proved difficult.

Data on trends in environmental heavy metal loads are partly deficient, as the current monitoring system cannot give information on e.g. heavy metal discharges and emissions from municipal sewage plants, nor completely on those from all industries. Data on the metal industry sector are comprehensive, however. Data on other chemical loads are also incomplete.

Industrial discharges of heavy metals into Finnish coastal waters in 1982 and 1990-1999. Data source: Finnish Environment Institute.

METAL	1982 TONS/YEAR	1990	1995	1999	CHANGE 1990-99, %
Mercury	0.06	0.03	0.03	0.01	-67
Cadmium	0.15	0.05	0.10	0.03	-40
Chromium	20.0	37.4	18.0	6.1	-84
Copper	16.0	4.9	5.1	4.2	-74
Lead	2.9	1.0	1.3	0.01	-99
Nickel	..	22.9	8.7	4.8	-79
Zinc	210	117	47	8.3	-93

Nutrient discharges from fish farming fell slightly after the mid-1990s, but those of nitrogen and phosphorous reincreased a little in 1998. In 1999 they again fell slightly to around 1995 figures.

Systematic data on scattered discharge loads is impossible to gather, instead their monitoring is based on empirical and theoretical models. Part of the monitoring is based on quality analyses of samples from around the country.

Agriculture is still the greatest single nutrient load source in Finland. About half of its runoff affects coastal waters. Agriculture in general and most land given over to cereal production are centred in S and SW Finland, reflected in discharge levels to the Baltic Sea. However, fertilisation procedures have changed considerably; the reduction in their use will in the long term also affect nutrient loads. Despite this, phosphorous loads are expected to decline only slowly, as soils store considerable amounts of this element, releasing it very gradually.
(appendices 4-5).

So far changes in agriculture's waterway discharges have been small, with the greatest improvements in nitrogen runoff. EU agri-environment programme nitrogen load reduction targets are, however, unlikely to be met within the planned timeframe. Measured phosphorous runoff has even increased, which is assumed to be caused by lighter tilling and increased farming of pasture. Agri-environment schemes will therefore affect agricultural waterway loads only slowly. Nevertheless, the Finnish agriculture sector is still regarded as clearly the most important source where nutrient loads can still be reduced.

12. Water Quality of Lakes, Rivers, and the Baltic Sea

The most recent comprehensive quality classification of Finnish waters was made in 1994-1997. It assigned 80 % of the assessed lake area and 88 % of the sea area to classes 'excellent' or 'good'. Water quality in rivers was notably weaker than that of lakes, because the former receive greater wastewater loads. At sea, problems caused by eutrophication are evident particularly in the Gulf of Finland and the Archipelago Sea.

The most load-stressed sea area of all, the Gulf of Finland, now receives one third less nutrients from the Finnish mainland than at the beginning of the 1990s. This should have shown up as an improvement in the Gulf's condition, but the reduction coincided with a strong release of the sea's internal nutrients in the middle of the 90s. This neutralised the beneficial effects of load reductions and in fact initiated a rise in phosphorous concentrations that halted only at the very end of the decade. The Archipelago Sea's condition has continued to weaken, although outside loads from the mainland have decreased. Also here there are signs of increased release of internal marine nutrients. Trends vary around the Archipelago Sea, however, and in some areas the situation has improved.

13. Compliance with HELCOM Recommendations in Finland

13.1. Compliance with Recommendations on Agriculture

A review publication by the Finnish Environment Institute contains a summary of the 1998 implementation status in Finland of recommendations of the HELCOM Technology Committee. Most of the principles inherent in HELCOM's recommendations on agriculture have been incorporated into the requirements of the EU agri-environment programme.
Joining the agri-environment programme is voluntary, but signing on requires compliance with all the programme's regulations. The report notes that agri-environment support is such an important part of farm income that almost 90% have

joined the basic part of the scheme. In designing the agri-environment programme, it was estimated that its basic part together with its environmentally more advanced special support schemes would help reduce waterway phosphorous loads from agriculture by 40% and those of nitrogen by 30%. These targets are not likely to be quite achieved, because certain special support schemes such as creation of waterway protection zones have suffered from considerable practical problems. By the end of 1997 it has been drawn up an environment plan for every farm within the agri-environment scheme.

HELCOM recommendation 13/7 concerns lowering ammonia emissions of manure pits. Finland is not yet in full compliance with this recommendation, although the agri-environment programme includes wording on the need to lower agricultural ammonia loads. Finnish manure pits are currently not covered well enough. Additional environment information on agriculture in SW Finland has been published at the end of 1999 in connection with reports on Baltic Sea hotspots. One problem cited in this report is the slow start-up pace of special support schemes within the EU agri-environment programme. According to the Southwest Finland Regional Environment Centre, HELCOM recommendations on agriculture can be regarded as minimum standards to which all should conform.

13.2. The Meaning of HELCOM Agricultural Recommendations for Water Protection in Finnish Agriculture

The agriculture annex (recommendation 19/6) of the Helsinki Convention came into force 1 July 2000. Before the approval of the annex, HELCOM regulations on agriculture have been recommendations which have not bound individual farmers. Legislation required to be implemented as described in the agriculture annex is already included in the environmental protection legislation, Water Act, and in the legislation of agri-environmental programme. When the annex came into force, there was no need to make changes in the legislation. Targets in the annex are less demanding than those in the agri-environmental programme.

At the beginning of the 1990s, environmentally friendly farming methods based on HELCOM standards were introduced to farmers through personal instruction and explanatory booklets. However, it was only the implementation of the EU agri-environment schemes that really initiated widespread application of water protection measures. Voluntary programmes have not been sufficient to obtain significant results in the agriculture sector.

Despite the above, HELCOM recommendations on agriculture were taken account of in designing the EU agri-environment programme, so that the latter is in fact

instrumental in implementing also HELCOM principles. Where possible, the recommendations have also been integrated into regulatory information.

The efficacy of the EU agri-environment programmes is emphasised by the fact that their measures are binding and requirements obligatory, as non-compliance means that funds are neither approved nor paid. The programme also contains provisions for sanctions and monitoring, which enhance compliance with its regulations.

In 1999 the State Audit Office completed an audit of the administrative and monitoring procedures for agri-environment support. The main purpose of the audit was to assess whether the agri-environment support's administrative and monitoring procedures were adequate for ensuring proper implementation of the programme's conditions and for achieving its targets.

The State Audit Office found serious administrative deficiencies in the programme implemented during 1995-1999. Before payments, sufficient checks were not carried out to ensure that the farm had in fact implemented the requirements. The agri-environment programme inspections were excessively centred on aerial mapping, which is suitable for checking that surface areas and cultivars are as declared on application forms. However, the quality of environmental measures, i.e. those of key importance, can only be inspected through actual on-site visits. Regional variation in on-site visits was also considerable, and the State Audit Office considered that regions were treated unequally.

The 1995-1999 programme contained conditions that were hard to verify and inspect. This was regarded as especially true of the support programme's limits on fertiliser use, which from a water protection viewpoint is an especially important support condition to monitor. The State Audit Office's report stated that the agri-environment programme's conditions should be so clear, precise, and unambiguous that their objective assessment is possible.

A revised agri-environment programme started up in 2000. Monitoring of support granted is now perceptibly improved and more efficient. The volume of monitoring has also been significantly increased; e.g. all farms inspected through aerial mapping were also required to have an on-site inspection during the summer of 2000. Co-operation with environmental authorities has also improved.

Evaluating the efficacy and results of the EU agri-environment programme can be expected to take quite a long time. The programmes have been implemented in Finland for only ca. five years, and there will be a time lag before their effects on the environment and water quality will show up.

As well as the agri-environment programme, also the Finnish Government Act on Implementation of the EU Nitrate Directive is a central guidance tool when the aim is to decrease discharges in agriculture. It has been demonstrated that before implementation of the Nitrate Directive, agricultural discharges to waterways were not restrictable through the legislation. The importance of the Act is emphasised by the fact that it binds also those farmers not taking part in the agri-environment programme.

The new Environmental Protection Act has brought licensing procedures also to agriculture. For example, the largest livestock shelters are now required to apply for an environment permit. This procedure will improve regulation of the environmental loads caused by such farms.

In Finland, national and partly EU-funded agri-environment programmes as well as national legislation are stricter in content than the corresponding HELCOM recommendations.

13.3. Implementation in Finland of HELCOM Recommendations on Fish Farming

The Finnish Environment Institute report of 1999 assesses the implementation of recommendation 18/3. According to the report, average discharges from fish farming slightly exceed recommendations for phosphorous. Individual farms may exceed the limit to a greater degree.

Finnish water legislation and related licensing regulations do not define discharge limits for e.g. fish farming. Regulations are more generalised, e.g. no limits for phosphorous are explicitly defined in the law. Target discharge limits have, however, been included in numerous policy programmes plans such as the Environment Programme for Fish Farming and the Water Protection Action Plan. The latter even tightens specific discharges target levels for 2005 for nitrogen at individual fish farms to 44 g N/produced kg of fish. Figures at coastal farms in 1999 were 7,6 g P/fish kg for phosphorous and 57,9 g N/fish kg for nitrogen.

Although water-licensing regulations set no limit values on discharges, regulations contained in licensing decisions concerning fish farms set maximum values for phosphorous and nitrogen. A report by the Finnish Environment Institute on legal regulation of fish farms studied licenses issued during 1994-1997. The report's appendix lists by each fish farm the maximum discharge levels set by the Western Finland District Water Court. Most of the set specific discharge levels for phosphorous and nitrogen are the same as in HELCOM's recommendations (8 g P/kg and 70 g N/kg). Other licensing regulations include those on monitoring fish health, with any diseases reportable to the authorities. Such monitoring must be carried out

in a way approved by the Regional Environment Centre. Other conditions concern keeping written track of fish care measures, disposal of wastewater from fish cleaning, and on disposal of dead fish. Also these are mostly uniform with HELCOM recommendations. During 1994-1997 the Western Finland District Water Court did not grant a single permit without some modification requirement to the original application.

HELCOM's recommendations also include details on how to locate fish farms, stressing the need to steer the industry to areas best suited to them. The Finnish Government's Water Protection Action Plan and the new environmental guidelines for fish farming also take account of location. Regulating location should aim to minimise harm caused by eutrophying discharges. The Baltic Sea Protection Commission's maritime environment conservation targets include direct references to decisions of the Western Finland District Water Court concerning the proposed location of certain fish farms.

13.4. HELCOM’s Role in Finland's Environmental Policy on Fish Farming

The environmental effects of fish farming and the available policy instruments for its regulation have in recent years frequently been studied and assessed by Finnish Environment Institute and Southwest Regional Environment Centre projects. These have included examining the reliability of statistics on fish farming, and suggesting ways to improve them. Current data gathering on discharges is based on annual report forms returned by the fish farms themselves, which are regarded as partly inaccurate. Improving statistics on fish farming, especially those on feed use, would improve also overall discharge statistics. Proposals have been made to extend monitoring to on-site inspections based on evaluations of local discharge risks.

The aim of the environmental administration is to apply the discharge targets of official programmes when processing licensing applications. The target limit values of the national Water Protection Action Plan are stricter than those recommended by HELCOM. For example, in its assessments to administrative officials, the Southwest Finland Regional Environment Centre uses target values for specific discharge levels defined in the Water Protection Action Plan. It is clear that HELCOM's recommended limit values for discharges have been used in licensing decisions by Finnish water courts, as the maximum permitted discharge levels for both nitrogen and phosphorous accord with those issued by HELCOM. However, verifying that plants in fact keep to permitted levels has been difficult under current monitoring schemes. Statistics generated by current administrative processes do not give unambiguous data on discharge trends.

13.5. Compliance with HELCOM Recommendations by Industry

The following gives details on HELCOM recommendations and their fulfilment in Finland by the industrial sector.

The pulp industry is governed by HELCOM recommendations 16/4 and 17/8. Their targets were to have been met by 2000; by 1998 Finland had already attained all of the targets for individual plants in all major categories (AOX, phosphorous, organic matter). The paper and pulp industries have indeed considerably reduced their emissions and discharges over the last decade. Individual plants have succeeded in this by building new water treatment units and by applying improved technology to their manufacturing processes. Variations in load levels from individual plants have been considerable. Finland complies entirely with recommendations for the sulphate pulp industry.

The Iron and steel industries are governed by HELCOM recommendations 11/7, 13/4 and 17/5. Environmental loading from these industries in Finland has decreased considerably, although Finland is not yet in full compliance for all classes of the latest recommendations. Finland complies with the general requirements of recommendation 11/7, but discharges from scattered sources are not sufficiently recovered from all processes. A number of projects have been initiated to assess and solve this problem.

The Metal surfacing industry's discharges are limited by HELCOM's recommendation 16/6. Finland has nearly 300 surface treatment plants, most of which are connected to municipal sewage systems. Many plants have also improved their internal wastewater treatment. The Ministry of the Environment regards their standards as relatively satisfactory.

Oil refinery emissions and discharges are governed by HELCOM recommendation 6/2. Finland has two refineries affected by this recommendation, and both comply with it. The refineries' oil and phenol discharges have decreased considerably during the last decade. Both plants also use biological wastewater treatment.

The chlorine-alkali industry is governed by HELCOM recommendation 6/3. The recommendation covers reduction targets to mercury discharge levels in the chlorine-alkali industry. In Finland, this industry’s mercury discharges have decreased considerably in recent years, because two plants using this metal have closed during the last decade. The single remaining plant to use mercury will change to a mercury-free production method by 2010.

Discharges from the chemical industry are limited by HELCOM recommendation 16/5. The recommendation covers a large number of plants, many of which discharge their wastes into municipal sewage systems. The limited availability of information

makes assessing compliance with the recommendation difficult, but in the main the recommended discharge limits are met at most of the plants.

The leather industry's basic water treatment requirements are governed by HELCOM recommendation 16/7. Finland has already attained most of the recommended actions and discharge limit values for the industry.

The textile industry's discharges are limited by HELCOM recommendation 16/10. Finland has numerous textile plants, most of which discharge their wastewater into the municipal sewage system. Most plants can be regarded as complying with the main points of the recommendations.

The food industry's discharges are governed by HELCOM recommendation 17/10. The report by the Finnish Environment Institute states that these are not fulfilled at all Finland's food processing plants. HELCOM's recommendations give basic principles for establishing best environmental practices in the industry using the best currently available technology.

The Finnish Environment Institute considered that, on a general level, the recommendations are somewhat ambiguous because their conditions are solely numerical or are otherwise open to interpretation. The recommendations also contain target levels for many compounds that are not necessarily monitored at all plants. According to the report, most HELCOM recommendations are fulfilled at most plants or spheres of operation, although differences between individual units may be considerable.

13.6. The Regional Role of HELCOM Recommendations in Regulating Industrial Environmental Activities

Regional Environment Centres play a significant role as licensing officials and statement makers concerning affairs of industrial and municipal wastewater control. The Centres process their jurisdiction's most significant environmental permit applications, and prepare statements for the Environmental Permit Authorities on the most significant cases.

As regards regulation of industrial environmental activities, Environment Centres view the traditional legislative-administrative permit application process as the most significant method, although HELCOM recommendations complement this. HELCOM recommendations are an additional regulatory tool. HELCOM’s industrial recommendations have mostly been well implemented, although Finland’s report cites certain problematic sectors and individual plants.

Regional Environment Centres have used HELCOM recommendations on a case by case basis when making statements on licensing applications. The recommendations have therefore been applied, but variably. Permits issued by water courts have also contained references to HELCOM recommendations, which means they are also used for monitoring purposes. Monitoring is not effective if backed up only by the recommendation without reference to the regulations set out in the licence's requirements. Recommendations are better attained if reinforced by mention in the water court's requirements.

The audit reveals that a particularly problematic group for monitoring programmes are those plants connected to municipal sewage systems but which are not liable for reporting their discharges to the national register on environmental loading. Data is deficient especially on dangerous substances used by these plants and Finland is unable to report to HELCOM on their current status overall. Even significant parts of entire industrial sectors may therefore remain outside national monitoring processes. For example, some food processing and metal surfacing plants remain outside national and HELCOM monitoring processes. A report by Uusimaa Regional Environment Centre states that metal surfacing plants frequently exceed permitted discharge limits.

Certain Regional Environment Centres have in some cases regarded HELCOM recommendations as complicated and difficult to interpret, and therefore difficult to implement. The recommendations tend to ever greater details and technicality. The State Audit Office believes the recommendations could be applied more widely if the preparation process paid more attention to problems of their practical application. Finland should further develop methods for preparing recommendations and simultaneously increase co-operation between the Ministry of the Environment and Regional Environment Centres.

According to Regional Environment Centres, HELCOM’s industrial recommendations can be regarded largely as a minimum standard and supplementary regulatory mechanism within the Finnish administrative system. The State Audit Office nonetheless recommends that implementation of HELCOM recommendations be stepped up in areas of industry with deficiencies in national regulations, and also in sectors where HELCOM recommended targets have not yet been attained. The Ministry of the Environment should provide Regional Environment Centres with instructions concerning wider application of HELCOM recommendations in license handling processes. Municipal water treatment plants should also be informed about HELCOM recommendations, especially concerning industry sectors that
negotiate separate contracts with these plants.

13.7. Compliance in Finland with HELCOM Recommendations on Municipal Wastewaters

The summary of the Finnish Environment Institute report assesses the implementation in Finland of the HELCOM Technology Committee recommendations in 1998.
The report concludes that Finland does not comply with nitrogen removal levels recommended for municipal sewage plants. Finland fulfils all other recommendations.

The report lists nitrogen discharge reductions at some of the largest coastal treatment plants in 1998: Espoo (67 %), Helsinki (58 %), Turku (35%), Salo (49%), and Vaasa (36 %). The report finds that in Finland nitrogen forms a large part of the pollutants contained in wastewaters received by treatment plants, and that the cold climate makes its removal more difficult. The technology for achieving high nitrogen removal is also expensive. Studies required by HELCOM on so-called nitrogen-sensitive areas have been carried out, and nitrogen removal requirements can now be assessed separately for each treatment plant. The report also states that re-equipping all treatment plants even in nitrogen-sensitive areas will be a fairly slow process. The report refers to Finland's Water Protection Programme to 2005, which aims at achieving a 50% reduction in nitrogen at municipal treatment plants in so-called nitrogen-sensitive areas by that year.

The Helsinki metropolitan area, a HELCOM discharge hotspot, has invested heavily in nitrogen removal from municipal wastewaters. The Helsinki Water Company's new Viikinmäki water treatment plant achieved a 60% nitrogen removal rate in 1999. A 1999 decision of the Western Finland District Water Court requires this to be raised to 70%. The government's Water Protection Programme and the associated Action Plan also take account of HELCOM nitrogen recommendations. Regional Environment Centres have been instructed to recommend enhanced nitrogen removal for water treatment plants that discharge directly into the sea.

13.8. The Role of HELCOM in Regulating Municipal Environmental Action for Wastewater Treatment

Regional Environment Centres also have certain regulatory and monitoring responsibilities in the municipal wastewater treatment sector, including responsibilities for overall system improvement and development.

Several legal and policy instruments are available for regulating municipal wastewater management in Finland. The available options' recommendations are

partly uniform and with similar limit values for discharges. The most significant legal instrument is Government Act (365/1994), which implements the EU Directive on Municipal Wastewaters.

HELCOM recommends removal of nitrogen from municipal water discharges. The limit values and per cent reduction targets contained in the recommendations are at one with those of the aforementioned governmental act, i.e. Finland had in place nationally equivalent goals before the relevant HELCOM paper was published. However, despite such strong regulation, it was noted in the audit that Finland still does not comply with the HELCOM recommendations and therefore has also not attained the targets set out in the government act.

In statements pertaining to municipal wastewater permits, Regional Environment Centres mostly apply national legislation and programmes. The Water Protection Programme and Government Act (365/1994) are the main regulatory mechanisms, and HELCOM is seldom referred to.

Also in the audit of municipal wastewater treatment it was found that the Ministry of the Environment did not keep sufficiently in contact with the Regional Environment Centres concerning preparation of the HELCOM as well as national programmes. Such contacts are important in view of the desire to achieve uniform licensing decisions across the country.

14. Monitoring of Wastewater Permits

Before the enactment of the new Environmental Protection Law (1st March 2000), wastewater discharge licensing applications under the Water Act were handled by District Water Courts. Permits issued by these courts contained limits on allowable discharges as well as regulations related to processes and monitoring (appendix 6).

In granting a wastewater permit, the authorities usually require the holder to carry out monitoring. This required water protection monitoring contains checks on discharge levels and waterway quality as well as (in some cases) also fish population monitoring. Businesses draw up a monitoring plan, which is approved by the authorities. Officials use information from the monitoring process to assess compliance with licensing regulations. In addition to required monitoring, businesses carry out voluntary inspections on discharges and company equipment to ensure proper functioning. These inspections include inspections of production processes and water cleansing machinery insofar as they give information on discharge control. Such inspections and user logbooks are primarily of value to the business itself, but they give background information useful for controlling discharges. Discharge monitoring gives information on discharge volumes, quality, their temporal variation,

and the effects of malfunctions and aberrant situations on discharge quality. Monitoring is carried out using measurement instruments or discharge balance calculations. In the case of wastewaters, this means monitoring load levels. Such monitoring measures the volume and quality of wastewaters entering the waterway. The authorities are responsible for ensuring that monitoring is sufficient, by e.g. inspecting the analytical methods and reporting accuracy of the business or consultants hired by it to carry out the required water checks. In the case of wastewaters, the quality of monitoring is also inspected by control samples taken by the authorities themselves.

Administrative officials have various corrective procedures at their disposal in the event of suspected or demonstrated failure by businesses to uphold laws and regulations during the course of their activities. The primary procedure is to request an explanatory report from the suspected violator. If this does not have the desired result, the business may be sent a written request to change its practices to comply with regulations. The new Environmental Protection Act names the Regional Environment Centres as the key monitoring authorities. Municipal environment authorities also carry out some of the practical monitoring duties.

The inspection checked on the Regional Environmental Centres' daily work and difficulties of monitoring compliance with water permit regulations. Laws governing licensing practices changed with the new Environmental Protection Act of 2000. Regulations on discharges under the Water Act were moved to the Environmental Protection Act. The former Water Courts were replaced by Environmental Permit Authorities that process the most significant regional wastewater permits. One of the basic aims of the new environmental protection legislation is to evaluate all the permit-requiring operations of a particular business in one unified process. The Environmental Protection Act also requires inspections of the licensed plant at sufficiently frequent intervals.

Interviews carried out at Regional Environment Centres revealed numerous problems that complicate compliance with regulations. One is lack of resources. For example, there is a lack of capacity to monitor licensed plants because of the constant glut of new permit applications. Regional Environment Centres have insufficient resources to make on-site visits, which would especially benefit smaller companies. A considerable number of new regulations are passed annually, and businesses are not always aware of the latest requirements. Practical monitoring is in fact mostly inspection of submitted reports and updating of data banks. Documentation of monitoring results also varies between Environment Centres, and is not always systematic. Monitoring praxis varies from one Environment Centre to another.

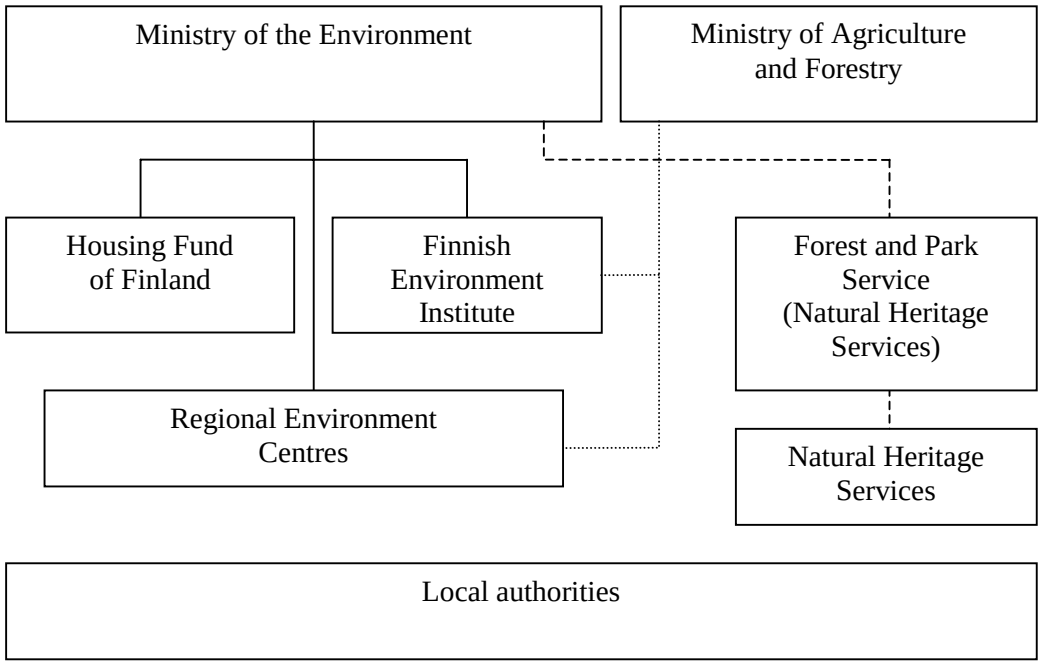
The State Audit Office regards as unsatisfactory the current state of practical monitoring work in the Regional Environment Centres. The situation is unfavourable

with regard to both regional equality and equal treatment of businesses. Practical monitoring and other functions need to be developed in such a way as to ensure certainty for all parties that environment permit requirements are being fulfilled. It would be important to achieve a workable balance between the various steering and monitoring elements in the process, so as to promote informative assistance as well as overseeing legal compliance. This would especially assist small businesses.

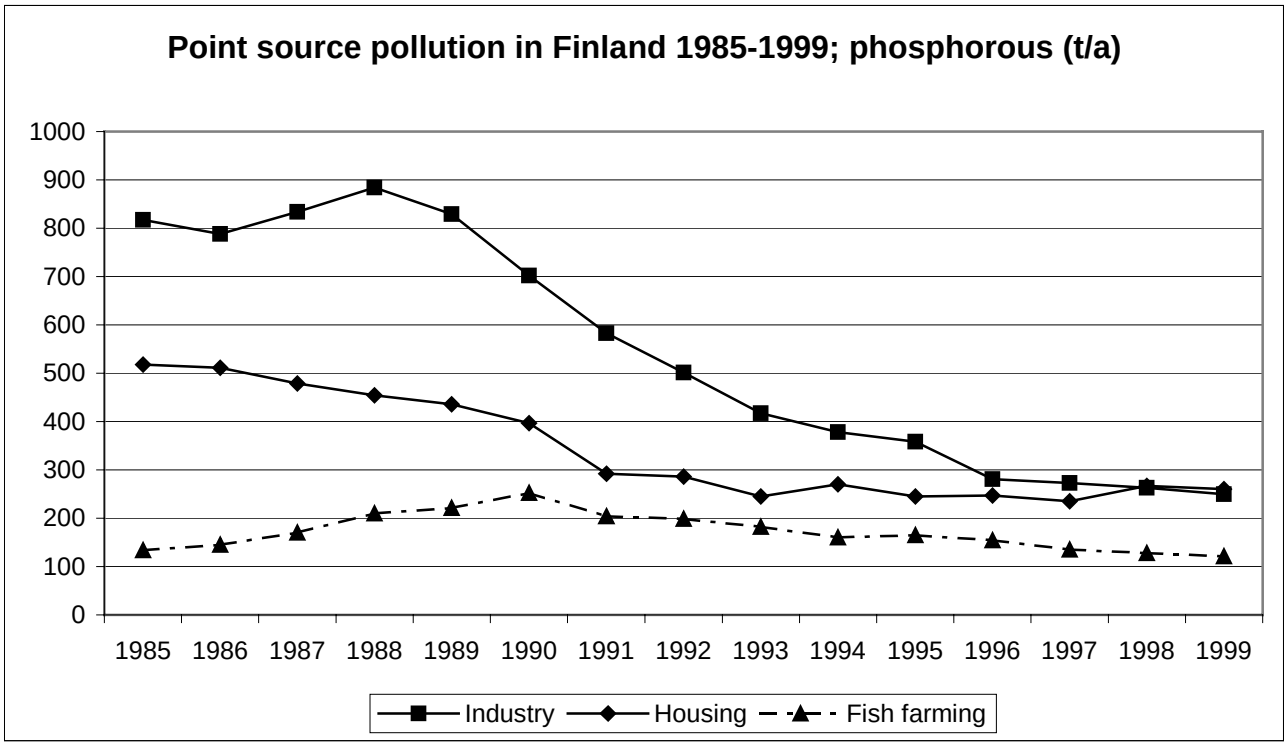
Finland's Regional Environment Centres have requested that the Ministry of the Environment take a stronger co-ordinatory lead, so as to ensure a unified level of monitoring. Currently Regional Environment Centres are separately setting precedents in matters that should have a uniform national standard. It would also be necessary to make a thorough assessment of the Environment Centres' duties and their resources, and to take account of the number of businesses in the region requiring operating permits. Regional Environmental Centres themselves also have opportunities to develop their methods and optimise resource use. Some have already drawn up plans about which matters to prioritise in annual monitoring work. Basic assessments, such as thorough analysis of individual sectors, have also been emphasised. These aid in concentrating monitoring on e.g. risk sites, and to better apply the limited available resources.

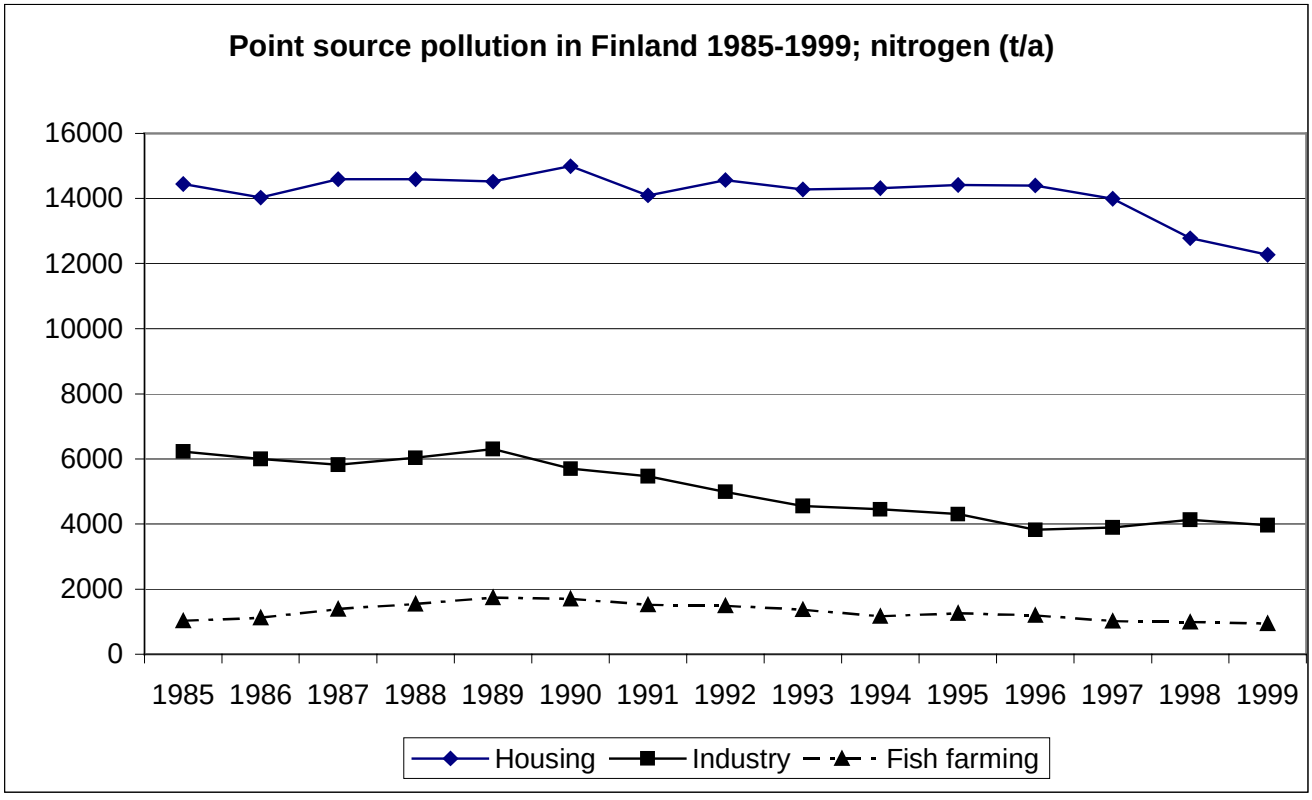
Appendix 1

Organisation of The Finnish Environment Administration



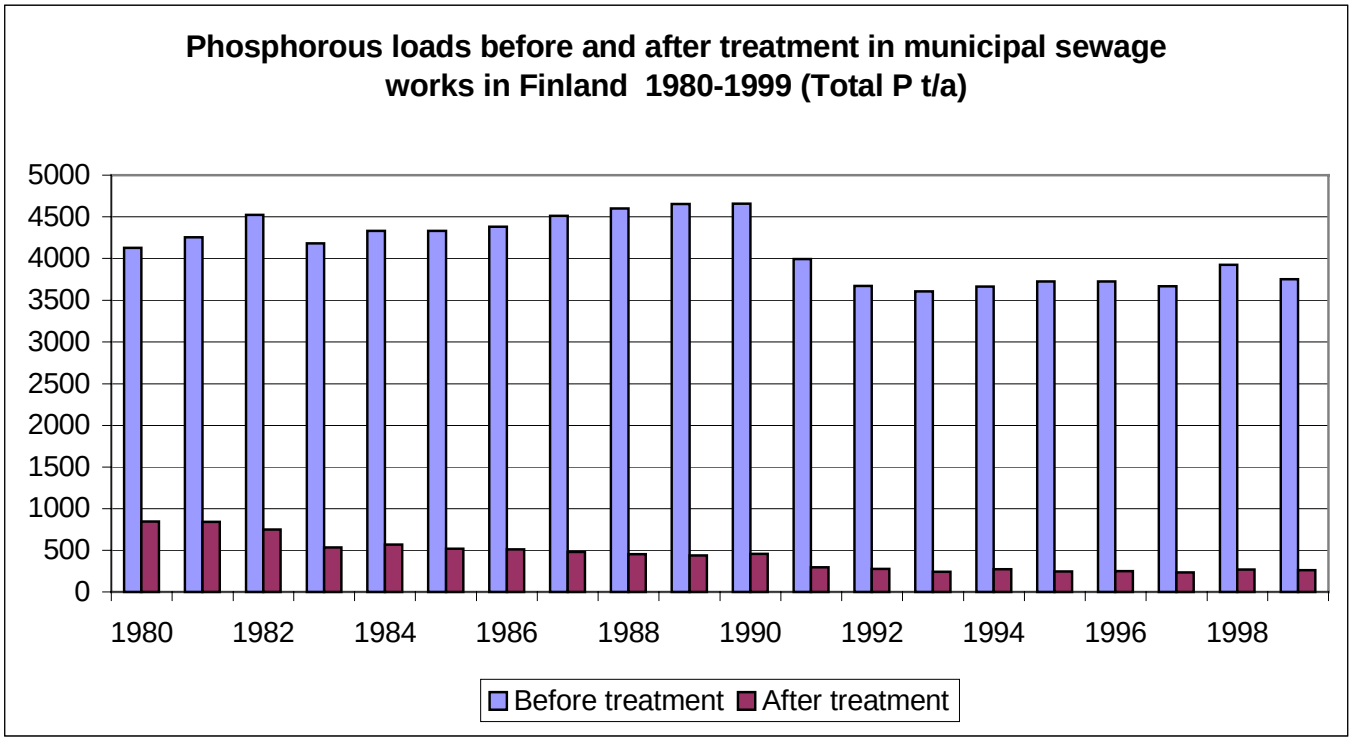
Appendix 2

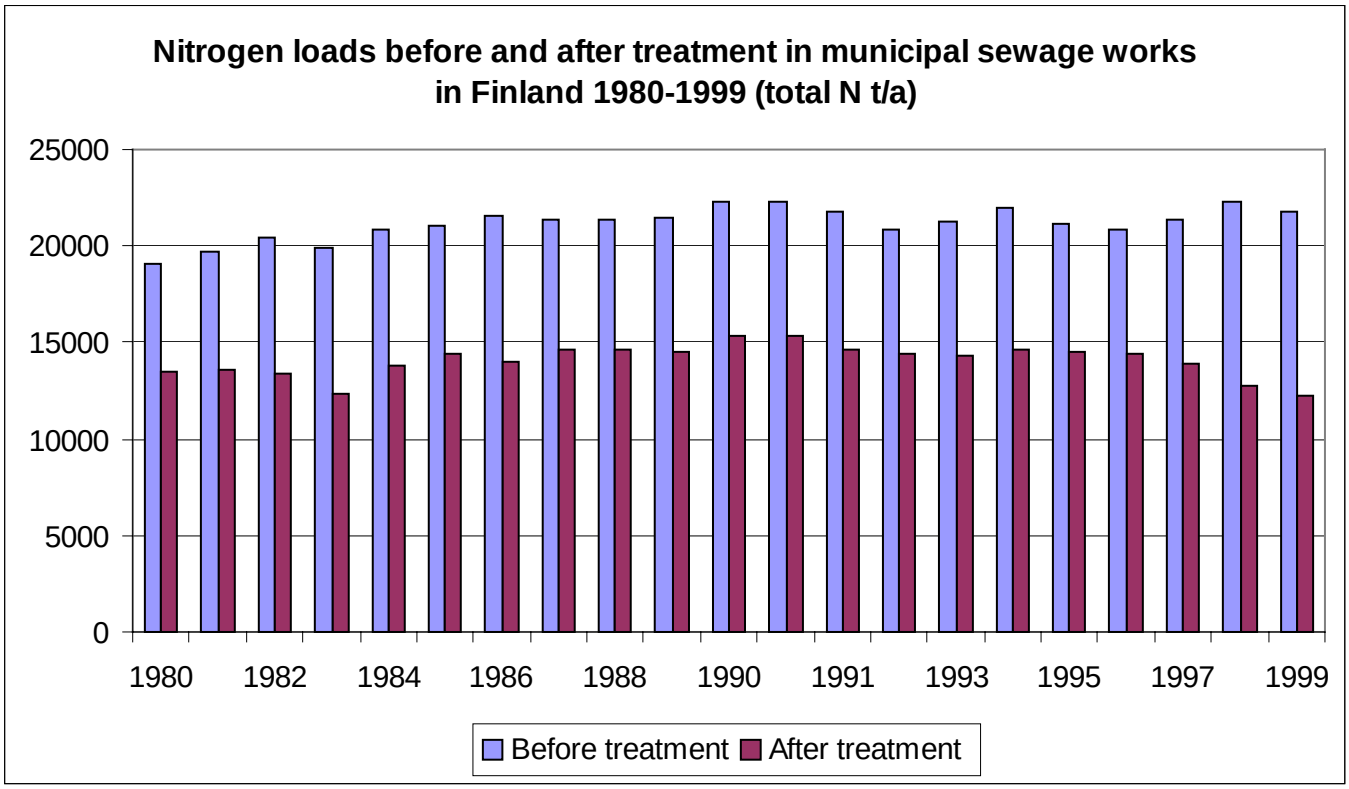




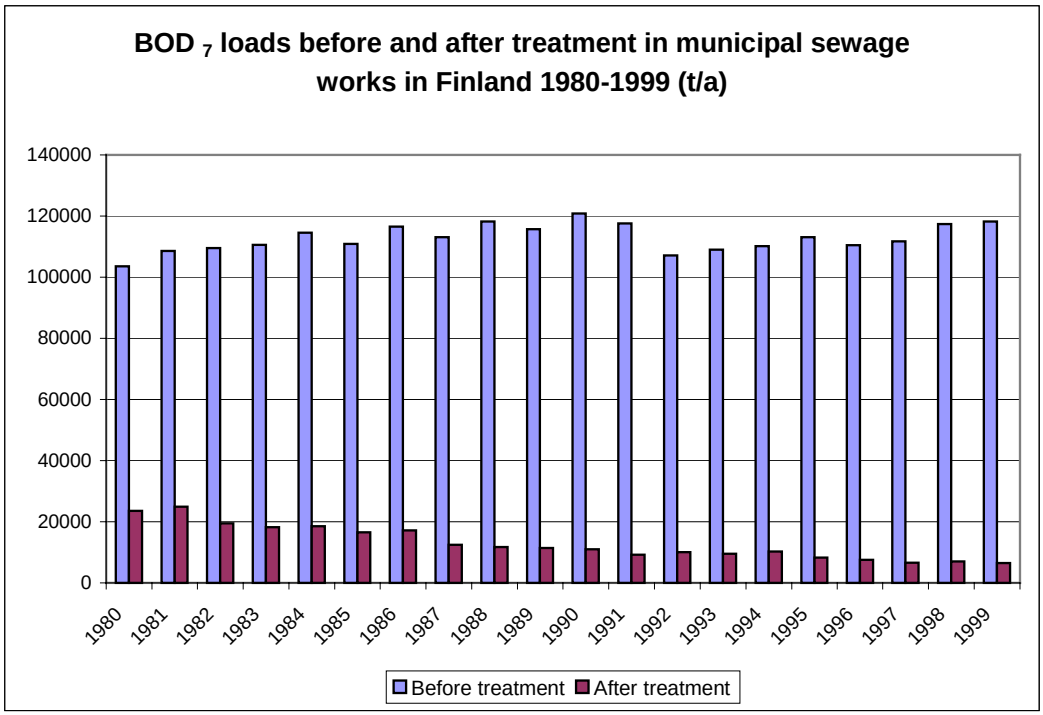
Data source: Finnish Environment Institute

Appendix 3





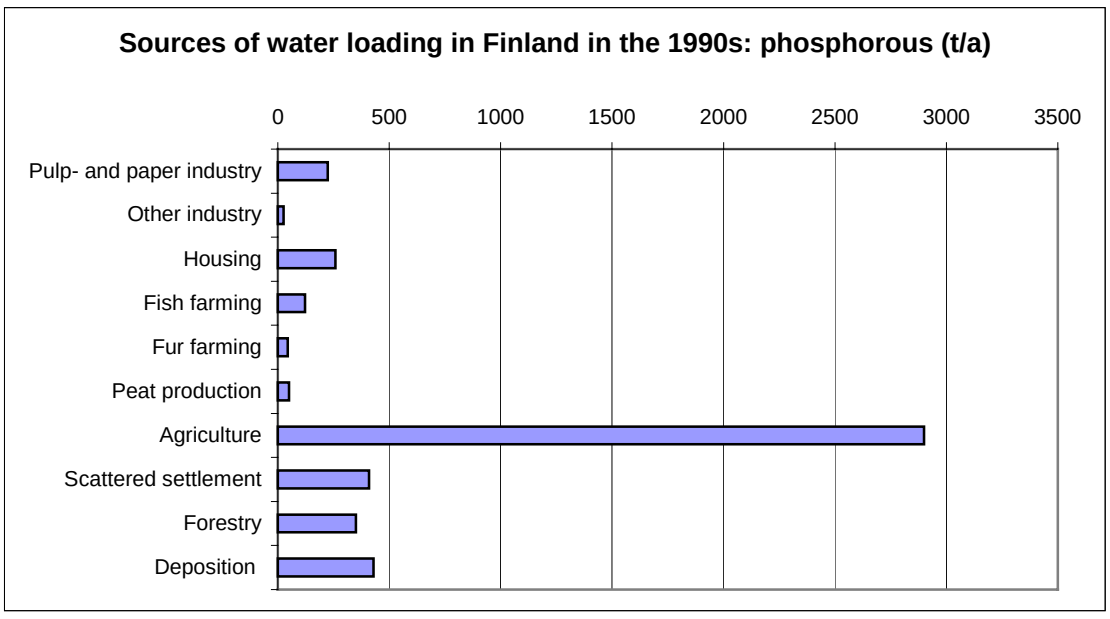
Data source: Finnish Environment Institute

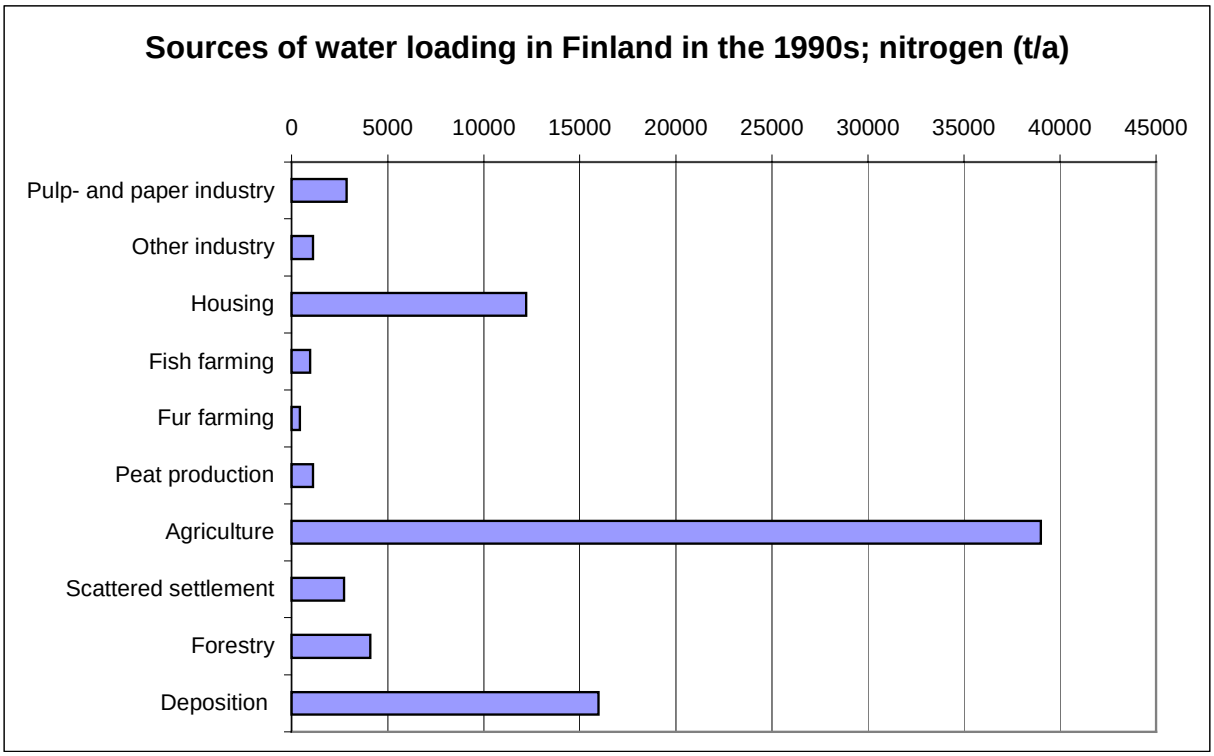


Appendix 4

Data source: Statistics Finland

Appendix 5

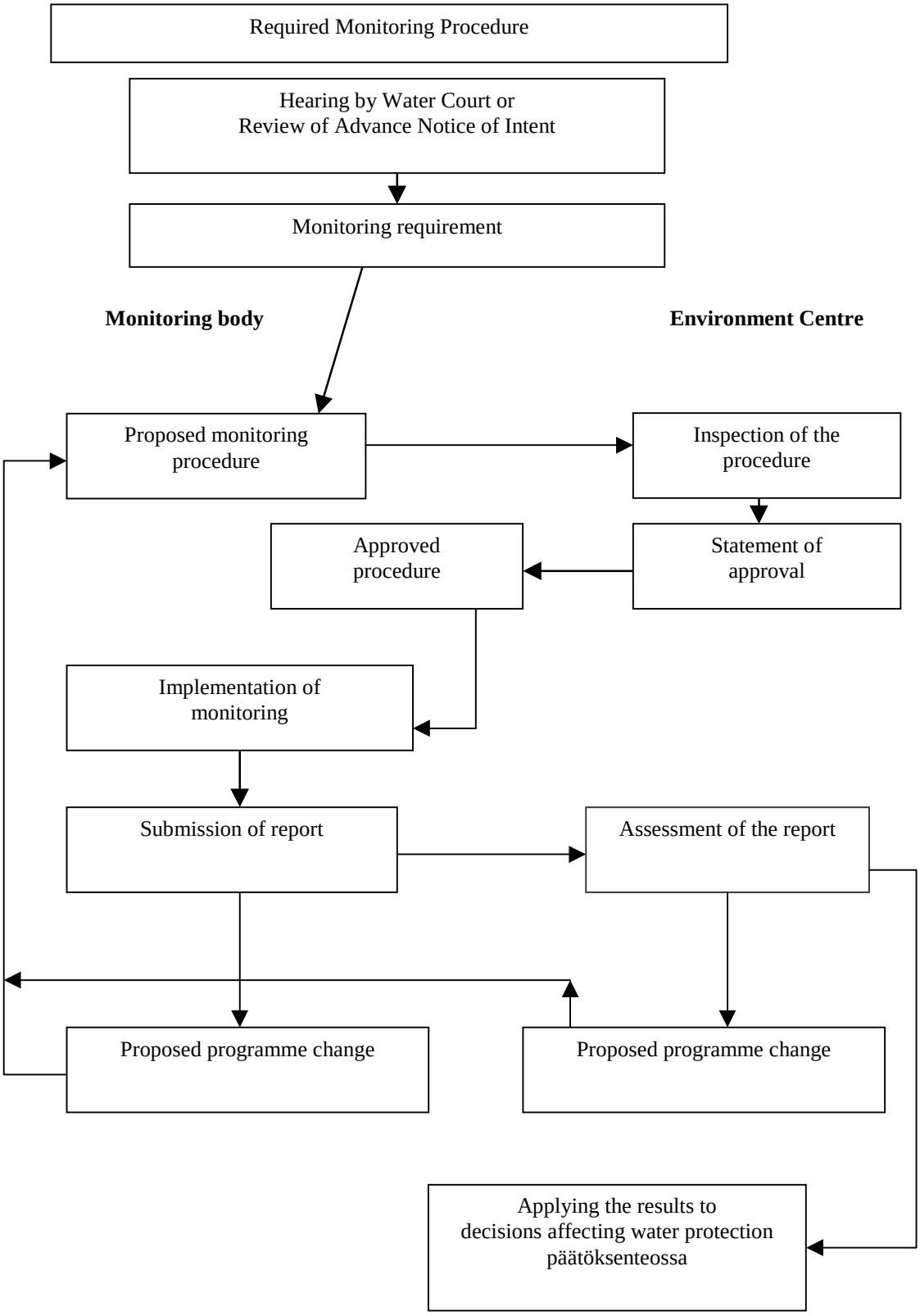



Sources of water loading in Finland in the 1990s; nitrogen (t/a)
0
5000
10000
15000
20000
25000
30000
35000
40000
45000
Pulp- and paper industry
Other industry
Housing
Fish farming
Fur farming
Peat production
Agriculture
Scattered settlement
Forestry
Deposition

Appendix 6

Required Monitoring Procedure

for Waterways



Source: Finnish Environment Institute

The National Audit Office of Latvia

Report on Implementation of the Helsinki Convention

Audits of the activities and use of public funds with regard to implementation of the Helsinki Convention on the Protection the Marine Environment of the Baltic Sea Area were performed in the Ministry of Environmental Protection and Regional Development, as well as in its subordinated institutions and institutions under supervision of the Ministry, in the Marine Environment Board and in the limited liability company to be privatised "Liepaja Water" of Liepaja City Council. The audits were carried out within the period of 4 September 2000 until 12 April 2001.

The length of coastal border of the Baltic Sea and the Gulf of Riga is 494 km of the total borderline of Latvia of 1,862 km. The total area of Latvia is 64,589 square kilometres, of which 2,543 square kilometres are inland waters. The number of permanent inhabitants in year 2000 was 2,424,150 of which 1,671,125 lived in urban areas.

Please find attached 6 tables in the Appendix that have been filled in on the basis of the review of the state statistics report "2 – Water". The review does not require information on industrial companies having their own wastewater treatment facilities and their breakdown in municipal and industrial ones, therefore we cannot provide such information.

1. Compliance of the national legislation with the provisions of the Helsinki Convention

1.1 General information

Latvia joined in the work of the implementation of the objectives of the Convention on the Protection the Marine Environment of the Baltic Sea Area already in 1991 after regaining its national independence. Latvia took part in elaboration of the Baltic Sea Joint Comprehensive Environmental Action Programme. Latvia became an observer country to the Helsinki Convention after signing it in March of 1992. On 3 March 1994 the Saeima (the Parliament) of the Republic of Latvia ratified the Helsinki Conventions of 1974 and 1992, by adopting the Law "On the Helsinki Conventions of 1974 and 1992 on the Protection the Marine Environment of the Baltic Sea Area" (in effect since 10 March 1994). On 27 May 1994 Latvia became a full-fledged member country of the Convention.

Already before Latvia became a member of the Helsinki Convention, the first necessary legal acts were prepared in line with the requirements of the international environment protection policy:

- The Law of 1990 "On Nature Resource Tax";
- The Law of 1991 "On Environment Protection";
- The Law of 1993 "On Hazardous Waste";
- The Law of 1993 "On Specially Protected Nature Territories".

The above laws already comprised such fundamental principles as "Best Environmental Practice", "Best Available Technology", "the polluter-pays" and "information to the public on the environment issues". Latvia's rapid progress

towards integration in the European Union, development of the democracy and market economy resulted in the necessity to amend many of the existing laws. In line with the recommendations of the EU and the Helsinki Commission the Law "On Environment Protection" was amended on 22 May 1997 and 20 June 2000, the Law "On Nature Resource Tax" was amended on 14 September 1995, as well as on 19 December 1996 and 6 April 2000.

Latvian national environmental legislation forms a joint system where the requirements of the European Union, the Helsinki Convention and other international agreements, legally binding for Latvia, are implemented.

1.2 Compliance with Article 6 of Helsinki Convention

The provisions of Article 6 of the Helsinki Convention have been included into the Regulations of the Cabinet of Ministers No.155 "Regulations on Water Use Permits" (amended on 20 January 1998 and 17 November 1998). The Regulations determine the emission standards in line with the requirements of the EU and the Helsinki Convention, establishes the procedure for requesting and issuing water use permits, as well as prescribe the rights and obligations of the party utilising water and the party issuing the permit. The permit is mandatory and it regulates use of inland and seawater in the territory of Latvia. Concentration limit values and the admissible pollution values are established by the Regional Environmental Boards (REB), considering the quality requirements for surface water that have been developed according to the recommendations of the Helsinki Convention. It has been identified during the audit that the volume of wastewater and the admissible concentration of polluting substances in it is established on the basis of the water use permit, without recalculating it according to the actual volume of wastewater, which is considerably lower. As the result of that the responsibility of water treatment facilities for reducing the pollution and the possible payment for over- limit pollution, according to the Law "On Nature Resource Tax", is considerably decreased.

2. Activities to ensure implementation of legal norms

2.1 Control measures

The Environmental State Inspectorate (ESI), established on 7 September 1993, performs the state control on implementation of the environmental legal acts and use of natural resources in the whole territory of Latvia, in the territorial waters of the Baltic Sea and the Gulf of Riga, as well as in inland waters of the Republic of Latvia. ESI operates in accordance with the Satversme (Constitution) of the Republic of Latvia, the Law "On Environment Protection" and other legal acts, as well as the ratified international conventions in the field of environment protection. The inspectors of Regional Environment Boards are not structurally subordinated to the ESI, which does not ensure effective state control and supervision over environment protection and use of natural resources.

The table below reflects the number of companies inspected and the number of inspections performed by ESI:

		unit	1996	1997	1998	1999
1.	Inspections of compliance with requirements of water use permits in companies	number	2830	3625	3861	4078
2.	Companies where no violations were identified	number	1753	2319	2104	2203
3.	Companies where violations were identified	number	374	468	782	829
4.	Fines collected	EUR*	8 129	20 364	7 191	19 671
5.	Other measures taken (instructions, decisions)	number	486	759	776	1006

*Exchange rate from 30April 2001

2.2 Reduction of point source pollution

Protection of waters is one of the key priority areas in the environmental policy of Latvia. The situation in wastewater treatment has been improved considerably. As the result of improved recording, water savings and reduced production, the total volume of wastewater in the country has decreased. Construction of wastewater treatment facilities in Liepaja, Strenci, Cesis and Ligatne has been completed, but construction work is still ongoing in a couple of dozen sites. The volume of untreated wastewater has been reduced by 3.9 times in 1998 in comparison with 1990, but the volume of wastewater treated according to standards has increased by 50 % in 1999 in comparison with 1996. Discharge of polluting substances in water bodies is reduced year by year.

See the table for changes in wastewater:

(million m^3)

Breakdown of wastewater	1996	1997	1998	1999
Total volume of wastewater	331.2	326.5	320.8	286.2
relatively clean	109.5	99.6	92.3	89.2
treated according to standards	76.3	87.4	98.7	114.4
polluted	145.4	139.6	115.6	68.3
of that without treatment	*29.3*	*29.5*	*27.9*	*19.8*
treated according to standards	*29.3*	*110.1*	*87.8*	*48.5*
other	-	-	14.2	14.4
Wastewater from cities:	-	-	202.2	174.6
Riga	-	-	140.7	116.4
Daugavpils	-	-	21.7	20.5
Liepaja	-	-	15.1	14.6

Wastewater treatment facilities in Latvia in 1999:

Indicators	Mechanical treatment facilities	Biological treatment facilities	Chemical treatment facilities
Number	477	956	6
Capacity t.m^3 per annum	100901	378363	1458
Actual workload	24170	140816	1137
of that primary treatment	17866	7990	117
secondary treatment	-	103348	960
Biogenic reduction	-	2504	-
Workload as % of capacity	24	37	78

Treatment facilities built in and inherited from the times of the Soviet Union are of low quality and partly unusable. It is necessary to reassess them, because according to the statistics of 1999, the total treatment capacity of the facilities, in comparison with actual workload, has been used by 34.6% in average.

3. Use of public funds for environmental protection

In order to ensure the rights of people not only in Latvia, but also in the whole Baltic Sea catchment area, to live in high quality environment, investments in environmental protection are needed. Municipal companies, particularly in the period of transition to market economy in the state, are not financially strong enough to implement environmental protection measures in line with the requirements of the EU and the Helsinki Convention, therefore the state financial support has increased for environmental protection programs and projects.

Investment structure in environmental protection /million EUR/

	1996	1997	1998	1999
National budget	**5.74**	**6.45**	**11.00**	**10.46**
- ear-marked subsidies	3.47	3.05	7.39	8.64
- national investment program	2.27	3.40	3.61	1.82
Special budget	-	**0.12**	**1.16**	**3.72**
Funds of companies and local governments	**3.35**	**8.46**	**9.61**	**13.38**
Loans to local governments	**1.75**	**3.14**	**5.77**	**10.76**
Gifts	**4.61**	**7.11**	**13.21**	**9.71**
- to local governments	4.43	6.28	11.71	**9.22**
- organisations of the Ministry	0.18	0.83	1.50	0.49
Total	**15.45**	**25.28**	**40.75**	**48.03**

Exchange rate from 30 April 2001

The funds of the special budget that have been included in financing environment protection activities are a part of the nature resource tax transferred to the Environment Protection Fund. If a nature resource taxpayer is financing projects with an objective to reduce environment pollution, by way of technological improvements or environment protection activities, he receives tax reduction for an amount necessary for implementation of the project.

Investment volumes by environment sectors in 1999, see the table:
/million EUR/

Environment sectors	in 1999
Water management	42.90
Household waste management	2.08
Hazardous waste management	0.83
Air protection	0.72
Regional development	0.44
Environment control and monitoring	1.06
Total	48.03

Exchange rate from 30 April 2001

In comparison with the European Union, the GDP funds for environment protection in Latvia in 1998 were 0.64% of GDP, but in 1999 0.74% of GDP which is considerably less than the average in the EU member states – 1.5% of GDP.

Implementation of the EU directives in the field of environmental protection, according to the chapter "Environment Protection" and Recommendations of the Helsinki Commission, demands large expenses both in the public and private sectors. It is anticipated that until the year 2015 1 710 millions EUR will be needed for implementation of the EU norms. Starting with 2007 the Council Directive on Integrated Pollution Assessment and Control will come into force, and approximately 353 millions EUR will be needed for its implementation. In spite of the considerable shortage of funds, Latvia's annual contribution to be paid to the Helsinki Commission has been defined at the amount of 71 thousand EUR, with a tendency to increase up to 90 thousand EUR in 2005. The contribution has been defined without considering the number of inhabitants in Latvia, the total area of the country and the relatively low level of pollution load in comparison with other member states of the Helsinki Convention.

4. Monitoring

The Cabinet of Ministers Regulations "On State Environmental Monitoring" (16 December 1997), regulates the sphere of environment monitoring in Latvia. The environment monitoring system comprises four functionally different components:

- environmental quality monitoring;
- monitoring of emissions;

- early warning monitoring;
- environmental policy implementation monitoring.

The monitoring system network includes:

- state environmental monitoring;
- environmental monitoring realised by branches;
- environmental monitoring realised by municipalities;
- environmental monitoring realised by companies;
- environmental monitoring realised by voluntary performers.

The complex surface water monitoring that includes hydrological, hydrochemical and hydrobiological parameters is performed at open sea, in inland waters and coastal waters see the table:

No.	Parameters	1996	1997	1998	1999
1.	**Inland surface waters**				
1.1.	Inland surface waters of the Baltic sea area /thous.km/	38 000	38 000	38 000	38 000
1.2.	Length of monitored rivers /km/	2 209	2 209	2 209	2 209
1.3.	Number of measurement points	60	65	47	57
1.4.	Frequency of taking water samples per annum*	4-12	4-12	4-12	4-12
2.	**Coastal waters and open sea**				
2.1.	Number of measurements in coastal waters and open sea	42	42	42	42
	- In coastal waters	21	21	21	21
	- In open sea	21	21	21	21
2.2.	Frequency of taking water samples per annum*	2-24	2-24	2-24	2-24

* depending on the parameter to be evaluated

Monitoring is performed on the basis of standards and methodologies accepted in the European countries. Water quality is assessed according to standardised long-term indicators, and the key indicators are: level of eutrophication, biological oxygen demand, chemical oxygen demand (standard LVS ISO-6060/1989), Oxygen content in water (standard LVS EN 1899/2-1995), total amount of Nitrogen and total amount of Phosphorus (standard ISO 10048/1991 and ISO 6878/1990).

Latvia with its 167 km of land border with Belarus and 576 km of land border with Lithuania receives cross-border pollution from the above countries, discharged into the Baltic Sea via the Daugava, the Venta and the Lielupe Rivers.

Cross-border transfer and efflux of the Daugava River, see the table:

(mg/l)

Year	Nitrogen /N tot/		Phosphorus /P tot/		Biochem. oxyg.dem. /BOD_7/	
	Border with Belarus	The Gulf of Riga	Border with Belarus	The Gulf of Riga	Border with Belarus	The Gulf of Riga
1996	2.38	2.12	0.064	0.052	1.78	1.50
1997	2.49	2.40	0.066	0.042	1.87	1.65
1998	1.69	1.57	0.060	0.058	2.46	1.86
1999	1.21	1.45	0.067	0.053	2.73	2.26
2000	1.56	1.84	0.063	0.067	1.96	1.67

Cross-border transfer and efflux of the Lielupe River, see the table:

(mg/l)

Year	Nitrogen /N tot/		Phosphorus /P tot/		Biochem. oxyg.dem. /BOD_7/	
	Border with Lithuania	Baltic Sea	Border with Lithuania	Baltic Sea	Border with Lithuania	Baltic Sea
1996	-	3.05	0.097	0.119	1.67	2.03
1997	-	3.42	0.097	0.090	1.88	1.96
1998	3.75	4.50	0.099	0.086	2.13	2.02
1999	2.81	3.08	0.097	0.115	2.21	2.50
2000	2.81	3.45	0.073	0.105	2.49	2.52

Cross-border transfer and efflux of the Venta River, see the table:

(mg/l)

Year	Nitrogen /N tot/		Phosphorus /P tot/		Biochem. oxyg.dem. /BOD_7/	
	Border with Lithuania	Baltic Sea	Border with Lithuania	Baltic Sea	Border with Lithuania	Baltic Sea
1996	2.98	-	0.053	-	2.00	-
1997	2.98	-	0.045	-	1.82	-
1998	3.45	2.91	0.063	0.051	1.85	1.93
1999	2.67	1.73	0.057	0.049	1.88	1.94
2000	2.06	1.72	0.058	0.037	2.75	2.34

Average pollution concentration of transfer and efflux of all rivers in Latvia in 1999, the indicators are summarised in the table below:

(mg/l)

	N tot	P tot	BOD_7
All rivers of Latvia	1.657	0.059	2.247
Rivers of the territory of Latvia	1.409	0.051	2.203
Rivers of cross-border transfer	1.708	0.061	2.256
of which cross-border transfer	1.526	0.068	2.579

According the data in the table it is obvious that considerable pollution reaches the Baltic Sea as the transboundary pollution from Belarus and Lithuania. Therefore, there is a need for more effective measures set by the Helsinki Convention to implement the monitoring of transboundary pollution and also for financing of the treatment.

After evaluation of the pollution load to the Baltic Sea area, the following has been identified:

1. inland surface waters:

1.1. water quality in the biggest rivers:

- the water of the monitored rivers meets the quality standards, except for the Gauja River basin;

1.2. water quality in the small rivers:

- in 85% of the monitored rivers the water quality is acceptable.

2. In the Gulf of Riga:

- the concentration of nitrogen has reduced considerably,
- no increase of the concentration of phosphorus has been observed since 1996,
- the status of benthofauna since 1996 can be assessed as stable, but the environment of the bottom layers in the Gulf is in bad quality,
- the concentration of heavy metals shows low level of pollution,
- the pollution of polyaromatic hydrocarbons has not changed during the last four years.

3. In open sea, in comparison with the Gulf of Riga:

- lower oxygen content,
- reduced salinity,
- higher content of silicates and turbidity,
- lower content of compounds containing nitrogen and phosphorus.

Conclusions

1. The normative acts of the Republic of Latvia contain the provisions of the Helsinki Convention and HELCOM Recommendations.
2. The structure has been established and it performs the control of and supervision over the implementation of legal acts.
3. The Investment Department manages the resources for environmental protection, no violations of the use of the resources have been identified.
4. The admissible content of polluting substances in wastewater is not determined on the basis of the actual volume.
5. There is a need to extend the information comprised in the state statistical review "2-Water" to ensure that it provides more comprehensive picture of the situation in water use and in the field of wastewater treatment, as well as to make this information more useful for the decision making when allocating resources in the water management sector.
6. It would be desirable to have a more comprehensive and simplified procedure for informing general public about the status in environment pollution.

GENERAL DATA

Nr	PARAMETERS	1996	1997	1998	1999
1.	Population living in the country part of the Baltic Sea catchment area, [in thousands]	2480	2460	2440	2420
2.	Inland surface waters:				
2.1.	length of rivers in the Baltic Sea catchment area,[in thousand km],	38	38	38	38
2.2.	length of rivers monitored,[km]	2209	2209	2209	2209
2.3.	Number of measurement points	60	65	47	57
2.4.	Frequency of water sampling [times / year]*	4-12	4-12	4-12	4-12
2.5.	Scope of analyses conducted:				
	estimation and evaluation of biological and hydrobiological water quality,	+	+	+	+
	examination of macroinvertibrates as a one of the most stable cennosis of running water ecosystem.	+	+	+	+
3.	Coastal waters and the Open Sea :				
3.1.	Number of measurement points,	42	42	42	42
	- costal waters,	21	21	21	21
	- open sea	21	21	21	21
3.2.	Frequency of water sampling [times / year]*	2-24	2-24	2-24	2-24
3.3.	Scope of analyses conducted:				
	Complex marine monitoring in the Gulf of Riga and the coastal zone of the Baltic Sea including estimation of hydrological, hydrochemical and hydrobiological parameters	+	+	+	+

* depending on the estimated parameter

Attachment 1

Table 1. Number of cities with a population exceeding 2 thousand, located in the country part of the Baltic Sea catchment area, equipped with waste water treatment plants and population (thousands people) served by waste water treatment plants.

No.	Cities with/without waste water treatment plants/population served by waste water treatment plants	Number of cities with a population exceeding 2 thousand, located in the country part of the Baltic Sea catchment area / population (thousands people) served by waste water treatment plants in the years:			
		1996	1997	1998	1999
1.	Total number of cities / total population (thousands people)	63/1693	62/1676	60/1658	60/1646
2.	Number of cities equipped with waste water treatment plants/ population served by waste water treatment plants*				
	total,	63/-	62/-	60/-	60/-
	including:				
	a) mechanical	46/-	47/-	41/-	39/-
	b) biological	60/-	60/-	61/-	59/-
	c) chemical	5/-	6/-	4/-	4/-
3.	Number of cities not equipped with waste water treatment plants/ population not served by waste water treatment plants	0	0	0	0

* data about population served by waste water treatment plants will be partly available from 2000

Attachment 2

Table 2. Volume of treated waste water and population served by waste water treatment plants in cities with inhabitant number exceeding 300 000, located in the country part of the Baltic Sea catchment area [1].

Lp.	Name of the city / population / treatment level	Volume of waste water treated (in thousands m^3/a) in the years:			
		1996	1997	1998*	1999*
1.	Riga / ~ 650 000**/ volume of waste water treated				
	total,	136100	135408	140692	116416
	including those treated:				
	a) mechanical	274	247	559	385
	b) biological	79233	98226	83145	67517
	c) chemical	8	3	4	27

* data under verification

** data abut population served by waste water treatment plants will be available from 2000 and the given number is approximate after 1997

Attachment 3

Table 3. Industrial enterprises equipped with waste water treatment plants and volume of treated industrial waste waters (thousands m^3/a)

No.	Industrial enterprises with / without waste water treatment plants	Number of industrial enterprises discharging sewage into surface waters of the country part of the Baltic Sea catchment area / volume of industrial effluent treated in the years:			
		1996	1997	1998*	1999*
1.	Number of industrial enterprises that require waste water treatment plants	-	-	-	-
2.	Number of industrial enterprises equipped with waste water treatment plants, total, including: a) mechanical b) biological c) chemical	636/ 57 710 320/ 24 940 308/ 32 335 8/ 435	604/ 60 526 308/ 25 529 293/ 34 825 3/ 172	519/ 40 037 247/ 14 946 269/ 24 951 3/ 140	466/ 39 181 212/ 13 451 251/ 25 571 3/ 159

* data under verification

Attachment 4

Table 4. Treatment of municipal and industrial waste waters discharged to surface waters of the country part of the Baltic Sea catchment area

No.	Type of sewage	Volume of waste waters (thousands m^3/a) discharged to surface waters of the country part of the Baltic Sea catchment area in the years:			
		1996	1997	1998*	1999*
1.	Municipal (including industrial) waste waters <u>total</u>,	331 184	326 524	320 840	286 226
	including those treated:				
	a) mechanical	28 623	23 687	26 135	24 170
	b) biological	163 555	173 293	245 074	140 816
	c) chemical	437	1 672	1 086	1 137
2.	Industrial waste waters <u>total</u>,	-	-	-	-
	including those treated:				
	a) mechanical				
	b) biological				
	c) chemical				

* data under verification

Attachment 5

Table 5. Load of pollution discharged from land-based sources to the Baltic Sea from the country part of the Baltic Sea catchment area

No.	Pollution indicator	Load of pollution (Mg/a) discharged from land-based sources to the Baltic Sea from the country part of the Baltic Sea catchment area in the years:			
		1996	1997	1998	1999*
1.	BOD_7	28083	49222	84064	-
2.	Total Nitrogen	46302	83923	99323	-
3.	Total Phosphorus	911	1336	2714	-
4.	Mercury	-	-	-	-
5.	Copper	23,823	34,933	67,220	-
6.	Lead	1,787	4,202	5,004	-

* data will be available after June 2001

Attachment 6

Table 6. Volume of wastewater and load of pollution discharged to waters by organisations included in the HELCOM "hot-spot" list

No. and name of the „hot-spot" in the HELCOM list	Volume of waste waters and pollution indicators	Volume of waste waters (thousands m^3/a) and load of pollution (Mg/a) discharged to waters by the audited organisations included in the "hot-spot" list			
		1996	1997	1998*	1999*
Rīga	Volume of waste waters	136100	135408	140693	116415
	BOD_5	6088**	6347**	1399	3674
	Total Nitrogen,	1665	1841	11409	1620
	Total Phosphorus	251	320	705	293
	Mercury	-	-	-	-
	Copper	4.935	4.935	0.021	1.300
	Lead	-	-	0.618	0.031
Liepāja	Volume of waste waters	17616	19177	15085	14577
	Total Nitrogen	279	284	177	144
	Total Phosphorus	50	44	8	10
	Mercury	-	-	-	-
	Copper	0.008	-	-	-
	Lead	-	-	-	-
Olaine	Volume of waste waters	2877	3183	2574	2318
	BOD_5	45**	28**	14	14
	Total Nitrogen	53	92	28	65
	Total Phosphorus	1	4	3	4
	Mercury	-	-	-	-
	Copper	-	-	-	-
	Lead	-	-	-	-
Daugavpils	Volume of waste waters	26464	25209	21680	20489
	BOD_5	2051**	1556**	1368	927

	Total Nitrogen	206	180	210	234
	Total Phosphorus	19	31	34	31
	Mercury	-	-	-	-
	Copper	0.01	-	-	-
	Lead	-	-	-	-

* data under verification; ** BOD_5 full

The data about volume of waste waters and waste water treatment plants have been taken from the State Statistical Report “Nr2-Water”. From 1998 a revised questionary form was introduced in Latvia.

The National Audit Office of Lithuania

CONSOLIDATED REPORT
(short version)
27 April 2001

On subject-matter control "1992 Helsinki Convention on the Marine Environment of the Baltic Sea provisions implementation" findings.

PREAMBLE

Issue of control: 1992 Helsinki Convention on the Marine Environment of the Baltic Sea provisions implementation.

Basis of control: agreement between the Lithuanian, Danish, Estonian, Finish, Latvian, Polish, Russian, Swedish SAIs.

Object of control: Convention of the Marine Environment of the Baltic Sea, signed up during the conference 18-22 March 1974 by all Baltic states. On 9 April 1992 the new version of the Convention was signed up by the authorized representatives of Denmark, Estonia, Latvia, Lithuania, Russia, Finland, Sweden, and Germany. The Seimas of the Republic of Lithuania has ratified the Helsinki Convention on 25 January 1997 by the act No VIII-139 "On ratification of the 1992 Helsinki Convention on the Marine Environment of the Baltic Sea".

Goals of control:

To evaluate the implementation of the 1992 Helsinki Convention on the Marine Environment of the Baltic Sea (hereinafter "Helsinki Convention") provisions from the standpoint of:

- Examining whether or not national legislation respects the Convention's provisions on the protection of the Baltic Sea against pollution;
- Examining whether or not appropriate audit procedures and inspection measures are applied;
- Auditing the utilisation of the public funds for the implementation of tasks connected with the protection of the Baltic sea.
- Auditing non-point source pollution, mainly from agriculture.
- Auditing point source pollution, mainly from urban areas and municipal wastewater treatment plants.
- General evaluation of the examined activities.

Co-operation with other SAIs: parallel audit carried out together with the Danish NAO, Estonian NAO, Finish NAO, Latvian NAO, Polish NAO, Russian NAO Swedish NAO.

Auditees: Ministries of Environment and Agriculture, local governments of Vilnius, Klaipeda, and Alytus, special joint stock companies "Vilniaus vandenys" (*Vilnius water*), "Kauno vandenys" (*Kaunas water*), "Klaipėdos vandenys" (*Klaipeda water*), "Šiaulių vandenys" (*Siauliai water*), "Dzūkijos vandenys" (*Dzukija water*).

The audit used the information obtained in 2000 from 58 local governments about the quality of the surface water sources, their monitoring, sewage treating, building of treating facilities, licenses for utilisation of natural recourses, money from the Environment protection fund. Besides was used information from the Environment ministry on pollution dynamics by JSC "Achema", JSC "Lifosa", JSC "Klaipedos kartonas", and Vilnius, Kaunas, Klaipėda, Šiauliai, Panevėžys, and Alytus municipal sewages.

Duration of the audit and audited interval: The audit started at 21 September 2000, and ended at 2 April 2001. The audited interval is from 1996 to 1999.

Methodology of the audit: the audit was carried out by the method of document control in complete or sampling way.

Participants of the control: 10 controllers including 2 controllers from the central headquarters, and 8 officers from the regional units.

SUMMARY OF THE AUDIT FINDINGS

1. Examining whether or not national legislation respects the Convention's provisions on the protection of the Baltic Sea against pollution

1.1. Implementation of Helsinki Convention in course of preparation of national strategies and programs and taking it into account in separate programs carried out by Environment ministry.

Now Environment ministry is carrying out environmental strategies that are indirectly cover the provisions of Helsinki Convention:

- Environmental strategy of Lithuania (adopted by the Seimas of the Republic of Lithuania by decree No I-1550 from 25 September 1996).
- Strategy of harmonisation of the environmental legal acts with the requirements of the EU (adopted by decree of the Minister of the Environment No 199 from 12 October 1998).

Lithuania has adopted 10 legal acts regulating the protection of the Baltic sea marine environment and internal waters. Besides there are in force another 10 strategies and programs relevant to the provisions of Helsinki Convention. In order to meet EU requirements for water protection that partly cover the Helsinki Convention provisions the 22 negotiation position was affirmed by the Government of the Republic of Lithuania by the decree No 935 from 17 August 2000 called

"Environment" points out laws and other legal acts that should be adopted, amended or supplemented and relevant programs.

Lithuania has adopted legal acts covering Helsinki Convention provisions, and two of them are regulating urban sewage (point pollution sources):

In the negotiations position No 22 adopted by the decree No 935 from 17 August 2000 of the Government of Lithuania called "Environment" it is foreseen to change in 2001 norms of sewage pollution, and in 2002 to supplement the Water law of the Republic of Lithuania with urban sewage and excess silt treatment regulations.

The other eight provisions of Helsinki Convention are also in force in Lithuania. They are relevant to licenses issuing, planning of damages liquidation, and other provisions.

The main document regulating the implementation of Commission's recommendations is 23 January 1997 decree of the Minister of Environment No 17 "On issuing of licenses for utilisation of natural recourses and application of Helsinki Commission recommendations". This decree establishes basis for implementation of the recommendations of the Commission.

1.2. Evaluation of the compliance of legal acts to the provisions of Helsinki Convention, preparation of the reports on implementation of Helsinki Convention provisions, and activities on National Helsinki Commission committee.

After ratification of Helsinki Convention in 1997 no evaluation of compliance of national legal acts to Helsinki Convention was carried out. So it is expedient to carry out such evaluation and to include provisions of the Convention into national strategy.

There is no set internal order of the implementation and reporting on the recommendations of the Commission that are obligatory to all countries that have signed the Convention. Since signing the Convention in 1992 and its ratification in 1997 till 1999 Environment ministry did not submit the report on Helsinki Convention implementation.

In order to implement Helsinki Convention efficiently the minister of Environment has established by his order No 180 from 30 September 1997 the National Committee on Helsinki Commission (HELCOM) and appointed officials in the HELCOM work groups and projects. However the Environment ministry has not set the internal legal regulations for accountability of the officials involved in the National Committee on Helsinki Commission (HELCOM) activities and projects.

Developing the legal framework the ministry of Agriculture 1997-1999 has elaborated recommendations for reducing the non-point pollution. In order to implement these recommendations ministry of Agriculture itself, and with the help of Danish specialists in 1997-1999 has realised the following arrangements: adopted preventive recommendations for reducing the non-point pollution, elaborated the project of Agricultural ecology, elaborated norms of applying fertiliser(s), adopted rules and recommendations for progressive farming.

In order to prevent the pollution of the fishery waters fishery central laboratory determines the indicators of the water pollution in the spring and in the autumn.

2. Examining whether or not appropriate audit procedures and inspection measures are applied

The Law on Environment Monitoring of Lithuania states three levels of implementing of monitoring system: state, local government, and economic body.

The ministry organises and co-ordinates the implementation of public monitoring according to the monitoring program adopted in 1998. The goal of this program is to elaborate rational environment monitoring system that allows to manage the environment quality objectively taking into account Lithuania's international obligations, provisions of national strategy, and obtained experience.

Paragraph 2 of art. 9 of this Monitoring law defines that the order of the monitoring carried out by local governments is set by general provisions of local environmental monitoring. However Ministry has not yet adopted regulations for state and local monitoring.

The surface water monitoring is carried out according to the law and program on Environment Monitoring taking into account EU directives and recommendations of Helsinki Commission. According to the state monitoring program the quality of the water in rivers and lakes is assessed by more than 70 indicators. Bottom deposits are analysed for heavy metals and pesticides and activity of radio nuclides.

The surface water is evaluated according to the maximal admissible concentrations of the materials that correspond the fishery requirements and classification of the water quality. The data on water quality are gathered, processed and saved in computer system.

The monitoring of the Baltic Sea is carried out by the Centre of Marine research. Its activity program incorporates provisions and requirements of Helsinki Commission (BMP). Lithuania fulfils its obligations to Helsinki Convention. In the Lithuanian economy zone there is 1 BMP station. The Centre of Marine research (in 1992-2000) carried out researches in the monitoring stations that are near Lithuanian economy zone and directly affecting our waters. These are the Gotland hollow and Gotland bay stations. The parameters, methods, management of data quality is carried out according to HELCOM requirements. The main problem is the lack of equipment that is old and not renewed because of the funding shortage.

According to the HELCOM program in Preila (Neringa) atmosphere monitoring station in approximately 100 meters from the sea shore daily are explored the concentrations of pollution: SO_2 (gas), NO_2 (gas), SO_4^{2-} (aerosol particles), NO^{3-} (the sum of the gas HNO_3 and aerosol particles NO_3) and NH_4^+ (sum of the gas NH_3 and aerosol particles NH_4).

According to the HELCOM program the radiological researches are held in the Baltic Sea in 4 stations. Samples are taken once per year for water and bottom

deposits analysis. The first radiological research in the sea began at 1995. Since that time the quantity of the stations left the same. In 2000 were taken 4 sea water and 8 bottom deposits tests.

The monitoring of the seashore water is included into the complex marine environment monitoring program. This program has 15 stations. The parameters, methods, data processing is carried out according to HELCOM requirements.

According to BMP program Baltic Sea marine environment is evaluated periodically each five years. Three assessments are already published. The last was issued in 1996 (Third periodic assessment of the state of the Baltic Sea, 1989-93, HELCOM, 1996, No 64 B, p. 252). Every year all countries submit their monitoring data to the HELCOM data base. Lithuania does it regularly. During 1992-2000 the Environment ministry has submitted 9 marine environment evaluation reports.

Comparing the activity of the bottom deposits during the last 5 years major changes were not noticed.

There is no natural population of seals in Lithuania. Single appearances of seals are monitored and registered. Lithuanian seal experts take part in the HELCOM activities and submit all information.

Special questions. Plunging of the soil is legal only with the permission of the authorities. The works of soil plunging are usually proceeded by the Environmental impact procedure that ensure the maximum attention to the ecological issues.

Flowering of silt is monitored by the Centre of Marine Research of the Environment ministry. There is appointed expert of the issue who takes part in all HELCOM events on abnormal environmental situations prevention. During 1992-2000 such situations did not occurred at Lithuanian shore. All silt monitoring is carried out according to HELCOM methods and recommendations. Laboratory equipment complies with international requirements.

Since 1972 it is prohibited to import, produce and use DDT. PCB and PCT usage is to be regulated and controlled according to Council Directive 96/59/EC from 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls. The total amount of dangerous pollutants, including PCB and PCT is regulated by the 14 July 1999 Environment minister's decree No 217 "On adopting the rules of waste management". 14 November 1999 decree No 387 "On the adoption of the document LAND 32-99 "On issuing the licenses of utilisation of the natural recourses and permissible pollution norms" states the requirements for enterprises moving away wastes (including PCB/PCT). The rules fully complying with 96/59/EC directive on PCB/PCT gathering and moving away will be adopted by the end of 2003.

3. Auditing the utilisation of the public funds for the implementation of tasks connected with the protection of the Baltic sea

3.1. Privatisation fund. In 1999 from 48.85 M Lt provision only 30.585 (or 62.6 per cent) were assigned. Although local governments exceeded their commitments and used 5.437 M Lt. or 137 per cent of funds allocated for State investment program it was not enough to acquire planned international funds.

3.2. Foreign loans. In 1999 was used 19.059 M Lt of foreign loans what makes only 19 per cent of the planned sum. Subsides and guarantees were used only at the level of 6 per cent (2.374 M Lt). Some issues of loan procedures got stuck. Although loan agreement with the North investment bank was signed at 19 January 1998, the loan did not come till the end of 1999. That was the reason of underfeeding of some objects. The water protection objects number decreased from 86 in 1992 to 21 in 1996, and 9 in 1999.

In 1992-1999 were signed or guaranteed by the Government of Lithuania loans for $192351.2 thousand.

3.3. Off-budget funds. Local government environmental funds acquired 33 M Lt., and spent 35 M Lt. Public environmental fund is also used. Income of the Public environmental fund were 3.23 M Lt and costs were 3,17 M Lt.

4. Audit of non-point source pollution

4.1. Reducing of pollution from non-point pollution sources in agriculture. In order to reduce pollution from non-point pollution sources in agriculture the Environment minister has issued the decree No 426 from 27 December 1999. In the Government decree No 935 adopted negotiation position No 22 provided that in 2001 will be adopted acts regulating the use of nitrates in the nitrate sensitive areas of agriculture. In 2002 it is planned to adopt program of reducing nitrate use in agriculture.

4.2. Assigning and using funds for Helsinki Convention on the Marine Environment of the Baltic Sea. Analysis of the 1996-1999 public assignments for ministry of Agriculture and its social-economic programs revealed that specially for Helsinki Convention on the marine environment of the Baltic sea no budget funds were assigned.

Implementing Helsinki Convention provisions and HELCOM recommendations the ministry of Agriculture funds Ecological Agriculture task program, orders research works, implements other agricultural ecological arrangements.

National agriculture development program fund in 1996 assigned 2 673 thousand Lt. for ecological agriculture production and elimination of the point pollution sources.

One of the priority investment program financed since 1997 from the Fund of Rural development is Program of Ecological Agriculture. The goal of the program - to harmonise Lithuanian legal acts with EU environment norms, to protect nature and

human health, to develop ecological agriculture, to create favourable infrastructure. During 1996-1999 the number of ecological farms has grown 3,5 times, the area of certified crops has grown 4,2 times.

Implementing HELCOM recommendations the ministry of Agriculture was carrying out 6 arrangements and programs.

5. The audit of point source pollution

In Lithuania in 1999 was used for various purposes 4 595 M m^3 of water that is by 471 M m^3 less than in 1998. The main reason - the decrease by 456 M m^3 use in energy sector.

The biggest part - 4 329 M m^3 or 94 per cent is used in energy sector. 99,7 percent of this amount comes to Ignalina nuclear power plant and Kruonis hidro accumulation power plant.

For non-energetical needs in 1999 was used 266 M m^3 of water: 19,9 % in industry, 44,2% - households, 0,8% - agriculture, 34,6 % fishery reservoirs, other needs - 0,5 %.

The most sewage (121 M m^3 - 66%) was treated in biological cleaning plants without elimination of nitrogen and phosphorus, and 14 M m^3 (8%) was treated in mechanical cleaning plants. In the new or renovated cleaning plants were treated 26 M m^3 or 14% sewage with eliminating nitrogen and phosphorus, the rest of the sewage (21 M m^3) was left untreated.

In 1999 compared to 1998 was produced by 35 M m^3 less sewage that had to be treated, and by 13 M m^3 less not treated sewage was let to the natural waters. In 1999 by 6% increased amount of sewage cleaned up to the maximal permissible pollution norm according to BDS_7.

The amount of the main pollution spilled into surface water in 2000 compared with 1992 has decreased: BDS_7 from 36800 tons to 7000 tons, Ntot from 10600 tons to 3671 ton, Ptot from 1438 tons to 645 tons.

6. General evaluation of the examined activities

6.1. Measures to reduce pollution in technological area. The potentially dangerous materials can be imported only with the permission of Environment ministry. The spill of the poison materials is prohibited by law (this prohibition works within the system of environment affect evaluation and licensing procedures).

6.2. Evaluation of the pollution burden. Economic bodies that are using licenses for natural recourses shall submit to the Environment ministry in the set order information about the emission of pollution.

6.3. Control. Lithuanian National Helsinki Commission committee in the set order and terms submits to the secretariat of the Commission or assessing countries information on implementing of the convention and recommendations. Secretariat of

the Commission or assessing countries summarise information on implementing of the convention and submit it to the Commission.

6.4. The reduction of the operational pollution from the ships. On 13 November 1997 the Seimas of the Republic of Lithuania adopted the Law on Marine environment protection, according to which it is forbidden to discard materials containing oil or its products (MARPOL 73/78 I enclosure), damaging liquid or friable materials (MARPOL 73/78 II enclosure), and waste (MARPOL 73/78 V enclosure). Besides each ship should have and file registers of cargo and waste. Lithuania is implementing provisions of MARPOL 73/78 and recommendations of HELCOM in area of prevention of oil spills.

6.5. Readiness to react to the oil and other damaging material spills. The national plan of the liquidation of oil spills in the sea is jointly adopted by Environment and Transport ministers. Lithuanian forces are ready to fight spill up to 2500 tons of oil.

6.6. Aerial observation. According to HC recommendation 12/8 all member countries should carry out aerial observation using distant monitoring equipment. Lithuania carries out such monitoring without distant monitoring equipment which is not acquired because of funding shortage.

6.7. Simulation of oil and other damaging materials drifting. Seeking to develop and apply systems of oil drifting forecast and use them as the tool for revealing of pollution sources Lithuanian rescue and search co-ordination centre and Marine Research Centre has installed the oil drift computer model elaborated by Swedish hydrometeorology institute.

6.8. Help to Lithuania in fighting the spills. Lithuania has got from the Helsinki convention members the following aid for fight with the spills: aid for acquiring spill liquidating equipment (Finland and Denmark) - approximately $2 M, aid for developing national spill liquidation plan (Denmark) - appr. 2278000 DKK; aid for installing oil drifting computer model (Sweden) appr. 450000 SEK.

6.9. “Hot spots”. Implementing Helsinki Convention Lithuania has indicated its “hot spots”. Data on pollution emission from “hot spots” in 1999 compared to 1993 is submitted in the following table. Besides the table indicates the date by which the normal treating of the waste should be achieved in those spots.

Tons/year

Date Indicator No. of the spot, town	1993 BDS7	1999 BDS7	1993 Nitrogen	1999 Nitrogen	1993 Phosphorus	1999 Phosphorus	Date of the planned solution
41 Šiauliai	769	86	704	297	84	20	2004
51 Kaunas	8307	3085	1526	988	289	144	2005
53 Kėdainiai	26	40	63	40	8.8	6.5	2006
55 Panevėžys	55.9	72	67	336	96	72	2004
57 Marijampolė	83	123	90	101	12	12	2003-04
58 Alytus	331	96	224	87	47	4	2001
59 Vilnius	8250	461	2618	252	290	172	2002-03
63 Klaipėda	3172	818	1227	360	112	53	2001-02
65 Palanga	276	208	88	74	16	10	2001

The amount of BDS7, nitrogen and phosphorus emitted in the "hot spots" makes in comparison with 1992 correspondently: BDS_7 - 23%, nitrogen 38%, phosphorus - 52%.

The main atmosphere pollution reduction in 1999 in comparison with 1992 was: SO_2 from 139 to 70 thousand tons, Nox from 98 to 54 thousand tons, NH_3 from 81 to 29 thousand tons, CO from 350 to 320 thousand tons, CH_4 from 333 to 262 thousand tons. Insoluble volatile organic compounds increased from 66 to 68 thousand tons.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions:

- Environment Ministry does not fulfil any special strategies or programs relevant only to Helsinki Convention provisions.
- Taking into account the priorities of accession to the EU policy the bulk of ministry's strategies and programs is connected to the harmonisation of legal acts and implementation of the EU requirements transferring in the same time some provisions of Helsinki Convention and additional recommendation.
- The newly adopted Lithuanian legal acts on protection of water quality in general correspond to Helsinki Convention provisions.
- New environmental legal acts are prepared and acts in force are amended in line with EU requirements. In some cases Helsinki Convention provisions are included.
- In 1997 when Helsinki Convention was ratified compliance of Lithuanian legal acts in force to Helsinki Convention provisions was not assessed.

- Environment ministry has not yet affirmed internal legal acts regulating the control and accounting on the recommendations of Helsinki Commission that are obligatory to all member countries.
- Since signing the Convention in 1992 and its ratification in 1997 till 1999 Environment ministry did not submitted consolidated reports on Helsinki Convention implementation.
- 1999 annual report of the Environment ministry contains some information on implementation of some Commission's recommendations. Besides, in the order set by Commission ministry submits information on implementation of recommendations in the Republic of Lithuania.
- Environment ministry organises and co-ordinates state monitoring implementing 1998 State environment monitoring program.
- Environment ministry has not yet affirmed rules regulating state and local monitoring that are provided in the paragraphs 1 and 2 of the article 9 of the Environment Monitoring law.
- Ministry of Agriculture has not assigned special budgetary funds for implementation of Helsinki Convention on the Marine Environment of the Baltic Sea provisions.
- Seeking to implement Helsinki Convention provisions and HELCOM recommendations Ministry of Agriculture finances agricultural environment measures from Agriculture development program funds.
- In 1996 from Agriculture development program funds for organisation of ecological agriculture production and elimination of the point pollution sources 2 673 thousand Lt. were allocated.
- In 1997-1999 for funding of task program of ecological agriculture 2 681.4 thousand Lt. were spent from Rural development fund.
- In 1996-1999 the number of ecological farms has increased 3.5 times, the area of certified crop has increased 4.2 times.
- Municipal environment protection rules do not specify what arrangements compensate environmental damage, environmental objects, sources of pollution.
- Most of local governments have no environment monitoring program co-ordinated with Environment ministry.
- There are no rules regulating local environment monitoring.
- Local governments planning and implementing arrangements of water protection and other environment measures do not relay on the data of monitoring that is the most objective source and criteria of environmental information.

Proposals:

To recommend to the Seimas and Government of the Republic of Lithuania:

- After signing and ratifying international Agreements and Conventions to evaluate Lithuanian legal framework for its conformity with Agreements and Conventions and to assess the present situation in this field.

To recommend to the Government of the Republic of Lithuania:

- To adopt procedures of control and accountability of Helsinki Commission recommendations obligatory to all member countries implementation.
- In order local governments spend environment fund money strictly purposely to initiate the amendments of the Local government environment fund rules adopted by the Supreme Soviet decree No I-1922 from 24 October 1991 and to define arrangements compensating environmental damage, environmental objects, sources of pollution.

To recommend to Environment ministry:

- To adopt internal legal acts regulating implementation of Helsinki Commission recommendations obligatory to all member countries.
- To submit periodically (at least once in three years) reports on Helsinki Convention implementation.
- In order to make implementation of Helsinki Convention more clear to prepare annual reports of National Helsinki Commission (HELCOM) committee reports not only on activities of work group members but also the review of general information on implementation of Commission's recommendations and passing of legal acts relevant to the Convention.
- To adopt provisions regulating the state and local government monitoring, provided in the Environment Monitoring law's paragraphs 1 and 2 of the article 9.

Acting head of the Control and
K. Širvaitis
Performance Audit division

The National Audit Office of Poland

THE SUPREME CHAMBER OF CONTROL

ENVIRONMENT PROTECTION DEPARTMENT

I N F O R M A T I O N

ON THE AUDIT RESULTS AS REGARDS

THE FULFILMENT OF OBLIGATIONS UNDER THE PROVISIONS OF THE CONVENTION ON THE PROTECTION OF THE MARINE ENVIRONMENT OF THE BALTIC SEA AREA (THE HELSINKI CONVENTION)

Audit carried out by the Supreme Chamber of Control of the Republic of Poland in parallel with the Supreme Audit Institutions of the States – Signatories to the Helsinki Convention.

DOMESTIC PART

Warsaw **July 2001**

I. GENERAL INFORMATION

1. Audit description

Subject Fulfilment of obligations under the provisions of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (the Helsinki Convention)

Number P/00/089

Type Planned, co-ordinated audit

The audit was carried out by the Supreme Chamber of Control (SCC) in parallel with the Supreme Audit Institutions of the States – Signatories to the Helsinki Convention: Denmark, Estonia, Finland, Latvia, Lithuania, Poland, the Russian Federation and Sweden

Objective The audit aimed to assess the state of implementation of the Helsinki Convention provisions concerning the protection of the Baltic Sea against the pollution from land-based sources, and in particular to examine and evaluate measures taken by public administration organs, and their subordinate units and economic entities with a view to:

- harmonizing domestic legislation with the requirements of the Helsinki Convention as regards the protection of waters against pollution coming from point and non-point land-based sources,
- reducing pollution in surface waters flowing into the Baltic Sea and in particular:
  - decreasing inputs from land-based point sources to water – from municipal and industrial waste water treatment plants,
  - decreasing inputs from land-based non-point sources to water mainly from agricultural areas, including animal breeding and fish-farming,
- reasonable use of public funds by economic entities for carrying out investments aimed at the protection of the Baltic Sea,
- exercising efficient supervision and control, including combating corruption in exceptionally vulnerable areas, in particular as regards:
  - spending public funds in accordance with their intended use, in areas related to financing projects in water management,
  - keeping true and fair documentation of using public funds accurately and timely to fund objectives mentioned above, following the provisions of the act on protection and shaping of the environment and other binding legal regulations.
  - correct implementation of tendering procedures applied with a view to executing water management projects – in compliance with the act on public procurement.

The Helsinki Convention dated 22 March, 1974, was ratified by the Polish Parliament on the 8th of November, 1979, and came into force on the 3rd of May 1980. On May 17, 2000, it became ineffective as a result of the Helsinki Convention of 9 April 1992 entering into force upon prior ratification by the Polish Parliament. The subject of the audit covered the issues

tackled in both Conventions, thus throughout the text the term "the Helsinki Convention" is used without specifying which one is referred to.

Subject, period studied and time to perform audit

The audit was conducted on the SCC's own initiative subject to guidelines laid down by INTOSAI and EUROSAI on initiating and performing international and regional audits of fulfilment of obligations under the provisions of international treaties on environment protection. The audit was carried out between 19 June and 18 October, 2000, and covered the period between 1996 and 1999.

The audit covered primarily:

- in the Ministry of Environment, Ministry of Agriculture and Rural Development and Ministry of Economy – the degree to which the Helsinki Convention provisions have been transposed into domestic legislation; supervision and co-ordination of actions taken with a view to reducing pollution inputs to rivers and the Baltic Sea as well as the reasonable way of spending public funds on projects related to water purity improvement, including the functioning of a control system for the prevention of corruptive practices,
- in the Chief Inspectorate for Environmental Protection and in voivodship inspectorates for environmental protection – exercising control over organisational units in respect of their compliance with water law permits to discharge wastes to surface waters as well as methodology for surveying and results from monitoring the quality of the Baltic Sea and the rivers in its catchment area.
- in the National Environmental Protection and Water Management Fund and in voivodship environmental protection and water management funds – management of funds' resources allocated to projects aimed at the reduction of surface water pollution, including the Baltic Sea, and, in particular, investments related to "hot spots", plants from the "List of 80" and voivodship lists. The audit also covered the funds' supervision over the use of financial aid allocated to entities as well as ecological effects brought about by the implementation of the financed projects,
- in voivodship offices (province level), municipal and gmina offices (city and commune level), and powiat starosta offices (district level) – actions taken to decrease the volume of polluting substances discharged from municipal and industrial waste water treatment plants and agricultural areas, including: issuance of water law permits to discharge wastes to surface waters and control of compliance with the conditions set out therein, scope of projects carried out to improve water purity as well as due application of tendering procedures and the correctness of investment process,
- in the Institute of Meteorology and Water Management – results of audits carried out by the Institute as regards waste disposal and monitoring the quality of the Baltic Sea and rivers in its catchment area, scope of implementation, sources of financing and degree of application of scientific and research works on the quality of surface waters, assessment and forecast results regarding the purity of rivers and the Baltic Sea,
- in economic entities, including those listed as "hot spots", conducting activities that involve discharge of wastes into waters – possession of water law permits for the

disposal of wastes to surface waters and compliance with the conditions set out therein, measures taken to decrease the volume of polluting substances discharged with wastes into waters, cost of the above-mentioned activities, sources of financing and ecological effects. As regards investing, the audit covered compliance with the act on public procurement and the correctness of investment process.

Units subject to audit

The audit was carried out in 107 organisational units, including:

- 77 SCC-audited units,
- 30 voivodship inspectorates for environmental protection-audited units.

Participants in the audit

Environment Protection Department as a co-ordinating unit, Agriculture and Food Economy Department, Regional SCC Offices in Bydgoszcz, Gdańsk, Katowice, Olsztyn, Szczecin and Wrocław and voivodship inspectorates for environmental protection on the basis of the SCC's instruction issued pursuant to art. 12 item 3 of the act dated 23 December 1994 on the Supreme Chamber of Control (Journal of Laws 1995, No. 13, item 59, as amended).

The SCC audited:

- Ministry of Environment,
- Ministry of Economy,
- Ministry of Agriculture and Rural Development,
- Chief Inspectorate for Environmental Protection,
- 6 voivodship offices,
- 26 municipal and gmina offices,
- 7 powiat starosta [administrative district head's] offices, including one exclusively for fish farming conducted within the powiat,
- 6 voivodship inspectorates for environmental protection,
- National Environmental Protection and Water Management Fund,
- 6 voivodship environmental protection and water management funds,
- Institute of Meteorology and Water Management and its 2 subordinate units:
  Marine Division in Gdynia,
  Water Quality Monitoring Office in Katowice,
- 18 economic entities, including:
  11industrial plants,
  7 municipal plants.

Voivodship inspectorates for environmental protection audited:

- 18 industrial plants,
- 12 municipal plants.

During the audit, subject to art. 29 item 2 sub-item f of the act on the SCC, additional information was gathered from 75 units, e.g.: „EkoFund" Foundation in Warsaw, Institute of Land Reclamation and Pasture Cultivation in Falenty near Warsaw, Institute of Plant Protection in Poznań and Institute of Soil Science and Plant Breeding in Puławy.

2. Summary of audit findings and assessment of audited activities

1. The audit revealed that the Minister of Environment, who is responsible for overall co-ordination of measures resulting from obligations assumed by Poland as a Signatory to the Helsinki Convention, managed to incorporate into the law on the protection of the water environment essential provisions of the Convention as regards the protection of the Baltic Sea against pollution from land-base point and area sources. However some provisions were transposed with delay, and some of them have not been implemented so far. And so:

   - In accordance with the provisions of the Helsinki Convention the following were, among others, incorporated into the internal law:
     - requirement to develop regional environment protection programmes,
     - quality standards for wastes discharged into surface waters,
     - duty for industrial plants to obtain water law permits for discharge of wastes and performance of surveys to study the quality and volume of wastes discharged,
     - setting quota on phosphates levels in washing and cleaning agents,
     - rules on trading in and using plant protection chemicals,
     - rules on monitoring waters and their classification.
   - During the audit some delays in the implementation of the provisions contained in the Convention were disclosed, e.g.:
     - state environmental monitoring system, including monitoring of waters, was established in 1991,
     - establishing rules on trading in and using plant protection chemicals initiated in 1995,
     - rules on trading in and using fertilisers were not introduced until 2000.
   - On the day the audit was finished Polish legal regulations were still deficient, e.g.: emission quota for nitrates in wastes discharged into the aquatic environment were not tightened, conditions for establishing in industries closed water circuits, including those with high degree circulation, were not laid down, use of chloroform and toxaphene – compounds from the pesticide group, listed in the Convention among exceptionally hazardous substances – was not limited.

2. The audit showed that between 1996 and 1999 units subject to audit, i.e. 26 municipal and gmina offices and 48 plants discharging municipal and industrial wastes into the

sea environment, including 30 plants recruited from the area of 24 Polish "hot spots" included in the Helsinki Commission list, had taken measures, including investments, for the protection of water against pollution coming from point and area sources, which resulted in the reduction of pollutant load discharged into the sea environment from 5.3% to 76.3% - depending on the type of pollution index applied - and they reduced amount of wastes discharged into water without prior treatment by over 60%.

At the same time the results showed that the above-mentioned plants did not sufficiently observe the law on the protection of the sea environment and comply with water law permits for discharge of wastes into surface waters and operation of water protection apparatus. Also the audit results unveiled inefficient enforcement of post-audit recommendations and penalties imposed by voivodship inspectorates for environmental protection as a consequence of the above-mentioned failures, as well as inaccuracies in preparation and implementation of water protection projects, resulting in prolonged periods of their execution and high pollutant loads continually discharged into rivers.

2.1. Between 1996 and 1999 the municipal and gmina offices and municipal and industrial plants subject to audit made investments in the protection of water against pollution, including, among others, construction, expansion and modernisation of waste water treatment plants, construction of sewerage systems, introduction of water-efficient production technologies and closed circuits of industrial waters.

- Between 1996 and 1999, in the area within the competence of 26 municipal and gmina offices subject to audit, 14 waste water treatment plants were built and 4 were expanded, including 2 chemical, 11 biological and 5 biological ones with intensified removal of biogenous compounds. The number of waste water treatment plants operating in cities and gminas concerned increased form 57 to 71.

  Among the 18 waste water treatment plants, 13 were completed with a delay of a few months to over 8 years. The reasons why the development of these investments did not meet a deadline include for example: subsequent changes in the scope of the project, changes in the schedule of works, financial limitations and prolonged procedures for purchasing and supplying equipment.

- The audit carried out in 48 plants that discharge municipal and industrial wastes into water showed that in the period studied 33 plants executed projects concerned with the protection of water against pollution, by means of construction of 15 waste water treatment plants, expansion and modernisation

of 16 waste water treatment plants, construction of sewerage systems, replacing old production technologies with water-efficient ones and building closed circuits of cooling water.

- Out of those 48 plants, 30 were located in the areas of 24 "hot spots". In the period studied they constructed 5, expanded 10 and modernised 4 waste water treatment plants. The investments included treatment plants that treated municipal wastes from large urban areas: Bydgoszcz, Gdańsk, Gdynia, Kraków, Łódź, Poznań and Toruń. A substantial decrease of pollutant load in wastes discharged into the sea environment, achieved owing to the implementation of the above-mentioned projects, may serve as a ground for their submitting a request for being removed from the list of "hot spots".
- Water protection investments made by the 48 municipal and industrial plants subject to audit between 1996 and 1999 resulted in the decrease in pollutant loads discharged with wastes generated at these plants into rivers accordingly: BOD_5 – by 32%, COD – by 19.3%, total suspension – by 54.5%, total nitrogen – by 20.6%, total phosphorus – by 5.3%, aggregate of heavy metals – by 76.3%.
- Between 1996 and 1999 the amount of wastes discharged into surface waters by the 26 cities and gminas and the 48 municipal and industrial plants subject to audit decreased by 15.7%, and the amount of untreated wastes by 61.1%. The share of untreated wastes in the total of treated wastes decreased from 12.5 % to 5.8%.

2.2. On the basis of audit results it was stated that agriculture, which pollutes waters with compounds of local area origin, between 1996 and 1999 was characterised by low and stable use of fertilisers and plant protection chemicals, which was beneficial to the purity of rivers. However, it also had problems with storage and application of fermented and unfermented liquid manure and low infrastructure index (sewerage systems and waste water treatment plants) occurring in the countryside.

- Activities, aimed at reducing water pollution from agricultural land, undertaken within the areas subordinate to the 6 audited voivodship offices included, for example,: drawing and implementing voivodship environmental protection programmes, constructing rural waste water treatment plants, dunging gutters and tanks for fermented manure, establishing soil monitoring system, and promoting Best Environmental Practices among farmers.

- Out of 7 audited powiat starosta offices, 6 knew little about the impact of pollution from agricultural land on the purity of main rivers flowing through the district and the need to take measures to limit such influence.
- Surveys carried out in 26 municipal and gmina offices showed that in the period studied 4 offices did not check compliance with the provisions dealing with conditions for collecting fermented liquid manure, sewage from animal farms, eluate from silage and the application of fertilisers and crop protection chemicals.
- Audits performed at fish farms showed for e.g. inaccuracies in issuing decisions on land development and physical management as well as in the water law permits issued to allow for a specific water use, which failed to comply with conditions of the water law permit and discharge of wastes for pollution levels exceeding quota into the sea environment.

2.3. Out of the 48 plants subject to audit, which discharged municipal or industrial wastes into surface waters in whole or in one part of the period studied, 17 plants did not hold water law permits for the disposal of wastes and operation of water treatment installations. Also units that operate waste water treatment plants in the areas managed by 10 municipal and gmina offices audited did not have water law permits to discharge wastes into the aquatic environment.

The audit revealed that the failure to comply with legal and formal regulations was caused by expiry of permits due to changes in the ownership of the plants, changes in production processes and production volumes, denials by authorities granting water law permits on the grounds of plants' non-compliance with waste quality requirements, and unreasonably long time spent on considering applications for granting permits.

2.4. For breach on regulations concerning protection of sea environment and non-compliance with the conditions set out in water law permits, voivodship environmental officers from the audited 6 voivodship inspectorates for environmental protection imposed on economic entities 800 fines for the total of approx. 52.1 mln Polish zloties, 34.3 % of which was deferred on grounds of their making water protection investments. The audit disclosed insufficient execution of the conditions set out in decisions on deferment of fines and amounts due as exactable penalties.

- Part of the fines imposed, approx. 17.9 mln Polish zloties, was deferred on grounds of plants' making water protection investments. However, it was disclosed that in two cases the voivode did not increase by 50% the fines

imposed, to the total amount of 809.4 thousand zloties, for defaulting by the punished entity on the conditions set out in the deferment decision.

- Out of 34.2 mln zloties due for fines imposed, only the amount of around 5.5 mln zloties was paid in, i.e. around 16%, while outstanding payments together with default interest amounted to approx. 167.1 mln zloties.
- Discretion in not increasing the fines and collection thereof led to corrupt practices. Surveys revealed that they amounted to approx. 5.2 mln zloties.

3. Audit studies disclosed that between 1996 and 1999 audited units, financing and co-financing the implementation of water protection projects, spent on them the total of 4.757,3 mln zloties, including 7.1% paid out from the budgets of 4 voivodship offices', 40.9% from financial resources of the National Environmental Protection and Water Management Fund, 6.5% from foreign aid, 17.9% from 6 voivodship environmental protection and water management funds, and 12.6% from 33 plants' own resources, including 14 municipal and 19 industrial ones, out of 48 auditees, 11.9% of resources were in the possession of 26 cities and gminas subject to audit, and 3.1% - the EcoFund.

   3.1. In the period studied, 4 out of 6 controlled voivodship offices co-financed the construction, expansion or modernisation of waste water treatment plants and construction of sewage systems for the total of 340 mln zloties. 77% of the resources from voivodship budgets were spent on waste water treatment plants and about 23% on the construction of sewage systems. As a result of these investments, 99 waste water treatment plants with a total capacity of 311 000 m^3/24 hours started to operate in 1999. Moreover, the voivodship offices were engaged in education and promotion activities taken in order to encourage the use of Best Environmental Practices and Best Available Technology, as regards, for example, the protection of the sea environment.

   3.2. In the period studied the National Environmental Protection and Water Management Fund spent on projects connected with the protection of waters against pollution 1.948,2 mln zloties, i.e. about 86% out of its own funds, 60.7 mln zloties, i.e. about 3% out of PHARE funds, and 245.8 mln zloties, i.e. about 11% non-refundable foreign aid. The Fund's financial aid was spent on the implementation of water protection investments, including the liquidation of the so-called "hot spots", monitoring surveys, developing experts' opinions and scientific and research works. As a result of the implementation of projects co-financed with the Fund's resources, 759 waste water treatment plants, 245

sewage pumping stations and 3.181 km of sewage systems started to operate between 1996 and 1999.

3.3. Between 1996 and 1999, the 6 audited voivodship environmental protection and water management funds allocated out of their own resources 850.4 mln zloties to water protection investments, i.e. 45% of the total amount spent in this period by funds on the protection of the environment. The resources engaged by the funds enabled the operation of 233 and the expansion and modernisation of 155 waste water treatment plants.

3.4. In the 6 powiat starosta offices subject to audit, in 1999 no resources of the powiat environmental protection and water management funds were allocated to projects aimed at protecting water against pollution. The starosta offices knew little about activities taken in this regard by other organisational units located within powiats.

3.5. In the period studied, 33 out of 48 audited municipal and industrial plants spent 1.583,3 mln zloties, including 597,7 mln zloties, i.e. 26.5% out of their own resources, on projects related to protection of the sea environment, e.g. on the construction of 15 and expansion or modernisation of 16 waste water treatment plants. In the group of the municipal and industrial plants concerned, 17 included in the list of "hot spots" spent 1.469,4 mln zloties on water protection investments, of which 532,4 come from their own resources.

3.6. 23 out of the 26 audited municipal and gmina offices co-financed water protection investments.

Between 1996 and 1999, the amount of 565,9 mln zloties was spent on the construction, expansion and modernisation of waste water treatment plants and construction of sewage systems.

3.7. Projects related to protection of the Baltic Sea against pollution were one of the priorities financed out of the EcoFund's resources. Between 1996 and 1999 EcoFund subsidised the construction of 52 waste water treatment plants, including 29 in valuable ecosystem areas and 23 in the coastal belt, with the amount of 148.6 mln zloties. As a result of these investments, the pollutant load discharged into surface waters was reduced for: BOD_5 – by 27 thou. tons/yr, suspended particulates – by 22 thou. tons/yr, total nitrogen – by 7,6 thou. tons/yr, total phosphorus – by 1,25 thou. tons/yr.

3.8. Audit results showed that between 1996 and 1999 there were instances of inaccuracies likely to cause corruption in the management of public funds, including a breach on the laws on public finances and on public procurement,

both during the implementation of the project and ordering research work on the protection of water against pollution. And so:

- Inaccuracies were detected in all the 11 contracts concluded between the Chief Inspector for Environmental Protection and Institute of Meteorology and Water Management in Warsaw and National Water Management Foundation in Warsaw, on conducting monitoring surveys of rivers and the Baltic Sea. The audit showed, for instance, that no calculation of anticipated cost of works was done at the stage of contract conclusion, acceptance of works fell short of the scope of the contract and acceptance inspection protocols were not signed by contractors, and contractors were not required to submit a detailed settlement of research costs.
- In the National Environmental Protection and Water Management Fund, no one supervised conformity of the use mode of granted funds and scope of concluded contracts, with some contracts were settled on the basis of subject and finance schedules that did not include the work cost calculation. Moreover, the Fund neither supervised the execution of contracts financed with foreign resources nor did it possess any information on environmental effects produced by the execution of such contracts.
- In 2 out of 6 voivodship environmental protection and water management funds the payment of loans granted was cancelled without making any analysis of environmental effects produced by the execution of investments financed with these loans, and in 1 fund the interest on 5 granted loans, whose documentation was analysed during the audit, was incorrectly calculated. In 1 fund some part of the loan that amounted to 224.5 thousand zloties was misused.
- In 6 out of 26 municipal and gmina offices subject to audit, the provisions of the law on public procurement, as regards contracting out construction works and supplies of machines and equipment, were infringed on. For example: the value of the order was not specified, tender bids that failed to meet essential procurement conditions were accepted, incorrect procedures were applied while awarding contracts.
- Audit of receipts and expenditures in communal environmental protection and water management funds for the year 1999 carried out in 23 municipal and gmina offices revealed that 21 communal environmental protection and water management funds accepted receipts for fees due for special usage of

waters, but 10 of them did not use the funds collected to finance water protection investments or spent them but in minimum amounts.

- The survey showed that between 1996 and 1999 voivodship offices were inefficient in collecting fees due for special usage of waters. In the period studied the voivodes in 5 voivodships issued decisions to economic entities specifying the amount of fees due for discharge of wastes into surface waters that amounted to 2.202,1 mln zloties, the plants, however, paid in only 755.5 mln zloties. After deduction of the fees deferred and cancelled the amount of outstanding fees together with interest reached 13.766,3 mln zloties at the end of 1999 despite all collection efforts.

4. Audit findings disclosed insufficient supervision and co-ordination of activities in Ministries by particular Ministers responsible for the implementation of the provisions laid down by the Helsinki Convention, lack of thorough knowledge as regards the degree to which Poland had fulfilled obligations under the Convention, and facts of providing the Helsinki Commission with incomplete information presented under the agreed report rounds. And so:

   4.1. The Minister of Environment, in three reports on implementation of the state environmental policy, drawn up between 1997 and 1999 on the basis of data presented in statistical yearbooks published by the Central Statistical Office, gave information about positive trends in environment protection, despite the fact that priority objectives in the environmental policy were not attained and pollutant loads discharged from the territory of Poland into the Baltic Sea had actually increased. In the period studied the Ministry of Environment did not assess the execution of the implementation programme for the state environmental policy till 2000 ("Program Wykonawczy do polityki ekologicznej państwa do roku 2000"). Also no assessments were made as regards the scope and progress of the activities pursued in order to meet the obligations arising from the provisions laid down in the Helsinki Convention.

   - Half of the 8 reports on public utilities, which had been written by the competent Minister of environmental protection, submitted to the Helsinki Commission under reporting rounds in 1996 and 1999 and later made subject to audit, contained incomplete data. The competent Minister of environment did not request of the President of Housing and Urbane Development Office to fully and timely submit the necessary data to the Helsinki Convention Secretariat in Gdańsk. The reports on the implementation of the Baltic Sea Monitoring Programme, which were

submitted to the Commission, contained incomplete data on pollutant loads discharged from the Polish "hot spots".

- The competent Minister of environment failed to transfer to the Minister of Economy and the former Minister of Agriculture and Food Economy opinions on sectoral reports, on the basis of which internal reports were drawn up for the Helsinki Commission. The competent Minister of environment did not take his stance on the motions put forward by the former Minister of Industry and Trade, later by the Minister of Economy, concerning the procedures for preparation of the above-mentioned reports, as well as incorporation into the law on the protection of the sea environment quota levels for concentration of polluting substances that had not been standardised so far, following the requirements of the Helsinki Convention, such as antimony or aliphatic halogenated compounds.

4.2. Between 1996 and 1999, the Minister of Industry and Trade, and since the 8th of August 1996 the Minister of Economy, did not establish limits on some types of pollutant loads discharged into waters from industrial plants, despite actions undertaken to implement the provisions of the Helsinki Convention. In 1998 quota levels for the concentration of mercury in wastes generated by chloroalkaline industry, copper and chromium generated by chemical and pharmaceutical industries, and for zinc - by pharmaceutical industry were exceeded. Statewide, the copper load discharged into the Baltic Sea increased by around 217%, zinc load by around 48%, and mercury load by 19 times.

4.3. It was not till 1995 that the Minister of Agriculture and Food Economy undertook some legislative work to limit the pollutant loads discharged into the aquatic environment from agricultural areas. As a result legal acts were drafted to specify the rules concerning fertilisation and application of plant protection chemicals as well as establish environmentally friendly agricultural production methods. He also contributed to writing a development programme and a plan of financing rural infrastructure to be implemented till 2010. He initiated scientific and research works and promoted their results by means of publishing and agricultural counselling.

4.4. The audit showed that the Chief Inspectorate for Environmental Protection exercised ineffective supervision over the execution of contracts on the monitoring of rivers and the Baltic Sea. The information about the scope and results of work performed by voivodship inspectorates for environmental protection, in possession by the Inspectorate, was deemed incomplete.

- The Institute of Meteorology and Water Management and voivodship inspectorates for environmental protection responsible for carrying out monitoring surveys of surface waters did not comply with dispositions issued by the Chief Inspectorate for Environmental Protection as regards the research carried out under the initiative of monitoring of flowing surface waters for the years 1996 – 1998 (Monitoring Powierzchniowych Wód Płynących) and the programme of surveying rivers included in the national monitoring network for the years 1999 – 2002 (Program Badań Rzek Objętych Krajową Siecią Monitoringu). The research in some gauging and control sections was renounced and the established frequency of surveys and the number of pollution indices subject to analysis had been changed. In the second half of 1998 monitoring surveys in two bench-mark sections essential to the assessment of pollutant loads discharged into the Baltic Sea, i.e. in Kiezmark on the Wisła River and in Wejherowio on Reda, were renounced.
- As the audit findings show, the Chief Inspectorate for Environmental Protection did not possess the information on the scope and results of audits conducted by voivodship inspectorates for environmental protection as regards the protection of the sea environment. It did not register the number of audits planned and actually carried out in this regard. It let the voivodship inspectorates default on their obligations arising from the Environmental Monitoring Programme as regards monitoring of waters.

4.5. 3 out of 6 audited voivodship offices and 5 out of the surveyed 6 powiat starosta offices could not specify plants that discharged wastes into surface waters and that were obliged to have water law permits for water use. It prevented voivodes from including all such plants in their decisions on the amount of fees due for discharging wastes into waters and collecting debts due. This resulted in the decrease in the revenues of environmental protection and water management funds.

5. The audit revealed that between 1996 and 1999 the purity of Polish rivers did not improve and the pollutant loads discharged into the Baltic Sea increased despite substantial financing, speedy implementation of water protection investments, as well as sizeable reduction in pollutant loads discharged into surface waters. However in 1997 and 1998 a considerable increase in pollutant loads flowing into the Baltic Sea was caused by flooding.

- Comparison of the size of loads of basic pollution indices, discharged from the Polish territory into the Baltic Sea in 1999, with loads of such pollution discharged in 1996 showed that within 4 years only the size of 6 kinds of pollutant loads decreased, e.g. chlorides by around 20%, ammonium nitrogen by around 15%, total iron by around 18%, cadmium by around 2% and iron by around 22%. Pollutant loads expressed in terms of the remaining 16 indices increased, including the most harmful to the Baltic marine environment: BOD_5 by around 5%, COD by around 43%, total suspension by around 26%, total nitrogen by around 1%, total phosphorus by around 21%, zinc by around 48%, copper by around 217%[1].
- Monitoring of surface waters conducted in the period studied revealed that the quality of river waters deteriorated, i.e. there was an increase in sections of rivers designated to purity class III (the lowest degree of purity) and in those failing to meet standards, by 9.1% and 1.3% respectively, and a decrease in sections of rivers classified as class I and class II water, by 4.1% and 6.3% respectively[2].

According to the Chief Inspectorate for Environmental Protection, an increase in pollutant loads discharged into rivers and then flowing into the Baltic Sea between 1996 and 1999, as showed by the results of monitoring surveys, was mainly caused by:

- an increase in the annual river outflow in Poland from 60.9 km^3 in 1996 to 80.3 km^3 in 1999,
- overbank flows, caused mainly by flooding, which washed out impurities from the ground surface and disturbed and carried away fluvial deposits accumulated in river-beds,
- more detailed measuring of heavy metals content in water, thus including in the balance and indicating pollutant loads that so far were impossible to detect,
- construction of water supply and sewage systems in rural areas, which improved the sanitary conditions in the countryside and directed wastes, which had so far been discharged into the ground and not included in the balance, to surface waters.

It is also noted that between 1998 and 1999 over 60% of waste water treatment plants, which were completed owing to considerable financial resources allocated in the preceding years, started to operate. However the effects of their work on the quality of rivers (taking in water), will be only felt in distant future.

6. The audit revealed:

[1] Statistical Yearbook on the protection of the environment „Ochrona Środowiska", 2000.
[2] As above.

- amounts spent with the violation of the law: 37521.2 thou. Polish zloties,
- decrease in revenues to the amount of 3890.4 thou. Polish zloties, including:
  state-allocated funds – 1548.4 thou. Polish zloties
  self-governmental-allocated funds – 2120.9 thou. Polish zloties
- other financial irregularities to the amount of 5143.5 thou. Polish zloties

The SCC has taken measures to recover the amount of (in total) 2683.5 thou. Polish zloties.

The amounts recovered totalled 457.4 thou. Polish zloties.

* * *

The audit disclosed that competent Ministers of Environment, Agriculture and Economy had harmonised the domestic legislation with essential requirements of the Helsinki Convention and pursued policies in compliance with its provisions. However, there were some delays in drafting and implementation of some legal acts.

The audit also showed that heads of departments as well as central and local administration bodies took strenuous actions aimed at implementing water protection investments, mainly the construction of waste water treatment plants and sewage systems, and the introduction of water-efficient production technologies and closed water circuits.

The protection of the sea environment against pollution made an ecological priority in funding nature conservation projects by voivodship environmental protection and water management funds. The National Environmental Protection and Water Management Fund drafted and implemented programmes to finance obligations arising from the Helsinki Convention. It found reflection in an increase in funds' expenditures on water protection investments. However, some irregularities appeared and the law on public finances was infringed.

Thanks to the construction and expansion of waste water treatment plants, the industrial and municipal plants subject to audit managed to limit pollutant loads discharged with wastes into waters and reduce the volume of untreated wastes by over 60%. Statewide, between 1996 and 1999, the volume of wastes discharged into waters without prior treatment was reduced by approx. 7%.

The audit of the most dangerous sources polluting the Baltic Sea, the so-called "hot spots", located on the Polish side of the Baltic Sea catchment area, revealed significant improvements in sewage and water management.

The decrease in levels of pollution coming from the ground was mostly connected with reduced application of fertilisers and plant protection chemicals.

Despite substantial investments in the protection of waters, results of the Surface Waters Monitoring Survey showed an increase in pollutant loads discharged into rivers and flowing into the Baltic Sea as well as deterioration in the quality of sea waters. It was due to an increase in the annual outflow of rivers and their overbank flows, introduction of more detailed surveys conducted by voivodship inspectorates for environmental protection, directing wastes discharged formerly into the ground to sewage systems and then into waters, etc.

The audit disclosed irregularities in the operations of economic entities and the civil service. For example, not all the plants possessed water law permits required by the law and allowing for the disposal of wastes into waters and operations of treatment installations; voivodes showed inefficiency while collecting fees due for special usage of waters; and voivodship inspectorates for environmental protection failed to collect all fines imposed on grounds of illegal disposal of wastes. Voivodship inspectorates for environmental protection and the Institute of Meteorology and Water Management monitored rivers and the Baltic Sea without following dispositions issued in this regard by the Chief Inspectorate for Environmental Protection, and the Chief Inspector for Environmental Protection together with voivodes failed to exercise effective supervision over these units.

The audit results point to the need for stricter supervision by the Minister of Environment over subordinate services as well as co-operation between ministers and voivodes who implement the provisions of the Helsinki Convention.

Detailed audit findings were presented in the subsequent part of the report drafted for internal use.

Attachment 1

Table 1. Number of cities located in the country part of the Baltic Sea catchment area, equipped with waste water treatment plants and population (thousands people) served by waste water treatment plants.

No.	Cities with/without waste water treatment plants/population served by waste water treatment plants	Number of cities located in the country part of the Baltic Sea catchment area / population (thousands) served by waste water treatment plants in the years:			
		1996	1997	1998	1999
1.	Total number of cities / total population in cities	864/23876.7[1]	870/-	875/23922.8	875/23894.2
2.	Number of cities equipped with waste water treatment plants/ population served by waste water treatment plants	683/15876.8	720/17177.2	745/17984.9	778/18647.3
	a) mechanical[1] or	95/2727.2	74/2284.1	50/2062.7	42/1590.3
	b) biological	514/10929.9	525/11321.0	535/10957.9	537/11250.5
	c) biological with intensive nutrient removal	69/1756.7	115/3097.4	158/4834.9	197/5665.2
3.	Number of cities not equipped with waste water treatment plants/ % of population not served by waste water treatment plants	181/33.6	150/28.2	130/24,8	97/22.0

[1] – data 1995 y., [2] - including mixed mechanical-chemical wwtp

Attachment 2

Table 2. Industrial enterprises equipped with waste water treatment plants and volume of treated industrial waste waters

No.	Industrial enterprises with / without waste water treatment plants	Number of industrial enterprises discharging sewage into surface waters of the country part of the Baltic Sea catchment area / volume of industrial effluent treated (hm^3) in the years:			
		1996	1997	1998	1999
1.	Number of industrial enterprises/that require waste water treatment plants	3344/1781	3281/1727	3028/1735	2822/1640
2.	Number of industrial enterprises equipped with waste water treatment plants / volume of treated industrial waste waters,	1409/1058.4	1421/1054.5	1359/1066.3	1310/995.7
	including:	663.0	680.8	716.9	676.0
	a) mechanically	145,5	141.9	134.3	125.2
	b) chemically	249.9	231.8	203.2	183.5
	c) biologically	-	-	11.8	10.9
	d) biologically with intensive nutrient removal	103.6	102.7	80.1	79.2
3.	Volume of untreated industrial waste waters				

Attachment 3

Table 3. Treatment of municipal and industrial waste waters discharged to surface waters of the country part of the Baltic Sea catchment area

No.	Type of sewage	Volume of waste waters (hm^3/a) discharged to surface waters of the country part of the Baltic Sea catchment area in the years:			
		1996	1997	1998	1999
1.	Purified municipal waste waters,	1751.8	1633.1	1698.3	1718.2
	including those treated:	276.0	216.4	183.3	111.8
	a) mechanically	42.2	41.9	11.9	8.8
	b) chemically	1070.9	1074.4	1064.3	1068.3
	c) biologically	171.3	300.4	438.8	529.3
	d) biologically with intensive nutrient removal				
2.	Industrial waste waters total / requiring treatment,	8323.7/1162.1	8269.0/1157.2	8188.0/1146.3	7902.3/1074.9
	including those treated:	663.0	680.8	716.9	676.0
	a) mechanically	145.5	141.9	134.3	125.2
	b) chemically	249.9	231.8	203.2	183.5
	c) biologically	-	-	11.8	10.9
	d) biologically with intensive nutrient removal				

Attachment 4

Table 4. Load of pollution discharged from land-based sources to the Baltic Sea from the country part of the Baltic Sea catchment area

No.	Pollution indicator	Load of pollution (thousands Mg / a) discharged from land-based sources to the Baltic Sea from the country part of the Baltic Sea catchment area in the years:			
		1996	1997	1998	1999
1.	BOD_5	225.9	281.5	263.2	237.8
2.	Total Nitrogen	242.3	207.7	229.1	245.1
3.	Total Phosphorus	12.4	15.5	14.2	15.0
4.	Mercury	lack of statistical data			
5.	Copper[1]	115.6	134.0	115.6	366.0
6.	Lead[1]	71.6	62.0	37.0	56.0

[1] – load in t/a

Attachment 5

Table 5. Volume of waste waters and load of pollution discharged to waters by the audited entities

No.	Volume of waste waters and pollution indicators	Volume of waste waters (mil m^3/a) and load of pollution (Mg/a) discharged to waters by the audited entities	
		1996	1999
1.	Volume of waste waters	1051.0	892.1
2.	BOD_5	76984.2	52222.5
3.	Total Nitrogen,	19036.9	15111.8
4.	Total Phosphorus	2308.4	2187.0
5.	Heavy metals	127.9	33.7

Attachment 6

Table 6. Volume of waste waters and load of pollution discharged to waters by the audited organisations included in the HELCOM "hot-spot" list

No. and name of the „hot-spot" in the HELCOM list	Volume of waste waters and pollution indicators	Volume of waste waters (thousands m^3/d) and load of pollution (Mg/a) discharged to waters by the audited "hot-spots"	
		1996	1999
Nº 80 Toruń Waste Water Treatment Plant	Volume of waste waters	whithout treatment	54.0
	BOD_5	6676.3	583.7
	Total Nitrogen,	1009.8	102.8
	Total Phosphorus	55.2	14.3
Nº 76 "Gdańsk-Wschód" Waste Water Treatment Plant	Volume of waste waters	101.3	96.9
	BOD_5	3957.3	459.8
	Total Nitrogen,	1701.2	622.5
	Total Phosphorus	111.0	88.4
Nº 100 Łódź Waste Water Treatment Plant	Volume of waste waters	271.0	246.0
	BOD_5	27124.0	5781.0
	Total Nitrogen,	4312.0	2908.0
	Total Phosphorus	667.0	333.0
Nº 77 Świecie Pulp&Paper Mill	Volume of waste waters	100.1	60.1
	BOD_5	5384.8	483.9
	COD	13680.0	483.9
	Suspended Solids	3736.6	732.0
Nº 87 Kraków – Nowa Huta Steel Plant	Volume of waste waters	374.0	259.0
	BOD_5	196.2	29.7
	COD	1067.8	291.8
	Suspended Solids	678.8	214.1
	Heavy metals	8.3	2.4

The National Audit Office of Russia

Report of the Chamber of Accounts of the Russian Federation on the International Parallel Environmental Audit of the Baltic Sea Area (on the Basis of the Helsinki Convention) Prepared for the Session of the EUROSAI Working Group (June 2001, Warsaw)

The audit was performed on the basis of the agreements on cooperation as part of the activities of the Environmental Working Group of the European Organization of Supreme Auditing Institutions (EUROSAI). The purpose of the check-up was to verify compliance with the obligations arising from the Convention on the Protection of the Marine Environment of the Baltic Sea Area.

The check-up was organized as an international parallel audit, i.e. each country of the Baltic region checked the status of the issue within its national borders. In Russia the audit was carried out by the Chamber of Accounts of the Russian Federation in September through December 2000.

Preliminary results of the international audit were presented to the session of the EUROSAI Environmental Working Group and were unanimously approved of.

The audit was performed in the Ministry of Natural Resources of the Russian Federation, the chief federal executive body responsible for compliance with the obligations under the Helsinki Convention, and also in the administrations of St. Petersburg and the Kaliningrad region, where the main facilities to be checked for compliance with the above Convention are concentrated. In respect of the other regions located in the Baltic Sea basin, an analysis was done to check the allocation and use of funds from all the sources of finance earmarked for the protection of the Baltic Sea in accordance with the international obligations.

The audit covered the period between 1996 and 1999.

A special feature of the international audit was that it included not only financial but also legal and environmental issues in accordance with the approaches developed by EUROSAI for this audit. The audit aimed not only to check the legal, financial and environmental aspects of the problem but also to identify real achievements and difficulties in the environmental protection of the Baltic Sea area and to improve the mechanism of implementing the Helsinki Convention.

The results of the audit can provide a basis for making specific decisions on this problem at the national and international levels.

The financial part of the audit covers such issues as completeness and timeliness of the allocation and intended use of federal budgetary funds, analysis of

finance from other sources, including local and foreign, earmarked for rational nature management and environmental protection of the Baltic Sea area.

The audit established that in 1996-1999 the Russian Federation did not examine whether the funds from the federal budget, as well as funds from regional and local budgets, internal funds of industries and foreign funds that were allocated for the environmental protection of the Baltic Sea area under the Helsinki Convention were used according to their purpose.

In Russia the main obstacle to the protection of the marine environment of the Baltic Sea is insufficient financing of nature conservation measures, including construction of nature conservation facilities, without which the requirements of the Convention cannot be met. An acute shortage of finance is typical of all the sources: the federal budget, regional and local budgets and industries' internal funds.

The primary reason for this is the absence of a federal programme for the implementation of the Helsinki Convention.

On a commission from the Russian Government, in 1997 the Ministry of Natural Resources, jointly with other departments concerned, prepared a draft federal programme for improving the ecological situation in the Baltic Sea basin. But the Russian Government has not yet adopted the programme, which fact makes it more difficult for Russia to meet its international obligations under the Helsinki Convention both at the federal and the regional level.

In 1996-1997, the federal budget allocated no funds to the Leningrad region for measures to protect the Baltic Sea. In 1998, the Leningrad region received only 10 million rubles from the federal budget (in the 1998 prices) and in 1999 – 16 million rubles for the overhaul of the sewage system and for planning and surveying works at a number of water conservation facilities located in the region.

In 1996-1999, the federal budget allocated 5.5 million rubles to the Novgorod region for the commissioning of the municipal sewage system as part of the measures for the protection of the Baltic Sea in compliance with the international obligations.

Nineteen out of the 132 major sources of pollution (the so-called "hot spots") are found in the Russian Federation, including 9 spots in St.Petersburg and the Leningrad region and 10 spots in the Kaliningrad region. The use of the federal budgetary funds in St.Petersburg and the Leningrad region was checked in the hot spots located in these regions.

In 1996-1999, the federal budget allocated St.Petersburg 123,5 million rubles' worth of government investment, or 88% of the budgetary allocations in the said period, for the financing of hot spots 18, 19, 20 and 21. During this period 12.1

million rubles, or 45% of the budgetary allocations, were allotted for the financing of hot spot 23 – the industrial hazardous waste deposit “Krasny Bor”.

During the audit an analysis was done to check the allocation and use of funds from other sources of finance for the environmental protection of the Baltic Sea area in St.Petersburg and the Leningrad and Kaliningrad regions. The analysis shows that in 1996-1999 over 80% of the allocations for nature conservation measures in the Baltic Sea area came from the regional and local budgets, the regional environmental funds and industries’ internal funds.

In addition to the mentioned sources of finance for the hot spots located in St.Petersburg and the Leningrad region, loans and grants from international institutions were used. In 1995-1999, St.Petersburg received 10.7 million euros’ worth of foreign investment from international sources by grants for financing its projects. In 2000, borrowed foreign investments amounted to 1.2 billion dollars. A portion of the investments comes through the TASIS programme. But currently this programme mostly finances technical assistance provided by European consultants.

The most critical situation with regard to wastewater treatment is observed in Kaliningrad, where the construction of municipal wastewater treatment facilities, which began in 1976, seems to be interminable. Municipal wastewater is flushed into the Baltic Sea with practically no treatment. In 1996-1999, the federal budgetary financing of the project made just 10.6% of the budgetary apppropriations in this period.

During the check-up of hot spot No. 67 (municipal and industrial wastewater treatment facilities), located in the Kaliningrad region, it was established that in 1996-1999, in addition to the federal budgetary funds, the regional budget spent 12.8 million rubles on the construction of wastewater treatment facilities in Kaliningrad. In future the construction will be financed as part of the project “Reconstruction of the Water Supply and Environmental Protection System in Kaliningrad”, by an EBRD loan, grants from the governments of Sweden and Denmark, and the federal and local budgets. The cost of the project is $56.7 million.

Besides, in order to enhance the region’s ecological safety, the European Commission, through the TASIS programme, gave the Kaliningrad region a grant of 255 thousand écus for the financing of the common coordination plan for the liquidation of accidental oil spills, BALTSPILL. The audit notes that a portion of the funds from international sources for nature conservation measures to be implemented in St.Petersburg and in the Kaliningrad region in compliance with the Helsinki Convention was spent not on environmental investment projects but on projects producing no practical results in this area. This primarily concerns the projects that are financed through the TASIS programme.

The international audit included an analysis of the correspondence of the national and regional laws and other acts of standards to the text of the Helsinki Convention. As shown by the analysis, the nature conservation and natural resources laws of the Russian Federation make it possible to ensure the ecological safety and environmental protection of the Baltic Sea area. But at present Russia does not have special laws on protection of the coastal strip, and the notions and terms used in the Convention do not correspond in full to the terminology of the Russian legislation. The audit has proved that the effective Russian laws on protection of water facilities from pollution are based on compliance with the requirements to the quality of water in reservoirs used for drinking water supply and fish-farming. Based on these requirements, the Russian standards for wastewater discharge are stricter than the standards adopted in accordance with the Helsinki Convention.

The analysis of the ecological condition of the Baltic Sea marine environment and of the territory of its basin has shown that the open part of the Baltic Sea is its least polluted area. In the eastern part of the Gulf of Finland, the greatest concentrations of pollutants in water were observed in 1997-1998, and the Gulf's waters were described as "dirty" and "very dirty".

As per the state records of water use according to Form 2-tp (water utilization), in 1996-1999 wastewater discharge into surface waters in the Baltic Sea basin increased by 12%. In the same period, the amount of polluted wastewater grew by 2%, while the discharge of untreated wastewater increased by 15%. At the same time, in 1996-1999 the capacity of wastewater treatment facilities in the Baltic Sea basin remained at the 1996 level.

The audit has revealed progress in the fulfillment of some recommendations of the Helsinki Baltic Marine Environment Protection Commission (HELCOM) with regard to preservation of biodiversity, prevention of marine pollution from sea and land-based sources, sea monitoring and assessment of the state of marine environment, etc. At the same time, the audit has established that the Russian Ministry of Natural Resources and its local subdivisions in the Kaliningrad and Leningrad regions and in St.Petersburg mostly concentrate on the HELCOM recommendations, while certain requirements of the binding Annexes to the Convention are not fully observed. Article 5 of the Convention, as well as the Russian legislation, prohibits the use of hazardous substances included in the "list of banned substances and pesticides" (Annex 1). But according to the data provided by the Kaliningrad Committee of Natural Resources, about 90 tons of banned pesticides (including those containing mercury) have been accumulated over the last 10 years and are currently stored in the region. In the early 1990s, the most part of previously prohibited reagents was transported to the Krasnodar region for reprocessing. At present the situation is aggravated by the fact that the Kaliningrad region has no plants for reprocessing and burial of hazardous waste and because of the region's

geographical location the waste cannot be transported to other Russian regions that have facilities for its reprocessing or burial.

From the point of view of preserving the biodiversity of both the animal world and the vegetable kingdom and maintaining the climatic and geographical conditions, the national park “Kurshskaya Kosa” is of unique importance for the Kaliningrad region. Owning to these circumstances, the park has been listed in the UNESCO world natural heritage (it is the sixth Russian nature complex that has been included in the world natural heritage list).

Before measures for prevention of pollution from land-based sources (Annex III of the Helsinki Convention, “Criteria and measures concerning the prevention of pollution from land-based sources”) are taken, the quantity and quality of discharges and emissions in the territories adjacent to the Baltic Sea (the Kaliningrad, Leningrad, Novgorod and Pskov regions, Karelia and St.Petersburg) are inspected by 10 specialized analytical inspectorates of state ecological control under the nature conservation committees of these regions.

Regarding some of the HELCOM recommendations, such as Recommendation 6/6 “Limitation of discharges of cadmium from land-based sources”, Recommendation 9/4 “Reduction of emissions of lead from combustion of leaded gasoline”, Recommendation 14/5 “Reduction of diffuse emissions from used batteries containing heavy metals (mercury, cadmium and lead)” and Recommendation 16/6 “Restriction of discharges and emissions from the metal surface treatment”, the administration and nature conservation organizations did not provide any information on their implementation, which actually means that these recommendations are not properly followed. In St. Petersburg these recommendations are not fully implemented either.

The check-up has revealed that the HELCOM recommendations that St.Petersburg and the Leningrad region follow most accurately are those for municipal sewage systems and wastewater treatment facilities.

In St.Petersburg 78% of municipal wastewater undergo mechanical and biological treatment at 19 wastewater treatment plants managed by the state-owned water works “Vodokanal of St.Petersburg” (hereinafter, Vodokanal of St.Petersburg). The recommendations are followed with regard to the content of phosphorus and reduction of the percentage of nitrogen in treated wastewater as compared with its amount in the total wastewater release (50%) but the concentration of total nitrogen still exceeds the recommended level.

The check of compliance with the above-mentioned HELCOM recommendation in the Kaliningrad region has shown that the exiting wastewater biological treatment capacities account for just 5-8% of the region’s requirements. The construction of

off-site facilities for complete biological treatment of wastewater, including wastewater discharged by the pulp and paper mills, in Kaliningrad, Sovetsk and Neman is far from being completed and seems interminable because of an acute shortage of finance.

Another important item of the audit was to determine the impact of the "hot spots" on the environment of the Baltic Sea area in 1996-1999.

Out of 19 priority hot spots located in the Russian Federation and listed in the Baltic Sea Joint Comprehensive Environmental Action Programme, which was adopted to facilitate the implementation of the Helsinki Convention, 10 spots are located in the Kaliningrad region and 9 spots – in St.Petersburg and the Leningrad region.

Vodokanal of St.Petersburg is responsible for solving the ecological problems in 4 hot spots – No.18, 19, 20 and 21. The check-up showed that Vodokanal took concrete measures leading to a substantial improvement in the removal, treatment and quality of discharge of treated municipal and industrial wastewater.

Increased amount of treated wastewater (hot spot 19). Thanks to the commissioning of the 3rd line of the North Aeration Plant and the 14-km-long Petrograd Sewer, the switching of 31 direct discharge outlets to wastewater feed into wastewater treatment plants and reduced water consumption, currently 78% of the wastewater undergo treatment.

Repair of the sewage system (hot spot 18). 1200 km of the St.Petersburg sewage system are in a state of disrepair and another 200 km need immediate repair. The rate of the sewage system's overhaul is 25-30 km per year, and 50% of them are repaired by the underground method.

Development of a water disposal inspection, monitoring and control system (hot spots 18-21). Since 1996 Vodokanal of St.Petersburg has been working to create a water disposal automatic control system. They have already developed a design of a sewage network monitoring system. The first stage of the project has provided the conditions for installing level detectors in the sewage system and modeling operations of the water disposal system.

Modernization of the sewage pumping plants (hot spot 18). Reconstruction of 30 sewage pumping plants has been completed to date. Their modernization has helped enhance water disposal reliability, reduce electricity consumption, automate operations of the plants and reduce the operating personnel.

Removal of nitrogen and phosphorus at the wastewater treatment plants in St.Petersburg (hot spot 21). The existing aeration plants in St.Petersburg treat

wastewater by the traditional biological method, which does not allow for the removal of biogens.

As a result of the reconstruction and expansion of the wastewater treatment plants, introduction of the latest biogenic element removal technology at the wastewater treatment plants, connection of the direct discharge outlets to the city sewer and treatment of wastewater residue, in 1990-1998 the disposal of total phosphorus with the wastewater of St.Petersburg decreased two times. In 1993-1998 the average concentration of total phosphorus in the wastewater released by St.Petersburg was reduced four times; the concentration of total phosphorus in the Neva inlet decreased two times and in the eastern part of the Gulf of Finland – by 20%.

South-West Wastewater Treatment Plant in St.Petersburg (hot spots 19 and 21). One of the main reasons why Vodokanal of St.Petersburg cannot meet the HELCOM requirements is that the construction of the South-West Wastewater Treatment Plant, which started in 1986, has not been completed yet. According to the EBRD experts, the completion of the South-West Wastewater Treatment Plant alone will require some $100-145 million.

Wastewater precipitation utilization (hot spots 19 and 20). At present St.Petersburg is the only Russian city where all residue obtained as a result of wastewater treatment is dewatered mechanically. The Central Aeration Station has put in operation an incinerator plant. The installation of a wastewater residue incinerator plant in the south of the city made it possible to stop storing 278 thousand tons of residue a year and also to reclaim 65% of the residue formed at the city's wastewater treatment plants.

Suburban wastewater treatment (hot spot 20). In order to reduce the amount of polluting substances flushed into the Gulf of Finland by small projects, a feasibility study of extension and reconstruction of the wastewater treatment facilities was conducted in the town of Sestroretsk. The town of Pushkin, jointly with the consultants, put through a comprehensive programme for optimization of the water disposal system, carrying out measures to rationalize water use, repair the sewage system and eliminate leaks and thus removing the need for additional investments in the increment of wastewater treatment capacities. Vodokanal of St.Petersburg is taking gradual action to improve the ecological situation in the region. The reconstruction of the wastewater treatment facilities has reduced the discharge of untreated wastewater by 110 million cubic metres, cut down the discharge of pollutants and made the operation of the wastewater treatment facilities more effective, which is in line with the HELCOM requirements. To achieve this, Vodokanal of St.Petersburg developed a long-term programme for the development of the water sector of St.Petersburg for the period up to 2015. All water disposal measures provided for in the programme are aimed to meet the HELCOM standards.

The long-term programme includes a mid-term programme for the period till 2005. All the priority strategic areas of Vodokanal's activity are in correspondence with the HELCOM requirements and have been recognized by the EBRD experts.

All these measures have increased the water treatment rate in St.Petersburg from 60% in the early 1990s to the current 78%.

Thus, Vodokanal of St.Petersburg implemented HELCOM Recommendation 9/2 concerning phosphorus removal at the wastewater treatment plants in St.Petersburg. On the basis of the data provided by Vodokanal, the RF State Committee for Environmental Protection sent the HELCOM a letter (No. 16-2-11/461 of 29 October 1999) with a request to delist hot spot 21 (removal of phosphorus for wastewater) from Russia's priority hot spots.

At the same time, in St.Petersburg there is a bad situation with regard to waste storage and reprocessing in hot spot 23 (hazardous waste management, reprocessing and removal), whose problems are being tackled by the state-owned industrial hazardous waste deposit "Krasny Bor". The territory allotted to the deposit has been completely used. The technology applied there is obsolete and does not meet the requirements of the effective environmental protection laws. The ecological situation will radically change only when the experimental industrial waste reprocessing and burial plant in the settlement of Krasny Bor in the Leningrad region is put in operation. As shown by the check-up, there is a number of substantial drawbacks that impede the commissioning of the facility according to schedule, which leads to the non-fulfillment of the HELCOM recommendations.

In the majority of the hot spots located in the Kaliningrad region, the situation with regard to the implementation of the Helsinki Convention is unsatisfactory.

This particularly concerns hot spot 67 – municipal and industrial wastewater treatment facilities in the city of Kaliningrad. Their construction began in 1976 and has not been completed yet, though in the 1980s the completeness of the project accounted for 70% of its estimated cost. The city's wastewater is flushed into the Baltic Sea with practically no treatment and is categorized as strongly polluted and exceeding the limits established for all monitored pollutants. In 1999 the sewage pollution of the Primorskaya Bay in the Vistula Lagoon and the low quality of drinking water supplied to Kaliningrad made the State Sanitary and Epidemic Inspection Centre approach the Kaliningrad government, insisting that civil and industrial construction in the city should be restricted until the municipal wastewater treatment facilities have been put in operation.

In hot spot 70 – the Kaliningrad hazardous waste reprocessing plant/hazardous waste deposit (hazardous waste management), the situation is critical. The initial

schedule of its completion set by the Kaliningrad Regional Executive Committee in 1992-1993 is utterly broken. The construction of the plant has not started yet and, moreover, there is even no construction plan, though the Kaliningrad region stores over 6 thousand tons of toxic industrial waste of four classes of hazard in various deposits, store-houses and dumps. Therefore, the construction of an industrial hazardous waste deposit is of paramount importance for the region.

The problems of hot spot 71 (oil spill control), located in the Kaliningrad region, are being tackled by the Federal State Unitary Enterprise "Kaliningrad Oil Terminal". The examination carried out by the St.Petersburg Independent Experts' Agency in 2000 showed that the content of petroleum products in the ground at the oil terminal was 1332 tons. The ground in the area of the fuel ramp, located in immediate proximity to the shoreline of the Pregol river flowing into the Vistula Lagoon, is categorized as strongly polluted with petroleum products. This accumulation of petroleum products in the ground (in form of lenses in some places) has been caused by many years of operation without due regard for ecological requirements and today it is a serious source of petroleum pollution for the Pregol river and the Vistula Lagoon.

The audit established that during the privatization of hot spot 69, Closed Joint Stock Company "Tsepruss", and of other pulp and paper mills in the Kaliningrad region (Sovetsky and Nemansky Pulp and Paper Mills), hot spots 49 and 50, in the early 1990s, the ecological factor was not taken into account and no environmental requirements were observed, though these enterprises are classified as sources of high ecological danger. The mills have no wastewater treatment facilities and discharge large amounts of untreated wastewater.

As shown by the audit, the shortage of finance for environmental measures to meet the Helsinki Convention requirements and the absence of proper supervision and coordination by the Russian Government and the Ministry of Natural Resources impede the implementation of the requirements.

The legal standards provided for in some of the articles of the Helsinki Convention are governed by other international conventions.

The audit included an assessment of the implementation by the Russian Federation of its international obligations arising from Article 11 of Annex V of the Helsinki Convention, which require prevention of marine pollution with banned chemical substances. These requirements have to do with the implementation of the Convention "On Elimination of Chemical Weapons" securing one of the aspects of global environmental safety in this area. After World War II, 12 thousand tons of toxic agents (about 600 thousand units of chemical ammunition and tanks) were sunk in the Baltic Sea. These chemical weapons can become a great danger if the

ammunition or tanks are lifted up by deep-sea trawls of fishing vessels. This conclusion has been corroborated by the conclusion of the HELCOM Task Force.

The provisions of Article 7 “Environmental Impact Assessment” of the Helsinki Convention correspond with the UN ECE Convention on Environmental Impact Assessment in a Transboundary Context. But the Russian Federation has not yet finalized the adoption of the Convention, which fact hinders the implementation of Article 7 of the Helsinki Convention in full measure.

The provisions of Regulations 8-9 of Annex IV “Prevention of Pollution from Ships Including Pleasure Craft” of the Helsinki Convention are connected with the 1973 International Convention for Prevention of Marine Pollution by Dumping from Ships as modified by the Protocol of 1978 (MARPOL 73/78). In recent years, no violations of the Helsinki Convention and MARPOL 73/78 by Russian ships have been revealed.

With a view to eliminating the drawbacks in the implementation by the Russian Federation of its international obligations under the Helsinki Convention as revealed by the audit, formal letters were sent to the Chairman of the Government of the Russian Federation, the Minister of Natural Resources of the Russian Federation, the governor of St.Petersburg and the head of the Kaliningrad regional administration, and a report on the results of the audit was sent to the Security Council of the Russian Federation.

In addition, Sergei Stepashin, Chairman of the Chamber of Accounts of the Russian Federation, sent Russian President Vladimir Putin an information letter with a request to expedite the adoption of the federal programme for improving the ecological situation in the Baltic Sea basin, to augment finance for environmental measures, and also to expedite the ratification of the UN ECE Convention on Environmental Impact Assessment in a Transboundary Context.

The international parallel environmental audit of the Baltic Sea area (on the basis of the Helsinki Convention) is already producing tangible results. The audit has helped to bring the issue to the attention of the Russian President and the Russian Government, federal departments and the regional administrations in the Baltic Sea area and to reveal both progress and shortcomings in the protection of the Baltic marine environment. The audit has made it possible to draw certain conclusions on how to improve the fulfillment by the Russian Federation of its obligations arising from the Helsinki Convention. This is indicated by the replies to the formal letters sent to the departments and organizations concerned.

The National Audit Office of Sweden

Parallel Audits of the Implementation of the Helsinki Convention –

Abstract of Audit Findings from The Swedish National Audit Office

1. Introduction

The Swedish National Audit Office (RRV) presents below its contribution to international audit cooperation on the implementation of the Helsinki Convention.

The RRV's contribution consists of four studies that take up eutrophication and discharges of hazardous substances. These two problems are considered by most experts to be among the most serious environmental problems in the Baltic Sea. The most important conclusions are presented in section 2. Sections 3-6 report the results of each of the four studies.

Section 3 contains an overview of the *eutrophication problem* from the perspective of fulfilment of objectives and the major sources of discharges of nutrients[1]. Section 4 presents the conclusions of an audit of effectiveness and efficiency in the environmental grants programme, which has the aim of reducing discharges of nutrients from Swedish *agriculture*[2]. In section 5 the RRV describes the work done in Sweden to reduce discharges of nitrogen from the municipal *wastewater treatment plants* in the Stockholm area, in line with HELCOM PITF's action programme. Finally, in section 6, we present the conclusions of a study made by the RRV of the possibilities available to Sweden to follow up the objectives for *hazardous substances* in the Baltic Sea.

2. Summary of conclusions

Where eutrophication is concerned, Sweden has not fulfilled the objectives pertaining to the discharge of nutrients, and it will take a long time for the goals to be achieved. The main source of the eutrophication problem is the leakage of nutrients from farming activities. Agriculture is therefore the most important sector today for action to be taken to reduce Sweden's contribution to the eutrophication of the Baltic Sea.

[1] This section is taken from an audit made by the RRV on the possibilities of providing reports on goal fulfilment in the environmental sector. The audit report is entitled *Reports on the Fulfilment of the Environmental Objectives – the Missing Link in Performance Management.* (RRV: 2000:29)

[2] The audit is presented in the report *Environmental Grants in the Agricultural Sector – Reduction of Nitrogen Leakage and Conservation of Biological Diversity.* (RRV:1999:2).

Nitrogen leakage from Swedish agriculture is greatest in the intensive farming areas in the counties of Skåne and Halland in southern Sweden. One important component of the government's measures to reduce the effects of farming activities on the environment are the grants which farmers can receive to introduce environment-friendly farming methods. The RRV's audit of these grants showed that the effects on the environment of these grants are considerably smaller than they would have been if, for example, they had focused more on the counties of Skåne and Halland where there is extensive nitrogen leakage.

In HELCOM PITF's list of major sources of pollution, Sweden has three "hot spots" which consist of discharges from farming areas in southern Sweden. The results of the studies made by the RRV indicate that much remains to be done in Sweden before these hot spots can be removed from the list.

Wastewater treatment plants also discharge nutrients to the Baltic Sea. Sweden has two "hot spots" in respect of wastewater treatment, namely the treatment plants in Stockholm and Gothenburg. However, the survey made by the RRV shows that Sweden has fulfilled requirements to have "hot spot 130" (wastewater treatment in the Stockholm area) removed from HELCOM PITF's list.

Where hazardous substances are concerned, the RRV's study shows that it is difficult to link changes in concentrations of hazardous substances in the Baltic Sea to discharges. This, in turn, means that it is difficult to follow up how successfully Sweden has lived up to its undertakings to reduce discharges of hazardous substances into the Baltic Sea. The follow-up of the objectives is also made difficult by the fact that there is some ambiguity in the formulation of the objectives.

3. Eutrophication

Summary

- The environmental objectives in respect of eutrophication have not been fulfilled and it will take a long time before they are achieved.
- The main source of the eutrophication problem is leakage of nitrogen and phosphorus from agriculture.

Introduction

Eutrophication is one of the greatest threats to biological diversity in Swedish marine environments. The environment in the seas around Sweden has changed in recent decades. Visibility has decreased, as has the proliferation of algae at various depths in the sea. Increasing areas of the seabed are deficient in oxygen. These changes are being caused by greater use of nutrients. The present transport of nutrients to water,

particularly nitrogen and phosphorus, disrupts the natural conditions for the ecosystems and leads to changes in the water environment of lakes, watercourses and seas. Changes have taken place in both the North Sea and the Baltic Sea, both in coastal waters and in the open sea. Large-scale changes have taken place in plant and animal life, both at species and ecosystem levels. Stocks of economically important fish species have been reduced.

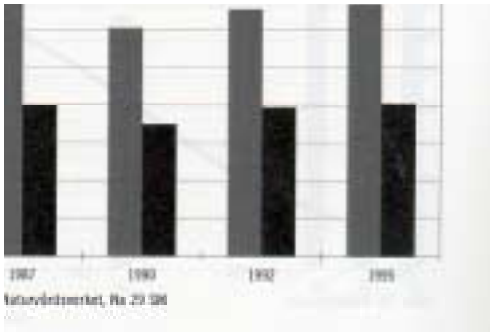
Eutrophication also has negative consequences for the land and can be harmful to human health through toxic algal bloom and nitrogen-polluted ground water. Today the drinking water of some 100,000 people in Sweden has nitrate contents in excess of Swedish health standards.

The objectives have not been achieved

The Swedish national objective is that water-borne discharges of nitrogen from human activity to the sea south of the Åland Sea shall decrease by 40 per cent on 1995 levels. The Helsinki Commission's objective is that discharges of nutrients shall decrease by 50 per cent in the Baltic Sea.

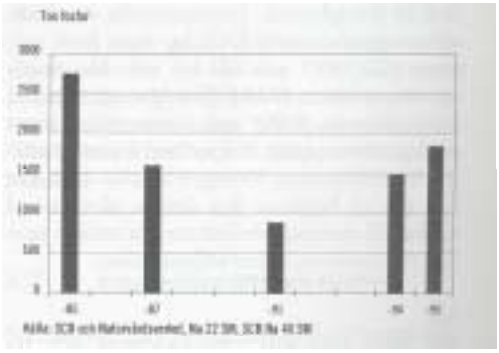
In the 1999 Spring Fiscal Policy Bill, the Government reported trends in the amounts of phosphorus and nitrogen discharged into the seas around Sweden. Diagrams 1 and 2 show trends over time.

Diagram 1 Swedish discharges of nitrogen to the seas (in tons)



The higher bars show the total discharges. The lower bars show the discharges to the sea south of the Åland Sea.

Diagram 2 Swedish discharges of phosphorus in the seas (total discharges in tons)



The Government states that discharges of phosphorus into the sea decreased at the end of the 1980s and the beginning of the 1990s, but that thereafter they started to increase again. Discharges of nitrogen to the seas increased during the first half of the 1990s. The objectives decided on earlier have not been achieved.

It is true that eutrophication has been reduced in comparison with the 1980s but the environmental objectives have not been fulfilled and they are far from being achieved. The objective of a 40 per cent reduction of nitrogen discharges into the Baltic Sea and North Sea from the 1995 level will not be achieved in 2005, or in 2010, in the opinion of the Swedish National Environment Protection Agency.

Greatest problems in the agricultural sector

Eutrophication is caused by discharges of nitrogen or phosphorus compounds which have their origins in many sectors. Agriculture and wastewater treatment are responsible for most of the discharges into water, and road traffic and machines for discharges into the air.

In the opinion of the Swedish National Environment Protection Agency, agriculture is responsible for approximately 49 per cent of the Swedish discharges of nitrogen into the sea. This makes agriculture the largest source of discharges where eutrophication of water is concerned. Agriculture is therefore today the most important sector for action to be taken to reduce eutrophication of water. Nitrogen leakage is greatest in the intensive farming areas in the counties of Skåne and Halland, in the south of Sweden.

The second largest source of discharges of nitrogen into water is wastewater treatment plants, which are responsible for 26 per cent of the discharges.

Discharges of nitrogen compounds into the atmosphere also contribute to the amount of nitrogen in the sea. All in all, air pollution accounts for approximately one-third of

the amounts of nitrogen that reach the Baltic Sea. Road traffic is the largest source of discharges of nitrogen into the air.

The eutrophication problem also has an international dimension. The Baltic Sea currently receives, via streams and rivers, several hundred thousand tons of nitrogen from the land that surrounds it. However, Swedish watercourses account for only a small proportion of these discharges. Instead, most comes from Eastern Europe where populations and the farming areas are considerably larger than in Sweden. Sweden's proportion of total waterborne discharges (human and natural causes) of nitrogen constitutes some 6 per cent of the total discharges into the Baltic Proper (from Åland to Öresund), of which most is due to human activity. Sweden contributes some 50 per cent of the discharges into Kattegatt and some 10 per cent into Skagerrak. However, it is the Swedish discharges that dominate the situation along much of our coast and can cause eutrophication problems in coastal waters where water turnover is low, for example in the archipelagos.

In the assessment of the Swedish National Environment Protection Agency there are good prospects of reducing the discharges of nitrogen from the wastewater sector into the Baltic Sea and the North Sea by 40 per cent by the year 2010, compared with levels in 1995.

According to the Swedish Board of Agriculture's preliminary assessments, a reduction corresponding to that expected to be achieved in the wastewater sector will be achieved by agriculture by 2020 at the earliest. In this case the objective of reducing the total amount of Swedish discharges of waterborne nitrogen into the Baltic Sea and the North Sea by 40 per cent compared to 1995, will not be reached in 2005 or in 2010. In the present situation it is impossible to specify the degree to which discharges of phosphorus can be reduced by 2010.

The measures which have been used hitherto to reduce the leakage of nitrogen and phosphorus from Swedish farming areas have therefore not been adequate.

Measures in the agricultural sector

In the agricultural sector there are measures designed to reduce the eutrophication caused by agriculture, i.e. through plant nutrients and ammonia. Apart from the general regulations relating to consideration of the environment in the environmental legislation, there are also special regulations where agriculture is concerned.

The ordinance on consideration of the environment in agriculture contains special provisions that have the aim of reducing leakage of nutrients into the water and air from farmyard manure and plant cultivation. Supplementary directives are the advisory and information programmes of the Swedish Board of Agriculture and the

agricultural units at the County Administrative Boards that have the aim of reducing plant nutrient leakage.

Agricultural companies can also receive grants for the reduction of nitrogen leakage from agriculture. These grants are an important component in the measures that are intended to deal with the effects of agriculture on the environment (see further in the next section on the RRV's audit of environmental grants).

4. Environmental grants for agriculture – reduction of nitrogen leakage

Summary

- Levels of goal fulfilment and cost efficiency are often low for the environmental grants relating to plant nutrients.
- Most of the grants for reducing nitrogen leakage are channelled to perennial ley farming. The effects on the environment of these grants are considerably smaller than they would have been if the grants had focused more, for example, on the counties of Skåne and Halland where there is extensive nitrogen leakage.

Introduction

Reduction of nitrogen leakage is a central objective of the Swedish agricultural policy. This was the point of departure of an RRV audit of environmental grants to the agricultural sector.

The RRV studied the extent to which the different environmental grants contribute to achieving the environmental objectives for the sector. The study focused on the effects of the environmental grants and possible obstacles to the fulfilment of the environmental objectives for agriculture.

The point of departure of our study was the objective of a reduction of 50 per cent in nitrogen leakage. At the North Sea Conference in 1987 it was decided that discharges of nutrients, including nitrogen, should be reduced by 50 per cent between 1985 and 1995. The objective has not yet been achieved: Sweden's discharges of nitrogen into the North Sea and the Baltic Sea decreased by only 20 per cent between 1985 and 1995.

The transport of nitrogen from arable land to the sea is a complicated process and it is only possible to make *estimates* of the reduction in nitrogen resulting from the environmental grants. We used the simulation model for nitrogen transport which has been developed by Sweden's Meteorological and Hydrological Institute (SMHI) as the basis of our calculations.

Environmental grants for the reduction of nitrogen leakage

Swedish environmental grants for agriculture were introduced in 1995 when Sweden joined the EU, and are co-financed (50 per cent) by the EU. Environmental grants are payable for example for measures designed to reduce nutrient leakage.

Environmental grants for agriculture is the form of agricultural support which has increased most since Sweden's entry into the EU. In 1997 they amounted in total to SEK 1.6 billion, or 24 per cent of the direct support to agriculture. Total grants disbursed in 1997 for the reduction of nitrogen leakage amounted to SEK 422 million, of which SEK 411 million for perennial ley farming.

Other environmental measures which aim to reduce plant nutrient leakage in agriculture are the establishment of extensive grasslands, riparian zones, catch crops and wetlands. Today these grants are directed towards areas with extensive nitrogen leakage, but this is not the case of grants for perennial ley farming. Grants for perennial ley farming, which account for most of the total nitrogen reduction among the environmental grants, can be applied for in all parts of the country.

Special acreage objectives have been established for each of the various types of grants. These state the total area in Sweden that can be covered by the measures.

Conclusions

Our study showed that grants for perennial ley farming tended to function as a form of income support rather than a form of support for the environment since they are not directed specifically to areas with extensive nitrogen leakage. The environmental effects of these grants are at present considerably smaller than they would have been if, for example, they had been directed to the counties of Skåne and Halland, which have extensive nitrogen leakage.

According to our estimates, the measures in their existing form contribute at present to reducing nitrogen leakage in Skåne and Halland by some 7 per cent only. It should be possible to reduce nitrogen leakage in this region by some 40 per cent if the environmental grants were allocated on the basis of the amount of leakage and, at the same time, existing acreage objectives for the establishment of wetlands, catch crops, riparian zones, permanent grasslands and perennial ley farming were also fulfilled.
Skåne and Halland are responsible for 36 per cent of Sweden's nitrogen leakage but only receive 14 per cent of the environmental grants intended to reduce the leakage. Our study showed that the present organisation of the environmental grant system is not cost efficient, mainly since the environmental grants for perennial ley farming have not been directed to areas with extensive nitrogen leakage. It is first and foremost perennial ley farming and the establishment of wetlands which contribute to the total reduction of nitrogen leakage in the present design of the environmental grant system.

Modern farming methods are often the most profitable from the business point of view and lead to extensive nitrogen leakage in intensively farmed areas. Since the environmental grants are mainly a financial policy instrument, it is necessary that the farmers have sound business reasons to apply for the grants. Our study showed that there were few financial incentives for farmers to apply for environmental grants for the reduction of nitrogen leakage. Compared with other forms of support in the agricultural sector, the criteria for the receipt of environmental grants are set at high levels, the rules are complicated and the financial payments are small.

There is a considerable element of interpretation in the extensive regulations governing environmental grants, which leads to an extensive amount of administration. It is therefore sometimes the case that farmers refrain from applying for environmental grants.

5. Hot spot no 130 – wastewater treatment in the Stockholm area

Summary

- Sweden has fulfilled the requirements for the removal of "hot spot 130" - wastewater treatment in the Stockholm area - from HELCOM PITF's list of major sources of pollution.
- There is a system in place to guarantee that stipulated maximum levels of discharges are not exceeded in the future.

Introduction

The RRV provides below an outline description of the work of the Swedish Government and Swedish governmental agencies to reduce discharges of nitrogen from the municipal wastewater treatment plants in the Stockholm area, in accordance with HELCOM PITF's action programme.

Wastewater treatment in the Stockholm area is "hot spot" no. 130 on HELCOM PITF's list of major sources of pollution (see below).

Discharges from wastewater treatment plants are measured using a number of parameters. Below we focus on the parameter for nitrogen since it is the discharge of nitrogen that is the reason why the wastewater treatment plants in question constitute a "hot spot".

The description contains:

- a comparison of the levels of discharges of nitrogen with HELCOM's maximum levels
- a brief description of how the requirements have been implemented, and
- a brief report on the guarantees in place to ensure that the requirements are observed in the future.

Comparison with HELCOM's requirements

HELCOM's recommendation on wastewater treatment (HELCOM recommendation 16/9) of March 15, 1995 has the effect that discharges of total nitrogen from wastewater treatment plants in the Stockholm area, measured as an average annual value, may not exceed 10 mg/l. The recommendation states that the maximum value shall apply from January 1, 1999. The maximum value is the same as that expressed in a binding EU directive (91/271/EEC) on the urban wastewater treatment and an amendment to this directive (98/15/EC).

The "hot spot" in question consists of five wastewater treatment plants in the Stockholm area.

In the municipality of Stockholm there are three treatment plants: Bromma, Henriksdal and Loudden. Henriksdal is the largest and Loudden the smallest. All are owned by Stockholm Water Ltd.

These treatment plants have common conditions in respect of their discharges. The plants discharge their treated wastewater to the recipient at more or less the same point. The content of the discharges that shall be compared with the HELCOM requirements is a flow proportional combined value from the three treatment plants in the municipality. According to the Swedish interpretation, which is recognised by the EU Commission, the EU's directive allows the content of discharges to be measured in this way.

In the southern part of the region there is the Himmerfjärd treatment plant, which is owned by South West Stockholm Region Waterworks Ltd.

On the island of Lidingö there is the Käppala treatment plant, which is owned by the Käppala Association.

The table below shows discharges of total nitrogen from the treatment plants in question. The information can be found in the environmental reports which the treatment plants are obliged to draw up annually (see below). The RRV has obtained the information via direct contacts with representatives of the owners of the treatment plants.

Table 1. Concentration of total nitrogen in treated wastewater (mg/l)

	1999	2000
Bromma	14	14
Henriksdal	7	6.6
Loudden	18	19
Total combined value:	9.5	9.4
Käppala	8	8
Himmerfjärd	3.6	4.1

It is evident from the table that discharges of total nitrogen are under the maximum values. It is true that the discharges from the plants in Bromma and Loudden exceed the maximum value but the total combined value for the three plants is lower than the maximum value. All treatment plants succeeded in achieving the values required in 1999.

The Swedish National Environment Protection Agency has submitted a report to HELCOM on discharges from the wastewater treatment plants in the Stockholm area. In this report the Agency makes the assessment that discharges of total nitrogen in the Stockholm area are at a level that is compatible with HELCOM's recommendation. The question of removing Hot Spot 130 from the list will be taken up at a HELCOM meeting in May 2001.

It can be mentioned that the maximum value of 10mg/l was first specified in EU's amendment of 1998. Sweden had interpreted the content of the original directive to mean that discharges of 15mg/l were permitted for the treatment plants in question. But, with the adjustments made by the plants, they were able to fulfil even the stricter requirements of 10mg/l, specified in the amendment to the directive, without needing to take further action.

How HELCOM's requirements have been implemented

As mentioned above, HELCOM's recommendation 16/9 on wastewater treatment was issued on March 15, 1995. HELCOM's recommendation follows the EU directive (91/271/EEC) on the treatment of wastewater from urban areas and the amendment to this directive (98/15/EC).

In general EU directives are binding on each member state where the results to be achieved are concerned, but the national authorities are permitted to reach their own decisions on the forms and approaches for their implementation of the directives.

The Swedish National Environment Protection's regulations on wastewater treatment (SNFS 1998:7, table 2), which are based on the EU directive, stipulate current maximum values for discharges of total nitrogen from major treatment plants:

If the plant receives wastewater from agglomerations of between 10,000 and 100,000 population equivalent, the discharge of total nitrogen may amount to a concentration not exceeding 15 mg/l, measured as an average annual value. Alternatively the nitrogen load of the incoming wastewater must be reduced by at least 70 per cent. If the plant receives more than 100,000 population equivalent, the discharge of total nitrogen may not exceed 10 mg/l. Alternatively, in this case also, the nitrogen load of incoming wastewater must be reduced by at least 70 per cent. To check that stipulated levels in respect of nitrogen are met, it is also possible to use daily averages if it can be guaranteed that a corresponding level of protection is achieved in this way. In this case the daily average for total nitrogen may not exceed 20 mg/l where the water temperature is 12° C or more during the operation of the biological reactor of the wastewater treatment plant. As a substitute for the condition concerning the temperature, it is possible to apply a limited time of operation, which takes into account the regional climatic conditions.

In other words, the regulation contains two alternative maximum values. In view of the climatic situation and other conditions that prevail in Sweden, this means, in practice, selecting the requirement that the discharge shall amount to a concentration not exceeding 15 mg/l or 10 mg/l depending on the size of the treatment plant. It is considered that the alternative value, i.e. that the nitrogen load of incoming wastewater shall be reduced by at least 70 per cent, is more difficult to achieve.

According to the EU directive and thereby also the HELCOM recommendation, the maximum values in question should be in effect no later than the end of 1998. As stated above, the treatment plants met the requirements in 1999.

Guarantees that HELCOM's requirements are followed

The regulations that supplement EU's wastewater treatment directives are mainly to be found in the environmental legislation, together with ordinances and regulations issued by the Swedish National Environment Protection Agency.

Permits

Under Chapter 9 of the Environmental Code, which regulates permits for activities hazardous to the environment, wastewater treatment plants are obliged to obtain a permit for their operations.

For the wastewater treatment plants in question, individual permits that state authorised levels of discharges are granted by the County Administrative Board. The permits are issued after the different plants have been examined on the basis of applicable legal sources, i.e. in this case the EU's wastewater treatment directives.

The Swedish National Environment Protection Agency's regulations regulate measurement methods and frequencies etc.

Supervision

Supervision has the aim of guaranteeing that the legislation is observed. Regulations on supervision, as well as the controls to be exercised by the wastewater plants themselves, are to be found in the Environmental Code (chapter 26), in the ordinance (1998:900) on supervision, in the ordinance /(1998:901) on controls to be performed by the wastewater treatment plants themselves, and in a number of regulations issued by the Swedish National Environment Protection Agency.

Much of the work of guaranteeing that the provisions of the Environmental Code are followed shall be performed by the wastewater treatment plants themselves through their own controls. Among other things the plants are obliged to have documented routines for regular checks of the condition of equipment etc used for maintenance and control purposes.

The operative supervision of the treatment plants in question is the responsibility of the municipal environmental health committee. However, the County Administrative Board is the supervisory authority for the Käppala plant.

The wastewater plants shall submit an environmental report each year to the supervisory authority. The environmental report shall report the actions taken to fulfil the conditions stipulated in the permit. It may also be prescribed that the report shall contain other information relating to the application and objectives of environmental legislation.

The wastewater plants shall make proposals for control programmes and operational improvements to the supervisory authority, if so requested by this authority.

In certain cases the supervisory authority may prescribe penalties and restrictions. The supervisory authority shall report breaches of regulations to the police or prosecution authorities if a crime is suspected.

The Swedish National Environment Protection Agency coordinates, follows up and evaluates the operative supervision, and provides advice and support to the operative supervisory authorities.

6. Hazardous substances – and the possibilities of following up the environmental objectives

Summary

- It is difficult to link changes in concentrations of hazardous substances in the Baltic Sea to types of discharges where it is possible to determine the nationality of, and the responsibility for, the discharge. This in turn, makes it difficult to follow up the objectives for hazardous substances.
- The follow-up of the objectives is also made difficult by the fact that there is some ambiguity in the formulation of the objectives.

Introduction

The RRV has studied the possibilities available to Sweden to follow up objectives in respect of hazardous substances in the Baltic Sea. The point of departure of the RRV's study is HELCOM's objective to reduce hazardous substances by 50 per cent, as well as other Swedish objectives in respect of discharges.

The study has been made in the form of case studies of seven different substances that can be regarded as being among the most serious sources of environmental problems in the Baltic Sea, and thus particularly important to tackle. The substances selected are: cadmium, mercury, lead, DDT, PCB, the brominated flame retardant PBDE, and dioxins[3].

The effects on the environment caused by hazardous substances are mainly effects on human health and biological diversity. We have therefore selected to use concentrations in living biological organisms as our indicators. This enables us to come as close as possible to a description of the effects of the hazardous substances. The data we have used have been taken from the Swedish national environmental monitoring programme.

Trends in the Baltic Sea

- Concentrations of cadmium are increasing in certain parts of the Baltic Sea. Since the beginning of the 1980s concentrations of cadmium have doubled in the Baltic Proper[4] and the Bothnian Sea.

[3] To obtain information on which to base our selection of hazardous substances for the case studies, we distributed a questionnaire to experts working at different research institutions and government agencies to ascertain which hazardous substances they considered were the most serious threats to the environment in the Baltic Sea.

[4] The Baltic Proper is bounded in the north by the Åland Sea

- Where mercury is concerned, measurements are contradictory. Some measurements show that the concentrations of mercury are increasing, while others show a reduction in concentrations.

- Concentrations of lead are decreasing. Concentrations of lead have been halved in the northern part of the Baltic Proper, the Bothnian Sea and the Bothnian Bay since the beginning of the 1980s.

- Up to the end of the 1980s concentrations of PCB decreased in the Baltic Sea. In the Bothnian Sea and the Bothnian Bay the decrease in concentrations of PCB also continued during the last decade, but this does not appear to have occurred in the Baltic Proper. At the same time changes in the proportions of different types of PCB indicate that a new and less persistent PCB is being discharged once again into the Baltic Sea.

- Concentrations of the flame retardant PBDE are decreasing in the Baltic Sea. However, analyses of breast milk from Swedish women show that concentrations are twenty times higher today than in the beginning of the 1970s.

- Concentrations of DDT have decreased steadily since the beginning of the 1970s.

- Concentrations of dioxins are no longer decreasing. Up to the end of the 1980s concentrations of dioxins decreased to a third of the concentrations measured at the end of the 1960s, but during the last ten years no further reduction in concentrations of dioxins has occurred.

Conclusions based on the trends

The mobility of hazardous substances in nature makes it difficult to draw conclusions about the origins of hazardous substances measured in the sea.

Firstly it is difficult to determine the proportion of the concentrations measured in the Baltic Sea that is a result of human activity and the proportion that is a consequence of natural processes, such as the leaching of cadmium. Secondly it is difficult to determine the proportion of the concentrations resulting from human activity that is due to discharges for which Sweden is directly responsible, and the proportion that is due to discharges from other countries. Finally it is difficult to determine the sources that are responsible for the Swedish discharges, and therefore it is also difficult to determine the actions that should be taken on the part of Sweden, as well as the actions, already taken by Sweden, that have not had their intended effect.

There is also a certain degree of mobility among the animal species used in the measurements, which can lead to difficulties in the interpretation of results. These

difficulties are not unique to measurements of biological organisms. Measurements of sediment and measurements in water are also affected by the mobility of matter.

To sum up, it is difficult to link changes in the concentrations in the Baltic Sea to types of discharges where it is possible to determine the nationality of, and the responsibility for, the discharge.

Conclusions in respect of the objectives

While the measurements provide some information about the load on the environment, the operative objectives refer to discharges. The difficulties in linking measurements of concentrations of hazardous substances in the Baltic Sea to Swedish discharges therefore makes it difficult in turn to follow up objectives for discharges of hazardous substances.

The follow-up of the objectives is also made difficult by the fact that the concepts used in the objectives are not clearly defined. One problem of this type is that the starting point – for example total discharges during the first year – is not made clear. Nor is the type of discharge referred to made clear: flows from chimneys and wastewater pipes only, or other flows from the technosphere, for example leached water from refuse deposits and diffuse flows from products and buildings.

Due to these uncertainties, it is difficult to determine whether Sweden fulfils the objectives in respect of reductions of discharges, with the aid of measurements and calculations of flows.

However, it can be mentioned that extensive efforts to make clear definitions of the environmental objectives are currently being made in Sweden. This is due to the adoption by the Swedish Parliament in 1998 of 15 new environmental objectives, of which one is a non-toxic environment.