DANUBE POLLUTION REDUCTION PROGRAMME

NATIONAL REVIEWS 1998
HUNGARY

TECHNICAL REPORTS

Part C: **Water Quality**

Part D: **Water Environmental Engineering**

Ministry of Environment
Ministry of Transport, Communication and Water Management

in cooperation with the

Programme Coordination Unit
UNDP/GEF Assistance

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Preface

The National Reviews were designed to produce basic data and information for the elaboration of the Pollution Reduction Programme (PRP), the Transboundary Analysis and the revision of the Strategic Action Plan of the International Commission for the Protection of the Danube River (ICPDR). Particular attention was also given to collect data and information for specific purposes concerning the development of the Danube Water Quality Model, the identification and evaluation of hot spots, the analysis of social and economic factors, the preparation of an investment portfolio and the development of financing mechanisms for the implementation of the ICPDR Action Plan.

For the elaboration of the National Reviews, a team of national experts was recruited in each of the participating countries for a period of one to four months covering the following positions:

- Socio-economist with knowledge in population studies,
- Financial expert (preferably from the Ministry of Finance),
- Water Quality Data expert/information specialist,
- Water Engineering expert with knowledge in project development.

Each of the experts had to organize his or her work under the supervision of the respective Country Programme Coordinator and with the guidance of a team of International Consultants. The tasks were laid out in specific Terms of Reference.

At a Regional Workshop in Budapest from 27 to 29 January 1998, the national teams and the group of international consultants discussed in detail the methodological approach and the content of the National Reviews to assure coherence of results. Practical work at the national level started in March/April 1998 and results were submitted between May and October 1998. After revision by the international expert team, the different reports have been finalized and are now presented in the following volumes:

Volume 1:	Summary Report		
Volume 2:	Project Files		
Volume 3 and 4:	Technical reports containing:		
	-	Part A:	Social and Economic Analysis
	-	Part B:	Financing Mechanisms
	-	Part C:	Water Quality
	-	Part D:	Water Environmental Engineering

In the frame of national planning activities of the Pollution Reduction Programme, the results of the National Reviews provided adequate documentation for the conducting of National Planning Workshops and actually constitute a base of information for the national planning and decision making process.

Further, the basic data, as collected and analyzed in the frame of the National Reviews, will be compiled and integrated into the ICPDR Information System, which should be operational by the end of 1999. This will improve the ability to further update and access National Review data which is expected to be collected periodically by the participating countries, thereby constituting a consistently updated planning and decision making tool for the ICPDR.

UNDP/GEF provided technical and financial support to elaborate the National Reviews. Governments of participating Countries in the Danube River Basin have actively participated with professional expertise, compiling and analyzing essential data and information, and by providing financial contributions to reach the achieved results.

The National Review Reports were prepared under the guidance of the UNDP/GEF team of experts and consultants of the Danube Programme Coordination Unit (DPCU) in Vienna, Austria. The conceptual preparation and organization of activities was carried out by **Mr. Joachim Bendow**, UNDP/GEF Project Manager, and special tasks were assigned to the following staff members:

- Social and Economic Analysis and Financing Mechanisms: **Reinhard Wanninger**, Consultant
- Water Quality Data: **Donald Graybill**, Consultant,
- Water Engineering and Project Files: **Rolf Niemeyer**, Consultant
- Coordination and follow up: **Andy Garner**, UNDP/GEF Environmental Specialist

The **Hungarian National Review** was prepared under the supervision of the Country Programme Coordinator, **Ms. Maria Galambos**. The authors of the respective parts of the report are:

- Part A: Social and Economic Analysis: **Mr. Judit Rakosi**
- Part B: Financing Mechanisms: **Ms. Klara Toth**
- Part C: Water Quality: **Mr. Gyorgy Pinter**
- Part D: Water Environmental Engineering: **Mr. Sandor Kisgyorgy**

The findings, interpretation and conclusions expressed in this publication are entirely those of the authors and should not be attributed in any manner to the UNDP/GEF and its affiliated organizations.

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Part C

Water Quality

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Quantitative abbreviations

kg/a	kilogram per year
kt/a	thousand kilogram per year
KÖQ	mean water discharge (arithmetical mean of daily discharges occurring within a given period)
KQ	low-water discharge (the lowest discharge within a given period)
NQ	high-water discharge (the highest discharge within a given period)
m^3/s	cubic meters per second
m^3/d	cubic meters per day
T/a	tons per year
Tm^3/a	thousand cubic meters per year

Qualitative abbreviations

BOD	Biochemical Oxygen Demand
COD_{cr}	Chemical Oxygen Demand (chromate)
COD_p	Chemical Oxygen Demand (permanganate)
MBAS	Methileneblue Anionactive Surfactants (ANA Detergents)
N	Nitrogen (generally Total Nitrogen in the Tables of the report)
NH_4^+	Ammonium ions
NH_4^+ - N	Ammonium nitrogen
NO_3	Nitrate ions
NO_3 - N	Nitrate nitrogen
PAH	Polycyclic Aromatic Hydrocarbons
PCB	PolyChlorinated Biphenyls
PO_4^{3-}	Orthophosphate ion
PO_4^{3-} - P	Orthophosphate phosphorus
O&G	Oil and grease
P	Phosphorus (generally Total Phosphorus in the Tables of the report)
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids

Other abbreviations

Biol.	Biological
Biol+N-P	Biological treatment with nutrient removal
Inhab.	Inhabitants
Irr.	Irrigation
M Ft	Million Hungarian Forint
Mech.	Mechanical
Recr.	Recreation
Sew%	Rate of population supplied by public sewer system
Sludge tr.	Sludge treatment
TPE	Thousand Population Equivalent
Ww	Wastewater
Wwtp	Wastewater treatment plant

1. Summary

The Part C: Water Quality report consists of two volumes, the Volume I presents the material of the updated National Review of Hungary and the Volume II (Annex 10) contains the basic water quality data of selected monitoring station for further basin-wide studies, covering the period between the years 1994 and 1997.

1.1. Updating, Evaluation and Ranking of Hot Spots

The evaluation and ranking of hot spots in the Hungarian part of the Danube basin was carried out on the basis of the general approach and methodology that was debated and mostly accepted by the water quality working group during the January 1998 National Reviews Workshop. The most important wastewater dischargers were evaluated on the basis of detailed analysis and the assessment of priority ranking was made into three priority groups, such as high, medium or low priority. The given high priority ranking indicates that the source of emission has outstanding importance in Hungary, its impact on the recipient river could be transboundary and it is advised to be considered as a significant factor on basin-wide level.

There are five significant towns in Hungary, which were considered as high priority municipal hot spots, and three of them are situated directly along the river Danube:

- BUDAPEST, the capital of the country,
- GYŐR, the center of Győr-Moson-Sopron County, and
- DUNAÚJVÁROS, the center of Fejér County.

Two other high priority municipal hot spots are located directly along the river Tisza:

- SZOLNOK, the center of Jász-Nagykun-Szolnok County, and
- SZEGED, the center of Csongrád County.

Each of these towns was listed as “hot spots” in the Strategic Action Plan as important wastewater dischargers needing urgent pollution control investments.

There are two Hungarian industrial units in the hot spot list of the Strategic Action Plan: the Oil Refinery in Százhalombatta, where the upgrade of the wastewater treatment facilities was considered, and the Tannery in Pécs, where improvement of sludge treatment and waste disposal is needed. The analysis on the industrial polluting sources however resulted in two additional significant industrial units in the sector of chemical industry, which are advised to be considered in the regional pollution reduction studies as new high priority hot spots (the Nitrokémia Rt. in Balatonfűzfő and the BorsodChem Rt. in Kazincbarcika), while the Tannery in Pécs has got lower priority ranking.

Details on wastewater treatment, emission, pollution impact and transboundary implications of the hot spots are summarized in the relevant Tables of the report. Altogether 38 municipal and 27 industrial dischargers were evaluated and ranked into priority groups. Data on agricultural point source wastewater dischargers were available only for 9 units, all of them belonging to the low priority group.

Nation wide database on agricultural non-point source pollution is not available in Hungary at present. Different research studies were carried out during the last decade on small size catchment areas of creeks to assess the magnitude of nutrient loads originated from agricultural land runoff (e.g.: tributaries of Lake Balaton, etc.). Nation-wide agricultural nutrient load assessments were carried out recently by two projects of the Applied Research Programme of the Environmental Programme of the Danube River basin. Main findings of these projects are presented.

1.2. Updating, Analysis and Validation of Water Quality Data

The existing hydrological surface water observation network to monitor the quantitative characteristics of the river system in Hungary consists of 2700 stations, of which 370 are considered to be basic stations. Network diagrams of the river system illustrate the location and types of observation stations. Special attention is given on stations at the border section of rivers entering the country. Source and availability of hydrological observation data (stage/flow), river characteristics, etc. are indicated.

Characteristics of the regular water quality monitoring network running under the requirements of the MSZ 12749 Hungarian Standard are discussed in details, concerning sampling sites, frequency, determinants, data management and classification system. Available data on accidental water pollution incidents are presented. Short information is given on the Danube Accident Emergency Warning System and its Hungarian National Center the PIAC-05.

Data quality control and quality assurance is introduced both for the analytical field and water quality data area. Laboratories working in the field of water pollution control are participating in the intercalibration programme working with quarterly distributed control samples. The most important laboratories are participating also the international Qualco Danube intercalibration and quality assurance programme.

The consistency and comparability of the water quality database is good due to the continuous checking and improvement activities. The length of water quality records, which can be considered homogenous is more than 25 years. Orthophosphate and mineral oil are the exceptions among the traditional components. In respect to the new water quality indices, which were included in the routine analysis since 1994, the accuracy of organic micropollutant data remains questionable due to the low frequency of the analysis. There is no simultaneous flow measurement in the time of sampling, only a reading of the nearest water level gauge is made. Discharge data are obtained from the so-called Q-H rating curves (the relationship between water stage and flow). Systematic correction of discharge data, in close cooperation with hydrologists, started in 1994 and is being currently made.

Flood and excess water control is briefly discussed as well as the conditions of the most important wetlands, and the corresponding water quality problems. Summary on important dams, impoundments and reservoirs are given, and known major water transfers are listed. Information on the source of sediment movements and recent studies on bottom sediment quality of rivers are given in the report.

For the purpose of transboundary diagnostic analysis and basin-wide water quality simulation studies 18 preferred water quality monitoring stations are advised, containing the most important regular water quality monitoring stations at the border sections of rivers entering the country. This list includes all the stations, which are selected monitoring stations for the Trans-National Monitoring Network of the Environmental Programme for the Danube River Basin and also those stations which participate in the Bucharest Declaration Monitoring Programme.

Basic water quality data of the period 1994-1997 are provided for further basin-wide studies. Comments on use and understanding of the elements of this database are given. For better understanding the changes of water quality of these stations, statistics of the recent 10 years period are enclosed in Annex 10, which contains the water quality data series of the 1994-1997 period.

2. Updating of Hot Spots

During the recent years intensive studies and planning activities were carried out in Hungary in the field of decreasing the water pollution impacts of polluting sources to improve available background information for pollution reduction programs. Investment programs to develop the wastewater treatment of several important polluting sources have been started. These activities were supported and accelerated by the National Environment Protection Program **[1.]**, entered into force by the Hungarian Parliament on September 1997, and also by the National Master Plan for Wastewater Treatment dealing with the development of sewerage and wastewater treatment of municipalities (towns and villages) in Hungary.

The above mentioned pollution reduction efforts were also promoted by international contributions. Under the activities of the Environmental Programme for the Danube River Basin (EPDRB) the National Review **[2.]** of the country was prepared by the substantial support of the Ministry for Environment and Regional Policy. This National Review was completed by the end of 1993 and gave a detailed overview on the state of the environment, polluting sources, water uses, nature conservation and institutional background in Hungary. Another essential development was the elaboration of the Strategic Action Plan (SAP) for the Danube River Basin **[3.]** with the cooperation of the Danube countries.

The Strategic Action Plan among others concentrated on the “hot spots” (significant polluting sources) of the Danube countries, which represent a potential, or actual danger on the quality of the environment, especially on the aquatic environment. The selections of these hot spots however have not been carried out on the basis of similar considerations. As a consequence of this fact, there are significant differences in the importance of the hot spots on the list of from point of view of basin-wide significance of emission impacts.

The list of hot spots submitted to the SAP by the Hungarian authorities also need certain supervision and revision due to two main reasons:

- Significant changes occurred during the recent period in the national economy in Hungary resulting changes also in the emissions especially in the industrial and agricultural sector;
- The use of harmonized evaluation methods in the analysis and ranking of hot spots all over the Danube River basin is applied, which was agreed during the January 1998 National Planning Workshop.

The analysis of the existing point sources of polluters (potential hot spots) faced deficiencies in areas where the available database was not sufficient to consider all the necessary factors for evaluation and ranking as hot spots. Assumptions based on practical knowledge and experience were made in such cases to provide full picture on the investigated emissions. The sector where inadequate data was found in most of the cases was the agriculture. Due to the privatization process during the recent years significant changes occurred and the available existing data sources could not follow them.

2.1. General Approach and Methodology

The evaluation and ranking of hot spots in the Hungarian part of the Danube basin were carried out on the basis of the general approach and methodology that was debated and mostly accepted by the water quality working group during the January 1998 National Planning Workshop.

For the purpose of the present study, those wastewater discharges are considered first of all as “hot spots”, which have the following disadvantageous impacts on the recipient water bodies:

- The emission cause water quality deterioration downstream from the discharge section to such an extent, which endanger the operation of the nearby water users;
- The emission may cause transboundary pollution effect;
- In case of accidental failure in the technological operation major river pollution incident could occur with transboundary impact.

Starting point of the evaluation is the existing hot spot list of the Strategic Action Plan, which consisted of 16 municipal, two industrial wastewater polluting sources and one wetland rehabilitation problem in Hungary **[3.]**, as follows:

Table 2.1. Hungarian hot spots of the Strategic Action Plan

No.	Site of polluting source	Recipient	Sector	SAP proposal for development of wastewater treatment
1.	Békéscsaba	Körös	Municipal	Upgrade: sludge treatm.
2.	Budapest	Danube	Municipal	Upgrade: +220 000 m^3/d biol. New: +375 000 m^3/d biol.
3.	Debrecen	Körös	Municipal	Enlarge: +40 000 m^3/d biol.
4.	Dunaújváros	Danube	Municipal	New: +30 000 m^3/d biol.
5.	Eger	Eger Creek	Municipal	Enlarge: +4 000 m^3/d+sludge tr.
6.	Gyõr	Rába	Municipal	Enlarge: II. phase biol. + sludge tr.
7.	Kaposvár	Kapos	Municipal	Enlarge: +5 000 m^3/d biol.
8.	Miskolc	Sajó	Municipal	Enlarge: +75 000 m^3/d bioltr.
9.	Nagykanizsa	Dráva	Municipal	Upgrade: sludge treatment
10.	Nyíregyháza	Tisza	Municipal	Upgrade: intensification
11.	Sopron	Rába	Municipal	Enlarge: +7 500 m^3/d+sludge tr.
12.	Szeged	Tisza	Municipal	New: 60 000 m^3/d mech. tr.
13.	Székesfehérvár	Séd-Nádor	Municipal	Enlarge: +7 500 m^3/d+sludge tr.
14.	Százhalombatta	Danube	Industrial	Oil refinery: upgrade
15.	Szolnok	Tisza	Municipal	New:50 000 m^3/d mech+ 30 000 m^3/d biol.+sludge
16.	Veszprém	Séd	Municipal	Enlarge:+13000m^3/d biol.+sludge
17.	Pécs	Drava	Industrial	Tannery: waste disposal, sludge
18.	Kis Balaton	Balaton	Wetland	Reconstruction
19.	Zalaegerszeg	Zala	Municipal	Enlarge: +8 000 m^3/d+sludge tr.

There are three main objectives of the analysis on those hot spots, which represent significant loads through their discharges into the recipient surface water bodies, as follows:

- to improve the descriptions of existing hot spots to facilitate their comparison and technical and economic evaluation;
- to clarify if major changes or discoveries may have occurred which eliminate the justification for some of the hot spots to be on the list;
- to determine if major changes or discoveries may have occurred which justify the addition of new hot spots to the list.

The quality of surface water is regularly monitored in Hungary, according to the requirements of the Hungarian Standard MSZ 12749 **[4.]**. The District Environmental Protection Inspectorates are responsible for this activity and the operational areas and headquarters of the 12 Inspectorates are illustrated in Figure 2.1. Classification of the quality of the river system are carried out and disseminated annually. The results of these activities are discussed later in chapter 3 of this report. The latest available water quality map of Hungary (Figure 4.5.) of the year 1996 clearly shows those problem areas with considerable water quality deterioration, where the river system gets high pollutant loads from the existing significant municipal or industrial polluting sources **[5]**. There are 16 of these quality problem areas, illustrated also in Figure 2.1., and there are also five rivers entering into the country from abroad with considerable pollution load. These rivers are Sajó, Kraszna, Szamos, Berettyó and Maros. Important polluting sources are located within these water quality problem areas, especially where there are small size river courses as recipients getting significant amount of pollutants in the wastewater discharge. For example this is the situation in case of the following areas:

Area No.4.:	Creek Ikva	-	Sopron town;
Area No.5.:	Séd-Nádor System	-	Székesfehérvár and Veszprém towns, NIKE Industrial plant.
Area No.8:	River Kapos	-	Kaposvár town;
Area No.9:	Creek Pécsi Víz	-	Pécs town;
Area No.14:	Creek Eger	-	Eger town;
Area No.16:	Creek Kösely	-	Debrecen town

Significant industrial units are operating in most of the above listed towns and the public sewer systems are loaded by more or less pre-treated industrial wastewaters.

Specific measures are applied for accomplishing the improvement of the previous list of hot spots in Hungary. The most important wastewater discharges (hot spots) are studied in three groups. The first group consists of municipal hot spots (including important towns in Hungary, size of which are above 50 000 population equivalents). The second group is the industrial hot spots. The third group contains the known agricultural polluting sources. Characteristic data on municipal and industrial emissions presented in this report were harmonized with the EMIS activities and related data inputs.

The evaluation of the most important wastewater dischargers from point of view of their significance, pollution impacts and priority ranking was carried out considering the following main features:

- Critical emissions discharged into the recipient water body;
- Seasonal variations in the emission or in the river's water regime;
- Immediate cause of emissions;
- Root causes of water quality problems which create the pollution case;
- Condition of the receiving waters;
- Vulnerability of downstream water uses;
- Transboundary implications.

As a result of the evaluation concerning the above main features of the most important wastewater dischargers, assessment on priority ranking was made into three priority groups, such as high, medium or low priority.

The priority rankings were developed on the basis of detailed analysis, and the given rankings have the following special general meanings for the Danube River Basin Pollution Reduction Programme:

- **High priority** indicates that the source of emission has outstanding importance in Hungary, its impact on the recipient river could be transboundary and it could be a significant factor on basin-wide level;
- **Medium priority** indicates that the source of emission is an important wastewater discharger on national level, needs immediate investments to develop its pollution control facilities because of the significant pollution impact on the recipient water body. Most of the cases there are ongoing investments in this respect.
- **Low priority** means, that the source of emission also needs investments in the field of wastewater treatment in the close future because its national importance, but the necessary investments are scheduled not earlier then 1999/2000.

The important issue implied by the above priority groups is that only the polluting sources having "high priority" are proposed to be considered in the basin-wide studies of the Danube River Basin Pollution Reduction Programme.

Basic information for the analysis of the wastewater dischargers came from different sources of which the most important sources were as follows:

- the Master Plan for Sewerage and Wastewater Treatment of Municipalities in Hungary **[6.]** prepared under the guidance of the Ministry of KHVM (Ministry for Transport, Communication and Water Management) in 1996;
- National Environmental Program **[1.]** developed by the Ministry of KTM (Ministry for Environment and Regional Policy) approved by the Hungarian Parliament in 1997;
- the data sheets on wastewater dischargers of the District Environmental Protection Inspectorates provided for the KTM in 1998 **[7.]**;
- data on the characteristics of important emissions into recipient waters, developed by a special Emission Working Group of the Ministry of KTM, as a Hungarian contribution to the EMIS Sub-Group **[8.]**;
- direct information from different district and central Authorities and Institutions dealing with water quality and pollution control affairs;
- related data from the Annual Statistical Yearbook (1997) of the Hungarian Central Statistical Office in Budapest **[9.]**.

The studies carried out on developing the priorities of important polluting sources also took into consideration the methods and results of the EBRD-EPDRP project entitled "Environmental Project Financing and Investment Action Programme for Hungary" **[10.]**.

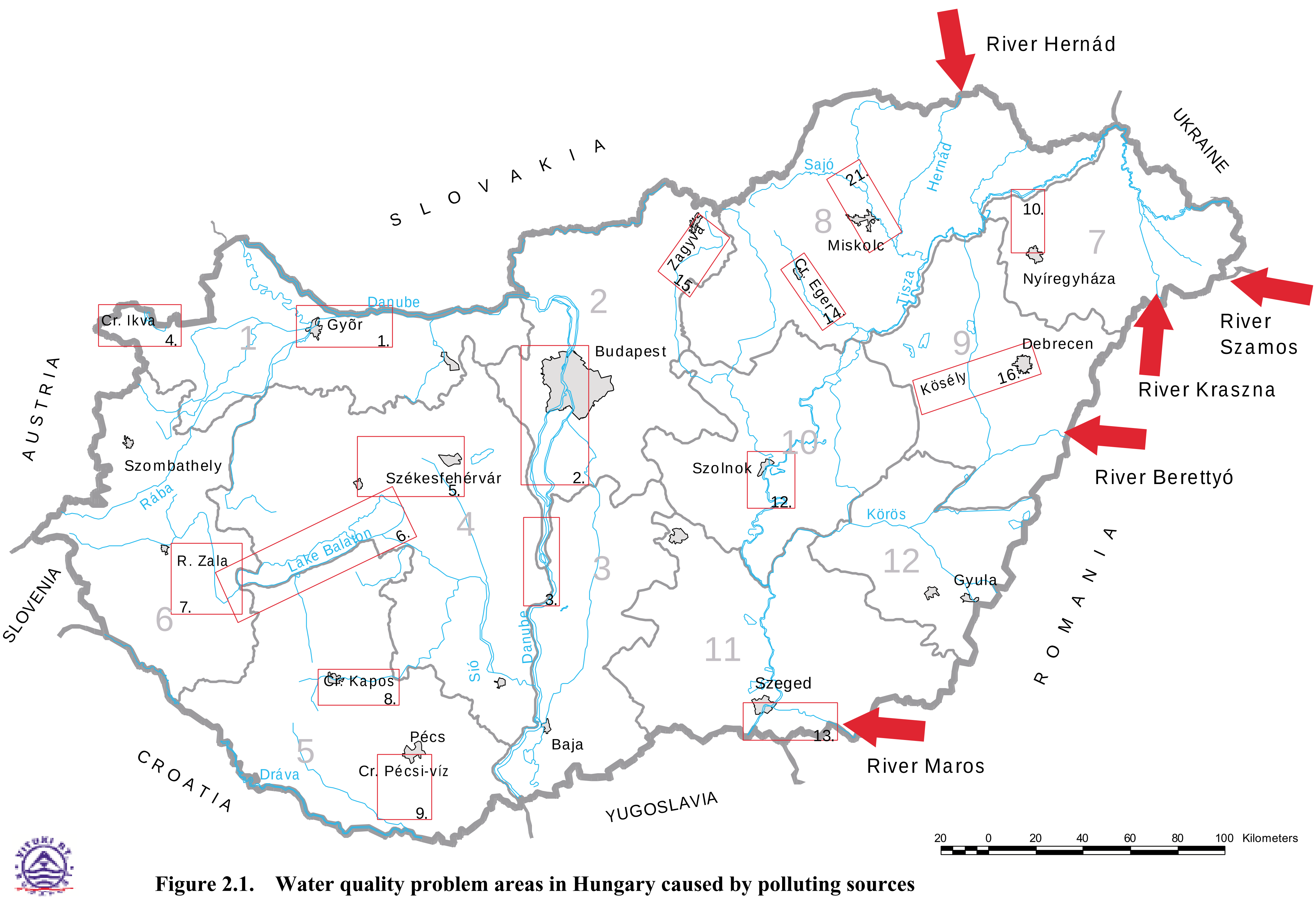


Figure 2.1. Water quality problem areas in Hungary caused by polluting sources

2.2. Municipal Hot Spots

The existing situation of the sewerage, wastewater treatment and impacts on the recipient waters were evaluated. The evaluation covered all the significant towns in Hungary having wastewater load greater than 50 thousand population equivalents. The analysis ended up with a priority ranking considering the main features of evaluation standpoints discussed above in chapter 2.1.

Municipal polluting sources getting “high priority” ranking are advised to consider them as “hot spots” for the Danube River Basin Pollution Reduction Programme. Summarizing information sheets are provided on these hot spots containing the basic data on which the priority ranking was elaborated.

2.2.1. High priority

There are five significant towns in Hungary, which were considered as high priority municipal hot spots from point of view of the Danube Pollution Reduction Programme. Three of these municipalities are situated directly along the river Danube:

- BUDAPEST, the capital of the country,
- GYŐR, the center of Győr-Moson-Sopron County, and
- DUNAÚJVÁROS, the center of Fejér County.

Two other high priority municipal hot spots are located directly along the river Tisza:

- SZOLNOK, the center of Jász-Nagykun-Szolnok County, and
- SZEGED, the center of Csongrád County.

Each of these towns were listed as “hot spots” in the Strategic Action Plan as important wastewater dischargers needing urgent pollution control investments (Table 2.1.)

General information on the main characteristics of the size, the percentage of population supplied with public sewer system (column 5), the quantity of wastewater discharged and also the applied wastewater treatment technology in these settlements are summarized in Table 2.2.

Budapest is outstandingly the biggest point-source wastewater discharge into Danube along the whole Hungarian stretch of the river. Nearly 20 percentage of the population of the country lives here and it is also one of the important industrial centers of the country. The combined sewer system of the Capital gets significant industrial wastewater load with more or less efficient pretreatment. The sewer system has several direct outlets into the river without the necessary treatment. The existing two biological wastewater treatment plants can manage only about 16 percentage of the total dry weather wastewater flow, the remainder is pumped into the river practically without treatment (using only screens and sand traps). The main pollution impact of the Capital on the quality of the river is the high microbiological pollution. Due to the big dilution effect of the river generally no notable change of the most important quality chemical parameters can be observed at the next regular downstream sampling site at Dunaföldvár (rkm 1560.6).

Győr is the most important town in the North-Transdanubian part of the country along the common Hungarian-Slovakian stretch of the river Danube. The town has large industrial sites of national importance. The municipal wastewater treatment plant is under reconstruction and enlargement, the emission discharged from the plant into the recipient river however represents a significant pollution impact from point of view of microbiological quality parameters.

Dunaújváros is a significant town and industrial center of the Middle-Danube area. The sewer system of the municipality provides a nearly full supply for the population but the treatment of the collected wastewater gets only a very poor mechanical treatment. The river flow in this section provides a high dilution effect on the emission discharged into Danube, thus only the microbiological pollution impact is considerable in this respect.

Szolnok is located in the middle of the Hungarian catchment area of the river Tisza. It is an important municipal and industrial center of this area. The existing sewer system of the town serves nearly all of the population, practically there is no wastewater treatment. The wastewater is pumped into the river only after the applied raw mechanical screening. In spite of the considerable dilution effect of the river, there is a one-class quality deterioration downstream from the effluent.

Szeged is the biggest Hungarian town in the lower part of Tisza catchment in Hungary, located near to the south national border. As the center of Csongrád County and the third biggest city in the country (except the Capital), it is a significant administrative and economic power in this region, with considerable industrial production. There is no wastewater treatment plant to treat the sewage collected by the public sewer system. Though there is a considerable dilution effect of the river on the quantity of the direct emission discharge, this is the only effective transboundary pollution impact on the rivers leaving the territory of Hungary.

Table 2.2. High priority municipal hot spots in Hungary

No.	Municipality	Area Code No.	Population		Main recipient	Ww Discharge m3/d	Ww. treatment Technology, Capacity:m3/d
			1000 inhab.	Sew. %			
1	2	3	4	5	6	7	8
1	Gyõr	1	127	88	Danube	37 300	Biol: 80 000
2	Budapest: North	2	1 886	90	Danube	60 000	Biol: 82 000
	South					70 000	Biol: 72 000
	Untreated					700 000	None
3	Dunaújváros	4	57	96	Danube	6 200	Mech: 12 700
4	Szolnok	10	78	96	Tisza	13 700	None
5	Szeged	11	166	67	Tisza	34 700	None

The wastewater loads (emissions) of the above five high priority municipal hot spots are summarized in Table 2.3. This table contains the estimated population equivalent values of the raw wastewater and the total load discharged into the recipient waters, concerning the quality parameters of BOD, COD, total N and total P. Data contained in this table are mostly the same, which were provided for Emission Sub-Group by the Ministry of KTM **[8.]**, while the data with (*) sign were provided by the local Environmental Protection Inspectorate, and data with (**) sign are estimations because the lack of available data.

Table 2.3. Wastewater load of the high priority municipal hot spots

No	Municipality	Main Recipient	Raw water Load in TPE (thousand)	Wastewater Discharge (Tm3/a)	Total load discharged into Recipient waters (T/a)			
					BOD	COD	N	P
1	2	3	4	5	6	7	8	9
1	Gyõr	Danube	212	16 597	2 300	4 600	423	63
2	Budapest: North	Danube	286	20 867		1 020	524	103
	South		295	21526		1 500	715	50
	Untreated		2 255	174 607		69 299	3 490	
3	Dunaújváros	Danube	**88	**4380	**680	**1700	**160	**25
4	Szolnok	Tisza	101	*5004	*785	*1935	*186	*30
5	Szeged	Tisza	**186	**14500	**2200	**5130	**540	**90

The main issues and facts considered during the priority ranking analysis are summarized in separate Tables for each of the above five high priority municipal hot spots at the end of this chapter (Tables 2.14/18).

2.2.2. Medium Priority

The municipal polluting sources of medium priority have outstanding national importance, because most of them are located near a relatively small recipient watercourse, or stream. This unfavorable situation usually generates local water quality problems, due to the generally small flow of the recipient and the high emission load of the wastewater discharge. The most important sensitive areas where these municipal emissions causes water quality deteriorations are illustrated in Figure 2.1. National efforts are already made to improve this situation and in most of the cases investments are running, or are planned to start for the enlarging or upgrading the wastewater treatment facilities in these towns. The municipal wastewater dischargers being ranked into the medium priority group are listed in Table 2.4. These municipal dischargers are advised to be considered on national level and they are not recommended as single "hot spot" for basin-wide studies. The wastewater load of selected medium priority municipal dischargers is listed in Table 2.5.

Table 2.4. Medium priority municipal hot spots in Hungary

No.	Municipality	Area Code No.	Population		Main recipient	Ww Discharge m3/d	Applied Ww. treatment Technology
			1000 inhab.	Sew. %			
1	2	3	4	5	6	7	8
1	Sopron	1	54	88	Ikva Creek	18 100	Biol: 15 000
2	Tatabánya	1	72	87	Általér Creek	33 900	Biol+N-P.
3	Veszprém	4	64	75	Veszprémi Séd	18 900	Biol: 17 200
4	Székesfehérvár	4	107	83	Gaja Creek	23 700	Biol: 40 000
5	Kaposvár	5	68	74	Kapos Creek	19 800	Biol: 40 000
6	Szombathely	6	83	90	Sorok-Perint	22 500	Biol
7	Zalaegerszeg	6	62	87	River Zala	16 200	B+N-P: 20 000
8	Keszthely	6	21	88	Lake Balaton	12 800	B+N-P:
9	Balaton Region	6	✶	✶	✶	✶	Biol.
10	Nagykanizsa	6	53	73	Cigény Ch.	12 000	Mech: 25 000
11	Pécs	5	161	90	Pécsi-Víz Cr.	46 600	Biol.
12	Nyíregyháza I.	7	114	73	No.VIII. Canal	17 000	Biol: 30 000
					No.IX. Canal	10 300	Mech: 10 300
13	Miskolc	8	178	93	Sajó	64 500	Biol: 70 000
14	Eger	8	59	83	Eger Creek	18 500	Biol: 22 000
15	Debrecen	9	209	76	Kösely	78 000	Biol: 75 000
16	Kecskemét	11	105	46	Csukás Ch.	31 600	Biol: 48 000
17	Hódmezővásárh	11	50	32	Hódtó-Kistisza	9 600	Biol.
18	Békéscsaba	12	65	51	Élővíz Ch.	21 100	Biol: 28 000

Table 2.5. Wastewater load of selected medium priority municipal hot spots

No.	Municipality	Main Recipient	Raw water Load in TPE (thousand)	Wastewater Discharge (Tm3/d)	Total load discharged into recipient waters (T/a)			
					BOD	COD	N	P
1	2	3	4	5	6	7	8	9
1	Székesfehérvár	Gaja Creek	211	8 564	302	572	257	36
2	Szombathely	Sorok-Perint	112	9 125	119	319	137	46
3	Zalaegerszeg	River Zala	112	5 800	20	226	46	6.4
4	Nagykanizsa	Cigény Ch.	107	6 200	33	363	36	12
5	Pécs	Pécsi-Víz Cr.	150	17 000	219	766	122	49
6	Nyíregyháza	Canals VIII-IX	45	4 311	51	365	221	18
7	Miskolc	Sajó	200	19 528	222	986	388	130
8	Debrecen	Kösely	209	19 581	458	1 672	544	321
9	Békéscsaba	Élővíz Ch.	53	5 189	144	581	58	36

The outputs of the analysis of the municipal hot spots resulted in a clear distinction between the national and international (basin-wide) importance of the Hungarian municipal hot spots, listed in the Strategic Action Plan. As a consequence of the present studies, it is proposed therefore to leave out all the medium priority municipal hot spots from the list of the SAP (Table 2.1.) due to their national importance only. These municipal hot spots to delete are:

Békéscsaba, Debrecen, Eger, Kaposvár,
Miskolc, Nagykanizsa, Nyíregyháza, Sopron,
Székesfehérvár, Veszprém, Pécs, Zalaegerszeg.

2.2.3. Low Priority

Municipal wastewater dischargers ranked as low priority hot spots are generally towns with population under 50 thousand, having public sewer system and wastewater treatment plant. The efficiency of the treatment generally needs upgrading and modernization.

The emissions from these plants in most of the cases represent overload of the recipients, except in case of Danube (Vác, Baja, Százhalombatta) and river Sajó (Kazincbarcika). The municipal hot spots with low priority are listed in Table 2.6.

Table 2.6. Low priority municipal hot spots in Hungary

No.	Municipality	Area Code No.	Population		Main recipient	Ww Discharge m3/d	Applied Ww. treatment Technology
			1000 inhab	Sew. %			
1	2	3	4	5	6	7	8
1	Mosonmagyaróvár	1	30	48	Mosoni.Duna	17 800	Mech.
2	Esztergom	1	28	54	Kenyérm. Cr.	8 700	Biol.
3	Vác	2	34	85	Duna	12 200	Biol.
4	Budaőrs	2	22	69	Hosszúrét Cr.	7 500	Biol.
5	Gödöllő	2	30	48	Rákos Creek		Biol.
6	Salgótarján	2	46	77	Tarján Creek	10 000	Biol.
7	Baja	3	38	86	Duna	12 000	Mech.
8	Százhalombatta	4	16	54	Duna		Biol.
9	Pápa	4	34	47	Bakony Creek	10 000	Biol.

1	2	3	4	5	6	7	8
10	Siófok	4	22	84	Sió	13 500	Biol.
11	Szekszárd	4	36	87	Sió	13 000	Biol.
12	Ózd	8	42	50	Hangony Cr.	7 300	Biol.
13	Kazincbarcika	8	35	87	Sajó River	9 500	Biol.
14	Gyöngyös	8	34	55	Gyöngyös Cr.	8 400	Biol.
15	Nagykőrös	10	27	26	Körös Cr.	7 200	Mech.

2.2.4. Ongoing Investments to Develop Municipal Wastewater Treatment

The Hungarian Parliament accepted and put into force the governmental programme to assist the healthy drinking water supply of the municipalities of the country in 1993. Another, but closely linked national program is the program for the sewerage and wastewater treatment of the Hungarian municipalities (towns and settlements) approved in 1996. There is straight overlapping between these programs in case of municipalities located in the area of sensitive drinking water resources, where the urgent solution of adequate treatment and safe disposal of liquid and solid wastes is outstandingly important. Significant towns located in such areas are for example: Győr, Veszprém, Eger, Miskolc, Kazincbarcika. The most important ongoing investments for the development of municipal wastewater treatment facilities are listed in Table 2.7.

Table 2.7. Investments running to develop municipal wastewater treatment

No.	Municipality	Area Code No.	Main recipient	Priority	Investment and schedule
1	2	3	4	5	6
1	Győr	1	M.Duna/Duna	High	Wwtp enlargement Phase I/A :1996/1998
2	Budapest: North	1	Danube	High	Wwtp enlargement :1996 / 1998
3	Budapest: South	1	Danube	High	Wwtp enlargement :1996 / 1999
4	Dunaújváros	4	Danube	High	New wwtp construction: 1996 / 1999
5	Székesfehérvár	4	Gaja Creek	Medium	Wwtp enlargement : 1995 / 1999
6	Veszprém	4	Veszprémi Séd	Medium	Wwtp enlargement : 1997 / 2000
7	Zalaegerszeg	6	River Zala	Medium	Wwtp enlargement : 1996 / 1998
8	Keszthely	6	Lake Balaton	Medium	Wwtp enlargement PhaseIV/2 1996/1999
9	Balaton Region	6	✶	Medium	Reg.sewer+wwtp program 1995/2000
10	Nyíregyháza I.	7	No.VIII. Canal	Medium	Wwtp enlargement : 1998 / 1999
11	Miskolc	8	Sajó	Medium	Wwtp enlargement Phase II :1986/1998
12	Eger	8	Eger Creek	Medium	Wwtp enlargement : 1997 / 1999
13	Debrecen	9	Kösely	Medium	Wwtp enlargement Phase II :1998/1999
14	Szolnok	10	Tisza	High	New wwtp construction: 1995 / 1998
15	Szeged	11	Tisza	High	New wwtp construction: 1995 / 1999

2.3. Industrial Hot Spots

There are two Hungarian industrial units in the hot spot list of the Strategic Action Plan: the Oil Refinery in Százhalombatta, where the upgrade of the wastewater treatment facilities was considered, and a tannery in Pécs, where improvement of the waste disposal solution is necessary.

The analysis on the industrial polluting sources resulted in two other significant industrial units in the sector of chemical industry, which were advised to be considered in the regional pollution reduction studies as new high priority hot spots instead of the tannery.

2.3.1. High Priority

The **Oil Refinery of MOL Rt.** in **Százhalombatta** is an important factor in the national economy and has a key role in the multiple supply for the different users of their products. This industrial complex has a direct emission discharge into the River Danube. Another important issue concerning this important industrial unit is the safety of pollution free operation of the production technology. In October 1997 a significant accidental water pollution incident was caused by this industrial plant on the river Danube in the form of an oil spill. Due to the effective pollution control measures partly carried out by the emergency unit of the industrial plant itself, there was no transboundary effect of this pollution incident.

There are two big chemical industrial units, which were also considered as high priority hot spots. The complex of the **Nitrokémia Rt. (NIKE Rt.)** is located in the catchment area of Lake Balaton in **Balatonfűzfő**. The emission of the industrial plant is transferred however into other catchment area, into the Séd-Nádor Creek system, which is a secondary tributary of Danube. There is an up-to-date biological wastewater treatment plant in operation, but the wastewater containing non-degradable chemical pollutants are stored in a wastewater reservoir and released periodically when the water regime of the recipient provides dilution to meet the requirements of the emission standards and permission of the local authorities. Downstream water users have frequent quality problems and complaints.

Another big chemical complex considered as high priority industrial hot spot is the **BorsodChem Rt.** situated along the river Sajó in **Kazincbarcika**, which is a primary tributary of the river Tisza. There is also a biological wastewater treatment plant in operation, however it is overloaded and the dilution rate of the recipient river is not high enough. There are problems to meet the emission standards with that part of the effluent containing outstandingly high salt content.

General information on these high priority industrial hot spots are given in Table 2.8., and some of the important characteristics of their wastewater load on the recipient water bodies are illustrated in Table 2.9.

The main issues and facts considered during the priority ranking analysis are summarized in separate Tables for each of the above five high priority municipal hot spots at the end of this chapter (Tables 2.19/21).

Table 2.8. High priority industrial hot spots in Hungary

No.	Location & discharger	Area Code No.	Main recipient	Sector	Wastewater Discharge m3/d	Treatment Technology	Ww fine M Ft
1	2	3	4	5	6	7	8
1	Százhalombatta MOL	4	Danube	Oil refinery	62 200	Biological	0.26
2	Balatonfűzfő: NIKE Rt.	4	Séd-Nádor	Chemical ind.	13 700	Biological	17,93
3	Kbarcika: Borsodchem	8	Sajó	Chemical ind.	13 500	Biological	0,12

Table 2.9. Wastewater load of high priority industrial hot spots

No.	Location and discharger	Main Recipient	Total load		Discharged into (T/a)			Recipients	
			BOD	COD	N	P	TDS	O&G	Hg
1	2	3	4	5	6	7	8	9	10
1	Százhalombatta: MOL	Danube		2494.2	8.0			101.7	
2	Balatonfűzfő: NIKE Rt.	Séd-Nádor	770.0	1180.0	835.8	12.0	17 410	14.3	
3	Kbarcika: Borsodchem	Sajó	82.0	130.4	123.4		7 350	3.6	✶

The above three high priority industrial hot spots have no transboundary pollution impacts during their regular operation. However they are considered as sites of potential risks in case of serious technological failures.

2.3.2. Medium Priority

Industrial units getting the medium priority ranking are considered as significant industrial sites on national level. They have direct discharges into main recipients like Danube, Tisza and Sajó Rivers, but these emissions generally do not cause significant quality changes in the recipient water bodies. Considerable water quality deteriorations were observed only in case of the small size recipient Séd-Nádor Creek (secondary tributary of the Danube) due to the emissions of the Nitrogen Works fertilizer factory. General characteristics of the medium priority industrial hot spots are summarized in Table 2.10 below.

Table 2.10. Medium priority industrial hot spots in Hungary

No.	Location & discharger	Area Code No.	Main recipient	Sector	Wastewater Discharge m3/d	Treatment Technology	Ww fine M Ft
1	2	3	4	5	6	7	8
1	Győr: Szeszip.V.	1	Danube	Distillery	10 700	Mech.	
2	Lábatlan: Piszke Paper Rt	1	Danube	Paper mill	14 900	Mech.	0.16
3	Nyergesújfalú: Viscosa	1	Danube	Chemical ind.	8 500	Biological	0.03
4	Budapest: Buszesz	2	Danube	Distillery	7 500		10.27
5	Csepel Works			Machinery	10 200		2.12
6	Dunaújváros: Dunapack	4	Danube	Paper mill	22 000		-
7	Dunaferr			Steel industry	224 000		0,70
8	Pétfürdő: Nitrogen Works	4	Séd-Nádor	Chemical ind.	12 800		6,09
9	Sajóbábony: Waste Man.	8	Sajó	Chemical ind.	6 700	Biological	-
10	Tiszaújváros: TVK Rt.	8	Tisza	Chemical ind.	11 000		17,21
11	Szolnok: TVM Rt.	10	Tisza	Chemical Ind.	10 800		-
12	Neusidler Paper			Paper mill	7 200		0,34

Main characteristics of the wastewater loads of the medium priority industrial wastewater dischargers are summarized in Table 2.11. The industrial wastewater dischargers belonging into the medium priority group have no transboundary impacts on river water quality.

Table 2.11. Wastewater load of medium priority industrial hot spots

No.	Location and discharger	Main recipient	Total load discharged into recipients							
			T / a				Kg / a			
			BOD	COD	N	P	Cd	Ni	Cu	Cr
1	2	3	4	5	6	7	8	9	10	11
1	Győr: Szeszip.V.	Danube		198.8	0.1					
2	Lábatlan: Piszke Paper	Danube		712.1	0.1					
3	Nyergesújfalú: Viscosa	Danube		192.7	1.6					
4	Budapest: Buszesz	Danube		188.5						
5	Csepel Works		126.0				4.1	120.7		606.4
6	Dunaújváros: Dunapack	Danube		5636.4	1.0					
7	Dunaferr			2682.4	287.1					
8	Pétfürdő: Nitrogen Works	Séd-N.		192.5	727.1					
9	Sajóbábony: WasteMan.	Sajó		155.7	60.0		1.0			
10	Tiszaújváros: TVK Rt.	Tisza		128.5	2.0	0.3		3.0		
11	Szolnok: TVM Rt.	Tisza	27.6	108.0	89.2	16.9		6.0	798.0	30.0
12	Neusidler Paper			957.0	1.9	0.1				

2.3.3. Low Priority

The following industrial units of the analysis on point-like wastewater dischargers were evaluated as low priority hot spots having no transboundary impacts on river water quality:

Table 2.12. Wastewater load of low priority industrial hot spots

No.	Location and discharger	Area Code No.	Main Recipient	Sector	Total load discharged into recipients				
					T/a				Kg/a
					BOD	COD	N	P	Cr
1	2	3	4	5	6	7	8	9	10
1	Dorog: Richter G. Ch.	1	Danube	Chemical ind.		329.3	55.4		
2	Mohács: Wood Ind.	3	Danube	Other industry		3201.0	0.6		
3	Paks: Canning Fact.	4	Danube	Food industry		184.5	0.5		
4	Stornya: Leather Fact.	5	Danube	Leather ind.		207.8	37.2		2196.0
5	Pécs: Leather Factory	5	Drava	Leather ind.	117.0	273.0	78.0		
6	Kaba: Agroferm	9	Kösely	Food industry	275.2	731.8	199.1	18.4	
7	Hszoboszló: MOL Rt.	9	Berettyó	Oil industry	31.8	240.6	82.0	3.3	
8	Kfélegyháza: GYTV.	10	Tisza	Food industry		207.9	3.5		
9	Szolnok: Solami Ltd.	10	Tisza	Food industry		185.9	10.0	4.2	
10	Szolnok: Sugar Fact.	10	Tisza	Food industry	576.5	946.2	33.2	3.8	
11	Szarvas: Thermal W.	10	Körös	Other industry	272.7	405.4	6.6	0.3	
12	Makó: Floratom	11	Tisza	Food industry		212.0	5.7		

2.4. Agricultural Hot Spots

The area where the studies on wastewater dischargers had to face considerable problems because of inadequate data for the analysis was the agriculture. During the recent years significant changes and transitions occurred in the field of agricultural production units, as a result of privatization. The existing agricultural information systems were unable to follow these rapid changes. As a consequence of these processes no reliable data are available at present (even at the Ministry of Agriculture) on the applied technologies and wastewater management of the new, or changed agricultural units.

The only source regarding the existing agricultural emissions was the data coming from the district Environmental Protection Inspectorates **[7.]** which were collected and evaluated during their pollution control activities carried out over their operational areas and provided for the Ministry of KTM. The analysis of the available agricultural emission data indicated, that none of these wastewater discharges cause such water quality problems in the recipient waters that would result high priority ranking.

2.4.1. Low Priority

According to the available data on point-like agricultural emissions, the units studied generally have no major influence on the quality of recipients. Thus only low priority was given to the following agricultural wastewater dischargers:

Table 2.13. Wastewater load of low priority agricultural hot spots

No.	Location and Agricultural unit	Area Code No.	Main Recipient	Waste water Discharge (m3/d)	Total load discharged into recipient waters (T/a)		
					COD	N	P
1	2	3	4	5	6	7	8
1	Mocsa: Agr. Co-op.	1	Danube	150	331.0	16.0	2.1
2	Környe: Agroindusrty	1	Danube	650	239.4	7.3	0.4
3	Budapest:Csepei DunaNekt.	2	Danube	130	12.7		
4	Hildpuszta: Hajósvin	3	Local cr.	120	39.0	0.1	0.1
5	Hévíz: Balaton Fishery Plc.	6	Balaton	4000	18.5	1.2	0.3
6	Dalma Transdanubian Fruit	6	Local cr.	160	4.7	3.1	0.2
7	Zagyvarékás: Conavis Rt.	10	Zagyva	490	6.0	0.4	0.2
8	Orosháza: Agr.Co-op.Dózsa	11	Tisza	140	102.0	0.4	
9	Földdeák: Agr.Co-op.	11	Tisza	425	100.0	1.2	

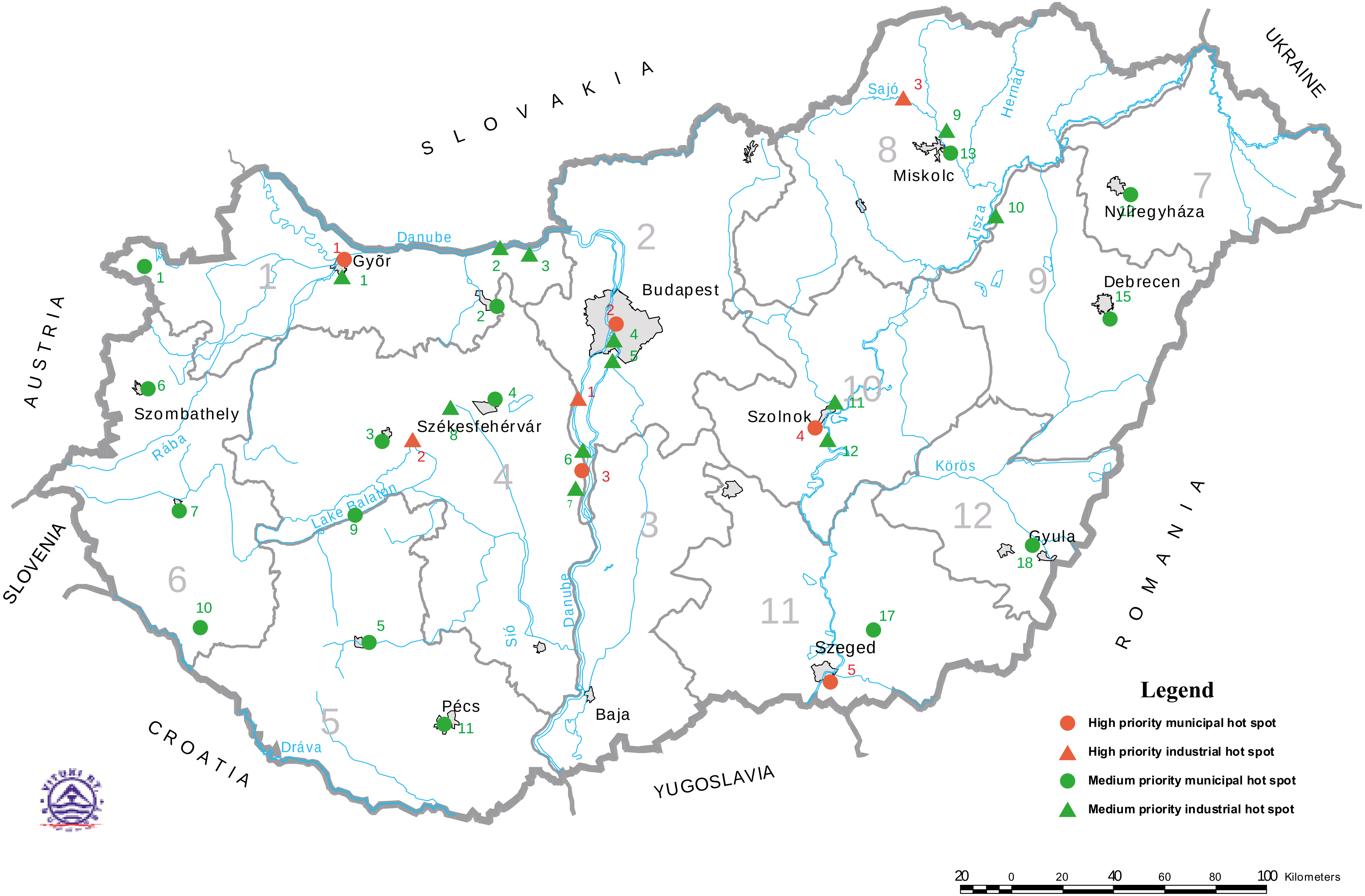


Figure 2.2. Location of high and medium priority hot spots

2.5. Summary Information on High Priority Hot Spots

The following Tables summarize the basic information used for the ranking of high priority municipal and industrial hot spots recommended for the basin-wide pollution reduction studies (Tables 2.14/21). The location of the high and medium ranked hot spots are illustrated in Figure 2.2, where the numberings refers to the items in the corresponding Tables for the purpose of identification.

Table 2.14. Summary of information for the Győr municipal hot spot

Hot Spot Name	Győr municipal wastewater treatment plant
Critical Emissions	High emission load is presented by the effluent (37300 m3/d) of the wastewater treatment plant: 584 mg/l COD_{cr} 23.4 mg/l NH_4-N 166.3 mg/l Na 6.9 mg/l ANA-Detergents Because of the emissions exceeding the limit values of the existing regulations 12.2 million HuFt wastewater fine was imposed for the company operating the plant.
Seasonal Variations	The quality of the wastewater is equalized during the dry weather flow, changes are observed only in relation of the variations of hydrometeorological conditions.
Immediate Causes of Emissions	The wastewater treatment plant has biological treatment technology using activated aeration system after the mechanical stage, disinfection, sludge centrifuges and drying beds. The plant is running with poor treatment efficiency of about 50 percent.
Root Causes of Water Quality Problems	There are significant quantity of industrial wastewater discharged into the public sewer system of the town (about 40 %) with more or less acceptable pre-treatment. Partly this is the cause of the poor treatment efficiency of the plant. Moreover the flow conditions of the small size recipient are also unfavorable, the rate of dilution is low.
Receiving Waters	Substantial water quality deterioration is the impact of the emission on the recipient water body: downstream from the effluent the components of oxygen household deteriorate from class III to Class IV, the bacteriological quality fall into the worst V quality class (see Annex 1).
Nearby Downstream Uses	There is no sensitive water use downstream from the effluent discharge into the recipient Moson-Danube, however the outer protection zone of the Szögy drinking Highwater resource is affected by the discharge.
Transboundary Implications	No transboundary pollution effect on the main recipient. River Danube because of the very long distance from the downstream border section and the significant self-purification capacity of the river.
Rank	**High Priority**

Table 2.15. Summary of information for the Budapest municipal hot spot

Hot Spot Name	Budapest public sewer system
Critical Emissions	The Capital is outstandingly the biggest direct polluter of Danube. Most of the wastewater (84 %) collected by the sewer system is pumped directly into the main stream of the river, only after removing the floating rough material by screens. Quality characteristics of this raw wastewater are: 500-700 mg/l COD_{cr} 250-300 Mg/l BOD The ratio of industrial wastewater discharged into the public sewer is about 40 %.
Seasonal Variations	Intensive precipitation often causes additional river pollution effect, when the storm-water overflows of the sewer system along the embankment are in operation, and discharge the highly polluted first surface runoff directly into the river.
Immediate Causes of Emissions	The main cause of the large emission into the river is the lack of adequate wastewater treatment capacity. The existing two biological treatment plants can handle only 16 % of the total dry weather wastewater flow. In case of low flow conditions in the river there are still high dilution effects on the effluent.
Root Causes of Water Quality Problems	Though the sensitive water intakes are much farther downstream from the Capital's discharge, and there is a substantial self-purification capacity of the river, the large amount of untreated wastewater represents a potential risk from point of view of public health.
Receiving Waters	In spite of the huge dilution effect, the discharge contributes to the pollution load of the river, especially from point of view of bacteriological parameters. Public Health Authorities prohibited the bathing nearly along the whole lengths of the river. The river quality deteriorates one class downstream from Budapest concerning nutrient compounds.
Nearby Downstream Uses	The river water is not suitable for recreational purposes because of IV class microbiological quality, partly as a consequence of the untreated wastewater discharge of Budapest (see Annex 1.).
Transboundary Implications	There is no direct transboundary pollution effect, due to the long distance from the downstream border section and the significant self-purification capacity of the river, however Budapest is the biggest point source emission along the whole Hungarian Danube stretch.
Rank	**High Priority**

Table 2.16. Summary of information for the Dunaújváros municipal hot spot

Hot Spot Name	**Dunaújváros public sewer system**
Critical Emissions	Considering the lack of treatment plant and the significant dilution effect of the river, special higher emission limit values were given to the system by the district Environmental Protection Inspectorate (COD_{cr}=720 mg/l, O&G=72 mg/l, NH_4-N=36 mg/l). The emission exceeded even these values and 0.6 million HuFt wastewater fine had to be paid last year.
Seasonal Variations	No characteristic seasonal change observed, concerning the quantity and quality of the wastewater collected by the public sewer system. In case of low flow conditions in the river there are still high dilution effects on the effluent.
Immediate Causes of Emissions	The actual cause of the emission (which is a direct point source discharge into the river) is the lack of wastewater treatment facilities. The wastewater is discharged into the river after a rough mechanical treatment (screen only).
Root Causes of Water Quality Problems	The Danube section, where the emission enters, carries the upstream wastewater loads. The additional load (especially the microbiological compounds) makes longer the river stretch where there are potential health risk to use the water for recreation purposes in case of direct body contacts.
Receiving Waters	The emission contributes to the pollution load of the river, especially from point of view of microbiological parameters, in spite of the considerable dilution effect of the river. Public Health Authorities prohibited the bathing nearly along the whole lengths of the river. The river quality belongs to the IV (polluted) quality class from point of view of nutrient compounds and microbiological parameters (see Annex 1).
Nearby Downstream Uses	There are bank-filtered drinking water resources in operation downstream from the entering section of the emission, which are not so sensitive for the above mentioned quality change due to the filtration processes.
Transboundary Implications	There is no direct transboundary pollution impact, due to the long distance from the downstream border section and the significant self-purification capacity of the river, however the emission is advised to be considered in the basin-wide studies as significant direct discharge into the river
Rank	**High priority**

Table 2.17. Summary of information for the Szolnok municipal hot spot

Hot Spot Name	**Szolnok town public sewer system**
Critical Emissions	The effluent (13700 m3/d) from the town represents high emission load on the river Tisza: 1935 t/a COD_{cr} 4170 t/a TDS 151 t/a O&G (oil & grease) Wastewater fine of 0.46 million HuFt was imposed because of exceeding the existing effluent limit values.
Seasonal Variations	No characteristic seasonal variations are observed in the quality of the emission. Extremely low flow conditions of the river superimposed with very high temperature usually cause additional problems in the river quality downstream from the section of the effluent.
Immediate Causes of Emissions	The basic cause of the emission is the lack of necessary wastewater treatment. The wastewater is discharged into the river after a rough mechanical treatment (screen only).
Root Causes of Water Quality Problems	The main cause of water quality problem is the pollution impact of the untreated wastewater discharged into the river. The decreased dilution effect during the low flow conditions of the river usually in August cause additional quality problems.
Receiving Waters	The quality of the receiving river Tisza deteriorates one quality class downstream from entering section of the emission from Szolnok.
Nearby Downstream Uses	There are only less sensitive agricultural water users for irrigation purposes.
Transboundary Implications	There is no direct transboundary water pollution impact from this source, due to the relatively long distance from the downstream border section and the existing self-purification capacity of the river, however as a considerable point-like wastewater discharge into the river, it represents a potential risk from this respect.
Rank	**High priority**

Table 2.18. Summary of information for the Szeged municipal hot spot

Name of Hot Spot	**Szeged town public sewer system**
Critical Emissions	The effluent (34700 m3/d) from the public sewer system of the town represents high emission load on the lower section of River Tisza: 5130 t/a COD_{cr} 469 t/a Oil compounds 307 t/a NH_4-N No wastewater fine was imposed.
Seasonal Variations	No characteristic seasonal variations are observed in the quality of the emission.
Immediate Causes of Emissions	The lack of necessary wastewater treatment is the main cause of the emission. The wastewater is discharged into the river after a simple mechanical treatment (screen only).
Root Causes of Water Quality Problems	The root cause of water quality problem is the pollution impact of the untreated wastewater discharged into the river. The special local condition, the confluence of the highly polluted river Maros into Tisza just downstream from the town also increases the unfavorable water quality situation.
Receiving Waters	The quality of the river Tisza deteriorates into the worst V quality class (microbiological parameters), and IV class concerning nutrient compounds downstream from the town. This quality deterioration is the consequence of partly the emission from the town and also the river Maris, which carries very high pollution load from abroad (see Annex 1).
Nearby Downstream Uses	Downstream water users are located in the downstream country.
Transboundary Implications	The emission represents in Hungary the only direct and permanent transboundary pollution impact at present towards downstream riparian country.
Rank	High priority

Table 2.19. Summary of information for the Százhalombatta industrial hot spot

Name of Hot Spot	**Százhalombatta, MOL Rt. Oil Refinery**
Critical Emissions	The regular operation of the Oil Refinery results the following concentrations in the emission into the river Danube: Oil compounds: 4.7 mg/l Phenols: 1.0 mg/l COD_{cr} : 133.0 mg/l Only technological failures cause essential quality problems in the river, which happened for example in October 1997 in the form of accidental oil pollution in Danube.
Seasonal Variations	No seasonal variations in the emission. There are no wastewater discharges on holidays.
Immediate Causes of Emissions	The immediate cause of emission is the large amount of oily wastes (50 000 m3/d), which first enter into a storage tank of 1000 m3 capacity. Two stages biological treatment plant is in operation with adequate treatment efficiency. The sludge is transported away from the plant in liquid condition because locally can not be dewatered.
Root Causes of Water Quality Problems	Usually the effluent from the Refinery does not cause water quality problems under normal operational conditions. The breakdown of production technology however can cause significant oil pollution problem in the river. To avoid such risks the company has an effective emergency control unit to prevent potential pollution damages.
Receiving Waters	The treated wastewater discharge is entered into the main stream of the river. There is a considerable dilution effect of the river even during low flow periods, thus no characteristic change of river quality is observed downstream from the effluent.
Nearby Downstream Uses	The bank-filtered drinking water resource of the town Ercsi is in operation 0.5 km downstream from the effluent of the Refinery. No quality complaints are registered.
Transboundary Implications	No direct transboundary pollution impact, because of the long distance from the downstream border section, however due to the considerable amount of discharge into Danube and the potential risk of technological failures, it is advised to consider this hot spot in the further transboundary studies.
Rank	**High priority**

Table 2.20. Summary of information for the Balatonfűzfő industrial hot spot

Name of Hot Spot	Balatonfűzfő, NIKE Rt. Chemical Industrial Plant
Critical Emissions	The emission of the industrial plant represent high pollution load, the effluent limit values is significantly exceeded in case of COD, TDS (Total Dissolved Solids) and NH_4-N. This is why the Industrial plant was imposed to an outstandingly high amount of wastewater fine of 17.9 million HuFt.
Seasonal Variations	There are no seasonal variations in the emission, there are changes only within a day. The emission is more concentrated during the first shift of the working day. The recipient of the wastewater discharge (biologically treated) is a relatively small size creek, dilution factor is under 10. During low flow period the discharge should be stored in a wastewater reservoir, according to the regulation made by the District Water Authority.
Immediate Causes of Emissions	There is an up-to-date biological wastewater treatment plant in operation, but the industrial wastewater contains non-degradable chemical compound in large amount. This is the basic quality problem of the emission. The industrial plant carries out effective self-control activity on the effluent quality.
Root Causes of Water Quality Problems	The water quality problem is caused by the outstandingly high concentration of pollutants in the raw wastewater, which are above the effluent limit values after the treatment processes, and the low dilution ratio of the recipient Veszprémi Séd Creek. The discharge from the wastewater reservoir also causes quality problems along the river system.
Receiving Waters	The recipient Veszprémi Séd is a tributary of the Séd-Nádor river system. The emission from the industrial plant deteriorates the water quality into the worst V class (see Figure 4-5). The release from the wastewater reservoir often causes fish kills along the river courses.
Nearby Downstream Uses	There are different downstream water users (fishponds, irrigation systems) which facing regular water quality problems. The periodical release of the wastewater reservoir blocks the operation of water uses along the river courses.
Transboundary Implications	No direct transboundary pollution impact, however even in Danube some of the non-degradable pollutants from this industrial plant can be detected.
Rank	**High priority**

Table 2.21. Summary of information for the Kazincbarcika industrial hot spot

Name of Hot Spot	Kazincbarcika, BorsodChem Rt. Chemical Industrial Plant
Critical Emissions	There are components in the emission of the industrial plant, which are essential from point of view of pollution control: TDS = 7350 t/a Na = 1650 t/a O&G = 3.6 t/a Hg = 63.4 kg/a The recipient river Sajó do not provide enough dilution effect for the wastewater discharge of the industrial plant
Seasonal Variations	There is no seasonal variation, the composition of discharge is depending from the actual production processes.
Immediate Causes of Emissions	The existing biological wastewater treatment plant is overloaded, and the critical emission components imply the lack of necessary industrial wastewater treatment processes.
Root Causes of Water Quality Problems	The release of the high Na concentration wastewater causes problems to meet effluent limit value. The material loss of obsolete production technology during the past decades caused major mercury pollution of the soil and groundwater resource under the area of an already abandoned unit of the factory.
Receiving Waters	The pollutant load of the industrial plant generally does not cause major water quality deterioration in the recipient river Sajó. Water quality problems arise mainly in the vegetation period. The fine fraction of bottom sediment of the river downstream from the effluent contains mercury in concentrations of large variety because of mobility.
Nearby Downstream Uses	Drinking water resource (Sajóládi Waterworks) is in operation downstream, using bank-filtered water. The applied technology of the Waterworks is not sensitive for the moderate changes of river quality.
Transboundary Implications	No direct transboundary impact, due to the outstandingly long distance from the downstream border section of river Tisza, however as outstanding industrial water user and discharger, it is advised to be considered during basin-wide pollution reduction studies.
Rank	**High priority**

3. Identification of Diffuse Sources of Agricultural Pollution

Nation wide database on agricultural non-point source pollution is not available in Hungary at present. Different research studies were carried out during the last decade on small size catchment areas of creeks to assess the magnitude of nutrient loads originated from agricultural land runoff (e.g.: tributaries of Lake Balaton, etc.). Nation-wide agricultural nutrient load assessments were carried out recently by two projects of the Applied Research Programme of the Environmental Programme of the Danube River basin **[11.]**. The EU/AR/203/91 Phare Project Water Quality Targets and Objectives for Surface Waters in the Danube Basin **[12.]** analyzed the nutrient immissions in the river system and made rough estimations on the proportion of nutrient load origin. For the purpose of the present Pollution Reduction Programme more detailed assessments were made in the EU/AR/102A/91 Phare Project Nutrient Balances for Danube Countries **[13.]**, summary of the main findings are briefly discussed in paragraph 3.2 below.

3.1. Land under Cultivation

The land area by agricultural land-use categories in Hungary was the following in May 1997 and for comparison there are the similar values from the year 1994, as it was published by the Hungarian Central Statistical Office **[9.]**:

Table 3.1. Land area by agricultural land-use categories (in thousand hectares)

Land use categories	1994	1997
Arable land:	4 714.4	4 710.8
Sown area	4 478.9	4 484.1
Unsown arable land	235.5	226.7
Garden	35.0	109.2
Orchard	92.7	95.6
Vineyard	131.9	130.9
Grassland	1 148.0	1 148.1
Agricultural area	**6 122.0**	**6 194.6**
Forest	1 766.5	1 766.7
Reeds	40.8	41.3
Fish-ponds	27.2	33.0
Productive land	**7 956.5**	**8 035.6**
Uncultivated area	1 346.5	1 267.4
From which: lake, water reservoir	20.4	20.1
Land area total:	**9 303.0**	**9 303.0**

The usage of fertilizers (as a factor of agricultural non-point source pollution) decreased significantly during the last decades [2.]. The gross agricultural production shows somewhat similar tendency, as it is illustrated in Table 3.2. Data contained in this Table were published in the volumes of the Annual Statistical Yearbooks **[9.]**.

Table 3.2. Agricultural production and fertilizer usage

Years	1980	1990	1994	1995	1996
Relative volume index of the total agricultural production (basis: 1980 = 100 %)	100.0	101.4	71.0	72.6	76.2
Total use of fertilizers, in Effective material, 1000 tons/year	1399	671	280	247	270

3.2. Diffuse Nutrient Emissions from the Agriculture

The EU/AR/102A/91 Phare Project Nutrient Balances for Danube Countries" **[13.]** carried out studies on national and Danube basin level on the magnitude and proportion of diffuse nutrient load compared to the total loads.

The investigation of the sources and pathways of nitrogen (considering the data from 1992) resulted in the conclusion on river basin level, that the importance of agriculture for N emissions into surface waters is evident: about half of the input stems from agriculture. The two main paths, runoff and base flow have the same importance, each carrying one third of the agricultural N emission. The contribution of private households to the input is about 20 %, while industry represents 10 % and other sources about 20 %. For phosphorus the importance of agriculture is even greater, clearly showing that when developing future emission reduction strategies agriculture will play a key role. Almost 60 % of the total P stemmed from agriculture. Herein, the paths erosion/runoff (about half of the agricultural emissions) and direct discharges of manure (about one third) should be underlined. Private households contributed to about 20 % and industry was about 15 % (the others were below 10 %).

Out of the total inputs in the Danube basin, about 60 % of N and 40 % of P stemmed from diffuse sources, according to the findings of this project. This ratio shows a similar pattern valid for many river basins in Europe. Base flow, erosion/runoff, runoff from forests stormwater overflow and N fixation was accounted for these assessment. The complementary values indicate point source contribution (wastewater effluents, direct discharges from households, industry and manure). The national patterns were also developed **[13.]**, of which the relevant values for Hungary are given in Table 3.3.

Table 3.3. Nutrient emissions from diffuse and point sources in Hungary Source: Phare Project EU/AR/102A/91 [13.]

Origin of nutrient emissions	Total Nitrogen in kt/a		Total Phosphorus in kt/a	
	1988/89	1992	1988/89	1992
Diffuse sources	88	53	7	7
% of the total load	71	62	42	42
Point sources	37	32	10	10
% of the total load	29	38	58	58

4. Updating and Validation of Water Quality Data

Water resources management has an outstandingly long tradition in Hungary. Observations and data collection on the quantity and quality of the surface water resources were always considered as important activities to assist the water management efforts.

Hydrological (water quantity) observations

Records of extreme hydrological events were preserved for the period before the 18-th century (e.g. the report of the first flood on the river Danube dates back to 1012). Extensive survey of watercourses started in the 18-th century. Beside hydrographic works, level/flow gauges were built in large cities of the Kingdom of Hungary in Pozsony/Pressburg (today Bratislava) and in Buda (today Budapest). Regular observation of water levels started in 1823. An observation network of 132 gauges was in operation in 1860, where water stages together with ice phenomena were observed on a daily frequency. Measurement of water temperatures started in 1865 with special regard towards the formation of ice jams. Operational water level data had been distributed during floods in the Tisza basin since 1856 for a large circle of interested agencies and authorities.

An important milestone in the development of observations over surface waters was the organization of a Central Hydrological Unit in the year 1886. This institution was one of the firsts of its kind in Europe. Regular hydrographic surveys of river channels were also organized. While stations of the observation network remained in the hands of local authorities, techniques and instrumentation were standardized. In addition, nation-wide supervision of activities was organized together with the formation of the national hydrological archives and the national hydrological forecasting service. Hydrological yearbooks have been issued since that time. Publishing of the Daily Water Regime Map started as a result of daily (and in the period of floods more frequent) collection of data from basic stations.

A new phase in water resources development started in the 1930's (irrigation, fisheries, industrial water use in large scale). Accordingly regular flow measurements and registration started (the first flow measurements however were attempted much earlier, already at the beginning of the 19-th century). Flow measurements on medium size rivers started in the 1930's and on small steams from 1950. Together with the construction of barrages and reservoirs measurements on suspended sediment started. Operational observations and data collection covered reservoirs and large water distribution systems.

Regular observations of subsurface waters started around 1930 in the interfluvial region, Danube - Tisza, and from 1950 groundwater level observations covered the whole country. Observation of springs also started around 1950 together with karstic water level observations. Organization of the observation of deep groundwater and thermal waters was the task of the following decades. Observation wells are the former boreholes of exploration drillings and also many former production wells are used in the network **[14.]**.

Water quality observations

The history of the measurement of water quality of Hungarian surface waters dates back to more than a century ago. The first published measurement data stem from 1873 when the water quality of the river Danube was discussed in terms of the cations and anions found in the river water. Only few publications are known from the first decades of the 20-th century. The need of the society for investigating the quality of waters occurred first upon the extensive industrialization after the Second World War. In the beginning, however, no overall scheme of these investigations was established and the measurements were limited to some special problems of individual watercourses.

The Water Resources Research Institute VITUKI made plans for the establishment of a nation wide water quality monitoring system right in the year of its establishment, in 1952. At this time, however, VITUKI did not have its own water chemical laboratory and the analytical work was carried out in MÉLYÉPTERV. Nevertheless, sampling and evaluation work was made in the water quality management department of VITUKI, founded in 1954. On the basis of the publications of this early period it can be concluded that VITUKI had made measurements in 1,400 stations of 130 streams and for 25 water quality constituents. The frequency of the random samplings was once a year. It is worthwhile to mention that the water quality parameters investigated in those times are still being measured today.

The above mentioned and published data are important sources of information on the water quality conditions of an era more than 40 years ago. Eventually there is no basis of full comparison with the presently measured data, due to the substantial development of analytical methods (for example those for nitrate and orthophosphate) since that time.

Development of the laboratory network of the district water authorities started in 1956 on the basis of the professional knowledge available in VITUKI. The work of these laboratories involved, in the early times, large number of stations (appr. 800) and low sampling frequency (about 4 samples/year). It took some years until the 12 district water authorities had more-or-less well equipped water quality laboratories and appropriately qualified staff.

Between 1960 and 1967 the district water authorities operated about 800 water quality monitoring stations on 290 streams and the supervision of the system was carried out by VITUKI. The frequency of sampling was 2-12 in a year. In about 60% of the stations the sampling was seasonally made (4 samples in a year). Random schedule was followed during the lowest frequency samplings (twice a year). Laboratory analysis involved 15-30 water quality constituents and indices.

Preliminary evaluation of the large number of data available for the period 1960-1967 indicated that the increasing of the frequency of sampling would be desirable, even at the expense of sacrificing some of the less important monitoring stations. Results of weekly sampling of the river Danube also indicated that this was the right solution.

Upon the proposal of VITUKI new sampling rules have been put into force in 1968. In this new network and system the number of stations was reduced to about 300 and the sampling frequency increased to 12 annually as the minimum. This way was the basic national water quality monitoring network (called national network further on) founded. Some stations started in 1968 and other ones in 1969 and they were operated in this form until 1984. The national network involved the 113 most important watercourses of the country, the analysis of appr. 50 water quality parameters and sampling frequencies of annually 12, 26 and 52 per year (108 samples per year in a single station). It is of importance that in this period the analytical methods were also internationally harmonized (within the so-called COMECON countries the harmonization was made on the basis of the Standard Methods of the USA).

The objective of the national network was to:

- obtain insight into the state and expectable changes of the water quality of the surface water resources of Hungary and
- to help various water users in assessing the options of using the given water for the desired purposes.

Requirements for the operation of the national network were as follows:

- to provide sufficient number of data for evaluating the quality of waters in a general way and also according to intended water uses and to follow the changes of water quality;
- to support transboundary water negotiations and to provide appropriate time series for research and planning.

The national network was operated in the above described manner between 1968 and 1984. New monitoring rules were established in 1985. This included 250 stations and the sampling frequency was 52, 26 and 12. This provided continuity of records for the bulk of the stations.

The sampling stations were selected to meet the following requirements:

- Entrance and exit stations of rivers entering and leaving the country;
- Upstream and downstream of significant sources of pollution that could basically alter the quality of water;
- At especially important sites (such as the water intake points of the waterworks).

The rules of sampling and the type of water quality parameters were defined by technical guidelines (MI-10-172/2-84 and MI-10-172/3-85). The evaluation system included three classes (not given in detail here) as specified in Hungarian Standard MSz-10-172/1-83.

The present water quality monitoring network has been in operation since 1994. Details of the operation (sampling sites, sampling frequency, analytical frequency, groups of water quality indices, analytical methods, methods of evaluation/classification and the system of limit values) are specified in a national standard (MSz 12749) **[4.]**.

4.1. Index of Water Quality Monitoring Records

The results of the existing monitoring activities of surface water resources are briefly summarized in this chapter, covering the quantitative (hydrological observations) and the qualitative (water quality monitoring) aspects. The topic of accidental water pollution incidents is also included.

4.1.1. Data Coming from the Hydrological Observation Network

The existing hydrological surface water observation network to monitor the quantitative characteristics of the river system in Hungary consists of 2700 stations, of which 370 are considered to be basic stations.

Stations of the basic network have been selected on cross boundary rivers/streams near the national borders. Basic stations are designated to each other in 20-30 km sections of major rivers, reservoirs, and large lakes, or one station for each 400-500 km^2 of territory in case of small streams and canals. Water levels are observed at each basic station together with ice phenomena. Thickness of the ice cover is measured on rivers with the formation of ice jams and on larger lakes. Flow rate is measured and registered at 185 stations, water temperatures at 87 stations and suspended sediment at 37 stations.

The network diagrams of the river system are illustrated in Figure 4.1. (Danube and its tributaries) and in Figure 4.2. (Tisza and its tributaries). These Figures give information also on the type of hydrological observation stations in operation in that region and the frequency of data reporting from that station **[15.]**. The locations of the main hydrological observation stations (stations of the national hydrological telemetry network) are shown in Figure 4.3.

The groundwater observation network consists of around 1600 observation wells, there are 500 karstic water and deep groundwater observation wells and around 50 springs are observed.

The tasks of the hydrological service are carried out by the 12 District Water Authorities and the Water Resources Research Center VITUKI Plc. The District Water Authorities are working under guidance of the National Water Authority (OVF) and VITUKI carries out central functions of the hydrological service on the basis of a contract with OVF. Supervision of the given scope of activities at the level of the national government is realized through the Ministry of Transport, Communication, and Water Management (KHVM). Tasks and functions within the hydrological service are divided among the players by relevant legislation and directives, which are to be changed in the near future. Legislation enforces reporting of water supply data to regional water authorities for all water uses. The hydrological service works in cooperation with different agencies of environmental protection and with the National Meteorological Service.

Unfavorable aspect for water management in Hungary is that approximately 95% of the surface water resources originate from abroad. This means that special attention is paid to the border sections of rivers entering into the country, not to speak about the fact, that some of them carry significant pollution load from abroad. For information on the size of these rivers Table 4.1. summarizes the daily flow condition data observed during the period between 1985 and 1994.

Table 4.1. Flow-data in the border-sections of transboundary rivers (1985 - 1994)

No.	River	Name of section quality/quantity	Daily average flow m^3/s		
			KQ	KÖQ	NQ
1	Rába	Szentgotthárd	4,1	22,6	458
2	Lapincs	Szentgotthárd	*	*	*
3	Pinka	Felsõcsatár	(0,1)	(2,7)	(33)
4	Gyöngyös-Sorok	Kõszeg	*	*	*
5	Lajta	Hegyeshalom	(3,8)	(8,3)	(23)
6	Duna	Rajka/Dunaremete	*	*	*
7	Duna	Szob/Nagymaros	930	2231	8070
8	Ipoly	Ipolytarnóc/Nográdszakál	0,2	5,9	80
9	Sajó	Sajópüspöki	1,9	15,2	237
10	Bódva	Hidvégardó	0,03	2,4	56
11	Hernád	Tornyosnémeti	6,3	24,9	454
12	Bodrog	Felsõberecki	7,6	104	816
13	Tisza	Záhony	53,6	369	2900
14	Tisza	Tiszabecs/Vásárosnamény	29,7	320	3300
15	Tur	Kishódos/Garbolc	0,2	9,2	170
16	Szamos	Csenger	16,2	102	2080
17	Kraszna	Mérk/Ágerdõmajor	0,9	4,8	110
18	Berettyó	Pocsaj/B.újfalu	0,7	7,6	167
19	Sebes-Körös	Körösszakál	0,4	18,6	517
20	Fekete-Körös	Sarkad/Malomfok	0,9	26,8	488
21	Fehér-Körös	Gyulavári/Gyula	0.0	18,6	316
22	Maros	Nagylak/Makó	28,2	139	750
23	Tisza (leave)	Tiszasziget/Szeged	57.8	721	2470
24	Duna (leave)	Hercegszántó/Mohács	906	2199	6400
25	Dráva (leave)	Drávaszabolcs	133	547	2110
26	Dráva	Örtilos/Barcs	138	487	1770
27	Mura	Letenye	53.0	174	1100

The above Table illustrates the mean flow (KÖQ) values of the transboundary rivers related to the 10 years period, and for additional information there are the observed smallest (KQ) and highest (NQ) flows of this decade. Time-series of flow data were not available for smaller rivers. The column „Name of Section" contains two names when the water quality observation (sampling) differs from the hydrological observation site. There is a straight requirement however to carry out quantity and quality observations in the same section to improve the information content of the observations. The identification codes and the measurement/sampling sites of these rivers are given in Table 4.2.

Table 4.2. Identification codes of border section of rivers entering into Hungary Source: Phare Project W 905/90 [14.]

No	River	Name of section quality/quantity	Code of section quality/quantity	River km quality/quantity
1	Rába	Szentgotthárd	06FF08/000342	202.6/200.5
2	Lapincs	Szentgotthárd	06FF07	0.1
3	Pinka	Felsõcsatár	06FF06/000345	38.2/33.7
4	Gyöngyös-Sorok	Kõszeg	06FF02	15.8
5	Lajta	Hegyeshalom	01FF13/000019	10.3
6	Duna	Rajka	01FF01/000001	1848.4
7	Duna	Szob/Nagymaros	02FR51/001020	1708.0/1694.6
8	Ipoly	Ipolytarnóc/Nógrádszakál	02FF13/001041	179.0/158.8
9	Sajó	Sajópüspöki	08FF10/001726	123.5/123.6
10	Bódva	Hidvégardó	08FF17/001742	63.7/54.8
11	Hernád	Tornyosnémeti	08FF39/001732	102.0/97.0
12	Bodrog	Felsõberecki	08FF07/001724	46.0/47.8
13	Tisza	Záhony	07FF04/001518	636.8/627.7
14	Tisza	Tiszabecs/Vásárosnamény	07FF01/001514	757.0/744.2
15	Tur	Kishódos/Garbolc	07FF07/001527	23.7/26.6
16	Szamos	Csenger	07FF09/001523	45.4/47.6
17	Kraszna	Mérk/Ágerdõmajor	07FF11/001530	42.2/44.9
18	Berettyó	Pocsaj/Berettyóújfalú	09FF06	71.5
19	Sebes-Körös	Körösszakál	12FF03/002736	58.6/54.6
20	Fekete-Körös	Sarkad/Malomfok	12FF02/002745	15.9/15.2
21	Fehér-Körös	Gyulavári/Gyula	12FF01/002747	9.3/7.4
22	Maros	Nagylak/Makó	11FF21/002278	50.6/24.3
26	Dráva	Örtilos/Barcs	05FF18/000833	225.0/235.9
27	Mura	Letenye	06FF23/000360	35.2/35.6

Figure 4.1. Network diagram of the river system in Hungary Danube and its tributaries

Figure 4.2. Network diagram of the river system in Hungary River Tisza and its tributaries

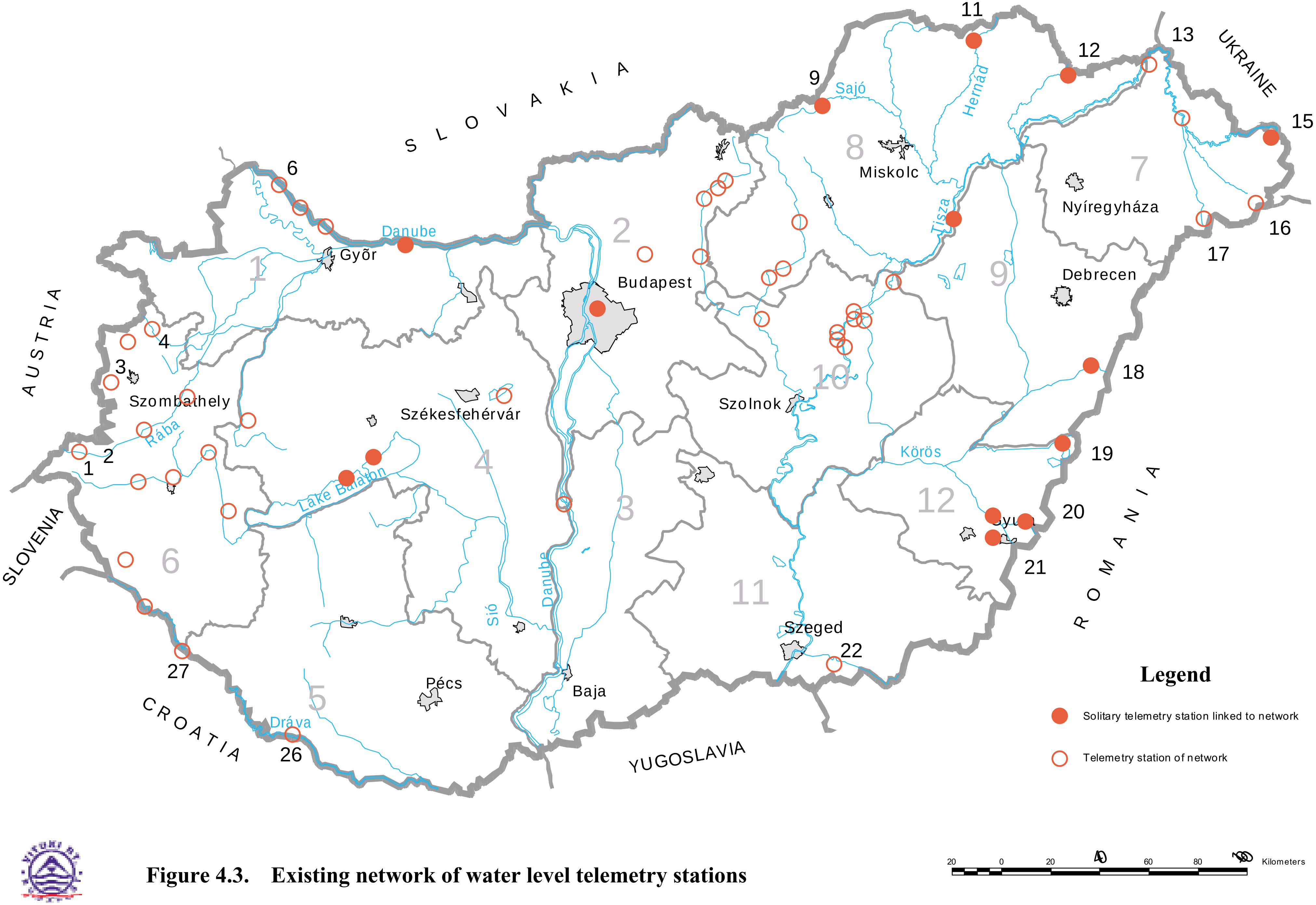


Figure 4.3. Existing network of water level telemetry stations

4.1.2. Data Coming from the Routine Water Quality Monitoring

The national water quality monitoring network is in operation at present according to the requirements of the relevant Hungarian Standard MSZ 12749 **[4.]** and consists of 150 sampling stations. The Standard precisely regulates the requirements and conditions of the routine water quality monitoring activities and contains the following main issues:

- list of sampling sites on rivers, main canals, lakes and reservoirs,
- frequency of samplings (Table 4.3.),
- list of quality parameters to be determined in each sampling sites,
- surface water quality standards (see Annex 1.),
- classification system, and
- method of preparing water quality maps.

Novelty of the monitoring system in operation since 1994 is the complexity, the evaluation and processing of quality data and covers also the results of the microbiological investigations carried out by the cooperating partners within the public health sector. Locations of the important water quality monitoring stations are illustrated in Figure 4.4.

Table 4.3. Sampling frequencies in the national monitoring system

River System	Sampling frequency							Total
	52	26	3x26	24	12	8	6	
	minta/év							
Danube	8	65	6	6	3	0	6	94
Tisza	8	43	1	0	0	4	0	56
Total	16	108	7	6	3	4	6	150

The national water quality monitoring network is supplemented by a regional network with further 91 stations, data of which are also processed together with the data coming from the national network.

The up-to-date on-line connection between the laboratories of the Environmental Protection Inspectorates (which took over this task from the district water authorities) and the Institute of Environmental Management (KGI), where the data processing is made, is still lacking. The form of data transfer is still the sending of floppy diskettes. The Environmental Protection Inspectorates are to send the monthly records to KGI by the middle of the next month.

Publishing of the water quality data

The Institute of Water Management VGI, predecessor of KGI, regularly published the data in annual Water Quality Year Books in the period 1970-1981. Volume 11 of this series, for example, includes (among others) the statistical evaluation of the 1976-1978 data of 95 stations: annual minimum, maximum and mean, standard deviation, annual median, summer half-year average and classification on the basis of limit values of the prevailing standard, 90%, 80% and 10% duration values. The tabulated summary was made for the following parameters: COD_d, BOD_5, DO, TDS, NH_4, NO_3 and extracted (UV) oil.

The series of Water Quality Year Books was terminated in 1981 and was replaced by a new series "The Quality of Waters in Hungary", which is being still published annually, with a one year time lag. The volume, rich in tables and figures and evaluating texts can be considered an outstanding and important source of information even in international relation. The latest volume was published in 1997 containing information on the situation in 1996 **[5.]**.

Similarly the VGI/KGI has annually published since 1970 the overall water quality maps of Hungary. The maps show the water quality classes and critical values on the basis of the relevant Hungarian standards of the period of concern (MSz-10-172/1-83 and MSz 12749).

The computer software system of the water quality data base

The publications mentioned above serve, in spite of their information richness, mostly for supporting the work of higher level decision makers. The blast-like propagation of PCs in Hungary made the water quality database accessible for many users. In this respect the computer software system termed "Collection and processing of surface water quality data" should be mentioned. This system is being developed in VITUKI in an MS WINDOWS version and will be available by the fall of 1998 for nation wide distribution. The hardware requirements are, as minimum, a 486 processor, 16 MB RAM, SVGA monitor and a relatively fast printer (such as HP 4L).

In the main menu of the system the following initial settings can be made: monitoring stations (and the saving of them), components (and their saving), period to be processed, months to be included, filter values for any water quality parameter, relations ($<$, $\leq$, $>$, $\geq$, $=$, $\neq$), operations (printing, exporting to EXCEL, etc). The present version of the software offers the following functions:

- Entering measurement data
- Visualization of measured values
- Basic statistics
- Basic statistics in annual distribution
- Basic statistics in monthly distribution
- Linear trend analysis
- Water quality classification
- Export of basic data to EXCEL
- Data supply for other agencies (KGI, ANTSZ)
- Listing of measurement data
- Preparation of tables of content
- Visualization of the results of a single investigation for each records
- Tables of duration values

The term "basic statistics" means in this case: number of measurements, minimum, maximum, mean, standard deviation, variance, 10%, 90% and 95% duration values.

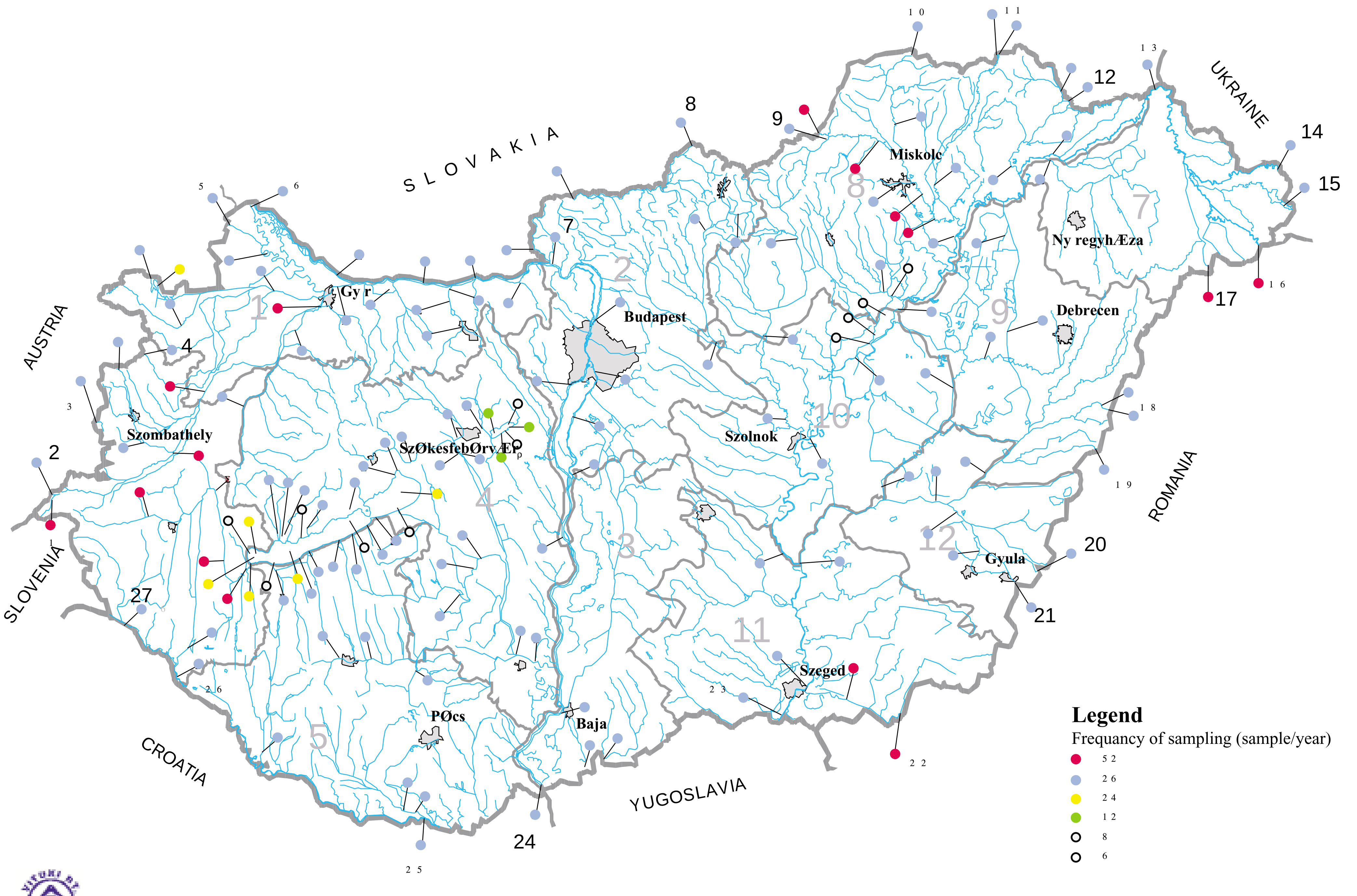


Figure 4.4. Sampling stations of water courses and lakes

Water quality classification system

The monitoring systems of 1984 and 1994 (and the standards behind them MSz-10-172/1-83 and MSz 12749 respectively) differ from each other in three aspects:

- The qualification system, which came into force in 1985, was based on various water uses (biological stability, drinking water supply industrial water supply, irrigation, fisheries and integrated requirements), while that of 1994 is focused at the water as an ecological unit, disregarding water uses. Instead of this latter different groups of components are specified (Annex 1) The difference is only virtual since the integrated qualification system of the former actually includes the quality indices of all water uses and the limit value system is the corresponding range. The latter cannot be used for qualifying according to water uses. In respect to the second the original concept was that as a continuation of MSz 12749, which was developed by the environmental ministry KTM, another system will be developed by the ministry for water management (KHVM) focusing solely at qualification according to water uses. This latter has not yet been done. According to the available information the ministry KTM will again give a contract for the development of a new system.
- In the system of 1985 the basis of the classification is the 80% duration value (the 80% percentile), while in that of 1994 the 90% value (that is a value which is closer to the measured maximum than in the case of the former one). It is to be noted that in case of fewer than 10 samples the determination of these percentiles is not allowed by the rules of statistics. In this case we usually apply the measured maximum, marking this in a footnote.
- The standard of 1994 has substantially expanded the scope of the measured parameters (Annex 1).

Both systems classify for each of the components. In the first system the quality class was defined on the basis of the worst component. In the second system the classification is made for component groups, also on the basis of the worst component of that group.

For the purpose of transboundary studies on water quality conditions, it is important to have information regarding the number of samples (frequencies of sampling) at the different stations and also on the frequency of analytical determinations of certain special water quality parameters.

The Tables (which are attached as Annexes) prepared for this purpose correspond to the near-border stations of the most important transboundary rivers of Hungary and to the mouth stations of three rivers whose catchments fall entirely to Hungarian territory. Annex 2.3. shows the number of samples for the period 1968-1997, separately for the Danube and Tisza River systems. Annex 4.5. presents the number of water quality analyses, also for the two larger catchments, but only for the year 1997. For the traditional components (COD_d, COD_p, BOD_5 NH_4-N, NO_2-N, NO_3-N, mineral-N and PO_4-P) the sampling frequency does not considerably differs from the analytical frequency. The analytical frequency of special components measured since 1994 can be well estimated on the basis of data given for 1997 **[16.].**

Water quality classification was made on the basis of Hungarian Standard MSz 12749 for the stations listed in Annex 2.3. Resulting 90% duration values are in Annex 6.7. while the classes are shown in Annex 8.9. Data of these tables are self-explanatory ones and only some additional remarks will be given below:

- In order to facilitate lucidity water quality class ***IV*** are given in ***bold italic*** while class ***V*** in ***bold italic underlined***.
- Comparing the water systems of the rivers Danube and Tisza it can be concluded that the water quality of the former is generally better.

- In Danube system the worst conditions were observed in the Szekszárd-Palánk station of the Canal Sió. In case of microbiological parameters the worst condition was observed at the Dunaföldvár station of the river Danube, indicating the pollution effect of Budapest. In case of inorganic micropollutants the Győrzámoly station of the river Danube was the worst, showing the effects of the inadequately treated wastewaters of the industrial region along the river Morava.
- In Tisza water system the least satisfactory situation was observed in station Mérk of the river Kraszna. Exceptions are: the heavy metals for which the Station Csenger of the river Szamos was the most polluted one, well characterizing the shortcomings of industrial wastewater treatment in the Rumanian drainage basin.
- It should be mentioned that in the Danube water system the cleanest station was Drávaszabolcs of the river Dráva, while in the Tisza water system the Tiszabecs station of the river Tisza was the least polluted one.
- Comparing component groups to each other the most unfavorable group was that of the microbiological parameters, well characterizing the conditions of communal sewage treatment in some of our upstream neighbor countries.
- Regarding organic micropollutants it should be mentioned, in the light of the data of Annex 4.5. that only scattered data area available and the field laboratories are still in the phase of training. Exceptions are mineral oil products, phenols and ANA detergents.
- Of the parameters of radioactivity satisfactory data are available for beta-activity only.
- Regarding iron and manganese it should be mentioned that occasionally observed unfavorable conditions are due mostly to natural, geochemical, factors and not to anthropogenic impacts.
- Anions and cations are not shown in the tables. Hungarian standard MSz 12749 requests monthly measurement of these parameters but does not specify limit values. Their evaluation and classification can be made in terms of conductivity, which is proportional to total dissolved solids.
- Finally it should be emphasized that the data presented correspond to a ten-year period (1988-1997). Water quality changes, which have occurred in the meantime, will be discussed in the next section.

The latest water quality map of the Hungarian river system is illustrated in Figure 4.5.

Tendency of water quality changes

To assess the changes and water quality linear trend analysis were made for the stations discussed in previously for the ten-year period of 1988-1997. Results of this analysis are shown in Table 4.4. and Table 4.5., according to the water systems of the rivers Danube and Tisza. Results of the calculation are presented in %/year dimension.

In selecting the period the basic concept was that this is the period when substantial economic recession was experienced in both Hungary and in some of our upstream neighbors (while in other upstream neighbor countries this was the period of large scale development of sewerage and sewage treatment). Both resulted in substantial decrease of pollution loads. To illustrate this we mention here only a single numerical date: in 1994 in Hungary the total of nitrogen fertilizer application rate was as low as in 1960 and was about one-third of the maximum rate of 1988.

Table 4.4. Tendency of quality changes in selected river sections (Danube catchment)

Quality Parameter	Unit	**Duna** Győr-zámoly 1806.0 rkm	**Duna** Szob 1708.0 rkm	**Duna** Duna-földvár 1560.0 rkm	**Duna** Herceg-szántó 1435.0 rkm	**Ipoly** Ipoly-tarnóc 179.0 rkm	**Dráva** Dráva-szabolcs 68.0 rkm	**Rába** Szent-gotthárd 202.6 rkm	**Sió csat.** Szekszárd-palánk 13.0 rkm
BOD	mg/l	-4,2	-1,4	-1,2	0,5	-0,1	-1,9	2,6	-4,3
CODp	mg/l	-2,1	-3,2	-1,9	-1,9	-0,6	-7,0	2,1	-1,6
CODcr	mg/l	-2,8	-2,5	-1,4	-1,8	-0,7	-7,8	0,7	-3,0
NH4-N	mg/l	-13,1	-7,5	-8,0	-8,7	-4,1	-8,8	-10,5	-34,4
NO3-N	mg/l	-1,1	-1,3	-2,0	-1,7	-0,5	3,4	-0,6	-11,9
Mineral N	mg/l	-1,9	-1,7	-2,4	-2,2	-1,7	2,1	-1,7	-21,2
PO4-P	μg/l	-11,2	-11,0	-14,3	-13,8	-2,9	-11,9	-7,9	-13,3

Table 4.5. Tendency of quality changes in selected river sections (Tisza catchment)

Quality Parameter	Unit	**Tisza** Tiszabecs	**Tisza** Tiszasziget	**Sajó** Sajópüspöki	**Bódva** Hídvégardó	**Hernád** Tornyosnémeti	**Bodrog** Felsőberecki	**Szamos** Csenger	**Kraszna** Mérk	**Berettyó**Pocsaj	**Maros** Makó
		757.0 rkm	162.5 rkm	123.5 rkm	63.7 rkm	102.0 rkm	46.0 rkm	45.4 rkm	42.2 rkm	71.5 rkm	24.3 rkm
BOD	Mg/l	-5,3	-8,2	-14,2	0,5	-3,6	-3,1	-8,7	-6,8	-2,9	-13,5
CODp	Mg/l	-4,6	-5,8	-25,8	0,6	-2,5	-2,0	-14,0	-8,9	-4,5	-4,3
CODcr	Mg/l	-6,7	-2,6	-21,5	-0,3	-3,3	-2,4	-14,2	-11,2	-0,7	1,6
NH4-N	Mg/l	-16,6	-18,1	-11,6	-5,6	-14,4	-8,1	-21,8	-18,9	-4,0	-30,3
NO3-N	Mg/l	-3,1	-10,3	2,6	-1,8	-0,7	-4,9	-3,4	1,9	-1,6	-16,5
Mineral N	Mg/l	-5,3	-11,8	-0,1	-2,1	-5,0	-5,4	-10,5	-11,7	-3,9	-19,2
PO4-P	μg/l	6,1	-6,1	-2,8	-3,7	-2,7	-0,7	-2,9	-7,7	2,5	-11,0

4.1.3. Data on Accidental Water Pollution Incidents

Approximately 95% of the surface water resources originate from abroad. This condition creates a continuous potential risk for water users principally from the point of view of quality, but also of quantity. In particular, the safety of drinking water intakes is endangered, because the river systems entering Hungary are often subjected to accidental water pollution incidents. An actual need has been formulated during the recent decade by the Waterworks using surface water resources for public drinking water supply towards early warning services, which can increase the safety of their operation by providing information in due time about the characteristics of an unexpected accidental water pollution event. There are no early warning water quality monitoring systems in operation at present in Hungary, except the international Danube Accident Emergency Warning System (Danube AEWS). One of the main goals of a recently completed Phare project ("Development of surface water monitoring based on the EU practice in Hungary") in this field **[14.]** was to evaluate the existing data and information from this respect and create a practical basis for the future implementation of early warning systems. On the other hand Hungary actively participates in the operation of the Danube AEWS, having the fully operational Hungarian National Center of this Danube AEWS in Budapest called PIAC-05 (Principal International Alert Center).

The regular surface water quality monitoring network has 27 sampling sites on rivers crossing the national borders of Hungary, of which there are 24 sites of entering sections and only 3 sites of leaving sections. This situation underlines the importance of water quality control at the border sections of the river-system, with special attention on sudden changes of quality caused by accidental river pollution incidents abroad. Figure 4.7. illustrates the river system of Hungary with special attention on the transboundary rivers arriving from upstream countries, and based on a former study **[18.]** the distribution of foreign accidental water pollution incidents are also introduced.

Figure 4.6. Accidental water pollution incidents in Hungary between 1985-1986

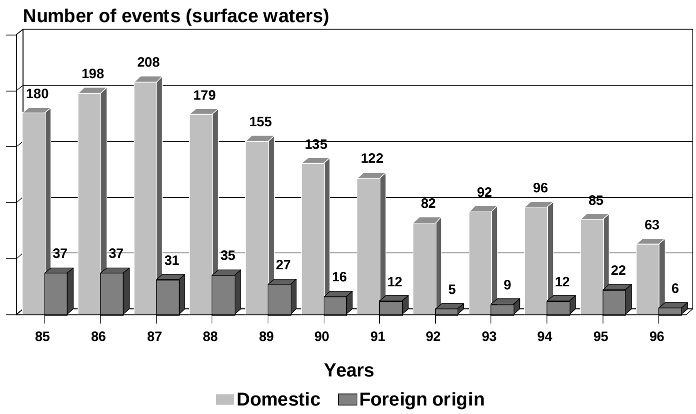


Figure 4.7. The river system of Hungary and statistics on transboundary water pollution incidents

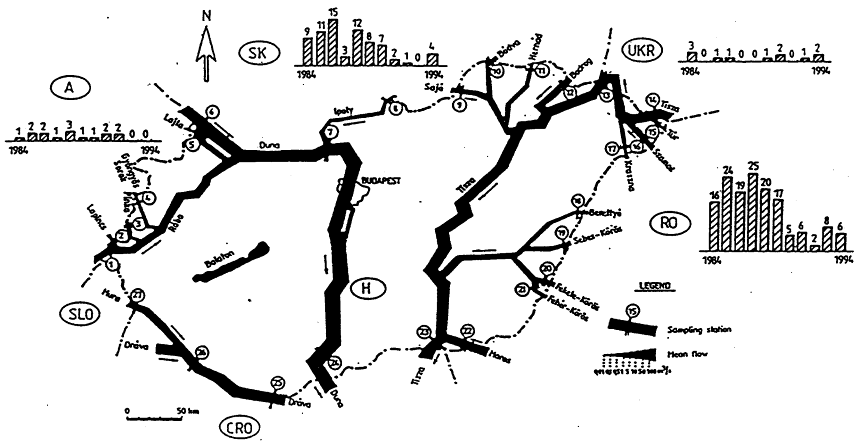
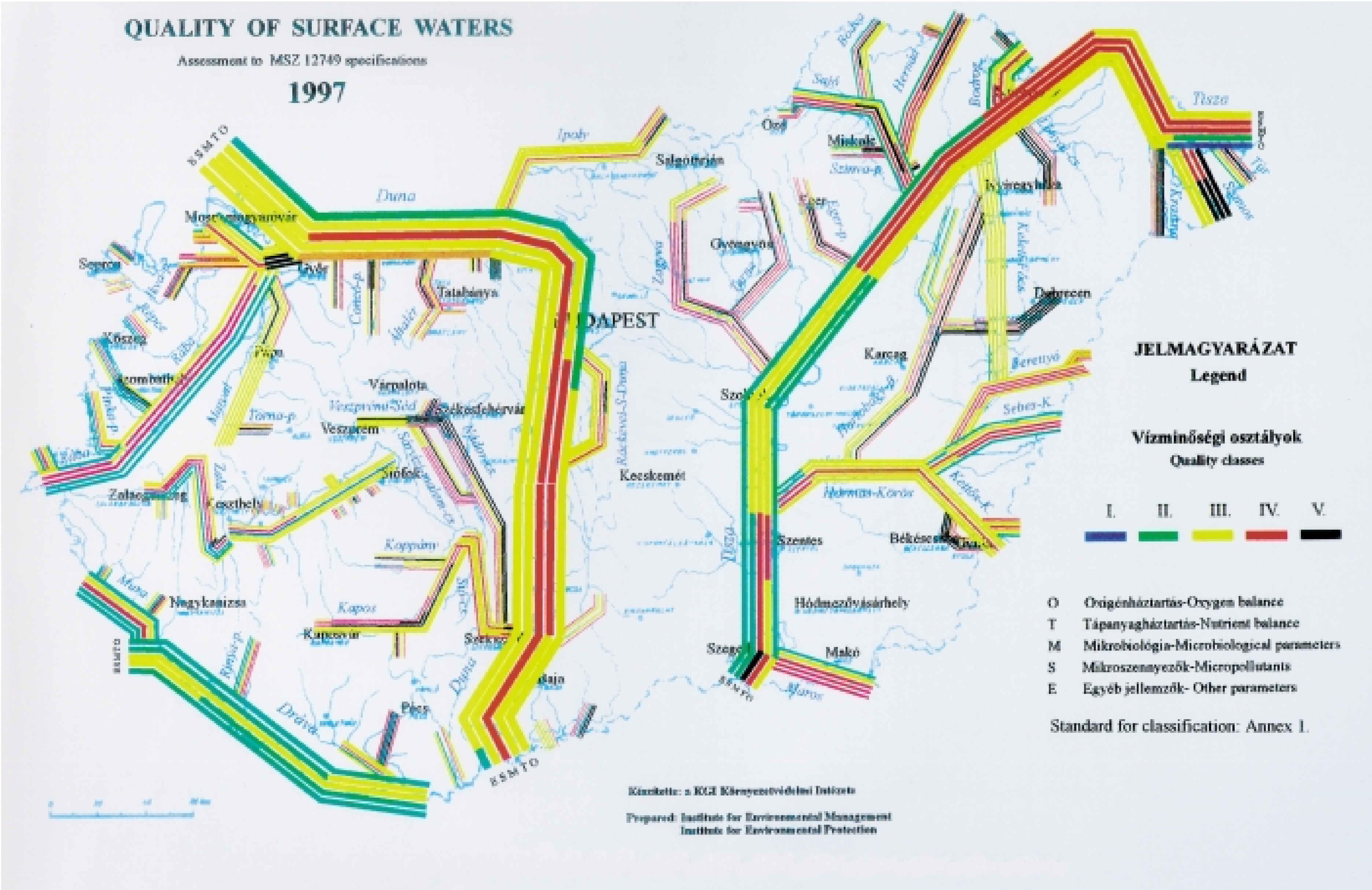


Figure 4.5. Water quality map of the river system in Hungary, 1997



Accidental water pollution incidents registered on national level by the responsible Hungarian Authorities (the 12 district Environmental Protection Inspectorates) are summarized in Figure 4.6., illustrating the number of pollution cases originated both from domestic and foreign sources between 1985 and 1996. The culmination of the numbers of pollution incidents has occurred in 1987, when there were 262 cases, of which 208 affected surface waters within the country and 31 arrived from upstream foreign countries **[17.].** The polluted water travelled down on the rivers to Hungary and caused temporary problems in the use of river water. Following the year 1987 the observed annual number of accidental water pollution events generally decreased, and since 1991 a significant decrease of cases was observed. It is necessary to note, that the basic cause of this change is assumed to be the recession of economies of the countries upstream from Hungary, resulting in decreased industrial activities, less usage of agrochemicals in the agriculture, etc.

The results of the regular water quality monitoring usually can not reflect the unfavorable effects of accidental pollution events, which basically have a stochastic character. This is why the automatic water quality monitoring stations have outstanding importance in border sections of those rivers, which are often subjects to accidental water pollution originated abroad.

The analysis of the distribution of the type and kind of observed accidental water pollution events showed that mineral oil and its products coming from different sources were responsible for most of the pollution events in each of the years. Pollution from source indicated as "industry" organic and inorganic industrial wastes were reported, from "agriculture" generally land runoffs polluted by fertilizers and pesticides and accidental discharges from animal husbandries were observed, while as "other" sources different specific pollution incidents were summarized, like algae blooms (increased rate of primary production), etc.

According to the results of a previous study based on the available data on the ten years period between 1981 and 1990, accidental water pollution events endangered drinking water resources, resulting in restrictions on, or even the shut-down of surface water intakes in 26 cases during this period. There were also temporary closures of intakes on five occasions for periods longer than two days. Events of special interest were related to an increased rate of primary production (algae blooms), that had paralyzed the operation of the Surface Water Intake Works of the Budapest Waterworks on four occasions **[18.].**

A significant number of the accidental river pollution cases were caused by oil-spills from different sources during the last ten years. The Danube-Maine-Rhine waterway, after being put into operation, may be exposed to an increase in oil pollution, which may also affect the Hungarian stretch of the river Danube, where the safety of drinking water resources is outstandingly important from point of view of public supply.

There is a nation-wide watching and observation system of the environment protection and the water management sectors to detect accidental water pollutions, assisted by public organizations (e.g.: angling societies, etc.) as well as state organizations, like Water Police, Home Guard, etc. The separation of the formerly unified water and environment protection sector in 1990 however significantly weakened the efficiency of the formerly common and unified activities in this field.

The Danube Accident Emergency Warning System (DAEWS)

The objective to establish the DAEWS was to increase the safety of the population and to protect drinking water resources in particular, should accidents occur which have a negative impact on the Danube River or its tributaries, and to protect the environment against the effects of such incidents. Especially in case of water pollution incidents having transboundary character there is a clear need to improve the flow of early information about such events between the riparian countries. In the present phase the DAEWS deals first of all with transboundary water pollution problems, and able also to assist flood control activity by providing rapid information on unexpected changes of water levels. Later the fields of activity of the system can be extended to any kind of environmental hazards or catastrophic events **[19.].**

The development work of the regional DAEWS system has been designed and carried out by the Accident Emergency Warning System Sub-Group (composed of experts from the riparian countries). Delft Hydraulics as Consultant partner provided technical support for the development activities and the Danube Program Coordination Unit in Vienna carried out coordinative assistance for this work between the years 1992 and 1997.

The practical experiences gained in the many year’s operation of the international Rhine Alarm System and also the recently developed system for the Elbe River have been the basis for the proposed set-up of the DAEWS. Activities are still going on, focussed mainly on the preparation of the field implementation of the system in the riparian countries. An essential feature of the set-up of the DAEWS is that it is in accordance with the relevant and adopted multilateral conventions and declarations, as well as on the existing bilateral agreements between the neighboring countries of the River Basin.

The DAEWS consists of three basic elements:

- the National Centers which are already established in the riparian countries, called **P**rincipal **I**nternational **A**lert **C**enters (PIAC-s);
- the international satellite communication system between the PIACs, and
- the supporting institutional background in each country.

The basic role of the PIACs is to coordinate emergency warning at international level. Participating countries already nominated the locations of these Centers, which are forming the backbone of the system. The location of the PIACs in the Danube River basin is illustrated in Figure 4.8.

There is a territorial "gap" in the system for the time being, represented by the countries of Yugoslavia and Bosnia-Herzegovina. The design of the DAEWS however easily allows the extension of the system in the future, with an integration of the remaining areas in the region. The PIACs of Ukraine and Moldova are under establishment by the financial assistance of the Tacis Fund.

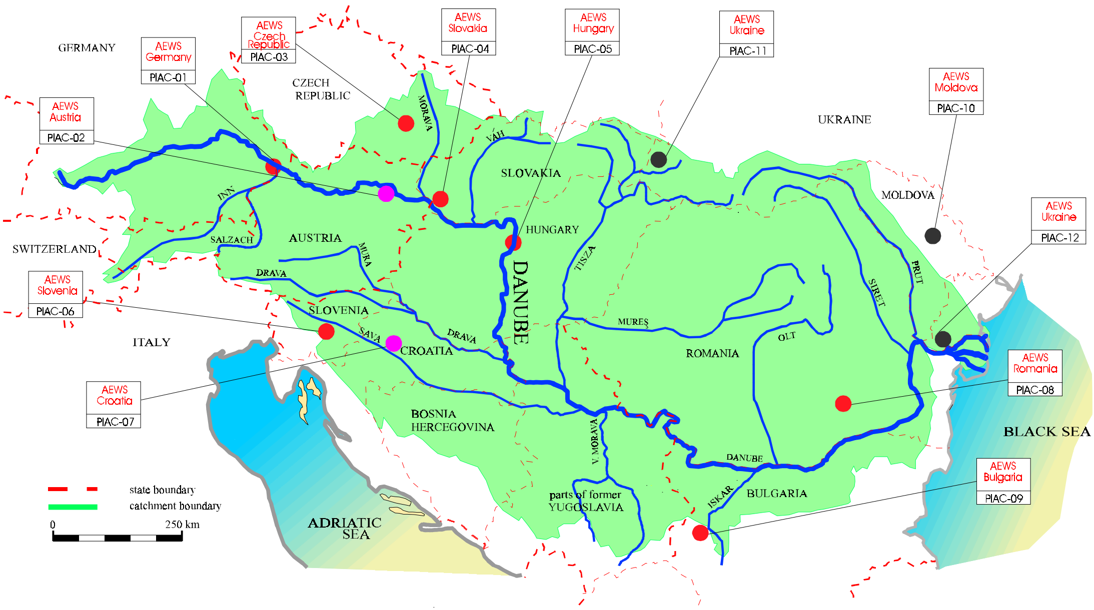
The basic role of the PIACs is to coordinate emergency warning at international level. In case of an accidental spill an early message (or warning if there is serious water quality deterioration observed) is transmitted towards the downstream with detailed information on the characteristics and expected effects of the pollution. Information provided in due time by the PIACs could substantially support the pollution control activities of the responsible local authorities of the riparian countries and could prevent possible damages, or operational problems at the important water users.

To perform these tasks there are three units at each PIAC which closely cooperate in case of emergencies:

- the *Communication Unit: CU* (receiving and handling messages through the satellite communication system without delay, working on a 24 hours basis),
- the *Expert Unit: EU* (assessing the transboundary effects or impacts of a reported accidental pollution, this activity is supported by the use of the data-bank on dangerous chemical substances and the Danube Basin Alarm Model), and
- the *Decision-making Unit: DU* (licensed with authority to make decisions on local, or international warnings).

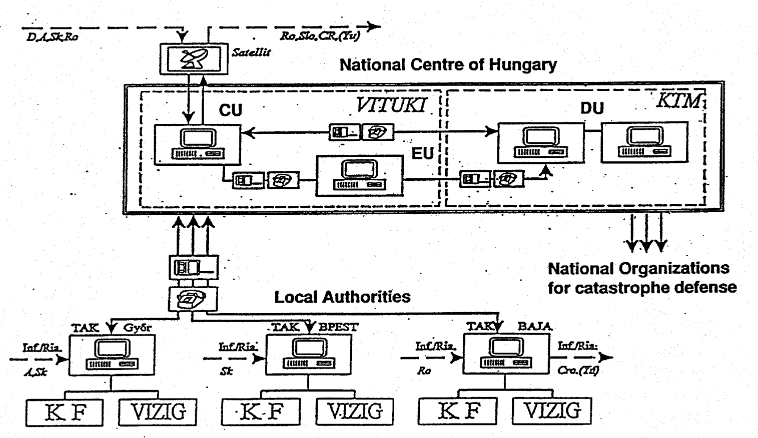
International Operation Manual ensures the smooth and unambiguous operation of the system. Standard Message Forms were developed for the international communication to be used for warning, information request, confirmation of messages, or end of alert messages. The language of the international communication via satellite is English, but the arriving messages are automatically translated into the national language at each PIAC by the applied Information Processing System.

Figure 4.8. The location of the PIACs of the Danube AEWS



The Hungarian PIAC-05 is located in Budapest and its *Communication* and *Expert Unit* is situated in the Water Resources Research Center VITUKI Plc. The Hydrological Forecasting Center deals with the tasks of the *Communication Unit*, dealing with flood forecasting operations and maintaining all day duty. The *Expert Unit* works at the Institute for Water Pollution Control, where the Central Water Quality Laboratory can assist this activity with high level analytical instrumentation. The *Decision Making Unit* is in the Ministry of Environment and Regional Policy (KTM) where the Department of Environmental Safety has this responsibility. There is an on-line computer system to support the activities of the three *Units* in case of emergency situations. The set-up and the institutional background and the communication lines (local Environmental Protection Inspectorates: KF, and Water Authorities: VIZIG) are illustrated in Figure 4.9.

Figure 4.9. Set-up of the Hungarian PIAC-05 of the Danube AEWS



The local Environmental Protection Inspectorates use the Hungarian versions of the Standard Message Forms to send immediate information to the PIAC about detected accidental water pollution incidents. Recently (October 1997 and May 1998) the Hungarian PIAC sent two times international warnings to downstream countries for information on Danube pollution occurred in Hungary, however none of these cases resulted later in transboundary pollution impacts and thus end of alert messages were sent to the same addressees.

4.2. Data Quality Control and Quality Assurance

The importance of reliable and correct control of data for water quality/pollution monitoring is internationally recognized. The quality control of data coming from the regular monitoring activities are running in two main areas. The first is the analytical quality control, which is particularly important in the monitoring of river systems when several laboratories are participating in the water quality monitoring programs, and especially in case of international rivers, when laboratories from different countries are involved. The other area is the data quality control, when the reliability, consistency and compatibility of the data elements are controlled. This activity is discussed in chapter 4.3.

4.2.1. Analytical Quality Control and Quality Assurance in Hungary

The analytical quality control (QC) using check samples for interlaboratory comparison among the laboratories of the Hungarian District Water Authorities started in early 1970s and was initiated by the Water Quality Department of VITUKI. In 1974 VITUKI organized, in collaboration with the Danish Water Quality Institute and the German Emmscher-Genossenschaft, interlaboratory comparison exercise among European water laboratories as part of a programme by WHO Regional Office for Europe. VITUKI continued the proficiency testing in Hungary among the laboratories of the Environmental Protection Inspectorates when they were established from the District Water Authorities in the mid 1980s and soon later extended the check sample distribution to the laboratories of the water works and wastewater treatment plants. At present the number of participating laboratories exceeds 130 within the country.

The QualcoDanube intercalibration program for the Hungarian laboratories includes the quality control of analytical determinations carried out from drinking water, surface water, wastewater, bottom sediment and sludge samples. The quality parameters covered are general parameters, nutrients, heavy metals and non-specific parameters (BOD, COD, ANA-detergents). The applied methods, distribution of samples, statistical processing and evaluation of results are regularly discussed in details in the relevant reports of VITUKI **[20.]**. The participating laboratories provided successful results in the determination of heavy metals and general parameters, among nutrients the nitrite. Improvement was observed in case of ammonium compared to previous years, while in case of BOD the results were not good.

The process of accrediting the Hungarian analytical laboratories in the field of water and environmental quality control has begun in 1995/96 and a three years' license is given to laboratories meeting the very strict requirements as stated in the Hungarian Standard MSZ EN 45 001.

4.2.2. Analytical Quality Control and Quality Assurance on International Level

The need for interlaboratory comparison studies in the Bucharest Declaration Danube monitoring was discussed during the 5th expert meeting in October 1992, held in Bucharest. This meeting agreed to organize an interlaboratory comparative exercise in 1993. The Institute for Water Pollution Control of VITUKI, Budapest, Hungary, took responsibility for organizing the first laboratory comparative runs under the name of QualcoDanube. As part of the AQC for the Bucharest Declaration monitoring, the first distribution in 1993 of samples for analysis included three determinants: pH, conductivity and total hardness. By the end of 1995, four more distributions had been made for analysis of the following determinants: chlorides, COD, nutrients (ammonium, nitrate, Kjeldahl-nitrogen, orthophosphate and total-P) as well as different metals, including Fe, Mn, Ca, Mg, Cd, Cu, Hg, Pb, Ni, Zn. By the end of 1995 five distributions had been conducted.

The Monitoring, Laboratory and Information Management Sub-Group (MLIM-SG) of the Environmental Programme for the Danube River Basin have discussed the problems of quality assurance and analytical quality control (AQC). In 1995 the QualcoDanube proficiency testing scheme was extended to the National Reference Laboratories (NRL) in the Trans-National Monitoring Network (TNMN) and the 1996/2 distribution already included all Danubian laboratories – 11 NRLs and 18 national laboratories – implementing the monitoring programme.

The QualcoDanube distribution 1996/3 was further extended to the Black Sea laboratories (seven) responsible for pollution monitoring in their area. Seven of the Hungarian District Environmental Inspectorates (No. 1, 2, 3, 4, 5, 8 and 11, location of them is illustrated on Figure 2.1.) are also participating in this international intercalibration programme and among them there are the three Inspectorates working along the Hungarian stretch of Danube. This is an important factor from point of view of providing harmonized water quality data for basin-wide studies.

In 1996 four distributions had been made for analysis of general parameters, nutrients, heavy metals and organic pollutants. In 1997 four distributions had been made, too. Most of the determinants were the same as in 1996, but for the first time petroleum hydrocarbon extracts – among organic pollutants – were also distributed. The type of samples and determinants are listed in Table 4.6.

The Institute for Water pollution Control of VITUKI annually evaluated the results of the QualcoDanube intercalibration programme **[21.].** Most of the data provided by the laboratories during the 1997 intercalibration study were satisfactory, when comparing to error thresholds.

While the results in 1996 showed the quality improvement in most of the determinants, in 1997 continuous improvement could not be observed. The performance for the general parameters was satisfactory. Some problems arose due to stability of the samples (e.g. MBAS, PO_4-P) and a relatively long analysis time, which can influence the variation between results.

In case of metals different digestion methods were used and there were some problems for less commonly measured metals (e.g. Hg, As) and at low concentration level (e.g. Cd, Ni, Pb).

Interlaboratory studies organized regularly help to improve analytical performances because the participants can review their own performance concerning the accuracy of the analytical results and where necessary, investigate the sources of error and take corrective actions.

So, it is expected that performance of the Danube basin laboratories will further improve and the comparability of the water quality monitoring results in the river basin and related regions will be ensured.

Table 4.6. Type of samples and determinants in the QualcoDanube check sample scheme

Determinant **Sample** Concentration level	**G** General parameters	**N** Nutrients	**HM** Heavy metals	**ORG** Organic pollutants
SW Surface water	- pH, - conductivity - alkalinity - Cl^{-}. SO_4^{2} - Na^{+}, K^{+}, - Ca^{2+}, Mg^{2+} - TDS	- NH_4^{+}-N - NO_3^{-}N - Kjeldahl-, or Total N - PO_4^{3-}P - Total-P	- Fe, Mn - Hg - Cd, Pb, Cu - Cr, Ni, Zn - As, Se	- BOD, COD, TOC - MBASm - Phenol index - TPHs - Lindane - Atrazine
SS Surface water Sediment	- Ignition loss - Carbonates	- Kjeldahl-, or Total-N - Total-P	- Fe, Mn - Hg - Cd, Pb, Cu - Cr, Ni, Zn - As, Se	- TOC - TPHs - PAHs - Lindane, DDT, PCBs
WW Wastewater	- pH, - conductivity - alkalinity - Cl^{-}. SO_4^{2} - Na^{+}, K^{+}, - Ca^{2+}, Mg^{2+}	- NH_4^{+}-N - NO_3^{-}N - Kjeldahl-, or Total N - PO_4^{3-}P - Total-P	- Fe, Mn - Hg - Cd, Pb, Cu - Cr, Ni, Zn - As, Se	- BOD, COD, TOC - MBAS - Phenol index - TPHs - Chlorinated hydrocarbs
WS Wastewater sludge		- Kjeldahl-, or Total-N - Total-P	- Fe, Mn - Hg - Cd, Pb, Cu - Cr, Ni, Zn - As, Se	- COD, TOC - TPHs - PAHs - Clorinated hydrocarbs

4.3. Data Consistency, Compatibility and Transparency

The results of the national water quality monitoring activities are centrally controlled and processed at the Institute of Environmental Management (KGI). The up-to-date on-line connection between the field laboratories of the Environmental Protection Inspectorates and the Institute is still lacking. The form of data transfer is still the sending of floppy diskettes. The Environmental Protection Inspectorates are to send the monthly records to KGI by the middle of the next month. This is followed by the routine validity checking there.

Essentially the checking includes comparison to a pair of limit values, which are being defined statistically for each station on the basis of the measurement data of the previous 3 years. A list of potential error is generated on the basis of this comparison for the "suspicious" data. These suspicious data are checked by the experts of KGI on the basis of professional and site knowledge and a decision is made on the correction or preservation of the data falling outside the pair of limit values.

Part of the results obtained on the basis of this above analysis of the compliance with limit value ranges will be subject to further and stricter testing. There are certain relationships between various water quality constituents. If the measured data do not comply with these relationships then one of the measured values must be faulty. Examples of such relationships are as follows:

$pH_{laboratory} - pH_{site}$	≤ 0.5
$M_{alkalinity}$	$< P_{alkalinity}$
$COD_{d, original}$	$> COD_{d, settled}$
$COD_{p, original}$	$>COD_{p, settled}$
$COD_{p, original}$	$> COD_{k, original}$
$COD_{p, settled}$	$> COD_{k, settled}$
Total N	> Mineral N
Total P	$> PO_4$-P
Total cation equivalent	≈ Total anion equivalent
Total hardness	> Carbonate hardness
Total dissolved solids	≈ 0.7 x conductivity
Total metals	> total dissolved metals

All those data, which proved to be correct in both formal and professional testing, will be entered into the water quality data base.

Water quantity data of the data base

At the time of taking water samples a reading of the nearest water level gauge is made. Discharge data are obtained from the so called Q-H rating curves (the relationship between water stage and flow). Unfortunately this Q value is the weakest element of the chain. There is more than one reason for this. The first is the shortcoming of information transfer between hydrologists and water quality experts. Another reason is the instability of the Q-H curves, due to the changes of the channel bed.

Systematic correction of discharge data, in close cooperation with hydrologists, started in 1994 and is being currently made. In this correction work KGI proceeds from the large water courses towards smaller ones and backward in time. This means, for example, that the water flow data of the river Danube can be considered reliable for the past 15-20 years and absurdly high and low flow data had been filtered out from earlier records as well. The case is similar for the medium size water courses but the corrected period is shorter than that of the river Danube. For the small water courses only the filtering of absurdly extreme discharge data can/could be made and this process is still under way **[16.].**

Impact of changes in the mean time

Regarding the length of the time series of 150+91=241 stations mentioned in section 4.1.2. the following statements can be made:

- The number of stations with uninterrupted records (in the periods 1968-1997 and 1969-1997) is 126, the majority of whose operate since 1968.
- The number of stations operating with smaller or larger interruptions since 1968 or 1969 is 22.
- At the rest of the stations observation has started either in 1975 (Lake Balaton), 1985 and 1994, at the onset of new standards.

The type and number of parameters have not changed much between 1968 and 1994. Smaller changes were as follows:

- Between 1968 and 1977 there was much uncertainty regarding the question whether COD_d and COD_p should be determined from settled or filtered samples. Since 1977 both parameters have been determined from the original sample.
- There was another question regarding COD_d and COD_p (mostly among foreign experts), namely; why to measure both? The answer is simple. Our upstream neighbors measure(d) almost exclusively COD_p, thus we could not disregard this parameter. However, Hungarian standards request the measurement of COD_d for characterizing wastewater discharges. Thus in order to remain able to compare emission and immission values we have to measure both.
- The scope of water quality parameters and indices has been changed in 1994. New components have also been included. This referred to various groups of components: components of the plant nutrient cycle (Total N and Total P); inorganic micropollutants (aluminium, arsenic, boron, cyanide, zinc, mercury, cadmium, chromium, nickel, lead and copper), organic micro pollutants (Chloroform, carbontetrachloride, trichlorethylene, tetrachlor-ethylene, lindane, malation, 2-4D, MCPA, atrazin adn PCB); hydrobiological parameters (Chlorophyll-a, Pheophytin, total algae count,, zooplankton, algae biomass); microbiological indices (coliform count, faecal coliform, faecal streptococcus, clostridium, total telepszám at 22 ^oC, and at 37 ^oC); radioactivity indices (total beta activity, cesium-137). Among the above mentioned parameters total N, total P, heavy metals (with the exception of arsenic, boron, and cyanide), chlorophyll-a, coliform count and total beta activity are the most frequently measured ones **[16.].**

Changes in analytical methods

Before 1968 the methods of laboratory analysis were characterized with high heterogeneity. After 1968, however, the methods of the American Standard became known also in Hungary and they were utilized when establishing the unified analytical methods of the COMECON countries.

Data of the first years after 1968 should be, however, still handled with care, due to reasons other than the heterogeneity of analytical methods. The restricted reliability is due to the fact that in 1956 the development of the laboratories of the district water authorities started from nothing and it took considerable time until they recruited appropriately qualified staff and had their work accepted in the water authority where the bulk of the activities was related to flood control and excess water drainage. The gradually upgraded instruments and equipment resulted, eventually, in increased analytical reliability.

Substantial change in the analytical methods was made in respect to orthophosphate phosphorus only, in the early 1980-ies. The exact date can not be given since it was "laboratory-specific", that is occurred at different times at the various laboratories, depending of the purchase of the respective instruments. In respect to mineral oil (UV) one cannot state that the database is homogenous in the whole country.

Comparable time series

As a consequence of the conditions discussed above, the length of water quality records, which can be considered homogenous, is more than 25 years. Orthophosphate and mineral oil are the exceptions among the traditional components. In respect to the new water quality indices, which were included in the analysis in 1994, the accuracy of organic micropollutant data remains questionable due to the low frequency of the analysis.

Suspended sediment and sediment load

The analyses of water samples always include (even before 1968) the total suspended solids (TSS). The analytical method basically differs from the one used in hydrology for the determination of suspended sediment and thus the two types of data can not be compared. Bed-load is not determined from the water samples.

4.4. River Channel Characteristics

Hungary has outstandingly long tradition in hydrography, river regulation and water management. The Hydrographic Service was established in 1886. As a consequence of this long tradition there are long practical experience, wide-range knowledge and large amount of data and publications on the characteristics of the water resources in the country. The first volume of the Hydrographic Yearbook was issued in 1887. This Yearbook is published every year by the Institute of Hydrology of the Water Resources Research Center VITUKI Plc., commissioned for this task by the Ministry for Transport, Communication and Water Management (KHVM) in Budapest.

The Hydrographic Yearbook contains a large variety of basic data for research, planning and control purposes on the characteristics of the different river sections and flow conditions, as well as the basic data of the observation wells. The latest Hydrographic Yearbook 1996 **[22.]** was published in 1997 and as a novelty a CD-ROM is attached, which contains a large amount of hydrological and water quality detail will be soon available also in this form too. To introduce the available data sets from this Yearbook, an example is given concerning the important Danube River section at Nagymaros (rkm 1694.6) as follows:

- Hydrometeorological characteristics,
- Basic data of the observation station
- (registration number, elevation, coordinates, catchment area, etc.)
- Daily, monthly and annual characteristic water level (stage) values,
- Water level curve of the year 1996,
- Stage duration values (written stage duration curve) for 1996,
- Daily, monthly, annual and multi-annual characteristic water flow (discharge) values,
- Hydrographs (water flow curve) of the year 1996,
- Flow-duration values (written flow duration curve) for 1996,
- Specific annual runoff in l/s/km2,
- Data on bed load and suspended load conditions,
- River bed profile (cross-section profile),
- List of flow measurement stations.

Similar data are available from the Yearbook also for other important river sections in Hungary.

Information on the channel profiles and gradients of the main rivers in Hungary are presented in the Hydrographic Atlas Series (HAS), which are public proceedings and available for any professionals for utilization. Detailed information for example about the river Danube is included in the three volumes of HAS No. 11. **[23.]**. These volumes contain a general description of the hydrography and geomorphology of the river's direct catchment as well as information of the changes of river bed conditions. Moreover the wide range of information cover also:

- List of bench marks along the river;
- Detailed map of the Hungarian section of the river (1:10 000) controlled by airphotogrammetry, showing the embankments, river regulation structures, flood protection dikes, and sites of stages, cross-sections, bridges, confluence of tributaries;
- Longitudinal section (gradients) of Danube (1:100, 1:200 000) illustrating the shore-lines, dikes, bottom of river bed, sites of stages, bridges, cross-sections, confluence of tributaries;
- Registrated cross-sections (1:250, 1:5 000);
- Valley cross-sections (1:500, 1:10 000);
- Bridge cross-sections (1:500, 1:2 500);
- Grain-size distribution curves of the river bed material in the registrated cross-sections.

Similar information are available about river Tisza in six volumes of HAS No. 22. **[24.]**. There are altogether 26 items of the Hydrological Atlas Series (HAS) covering all the important rivers in Hungary. These items are publicly available in technical, or scientific Public Libraries for those who are interested in. The best source of the HAS items is the Scientific Library of the VITUKI Plc. in Budapest.

The present National Reviews do not contain those data, which are publicly available in printed Yearbooks, Atlases and in other widely accessible information sources.

4.5. Floodplains/Wetlands

The establishments of the flood and excess water control are discussed in this chapter and also the floodplains/wetlands from point of view of nature conservation and water pollution problems.

4.5.1. Flood and Excess Water Control

The regulation of the water environment received an impetus in Hungary in the late 18th century, according to the requirements of the society. The construction of the system of flood protection embankments and the drainage of wetlands had been finished during the following 100-year period up to the end of the 19-th century. However the improvement of flood protection structures according to the rise in the value of the protected area and the development of the system of drainage canals and pumping stations have continued until now. One third of the total territory of the country lies under the level of floods and the system of drainage canals and pumping stations enables the normal functioning and protection of economic activities.

The areas of flood control and land drainage in Hungary are illustrated in Figure 4.10. Almost one-quarter of the country was exposed to extended or periodic inundation. The Figure shows both the flood plains and the lands above the flood level. Once the latter had been fully exploited economically early in the past century, society was compelled to encroach upon the flood plains and to confine the areas dominated by water i.e. introduce flood control. This vast transformation - though completed essentially during the past century - is still being perfected and expanded. As a result, flood control has been introduced over 25,000 km^2 of the ancient flood plains, and flooding now is confined to the 1,500 km^2 area between the flood levees. The main-line levees of 4.200 km total length, provide flood safety for about 45 per cent of the territory of the country inhabited by almost one half of the population. The flood waves travel down the rivers with peak stages considerably - on occasion several meters - higher than under the original conditions **[25]**.

A corollary of the construction of the levees has been the need to provide artificial drainage to vast areas at times of high stages. The protected flood plains have accordingly been subdivided into 83 polders. To illustrate the drainage capacity it should be noted that the total length of drainage canals surpasses 40 000 km, while about 450 pumping stations are capable of lifting a discharge of 840 m^3/s across the levees. The overall discharge per unit area thus reaches 28.5 $l/s/km^2$.

4.5.2. Nature Conservation in the Floodplain/Wetland Areas

Aquatic/wetland ecosystems used to be and are still endangered. At the same time it has to be mentioned that Hungary was very rich in perennially and temporarily inundated areas, until the beginning of large-scale river-regulation works and land-reclamation activities (which actually begun already during the era of the Roman empire’s presence in the western parts of the country, called at that times: Pannonia). In spite of very extended human impact on aquatic/wetland sites huge areas survived and there exists a great number of former wetland areas which are not yet beyond irreversible status, which can be still reconstructed. Hungary has quite a reputation in very effective revitalization-renaturalization of former wetlands. Just recently an extended work is done for the "complete" inventory of existing wetland areas and sites which can be still reconstructed. The work is based on the application of remote-sensing methods for such purposes and will lead to a categorization of such areas, plus the edition of an atlas on wetlands in Hungary. Kind of a manual will be available for NGOs in order to promote the participation of the public in similar activities.

The protected areas in Hungary are grouped into the following basic types:

- freshwater aquatic ecosystems,
- wetlands/floodplain ecosystems, and
- terrestrial ecosystems.

National Parks (NP), Landscape Protection Areas (LPA) and Nature Reserves (NR) were established for the protection of the most important ecosystems mentioned above and their location are illustrated in Figure 4.11.

The most important Hungarian wetlands (Ramsar sites) of international importance **[26.]** are listed in Table 4.7., and their location is illustrated in Figure 4.12.

Table 4.7. Hungarian wetlands of international importance

No.	Name of site	Area Code No.	Year of Regist-ration	Size In Hectares
1	2	3	4	5
1	Lake Fertő	1	1989	8 432
2	Tata Great Lake (Lake Öreg)	1	1989	269
3	Ócsa Landscape Protection Area	2	1989	1 078
4	Kiskunság alkaline lakes	2	1979	3 903
5	Bréda-Karapancsa	3	1997	1 150
6	Lake Kolon at Izsák	3	1997	2 962
7	Velence Bird Reserve + Lake Fertő at Dinnyés	4	1979	965
8	Lake Balaton (between 1 Oct. And 30 April)	4	1989	59 800
9	Gemenc	4	1997	16 873
10	Pacsmag Fish-ponds	4	1997	485

1	2	3	4	5
11	Rétszilas Fish-ponds	4	1997	1 508
12	Old riverbed of the Drava at Szaporca	5	1979	257
13	Kis-Balaton	6	1979	14 745
14	Bodrogzug	8	1989	3 782
15	Hortobágy: four separate sites	9	1979	23 121
16	Lake Fehér at Kardoskút	11	1979	488
17	Mártély Landscape Protection Area	11	1979	2 232
18	Pusztaszer Landscape Protection Area (parts)	11	1979	5 000
19	Biharugra Fish-ponds	12	1997	2 791
Total area of important wetlands:				**149 841**

It is important to note, that at present data are not available at all on the hydraulic loading of the wetland areas. Further studies are needed in this respect to have scientifically based knowledge for maintaining the best water management of these areas. Some of the most important wetlands are briefly discussed below from point of view of nature conservation aspects:

Fertő - Hanság NP- the lake is shared by Austria and Hungary. Area and depth are strongly depending on precipitation partly directly, partly by the floods of Danube. The lake is without natural outlet, thus having an alkaline character. The lake, the Hanság, the Szigetköz (and the Csallóköz) are forming a unique hydrological, hydrogeological, geomorphological and ecological unit. An almost complete series of freshwater and wetland habitat classes can be found in the area. Significant habitat types are the open-surface water bodies for migratory birds, the huge reed-beds for nesting of mixed heron colonies, the tall wet meadows and grasslands for geese and ducks, the short temporarily wet grasslands for different waterfowl and the barren soil surface- short grassland habitats, which preserve specific nesting bird species. The wet meadows are abundant in orchids. The Hanság lies east of Lake Fertô, a perfect plain hardly influenced by human activity (drainage, agriculture, extraction of peat). Communities: alder - fern bogs, hard wooded gallery forests, wet meadows rich in orchids, peat bogs, extended grasslands with a good population of Great Bustard.

Gemenc LPA - Hungary's largest wooded floodplain partly preserving the ancient status characteristic before river regulations. It is dissected by abandoned side branches and holds many swamps and other wetlands. The protected area is located between the flood protection dikes. The quality of water is good. The area has lush undergrowth and is rich in game. The woods are mainly oak - ash - elm. Snowdrop, Blue Star, Lily of the Valley are characteristic plants here and the clearings covered by native grasslands. Nesting birds are White-tailed Eagle, Saker, Lesser Spotted Eagle, Black Woodpecker. Large colonies of bats are unique feature of the area.

Kis - Balaton LPA - the area used to be part of the Lake Balaton basin, until it was drained in the last century. In the 1980's the first phase of its reconstruction began. Thus part of the former area became wetland again. It functions as natural filter, sediment and nutrient trap for the river Zala before entering Balaton. It is a waterfowl nesting and migrating area of international importance. The number of species is about a hundred. It is a Ramsar site.

Hortobágy NP -the largest NP, a continuous area which used to be an alkaline lowland area built up and regularly flooded by Tisza. From the beginning of the 19th century river regulation works significantly altered the water regime of the area. Today it contains a mosaic of open water surfaces, bare alkaline patches, alkaline swamps and marshes, meadows, loess grasslands and alkaline short grasslands, small patches of native oak forests and a series of fishponds. Its mosaic-like character comes from geological and edaphic differences and differences in elevation.

In the region from the European bird fauna more than 400 species were observed. The flora is also very rich according to the various habitat types listed above. An important genetic pool is preserved in the Park from ancient domestic animals. Their role is vital in maintaining the ecological balance of the "puszta" by grazing. Wetland reconstructions carried out in the area are important in a context of continental examples as well, and the water regime is adjusted to the movements and activities of birds.

Water quality problems of wetlands in general

Water quality problems related to wetlands might have several reasons. The two main types of these reasons are: the problems caused by *natural processes*, and the *man-made* (antropogenous) impacts. Very often it is not easy to separate the two types, because minor (hardly detectable) human impacts might trigger natural processes of much bigger effect. Very important regulating cycles of a clean/clear river course (a water body in general) are the sequence of: inorganic matter -- algae -- small crustaceans -- fish -- organic matter -- bacteria -- inorganic matter. In case this cycle is disturbed (e.g. by contamination) stability of it might be destroyed by fast multiplying bacteria and their high oxygen demand.

Water quality and - quantity issues can be hardly separated - changes in quantity result almost always in alteration of quality. Algal blooms, might be caused by long lasting high water temperature and high amount of nutrients; mass fish killing by viruses, bacteria, parasites as well. High concentration of suspended load can block penetration of light. But in the background there ought to be human impact (in the form of contamination, e.g. by toxic waste, thermal influx etc.), which is lowering the power of resistance of fish - flora and fauna in general.

Fertõ-Hanság National Park (NP) Directorate

Lake Fertõ is a steppe lake appearing in document since the Roman times, now it is shared by Austria and Hungary. The water resource of the lake originates from precipitation and surface watercourses. The water is shallow and has a salt-content (since it had originally no natural outlet and thus the level of it was mainly regulated by evaporation; and by an artificial canal. It is a 'Man and Biosphere' Reserve since 1979. An integral part of the lake is the *Hanság swamp,* which was fed (via surface and subsurface water) by the floods of Danube. The Szigetköz, the Hanság and the Lake Fertõ have been a common and singular hydrographical unit, until the introduction of human impact ("amelioration" of the Hanság, peat digging and the construction of the Gabčikovo Impoundment and hydropower plant). The establishment of wastewater treatment plants around the lake improved the water quality, and the risk of municipal nutrient load is decreased. Due to the changes in agricultural production, the non-point source pollution load is also much less than before.

Balaton Upland NP Directorate

Little (Kis) Balaton swamp and the Lake Balaton itself used to be one single unit including the inundated valleys ('berek's) adjacent to the southern side of the Lake. Kis Balaton was drained, ameliorated in former times and the bereks were partly drained and partly contaminated by agriculture (mainly stock breeding). Kis Balaton is recently reconstructed, thus acting again as a trap of suspended load which has partly silted-up the W-ern basin of the Lake during the years when the Zala River was running fast and directly between dikes to the recipient. Today the water of the river is again retained in the Kis Balaton Basin, but the original/natural water-household balance will be hardly achieved very soon, if ever. Until this situation, the existing problem caused by the more or less stagnant water will be there too: partly because the water becomes too warm, the formally settled sediment and its contaminants can be stirred-up and aquatic vegetation (reed) is not able to eliminate harmful matters.

Duna-Ipoly NP Directorate

Lake Velence. According to historical data it became dry in about every hundred years. It is shallow and was originally supplied by surface water courses fed partly by karstic springs. The water of the two main brooks was for irrigation purposes held behind barrages and the karstic springs became dry as a consequence of dewatering activities of (bauxite and coal) mines. A dry period lasting for more than a decade brought then the lake into a very labile situation. The lake and the adjacent *Dinnyési Fertõ* (swamp) had to be supplied by water artificially. The water was pumped from Danube and later from a mine, which is an expensive issue. The artificially supplied water had a rather unfavorable quality and caused problems as well (the karstic water from the mines was contaminated). Recently the original/natural water household of the lake becomes balanced again and so the quality problems will be eliminated too.

Tata Great Lake (Tatai Öregtó). It is an artificial lake built by the Romans. The lake is fed by the Általér Creek and used to be fed by lukewarm karstic springs to be found on the bottom of the lake. The Általér Creek was heavily polluted by pollutants from mining, and industrial activities, not treated wastewater effluents, agriculture pollution load and suspended load (erosion of cultivated land!) as well. The karstic springs became dry as a result of the mining activities. Life in the lake was almost lost and the lake as a recreational area and an element of the landscape destroyed. Reconstruction works begun years ago and brought good results.

Hortobágy NP Directorate

Kisköre Impoundment/Reservoir. The dam was built originally for several purposes (power plant, irrigation, navigation) and was never filled up to its full capacity, because of maleffect on agriculture. At the beginning the quality of the water was not suitable for a period of time, partly because of the trees in the lake, which were not removed from it in advance. Today it is a famous recreational area, but because of the lack of proper infrastructure, investments are still necessary in order to avoid problems.

Hortobágy. In the NP recently (partly by foreign aid) wetland areas were reconstructed and thus the former status of the “Puszta” is reappearing, at least in relatively small parts. Prior to the river regulation works of the last century, large areas of the Hortobágy were regularly inundated by the floods (usually twice a year) of the river Tisza. The “original” water quality of the perennially and temporarily inundated areas was obviously determined by these floods. After the river regulation (and amelioration) activities the river Tisza had (except for catastrophic events) to flow within the dikes and thus the very broad floodplain became dry and the depression were only filled up by water fed by precipitation and some minor, almost temporary water courses. The former river branches (having been separated from the river itself) became oxbow lakes and were sooner or later silted up. The reconstruction and revitalization of these is also an integral part of the activities carried out by the Directorate. Here again the main aim is to provide water in the necessary quantity and quality.

Figure 4.10. Flood plains and main levees in Hungary

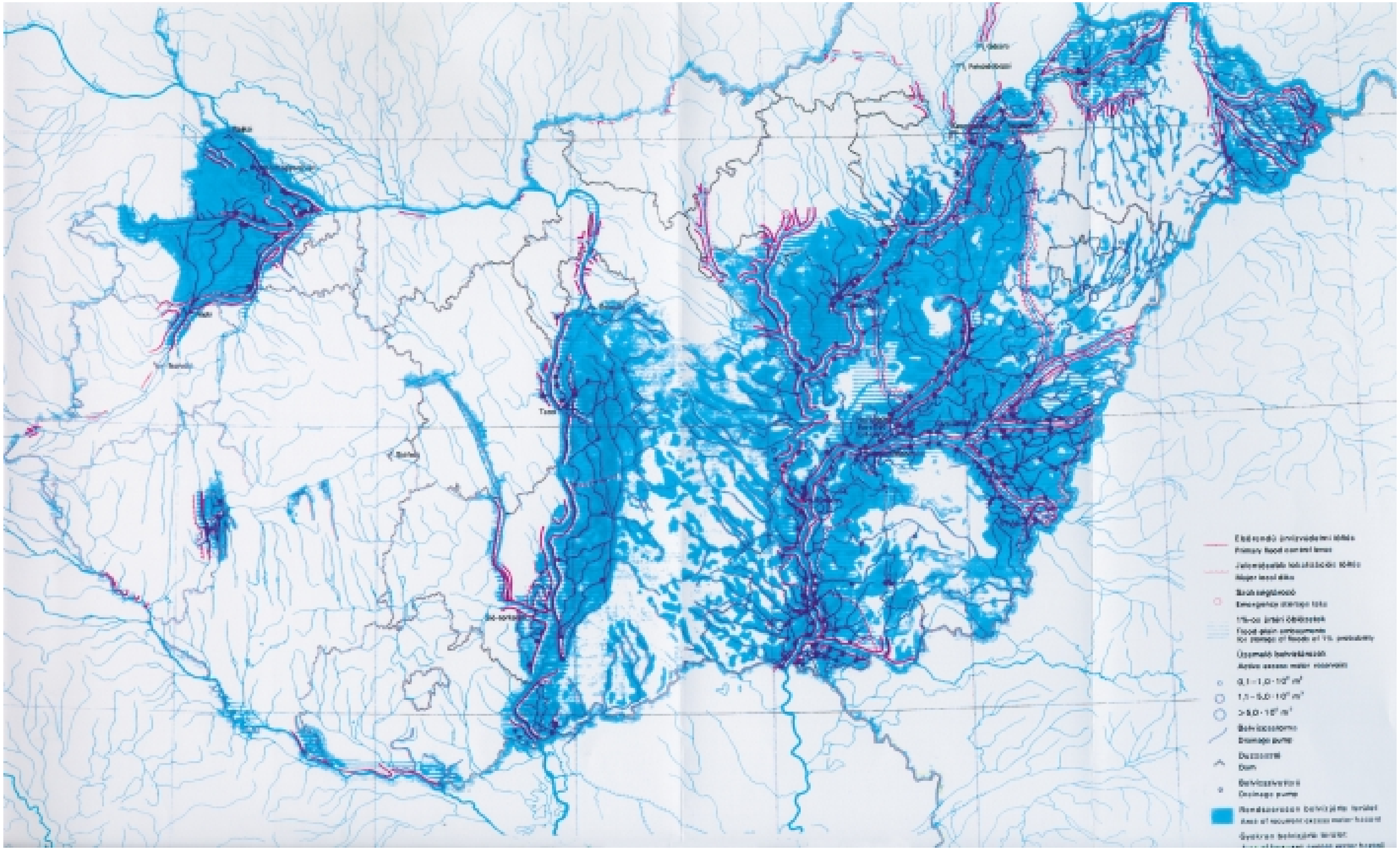
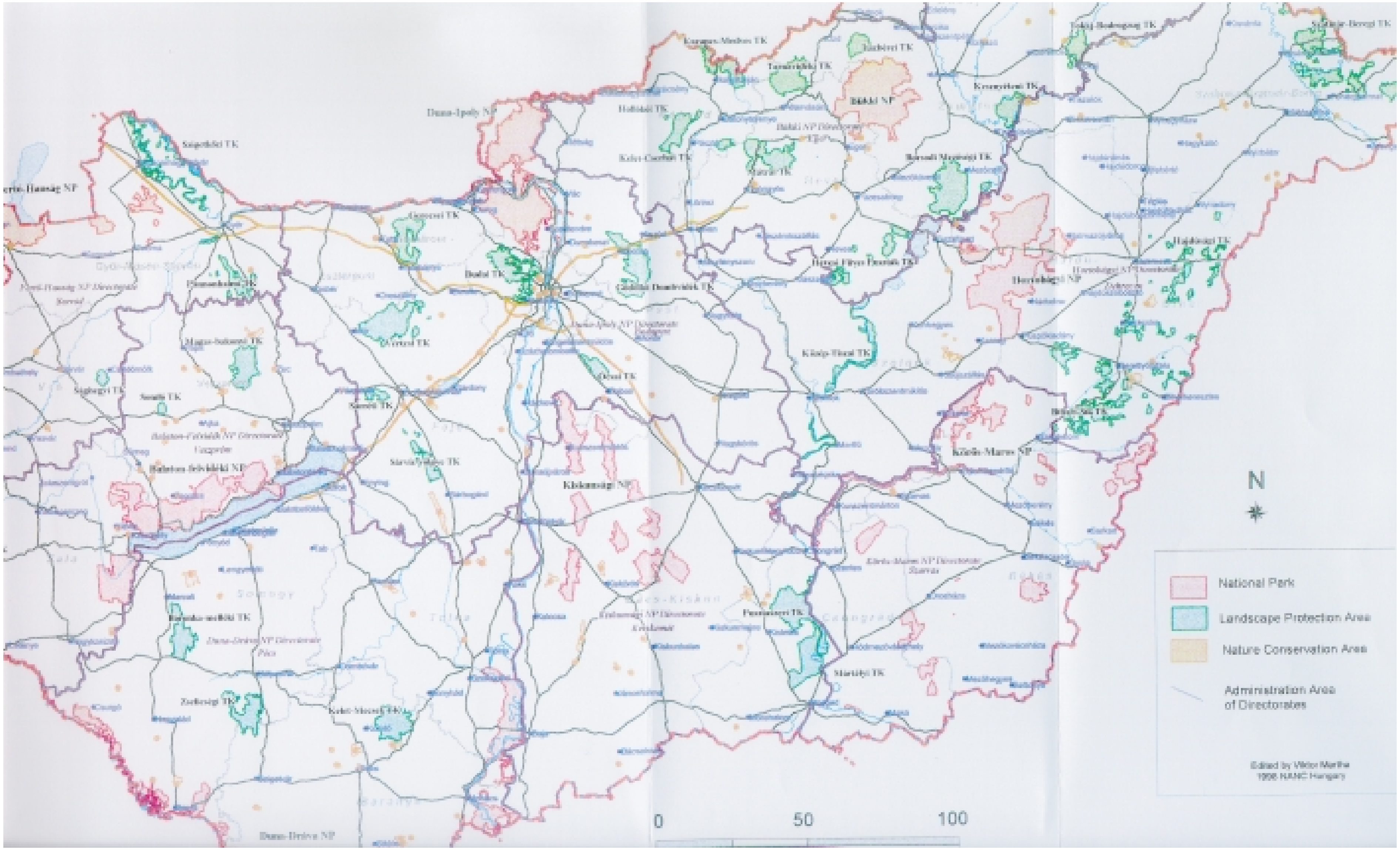


Figure 4.11. Areas for the protection of important ecosystems



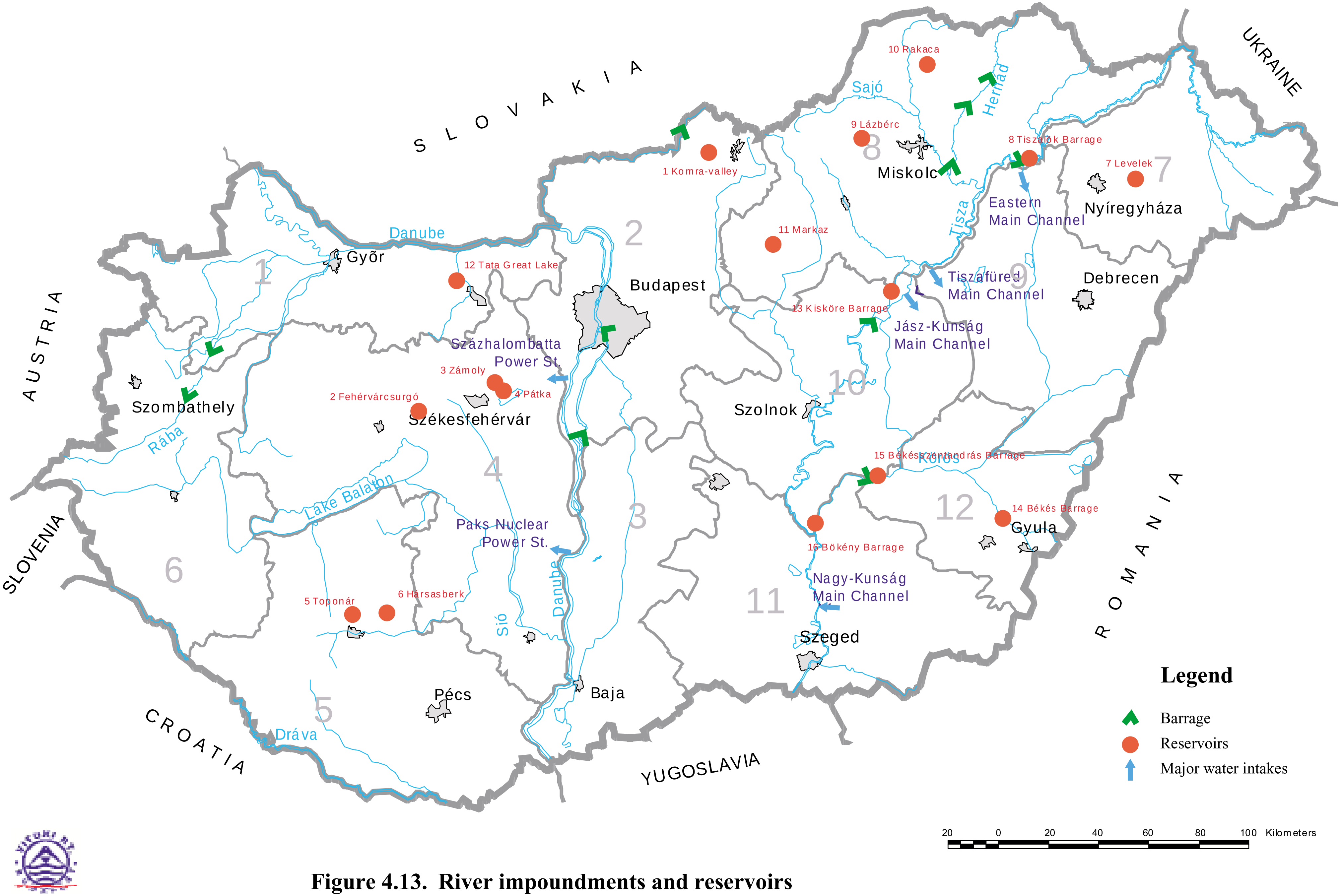


Figure 4.13. River impoundments and reservoirs

4.6. Dams and Reservoirs

The most important establishments of hydropower generation (impoundments) and reservoirs to serve different water usages are discussed under this chapter. The "Part A: Social and Economic Analysis" of the National Review briefly discussed the establishments of hydropower generation in Hungary in chapter 5.1.4. and some of the main characteristics are summarized in Table 5.1.4. There are only two among the listed hydropower stations and their impoundments which have national importance, located at Tiszalök and Kisköre on the river Tisza. Additional information on the most important characteristics of these impoundments and hydropower stations are given below.

4.6.1. Hydropower Stations and Their Multi-purpose Impoundments

The **Tiszalök (Tisza I.) Impoundment** was put into operation in 1954. The system consists of the dam of the impoundment with three weirs at the rkm 524.2 section of the river Tisza, the hydropower station with three Kaplan turbines of 100 m3/s flow-capacity and the ship-lock to maintain navigation. The presently available hydropower productivity is 7.2 MW. The average headwater is plus five meters (maximum 7.2 meters).

The main task of the Tiszalök impoundment system is to provide water for agricultural use (irrigation) for the northern part of the lowlands (Alföld) in the Tisza valley, where an area of 120,000 ha was planned for irrigated cultivation (Tiszalök irrigation system). From the impoundment a water flow of 60 m^3/s can be delivered to the agricultural units through the Eastern Main Canal and the Western Main Canal. Because of the good quality of water the Eastern Main Canal is also utilized for drinking water purposes. Due to the substantial cost-factors of the irrigation and the relatively low financial power of the agricultural units in this area, the utilization of irrigation possibilities is rather low.

The **Kisköre (Tisza II.) Impoundment** system consists of the dam at the rkm 403.5 section of the River Tisza, the hydropower station with pipe-turbines and the ship-lock to maintain navigation. The presently available hydropower productivity is 15.5 MW.

The main objective of the establishment of the Kisköre impoundment system was practically the same as that of the Tiszalök system, to store and provide water for the agricultural uses, first of all for irrigation purposes. The Kisköre reservoir has a storage capacity of 260 million m^3 during the low flow period of the river Tisza. The impoundment system is able to meet the irrigation water demand of a cultivated area of approximately 400 000 ha. The water for this purpose is distributed by two main canal networks, on the left from the reservoir through the Jászság Main Canal, and on the right the Kiskúnság Main Canal.

The Kisköre impoundment system naturally serves other purposes as well, for example it has a significant flood protection role by equalizing peak flow conditions in the river, and during the recent years it developed into a very popular recreation area for water sports and tourism.

The following small size hydropower plants in operation on smaller rivers have only local importance from point of view of energy production and water management:

Ikervár:	River Rába at rkm 100.56,	capacity 1.5 MW
Kesznyéten:	River Hernád at rkm 13.56,	capacity 2.8 MW
Felsődobsza:	River Hernád at rkm 54.35,	capacity 0.2 MW
Gibárt:	River Hernád at rkm 65.9,	capacity 0.4 MW.

The **Kvassay-Weir** with ship-lock and hydropower station is located in Budapest at the upper mouth of the Ráckeve-Soroksár Danube Branch. It was constructed first of all to protect the Danube Branch from flood effects and also to provide water level control and navigation possibilities. The water level management ensures the operation of water intakes for industrial water supply and irrigation. The hydropower station has 1.6 MW capacity for energy production, the average head is 4.6 m. The **Tassi-Weir** is located at the lower end of the Ráckeve-Soroksár Danube Branch. During the high flood event in early spring of the year 1956 the building of the weir broke down because of subsidence.

The **Nick-Barrage** was built on the river Rába at rkm 65.5 with the purpose to provide planned water quantity for the creek Little Rába for water supply purposes.

The **Békésszentandrás-Barrage** is located on the river Kettős Körös at rkm 48.0. It was built in the forties to provide irrigation water for the agricultural units in the Körös valley and to assist the navigation in that area. There is a weir with double tables, headwater is about 5 meters in average. The barrage system is capable to provide irrigation water for an area of 20 000 ha.

The location of the above discussed impoundments and barrages are illustrated in Figure 4.13.

4.6.2. Reservoirs

The existing reservoirs in Hungary were established generally in the catchment areas of relatively small river courses and they serve different purposes. Most of the reservoirs were built for agricultural utilization (mainly for irrigation purposes) and also for industrial and public water supply purposes. Some of them serve low flow augmentation or/and recreation. Especially on the lowlands of the Tisza valley there are several big excess water reservoir, which are mostly filled up only during the very wet periods to avoid the inundation of the cultivated areas. The main characteristics of the most important reservoirs (above four million m3 storage capacity, but without the excess water reservoirs) are summarized in Table 4.8.

The location of the important impoundments and barrages discussed are illustrated in Figure 4.12. , in which the numbering refers to the row-numbers of the above Table.

Technical details on some of the reservoirs being important from point of view of drinking and industrial water supply is provided as follows.

The **Komra-Valley Reservoir** is located on the Komra Creek at rkm 1.094 with a storage capacity of 4.5 million m^3. The reservoir is filled up from River Ipoly (primary tributary of Danube) by pumping up the water into the reservoir. For this purpose a barrage was built at the river section of rkm 125.2. The elevated water goes through a six-step aeration cascade before entering the reservoir. The main task of the reservoir to supply raw water for drinking water purposes for the regional Waterworks of the ENRV (Regional Waterworks of North Nógrád County). The effective water intake for this purpose is 24 200 m^3/day.

Table 4.8. Characteristics of important impoundments and reservoirs

No.	Reservoir	River, or Water Course	Area Code No.	Storage Capacity Million m3	Main use
1	2	3	4	5	6
1.	Komra-valley	Komra Creek	2	4.5	Drinking water
2.	Fehérvárcsurgó	Gaja Creek	4	12.45	Flood control
3.	Zámoly	Császárvíz Cr.	4	7.3	Low flow reg.
4.	Pátka	Császárvíz Cr.	4	8.6	Low flow reg.
5.	Toponár	Deseda Creek	5	8.2	Flood c.+recr.
6.	Hársasberk	Hársasberk Cr.	5	8.5	Flood control
7.	Levelek	IV. Main Canal	7	4.4	Irrigation+exc. w.
8.	Tiszalök Barrage	Tisza	8	10.0	Irrigation+power g.
9.	Lázbérc	Bán Creek	8	5.9	Drinking water
10.	Rakaca	Rakaca Creek	8	5.5	Low flow reg.
11.	Markaz	Nyiget Creek	8	8.4	Ind.water+irrigation
12.	Tata Great Lake	Átalér Creek	9	5.2	Recreation
13.	Kisköre Barrage	Tisza	10	260	Irrigation+recr.
14.	Békés Barrage	Kettős Körös	12	6.7	Irr.+water suppl.
15.	Békésztandr. Barr.	Hármas Körös	12	20.0	Irr.+water suppl.
16.	Bökény Barrage	Hármas Körös	12	12.0	Irrigation

The **Lázbérc Reservoir** is located on the Bán Creek (secondary tributary of River Tisza), near the village Bánhorváti at rkm 10.3 serving the drinking water supply system of the Borsod Industrial Region. The catchment area of the reservoir is 260 km^2 and the storage capacity is 5.9 million m^3. The reservoir belongs to the Borsod Regional Waterworks and provides 20 000 m^3/day water for public supply purposes.

The **Rakaca Reservoir** was built on the Rakaca Creek (secondary tributary of River Sajó) in the neighborhood of the village Szalonna and its dam is located at rkm 20.3 of the creek. The storage capacity of the reservoir is about 5.5 million m^3. The reservoir belongs also to the Borsod Regional Waterworks and works for low flow augmentation. It provides 0.7 m^3/sec flow during low flow periods for downstream water users along the Bódva Creek, mainly as raw water for drinking water production purposes.

The Mátra-area Regional Waterworks has two small-size reservoirs to provide raw water for public drinking water supply purposes. The **Köszörű-Valley Reservoir** is located on the Köszörű Creek with a storage capacity of about 1 million m^3. The raw water supply in average is 2,000 m^3/day. The **Csórrét Reservoir** uses the water resource of the Gyöngyös Creek and has an effective capacity of about 1 million m^3. The quantity of the raw water provided is 3,000 m^3/day also for public supply purposes.

Sediment trapping effect of reservoirs

There are only two large impoundments affecting the main rivers in Hungary, which could represent significant sediment trapping effects to be considered in regional studies: in case of Danube the Gabčikovo Impoundment (Čuňovo Reservoir) and in case of the river Tisza the Kisköre Reservoir. The sediment trapping effects of other reservoirs situated on the small tributaries of the river system in Hungary (listed in Table 4.8.) have no significance from point of view of transboundary analysis in the Danube River basin.

Danube: impacts of the Čuňovo Reservoir. The Water Quality Protection Working Group of the Slovak-Hungarian Transboundary Water Commission carried out detailed investigations on the tendency and dynamics of water quality changes observed during the period of 1989-1995 concerning the common stretch of Danube and its tributaries **[27.]** The following findings were published in their summary report on the observed changes of the suspended solids (TSS) content of the river water measured upstream and downstream from the reservoir:

> "The maximum concentrations of suspended solids have changed by several 100 mg/l during the past six years. More uniform variation characterizes the 90 percentile values. In the section of Medved'ov/Vámosszabadi the suspended solids content has substantially decreased due to the effect of sedimentation in the reservoir of Čuňovo. The remarkable differences between the sediment concentrations of the river reach of Bratislava and Medved'ov/Vámosszabadi can clearly be demonstrated by the measured data of the period October 1992 – December 1995."

The statistics of the measured TSS values (in mg/l) of the corresponding period were:

Station	Min.	Max.	Mean(M)	Median	St.dev.	St.dev/M	C90%	Quality Class
Bratislava	6	227	33	26	36	1.09	58	IV.
Medved'ov/Vámosszab.	6	319	29	20	39	1.35	44	III.

Data given by the detailed report of the evaluation of quality monitoring data **[28.]** however reflects some uncertainty on the suspended sediment retention impact of the reservoir, thus further detailed studies are needed in this respect.

River Tisza: impacts of the Kisköre Impoundment. There are no regular multi-point measurements on the suspended load in the upstream and downstream sections of the reservoir, the local laboratory fortnightly takes only one-point samples. These data can not provide full picture on suspended load conditions. During the higher storage level (720 cm) in summertime the measured concentrations are usually not higher than 10 mg/l. In wintertime however, having the lower storage level (520 cm) during flood periods the measured suspended load density at the upstream section of the reservoir reached even the value of 1000 mg/l too. The rate of the silting up of sediment is very small in the large flat areas of the bottom of the reservoir, but it is much higher in the ox-bow bends. Data on sediment retention impact of the reservoir is not available at present.

4.7. Major Water Transfers

There are only few major water transfers (intakes) from the Danube and Tisza Rivers, which are in the magnitude of the ten percentile monthly low flow. In case of Danube there are two power station cooling water intakes, which are discharged back with higher temperature with certain losses. In the river Tisza basin there are water intakes for agricultural utilization (irrigation) transferred by the Main Channels towards the irrigation systems. The most important major water intakes are listed in Table 4.9.

Table 4.9. Major water transfers from the Danube and Tisza Rivers

No	Site of water intake	River & Rkm	Area Code No.	Water intake		River mean flow
				Licen-Sed	Actual	
				m3 / s		
1	2	3	4	5	6	7
1.	Százhalombatta Power St.	Danube Rkm 1600.2	4.	25	24	1080
2.	Paks, Nuclear Power St.	Danube Rkm 1500.3	4.	110	110	1140
3.	Tiszalök, Eastern Main Canal	Tisza Rkm 524.2	9.	60	50	(69)
4.	Tiszafüred, Main Canal	Tisza Rkm 404.0	10.	6	3	(52)
5.	Jászkunság Main Canal	Tisza Rkm 403.5	10.	48	16	(52)
6.	Nagykunság Main Canal	Tisza Rkm 243.6	11.	82	50	101

The values in brackets in the column No.7 indicate that the water intake for irrigation is taken from an impoundment, independently from the actual value of monthly low flow conditions of the river. The sites of these intakes are illustrated in Figure 4.13.

4.8. Preferred Sampling Stations

For the purpose of transboundary diagnostic analysis and basin-wide water quality simulation studies data sets and sampling sites of the existing water quality monitoring stations were analyzed. This analysis took also consideration the results of the recently completed Phare Project EU/AR/303/91 “Development of a Danube Alarm Model” from point of view of river sections taking into account for modeling purposes **[29.]**. As a result of this analysis the preferred water quality monitoring stations advised for further basin-wide studies are listed in Table 4.10.

Table 4.10. Preferred water quality monitoring stations for basin-wide studies

No.	River	Monitoring site	River km	TNMN	Bucharest Declaration
1	2	3	4	5	7
1.	Duna	Medve	1806.0	Yes	Yes
2.	Duna	Szob	1708.0	Yes	Yes
3.	Duna	Dunaföldvár	1560.0	Yes	
4.	Duna	Hercegszántó	1435.0	Yes	Yes
5.	Rába	Szentgotthárd	202.6		
6.	Ipoly	Ipolytarnóc	179.0		
7.	Sió	Szekszárd-Palánk	13.0	Yes	
8.	Dráva	Drávaszabolcs	68.0		
9.	Tisza	Tiszabecs	757.0		
10.	Tisza	Tiszasziget	162.5	Yes	

1	2	3	4	5	7
11.	Sajó	Sajópüspöki	123.5	Yes	
12.	Bódva	Hidvégardó	63.7		
13.	Hernád	Tornyosnémeti	102.0		
14.	Bodrog	Felsőberecki	46.0		
15.	Szamos	Csenger	45.4		
16.	Kraszna	Mérk/Ágerdőmajor	42.2		
17.	Berettyó	Pocsaj	71.5		
18.	Maros	Nagylak/Makó	50.6		

The list of the above Table contains the most important regular water quality monitoring stations at the border sections of rivers entering the country. The list includes all the stations, which are selected monitoring stations for the Trans-National Monitoring Network of the Environmental Programme for the Danube River basin **[30.]** and also those stations which participate in the Bucharest Declaration monitoring programme **[31.]**. The locations of these monitoring sites are illustrated in Figure 4.14.

Several other stations of the routine water quality monitoring network had the role of preferred station during the studies on selecting the municipal and industrial hot spots, discussed in chapter 2. The closest upstream and downstream sampling stations were considered from this respect, and measurement data were compared to assess the impact on the recipient water bodies, as well as the results of the wastewater discharge control investigations of the District Environmental Protection Inspectorates.

Basic water quality data series for the period between the years 1994 and 1997 are provided for the further basin-wide studies consisting 15 of the above listed stations in a separate volume (Volume II) as part of this National Review update, discussed later in chapter 4.11.

4.9. Water Discharges

There are no simultaneous flow measurement carried out at the time of the regular and scheduled water quality samplings of the routine monitoring network, which is harmonized between the local Environmental Protection Inspectorates. The problem of getting simultaneous water quantity (river flow/discharge) and quality data was discussed in chapter 4.3. (data consistency, compatibility and transparency) and the methodology of generating flow data for the corresponding sampling action was described. Controlled and reliable flow data for a given date can be get from the Hydrological Data Bank at the Institute for Hydrology in VITUKU Plc. Dissemination of the data is made through the Hydrological Yearbooks (see: chapter 4.4.).

Significant efforts are made on the continuous correction of river discharge data belonging to each water quality data. This activity is carried out with the close cooperation of the experts working in the field of hydrology and water quality and it is still going on. The available multi-annual hydrological observation system and database provide substantial background for this activities. Generally it can be stated that flow data attached to the water quality determinations for the period of 1994-1997 have already been improved and are reliable enough for any further studies.

Simultaneous flow measurements and water quality determinations are carried out only during special case-studies and research projects, like environmental impact assessment studies on existing, or planned major emissions, etc.

4.10. Sediment Discharges

Hydrological data on sediment movements

The Hydrological Yearbook 1996 **[22.]** contains information on the frequency of measurements and data on bed load (bed sediment) conditions of the river system in Hungary. In case of Danube there are 30 years of measurement data on bed loads for six characteristic river sections (Medve, Dunaalmás, Nagymaros, Budapest, Dunaújváros and Mohács) and for the river Tisza there are three measurement sections used for this purpose (Tivadar, Szolnok and Szeged). Altogether there are 23 river sections where regular bed load measurements are carried out. Results consist of the concentration (g/m^3), specific load (kg/s) and total annual amount (m^3/year) of the bed load in the river. Similar data series are available for the suspended load in the rivers, which can not be compared to the TSS (Total Suspended Solids) measured during the water quality monitoring activities, because of different sampling and determination technique. The latest issue of the Hydrological Yearbook (including a CD-ROM with detailed data, completed in 1998) was published by the Institute of Hydrology of VITUKI Plc. in 1997 in Budapest.

The present National Reviews do not contain above publicly available data, disseminated in printed Yearbook as widely accessible information source.

Water quality data on bottom sediment

Regular quality determinations of the bottom sediment of rivers are not included in the routine water quality monitoring system running at present in the country. However several case studies investigated the quality conditions of bottom sediments in different sections of the river system in Hungary.

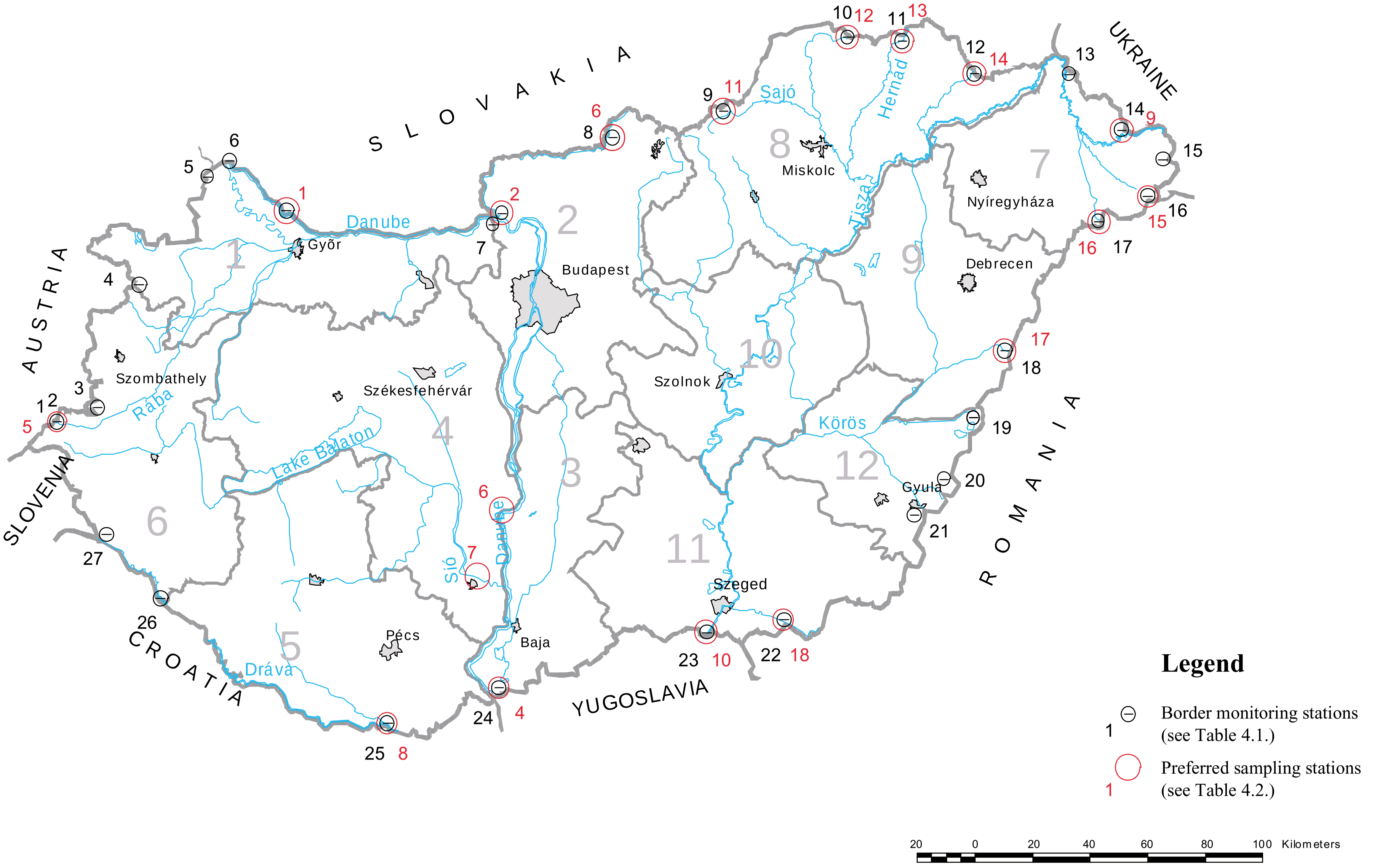


Figure 4.14. Border monitoring stations and preferred sampling stations

Basin-wide study on the quality of the bottom sediment of Danube was carried out in 1993 organized by the Equipe Cousteau and VITUKI Plc. This expedition collected on-site samples at 50 locations from the source of Danube to its delta:

- Sediment samples for analysis of organic and inorganic pollutants,
- Mussel samples for studying bioconcentration of chemical pollutants in biological indicators,
- Benthos samples for analysis of diversity of benthic organisms which are a qualitative indicators of the stress undergone by an ecosystem exposed to pollution.

This regional study [provided very valuable information and experiences on the polluting hot spots along the river. To illustrate some of the findings of this study, Figure 15. presents three characteristic longitudinal sections of concentration distribution of the pollutants: “coprostanol” (which indicates the effect of untreated municipal wastewater), “total aliphatic hydrocarbon” (indicating oil pollution) and “mercury”. The component coprostanol clearly shows the outstanding pollution effect of the untreated wastewater discharge of Budapest on the bottom sediment of the river, and in case of mercury the major polluting impact of the tributary river Vág/Vah on the recipient Danube. The accumulation of oil pollution impact is also significant.

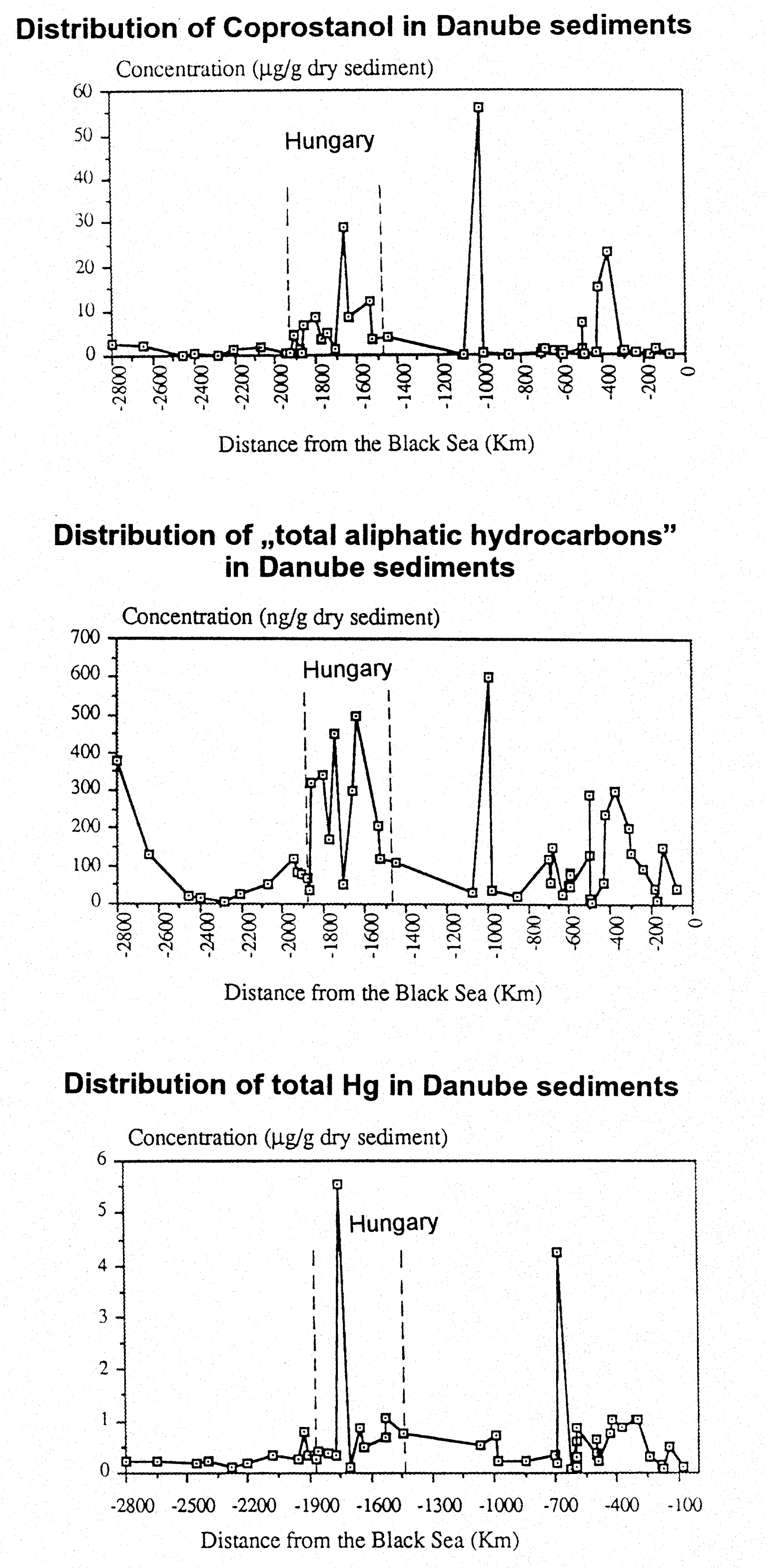
The most recent study on the problems of bottom sediment quality was carried out by a Consortium led by VITUKI Plc, under the Applied Research Programme of the Environmental Programme for the Danube River Basin. The Consortium elaborated the EU/AR/105/91 Phare Project “Quality of Sediments and Biomonitoring” **[29.]**. The project developed proposal for the introduction of routine investigation programme for the quality determination of bottom sediment of rivers.

4.11. Water Quality Data

Basic water quality data series coming from the regular water quality monitoring network between the years 1994 and 1997 are provided for further studies of the Danube River Basin Pollution Reduction Programme concerning the following monitoring stations:

Danube:	Szob,	rkm 1708.0 (left-middle-right bank samplings)
	Hercegszántó,	rkm 1435.0
Ipoly:	Ipolytarnóc,	rkm 179.0
Rába:	Szentgotthárd	rkm 202.6
Dráva:	Drávaszabolcs,	rkm 68.0

Figure 15. **Results of the basin-wide study on the quality of bottom sediments in the river Danube. (Source: Equipe Cousteau 1993.)**



Tisza:	Tiszabecs,	rkm 757.0
	Tiszasziget,	rkm 162.5 (left-middle-right bank samplings)
Sajó:	Sajópüspöki	rkm 123.5
Bódva:	Hidvégardó,	rkm 63.7
Hernád:	Tornyosnémeti,	rkm 102.0
Bodrog:	Felsőberecki,	rkm 46.0
Szamos:	Csenger,	rkm 45.4
Kraszna:	Mérk/Ágerdőmajor,	rkm 42.2
Berettyó:	Pocsaj,	rkm 71.5
Maros:	Nagylak,	rkm 29.1
	Makó,	rkm 25.0

These monitoring stations are controlling the sections where rivers are entering and leaving the territory of Hungary. Basic water quality data measured at these stations are given in printed form and on diskette in Annex 10 of this report.

To assist the better understanding of the changes of transboundary water quality conditions ten years statistics of the measured values of selected quality components are also provided in printed form in Annex 10. The water quality parameters cover selected items of oxygen household, nutrients, oils, metals, hydrobiological and microbiological parameters. Statistical compounds are minimum, maximum and mean values, standard deviation and probability values of 10, 90 and 95 percentiles. The messages of this statistics speak for themselves, however few notes are necessary too.

The ten years statistics clearly show that due to the significant self purification capacity of the big rivers like Danube and Tisza there is no characteristic change in the entering and leaving water quality concerning oxygen household and slight increase can be observed in nutrient compounds. In case of special parameters (oils, some of the metals, and especially microbiological components) however there are moderate deterioration.

Statistics on the water quality parameters of Tisza tributaries Szamos, Kraszna and Maros clearly show the entering high pollution load into the country: for example the 90 percentile probability value of COD, or Coliform belong in each case into the fifth highly polluted quality class. Several components of the group of micropollutants also belong to the IV-V quality class.

Comments on the database of 1994-1997

The basic description of the database of the period 1994-1997 was given in the chapter dealing with the history of water quality monitoring. This four years period cannot be separately discussed without viewing the development process as a whole. Some additional information from this respect is summarized in the followings.

The monitoring systems of 1984 and 1994 (and the standards behind them MSz-10-172/1-83 and MSz 12749) differ from each other in three aspects:

- The qualification system which came into force from the beginning of 1985 was based on various water uses (biological stability, drinking water supply industrial water supply, irrigation, fisheries and integrated requirements), while that of 1994 is focused at the water as an ecological unit, disregarding water uses. Instead of this latter different groups of components are specified. The difference is only virtual since the integrated qualification system of the former actually includes the quality indices of all water uses and the limit value system is the corresponding range. The latter cannot be used for qualifying according to water uses. In respect to the second the original concept was that as a continuation of MSz 12749, which was developed by the environmental ministry

KTM, another system will be developed by the ministry for water management (KHVM) focusing solely at qualification according to water uses. This has not yet been done. According to the available information the ministry KTM will again give a contract for the development of a new system.

- In the system of 1985 the basis of the classification is the 80% duration value (the 80% percentile), while in that of 1994 the 90% value (that is a value which is closer to the measured maximum than in the case of the former one). It is to be noted that in case of fewer than 10 samples the determination of these percentiles is not allowed by the rules of statistics. In this case we usually apply the measured maximum, marking this in a footnote.
- The standard of 1994 (Msz 12749) has substantially expanded the scope of the measured parameters. This has already been discussed and presented in Annex 1.

Both systems classify for each of the components. In the first system the quality class was defined on the basis of the worst component. In the second system the classification is made for component groups, also on the basis of the worst component of that group.

Regarding the data base of the period 1994-1997 and the components selected for water quality modeling the following additional remarks can be made **[16.]** :

- The number of total N data is limited even after 1994. This can be explained by financial and laboratory capacity reasons. Thus only the mineral N defined as the sum of NH_4-N, NO_2-N and NO_3-N can be used. Another solution might be the extrapolation using the ratio of total N to mineral N for the calculation of total N, for those cases when this date is lacking. Unfortunately this ratio shows high variation even in the same sampling point.
- For modeling purposes satisfactory number of total P data can be found in the database. If this is not the case, then the above mentioned extrapolation method can be used, but with much higher reliability than in case of total N.
- Regarding the questions related to COD or BOD it is to be noted that COD_d characterizes industrial pollution, while BOD – the communal dischargers. We have to use both, since there are numerous sources of both types of pollution in Hungary.
- In respect to heavy metals the attention of experts working with these data should be drawn to two special conditions. The first is that the standard MSz 12749 requests the measurement of dissolved forms. The other one is that the instrumentation of the various laboratories highly differs from each other and the measurement accuracy is also different.
- This also holds for organic micropollutants. Another problem is that large number of data (of higher analytical frequency) is available only for mineral oil, phenols and anionactive detergents. Only scattered data are available for the rest.

5. Brief Overview of Legal and Institutional Framework for Water Quality Control

The legal and institutional framework for sound environmental and management of water resources and ecosystems is already discussed in Part A chapter 6 of the National Review. Under chapter 6.2. the relevant organizations and responsibilities are presented in details, covering also the area of water pollution control.

Herewith the most important legislative means (laws, ministerial orders, etc.), regulations and standards in the field of pollution control and prevention are briefly listed and summarized as follows:

1995. LIII. Law - The general act of environmental protection

The goal of the LIII. Law is to develop harmonic connection between people and the environment, as well as to protect the environmental elements and processes, and to provide the environmental conditions for the sustainable development. The LIII. Law determines:

1. the environmental protection activity of the Government, the Parliament and the State,
2. the National Environmental Program and
3. the tasks of local governments, Fund of Environmental Protection, Management of Environmental Protection, National Council of Environmental Protection, Minister of Environmental Protection and task of development on research and technology as well.

1995. LVII. Law - Water Management

It covers the surface and subsurface waters, as well as the hydraulic structures, the activities with waters and the measurements of conditions of water. The LVII. Law regulates:

1. the public activity of water works,
2. the water resources management,
3. the mitigation of water damages,
4. the jurisdiction of water authorities, and
5. the activity of water management companies as well.

83/1997 (IX. 26.) Government Resolution - The National Environmental Program

This program is actually a sustainable development framework program. The National Environmental Program is an intervention plan system for six years, which should result in the solution of the current environmental problems or the beginning of the solutions and the prevention of future problems.

2031/1998. (II. 13.) Government Resolution - The 1998 years' Provision Plan of the National Environmental Program

The Provision Plan was completed on the basis of the Parliament resolution. Every Minister and the political under-secretary of the Prime Minister's Office are responsible for the Plan. Deadline: continuous. The Provision Plan includes the applicable devices and the assessment of the steps in 1998.

2207/1996. (VII. 24.) Government Resolution - Directives of wastewater disposal and treatment program of the Hungarian settlements

The Government set up the guidelines of wastewater disposal and treatment program of Hungarian settlements to:

1. improve environmental conditions, and
2. develop the necessary conditions to join to the European Union.

This resolution includes a wastewater treatment and disposal program up to the year 2010.

54/1995. (V.10.) Government Decree - Utilization Order of Central Budget’s financial aid of the wastewater treatment program for the capital and the county towns

The cities receive not refundable subsidy for building or enlarging of wastewater treatment plant in the framework of the Investment Aim-Program.

The Annexes of the decree include the documentation of professional program and the value of the subsidy (in per cent). The decree regulates the planning and utilization of subsidy, as well as the beginning and completion of investment.

152/1995. (XII. 12.) Government Decree – Necessity of environmental impact assessments, and detailed rule of the relevant official procedures

This decree orders the regulation of the device of preliminary environmental impact assessment studies, as well as the device of detailed environmental studies. Outlines the list of activities, where environmental impact assessment study is needed and the list of contributors as well.

36/1993. (V. 28.) Parliament Resolution - Government Program (1993-1994) to promote the healthy drinking-water supply of the settlements

The Parliament approved the 1993-1994 years' Government Program in such a way that should ensure the completion of drinking water supply in South-Great Plain, and should give yearly central budget subsidy for settlements having no public supply. The resolution states that the local government should be received financial aid for sewerage and wastewater treatment, which serve the protection of catchment areas. The resolution includes the list of settlements on the vulnerable subsurface drinking water resources.

1/1990. (XI. 13.) KTM Decree - General Environmental Protection Inspectorates and Environmental Protection Inspectorates

The tasks of the Ministry for Environment and Regional Policy are carry out due the Chief Environmental Protection Inspectorate and the District Environmental Protection Inspectorates, which are under its direction. This Decree determines the duties of the Chief Environmental Protection Inspectorate and the local Environmental Protection Inspectorates as well.

3/1984. (II. 7.) OVH Decree - Wastewater fine on water pollution

This decree introduces the determination of wastewater fine system, regulates the imposition and utilization of fund coming from wastewater fines. The limit values and unit amount of fine of water polluters, as well as the arrangement of water quality protection areas and other modifying factors are determined in Annex 1.of this decree. The Annex 1 was modified by the 33/1993 (XII. 23.) KTM Decree.

4/1984. (II. 7.) OVH Decree - Sewerage fine

This decree introduces the determination of sewerage fine system, regulates the imposition of sewerage fine as well. The decree is dealing also with the prohibition of harmful pollution inlet to the sewage systems. The limit values and unit amounts of fines, as well as the arrangement of water quality protection areas and other modifying factors are determined in Annex 1 of this Decree. The Annex 1 was modified by the 34/1993 (XII. 23.) KTM Decree.

9/1978. (V. É. 12.) OVH Instruction - Technical Regulation on the prevention of damages of accidental water pollution

This instruction is dealing with protection against exceptional - havarious - pollution of the surface and subsurface waters, and the prevention of damages. The prevention of damages in water quality - in case of waters and public hydraulic structures - should be carried out by the district Water Authorities. The instruction determines the necessary technical activities, regulate the duty of registration, and the way of the prevention of damages.

MSZ 12749 Hungarian Standard - Quality of surface water, quality characteristics and classification, 1994.

The limit values of the five water quality classes, as well as the parameters to be measured, the list of water quality monitoring sampling stations and the frequency of measurements are determined by this standard. The Standard deals also with the classification system of the surface waters.

1997 LIII. Law – Nature Conservation in Hungary

Entered into force on 1 January 1997.

Annexes

1. The water quality classification system. Hungarian Standard MSZ 12749
2. Number of water quality samples in selected stations, 1968-97. Danube system
3. Number of water quality samples in selected stations, 1968-97. Tisza system
4. Number of water quality samples for certain special water quality indices, measured since 1994 only (1997). Danube River system
5. Number of water quality samples for certain special water quality indices, measured since 1994 only (1997). Tisza River system
6. 90 % duration values in selected monitoring stations (1988-1997). Danube River system
7. 90 % duration values in selected monitoring stations (1988-1997). Tisza River system
8. Water quality classification on the basis of Hungarian Standard MSZ 12749. Danube River system
9. Water quality classification on the basis of Hungarian Standard MSZ 12749. Tisza River system
10. Bibliography

Annex 1. The water quality classification system. Hungarian Standard MSZ 12749

The water quality classification system
Hungarian Standard MSz 12749

Component group	Parameter	Unit	Classes				
			Excellent I	Good II	Tolerable III	Polluted IV	Heavily polluted V
1	2	3	4	5	6	7	8
Oxygen regime	Dissolved oxigen	mg/l	7	6	4	3	<3
	Oxygen saturation	%	80-100	70-80 100-120	50-70 120-150	20-50 150-200	<20 >200
	BOD-5	mg/l	4	6	10	15	>15
	COD-Mn	mg/l	5	8	15	20	>20
	COD-Cr	mg/l	12	22	40	60	>60
	TOC	mg/l	3	5	10	20	>20
	Saprobic index	-	1,8	2,3	2,8	3,3	>3.3
Nutrients	N- NH4	mg/l	0,2	0,5	1	2	>2
	N- NO2	mg/l	0,01	0,03	000.	000.	>0.30
	N- NO3	mg/l	1	5	10	25	>25
	P- PO4	µg/l	50	100	200	500	>500
	Total phosphorus	µg/l	100	200	400	1000	>1000
	Chlorophyl-a	µg/l	10	25	75	250	>250
Microbiology	Total coli	i/ml	1	10	100	1000	>1000
	Faecal coliforms	i/ml	0,2	1	10	100	>100
	Faecal streptococci	i/ml	0,2	1	10	100	>100
Inorganic Micropollutants	Aluminium	µg/l	20	50	200	500	>500
	Arsenic	µg/l	10	20	50	100	>100
	Boron	µg/l	100	200	500	1000	>1000
	Cianides total	µg/l	10	20	50	100	>100
	Zinc	µg/l	50	75	100	300	>300
	Mercury	µg/l	0,1	0,2	0,5	1,0	>1.0
	Cadmium	µg/l	0,5	1,0	2,0	5,0	>5.0
	Chromium	µg/l	10	20	50	100	>100
	Chromium (VI)	µg/l	5	10	20	50	>50
	Nickel	µg/l	15	30	50	200	>200
	Lead	µg/l	5	20	50	100	>100
	Copper	µg/l	5	10	50	100	>100

1	2	3	4	5	6	7	8
Organic Micropollutants	Oil compounds	µg/l	20	50	100	250	>250
	Phenol	µg/l	2	5	10	20	>20
	Anionactive surfactants	µg/l	100	200	300	500	>500
	Benzo/a/pyrene	µg/l	0,005	0,007	0,010	0,050	>0.050
	Chloroform	µg/l	5	10	30	100	>100
	Carbon tetrachloride	µg/l	1	2	3	10	>10
	Trichlorethylene	µg/l	3	5	10	50	>50
	Tetrachlorethylene	µg/l	3	5	10	50	>50
	Lindane	µg/l	0,1	0,2	0,5	2,0	>2.0
	Malation	µg/l	0,1	0,2	0,5	2,0	>2.0
	2,4 D	µg/l	0,5	1,0	2,0	5,0	>5.0
	MCPA	µg/l	0,2	0,3	0,5	2,0	>2.0
	Atrazine	µg/l	0,5	1,0	2,0	5,0	>5.0
	PCB	µg/l	0,001	0,05	000.	0.02	>2.00
	Pentachlorphenol	µg/l	2	5	10	20	>20
Radioactivity	Total b activity	Bq/l	0,17	0,35	0,55	0.01	>1.10
	Cézium137	Bq/l	0,011	0,100	0,220	0,440	>0.440
	Stroncium90	Bq/l	0,003	0,01	0,055	0,110	>0.110
	Tricium	Bq/l	8,3	50	165	330	>330
Other parameters	Hidrogenion conc.	PH	6.5-8.0	8.0-8.5	6.0-6.5 8.5-9.0	5.5-6.0 9.0-9.5	<5.5 >9.5
	Conductivity	µS/cm	500	700	1000	2000	>2000
	Iron	mg/l	0,1	0,2	0,5	1,0	>1.0
	Manganese	mg/l	0,1	0,1	0,1	0,5	>0.5

Annex 2. Number of water quality samples in selected stations, 1968-97. Danube system

Number of water quality samples in selected stations (1968-1997) (Water system of the River Danube)

Sampling stations	Duna Gyorzamoly 1806.0 Rkm	Duna Szob 1708.0 Rkm	Duna Szob 1708.0 Rkm	Duna Szob 1708.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Hercegszántó 1435.0 Rkm	Ipoly Ipolytarnóc 179.0 Rkm	Dráva Drávaszabolcs 68.0 Rkm	Rába Szentgotthárd 202.6 Rkm	Sió csat. Szekszárdpalánk 13.0 Rkm
Year	**Middle**	**Left bank**	**Middle**	**Right bank**	**Left bank**	**Middle**	**Right bank**	**Middle**				**Left bank**
1968	15	-	-	-	-	-	-	65	12	23	51	24
1969	6	-	-	-	24	24	24	58	11	24	25	24
1970	7	-	-	-	26	26	26	12	10	23	24	24
1971	35	-	-	-	30	31	30	12	12	23	24	24
1972	17	-	-	-	25	25	25	12	12	22	16	21
1973	24	-	-	-	24	24	24	14	11	23	24	24
1974	25	11	11	11	26	26	26	13	13	22	26	24
1975	24	9	13	9	26	28	26	12	12	61	25	24
1976	27	17	16	15	26	25	26	12	12	52	24	23
1977	25	11	11	12	24	24	24	26	12	49	23	24
1978	25	25	29	29	12	12	12	11	11	47	23	24
1979	24	21	21	21	26	27	25	28	11	51	25	24
1980	25	22	22	20	26	26	26	27	11	50	26	24
1981	24	23	23	23	25	25	26	25	10	49	25	24
1982	24	23	22	23	24	24	24	24	12	49	25	26
1983	-	24	24	24	25	27	26	26	25	50	47	26
1984	-	22	22	23	25	26	26	26	20	46	49	26
1985	-	19	19	19	22	23	24	25	22	51	48	25
1986	-	24	24	23	26	27	25	29	24	53	46	23
1987	-	23	22	22	28	27	28	30	22	49	47	26
1988	-	25	25	24	26	26	26	30	24	52	48	26
1989	51	25	25	25	26	26	26	30	24	52	49	26
1990	51	24	24	24	26	26	26	26	24	52	49	26
1991	26	25	25	25	26	26	26	32	24	52	48	25
1992	25	24	23	25	26	26	26	31	24	54	46	25
1993	25	25	25	25	26	26	26	32	24	54	45	26
1994	26	26	25	26	26	26	26	30	26	27	51	26
1995	26	26	26	26	26	26	26	32	26	25	51	26
1996	26	26	26	26	26	26	26	31	26	25	47	11
1997	26	25	25	26	26	26	26	32	24	24	49	-
94-97	104	103	102	104	104	104	104	125	102	101	198	63
68-97	609	525	528	526	730	737	733	793	531	1234	1106	701

Annex 3. Number of water quality samples in selected stations, 1968-97. Tisza system

Number of water quality samples in selected stations (1968-1997)
(Water system of the River Tisza)

Sampling station	Tisza Tiszabecs 757.0 Rkm	Tisza Tiszasziget 162.5 Rkm	Tisza Tiszasziget 162.5 Rkm	Tisza Tiszasziget 162.5 Rkm	Sajó Sajópüspöki 123.5 Rkm	Bódva Hídvégardó 63.7 Rkm	Hernád Tornyosnémeti 102.0 Rkm	Bodrog Felsoberecki 46.0 Rkm	Szamos Csenger 45.4 Rkm	Kraszna Mérk 42.2 Rkm	Berettyó Pocsaj 71.5 Rkm	Maros Makó 24.3 Rkm	Maros Nagylak 50.6 Rkm	Maros Nagylak 50.6 Rkm
Year	**Middle**	**Left bank**	**Middle**	**Right bank**	**Middle**								**Middle**	**Right bank**
1968	54	-	65	-	25	22	-	23	53	12	12	53	-	-
1969	52	-	65	-	26	24	-	31	52	12	19	50	-	-
1970	48	-	39	-	53	27	-	52	47	12	23	55	-	-
1971	52	-	61	-	56	23	40	51	52	26	52	54	-	-
1972	52	-	64	-	55	24	-	52	52	25	49	51	-	-
1973	53	-	64	-	54	24	54	52	52	26	52	51	-	-
1974	53	-	60	-	53	26	52	52	53	25	51	51	-	-
1975	52	-	64	-	53	27	54	55	51	26	53	52	1	-
1976	59	-	60	-	58	26	58	52	52	26	50	54	-	-
1977	37	-	64	-	53	41	44	52	52	25	52	54	-	-
1978	51	-	63	-	52	52	52	53	53	24	51	53	-	-
1979	51	-	62	-	49	50	54	47	52	25	52	49	-	-
1980	53	-	23	-	54	52	55	50	53	25	51	22	-	-
1981	53	-	29	-	54	51	59	50	52	27	52	24	-	-
1982	52	-	23	-	53	53	53	52	52	25	51	21	-	-
1983	52	-	51	-	55	53	53	52	52	52	50	49	-	-
1984	52	-	51	-	56	52	57	53	52	52	52	52	-	-
1985	52	-	44	-	53	52	54	53	52	52	52	52	-	-
1986	54	-	53	-	53	52	53	52	52	54	52	52	-	-
1987	49	-	50	-	54	52	53	51	51	49	52	51	-	-
1988	52	-	52	-	52	52	52	52	52	52	52	52	-	-
1989	52	-	52	-	52	52	53	52	52	52	51	52	-	-
1990	52	-	53	-	51	52	52	52	52	52	51	52	-	-
1991	52	-	52	-	52	52	52	52	52	52	52	51	-	-
1992	51	-	53	-	52	52	51	52	51	51	53	53	-	-
1993	51	-	52	-	52	52	52	52	51	51	52	52	-	-
1994	26	25	23	23	52	26	26	26	51	51	31	52	52	
1995	26	26	23	23	52	26	26	26	51	51	44	52	12	40
1996	27	26	26	26	52	26	26	26	52	52	26	52	-	52
1997	26	26	26	26	52	26	26	26	52	52	27	52	-	52
94-97	105	103	98	98	208	104	104	104	206	206	128	208	64	144
68-97	1446	103	1467	98	1538	1199	1261	1401	1553	1116	1367	1470	65	144

Annex 4. Number of water quality samples for certain special water quality indices, measured since 1994 only (1997). Danube River system

Number of water quality samples for certain special water quality indices, measure since 1994 only (1997) (Water system of the River Danube)

Parameter	Unit	Duna Gyorzamoly 1806.0 Rkm	Duna Szob 1708.0 Rkm	Duna Szob 1708.0 Rkm	Duna Szob 1708.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Hercegszántó 1435.0 Rkm	Ipoly Ipolytarnóc 179.0 Rkm	Dráva Drávaszabolcs 68.0 Rkm	Rába Szentgotthárd 202.6 Rkm	Sió csat. Szekszárdpalánk 13.0 Rkm*
		Middle	Left bank	Middle	Right bank	Left bank	Middle	Right bank	Middle				Left bank
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Nutrients													
N- total	mg/l	26	25	25	26	0	0	0	21	12	8	0	11
P- total	μγ/λ	26	25	25	26	25	25	25	31	24	24	49	11
Inorganic micropollutants													
Aluminium	μγ/λ	12	0	0	0	12	12	12	18	0	13	9	0
Arsenic	μγ/λ	3	12	12	12	0	0	0	14	11	0	0	0
Boron	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	1
Cianides (total)	μγ/λ	1	0	0	0	0	0	0	0	0	0	0	0
Cianides (free)	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0
Zinc	μγ/λ	12	12	12	12	12	12	12	22	11	13	11	5
Mercury	μγ/λ	12	11	12	12	11	12	12	22	11	9	11	0
Cadmium	μγ/λ	12	12	12	12	12	12	12	22	12	13	11	5
Chromium	μγ/λ	12	12	12	12	12	12	12	22	12	13	11	5
Nickel	μγ/λ	12	12	12	12	12	12	12	22	12	13	11	5
Lead	μγ/λ	12	12	12	12	12	12	12	22	12	13	11	5
Copper	μγ/λ	12	12	12	12	12	12	12	21	12	13	11	5
Organic micropollutants													
Chloroform	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0
Carbon tetrachloride	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0
Trichlorethyl ene	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0
Tetrachloreth ylene	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0
Lindane	μγ/λ	0	0	0	0	0	0	0	4	0	0	0	0
Malathion	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0
2,4-D	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0
MCPA	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0
Atrazine	μγ/λ	0	0	0	0	0	0	0	4	0	0	0	0
PCB	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Hydrobiological parameters													
Chlorophyl-a	μγ/λ	24	25	25	26	26	26	26	32	24	24	9	6
Feofitin	μγ/λ	24	25	25	26	0	0	0	0	24	0	0	0
Phytoplankton Abundance	mio. i/l	0	0	0	0	0	0	0	0	0	0	0	0
Zooplankton	i/10 l	0	0	0	0	0	0	0	0	0	0	0	0
Phytoplankton biomass	mg/l	0	0	0	0	0	0	0	0	0	0	0	0
Microbiological parameters													
Total coli	i/ml	25	23	24	25	24	24	24	29	23	24	19	3
Faecal coliforms	i/ml	9	6	6	6	6	6	6	6	4	24	8	0
Faecal streptococci	i/ml	9	6	6	6	6	6	6	6	4	7	8	0
Clostridium	i/100 ml	0	0	0	0	0	0	0	0	0	0	0	0
Psychriphilic bact. $22^{O}C$	i/ml	0	6	6	6	6	6	6	21	4	6	0	0
Mezophilic bacteria $37^{O}C$	i/ml	0	6	6	6	6	6	6	12	4	6	0	0
Radioactive parameters													
Total b activity	Bq/l	12	0	25	0	26	26	26	31	24	12	12	8
$Cesium^{137}$	Bq/l	0	0	0	0	0	0	0	0	0	0	0	0

** 1996-os adat (1997-ben nem történt mintavétel)*

Annex 5. Number of water quality samples for certain special water quality indices, measured since 1994 only (1997). Tisza River system

Number of water quality samples for certain special water quality indices, measure since 1994 only (1997) (Water system of the River Tisza)

Parameter	Unit	Tisza Tiszabecs 757.0 Rkm	Tisza Tiszasziget 162.5 Rkm	Tisza Tiszasziget 162.5 Rkm	Tisza Tiszasziget 162.5 Rkm	Sajó Sajópüspöki 123.5 Rkm	Bódva Hidvégardó 63.7 Rkm	Hernád Tornyosnémeti 102.0 Rkm	Bodrog Felsoberecki 46.0 Rkm	Szamos Csenger 45.4 Rkm	Kraszna Mérk 42.2 Rkm	Berettyó Pocsaj 71.5 Rkm	Maros Makó 24.3 Rkm	Maros Nagylak 50.6 Rkm	Maros Nagylak 50.6 Rkm
		Middle	Left bank	Middle	Right bank	Middle								Middle	Right bank
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Nutrients															
N- total	mg/l	26	26	26	26	52	0	26	0	52	52	0	0	52	
P- total	μγ/λ	26	26	26	26	52	26	26	26	52	52	26	52	52	
Inorganic micropollutants															
Aluminium	μγ/λ	12	12	12	12	12	12	12	12	12	12	0	12	12	
Arzenic	μγ/λ	4	3	4	3	4	0	4	0	4	4	0	0	3	
Boron	μγ/λ	0	4	4	4	4	0	4	0	0	0	0	0	4	
Cyanides (total)	μγ/λ	4	4	4	4	4	0	4	0	4	5	0	0	4	
Cianides (free)	μγ/λ	0	0	0	0	0	0	0	0	0	0	0	0	0	
Zinc	μγ/λ	12	12	14	12	12	12	12	12	12	12	0	12	14	
Mercury	μγ/λ	9	12	14	12	12	12	12	12	9	9	0	12	12	
Cadmium	μγ/λ	12	12	13	12	12	12	12	12	12	12	0	12	12	
Chromium	μγ/λ	12	12	13	12	12	12	12	12	12	12	0	12	13	
Nickel	μγ/λ	12	12	13	12	12	12	12	12	12	12	0	12	12	
Lead	μγ/λ	12	12	13	12	12	12	12	12	12	12	0	12	14	
Copper	μγ/λ	12	12	13	12	12	12	12	12	12	12	0	12	13	
Organic micropollutants															
Chloroform	μγ/λ	0	0	0	0	4	0	4	0	0	0	0	0	0	
Carbon tetrachloride	μγ/λ	0	0	0	0	4	0	4	0	0	0	0	0	0	
Trichlorethylene	μγ/λ	0	0	0	0	4	0	4	0	0	0	0	0	0	
Tetrachlorethylene	μγ/λ	0	0	0	0	4	0	4	0	0	0	0	0	0	
Lindane	μγ/λ	0	0	0	0	4	0	4	0	0	0	0	0	0	
Malation	μγ/λ	0	0	0	0	4	0	4	0	0	0	0	0	0	
2,4-D	μγ/λ	0	0	0	0	3	0	3	0	0	0	0	0	0	
MCPA	μγ/λ	0	0	0	0	3	0	3	0	0	0	0	0	0	
Atrazine	μγ/λ	0	0	0	0	4	0	4	0	0	0	0	0	0	
PCB	μγ/λ	0	0	0	0	4	0	4	0	0	0	0	0	0	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hydrobiological parameters															
Chlorophyl-a	μγ/λ	26	25	25	25	52	26	26	26	52	52	22	51	52	
Feofitin	μγ/λ	0	25	25	25	0	0	0	0	0	0	0	50	51	
Phytoplankton Abundance	mio. i/l	25	0	12	0	0	0	0	0	50	50	23	12	12	
Zooplankton Abund.	i/10 l	0	0	12	0	0	0	0	0	0	0	0	12	12	
Phytoplankton biomass	mg/l	1	0	12	0	0	0	0	0	1	1	0	12	12	
Mikrobiology parameters															
Total coli	i/ml	26	26	26	26	25	6	26	26	26	26	26	6	25	
Faecal coliforms	i/ml	6	10	10	10	6	6	6	6	0	0	26	6	11	
Faecal streptococci	i/ml	0	10	10	10	0	0	0	0	0	0	26	0	11	
Clostridium	i/100 ml	6	0	10	0	6	6	6	6	0	0	26	6	0	
Psychrophilic bacteria 22^{O}C	I/ml	6	8	13	7	0	0	0	0	0	0	26	6	8	
Mezophilic bacteria 37^{O}C	I/ml	6	8	13	8	0	0	0	0	0	0	26	6	8	
Radioactive parameters															
Total b- activity	Bq/l	26	12	12	12	12	12	12	12	52	52	26	12	12	
Césium^{137}	Bq/l	0	1	1	1	0	0	0	0	0	0	0	0	1	

Annex 6. 90 % duration values in selected monitoring stations (1988-1997). Danube River system

90% duration values in selected monitoring stations (1988-1997)
(Water system of the River Danube)

Component group	Parameter	Unit	Duna Gyorzamoly 1806.0 Rkm	Duna Szob 1708.0 Rkm	Duna Szob 1708.0 Rkm	Duna Szob 1708.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Hercegszántó 1435.0 Rkm	Ipoly Ipolytarnóc 179.0 Rkm	Dráva Drávaszabolcs 68.0 Rkm	Rába Szentgotthárd 202.6 Rkm	Sió csat. zekszárdpalánk 13.0 Rkm
			Middle	Left bank	Middle	Right bank	Left bank	Middle	Right bank	Middle				Left bank
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Oxigen regime	Dissolved oxygen	mg/l	8,1	8,4	8,2	8,3	9,0	70,0	8,8	8,7	7,1	8,5	8,5	5,9
	Oxigéntelítetség	mg/l	76	76	76	76	84	85	84	83	68	82	86	56
	BOD-5	mg/l	4,1	6,1	5,9	6,0	5,6	5,5	5,8	5,5	7,4	5,6	6,6	***14,3***
	COD-Mn	mg/l	5,1	7,1	5,8	6,0	6,8	6,8	6,9	6,0	8,4	6,6	7,5	***19,9***
	COD-Cr	mg/l	17,0	23,3	19,6	19,9	25,6	27,0	26,3	24,0	29,5	17,5	29,2	***70,7***
	TOC	mg/l	8,2	5,8	5,5	5,8				7,3	7,7			
	Szaprobic index	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	
Nutrients	N-NH4	mg/l	000.	0.01	000.	000.	000.	000.	000.	000.	***0.03***	000.	0.01	***0.07***
	N-NO2	mg/l	000	000	000	000	000	000	000	000	***000.***	000	***000.***	***000.***
	N-NO3	mg/l	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.04	0.02	0.04	0.07
	P-PO4	μγ/λ	160	170	147	138	136	131	129	141	***591***	132	72	***1131***
	P- total	μγ/λ	326	256	221	211	236	233	229	237	***804***	285	341	***1088***
	Chlorophyl-a	μγ/λ	61	55	55	57	***114***	***132***	***106***	***127***	17	22	***91***	***77***
Microbiology	Total coli	i/ml	92	***168***	***293***	***268***	***492***	***395***	***290***	***352***	***340***	***369***	***145***	***155***
	Faecal coliforms	i/ml	***24***	***93***	***49***	***35***	***121***	***59***	***49***	***34***	***80***	***73***	***28***	***21***
	Faecal streptococci	i/ml	***10***	***14***	9	8	***18***	***16***	***13***	***12***	***49***	***16***	***15***	7
Inorganic Micro-pollutants	Aluminium	μγ/λ	***298***	96	86	91	74	88	86	89	111	81	55	
	Arzenic	μγ/λ	0,6	3,3	3,0	3,6				2,6	3,0			
	Boron	μγ/λ												
	Cianides total	μγ/λ												
	Cianides free	μγ/λ												
	Zinc	μγ/λ	***247***	54	39	62	32	25	27	18	67	38	31	91
	Mercury	μγ/λ	***0.01***	000.	000.	000.	000.	000.	000.	000.	000.	000.	***0.01***	
	Cadmium	μγ/λ	0.02	0.01	0.01	0.01	0.01	0.01	0.01	000.	0.02	000.	000	***0.04***
	Chromium	μγ/λ	16,2	2,6	2,8	2,1	1,6	1,2	1,0	1,4	1,7	1,0	1,2	3,8
	Chromium(VI)	μγ/λ												
	Nickel	μγ/λ	17,4	4,8	4,4	4,3	4,0	2,8	2,4	4,8	5,8	1,7	3,7	6,4
	Lead	μγ/λ	15,0	4,7	4,7	4,3	1,4	1,5	1,2	1,7	6,0	5,2	0,6	6,9
	Copper	μγ/λ	35,2	6,7	5,6	5,9	5,1	5,3	4,6	5,1	5,2	5,0	5,6	17,2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Organic Micro-pollutants	Koolaj es termekei	μγ/λ	***219***	100	***107***	96	***432***	***402***	***478***	***343***	***114***	***232***	***426***	***197***
	Phenol	μγ/λ	3	5	5	4	6	6	7	6	7	7	7	***11***
	Anionactive surfactants	μγ/λ	98	121	123	110	68	69	69	61	187	89	79	189
	Benzo/a/pyrene	μγ/λ												
	Chloroform	μγ/λ												
	Carbon tetrachloride	μγ/λ												
	Trichlor ethylene	μγ/λ												
	Tetrachlor ethylene	μγ/λ												
	Lindane	μγ/λ												
	Malation	μγ/λ												
	2,4 D	μγ/λ												
	MCPA	μγ/λ												
	Atrazine	μγ/λ												
	PCB	μγ/λ												
	Pentaklórfenol	μγ/λ												
Radioactive Parameters	Total b aktivity	Bq/l	000.	000.	000.	000.	000.	000.	000.	000.	000.	000	000.	000.
	Cézium137	Bq/l												
	Stroncium90	Bq/l												
	Tricium	Bq/l												
Other parameters	Hydrogen ion conc.	pH	8,5	8,5	8,5	8,5	8,7	8,7	8,6	8,6	8,2	8,4	8,1	8,6
	Conductivity	μΣ/χμ	430	490	460	469	452	450	450	457	516	384	549	***1177***
	Iron	mg/l	000.	000.	000.	000.	000.	000.	000.	000.	***0.01***	000.	000.	000.
	Manganese	mg/l	***000.***	000.	000.	000.	000	000	000	000	***000.***	***000.***	***000.***	***000.***

Annex 7. 90 % duration values in selected monitoring stations (1988-1997). Tisza River system

90% duration values in selected monitoring stations (1988-1997)
(Water system of the River Tisza)

Component group	Parameter	Unit	Tisza Tiszabecs 757.0 Rkm	Tisza Tiszasziget 162.5 Rkm	Tisza Tiszasziget 162.5 Rkm	Tisza Tiszasziget 162.5 Rkm	Sajó Sajópüspöki 123.5 Rkm	Bódva Hídvégardó 63.7 Rkm	Hernád Tornyo-snémeti 102.0 Rkm	Bodrog Felsoberecki 46.0 Rkm	Szamos Csenger 45.4 Rkm	Kraszna Mérk 42.2 Rkm	Berettyó Pocsaj 71.5 Rkm	Maros Makó 24.3 Rkm	Maros Nagylak 50.6 Rkm	Maros Nagylak 50.6 Rkm
			Middle	Left bank	Middle	Right bank	Middle								Middle	Right bank
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Oxigen regime	Dissolved oxygen	mg/l	9,2	6,5	6,3	6,3	6,5	8,5	4,5	6,2	7,3	***1,4***	6,3	7,1	7,4	7,6
	Oxygen saturation	%	90	77	69	74	64	84	48	68	71	***14***	65	69	82	81
	BOD-5	mg/l	4,1	3,1	5,7	4,3	***11,9***	6,5	9,5	6,2	***10,1***	***11,3***	6,7	***10,4***	7,0	7,1
	COD-Mn	mg/l	5,6	6,2	8,4	6,1	***33,2***	8,8	11,1	7,4	***20,1***	***20,7***	13,6	13,7	8,5	12,7
	COD-Cr	mg/l	17,3	27,4	29,8	27,6	***75,0***	27,7	36,6	21,1	***55,3***	***59,7***	35,9	***52,3***	***62,6***	***53,6***
	TOC	mg/l		8,6	8,5	8,7										***11,2***
	Szaprobic index	-	0.02	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.02	0.03	0.03	***0.03***	0.03	0.03
Nutrients	N-NH4	mg/l	000.	000.	0.01	000.	0.01	0.01	***0.04***	0.01	***0.02***	***0.09***	***0.02***	***0.02***	0.01	0.01
	N-NO2	mg/l	000	000	000	000	***000.***	000	***000.***	000	000	***000.***	***000.***	***000.***	000	000
	N-NO3	mg/l	0.02	0.02	0.03	0.02	0.03	0.05	0.04	0.03	0.02	0.03	0.02	0.06	0.03	0.03
	P-PO4	μγ/λ	65	100	157	117	***213***	158	***573***	111	152	***920***	135	140	85	83
	P- total	μγ/λ	161	337	395	389	284	274	***702***	201	272	***1073***	***443***	***450***	***420***	***489***
	Chlorophyl-a	μγ/λ	9	43	***85***	47	17	28	24	16	***206***	71	11	***229***	***182***	***83***
Microbiology	Total coli	i/ml	***1383***	***1360***	***1999***	***11300***	***900***	***813***	***2790***	***478***	***1728***	***8440***	***476***	***535***	***2200***	***794***
	Faecal coliforms	i/ml	***294***	***92***	***264***	***1050***	***95***	***120***	***370***	***31***			***86***	***163***		***108***
	Faecal streptococci	i/ml	***18***	***37***	***73***	***64***	***20***	***42***	***110***	8			8	***34***		***84***

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Inorganic Micro-pollutants	Aluminium	μγ/λ	276	41	59	37	334	291	562	414	342	443		51	125	39
	Boron	μγ/λ		378	298	293	110		220							199
	Cianides total	μγ/λ	0,0	5,6	3,9	4,3	0,0		0,0		7,4	7,0				4,0
	Cianides free	μγ/λ														
	Zinc	μγ/λ	***127***	24	24	26	***183***	***186***	***221***	***179***	***<u>319</u>***	***167***		32	29	25
	Mercury	μγ/λ		000.	000.	000.	000	000.	000.	000		***0.01***		000.	000.	000.
	Cadmium	μγ/λ	0.01	000.	000.	000.	000	000.	000.	000.	***0.02***	0.02		000.	0.01	000.
	Chromium	μγ/λ	7,1	7,4	4,8	2,9	2,4	2,7	5,9	3,1	6,3	3,9		29,7	13,3	33,4
	Chromium(VI)	μγ/λ														
	Nickel	μγ/λ	7,6	3,6	3,8	3,0	2,7	3,2	8,0	3,8	6,9	7,5		4,4	2,9	2,8
	Lead	μγ/λ	8,8	0,6	0,9	0,6	2,6	4,5	4,1	3,9	8,6	10,5		0,9	0,9	0,9
	Copper	μγ/λ	5,8	8,3	6,2	6,4	9,1	10,3	13,9	10,7	48,9	5,5		8,6	6,3	8,2
Organic Micro-pollutants	Oil compounds	μγ/λ	0	***140***	***129***	***108***	***<u>338</u>***	***166***	***<u>439</u>***	***<u>298</u>***	90	***144***	***<u>345</u>***	***185***	***230***	***248***
	Phenol	μγ/λ	0	3	6	3	2	0	2	0	8	10	7	8	4	5
	Anionactive surfactants	μγ/λ	40	59	109	57	55	41	84	48	144	215	99	105	70	69
	Benzo/a/pyrene	μγ/λ														
	Chloroform	μγ/λ					3,2		6,2							
	Carbon tetrachloride	μγ/λ					***10***		***<u>115</u>***							
	Trichlorethylene	μγ/λ					1,0		2,8							
	Tetrachlor ethylene	μγ/λ					3,2		1,8							
	Lindane	μγ/λ					000									
	Malation	μγ/λ							000.							
	2,4 D	μγ/λ														

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	MCPA	μγ/λ														
	Atrazine	μγ/λ					0.01		0.01							
	PCB	μγ/λ														
	Pentachlorphenol	μγ/λ														
Radioactive Parameters	Total b aktivity	Bq/l	000.	000.	000.	000.	000.	000.	000.	000.	000.	000.	000.	000.	000.	000.
	Cézium137	Bq/l		000	000	000										000
	Stroncium90	Bq/l														
	Tricium	Bq/l														
Other parameters	Hydrogen ion conc.	pH	8,0	8,1	8,1	8,1	8,0	8,1	8,0	7,9	8,0	8,0	7,9	8,2	8,3	8,1
	Conductivity	μΣ/χμ	339	509	607	490	543	576	674	406	760	954	719	998	744	713
	Iron	mg/l	000.	000.	000.	000.	000.	000.	000.	000.	0.01	0.01	000.	000.	000.	000.
	Manganese	mg/l	***000.***	000	***000.***	000	***000.***	***000.***	***000.***	***000.***	***0.01***	***0.01***	***0.01***	***000.***	000	000

Annex 8. Water quality classification on the basis of Hungarian Standard MSZ 12749. Danube River system

Water quality classification on the basis of Hungarian Standard MSz 12749 (1988-1997)
(Water system of the River Danube)

Component group	Parameter	Unit	Duna Gyorzamoly 1806.0 Rkm	Duna Szob 1708.0 Rkm	Duna Szob 1708.0 Rkm	Duna Szob 1708.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Dunaföldvár 1560.0 Rkm	Duna Hercegszántó 1435.0 Rkm	Ipoly Ipolytarnóc 179.0 Rkm	Dráva Drávaszabolcs 68.0 Rkm	Rába Szentgotthárd 202.6 Rkm	Sió csat. Szekszár dpalánk 13.0 Rkm
			Middle	**Left bank**	**Middle**	**Right bank**	**Left bank**	**Middle**	**Right bank**	**Middle**				**Left bank**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Oxigen regime	Dissolved oxygen	mg/l	I.	I.	I.	I.	I.	I.	I.	I.	I.	I.	I.	III.
	Oxygen saturation	mg/l	II.	II.	II.	II.	I.	I.	I.	I.	III.	I.	I.	III.
	BOD-5	mg/l	II.	III.	II.	II.	II.	II.	II.	II.	III.	II.	III.	***IV.***
	COD-Mn	mg/l	II.	II.	II.	II.	II.	II.	II.	II.	III.	II.	II.	***IV.***
	COD-Cr	mg/l	II.	III.	II.	II.	III.	III.	III.	III.	III.	II.	III.	***V.***
	TOC	mg/l	III.	III.	III.	III.	III.	III.	***IV.***	III.	III.		***IV.***	
	Szaprobic index	-	III.	III.	III.	III.	III.	III.	III.	III.	III.	III.	III.	II.
Nutrients	N-NH4	mg/l	II.	III.	II.	II.	II.	II.	II.	II.	***V.***	II.	III.	***V.***
	N-NO2	mg/l	III.	III.	III.	III.	III.	III.	III.	III.	***IV.***	II.	***IV.***	***V.***
	N-NO3	mg/l	II.	II.	II.	II.	II.	II.	II.	II.	II.	II.	II.	III.
	P-PO4	μγ/λ	III.	III.	III.	III.	III.	III.	III.	III.	***V.***	III.	II.	***V.***
	P- total	μγ/λ	III.	III.	III.	III.	III.	III.	III.	III.	***IV.***	III.	III.	***V.***
	Chlorophyl-a	μγ/λ	III.	III.	III.	III.	***IV.***	***IV.***	***IV.***	***IV.***	II.	II.	***IV.***	***IV.***
Microbiology	Total coli	i/ml	III.	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***
	Faecal coliforms	i/ml	***IV.***	***IV.***	***IV.***	***IV.***	***V.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***
	Faecal streptococci	i/ml	***IV.***	***IV.***	III.	III.	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	III.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Inorganic Micropollutants	Aluminium	μγ/λ	***IV.***	III.	III.	III.	III.	III.	III.	III.	III.	III.	III.	
	Arzenic	μγ/λ	I.	I.	I.	I.				I.	I.			
	Boron	μγ/λ	III.											III.
	Cianides total	μγ/λ	I.											
	Cianides free	μγ/λ												I.
	Zinc	μγ/λ	***IV.***	II.	I.	II.	I.	I.	I.	I.	II.	I.	I.	III.
	Mercury	μγ/λ	***IV.***	II.	I.	II.	III.	III.	III.	II.	II.	III.	***IV.***	
	Cadmium	μγ/λ	III.	III.	III.	III.	II.	II.	II.	I.	III.	I.	I.	***IV.***
	Chromium	μγ/λ	II.	I.	I.	I.	I.	I.	I.	I.	I.	I.	I.	I.
	Chromium(VI)	μγ/λ										I.		I.
	Nickel	μγ/λ	II.	I.	I.	I.	I.	I.	I.	I.	I.	I.	I.	I.
	Lead	μγ/λ	II.	I.	I.	I.	I.	I.	I.	I.	II.	II.	I.	II.
	Copper	μγ/λ	III.	II.	II.	II.	II.	II.	I.	II.	II.	II.	II.	III.
Organic micropollutants	Oil compounds	μγ/λ	***IV.***	III.	***IV.***	III.	***V.***	***V.***	***V.***	***V.***	***IV.***	***IV.***	***V.***	***IV.***
	Phenol	μγ/λ	II.	II.	II.	II.	III.	III.	III.	III.	III.	III.	III.	***IV.***
	Anionactive surfactants	μγ/λ	I.	II.	II.	II.	I.	I.	I.	I.	II.	I.	I.	II.
	Benzo/a/pyrene	μγ/λ												
	Chloroform	μγ/λ	III.											
	Carbon tetrachloride	μγ/λ	***IV.***											
	Trichlor ethylene	μγ/λ	I.											
	Tetrachlor ethylene	μγ/λ	***IV.***											
	Lindane	μγ/λ								I.				
	Malation	μγ/λ												
	2,4 D	μγ/λ												

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	MCPA	μγ/λ												
	Atrazine	μγ/λ								II.				
	PCB	μγ/λ	I.											
	Pentachlorphenol	μγ/λ												
Radioactive Parameters	Total b aktivity	Bq/l	II.	I.	I.	I.	II.	II.	II.	II.	I.	I.	II.	II.
	Cézium137	Bq/l						I.		I.				
	Stroncium90	Bq/l								II.				
	Tricium	Bq/l						I.		II.				
Other parameters	Hydrogen ion conc.	pH	II.	II.	III.	III.	III.	III.	III.	III.	II.	II.	II.	III.
	Conductivity	μΣ/χμ	I.	I.	I.	I.	I.	I.	I.	I.	II.	I.	II.	***IV.***
	Iron	mg/l	III.	III.	II.	III.	II.	II.	II.	II.	***IV.***	III.	II.	III.
	Manganese	mg/l	***IV.***	I.	I.	I.	I.	I.	I.	I.	***IV.***	***IV.***	***IV.***	***IV.***

Annex 9. Water quality classification on the basis of Hungarian Standard MSZ 12749. Tisza River system

Water quality classification on the basis of Hungarian Standard MSZ 12742 (1988-1997)
(Water system of the River Tisza)

Component group	Parameter	Unit	Tisza Tiszabecs 757.0 Rkm	Tisza Tiszasziget 162.5 Rkm	Tisza Tiszasziget 162.5 Rkm	Tisza Tiszasziget 162.5 Rkm	Sajó Sajópüspöki 123.5 Rkm	Bódva Hídvégardó 63.7 Rkm	Hernád Tornyosnémeti 102.0 Rkm	Bodrog Felsoberecki 46.0 Rkm	Szamos Csenger 45.4 Rkm	Kraszna Mérk 42.2 Rkm	Berettyó Pocsaj 71.5 Rkm	Maros Makó 24.3 Rkm	Maros Nagylak 50.6 Rkm	Maros Nagylak 50.6 Rkm
			Middle	**Left bank**	**Middle**	**Right bank**	**Middle**								**Middle**	**Right bank**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Oxigen regime	Dissolved oxygen	mg/l	I.	II.	II.	II.	II.	I.	III.	II.	I.	***V.***	II.	I.	I.	I.
	Oxygen saturation	mg/l	I.	II.	III.	II.	III.	I.	III.	III.	II.	***V.***	III.	III.	I.	I.
	BOD-5	mg/l	II.	I.	II.	II.	***IV.***	III.	III.	III.	***IV.***	***IV.***	III.	***IV.***	III.	III.
	COD-Mn	mg/l	II.	II.	III.	II.	***V.***	III.	II.	II.	***V.***	***V.***	III.	III.	III.	III.
	COD-Cr	mg/l	II.	III.	III.	III.	***V.***	III.	III.	II.	***IV.***	***IV.***	III.	***IV.***	***V.***	***IV.***
	TOC	mg/l		III.	III.	III.										***IV.***
	Szaprobic index	-	II.	III.	III.	III.	III.	III.	III.	III.	III.	III.	III.	***IV.***	III.	III.
Nutrients	N-NH4	mg/l	II.	II.	IV.	II.	III.	III.	***V.***	III.	***V.***	***V.***	***V.***	***IV.***	III.	III.
	N-NO2	mg/l	II.	III.	III.	III.	***IV.***	III.	***V.***	III.	III.	***V.***	***IV.***	***IV.***	III.	III.
	N-NO3	mg/l	II.	II.	II.	II.	II.	III.	II.	II.	II.	II.	II.	III.	II.	II.
	P-PO4	μγ/λ	II.	III.	III.	III.	***IV.***	III.	***IV.***	III.	III.	***V.***	III.	III.	II.	II.
	P- total	μγ/λ	II.	III.	III.	III.	III.	III.	***IV.***	III.	III.	***V.***	***IV.***	***IV.***	***IV.***	***IV.***
	Chlorophyl-a	μγ/λ	I.	III.	***IV.***	III.	II.	III.	II.	II.	***IV.***	III.	II.	***IV.***	***IV.***	***IV.***
Microbiology	Total coli	i/ml	***V.***	***V.***	***V.***	***V.***	***IV.***	***IV.***	***V.***	***IV.***	***V.***	***V.***	***IV.***	***IV.***	***V.***	***IV.***
	Faecal coliforms	i/ml	***V.***	***IV.***	***V.***	***V.***	***IV.***	***V.***	***V.***	***IV.***	***V.***	***V.***	***IV.***	***V.***	***V.***	***V.***
	Faecal streptococci	i/ml	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	***IV.***	III.	***IV.***	***V.***	III.	***IV.***	***IV.***	***IV.***

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Inorganic Micro-pollutants	Aluminium	μγ/λ	IV.	II.	III.	II.	IV.	IV.	IV.	IV.	IV.	IV.		III.	III.	II.
	Arzenic	μγ/λ	III.	I.	I.	I.	I.		I.		III.	III.		I.	I.	I.
	Boron	μγ/λ		III.	III.	III.	II.		III.			I.			III.	II.
	Cianides total	μγ/λ	I.	I.	I.	I.	I.		I.		I.	I.		I.	I.	I.
	Cianides free	μγ/λ										I.				
	Zinc	μγ/λ	***IV.***	I.	I.	I.	***IV.***	***IV.***	***IV.***	***IV.***	***V.***	***IV.***		I.	I.	I.
	Mercury	μγ/λ	***V.***	II.	II.	II.	I.	II.	II.	I.	***IV.***	***IV.***		II.	I.	II.
	Cadmium	μγ/λ	II.	I.	I.	I.	I.	I.	I.	I.	***IV.***	III.		I.	II.	I.
	Chromium	μγ/λ	I.	I.	I.	I.	I.	I.	I.	I.	I.	I.		III.	II.	III.
	Chromium(VI)	μγ/λ	I.	I.	I.		I.	II.	I.	I.	I.	I.				
	Nickel	μγ/λ	I.	I.	I.	I.	I.	I.	I.	I.	I.	I.		I.	I.	I.
	Lead	μγ/λ	II.	I.	I.	I.	I.	I.	I.	I.	II.	II.		I.	I.	I.
	Copper	μγ/λ	II.	II.	II.	II.	II.	III.	III.	III.	III.	II.		II.	II.	II.
Organic Micro-pollutants	Oil compounds	μγ/λ	I.	***IV.***	***IV.***	***IV.***	***V.***	***IV.***	***V.***	***V.***	III.	***IV.***	***V.***	***IV.***	***IV.***	***IV.***
	Phenol	μγ/λ	I.	II.	III.	II.	I.	I.	I.	I.	III.	III.	III.	III.	II.	II.
	Anionactive surfactants	μγ/λ	I.	I.	II.	I.	I.	I.	I.	I.	II.	III.	I.	II.	I.	I.
	Benzo/a/pyrene	μγ/λ					I.	***V.***	I.			I.				
	Chloroform	μγ/λ	I.				I.	II.	I.		I.	I.				
	Carbon tetrachloride	μγ/λ	I.				***IV.***	***IV.***	***V.***		I.	I.				
	Trichlorethylene	μγ/λ					I.	III.	I.			I.				
	Tetrachlor ethylene	μγ/λ					II.	III.	I.		I.	I.				
	Lindane	μγ/λ					I.	***V.***	I.			I.				
	Malation	μγ/λ					II.		II.			I.				

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	2,4 D	μγ/λ					I.		I.			I.				
	MCPA	μγ/λ					I.	***V.***	II.			I.				
	Atrazine	μγ/λ					I.	***V.***	I.			***IV.***				
	PCB	μγ/λ					III.	***V.***	III.			I.				
	Pentachlorphenol	μγ/λ					I.	***V.***	I.			I.				
Radioactive Parameters	Total b aktivity	Bq/l	I.	II.	II.	II.	II.	II.	II.	I.	II.	III.	III.	III.	II.	III.
	Cézium137	Bq/l		II.	II.	II.		***V.***				I.			II.	II.
	Stroncium90	Bq/l						***V.***				***V.***				
	Tricium	Bq/l										I.				
Other parameters	Hydrogen ion conc.	pH	I.	II.	II.	II.	II.	II.	I.	I.	I.	I.	I.	II.	II.	II.
	Conductivity	μΣ/χμ	I.	II.	II.	I.	II.	II.	II.	I.	III.	III.	III.	III.	III.	III.
	Iron	mg/l	III.	II.	III.	II.	III.	II.	II.	II.	IV.	IV.	III.	III.	II.	II.
	Manganese	mg/l	***IV.***	I.	***IV.***	I.	***IV.***	***IV.***	***IV.***	***IV.***	***V.***	***V.***	***V.***	***IV.***	I.	II.

Annex 10. Water Quality Data

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
12.01.94	2980,000	4,7	8,00	345	9,70	75,2	3,1	5,1	21	0,17	0,040	4,23	4,44	0,52	4,96	75	260
26.01.94	1910,000	4,0	8,20	425	10,60	80,7	3,8	3,2	15	0,40	0,038	3,62	4,05	1,14	5,19	91	190
09.02.94	2160,000	5,0	8,30	430	10,20	79,7	3,4	3,3	15	0,19	0,051	3,28	3,52	-0,02	3,50	117	170
23.02.94	1510,000	1,2	8,30	470	12,00	84,7	3,7	3,4	14	0,16	0,048	3,96	4,17	0,63	4,80	62	90
09.03.94	2210,000	6,5	8,50	400	11,70	95,1	3,5	4,1	14	0,06	0,027	2,83	2,91	1,29	4,20	82	200
23.03.94	2720,000	7,2	8,50	335	11,20	92,7	5,1	3,8	14	0,16	0,029	2,15	2,33	1,12	3,45	72	170
06.04.94	3090,000	8,2	8,20	310	10,90	92,5	3,8	3,9	11	0,04	0,031	2,49	2,56	1,28	3,84	101	230
20.04.94	6280,000	7,9	7,80	270	10,00	84,2	5,7	8,2	22	0,12	0,049	2,37	2,54	0,90	3,44	124	200
04.05.94	3270,000	13,7	8,30	370	10,90	105,5	5,5	4,4	17	0,09	0,030	2,03	2,16	0,09	2,25	62	110
18.05.94	2550,000	17,9	8,10	350	12,20	129,5	8,0	4,7	12	0,07	0,040	1,70	1,81	0,58	2,39	40	40
01.06.94	3490,000	16,5	8,20	326	8,60	88,6	4,0	5,3	15	0,07	0,038	1,79	1,89	2,01	3,90	147	350
15.06.94	2890,000	15,0	8,00	364	9,60	95,7	3,9	3,3	10	0,19	0,019	1,70	1,90	0,44	2,34	29	130
29.06.94	2130,000	22,0	8,70	340	12,70	146,5	3,6	3,7	16	0,12	0,000	1,20	1,31	0,76	2,07	39	130
13.07.94	1930,000	19,0	8,20	360	9,50	103,2	6,0	5,2	16	0,08	0,023	1,36	1,46	2,14	3,60	36	420
27.07.94	1630,000	22,7	8,30	336	11,50	134,5	5,0	5,6	17	0,10	0,015	1,02	1,13	2,47	3,60	20	340
10.08.94	1190,000	23,4	8,30	351	9,40	111,5	3,7	4,3	15	0,15	0,010	1,36	1,51	2,29	3,80	26	320
24.08.94	1430,000	20,0	8,30	370	8,40	93,1	4,8	4,1	15	0,59	0,012	1,08	1,69	0,11	1,80	13	80
07.09.94	1860,000	18,0	8,10	350	8,50	90,4	5,2	4,5	17	0,13	0,042	2,03	2,21	1,09	3,30	150	230
21.09.94	1660,000	14,5	8,30	360	8,00	78,8	3,8	3,8	14	0,02	0,026	1,81	1,86	1,45	3,31	88	110
05.10.94	1220,000	14,6	8,30	406	8,80	86,9	2,8	4,2	23	0,07	0,033	1,81	1,91	1,99	3,90	91	120
19.10.94	1040,000	9,2	7,10	420	12,30	107,0	5,0	4,2	20	0,04	0,023	1,92	1,98	0,78	2,76	65	70
02.11.94	1410,000	9,9	8,00	340	10,10	89,4	6,2	6,4	20	0,09	0,028	2,35	2,47	0,13	2,60	104	160
16.11.94	1580,000	6,8	7,80	350	10,70	87,7	4,0	5,5	20	0,13	0,039	2,49	2,66	0,94	3,60	130	230
30.11.94	1690,000	6,5	7,80	415	11,00	89,4	2,6	3,6	15	0,16	0,035	2,26	2,46	2,04	4,50	114	140
14.12.94	2250,000	5,5	7,90	441	10,20	80,8	4,0	3,3	15	0,22	0,048	2,62	2,89	0,31	3,20	134	170
20.12.94	1670,000	3,0	7,60	430	12,00	88,9	4,1	3,7	13	0,21	0,034	2,71	2,96	0,44	3,40	137	180
11.01.95	1500,000	1,2	7,90	420	12,20	86,1	3,8	4,1	15	0,23	0,027	2,94	3,20	0,00	3,20	91	120
25.01.95	1620,000	0,3	7,60	435	12,80	88,1	3,5	3,4	15	0,34	0,027	2,71	3,08	0,22	3,30	82	90
08.02.95	2400,000	4,0	7,50	395	12,20	92,9	4,2	3,7	10	0,16	0,024	3,28	3,46	0,24	3,70	88	180
22.02.95	2760,000	4,5	7,50	330	11,20	86,4	2,7	4,1	12	0,11	0,030	3,05	3,19	0,41	3,60	98	200
08.03.95	2730,000	6,6	7,90	326	11,60	94,5	4,5	4,5	13	0,16	0,033	2,83	3,01	0,29	3,30	72	130
22.03.95	3040,000	5,0	7,90	326	11,60	90,7	4,0	5,3	19	0,06	0,024	3,16	3,25	0,15	3,40	91	160
05.04.95	4360,000	7,5	8,10	388	11,50	95,9	4,2	3,2	11	0,12	0,026	2,71	2,86	0,24	3,10	62	90

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
19.04.95	2940,000	8,8	8,10	425	11,70	100,8	4,6	3,8	14	0,11	0,018	2,03	2,16	0,67	2,83	85	120
04.05.95	3500,000	13,2	8,00	306	10,10	96,6	2,3	8,2	20	0,10	0,016	1,47	1,59	0,21	1,80	82	100
17.05.95	3780,000	13,5	7,80	305	11,50	110,8	4,8	5,1	12	0,07	0,031	1,70	1,80	0,14	1,94	72	80
31.05.95	3140,000	17,0	8,30	330	12,80	133,3	4,6	6,0	17	0,05	0,014	1,36	1,42	0,33	1,75	23	70
14.06.95	4590,000	16,8	7,70	290	8,90	92,3	6,5	14,7	35	0,09	0,034	1,36	1,48	0,22	1,70	147	220
28.06.95	4720,000	16,2	8,50	346	10,00	102,3	5,2	5,1	15	0,09	0,020	1,47	1,58	0,22	1,80	46	120
12.07.95	2610,000	21,5	8,10	340	9,10	104,0	4,4	4,4	16	0,12	0,012	1,58	1,72	0,08	1,80	52	100
26.07.95	2120,000	21,4	8,30	327	10,60	120,9	3,4	5,8	19	0,11	0,010	1,24	1,36	0,06	1,42	16	50
09.08.95	1390,000	20,9	8,00	350	8,60	97,1	4,6	4,8	17	0,06	0,011	1,47	1,54	0,08	1,62	13	30
23.08.95	1470,000	20,9	8,50	350	10,60	119,7	6,0	5,5	18	0,01	0,014	1,36	1,38	0,14	1,52	13	20
06.09.95	4780,000	12,7	8,00	365	9,10	86,1	4,7	7,0	20	0,13	0,039	1,92	2,09	0,11	2,20	91	170
20.09.95	2360,000	14,0	8,20	360	10,30	100,4	3,4	3,9	11	0,01	0,022	1,81	1,84	0,78	2,62	39	130
04.10.95	1860,000	12,1	8,10	390	9,00	84,0	1,8	3,2	15	0,11	0,019	2,03	2,16	0,55	2,71	88	160
18.10.95	1300,000	12,4	8,70	410	10,40	97,7	3,2	4,7	19	0,02	0,016	1,81	1,85	1,16	3,01	36	180
01.11.95	1080,000	9,5	8,30	450	10,50	92,0	4,0	4,5	16	0,08	0,021	2,15	2,25	0,89	3,14	23	180
15.11.95	1610,000	6,5	8,20	500	10,20	82,9	3,3	4,2	12	0,36	0,039	2,26	2,66	0,90	3,56	85	180
29.11.95	1650,000	3,6	8,30	520	12,20	91,9	4,0	3,7	14	0,36	0,030	2,94	3,33	1,05	4,38	121	200
13.12.95	1300,000	1,7	8,20	540	11,10	79,4	3,2	3,4	13	0,33	0,039	2,83	3,19	0,50	3,69	147	200
27.12.95	3300,000	0,0	8,10	560	12,70	86,7	3,8	3,4	13	0,34	0,031	3,84	4,21	0,93	5,14	114	210
10.01.96	1670,000	0,6	8,00	510	13,00	90,2	4,8	4,5	15	0,45	0,022	3,16	3,64	0,66	4,30	134	230
24.01.96	1410,000	0,0	8,30	530	12,50	85,3	4,6	4,1	14	0,35	0,029	3,28	3,66	0,04	3,70	121	250
07.02.96	1170,000	0,0	8,10	570	13,90	94,9	8,1	4,0	14	0,54	0,029	3,28	3,84	0,06	3,90	124	240
21.02.96	1520,000	1,0	7,60	530	12,70	89,1	5,3	5,1	14	0,45	0,030	3,62	4,10	0,01	4,11	121	240
06.03.96	1170,000	2,1	8,30	520	14,10	102,0	4,6	3,9	16	0,37	0,031	3,28	3,67	0,24	3,91	88	160
20.03.96	1450,000	4,0	8,40	510	13,90	105,8	5,9	4,9	23	0,08	0,023	3,50	3,60	0,11	3,71	88	200
03.04.96	2360,000	3,8	8,00	360	13,80	104,5	4,4	4,9	17	0,12	0,019	3,28	3,42	0,32	3,74	68	250
17.04.96	3080,000	6,7	7,90	390	10,50	85,8	4,1	4,3	15	0,10	0,016	3,16	3,28	0,30	3,58	65	160
02.05.96	2840,000	14,5	8,10	390	11,70	115,3	5,3	4,1	11	0,05	0,027	2,15	2,23	0,16	2,39	114	210
14.05.96	2820,000	15,1	8,00	390	8,60	85,9	8,0	9,0	28	0,09	0,031	2,49	2,61	0,05	2,66	130	150
29.05.96	3860,000	13,2	8,20	350	11,50	110,0	5,4	5,3	18	0,08	0,035	2,26	2,37	0,35	2,72	150	270
12.06.96	2210,000	22,0	8,70	370	11,60	133,8	4,2	5,3	24	0,04	0,010	1,81	1,86	2,28	4,14	42	231
26.06.96	3010,000	18,2	8,00	370	8,50	90,8	3,8	3,9	15	0,06	0,032	2,26	2,35	0,35	2,70	74	130
10.07.96	2700,000	17,5	8,30	350	9,80	103,1	3,7	3,9	11	0,12	0,024	1,58	1,73	0,16	1,89	82	210

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
24.07.96	1750,000	18,0	8,60	370	10,60	112,7	4,0	5,7	17	0,19	0,018	1,58	1,79	0,16	1,95	23	180
07.08.96	2280,000	17,8	8,40	410	10,70	113,3	4,3	4,8	19	0,04	0,021	1,47	1,53	0,48	2,01	68	230
21.08.96	1740,000	19,6	8,20	420	9,90	108,8	4,5	3,2	16	0,09	0,009	1,70	1,79	0,30	2,09	85	230
04.09.96	2210,000	17,1	8,10	330	10,40	108,5	4,4	5,0	19	0,09	0,029	1,81	1,92	0,37	2,29	150	230
18.09.96	3960,000	11,3	7,90	340	13,00	119,0	4,9	4,2	12	0,09	0,021	1,81	1,91	0,30	2,21	108	140
02.10.96	2660,000	11,9	8,10	350	12,20	113,3	4,2	3,8	18	0,06	0,019	1,81	1,89	0,81	2,70	124	137
16.10.96	1780,000	12,4	8,10	460	9,00	84,5	3,1	3,4	14	0,04	0,020	2,71	2,77	0,17	2,94	114	210
30.10.96	2820,000	8,3	8,10	450	11,70	99,5	4,3	4,8	14	0,05	0,022	2,03	2,11	0,25	2,36	150	300
13.11.96	2060,000	8,9	8,30	410	14,00	120,9	4,6	3,6	12	0,04	0,025	2,37	2,44	0,22	2,66	82	160
27.11.96	2190,000	3,9	8,20	370	12,60	95,7	4,7	3,9	14	0,15	0,029	2,49	2,66	0,26	2,92	62	140
11.12.96	1680,000	1,1	8,10	490	12,20	85,9	4,6	4,5	16	0,33	0,028	2,60	2,95	0,19	3,14	121	150
18.12.96	1650,000	2,0	8,00	500	12,50	90,2	5,3	4,5	19	0,37	0,036	2,60	3,00	0,05	3,05	166	230
08.01.97	1380,000	0,0	7,90	490	12,60	86,0	4,2	3,7	14	0,54	0,038	2,71	3,29	0,09	3,38	117	160
22.01.97	1190,000	1,0	8,10	500	14,10	98,9	3,6	3,4	12	0,57	0,042	3,05	3,67	0,18	3,85	124	160
05.02.97	1100,000	0,0	8,30	500	13,30	90,8	3,7	3,0	12	0,24	0,036	3,28	3,55	0,18	3,73	68	130
19.02.97	2280,000	2,4	8,20	520	11,70	85,3	7,0	8,0	22	0,40	0,028	3,84	4,27	0,82	5,09	183	260
05.03.97	2780,000	3,6	8,20	380	12,60	94,9	4,6	4,3	20	0,12	0,025	3,05	3,19	1,07	4,26	95	200
19.03.97	3260,000	5,2	8,10	440	12,50	98,2	5,8	5,3	15	0,10	0,030	2,94	3,07	0,43	3,50	82	300
03.04.97	2360,000	7,0	8,00	415	9,80	80,7	2,8	4,6	19	0,02	0,021	2,53	2,57	0,53	3,10	39	140
16.04.97	2400,000	6,2	8,60	380	11,20	90,3	4,5	4,3	17	0,03	0,020	2,19	2,24	0,46	2,70	62	150
30.04.97	2210,000	10,5	8,70	420	10,60	95,2	4,0	4,2	24	0,02	0,018	2,37	2,41	0,60	3,01	42	120
14.05.97	2470,000	15,6	8,40	363	10,80	109,1	5,1	5,7	23	0,02	0,034	1,81	1,86	0,74	2,60	33	140
28.05.97	2600,000	14,8	8,20	330	9,40	93,3	3,9	4,0	12	0,09	0,034	1,58	1,71	0,19	1,90	90	170
10.06.97	2040,000	19,0	8,70	335	12,50	135,7	4,1	4,7	17	0,02	0,015	1,13	1,16	0,15	1,31	13	100
26.06.97		18,5	8,20	330	9,30	99,9	4,6	4,4	15	0,01	0,025	1,47	1,50	0,10	1,60	98	160
09.07.97	5510,000	16,3	8,20	290	8,00	82,0	5,3	4,2	15	0,07	0,025	1,36	1,45	2,04	3,49	68	90
06.08.97	3350,000	18,9	8,30	360	8,10	87,8	3,2	3,8	11	0,16	0,012	1,58	1,75	0,08	1,83	88	170
21.08.97	2160,000	21,0	8,70	362	10,40	117,6	5,4	5,1	17	0,20	0,011	1,24	1,46	0,25	1,71	3	160
03.09.97	1880,000	20,5	8,20	410	9,20	103,0	5,0	4,6	14	0,02	0,019	1,70	1,74	0,08	1,82	30	110
17.09.97	1330,000	15,8	8,20	390	10,50	106,5	4,0	4,1	20	0,06	0,014	1,58	1,66	0,17	1,83	62	140
01.10.97	983,000	15,4	8,80	400	12,80	128,7	3,5	3,9	15	0,02	0,012	1,58	1,61	0,74	2,35	7	96
17.10.97	2010,000	11,2	8,30	420	10,50	95,9	5,5	4,7	16	0,05	0,016	1,70	1,77	0,27	2,04	98	190
29.10.97	1170,000	4,8	7,80	455	12,50	97,2	4,6	4,6	16	0,08	0,032	2,15	2,26	0,37	2,63	101	170

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
12.11.97	1220,000	8,0	8,10	440	10,50	88,7	3,8	4,4	15	0,09	0,032	2,03	2,16	0,02	2,18	68	140
26.11.97	1300,000	4,1	8,50	425	11,40	87,0	4,5	4,6	15	0,23	0,025	2,49	2,74	0,06	2,80	143	220
10.12.97	1320,000	3,1	8,30	410	10,10	75,1	3,7	4,4	13	0,23	0,029	2,26	2,51	0,06	2,57	111	160
22.12.97	2020,000	3,0	7,90	410	11,40	84,5		4,5	14	0,33	0,038	2,83	3,20	0,02	3,22	101	160

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
12.01.94		50	2	10	36,1	11,2	7,0	3,6	0,78			0,00									
26.01.94		20	2	20	52,1	14,6	11,0	3,4	0,33			0,00				2,0					
09.02.94		70	0	30	51,3	13,1	11,0	3,6	0,31			0,00									
23.02.94		60	2	30	59,3	14,8	11,0	2,8	0,04			0,00				1,7					
09.03.94		20	2	20	48,1	12,2	11,0	3,8	0,05			0,00									
23.03.94		50	1	30	40,7	11,8	7,0	2,4	0,08			0,00				1,2					
06.04.94		60	2	40	36,7	9,8	7,0	3,0	0,14			0,00									
20.04.94		100	1	30	32,5	7,4	6,0	3,2	0,32			0,00				2,0					
04.05.94		70	3	10	48,3	10,5	8,0	2,8	0,72			0,00									
18.05.94		70	1	20	42,5	10,5	8,0	2,4	0,26			0,00				1,7					
01.06.94		20	1	20	43,3	9,1	5,0	1,7	0,98			0,00									
15.06.94		30	2	20	50,9	8,6	8,0	2,8	0,63			0,00				0,9					
29.06.94		30	1		44,1	10,9	6,0	2,2	0,51			0,00									
13.07.94				40	44,1	2,4	15,0	3,0	0,34			0,00									
27.07.94		70	2	10	42,9	8,4	10,0	2,6	0,46			0,00				3,8					
10.08.94		40	2	20	41,3	10,0	11,0	2,8	0,59			0,00		37		5,8					
24.08.94				20	47,9	8,5	9,0	2,8	0,22			0,00									
07.09.94		20	4	100	40,9	10,9	10,0	5,0	0,66			0,00									
21.09.94		80	2	100	42,5	9,7	9,0	3,2	0,28			0,00		40		2,5					
05.10.94		30	3	20	40,1	14,3	18,0	7,5	0,65			0,00		37		3,0					
19.10.94				80	56,1	12,6	13,0	3,6	0,22			0,00									
02.11.94				10	42,5	11,2	9,0	4,4	0,45			0,00									
16.11.94				160	42,5	12,9	11,0	3,6	0,76			0,00									
30.11.94		10	1	20	46,7	11,3	12,0	3,8	0,28			0,00		25		2,0					
14.12.94		40	1	30	48,7	17,0	15,0	4,6	0,27			0,00		95		3,0					
20.12.94				50	48,3	14,8	15,0	5,0	0,41			0,00									
11.01.95		30	3	20	58,7	10,0	12,0	3,4		0,25		0,00		60		2,3					
25.01.95		30	2	30	57,5	10,6	10,0	2,4		0,13		0,00									
08.02.95		40	2	20	49,7	10,3	11,0	3,6		0,24		0,00		45		1,7					
22.02.95		10	2	40	36,1	8,3	9,0	3,2		0,06		0,00									
08.03.95		30	2	30	42,0	8,6	7,0	2,4		0,14		0,00		30		2,0					
22.03.95		20	2	40	41,0	10,0	10,0	3,6		0,27		0,00									
05.04.95		10	2	40	57,6	13,1	8,0	2,4		0,16		0,00		70		2,7					

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
19.04.95		20	1	40	54,5	14,0	10,0	3,6		0,17		0,00									
04.05.95		10	2	50	36,8	9,5	7,0	3,4		0,13		0,00		80		3,0					
17.05.95		30	0	39	37,0	11,0	7,0	3,0		0,17		0,00									
31.05.95		20	1	20	42,7	11,0	6,0	2,2		0,09		0,00									
14.06.95		30	1	10	35,0	9,5	7,0	5,0		0,46		0,00		100		4,2					
28.06.95		30	1	20	49,0	10,5	6,0	2,6		0,06		0,00									
12.07.95		50	1	20	45,0	11,0	7,0	2,2		0,09		0,00		20		4,0					
26.07.95		20	1	20	47,0	10,0	8,0	2,4		0,07		0,00									
09.08.95		50	2	50	48,0	9,6	11,0	3,2		0,09		0,00		30		2,2					
23.08.95		30	1	40	48,0	11,1	11,0	3,0		0,07		0,00									
06.09.95		40	2	20	48,0	11,1	12,0	4,2		0,13		0,00		80		4,0					
20.09.95		30	3	10	49,1	11,5	10,0	2,6		0,01		0,00									
04.10.95		50	4	80	54,0	12,9	13,0	3,4		0,07		0,00		90		1,7					
18.10.95		0	4	40	56,5	11,3	13,0	3,2		0,07		0,00									
01.11.95		10	4	20	60,0	13,6	15,0	3,8		0,09		0,00									
15.11.95		10	3	30	60,0	12,1	16,0	5,5		0,01		0,00		100		3,2					
29.11.95		20	2	20	57,6	13,6	16,0	4,4		0,09		0,00									
13.12.95		20	2	50	57,0	16,4	20,0	5,0		0,03		0,00		70		2,7					
27.12.95		20	2	30	56,0	15,0	19,0	6,6		0,03		0,00									
10.01.96		10	4	30	58,0	13,5	15,0	3,8		0,15		0,00				1,2					
24.01.96		0	3	30	69,1	13,2	17,0	4,2		0,07		0,01									
07.02.96		20	3	30	69,8	18,9	16,0	3,8		0,05		0,00				1,5					
21.02.96		80	1	50	64,9	15,9	22,0	4,6		0,02		0,00									
06.03.96		30	2	50	66,5	15,4	24,0	4,8		0,02		0,00				1,8					
20.03.96		10	3	50	64,2	14,0	20,0	4,0		0,03		0,00									
03.04.96		30	1	20	40,4	10,1	13,0	4,0		0,00		0,02				2,2					
17.04.96		80	1	40	48,0	13,0	14,0	3,4		0,03		0,00									
02.05.96		20	1	30	42,0	11,3	15,0	4,2		0,07		0,00									
14.05.96		30	2	40	31,4	12,4	13,0	4,4		0,13		0,00				2,0					
29.05.96		40	1	20	41,0	12,0	12,0	4,0		0,15		0,00									
12.06.96		10	2	30	46,0	10,0	13,0	2,6		0,01		0,00		16		2,0					
26.06.96		230	2	70	45,1	9,0	12,0	3,8		0,05		0,00									
10.07.96		10	1	60	44,0	11,0	13,0	3,0		0,00		0,00				1,6					

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
24.07.96		20	1	30	46,0	11,0	14,0	3,0		0,00		0,00									
07.08.96		20	2	30	44,0	10,0	17,0	4,4		0,04		0,00				1,6					
21.08.96		30	2	15	58,0	12,0	18,0	4,8		0,05		0,00									
04.09.96		20	1	100	41,0	6,0	11,0	4,0		0,04		0,00				1,5					
18.09.96		20	2	40	49,0	17,0	24,0	3,0		0,04		0,00									
02.10.96		20	1	20	44,0	12,5	11,0	2,6		0,01		0,00									
16.10.96		20	1	40	62,0	14,0	17,0	5,0		0,26		0,00				1,0					
30.10.96		20	3	30	58,0	17,0	17,0	3,6		0,17		0,00									
13.11.96		30	3	30	56,0	15,0	9,0	2,4		0,08		0,00				0,9					
27.11.96		120	1	50	43,0	13,0	12,0	3,2		0,22		0,00									
11.12.96		20	1	30	66,0	15,0	20,0	5,5		0,01		0,00				2,0					
18.12.96		10	2	50	66,0	15,0	18,0	3,6		0,01		0,00									
08.01.97		10	1	60	66,0	18,0	14,0	4,0		0,10		0,07				1,4					
22.01.97		20	2	50	69,0	20,0	19,0	4,2		0,12		0,00									
05.02.97		40	3	50	66,0	18,0	19,0	3,8		0,08		0,07				1,0					
19.02.97		10	1	60	59,0	19,0	14,0	3,2		0,04		0,00									
05.03.97		30	3	70	48,0	15,0	14,0	4,2		0,14		0,00				1,4					
19.03.97		70	6	70	59,0	15,0	15,0	3,4		0,13		0,00									
03.04.97		10	4	80	59,0	15,3	14,0	3,2		0,05		0,00									
16.04.97		30	3	60	59,0	13,0	13,0	2,8		0,34		0,00				1,3					
30.04.97		20	1	40	61,0	15,0	16,0	3,6		0,20		0,00									
14.05.97		30	1	50	53,0	12,0	13,0	3,0		0,07		0,00				2,0					
28.05.97		30	2	60	50,0	10,0	12,0	2,6		0,10		0,00									
10.06.97		30	2	100	47,9	9,7	11,0	2,4		0,13		0,00				1,9					
26.06.97		40	5	30	45,0	10,0	14,0	3,2		0,06		0,00									
09.07.97		30	1	60	45,0	9,0	10,0	2,4		0,02		0,00				3,0					
06.08.97		40	2	70	58,0	8,0	13,0	3,4		0,04		0,00				2,5					
21.08.97		20	1	160	42,0	15,0	12,0	3,4		0,03		0,00									
03.09.97		20	2	60	67,0	12,0	16,0	4,4		0,02		0,00				1,7					
17.09.97		30	3	90	64,0	15,0	14,0	3,6		0,05		0,00									
01.10.97		30	2	30	67,0	13,0	14,0	2,8		0,16		0,00									
17.10.97		40	1	80	66,0	14,0	16,0	4,2		0,09		0,00				2,3					
29.10.97		40	4	110	67,0	13,0	17,0	4,4		0,22		0,00									

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
12.11.97		30	2	110	64,0	17,0	14,0	3,4		0,12		0,00				1,8					
26.11.97		30	2	170	58,3	20,4	15,0	4,6		0,09		0,00									
10.12.97		20	1	130	71,0	12,4	13,0	3,0		0,10		0,00				2,4					
22.12.97		30	1	50	59,0	12,0	15,0	3,6		0,02		0,00									

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
12.01.94													
26.01.94	25		0,10		0,1		1,2		4,9		2,2		2,8
09.02.94													
23.02.94	54		0,10		0,1		0,6		0,5		1,1		6,8
09.03.94													
23.03.94	20		0,20		0,3		1,7		1,8		1,9		2,8
06.04.94													
20.04.94	30		0,20		0,1		3,1		1,8		1,4		3,1
04.05.94													
18.05.94	20		0,10		0,1		0,8		2,4		2,7		2,7
01.06.94													
15.06.94	30		0,20		0,1		1,9		4,9		2,2		4,2
29.06.94													
13.07.94													
27.07.94	30		0,10		0,1		0,9		1,7		2,1		1,7
10.08.94	40		0,10		0,1		2,0		4,9		1,2		2,3
24.08.94													
07.09.94													
21.09.94	20		0,20		0,1		1,1		5,1		3,0		3,5
05.10.94	22		0,10		0,3		2,4		1,0		3,6		10,5
19.10.94													
02.11.94													
16.11.94													
30.11.94	40		0,20		0,2		2,0		1,7		2,8		7,1
14.12.94	49		0,10		0,7		1,0		0,1		2,0		2,8
20.12.94													
11.01.95	27		0,10		0,2		0,9		1,7		2,1		6,7
25.01.95													
08.02.95	50		0,10		0,8		3,6		1,6		2,8		1,4
22.02.95													
08.03.95	70		0,10		0,2		5,2		4,7		4,0		5,5
22.03.95													
05.04.95	40		0,10		0,1		3,1		3,5		3,3		5,6

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
19.04.95													
04.05.95	50		0,10		0,2		1,9		2,7		2,8		6,6
17.05.95													
31.05.95													
14.06.95	40		0,10		0,2		0,7		3,0		6,1		6,7
28.06.95													
12.07.95	30		0,10		0,2		2,2		1,8		4,7		3,0
26.07.95													
09.08.95	20		0,10		0,4		1,7		2,5		5,0		4,0
23.08.95													
06.09.95	20		0,10		0,1		0,1		4,7		0,8		3,2
20.09.95													
04.10.95	20		0,10		0,2		0,6		2,2		2,7		0,8
18.10.95													
01.11.95													
15.11.95	40		0,15		0,2		0,9		2,7		4,5		3,7
29.11.95													
13.12.95	35		0,10		0,2		1,2		3,2		3,0		3,0
27.12.95													
10.01.96	20		0,10		2,2		0,4		1,9		4,7		7,0
24.01.96													
07.02.96	20		0,10		0,8		0,3		1,7		2,3		1,0
21.02.96													
06.03.96	20		0,10		1,0		5,5		6,1		10,6		5,6
20.03.96													
03.04.96	20		0,10		0,7		1,3		3,5		5,0		4,5
17.04.96													
02.05.96													
14.05.96	60		0,10		0,5		1,9		3,7		2,0		3,0
29.05.96													
12.06.96	40		0,10		1,7		1,7		1,8		1,7		1,1
26.06.96													
10.07.96	20		0,10		0,4		2,4		2,9		1,6		3,7

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
24.07.96													
07.08.96	30		0,10		0,7		0,8		2,7		2,0		3,6
21.08.96													
04.09.96	40		0,10		0,6		0,7		1,8		1,4		4,0
18.09.96													
02.10.96													
16.10.96	30		0,10		0,3		0,6		2,7		1,9		4,2
30.10.96													
13.11.96	20		0,10		0,2		0,7		3,0		5,0		2,8
27.11.96													
11.12.96	100		0,10		0,5		0,5		4,0		2,5		3,0
18.12.96													
08.01.97	25		0,10		1,4		1,7		1,8		2,6		2,6
22.01.97													
05.02.97	20		0,10		0,6		1,0		2,6		2,7		2,0
19.02.97													
05.03.97	20		0,10		0,9		1,5		2,6		3,0		2,1
19.03.97													
03.04.97													
16.04.97	30		0,10		0,7		2,4		3,2		1,5		3,5
30.04.97													
14.05.97	25		0,10		1,6		2,0		3,3		2,5		2,7
28.05.97													
10.06.97	35		0,10		0,9		1,7		5,0		1,7		3,0
26.06.97													
09.07.97	40		0,10		0,7		0,5		3,4		3,0		2,7
06.08.97	60				1,2		1,2		2,7		2,7		1,9
21.08.97													
03.09.97	20		0,10		0,9		1,5		1,9		1,8		4,0
17.09.97													
01.10.97													
17.10.97	30		0,10		1,0		2,0		3,0		2,0		4,2
29.10.97													

Duna at Szob, left bank, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
12.11.97	50		0,10		0,8		2,5		2,8		2,5		3,8
26.11.97													
10.12.97	60		0,10		1,3		1,8		3,5		3,5		4,7
22.12.97													

Duna at Szob middle, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
12.01.94	2980,000	4,8	8,20	435	9,60	74,7	3,1	4,4	17	0,19	0,058	3,71	3,96	0,52	4,48	75	210
26.01.94	1910,000	4,0	8,30	465	10,20	77,7	3,3	3,2	15	0,36	0,050	3,71	4,11	1,05	5,16	82	240
09.02.94	2160,000	5,0	8,30	430	10,60	82,9	2,7	3,6	15	0,13	0,049	3,62	3,80	0,10	3,90	88	130
23.02.94	1510,000	1,5	8,20	470	12,10	86,1	3,5	3,3	14	0,16	0,054	4,07	4,29	1,11	5,40	68	110
09.03.94	2210,000	6,4	8,50	440	11,20	90,8	3,5	4,2	15	0,06	0,029	3,16	3,25	1,45	4,70	55	190
23.03.94	2720,000	7,2	8,50	385	11,20	92,7	4,6	3,8	13	0,11	0,025	2,71	2,85	0,98	3,83	46	150
06.04.94	3090,000	8,4	8,30	375	10,10	86,1	3,8	3,5	11	0,02	0,023	2,03	2,08	1,54	3,62	49	170
04.05.94	3270,000	13,5	8,30	380	10,60	102,1	3,3	4,5	17	0,09	0,016	2,60	2,70	0,10	2,80	23	80
18.05.94	2550,000	17,9	8,10	345	13,20	140,1	8,6	4,4	12	0,07	0,020	1,70	1,79	0,57	2,36	20	20
01.06.94	3490,000	16,2	8,20	330	8,80	90,0	3,0	4,2	12	0,05	0,024	1,99	2,07	1,79	3,86	65	270
15.06.94	2890,000	15,0	8,00	336	9,80	97,7	3,6	3,3	10	0,18	0,017	1,70	1,89	0,51	2,40	7	120
29.06.94	2130,000	21,5	8,80	330	14,20	162,2	3,3	3,3	16	0,12	0,000	1,20	1,31	0,09	1,40	20	70
13.07.94	1930,000	18,5	8,20	320	9,00	96,7	5,0	4,8	18	0,10	0,013	1,47	1,58	1,02	2,60	26	490
27.07.94	1630,000	22,7	8,30	316	13,60	159,1	6,0	4,6	16	0,05	0,023	1,13	1,21	1,79	3,00	16	300
10.08.94	1190,000	23,3	8,30	331	9,90	117,2	3,1	3,5	12	0,13	0,007	1,47	1,61	2,19	3,80	20	310
24.08.94	1430,000	20,0	8,40	330	9,60	106,4	4,0	3,3	14	0,02	0,008	1,22	1,24	0,53	1,77	13	50
07.09.94	1860,000	17,5	8,10	350	9,50	100,0	5,2	4,2	16	0,13	0,013	2,03	2,18	1,52	3,70	52	90
21.09.94	1660,000	14,7	8,30	350	8,00	79,2	2,4	3,1	15	0,04	0,011	1,92	1,97	1,08	3,05	68	80
05.10.94	1220,000	14,5	8,40	377	9,60	94,6	3,8	3,1	11	0,12	0,020	1,70	1,83	1,27	3,10	98	120
19.10.94	1040,000	9,1	7,00	402	10,80	93,7	4,0	3,3	14	0,05	0,016	2,26	2,33	0,34	2,67	88	100
02.11.94	1410,000	9,9	8,00	420	10,60	93,8	5,0	5,0	17	0,04	0,026	2,03	2,10	1,00	3,10	52	100
16.11.94	1580,000	6,9	7,80	426	9,30	76,4	3,5	4,5	19	0,19	0,056	2,94	3,19	1,01	4,20	95	180
30.11.94	1690,000	6,6	7,80	400	10,40	84,8	3,5	4,0	15	0,16	0,036	2,03	2,23	1,77	4,00	72	100
14.12.94	2250,000	5,5	7,90	415	10,20	80,8	3,4	3,1	12	0,16	0,056	2,55	2,77	0,43	3,20	72	120
20.12.94	1670,000	2,0	7,50	420	10,90	78,6	3,5	3,3	14	0,16	0,050	2,71	2,92	0,18	3,10	85	140
11.01.95	1500,000	1,0	7,90	450	11,10	77,9	2,4	4,0	13	0,21	0,035	3,16	3,41	0,17	3,58	78	120
25.01.95	1620,000	1,0	7,80	450	12,60	88,4	3,8	3,2	10	0,30	0,040	3,05	3,39	0,41	3,80	68	80
08.02.95	2400,000	5,0	7,40	385	12,20	95,4	4,3	4,1	13	0,18	0,035	3,73	3,94	0,56	4,50	72	110
22.02.95	2760,000	4,5	7,60	400	10,70	82,6	3,4	3,6	11	0,11	0,038	3,05	3,20	0,40	3,60	62	160
08.03.95	2730,000	6,5	8,00	406	11,80	95,9	3,7	4,4	13	0,12	0,039	2,71	2,87	0,33	3,20	62	100
22.03.95	3040,000	5,5	8,00	425	12,60	99,8	3,1	4,2	17	0,05	0,021	3,05	3,13	0,24	3,37	13	160
05.04.95	4360,000	7,5	8,10	388	11,50	95,9	4,2	3,2	11	0,12	0,026	2,71	2,86	0,24	3,10	62	90
19.04.95	2940,000	8,5	8,10	380	11,50	98,3	4,3	4,0	12	0,08	0,021	2,15	2,25	0,51	2,76	124	150

Duna at Szob middle, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
04.05.95	3500,000	13,1	8,20	350	11,70	111,7	6,1	5,1	12	0,06	0,016	2,71	2,79	0,21	3,00	36	50
17.05.95	3780,000	13,4	7,90	320	11,00	105,7	3,7	3,1	9	0,05	0,022	1,70	1,77	0,13	1,90	23	80
31.05.95	3140,000	16,8	8,40	334	14,70	152,4	6,0	4,9	16	0,05	0,008	1,58	1,64	0,18	1,82	0	50
14.06.95	4590,000	17,1	8,20	330	8,30	86,6	3,2	5,3	14	0,19	0,040	1,58	1,82	0,13	1,95	78	80
28.06.95	4720,000	15,8	8,50	310	10,60	107,5	5,0	4,2	12	0,11	0,021	1,36	1,49	0,21	1,70	29	80
12.07.95	2610,000	21,4	8,10	310	9,10	103,8	3,4	3,5	12	0,10	0,012	1,67	1,79	0,01	1,80	39	70
26.07.95	2120,000	21,0	8,10	313	8,60	97,3	2,2	3,2	11	0,10	0,008	1,58	1,69	0,16	1,85	23	50
09.08.95	1390,000	20,5	7,90	330	8,20	91,8	2,0	3,0	12	0,06	0,011	1,58	1,65	0,09	1,74	29	50
23.08.95	1470,000	20,7	8,50	340	8,50	95,6	4,0	3,8	18	0,01	0,012	1,58	1,60	0,15	1,75	20	30
06.09.95	4780,000	12,7	8,00	300	9,10	86,1	4,9	6,0	16	0,12	0,033	1,92	2,07	0,12	2,19	65	150
20.09.95	2360,000	14,0	8,20	350	10,30	100,4	3,5	3,1	12	0,03	0,022	1,81	1,86	0,88	2,74	62	140
04.10.95	1860,000	12,4	8,00	370	9,50	89,2	1,8	3,2	14	0,11	0,013	1,97	2,09	0,61	2,70	36	130
18.10.95	1300,000	12,2	8,70	380	10,60	99,1	3,2	4,0	15	0,02	0,015	1,70	1,73	1,15	2,88	10	130
01.11.95	1080,000	9,8	8,30	415	10,50	92,7	3,8	4,6	15	0,08	0,023	2,26	2,36	0,89	3,25	13	150
15.11.95	1610,000	6,5	8,20	460	9,60	78,0	3,3	3,0	12	0,26	0,034	2,49	2,78	0,78	3,56	78	160
29.11.95	1650,000	3,8	8,30	460	12,20	92,4	4,2	3,4	14	0,23	0,047	3,05	3,33	1,06	4,39	98	170
13.12.95	1300,000	1,8	8,20	500	12,10	86,8	3,0	3,2	12	0,21	0,041	3,05	3,30	0,47	3,77	124	250
27.12.95	3300,000	0,2	8,10	480	12,90	88,5	3,9	3,2	12	0,19	0,040	3,84	4,08	0,67	4,75	95	160
10.01.96	1670,000	0,5	8,00	480	12,70	87,9	5,3	4,9	15	0,27	0,028	3,39	3,69	0,71	4,40	95	160
24.01.96	1410,000	0,0	8,30	500	12,60	86,0	4,7	4,0	14	0,23	0,035	3,28	3,54	0,02	3,56	75	170
07.02.96	1170,000	0,0	8,10	500	14,20	96,9	8,4	3,4	12	0,30	0,030	3,50	3,83	0,11	3,94	68	100
21.02.96	1520,000	1,0	7,60	480	12,70	89,1	4,9	5,1	15	0,27	0,029	3,73	4,03	0,04	4,07	55	120
06.03.96	1170,000	2,0	8,40	530	14,10	101,7	4,8	4,1	17	0,20	0,032	3,73	3,96	0,28	4,24	59	140
20.03.96	1450,000	3,5	8,40	520	16,00	120,2	5,6	4,8	20	0,02	0,027	3,73	3,77	0,11	3,88	46	160
03.04.96	2360,000	5,1	8,10	460	13,40	105,0	4,4	4,8	17	0,19	0,039	4,52	4,75	0,38	5,13	72	220
17.04.96	3080,000	6,7	8,00	440	10,50	85,8	4,1	4,4	17	0,05	0,025	4,52	4,60	0,39	4,99	42	230
02.05.96	2840,000	14,4	8,20	390	11,80	116,0	5,3	4,9	13	0,03	0,022	2,60	2,65	0,49	3,14	65	70
14.05.96	2820,000	14,1	8,20	380	9,70	94,7	4,2	5,3	21	0,09	0,030	2,26	2,38	0,02	2,40	68	110
29.05.96	3860,000	13,2	8,30	360	14,00	134,0	4,7	4,6	14	0,02	0,015	2,71	2,75	0,32	3,07	33	110
12.06.96	2210,000	21,2	8,70	360	11,70	132,9	3,9	4,6	18	0,05	0,005	1,81	1,86	2,29	4,15	52	167
26.06.96	3010,000	18,0	8,10	360	9,30	98,9	3,7	3,6	13	0,04	0,017	2,26	2,32	0,24	2,56	46	70
10.07.96	2700,000	17,5	8,20	350	9,80	103,1	3,2	4,1	12	0,11	0,014	1,81	1,93	0,14	2,07	39	150
24.07.96	1750,000	18,2	8,40	360	10,20	108,9	4,3	4,3	13	0,19	0,013	1,92	2,12	0,08	2,20	33	130

Duna at Szob middle, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
07.08.96	2280,000	17,5	8,50	350	11,20	117,9	4,0	4,6	17	0,03	0,009	1,24	1,28	0,34	1,62	13	130
21.08.96	1740,000	19,5	8,10	370	9,30	102,0	2,6	2,9	12	0,09	0,004	1,92	2,01	0,15	2,16	59	160
04.09.96	2210,000	17,0	8,20	370	10,70	111,4	4,4	3,0	14	0,10	0,010	1,92	2,03	0,23	2,26	98	140
18.09.96	3960,000	11,3	7,90	350	13,20	120,8	4,9	4,1	12	0,09	0,013	1,70	1,79	0,33	2,12	62	120
02.10.96	2660,000	12,3	8,20	370	11,50	107,8	4,3	3,5	13	0,06	0,013	1,92	2,00	0,25	2,25	104	560
16.10.96	1780,000	12,3	8,20	400	9,50	89,0	3,2	2,7	10	0,05	0,021	2,03	2,10	0,15	2,25	39	130
30.10.96	2820,000	8,5	8,10	380	11,40	97,5	4,8	4,6	12	0,09	0,020	2,15	2,26	0,24	2,50	55	410
13.11.96	2060,000	8,9	8,30	410	13,90	120,0	3,8	3,2	14	0,08	0,027	2,37	2,48	0,18	2,66	78	130
27.11.96	2190,000	4,0	8,20	410	12,80	97,5	4,8	3,6	13	0,09	0,032	2,49	2,61	0,26	2,87	62	120
11.12.96	1680,000	1,1	8,20	450	11,70	82,3	4,5	4,4	16	0,16	0,037	2,60	2,79	0,16	2,95	65	140
18.12.96	1650,000	1,9	8,00	470	9,00	64,7	4,2	3,7	15	0,12	0,044	3,05	3,22	0,03	3,25	78	130
08.01.97	1380,000	0,0	8,00	480	12,80	87,4	3,4	3,9	14	0,25	0,030	3,39	3,67	0,13	3,80	72	140
22.01.97	1190,000	1,0	8,20	500	14,10	98,9	3,4	3,0	12	0,31	0,032	3,28	3,62	0,23	3,85	88	160
05.02.97	1100,000	0,0	8,20	540	13,90	94,9	4,5	3,7	14	0,45	0,035	3,28	3,76	0,25	4,01	111	180
19.02.97	2280,000	2,4	8,40	440	11,00	80,2	4,0	4,1	14	0,23	0,031	3,50	3,77	0,35	4,12	91	200
05.03.97	2780,000	4,2	8,30	410	12,00	91,9	4,0	4,6	18	0,12	0,028	3,62	3,76	0,25	4,01	62	120
19.03.97	3260,000	5,9	8,20	410	12,00	96,0	3,3	5,2	14	0,05	0,023	3,16	3,24	0,32	3,56	46	270
03.04.97	2360,000	7,0	8,00	410	11,50	94,7	5,2	3,8	17	0,02	0,017	2,49	2,52	0,48	3,00	33	140
16.04.97	2400,000	6,1	8,60	400	11,50	92,5	4,0	3,8	16	0,03	0,013	2,46	2,51	0,49	3,00	26	110
30.04.97	2210,000	10,8	8,70	390	13,80	124,8	3,9	4,8	22	0,02	0,016	2,49	2,53	0,57	3,10	29	120
14.05.97	2470,000	15,3	8,40	340	11,40	114,4	4,0	4,1	20	0,02	0,017	1,81	1,84	0,36	2,20	0	70
28.05.97	2600,000	14,7	8,30	305	9,10	90,1	3,1	3,3	10	0,10	0,024	1,36	1,48	0,22	1,70	39	110
10.06.97	2040,000	19,0	8,70	320	13,60	147,7	4,0	4,5	13	0,02	0,012	1,02	1,04	0,14	1,18	10	100
26.06.97		18,0	8,30	280	8,50	90,4	3,5	3,3	11	0,02	0,016	1,36	1,39	0,01	1,40	85	130
09.07.97	5510,000	16,0	8,20	280	8,60	87,6	3,8	4,6	16	0,05	0,020	1,36	1,43	0,34	1,77	72	190
06.08.97	3350,000	18,2	8,40	350	8,40	89,7	2,0	3,9	10	0,18	0,010	1,58	1,77	0,08	1,85	49	130
21.08.97	2160,000	21,0	8,70	350	11,20	126,7	5,2	4,2	14	0,23	0,008	1,24	1,48	0,33	1,81	2	110
03.09.97	1880,000	19,5	8,20	360	9,50	104,2	4,0	3,4	11	0,02	0,012	1,58	1,62	0,06	1,68	24	80
17.09.97	1330,000	16,0	8,10	380	10,10	102,9	3,8	3,3	12	0,05	0,009	1,47	1,52	0,08	1,60	91	170
01.10.97	983,000	14,2	8,90	395	13,80	135,1	3,5	3,9	15	0,02	0,012	1,58	1,61	0,69	2,30	7	105
17.10.97	2010,000	11,6	8,30	390	10,50	96,8	4,8	4,3	19	0,06	0,012	1,70	1,77	0,20	1,97	101	140
29.10.97	1170,000	5,2	7,80	415	11,40	89,6	4,2	3,5	11	0,11	0,020	2,15	2,28	0,20	2,48	59	160
12.11.97	1220,000	7,9	8,10	430	10,20	85,9	3,0	2,7	11	0,09	0,028	2,03	2,16	0,02	2,18	59	120

Duna at Szob middle, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
26.11.97	1300,000	4,1	8,50	430	10,60	80,9	2,5	3,1	11	0,10	0,029	2,49	2,62	0,03	2,65	55	160
10.12.97	1320,000	3,6	8,30	450	10,10	76,1	2,2	3,1	12	0,15	0,036	2,49	2,67	0,02	2,69	68	130
22.12.97	2020,000	2,0	8,00	420	11,40	82,2		4,7	11	0,18	0,035	2,49	2,70	0,08	2,78	65	110

Duna at Szob middle, rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
12.01.94		20	1	10	56,1	13,6	8,0	2,8	0,39			0,00									
26.01.94		60	3	30	60,9	14,1	10,0	2,8	0,35			0,00				1,9					
09.02.94		70	0	10	54,5	13,1	9,0	2,6	0,97			0,00									
23.02.94		130	2	60	59,3	14,6	11,0	2,8	0,03			0,00				1,7					
09.03.94		50	2	20	54,9	13,9	11,0	3,2	0,04			0,00									
23.03.94		20	2	20	50,5	3,6	7,0	2,0	0,06			0,00				1,2					
06.04.94		70	1	20	50,5	11,3	7,0	2,0	0,06			0,00									
04.05.94		60	3	20	53,9	12,4	6,0	2,0	0,46			0,00									
18.05.94		30	2	30	44,1	10,5	6,0	1,8	0,38			0,00				0,8					
01.06.94		20	1	10	47,5	9,1	5,0	1,7	0,28			0,00									
15.06.94		30	1	20	50,1	7,5	5,0	1,6	0,48			0,00				0,3					
29.06.94		30	1		40,9	12,4	6,0	1,8	0,47			0,00									
13.07.94				100	40,1	9,2	14,0	2,2	0,34			0,00									
27.07.94		70	3	30	41,3	8,9	8,0	2,2	0,35			0,00				0,4					
10.08.94		50	2	50	41,3	11,6	8,0	2,2	0,33			0,00		35		2,5					
24.08.94				10	43,7	8,5	5,0	2,0	0,22			0,00									
07.09.94		40	4	150	44,1	11,4	7,0	2,0	0,30			0,00									
21.09.94		210	3	100	42,5	10,0	7,0	2,0	0,34			0,00		30		1,6					
05.10.94		40	2	30	46,9	10,5	10,0	2,6	0,15			0,00		32		1,6					
19.10.94				50	60,1	7,8	11,0	2,8	0,20			0,00									
02.11.94				70	57,7	14,1	11,0	3,2	0,30			0,00									
16.11.94				230	54,1	16,2	11,0	3,6	0,64			0,00									
30.11.94		20	1	50	51,3	11,8	9,0	4,0	0,21			0,00		24		0,9					
14.12.94		40	2	4	44,5	18,5	10,0	2,6	0,49			0,00		61		2,0					
20.12.94				20	36,9	21,8	11,0	3,0	0,54			0,00									
11.01.95		20	3	10	57,7	8,0	10,0	2,6		0,25		0,00		40		2,7					
25.01.95		30	1	40	60,1	11,4	11,0	2,2		0,04		0,00									
08.02.95		30	2	20	50,9	8,4	10,0	3,0		0,12		0,00		40		2,4					
22.02.95		10	1	30	49,7	10,0	9,0	2,2		0,10		0,00									
08.03.95		20	2	20	55,0	10,0	9,0	2,6		0,26		0,00		35		1,7					
22.03.95		10	2	30	61,0	12,0	12,0	2,6		0,05		0,00									
05.04.95		10	2	40	57,6	13,1	8,0	2,4		0,16		0,00		55		3,0					
19.04.95		20	2	50	51,5	11,7	5,0	1,5		0,08		0,00									

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
04.05.95		10	2	40	48,0	11,4	6,0	1,7		0,03		0,00		70		2,1					
17.05.95		50	1	21	43,0	10,5	5,0	1,6		0,04		0,00									
31.05.95		30	1	10	45,2	11,0	5,0	1,6		0,03		0,00									
14.06.95		20	1	40	46,0	10,4	5,0	2,0		0,16		0,00		60		3,0					
28.06.95		20	1	10	44,0	8,6	5,0	2,2		0,07		0,00									
12.07.95		10	0	10	45,0	8,6	8,0	1,6		0,09		0,00		20		1,7					
26.07.95		0	0	20	50,0	8,1	7,0	2,4		0,08		0,00									
09.08.95		50	2	40	48,0	9,6	8,0	2,4		0,07		0,00		30		1,6					
23.08.95		10	1	40	49,0	9,6	9,0	2,2		0,06		0,00									
06.09.95		50	0	10	45,0	8,2	9,0	2,2		0,15		0,00		100		3,4					
20.09.95		30	2	10	47,5	12,0	9,0	2,4		0,82		0,00									
04.10.95		60	3	80	54,0	12,9	10,0	2,6		0,05		0,00		85		3,0					
18.10.95		0	4	30	51,0	13,7	10,0	2,6		0,06		0,00									
01.11.95		20	4	20	56,0	13,6	12,0	3,0		0,07		0,00									
15.11.95		10	3	20	57,6	11,2	13,0	3,4		0,00		0,00		90		2,7					
29.11.95		10	2	10	54,4	14,1	12,0	3,2		0,02		0,00									
13.12.95		20	3	40	59,0	17,3	15,0	3,4		0,03		0,00		0		2,6					
27.12.95		20	3	30	54,0	15,0	13,0	3,4		0,02		0,00									
10.01.96		30	4	30	60,2	11,0	15,0	3,0		0,12		0,00				1,5					
24.01.96		30	3	20	63,6	14,6	15,0	3,2		0,05		0,00									
07.02.96		20	3	30	62,1	16,5	13,0	2,6		0,03		0,00				1,6					
21.02.96		50	1	50	63,4	13,0	18,0	3,2		0,04		0,00									
06.03.96		10	2	40	69,7	11,5	26,0	4,8		0,01		0,00				1,4					
20.03.96		10	1	30	64,2	14,0	22,0	4,0		0,04		0,00									
03.04.96		30	2	30	57,0	14,4	17,0	8,5		0,00		0,03				1,3					
17.04.96		80	1	30	56,0	11,0	15,0	3,4		0,01		0,00									
02.05.96		190	1	30	44,4	14,0	15,0	2,6		0,04		0,00									
14.05.96		30	2	30	44,7	10,5	13,0	2,8		0,01		0,00				2,0					
29.05.96		90	1	70	45,0	12,0	11,0	2,4		0,07		0,00									
12.06.96		10	1	30	44,0	11,0	14,0	2,4		0,01		0,00		39		2,0					
26.06.96		20	1	20	45,0	11,0	10,0	2,6		0,03		0,00									
10.07.96		10	1	50	46,0	11,0	12,0	2,6		0,04		0,00				1,8					
24.07.96		20	1	30	45,0	11,0	12,0	2,4		0,00		0,00									

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
07.08.96		10	3	20	44,0	10,0	12,0	2,4		0,04		0,00				1,5					
21.08.96		10	1	15	49,0	11,0	13,0	2,8		0,08		0,00									
04.09.96		50	1	80	46,0	13,0	13,0	2,8		0,00		0,00				1,6					
18.09.96		40	1	40	57,0	10,0	24,0	2,2		0,00		0,12									
02.10.96		20	1	30	48,0	12,0	12,0	2,4		0,01		0,00									
16.10.96		60	1	30	57,0	13,0	13,0	2,6		0,00		0,00				1,5					
30.10.96		30	3	20	56,0	14,0	12,0	2,3		0,04		0,00									
13.11.96		20	1	20	55,0	16,0	11,0	2,4		0,04		0,00				1,0					
27.11.96		70	1	80	53,0	17,0	11,0	2,5		0,13		0,00									
11.12.96		20	1	30	65,0	16,0	17,0	3,4		0,02		0,00				1,0					
18.12.96		40	1	40	68,0	15,0	18,0	3,8		0,01		0,00									
08.01.97		0	2	40	66,0	19,0	13,0	3,0		0,09		0,09				1,5					
22.01.97		30	2	60	69,0	19,0	20,0	3,6		0,11		0,00									
05.02.97		50	2	30	71,0	19,0	20,0	4,6		0,13		0,08				2,0					
19.02.97		60	1	70	61,0	19,0	13,0	3,4		0,07		0,00									
05.03.97		40	3	60	58,0	13,0	14,0	3,0		0,07		0,00				1,7					
19.03.97		70	5	60	58,0	14,0	12,0	2,8		0,11		0,00									
03.04.97		10	1	150	59,0	16,2	14,0	3,2		0,07		0,06									
16.04.97		20	1	60	62,0	17,0	12,0	2,2		0,32		0,00				3,0					
30.04.97		30	1	60	61,0	14,0	13,0	2,4		0,08		0,00									
14.05.97		20	1	30	53,0	12,0	11,0	1,9		0,08		0,00				1,5					
28.05.97		30	3	60	45,0	10,0	12,0	2,6		0,11		0,00									
10.06.97		20	2	50	47,9	10,6	10,0	2,0		0,14		0,00				1,9					
26.06.97		30	0	70	44,0	9,0	10,0	2,0		0,05		0,00									
09.07.97		30	1	50	44,0	8,0	9,0	2,2		0,04		0,00				3,0					
06.08.97		40	0	70	58,0	8,9	12,0	4,0		0,02		0,00				2,7					
21.08.97		30	1	90	48,0	11,3	11,0	2,6		0,05		0,00									
03.09.97		20	2	70	64,0	11,0	12,0	2,8		0,09		0,00				4,0					
17.09.97		20	2	50	64,0	12,0	13,0	2,8		0,04		0,00									
01.10.97		30	1	70	69,0	14,0	14,0	2,8		0,07		0,00									
17.10.97		40	0	30	64,0	14,0	13,0	3,0		0,08		0,00				3,7					
29.10.97		30	1	30	66,0	12,0	13,0	2,8		0,11		0,00									
12.11.97		30	2	40	64,0	17,0	13,0	2,6		0,05		0,00				2,8					

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
26.11.97		30	1	160	59,0	18,6	12,0	2,6		0,20		0,00									
10.12.97		30	1	100	70,0	14,2	13,0	3,0		0,08		0,00				3,5					
22.12.97		30	1	40	59,0	12,0	15,0	3,0		0,02		0,00									

Duna at Szob middle, rkm 1708.0
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Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
12.01.94													
26.01.94	23		0,10		0,2		0,2		5,0		2,0		3,0
09.02.94													
23.02.94	20		0,10		0,0		0,3		0,2		0,4		2,6
09.03.94													
23.03.94	25		0,20		0,0		0,5		1,8		1,7		2,7
06.04.94													
04.05.94													
18.05.94	30		0,10		0,1		0,9		2,0		1,9		2,4
01.06.94													
15.06.94	30		0,30		0,1		4,1		4,8		8,0		8,2
29.06.94													
13.07.94													
27.07.94	24		0,10		0,2		1,2		3,8		2,3		5,0
10.08.94	20		0,10		0,1		1,5		1,9		1,2		2,8
24.08.94													
07.09.94													
21.09.94	20		0,10		0,1		0,4		1,6		2,4		4,7
05.10.94	20		0,10		0,1		2,0		3,7		3,1		4,2
19.10.94													
02.11.94													
16.11.94													
30.11.94	20		0,10		0,7		0,6		0,9		0,9		4,9
14.12.94	20		0,10		0,5		0,7		0,1		0,9		1,6
20.12.94													
11.01.95	20		0,10		0,2		2,1		4,2		4,7		4,9
25.01.95													
08.02.95	20		0,10		0,3		2,8		3,8		3,9		2,0
22.02.95													
08.03.95	20		0,10		0,2		1,0		2,2		2,5		3,3
22.03.95													
05.04.95	20		0,10		0,2		2,5		2,7		2,3		9,5
19.04.95													

Duna at Szob middle, rkm 1708.0
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Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
04.05.95	20		0,10		0,1		1,4		2,9		2,7		6,4
17.05.95													
31.05.95													
14.06.95	20		0,10		0,0		2,8		4,7		2,9		4,9
28.06.95													
12.07.95	35		0,10		0,3		0,7		3,1		1,7		2,7
26.07.95													
09.08.95	30		0,10		0,4		1,2		3,0		2,8		3,9
23.08.95													
06.09.95	20		0,20		0,1		2,7		2,8		5,0		2,5
20.09.95													
04.10.95	20		0,10		0,2		2,9		2,7		2,2		0,9
18.10.95													
01.11.95													
15.11.95	35		0,10		0,2		3,2		3,7		3,2		4,9
29.11.95													
13.12.95	3		0,10		0,4		4,0		2,4		0,4		4,0
27.12.95													
10.01.96	20		0,10		1,8		0,3		1,0		7,8		8,7
24.01.96													
07.02.96	20		0,10		0,5		0,2		1,8		1,4		2,5
21.02.96													
06.03.96	20		0,10		0,7		2,0		1,0		6,5		6,4
20.03.96													
03.04.96	20		0,10		1,4		1,5		2,4		3,5		4,0
17.04.96													
02.05.96													
14.05.96	50		0,10		0,9		1,2		3,0		2,0		2,7
29.05.96													
12.06.96	40		0,10		0,1		1,1		0,8		1,9		2,0
26.06.96													
10.07.96	30		0,10		0,2		0,5		2,7		5,0		3,0
24.07.96													

Duna at Szob middle, rkm 1708.0
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Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
07.08.96	20		0,10		0,2		1,2		2,7		2,0		2,7
21.08.96													
04.09.96	20		0,10		0,4		0,8		2,6		2,7		3,0
18.09.96													
02.10.96													
16.10.96	35		0,10		0,8		0,2		4,0		1,9		2,8
30.10.96													
13.11.96	20		0,10		0,7		0,4		3,0		4,5		1,9
27.11.96													
11.12.96	100		0,10		0,6		0,5		2,8		3,6		2,0
18.12.96													
08.01.97	30		0,10		0,5		0,9		2,6		4,1		4,0
22.01.97													
05.02.97	20		0,10		1,5		1,4		2,0		2,6		5,5
19.02.97													
05.03.97	20		0,10		0,8		2,0		3,6		3,0		2,5
19.03.97													
03.04.97													
16.04.97	20		0,10		2,0		1,8		2,5		2,5		2,0
30.04.97													
14.05.97	45		0,10		0,7		1,2		3,5		1,8		4,1
28.05.97													
10.06.97	30		0,10		0,5		1,0		3,9		1,9		2,7
26.06.97													
09.07.97	40		0,10		0,7		0,7		5,2		3,5		2,6
06.08.97	35		0,10		1,0		0,5		4,7		2,7		1,8
21.08.97													
03.09.97	20		0,10		2,0		1,2		3,9		4,0		3,0
17.09.97													
01.10.97													
17.10.97	20		0,10		1,2		0,9		4,3		1,9		2,2
29.10.97													
12.11.97	40		0,10		1,2		0,7		4,4		1,8		2,7

Duna at Szob middle, rkm 1708.0
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Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
26.11.97													
10.12.97	60		0,10		0,8		0,9		3,7		2,5		3,2
22.12.97													

Duna at Szob right bank rkm 1708.0
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
12.01.94	2980,000	4,8	8,30	450	9,60	74,7	2,8	4,2	17	0,19	0,054	3,84	4,08	0,50	4,58	91	180
26.01.94	1910,000	4,0	8,30	455	10,00	76,1	3,7	3,6	15	0,37	0,048	3,73	4,15	0,95	5,10	75	220
09.02.94	2160,000	5,0	8,30	430	10,40	81,3	2,5	3,4	12	0,14	0,046	3,50	3,69	0,01	3,70	85	120
23.02.94	1510,000	1,7	8,30	460	12,60	90,1	4,2	3,6	14	0,30	0,044	3,84	4,19	1,21	5,40	85	140
09.03.94	2210,000	6,4	8,40	440	11,70	94,9	4,2	4,1	15	0,06	0,029	3,16	3,25	1,95	5,20	91	200
23.03.94	2720,000	7,2	8,50	390	10,40	86,1	3,0	4,6	15	0,13	0,026	2,60	2,76	0,49	3,25	42	130
06.04.94	3090,000	8,5	8,00	390	10,10	86,4	4,2	3,7	10	0,04	0,021	2,49	2,55	1,25	3,80	46	170
20.04.94	6280,000	8,0	7,80	355	10,90	92,0	3,7	6,0	18	0,12	0,045	3,50	3,66	0,01	3,67	78	120
04.05.94	3270,000	12,6	8,30	390	10,40	98,1	5,3	5,1	21	0,11	0,019	2,71	2,84	0,16	3,00	20	150
18.05.94	2550,000	17,8	8,00	340	12,98	137,5	8,2	4,5	13	0,05	0,020	1,70	1,77	0,60	2,37	7	20
01.06.94	3490,000	16,0	8,20	332	8,80	89,7	4,8	4,1	13	0,05	0,026	2,06	2,13	0,05	2,18	49	190
15.06.94	2890,000	15,5	8,00	348	10,50	105,8	3,6	3,9	11	0,18	0,016	1,70	1,89	0,04	1,93	7	130
29.06.94	2130,000	24,0	8,80	330	14,90	178,8	3,3	3,5	18	0,12	0,000	1,20	1,31	0,34	1,65	23	80
13.07.94	1930,000	19,0	8,20	320	9,00	97,7	4,7	4,4	20	0,09	0,016	1,47	1,57	1,03	2,60	26	530
27.07.94	1630,000	22,5	8,30	317	13,00	151,5	4,8	4,5	17	0,07	0,015	1,02	1,10	1,80	2,90	7	290
10.08.94	1190,000	23,2	8,20	335	9,60	113,4	3,9	4,4	15	0,13	0,010	1,36	1,50	2,20	3,70	16	300
24.08.94	1430,000	20,0	8,40	330	9,50	105,3	4,5	3,3	14	0,05	0,008	0,90	0,97	0,73	1,70	65	70
07.09.94	1860,000	17,5	8,10	350	8,90	93,6	5,6	4,2	17	0,12	0,014	1,81	1,95	1,65	3,60	49	70
21.09.94	1660,000	14,9	8,20	350	8,50	84,5	2,9	3,3	14	0,04	0,012	1,81	1,86	2,04	3,90	65	100
05.10.94	1220,000	14,5	8,40	380	9,40	92,6	2,5	3,2	12	0,12	0,019	2,03	2,17	0,47	2,64	88	120
19.10.94	1040,000	9,0	6,90	410	10,50	90,9	4,0	3,6	16	0,07	0,016	2,26	2,35	0,51	2,86	91	170
02.11.94	1410,000	10,0	8,00	415	10,80	95,8	5,2	4,2	16	0,05	0,023	2,08	2,15	1,85	4,00	36	90
16.11.94	1580,000	6,8	7,80	470	9,30	76,2	2,8	4,6	20	0,25	0,043	2,83	3,12	0,78	3,90	75	140
30.11.94	1690,000	6,7	7,70	400	10,10	82,5	4,4	4,5	17	0,17	0,036	2,49	2,69	2,21	4,90	65	80
14.12.94	2250,000	5,5	7,90	418	11,20	88,7	4,2	3,7	13	0,26	0,053	2,58	2,89	0,41	3,30	85	190
20.12.94	1670,000	3,0	7,20	420	10,90	80,8	3,5	3,2	12	0,18	0,047	2,60	2,83	0,27	3,10	85	140
11.01.95	1500,000	1,3	7,90	420	10,60	75,0	2,4	4,2	13	0,22	0,033	3,16	3,41	0,16	3,57	72	120
25.01.95	1620,000	1,3	7,80	445	12,20	86,3	3,5	3,2	12	0,30	0,036	3,16	3,50	0,30	3,80	62	70
08.02.95	2400,000	4,5	7,40	390	11,50	88,7	4,5	4,3	14	0,21	0,035	3,62	3,86	0,34	4,20	75	100
22.02.95	2760,000	4,5	7,60	410	11,10	85,6	3,0	3,4	13	0,11	0,011	3,05	3,17	0,43	3,60	55	120
08.03.95	2730,000	6,7	7,90	411	10,30	84,2	3,1	4,5	14	0,14	0,040	2,83	3,00	0,30	3,30	59	110
22.03.95	3040,000	5,5	7,80	434	13,00	103,0	5,2	4,3	18	0,02	0,022	3,16	3,20	0,68	3,88	13	100
05.04.95	4360,000	6,5	8,00	390	10,70	87,0	5,3	4,6	16	0,09	0,028	2,83	2,95	0,15	3,10	72	120

Duna at Szob right bank rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
19.04.95	2940,000	8,7	8,00	382	11,40	98,0	4,2	4,3	13	0,10	0,019	2,37	2,49	0,43	2,92	62	80
04.05.95	3500,000	12,3	8,20	354	11,50	107,8	4,5	5,2	12	0,03	0,018	2,03	2,08	0,12	2,20	13	30
17.05.95	3780,000	13,2	7,90	325	10,80	103,3	4,2	3,7	12	0,05	0,022	1,70	1,77	0,13	1,90	29	80
31.05.95	3140,000	17,0	8,40	334	15,10	157,2	6,2	5,2	16	0,05	0,010	1,36	1,41	0,49	1,90	0	40
14.06.95	4590,000	17,3	8,10	340	8,30	87,0	3,9	6,3	17	0,23	0,050	1,92	2,20	0,10	2,30	72	110
28.06.95	4720,000	16,0	8,50	320	10,20	103,9	5,0	4,2	13	0,11	0,020	1,47	1,60	0,20	1,80	20	60
12.07.95	2610,000	21,5	8,10	320	9,00	102,8	4,1	3,1	12	0,13	0,013	1,70	1,84	0,06	1,90	39	80
26.07.95	2120,000	21,0	8,00	316	9,60	108,6	2,4	3,3	16	0,12	0,009	1,47	1,59	0,13	1,72	23	60
09.08.95	1390,000	20,5	7,90	340	8,10	90,7	3,0	2,7	11	0,07	0,011	1,58	1,66	0,06	1,72	29	60
23.08.95	1470,000	20,2	8,50	340	9,80	109,1	3,1	4,1	18	0,02	0,013	1,58	1,61	0,19	1,80	13	20
06.09.95	4780,000	12,8	8,10	305	9,10	86,3	2,9	4,9	16	0,10	0,033	1,81	1,94	0,14	2,08	52	90
20.09.95	2360,000	14,0	8,20	350	9,00	87,7	2,5	3,1	10	0,01	0,024	1,70	1,73	1,48	3,21	39	150
04.10.95	1860,000	12,4	8,00	370	9,30	87,4	2,0	3,9	12	0,10	0,016	1,92	2,04	0,67	2,71	39	120
18.10.95	1300,000	12,4	8,70	380	11,40	107,1	4,7	4,0	18	0,01	0,019	1,70	1,72	1,25	2,97	13	120
01.11.95	1080,000	9,8	8,20	415	10,00	88,3	3,4	4,8	14	0,09	0,024	1,81	1,92	1,68	3,60	16	150
15.11.95	1610,000	6,5	8,10	470	9,60	78,0	3,0	3,0	13	0,26	0,033	2,26	2,56	1,02	3,58	7	140
29.11.95	1650,000	4,0	8,30	480	12,20	92,9	4,1	3,0	12	0,23	0,044	3,05	3,33	1,02	4,35	91	170
13.12.95	1300,000	2,1	8,20	510	11,10	80,3	3,2	3,2	13	0,23	0,039	2,71	2,98	0,76	3,74	88	160
27.12.95	3300,000	0,2	8,10	486	14,00	96,1	3,0	3,0	12	0,21	0,040	3,84	4,09	0,91	5,00	98	150
10.01.96	1670,000	0,5	8,00	490	12,70	87,9	6,0	4,9	14	0,26	0,025	3,50	3,78	0,74	4,52	88	160
24.01.96	1410,000	0,0	8,10	510	12,60	86,0	3,8	3,4	12	0,23	0,036	3,50	3,77	0,01	3,78	78	160
07.02.96	1170,000	0,0	8,30	515	13,90	94,9	8,4	3,3	12	0,30	0,030	3,57	3,90	0,05	3,95	75	90
21.02.96	1520,000	1,0	7,60	490	12,70	89,1	5,0	5,3	15	0,23	0,030	3,73	3,98	0,28	4,26	65	170
06.03.96	1170,000	1,8	8,40	540	13,90	99,7	4,8	4,2	18	0,18	0,032	3,73	3,94	0,39	4,33	65	160
20.03.96	1450,000	3,4	8,40	530	16,00	119,9	6,0	4,8	20	0,02	0,021	3,73	3,77	0,11	3,88	16	120
03.04.96	2360,000	5,3	8,10	465	13,10	103,2	4,5	4,2	15	0,19	0,036	4,18	4,41	0,33	4,74	85	370
17.04.96	3080,000	6,6	7,90	450	11,20	91,3	4,6	4,1	18	0,05	0,025	4,41	4,48	0,35	4,83	26	180
02.05.96	2840,000	14,1	8,20	415	11,70	114,3	5,3	4,9	13	0,02	0,024	2,60	2,64	0,33	2,97	59	80
14.05.96	2820,000	14,5	8,10	390	9,70	95,6	5,0	5,8	26	0,08	0,033	2,49	2,60	0,05	2,65	55	80
29.05.96	3860,000	13,4	8,30	390	14,00	134,6	4,5	4,3	13	0,03	0,017	2,37	2,42	0,48	2,90	23	70
12.06.96	2210,000	21,2	8,70	370	12,40	140,8	4,7	4,4	18	0,02	0,007	1,81	1,84	2,26	4,10	46	185
26.06.96	3010,000	18,1	8,00	360	8,20	87,4	3,7	4,1	16	0,05	0,018	2,03	2,10	0,27	2,37	59	220
10.07.96	2700,000	17,4	8,20	360	9,60	100,8	4,5	4,2	12	0,11	0,014	1,81	1,93	0,14	2,07	39	200

Duna at Szob right bank rkm 1708.0
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
24.07.96	1750,000	18,2	8,50	370	10,00	106,8	4,3	4,5	13	0,16	0,012	1,36	1,53	0,25	1,78	33	140
07.08.96	2280,000	17,0	8,50	350	12,00	124,9	4,5	4,6	15	0,02	0,010	1,36	1,39	0,32	1,71	3	230
21.08.96	1740,000	19,6	8,30	370	10,50	115,4	3,2	2,7	10	0,06	0,006	1,92	1,99	0,23	2,22	78	160
04.09.96	2210,000	17,2	8,30	370	9,10	95,1	3,0	3,0	17	0,09	0,011	1,81	1,90	0,25	2,15	95	140
18.09.96	3960,000	11,4	7,80	370	12,90	118,4	4,4	3,9	11	0,08	0,014	1,81	1,90	0,29	2,19	68	120
02.10.96	2660,000	12,9	8,10	380	11,50	109,3	3,8	3,8	13	0,05	0,014	1,92	1,99	0,35	2,34	78	290
16.10.96	1780,000	11,9	8,20	400	9,30	86,3	2,8	2,6	11	0,05	0,028	2,15	2,23	0,30	2,53	49	140
30.10.96	2820,000	8,7	8,10	390	10,90	93,7	6,0	6,3	16	0,05	0,024	2,15	2,22	0,24	2,46	72	400
13.11.96	2060,000	8,9	8,00	420	13,20	114,0	4,2	3,2	10	0,08	0,027	2,37	2,48	0,18	2,66	65	120
27.11.96	2190,000	4,1	8,20	420	12,30	93,9	4,2	3,4	12	0,09	0,032	2,37	2,49	0,41	2,90	62	150
11.12.96	1680,000	1,2	8,10	460	11,50	81,2	4,8	4,6	15	0,15	0,037	1,70	1,88	0,16	2,04	59	140
18.12.96	1650,000	2,1	8,00	470	12,60	91,1	4,0	3,3	12	0,12	0,043	2,94	3,10	0,04	3,14	82	140
08.01.97	1380,000	0,0	7,80	490	11,30	77,1	5,2	4,9	17	0,26	0,030	3,39	3,68	0,19	3,87	78	160
22.01.97	1190,000	1,0	8,10	510	13,60	95,4	3,8	3,2	12	0,30	0,030	3,28	3,61	0,24	3,85	82	160
05.02.97	1100,000	0,0	8,30	510	13,70	93,5	4,0	3,1	12	0,24	0,028	3,16	3,43	0,08	3,51	55	120
19.02.97	2280,000	2,5	8,40	450	11,40	83,4	4,1	4,6	16	0,22	0,027	3,39	3,63	0,30	3,93	78	190
05.03.97	2780,000	4,8	8,30	420	11,50	89,4	4,2	4,2	18	0,10	0,026	3,62	3,74	0,52	4,26	62	120
19.03.97	3260,000	5,1	8,10	430	11,00	86,2	4,6	5,2	15	0,05	0,024	3,16	3,24	0,37	3,61	52	190
03.04.97	2360,000	8,0	8,00	410	11,30	95,4	3,3	3,8	18	0,02	0,015	2,69	2,73	0,77	3,50	20	150
16.04.97	2400,000	6,2	8,60	400	11,40	92,0	4,5	4,2	18	0,03	0,014	2,53	2,58	0,42	3,00	59	130
30.04.97	2270,000	10,5	8,70	390	13,30	119,4	3,2	3,8	20	0,03	0,017	2,37	2,42	0,55	2,97	36	110
14.05.97	1470,000	15,2	8,40	346	11,90	119,1	4,0	4,0	17	0,01	0,017	1,58	1,61	0,39	2,00	0	80
28.05.97	2600,000	14,7	8,30	310	8,90	88,1	3,2	4,1	12	0,08	0,023	1,36	1,46	0,20	1,66	33	90
10.06.97	2040,000	19,0	8,70	320	13,60	147,7	4,1	4,7	13	0,02	0,011	0,90	0,94	0,11	1,05	7	90
26.06.97		17,8	8,30	290	8,40	89,0	3,5	3,3	11	0,02	0,016	1,36	1,39	0,01	1,40	59	110
09.07.97	5510,000	16,0	8,30	300	7,80	79,5	5,0	4,3	13	0,06	0,021	1,36	1,44	0,24	1,68	78	290
23.07.97	7320,000	16,5	8,20	295	8,60	88,6	3,6	5,6	15	0,22	0,023	1,36	1,60	1,88	3,48	59	120
06.08.97	3350,000	16,5	8,40	360	8,10	83,4	3,8	4,2	13	0,16	0,012	1,58	1,75	0,05	1,80	55	140
21.08.97	2160,000	20,0	8,70	350	10,60	117,5	5,1	4,1	17	0,23	0,009	1,13	1,37	0,17	1,54	2	100
03.09.97	1880,000	19,0	8,20	363	9,90	107,5	4,0	3,4	10	0,04	0,015	1,58	1,64	0,08	1,72	27	90
17.09.97	1330,000	16,0	8,20	380	10,50	107,0	3,9	3,4	14	0,05	0,009	1,47	1,53	0,07	1,60	36	150
01.10.97	983,000	15,6	8,90	430	13,10	132,3	4,7	5,1	19	0,01	0,016	1,47	1,49	0,61	2,10	42	141
17.10.97	2010,000	11,2	8,40	390	9,80	89,5	4,9	4,4	15	0,07	0,011	1,70	1,78	0,21	1,99	52	140

Duna at Szob right bank rkm 1708.0
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
29.10.97	1170,000	4,9	7,80	420	11,50	89,7	3,4	3,0	11	0,12	0,021	2,15	2,28	0,26	2,54	72	180
12.11.97	1220,000	8,0	8,00	450	10,50	88,7	2,3	3,0	12	0,09	0,031	2,03	2,16	0,01	2,17	62	130
26.11.97	1300,000	5,0	8,50	435	10,10	79,0	2,4	3,1	7	0,59	0,028	2,49	3,10	0,10	3,20	59	160
10.12.97	1320,000	4,0	8,30	450	9,70	73,9	2,5	3,1	11	0,16	0,035	2,37	2,56	0,03	2,59	85	130
22.12.97	2020,000	3,0	8,00	440	11,60	86,0		4,8	12	0,19	0,036	2,71	2,93	0,05	2,98	62	100

Duna at Szob right bank rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
12.01.94		20	1	20	56,1	14,6	9,0	2,8	0,44			0,00									
26.01.94		40	4	90	59,3	17,5	10,0	2,8	0,16			0,00				1,3					
09.02.94		60	0	30	54,5	14,1	10,0	2,8	0,32			0,00									
23.02.94		160	1	50	55,3	17,3	13,0	3,6	0,05			0,00				2,0					
09.03.94		10	1	20	54,9	13,9	11,0	3,2	0,04			0,00									
23.03.94		50	2	30	50,9	11,6	8,0	2,2	0,04			0,00				1,5					
06.04.94		30	2	30	51,3	11,8	7,0	2,2	0,05			0,00									
20.04.94		70	1	20	49,7	9,4	6,0	2,8	0,08			0,00				1,7					
04.05.94		90	3	20	53,1	12,9	7,0	2,0	0,89			0,00									
18.05.94		10	2	30	43,3	10,5	7,0	1,9	0,23			0,00				0,9					
01.06.94		30	2	30	46,7	9,6	5,0	2,4	0,44			0,00									
15.06.94		30	1	20	48,3	9,6	5,0	1,9	0,46			0,00				2,1					
29.06.94		20	1		42,5	11,9	6,0	1,8	0,44			0,00									
13.07.94				50	40,1	9,7	13,0	2,0	0,52			0,00									
27.07.94		30	3	10	40,5	9,4	9,0	2,2	0,40			0,00				1,2					
10.08.94		30	2	130	43,7	8,5	9,0	2,2	0,40			0,00		32		2,5					
24.08.94				20	45,5	7,5	7,0	2,0	0,40			0,00									
07.09.94		20	4	120	44,1	10,9	7,0	2,2	0,33			0,00									
21.09.94		100	3	200	43,3	10,0	7,0	2,0	0,36			0,00		20		0,4					
05.10.94		30	2	20	47,7	10,2	10,0	2,6	0,20			0,00		26		4,6					
19.10.94				40	72,1	12,6	11,0	3,2	0,23			0,00									
02.11.94				30	55,3	14,6	11,0	3,2	0,20			0,00									
16.11.94				110	56,5	12,9	13,0	3,4	0,81			0,00									
30.11.94		40	2	30	48,9	11,8	9,0	2,8	0,15			0,00		38		1,3					
14.12.94		130	2	40	48,7	17,0	10,0	2,6	0,37			0,00		95		1,7					
20.12.94				30	39,3	20,8	11,0	3,0	0,26			0,00									
11.01.95		30	1	30	58,7	10,0	11,0	3,8	0,20	0,06		0,00		1		1,2					
25.01.95		40	2	40	59,1	11,1	10,0	2,2		0,06		0,00									
08.02.95		40	2	40	51,7	8,1	10,0	3,0		0,19		0,00		40		4,3					
22.02.95		10	2	40	51,3	10,7	9,0	2,2		0,15		0,00									
08.03.95	0,0	20	1	20	55,0	10,0	10,0	2,8		0,32		0,00		30		1,8					
22.03.95	0,0	40	2	30	60,0	13,0	12,0	2,6		0,07		0,00									
05.04.95	0,0	10	2	40	59,1	9,8	8,0	2,6		0,11		0,00		25		2,7					

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
19.04.95	0,0	20	1	50	51,5	12,6	5,0	1,6		0,08		0,00									
04.05.95		10	2	60	48,0	11,9	6,0	1,8		0,02		0,00		20		3,0					
17.05.95		20	0	18	44,4	10,0	5,0	1,6		0,08		0,00									
31.05.95		10	0	10	44,4	11,5	6,0	1,6		0,04		0,00									
14.06.95		20	1	40	46,0	11,0	6,0	2,2		0,06		0,00		40		2,8					
28.06.95		20	1	10	44,0	9,0	6,0	2,2		0,09		0,00									
12.07.95		10	0	30	45,0	9,6	7,0	2,0		0,11		0,00		35		1,9					
26.07.95		0	0	30	51,0	7,2	7,0	2,0		0,09		0,00									
09.08.95		60	1	10	48,0	10,5	9,0	2,6		0,06		0,00		50		2,7					
23.08.95		30	2	30	48,0	10,6	9,0	2,4		0,07		0,00									
06.09.95		20	0	10	45,0	8,2	9,0	2,2		0,25		0,00		55		2,6					
20.09.95		30	1	10	46,7	12,5	8,0	2,2		0,05		0,00									
04.10.95		10	2	10	53,0	12,9	11,0	2,6		0,06		0,00		60		3,5					
18.10.95		10	3	50	54,1	11,8	11,0	2,6		0,06		0,00									
01.11.95		0	3	30	56,0	12,1	12,0	2,8		0,03		0,00									
15.11.95		10	2	30	64,0	7,3	13,0	3,4		0,00		0,00		50		5,2					
29.11.95		10	2	20	56,0	12,6	12,0	3,2		0,08		0,00									
13.12.95		20	4	30	59,0	15,4	15,0	3,2		0,03		0,00		90		2,5					
27.12.95		20	2	40	54,4	15,0	14,0	3,4		0,03		0,00									
10.01.96		10	4	40	58,5	12,5	15,0	3,2		0,13		0,00				1,0					
24.01.96		60	2	20	67,5	12,7	16,0	3,4		0,05		0,00									
07.02.96		30	3	50	63,0	16,0	17,0	2,4		0,04		0,00				2,0					
21.02.96		60	1	60	50,2	14,0	18,0	3,4		0,04		0,00									
06.03.96		10	2	30	74,4	11,5	28,0	4,8		0,02		0,00				1,6					
20.03.96		30	1	50	67,3	13,0	22,0	4,2		0,07		0,00									
03.04.96		30	1	30	61,8	11,5	17,0	9,0		0,03		0,02				2,2					
17.04.96		10	1	50	59,0	10,0	15,0	3,4		0,03		0,00									
02.05.96		20	1	20	47,0	13,0	14,0	2,8		0,02		0,00									
14.05.96		20	2	30	44,0	13,6	13,0	1,0		0,01		0,00				2,4					
29.05.96		70	1	20	47,0	10,5	12,0	2,6		0,03		0,00									
12.06.96		20	1	40	41,0	13,0	14,0	2,4		0,03		0,00		134		1,8					
26.06.96		210	1	50	46,0	11,0	11,0	2,7		0,00		0,00									
10.07.96		10	1	60	46,0	11,0	12,0	2,4		0,00		0,00				1,6					

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
24.07.96		10	1	40	44,0	11,0	13,0	2,6		0,00		0,00									
07.08.96		10	2	20	44,0	10,0	13,0	2,4		0,02		0,00				1,4					
21.08.96		30	1	12	49,0	11,0	14,0	3,0		0,04		0,00									
04.09.96		50	1	80	46,0	8,0	13,0	8,0		0,04		0,28				1,2					
18.09.96		30	1	50	53,0	17,0	24,0	2,2		0,00		0,00									
02.10.96		30	1	30	48,0	14,0	12,0	2,6		0,00		0,00									
16.10.96		20	1	30	57,0	14,0	13,0	2,6		0,00		0,00				1,3					
30.10.96		30	2	30	53,0	11,0	3,0	1,5		0,05		0,00									
13.11.96		30	1	20	55,0	16,0	22,0	2,4		0,08		0,00				1,5					
27.11.96		80	2	70	56,0	16,0	13,0	2,6		0,18		0,00									
11.12.96		40	1	40	65,0	15,0	17,0	3,4		0,01		0,00				1,4					
18.12.96		40	1	50	71,0	14,0	19,0	4,0		0,01		0,00									
08.01.97		10	2	50	68,0	18,0	14,0	3,2		0,21		0,03				1,5					
22.01.97		30	2	50	71,0	20,0	20,0	4,0		0,22		0,00									
05.02.97		40	2	40	66,0	20,0	20,0	4,0		0,07		0,05				1,3					
19.02.97		40	1	90	59,0	18,0	13,0	3,4		0,02		0,00									
05.03.97		30	4	70	56,0	15,0	12,0	3,8		0,08		0,22				2,0					
19.03.97		70	3	110	59,0	14,0	15,0	2,6		0,23		0,00									
03.04.97		10	1	160	59,0	15,3	14,0	2,4		0,10		0,07									
16.04.97		20	1	40	62,0	14,0	13,0	2,2		0,30		0,00				2,5					
30.04.97		30	1	20	58,0	16,0	13,0	2,2		0,07		0,00									
14.05.97		190	1	30	53,0	12,0	11,0	2,0		0,08		0,00				1,3					
28.05.97		30	2	50	47,0	10,0	12,0	2,6		0,09		0,00									
10.06.97		20	2	60	46,4	10,6	10,0	2,2		0,13		0,00				1,7					
26.06.97		30	1	70	42,0	9,0	11,0	2,0		0,08		0,00									
09.07.97		30	0	40	44,0	9,0	9,0	2,6		0,05		0,00				1,6					
23.07.97		130	0	20	47,0	8,0	10,0	3,0		0,06		0,00									
06.08.97		30	1	60	58,0	6,2	12,0	4,0		0,05		0,00				1,9					
21.08.97		20	2	70	45,0	11,3	11,0	2,6		0,05		0,00									
03.09.97		20	2	200	63,0	12,0	13,0	2,8		0,04		0,00				5,0					
17.09.97		20	3	80	64,0	12,0	13,0	2,8		0,08		0,00									
01.10.97		40	1	50	67,0	19,0	17,0	4,2		0,21		0,00									
17.10.97		30	1	100	66,0	10,6	12,0	4,0		0,22		0,00				4,0					

Duna at Szob right bank rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
29.10.97		20	1	90	67,0	13,0	13,0	2,8		0,10		0,00									
12.11.97		20	3	80	64,0	17,0	13,0	2,6		0,08		0,00				3,5					
26.11.97		10	1	60	60,0	18,6	12,0	3,0		0,36		0,00									
10.12.97		30	2	50	69,0	13,3	16,0	4,6		0,12		0,00				2,8					
22.12.97		30	1	50	59,0	12,0	15,0	5,0		0,04		0,00									

Duna at Szob right bank rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
12.01.94													
26.01.94	22		0,10		0,1		0,7		2,7		4,0		2,0
09.02.94													
23.02.94	20		0,10		0,0		0,4		1,2		1,2		3,2
09.03.94													
23.03.94	24		0,20		0,2		0,8		1,1		2,5		4,2
06.04.94													
20.04.94	30		0,40		0,1		2,1		3,8		1,6		3,3
04.05.94													
18.05.94	32		0,10		0,1		1,2		4,2		2,0		4,7
01.06.94													
15.06.94	20		0,20		0,0		2,7		1,5		1,2		4,8
29.06.94													
13.07.94													
27.07.94	30		0,10		0,1		0,9		0,9		3,2		2,7
10.08.94	40		0,10		0,1		1,6		1,3		1,2		2,3
24.08.94													
07.09.94													
21.09.94	20		0,20		0,1		1,4		3,8		0,2		2,9
05.10.94	20		0,10		0,5		1,8		3,0		3,2		2,3
19.10.94													
02.11.94													
16.11.94													
30.11.94	25		0,10		0,3		0,6		1,0		4,5		4,3
14.12.94	20		0,10		0,9		1,5		1,3		2,5		5,6
20.12.94													
11.01.95	30		0,10		0,2		0,2		2,5		1,2		10,5
25.01.95													
08.02.95	100		0,10		0,1		3,1		2,0		0,8		1,0
22.02.95													
08.03.95	40		0,10		0,2		1,3		4,0		4,5		7,0
22.03.95													
05.04.95	20		0,10		0,1		1,0		3,7		3,4		2,7

Duna at Szob right bank rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
19.04.95													
04.05.95	20		0,10		0,1		1,8		6,2		3,3		6,9
17.05.95													
31.05.95													
14.06.95	20		0,10		0,1		2,1		4,7		4,5		4,3
28.06.95													
12.07.95	30		0,10		0,3		1,7		3,8		3,2		4,1
26.07.95													
09.08.95	40		0,10		0,2		1,0		3,0		2,8		3,7
23.08.95													
06.09.95	20		0,10		0,1		1,2		4,2		4,2		2,1
20.09.95													
04.10.95	20		0,15		0,2		1,7		2,7		1,3		3,2
18.10.95													
01.11.95													
15.11.95	35		0,10		0,3		1,9		3,0		2,7		4,0
29.11.95													
13.12.95	20		0,10		0,1		2,7		1,9		0,9		2,7
27.12.95													
10.01.96	20		0,10		3,3		1,4		3,8		3,7		4,0
24.01.96													
07.02.96	20		0,10		0,5		0,2		2,0		1,9		1,3
21.02.96													
06.03.96	20		0,10		1,2		2,1		1,0		5,6		7,7
20.03.96													
03.04.96	30		0,10		0,9		1,2		2,0		2,2		3,3
17.04.96													
02.05.96													
14.05.96	35		0,10		0,6		1,4		2,7		2,0		4,5
29.05.96													
12.06.96	40		0,10		0,5		1,5		6,9		5,0		8,0
26.06.96													
10.07.96	50		0,10		0,7		0,9		3,0		1,7		3,5

Duna at Szob right bank rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
24.07.96													
07.08.96	80		0,10		0,4		0,5		2,7		1,8		2,7
21.08.96													
04.09.96	70		0,10		0,5		0,6		2,0		2,2		2,6
18.09.96													
02.10.96													
16.10.96	20		0,10		0,6		0,7		1,8		0,9		2,5
30.10.96													
13.11.96	20		0,10		0,5		0,8		2,7		3,0		4,0
27.11.96													
11.12.96	100		0,10		0,4		0,5		2,6		3,0		3,6
18.12.96													
08.01.97	45		0,10		0,5		1,3		2,7		2,4		3,8
22.01.97													
05.02.97	55		0,10		0,3		1,0		3,7		2,1		3,1
19.02.97													
05.03.97	25		0,10		0,8		0,7		3,0		2,5		1,4
19.03.97													
03.04.97													
16.04.97	20		0,10		1,5		2,0		1,6		3,0		2,1
30.04.97													
14.05.97	60		0,10		2,0		1,9		3,0		1,4		3,7
28.05.97													
10.06.97	35		0,10		0,9		3,0		3,2		2,5		3,0
26.06.97													
09.07.97	40		0,10		1,2		2,0		1,9		3,2		2,7
23.07.97													
06.08.97	50		0,10		1,9		1,8		4,5		4,0		1,9
21.08.97													
03.09.97	60		0,10		0,7		0,7		5,0		5,0		3,0
17.09.97													
01.10.97													
17.10.97	40		0,10		2,5		0,6		4,0		3,4		2,7

Duna at Szob right bank rkm 1708.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
29.10.97													
12.11.97	60		0,10		0,8		0,7		3,8		2,7		2,4
26.11.97													
10.12.97	80		0,10		1,2		1,2		2,7		3,5		3,0
22.12.97													

Duna at Hercegszántó, rkm 1433
01.01.1994 - 31.12.1997

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
05.01.94	2890,000	4,2	8,05	400	12,00	91,9	4,5	5,0	16	0,43	0,040	2,15	2,61	0,21	2,82	111	200
12.01.94	3490,000	5,1	7,95	448	11,50	90,1	2,8	4,0	14	0,31	0,030	2,49	2,83			78	180
26.01.94	2050,000	3,1	8,10	468	12,60	93,6	2,9	3,6	16	0,39	0,030	3,39	3,81			85	150
02.02.94	2890,000	3,6	8,00	442	11,90	89,6	3,1	3,5	12	0,35	0,040	3,16	3,55			78	140
09.02.94	2310,000	4,2	7,95	450	11,60	88,8	4,0	4,0	10	0,35	0,040	3,39	3,78			98	140
23.02.94	1780,000	1,3	7,90	472	13,30	94,1	3,5	3,5	14	0,31	0,029	3,39	3,73			78	140
09.03.94	2230,000	5,8	8,14	465	14,50	115,8	4,8	4,8	10	0,12	0,020	3,39	3,53	0,07	3,60	26	120
23.03.94	2650,000	6,8	8,00	395	12,20	99,9	3,0	4,5	12	0,16	0,018	2,49	2,66			52	140
06.04.94	2840,000	9,0	7,95	380	11,50	99,6	3,4	3,9	14	0,12	0,015	2,26	2,39	0,13	2,52	49	120
20.04.94	5340,000	8,4	7,85	350	10,70	91,3	3,6	5,3	14	0,23	0,021	2,71	2,97			49	210
04.05.94	3770,000	14,3	8,25	400	10,80	106,0	3,0	4,4	18	0,03	0,015	2,26	2,31	0,16	2,47	33	120
18.05.94	2550,000	18,5	8,30	348	12,80	137,6	5,5	5,5	20	0,08	0,013	1,36	1,45			7	120
30.05.94	3580,000	17,3	8,14	328	9,20	96,4	2,4	4,2	16	0,16	0,013	1,81	1,98			26	320
01.06.94	3800,000	18,9	8,25	326	10,40	112,7	4,7	5,4	16	0,12	0,014	1,70	1,83	0,32	2,15	13	110
15.06.94	3260,000	16,2	8,00	324	9,60	98,2	3,1	3,1	13	0,08	0,016	1,81	1,90			39	120
28.06.94	2480,000	20,5	8,39	300	14,70	164,6	5,3	7,8	30	0,08	0,009	1,08	1,17			3	170
06.07.94	2150,000	22,9	7,95	300	8,80	103,4	4,4	4,4	14	0,23	0,009	0,99	1,24	0,03	1,27	13	100
13.07.94	2160,000	21,0	8,14	310	9,60	108,6	3,3	4,2	17	0,16	0,009	1,13	1,29			20	120
27.07.94	1790,000	25,0	8,25	294	12,70	155,3	4,5	5,4	18	0,19	0,013	0,72	0,93			10	140
10.08.94	1260,000	26,5	7,80	320	8,39	105,6	4,1	4,1	10	0,23	0,009	0,99	1,24	0,54	1,78	163	250
24.08.94	1370,000	21,3	8,35	316	13,30	151,3	5,4	5,4	19	0,12	0,009	0,95	1,07			10	140
07.09.94	1680,000	20,2	8,05	348	9,30	103,5	2,4	4,3	18	0,43	0,018	1,47	1,91	0,32	2,23	36	60
21.09.94	1720,000	15,6	7,95	364	8,89	89,8	1,9	3,5	13	0,39	0,013	1,58	1,98			72	90
05.10.94	1310,000	17,2	8,20	372	10,60	110,8	4,6	4,9	16	0,16	0,010	1,24	1,41	0,12	1,53	59	150
18.10.94	1280,000	11,6	8,20	396	11,60	106,9	5,0	5,0	20	0,19	0,018	1,24	1,46			59	160
03.11.94	1560,000	11,6	7,85	408	11,00	101,4	4,7	5,6	16	0,23	0,020	1,92	2,17	0,04	2,21	65	180
16.11.94	1490,000	8,7	7,55	434	9,30	79,9	3,1	3,5	16	0,30	0,040	2,26	2,59			91	170
29.11.94	1900,000	6,6	7,90	410	10,50	85,6	2,7	3,4	12	0,39	0,036	1,70	2,12			82	130
07.12.94	1470,000	5,5	7,60	414	10,80	85,5	3,0	3,3	14	0,31	0,036	1,81	2,16	0,07	2,23	91	150
14.12.94	1560,000	5,4	8,00	424	10,70	84,5	2,1	2,8	12	0,39	0,036	1,92	2,35			98	150
03.01.95	2630,000	1,8	7,95	420	11,90	85,4	2,6	3,6	19	0,16	0,033	2,71	2,90	0,04	2,94	78	130
11.01.95	1900,000	1,4	7,85	404	12,40	88,0	3,0	3,7	14	0,23	0,040	2,53	2,80			98	150
25.01.95	1440,000	1,0	7,95	458	12,90	90,5	3,7	4,4	16	0,39	0,040	3,84	4,27			91	150

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
01.02.95	3790,000	2,8	8,00	430	12,50	92,2	8,5	3,9	14	0,31	0,033	3,82	4,16	0,03	4,19	130	212
07.02.95	2980,000	4,1	7,75	382	11,90	90,8	6,1	5,3	20	0,23	0,033	4,43	4,70			104	196
22.02.95	2890,000	5,8	8,00	398	11,30	90,2	3,1	4,4	17	0,16	0,046	4,02	4,22			72	179
01.03.95	2570,000	6,6	8,20	408	11,80	96,2	3,1	3,8	16	0,11	0,036	3,03	3,17	0,03	3,20	72	212
08.03.95	2800,000	6,1	8,10	408	11,50	92,5	2,2	3,8	16	0,12	0,036	3,03	3,18			72	163
22.03.95	2220,000	6,2	8,30	442	13,00	104,9	4,7	3,9	17	0,08	0,021	3,10	3,20			33	212
05.04.95	3140,000	8,0	8,00	394	11,90	100,5	5,4	4,1	16	0,03	0,027	2,37	2,43	0,01	2,44	46	143
19.04.95	3240,000	8,6	8,05	374	11,70	100,3	3,4	3,5	17	0,12	0,018	2,12	2,26			36	111
02.05.95	4160,000	13,3	8,10	342	9,90	94,9	2,5	3,8	14	0,04	0,021	2,15	2,21	0,18	2,39	39	120
17.05.95	3490,000	15,3	8,25	330	10,00	100,3	2,6	3,6	16	0,08	0,012	1,76	1,85			30	110
29.05.95	2870,000	17,6	8,75	346	12,10	127,6	2,3	5,2	24	0,04	0,018	1,92	1,98			20	140
08.06.95	4660,000	17,0	8,05	266	8,40	87,4	3,7	3,4	12	0,08	0,033	1,72	1,83	0,54	2,37	41	100
14.06.95	5220,000	16,8	8,10	316	8,20	85,0	4,2	4,4	16	0,12	0,046	1,76	1,92			59	130
27.06.95	4500,000	17,1	8,15	352	8,60	89,7	3,1	4,1	14	0,08	0,021	2,15	2,25			55	160
05.07.95	4540,000	19,7	8,05	332	8,20	90,3	2,0	4,5	11	0,08	0,030	1,58	1,69	0,44	2,13	55	150
12.07.95	3260,000	23,1	8,50	325	9,10	107,3	1,8	3,8	12	0,04	0,015	1,47	1,52			40	160
25.07.95	2410,000	23,5	8,50	320	8,60	102,2	2,1	4,0	11	0,08	0,012	1,36	1,45			25	205
09.08.95	1630,000	24,0	8,60	286	12,70	152,4	6,0	6,0	21	0,04	0,009	0,93	0,97	1,47	2,44	4	145
23.08.95	1850,000	22,0	8,55	348	10,20	117,7	3,2	4,1	16	0,08	0,012	1,47	1,56			15	110
06.09.95	4690,000	14,3	8,15	318	9,20	90,3	2,0	4,7	18	0,08	0,024	1,58	1,68	0,24	1,92	45	245
20.09.95	2840,000	16,8	8,20	346	8,80	91,2	1,7	3,5	8	0,08	0,018	1,81	1,90			70	140
04.10.95	2000,000	16,0	8,35	366	11,50	117,2	3,2	4,2	18	0,08	0,061	1,70	1,83	0,15	1,98	39	140
18.10.95	1520,000	14,6	8,65	394	13,20	130,4	6,0	6,2	15	0,04	0,046	1,58	1,67			16	100
31.10.95	1280,000	11,9	8,65	398	12,90	119,8	3,2	7,0	30	0,03	0,088	1,70	1,81			15	80
08.11.95	1650,000	5,7	8,30	426	11,30	90,0	3,1	4,1	17	0,05	0,021	2,51	2,58	0,37	2,95	51	165
15.11.95	1610,000	6,6	8,10	440	11,00	89,6	3,4	3,4	16	0,23	0,030	2,55	2,82			75	140
28.11.95	1930,000	4,3	8,10	412	10,70	82,1	3,4	4,3	17	0,22	0,030	2,83	3,07			29	140
06.12.95	1760,000	2,0	8,10	402	11,10	80,1	3,1	4,5	18	0,35	0,046	2,78	3,18	0,00	3,18	111	120
13.12.95	1580,000	2,7	8,15	452	11,90	87,5	3,2	3,7	16	0,39	0,052	2,94	3,38			91	120
04.01.96	2490,000	1,2	8,25	438	12,20	86,1	4,1	4,5	18	0,31	0,061	3,39	3,76	0,20	3,96	90	175
10.01.96	1960,000	1,1	8,05	454	12,00	84,4	5,0	5,0	19	0,31	0,033	2,53	2,88			105	170
24.01.96	1910,000	0,4	8,00	515	12,10	83,5	3,1	3,6	17	0,39	0,046	3,44	3,87			105	195
07.02.96	1500,000	0,0	7,90	525	12,90	88,0	4,5	3,5	16	0,39	0,036	2,55	2,98	0,21	3,19	80	180

Duna at Hercegszántó, rkm 1433
01.01.1994 - 31.12.1997

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
21.02.96	1430,000	2,2	8,05	540	13,60	98,6	5,4	4,3	22	0,23	0,030	1,83	2,09			60	185
06.03.96	1340,000	2,9	8,35	545	13,90	102,8	5,0	5,8	25	0,04	0,030	2,19	2,26	0,42	2,68	5	195
19.03.96	1300,000	4,6	8,10	575	15,50	119,9	8,0	6,3	31	0,04	0,024	3,53	3,59			30	150
03.04.96	2850,000	6,4	7,95	454	11,90	96,5	9,3	5,5	19	0,12	0,040	4,00	4,16	0,27	4,43	39	170
17.04.96	3920,000	7,5	7,90	448	11,20	93,4	3,5	5,6	15	0,08	0,030	3,75	3,86			49	170
24.04.96	2820,000	16,2	8,00	456	12,50	127,9	4,0	5,1	21	0,04	0,021	3,46	3,52			16	140
08.05.96	2950,000	16,3	8,15	384	10,40	106,6	6,3	4,9	17	0,04	0,027	1,94	2,01	0,08	2,09	16	150
15.05.96	3010,000	16,6	8,00	373	8,70	89,8	2,9	4,5	16	0,12	0,030	2,17	2,32			46	80
29.05.96	3450,000	16,8	8,15	372	9,80	101,6	4,4	5,1	13	0,08	0,021	2,37	2,47			39	120
04.06.96	4220,000	18,0	8,15	358	10,80	114,9	4,9	4,6	18	0,04	0,024	1,99	2,05	0,36	2,41	36	190
12.06.96	2460,000	22,6	8,40	364	10,60	123,8	9,5	6,4	25	0,04	0,015	1,81	1,86			10	180
25.06.96	1850,000	20,5	8,05	364	9,10	101,9	3,0	5,7	17	0,04	0,005	1,81	1,85			39	70
03.07.96	2360,000	18,2	8,10	372	9,70	103,6	4,8	4,0	14	0,04	0,009	1,81	1,86	0,17	2,03	39	150
10.07.96	2610,000	18,6	8,15	356	10,40	112,0	4,3	4,7	16	0,04	0,015	1,70	1,75			36	150
24.07.96	2200,000	19,6	8,35	352	9,60	105,5	2,5	5,6	21	0,04	0,011	1,58	1,63			29	150
07.08.96	1930,000	21,8	8,10	348	10,60	121,8	6,6	5,0	13	0,04	0,011	1,13	1,18	0,01	1,19	10	90
14.08.96	1730,000	21,1	8,25	350	10,60	120,1	2,5	5,1	19	0,04	0,011	1,36	1,41			0	110
04.09.96	2450,000	19,1	7,70	358	8,00	87,1	1,6	3,2	14	0,04	0,015	1,92	1,98	0,18	2,16	72	140
18.09.96	3350,000	13,1	8,00	344	9,50	90,7	1,0	4,0	12	0,08	0,029	1,81	1,91			65	150
02.10.96	3040,000	13,1	8,05	372	8,90	85,0	1,6	3,5	13	0,06	0,023	1,79	1,87			59	90
09.10.96	2550,000	13,9	8,15	314	9,20	89,5	3,3	3,3	13	0,02	0,018	1,99	2,03	0,08	2,11	59	135
16.10.96	2250,000	13,3	8,05	394	9,60	92,1	2,1	3,2	12	0,04	0,003	1,90	1,94			59	60
06.11.96	2720,000	9,9	8,10	388	9,80	86,7	1,2	3,2	12	0,09	0,023	2,03	2,15	0,03	2,18	55	65
13.11.96	2300,000	9,6	8,10	406	10,20	89,6	1,9	3,3	13	0,11	0,026	2,01	2,15			70	70
27.11.96	2770,000	5,5	8,10	392	10,50	83,2	2,2	3,7	10	0,12	0,032	2,58	2,73			65	70
04.12.96	2260,000	4,1	8,10	422	11,30	86,3	1,8	3,2	13	0,20	0,036	2,58	2,81	0,06	2,87	65	70
11.12.96	2160,000	3,7	8,05	426	12,00	90,6	2,9	3,0	14	0,18	0,038	2,26	2,48			75	90
07.01.97	1640,000	0,2	8,05	488	12,80	87,9	2,8	2,9	14	0,39	0,055	2,94	3,38	0,12	3,50	91	140
22.01.97	1490,000	0,5	8,00	505	12,80	88,6	2,7	2,7	15	0,43	0,049	2,71	3,19			75	110
05.02.97	1410,000	2,1	8,10	520	12,90	93,3	4,1	2,8	15	0,27	0,040	3,16	3,48	0,16	3,64	46	150
19.02.97	2350,000	2,2	8,20	478	13,30	96,5	4,1	3,7	20	0,08	0,030	2,15	2,26			42	210
05.03.97	2880,000	6,6	8,00	426	11,80	96,2	3,6	4,9	16	0,16	0,036	3,39	3,58	1,12	4,70	68	210
19.03.97	1930,000	8,2	8,20	438	11,20	95,1		4,7	16	0,04	0,020	2,71	2,77			46	110

Duna at Hercegszántó, rkm 1433
01.01.1994 - 31.12.1997

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
02.04.97	2760,000	7,2	8,25	418	12,20	101,0	4,2	4,2	16	0,04	0,018	2,49	2,54	0,21	2,75	38	77
09.04.97	2690,000	8,1	8,30	418	12,00	101,6	2,8	4,7	17	0,04	0,015	2,49	2,54	0,09	2,63	12	137
16.04.97	2570,000	8,2	8,30	402	11,80	100,1	3,4	4,6	18	0,05	0,012	2,26	2,32			22	136
07.05.97	2690,000	15,9	8,35	370	12,10	123,0	5,1	5,3	19	0,04	0,013	1,81	1,86	0,03	1,89	8	115
14.05.97	2730,000	18,2	8,55	354	12,40	132,4	4,1	5,4	15	0,02	0,011	1,13	1,16	0,34	1,50	1	120
28.05.97	3280,000	18,2	8,15	304	9,30	99,3	2,2	3,6	13	0,06	0,019	1,36	1,44			19	82
04.06.97	2150,000	17,0	8,50	322	11,90	123,9	4,1	5,1	15	0,02	0,014	1,13	1,17	0,05	1,22	5	153
11.06.97	2000,000	19,4	8,20	304	15,00	164,2	4,6	6,1	21	0,04	0,011	1,13	1,18	0,06	1,24	5	130
25.06.97	2590,000	19,6	8,25	292	9,70	106,6	2,9	3,2	13	0,03	0,016	1,24	1,29			32	110
02.07.97	2420,000	21,8	8,40	316	11,10	127,6	3,9	4,4	17	0,09	0,015	1,24	1,35	0,13	1,48	29	159
09.07.97	2760,000	19,4	8,30	312	9,00	98,5	1,6	4,0	18	0,04	0,011	1,24	1,29	0,09	1,38	13	48
23.07.97	5640,000	18,6	8,00	318	7,40	79,7	1,4	4,2	13	0,06	0,033	1,54	1,63			59	218
06.08.97	4350,000	21,5	8,30	350	8,70	99,4	8,4	4,6	16	0,03	0,014	1,47	1,51	1,21	2,72	53	69
13.08.97	2710,000	21,7	8,35	362	9,60	110,1	3,3	3,7	11	0,04	0,009	1,47	1,52	1,08	2,60	38	166
18.08.97	2120,000	22,3	8,50	336	13,60	157,9	8,5	6,5	25	0,04	0,002	0,90	0,94			3	142
03.09.97	1960,000	20,8	8,55	356	11,40	128,4	6,5	4,7	17	0,03	0,010	1,24	1,28	0,03	1,31	7	149
10.09.97	1680,000	21,2	8,50	348	12,10	137,4	6,2	5,3	24	0,03	0,020	1,13	1,18	0,02	1,20	5	151
17.09.97	1470,000	18,2	8,55	386	11,40	121,7	3,5	5,1	23	0,03	0,013	1,58	1,63			19	178
01.10.97	1210,000	17,0	8,30	372	14,70	153,0	8,6	5,6	23	0,04	0,015	1,08	1,14	0,63	1,77	0	170
08.10.97	1900,000	13,6	8,25	380	11,60	112,0	5,5	4,6	26	0,02	0,012	1,29	1,32	0,58	1,90	8	181
15.10.97	1440,000	13,0	8,35	402	10,40	99,1	4,5	5,4	21	0,04	0,018	1,15	1,21			5	137
05.11.97	1250,000	7,8	8,20	425	11,60	97,5	3,3	3,9	17	0,04	0,024	1,99	2,05	0,33	2,38	46	130
12.11.97	1250,000	8,9	8,15	436	10,60	91,5	3,1	4,0	18	0,04	0,027	1,92	1,99	0,48	2,47	46	220
24.11.97	1470,000	5,1	7,95	430	11,10	87,0	4,6	3,4	13	0,23	0,024	2,21	2,47			68	
03.12.97	1430,000	8,5	8,15	440	9,60	82,1	3,5	3,3	18	0,27	0,033	2,49	2,79	0,34	3,13	78	150
10.12.97	1730,000	4,6	7,95	444	10,60	82,0	4,0	3,8	16	0,23	0,043	2,58	2,85	0,21	3,06	88	140

Duna at Hercegszántó, rkm 1433
01.01.1994 - 31.12.1997

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
05.01.94		140	4	140	57,9	13,5	13,0	3,2	1,00	0,15		0,00		23		1,0						5		0,20
12.01.94		0	4	30	63,9	16,4	14,0	3,4		0,20		0,00												
26.01.94		140	2	20										85								12		0,20
02.02.94		160	2	10	65,9	16,9	14,6	3,0	0,30	0,05		0,00		62		1,0						62		0,20
09.02.94		230	4	30	65,9	15,9	15,0	3,2		0,04		0,00		98								1		0,20
23.02.94		0	4	25																				
09.03.94		270	2	26	65,9	15,9	16,0	2,8	0,50	0,10		0,00		26		1,0						17		0,20
23.03.94		0	2	12																				
06.04.94		60	6	20	55,9	13,5	10,0	2,0	0,45	0,04		0,00		378		1,0						14		0,20
20.04.94		80	4	40																				
04.05.94		60	4	20	60,9	14,0	11,0	2,4	0,45	0,04		0,00		43		1,0						10		0,20
18.05.94				31																				
30.05.94				11																				
01.06.94		170	4	17	49,9	11,4	9,0	2,0	0,65	0,04		0,00		110		1,6						10		0,20
15.06.94		150	2	12	50,9	10,8	8,0	1,7		0,04		0,00												
28.06.94		20	0	28	42,9	12,4	9,0	2,0		0,13		0,00		55								10		0,20
06.07.94		20	6	95	39,9	11,3	8,0	2,0	0,40			0,00		39		1,0						10		0,20
13.07.94		20	2	60	46,9	10,9	8,0	1,8		0,04		0,00		26								10		0,20
27.07.94				75																				
10.08.94		0	2	18	40,9	12,9	10,0	2,0	0,30	0,04		0,00		30		2,0						10		0,20
24.08.94				15																				
07.09.94		0	0	20	48,9	12,4	9,5	2,4	0,25	0,04		0,00		42		1,0						10		0,20
21.09.94				15																				
05.10.94		90	2	38	55,9	14,0	11,0	2,6	0,35	0,04		0,00		43		1,0						10		0,20
18.10.94				44																				
03.11.94		0	4	30	57,9	14,5	12,0	3,4	0,58	0,09		0,01		105		2,2						10		0,07
16.11.94				53																				
29.11.94				24																				
07.12.94		20	2	42	61,9	15,4	12,0	2,8	0,25	0,10		0,00		25		1,0						10		0,07
14.12.94				20																				
03.01.95		100	0	20	59,9	16,4	13,0	3,0	0,40	0,10		0,00				1,0						10	0,18	0,07
11.01.95		20	2	25	59,9	14,5	12,0	3,0		0,10		0,00		26								10		0,07
25.01.95				54																				

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
01.02.95		100	2	54	55,9	18,0	15,0	3,0	1,25			0,00			1,0						10		0,07	
07.02.95		70	2	10	46,9	16,4	13,0	3,0		0,15		0,00		28								10		0,05
22.02.95				44																				
01.03.95		80	3	28	57,9	12,9	13,0	3,0	0,60			0,00			1,0						10		0,12	
08.03.95				38																				
22.03.95		120	2	28	63,9	15,4	14,0	3,2		0,04		0,00		12								7		0,05
05.04.95		150	2	125	58,9	12,9	12,0	2,8	0,55	0,04		0,00		22	1,0						13	9	0,47	0,05
19.04.95				70																				
02.05.95		274	2	105	50,0	12,0	10,0	2,4	0,75	0,05	0,00	0,00		111	1,0						17	16	0,22	0,05
17.05.95				90																				
29.05.95				55																				
08.06.95		26	6	8	44,0	9,5	8,0	2,2	1,30	0,02	0,00	0,00			4,1	4,1					26	5	0,46	0,26
14.06.95		26	6	30	46,0	11,0	8,0	2,6		0,10		0,00		37								8		0,05
27.06.95				16																				
05.07.95		0	2	22	49,8	11,0	8,0	2,4	1,30	0,10	0,00	0,00		14	4,1	4,1					30	25	0,05	0,05
12.07.95				28																				
25.07.95				26																				
09.08.95		76	4	48	39,5	13,5	9,5	2,6	0,65	0,05	0,52	0,12		34	4,1	4,1					28	2	0,07	0,07
23.08.95				24																				
06.09.95		150	2	18	48,0	10,5	8,0	2,2	4,20	0,10	0,00	0,00		21	4,1	4,1					37	10	0,07	0,07
20.09.95				16																				
04.10.95		120	1	25	55,0	14,0	11,0	2,8	0,43	0,05	0,00	0,00		10	4,1	4,1					11	10	0,07	0,07
18.10.95				12																				
31.10.95		30	2	44	52,0	16,5	15,0	3,2		0,06		0,00		22								15		0,03
08.11.95		30	3	24	60,0	16,5	15,0	3,2	0,67	0,08	0,00	0,00			1,8	1,3					52	12	0,01	0,01
15.11.95				60																				
28.11.95		70	0	40	56,0	16,5	12,0	3,0		0,06		0,00										6		0,05
06.12.95		100	2	54	62,0	14,0	15,0	3,4	0,25	0,09	0,00	0,00			5,2	2,2					77	52	0,01	0,01
13.12.95				66																				
04.01.96		18	6	64	60,0	15,3	15,0	3,4	0,65	0,15	0,00	0,00			1,1	0,8					15	10	0,01	0,01
10.01.96		120	6	12	62,0	16,0	13,0	3,2		0,05		0,00		24								7		0,08
24.01.96				26																				
07.02.96		26	3	42	71,0	20,0	18,0	3,4	0,30	0,10	0,00	0,00		3							15	2	0,01	0,01

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
21.02.96				70																				
06.03.96		12	2	68	71,0	21,0	22,0	3,6	0,30	0,05	0,03	0,01		25	1,7	1,6					9	4	0,14	0,14
19.03.96				54																				
03.04.96		60	4	38	62,0	17,0	16,0	3,6	0,43	0,07	0,04	0,01		14	1,5	1,4					9	3	0,03	0,01
17.04.96				40																				
24.04.96				34																				
08.05.96		30	2	20	52,0	14,0	14,0	2,8	1,40	0,03	0,05	0,01			2,1	1,6					14	10	0,07	0,03
15.05.96		56	1	44	53,0	13,0	13,0	3,0		0,06		0,00		29								11		0,01
29.05.96				34																				
04.06.96		74	0	20	50,0	13,0	10,3	2,6	0,70	0,03	0,06	0,04			2,0	1,8					27	17	0,05	0,04
12.06.96		30	1	26	56,0	15,0	11,7	2,6		0,06		0,04		26								2		0,07
25.06.96				30																				
03.07.96		180	1	40	51,0	14,0	11,0	2,6	0,55	0,03	0,04	0,02		57	1,9	1,7					15	9	0,34	0,34
10.07.96				20																				
24.07.96				20																				
07.08.96		30	3	30	44,0	14,0	12,0	2,8	0,48	0,04	0,04	0,03		26							11	2	0,14	0,05
14.08.96				25																				
04.09.96		0	1	30	51,0	12,9	11,2	2,6	0,38	0,01	0,03	0,02		24	2,6	2,3					27	18	0,14	0,13
18.09.96				20																				
02.10.96		170	3	20	55,0	13,6	9,5	2,6		0,09		0,02		26								9		0,04
09.10.96		160	6	20	58,0	14,0	10,0	2,6	0,40	0,03	0,04	0,02			1,5	1,3					9	2	0,03	0,02
16.10.96				34																				
06.11.96		8	0	18	56,0	14,0	10,8	2,8	0,32	0,05	0,02	0,01		17							21	14	0,08	0,07
13.11.96				14																				
27.11.96				38																				
04.12.96		0	2	24	61,0	15,0	14,5	3,1	0,17	0,03	0,02	0,01			1,5	1,5					36	35	0,05	0,05
11.12.96		150	3	30	64,0	16,5	14,3	3,0		0,01		0,01		64								24		0,05
07.01.97		20	3	40	69,0	18,7	20,3	3,5	0,21	0,02	0,03	0,03		59							25	15	0,05	0,05
22.01.97				40																				
05.02.97			3	30	69,0	21,6	21,2	3,8	0,21	0,03	0,02	0,02		13	1,5	1,5					13	10	0,05	0,05
19.02.97				40																				
05.03.97		0	1	18	61,0	14,9	14,5	3,4	0,59	0,05	0,04	0,01		99							32	12	0,05	0,05
19.03.97				27																				

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
02.04.97		98	4	16	60,0	15,0	12,7	2,8	0,35	0,02	0,04	0,02		24	0,9	0,7					4	3	0,18	0,05
09.04.97			5	12	62,0	14,0	12,4	2,7		0,03				16								30		0,05
16.04.97				21																				
07.05.97		72	4	30	49,0	14,5	11,5	2,3	0,36	0,03	0,13	0,02		45							38	6	0,05	0,05
14.05.97		100	2	42	49,0	13,5	9,9	2,0	0,19	0,01	0,05	0,04			0,9	0,6						8		0,05
28.05.97				25																				
04.06.97		173	2	36	48,0	13,0	9,8	2,1	0,36	0,04	0,06	0,03		9	0,8	0,7					7	3	0,08	0,05
11.06.97		214	2	42	40,0	11,0	10,3	2,2	0,25	0,02	0,04	0,01		18		0,5						10		0,06
25.06.97				37																				
02.07.97		141	3	29	45,0	10,5	12,1	2,4	0,49	0,06	0,04	0,01		12	2,2	1,8					14	13	0,05	0,05
09.07.97		100	6	28	45,0	10,5	9,3	2,3	0,89	0,01	0,07	0,03				1,4						2		0,05
23.07.97				42																				
06.08.97		43	3	15	55,0	11,0	9,5	2,9	0,68	0,05	0,04	0,01		15	1,5	1,4					11	4	0,05	0,05
13.08.97		94	1	18	54,0	12,5	8,3	2,7	0,70	0,07	0,05	0,03		16		1,6						8		0,05
18.08.97				25																				
03.09.97		135	2	12	50,0	13,0	11,0	2,8	0,42	0,05	0,04	0,01		7	2,1	1,6					22	12	0,10	0,06
10.09.97		44	2	21	48,0	13,0	11,7	3,0	0,42	0,04	0,05	0,02		8	1,8	1,5					16	6	0,21	0,06
17.09.97				22																				
01.10.97		16	1	51	47,0	15,0	13,3	3,1	0,61	0,04	0,09	0,06			2,0	1,5					21	8	0,36	0,17
08.10.97		1	1	62	52,0	14,5	12,5	2,8	0,45	0,04	0,05	0,02										14		0,12
15.10.97		72	0	20	55,0	14,0	13,0	2,8		0,01		0,02		24								10		0,12
05.11.97		33	5	51	62,0	15,0	15,2	3,1	0,24	0,04	0,05	0,03		14							13	12	0,34	0,05
12.11.97		27	2	51	62,0	17,0	15,0	2,8	0,21	0,05	0,04	0,03		16								13		0,05
24.11.97				129																				
03.12.97		0	2	42	61,0	16,0	16,0	3,3	0,25	0,04	0,03	0,01		14	1,3	1,1					7	4	0,08	0,06
10.12.97		22	2	36	64,0	15,5	15,5	3,5	0,28	0,06	0,02	0,01		15		0,8						19		0,23

Date	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
05.01.94		0,0		2,0		10,0		5,8		3,8
12.01.94										
26.01.94		0,2		0,4		8,3		5,5		5,2
02.02.94		0,1		0,6		11,3		2,4		5,8
09.02.94		0,9		0,4		5,4		1,6		4,2
23.02.94										
09.03.94		0,0		1,9		7,1		0,7		3,5
23.03.94										
06.04.94		0,0		6,6		5,5		3,8		8,0
20.04.94										
04.05.94		0,0		2,0		0,3		0,6		6,2
18.05.94										
30.05.94										
01.06.94		0,1		1,0		1,6		0,7		2,4
15.06.94										
28.06.94		0,3		0,3		1,2		0,7		1,8
06.07.94		0,0		0,3		1,1		0,7		3,2
13.07.94		0,4		0,3		1,1		0,7		2,6
27.07.94										
10.08.94		0,0		0,6		2,0		2,5		2,1
24.08.94										
07.09.94		0,4		1,1		6,4		0,7		2,4
21.09.94										
05.10.94		0,5		0,3		1,2		0,7		1,6
18.10.94										
03.11.94		0,5		1,0		0,3		0,7		2,2
16.11.94										
29.11.94										
07.12.94		1,2		0,9		2,4		0,9		3,9
14.12.94										
03.01.95	2,3		1,2		6,1			0,6	2,1	0,4
11.01.95		0,1		0,7		0,8		1,0		0,8
25.01.95										

Date	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
01.02.95	2,9		2,0		4,1		8,3		3,8	
07.02.95		1,4		0,4		0,4		0,6		2,5
22.02.95										
01.03.95	0,5		1,0		2,2		2,1		1,7	
08.03.95										
22.03.95		0,2		0,7		1,4		1,3		1,7
05.04.95	0,9	0,1	1,1	0,8	2,4	1,7	0,9	0,7	1,8	0,8
19.04.95										
02.05.95	0,4	0,1	1,8	1,7	2,6	1,9	8,7	5,4	6,0	3,3
17.05.95										
29.05.95										
08.06.95	0,1	0,1	2,3	0,8	4,9	4,8	1,4	0,6	1,6	0,8
14.06.95		0,1		0,7		4,0		0,6		0,6
27.06.95										
05.07.95	0,3	0,0	0,6	0,0	1,5	0,4	2,5	0,6	3,8	2,4
12.07.95										
25.07.95										
09.08.95	0,1	0,1	0,8	0,1	0,5	0,4	2,4	1,6	4,0	1,4
23.08.95										
06.09.95	0,2	0,1	5,3	0,1	8,6	1,1	7,1	1,3	7,2	3,8
20.09.95										
04.10.95	0,1	0,1	0,8	0,2	0,8	0,5	1,7	1,7	2,8	1,4
18.10.95										
31.10.95		0,1		1,1		3,0		0,8		1,8
08.11.95	0,1	0,1	1,5	1,2	2,7	1,3	2,7	1,3	5,4	3,0
15.11.95										
28.11.95		0,1		1,4		2,2		2,4		3,4
06.12.95	0,1	0,1	0,6	0,1	3,0	2,2	1,9	1,3	3,7	3,5
13.12.95										
04.01.96	0,1	0,1	0,8	0,7	1,9	0,7	0,8	0,8	7,8	5,1
10.01.96		0,1		0,8		0,4		0,8		3,7
24.01.96										
07.02.96	0,1	0,1	1,1	1,0	0,4	0,4	0,9	0,8	2,6	2,2

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Date	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
21.02.96										
06.03.96	0,1	0,1	0,9	0,6	2,0	0,4	1,6	0,8	2,4	1,7
19.03.96										
03.04.96	0,1	0,1	1,2	0,3	1,1	0,6	1,3	1,1	4,5	3,3
17.04.96										
24.04.96										
08.05.96	0,3	0,1	2,5	0,1	1,8	0,4	2,2	0,8	2,0	1,7
15.05.96		0,1		0,4		0,4		0,8		4,4
29.05.96										
04.06.96	0,1	0,1	0,6	0,5	2,3	1,4	1,1	1,0	6,2	3,6
12.06.96		0,1		0,3		0,4		1,4		5,4
25.06.96										
03.07.96	0,2	0,1	1,3	0,6	3,0	1,5	1,3	0,8	7,1	4,7
10.07.96										
24.07.96										
07.08.96	0,8	0,4	0,8	0,5	1,1	0,5	1,8	0,9	5,1	2,1
14.08.96										
04.09.96	0,1	0,1	0,7	0,7	0,4	0,4	1,5	0,9	3,0	1,8
18.09.96										
02.10.96		0,1		0,9		1,0		0,8		2,3
09.10.96	0,1	0,1	0,9	0,5	0,8	0,7	1,5	0,8	1,8	0,5
16.10.96										
06.11.96	0,1	0,1	2,2	1,1	1,2	0,9	1,0	0,5	3,5	2,9
13.11.96										
27.11.96										
04.12.96	0,1	0,1	1,9	1,4	0,4	0,4	0,8	0,8	4,7	3,8
11.12.96		0,2		1,3		0,4		0,8		2,7
07.01.97	0,1	0,1	1,9	0,8	1,6	0,4	0,5	0,5	4,3	3,1
22.01.97										
05.02.97	0,1	0,1	0,4	0,1	0,8	0,7	0,8	0,6	2,9	2,6
19.02.97										
05.03.97	0,2	0,1	1,1	0,7	0,5	0,4	1,2	1,0	5,9	5,9
19.03.97										

Date	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
02.04.97	0,1	0,1	0,6	0,1	1,6	0,4	1,3	0,6	2,8	2,5
09.04.97		0,3		0,6		2,3		1,2		2,5
16.04.97										
07.05.97	0,1	0,1	0,1	0,1	0,7	0,4	2,0	1,0	3,7	2,3
14.05.97		0,3		0,1		1,3		0,7		5,6
28.05.97										
04.06.97	0,1	0,1	0,1	0,1	0,4	0,4	0,5	0,5	3,9	3,6
11.06.97		0,1		0,1		0,4		0,5		4,9
25.06.97										
02.07.97	0,1	0,1	1,0	0,3	1,2	0,8	1,1	0,7	4,1	3,2
09.07.97		0,1		1,5		1,0		0,5		2,8
23.07.97										
06.08.97	0,2	0,1	1,3	1,1	1,5	0,4	0,5	0,5	4,5	2,4
13.08.97		0,1		1,0		0,5		0,5		2,7
18.08.97										
03.09.97	0,2	0,1	0,6	0,4	3,6	1,4	0,5	0,5	4,8	1,0
10.09.97	0,2	0,1	0,4	0,4	2,7	2,2	0,5	0,5	2,8	1,4
17.09.97										
01.10.97	0,1	0,1	0,9	0,7	2,5	1,5	2,0	0,5	4,9	3,0
08.10.97		0,1		0,1		2,0		1,5		4,9
15.10.97		0,1		1,4		0,4		1,3		1,5
05.11.97	0,2	0,1	0,9	0,2	1,4	0,4	1,2	0,8	2,1	1,9
12.11.97		0,1		0,1		1,0		0,8		2,2
24.11.97										
03.12.97	0,3	0,2	1,4	1,3	0,8	0,8	1,8	1,3	1,8	1,8
10.12.97		0,1		0,4		0,8		1,4	4,5	

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
10.01.94	15,800	4,0	7,70	440	9,90	75,4	4,0	6,2	21	0,40	0,046	7,10	7,54	-1,24	6,30	98	370
24.01.94	6,020	2,1	8,10	380	10,90	78,8	3,3	3,5	16	0,76	0,041	4,09	4,89			127	
07.02.94	3,400	4,7	8,30	420	10,40	80,7	5,0	4,2	14	1,29	0,041	3,84	5,17			212	230
21.02.94	3,000	1,6	8,10	410	11,80	84,2	4,3	3,9	14	1,17	0,027	3,16	4,36			163	210
07.03.94	3,571	6,0	8,30	340	11,00	88,3	5,1	4,2	17	0,97	0,029	2,58	3,58			170	360
21.03.94	3,620	7,0	8,20	300	12,50	102,9	6,2	4,3	18	0,41	0,037	2,03	2,48	1,68	4,16	183	360
05.04.94	6,330	8,0	8,20	305	10,10	85,3	5,3	4,2	17	0,57	0,049	2,03	2,66	1,20	3,86	173	280
19.04.94	37,540	9,0	7,10	316	10,00	86,6	6,2	9,9	31	0,32	0,033	2,83	3,18			108	670
02.05.94	5,567	14,2	7,80	326	8,20	80,3	3,6	5,1	15	0,51	0,078	0,34	0,92	2,12	3,04	173	220
16.05.94	3,860	18,0	8,10	405	8,80	93,6	7,8	6,6	24	0,65	0,135	2,03	2,82			225	450
30.05.94	5,931	16,0	7,90	356	8,30	84,6	5,2	7,7	26	0,44	0,116	0,23	0,78			209	450
13.06.94	3,570	17,0	8,00	415	8,20	85,4	6,3	5,3	20	0,51	0,138	2,15	2,79	0,65	3,44	72	320
27.06.94	0,897	23,0	8,30	400	13,30	156,5	3,0	4,9	17	0,26	0,195	1,31	1,76			91	380
11.07.94	0,542	21,0	8,00	480	13,40	151,6	9,0	8,9	34	1,79	0,517	2,37	4,68	0,28	4,96	427	580
25.07.94	0,519	22,0	7,60	424	10,50	121,2	5,8	8,6	28	0,53	0,322	1,81	2,66			522	1300
08.08.94		24,0	8,10	350	8,90	106,8	8,1	9,4	29	0,82	0,304	1,02	2,14	0,26	2,40	652	1170
22.08.94		16,0	8,00	370	8,40	85,6	6,8	7,0	24	0,24	0,316	1,81	2,37			685	790
05.09.94	2,470	18,0	8,00	320	7,80	82,9	7,2	6,0	21	0,65	0,202	1,92	2,78	1,42	4,20	7	430
19.09.94	2,090	13,0	7,90	340	7,90	75,2	4,0	6,0	16	0,62	0,157	2,37	3,15			359	
03.10.94		15,8	8,00	385	7,60	77,1	6,5	7,6	28	1,94	0,239	2,37	4,55	3,14	7,69	1011	1100
17.10.94	1,530	9,0	8,30	330	9,60	83,1	5,0	5,6	19	1,22	0,079	1,47	2,77			378	1400
31.10.94	9,400	11,5	7,20	388	9,10	83,7	1,8	8,8	29	0,50	0,098	3,73	4,32			196	340
14.11.94	9,425	6,6	7,90	385	10,70	87,2	3,6	6,0	20	0,82	0,078	3,39	4,29	0,71	5,00	245	300
28.11.94	2,376	3,3	7,70	405	11,50	85,9	4,4	4,2	13	1,83	0,046	2,26	4,13			365	510
05.12.94	1,950	1,5	7,60	385	12,50	88,9	6,9	6,4	20	2,02	0,001	2,08	4,10	2,00	6,10	251	540
19.12.94	1,480	0,9	7,00	430	12,20	85,4	5,8	4,8	23	2,25	0,043	2,15	4,44			333	500
09.01.95	1,310	1,0	7,90	440	11,90	83,5	5,2	5,6	22	4,04	0,027	2,26	6,33	0,87	7,20	492	640
23.01.95	1,080	0,0	7,30	420	10,90	74,4	3,8	4,4	18	2,68	0,022	2,37	5,08			258	360
06.02.95	2,750	3,3	7,70	420	13,50	100,9	5,0	4,7	24	1,55	0,025	2,49	4,06	0,74	4,80	248	320
20.02.95	8,450	4,3	7,40	465	11,00	84,4	6,5	5,7	17	0,78	0,051	5,20	6,03			176	240
06.03.95		5,8	7,80	371	12,00	95,8	8,8	9,9	30	0,33	0,063	3,16	3,55	0,82	4,37	82	180
20.03.95	7,900	6,0	7,60	403	11,30	90,7	4,0	4,5	17	0,82	0,024	3,28	4,12			130	190
03.04.95	4,980	10,5	7,90	442	12,00	107,8	5,5	4,5	20	0,64	0,051	2,60	3,29	0,21	3,50	153	200

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
18.04.95	3,310	10,9	8,10	435	14,40	130,6	5,4	4,7	23	1,63	0,069	2,37	4,07			261	290
03.05.95	15,500	12,4	8,20	304	10,90	102,4	3,9	6,8	16	0,38	0,055	2,03	2,47	0,08	2,55	137	200
15.05.95	9,820	12,3	7,50	370	11,80	110,6	8,0	7,3	30	0,61	0,095	2,26	2,97			192	330
29.05.95	11,380	19,0	7,20	390	8,50	92,3	5,0	10,2	33	0,56	0,158	3,50	4,22			205	340
12.06.95	39,590	18,1	7,30	317	5,60	59,7	7,3	12,1	43	0,40	0,062	2,71	3,18	0,22	3,40	319	450
26.06.95	7,950	17,3	7,90	390	9,00	94,3	3,3	5,4	22	0,39	0,094	1,97	2,45			111	190
10.07.95	2,570	21,6	8,30	445	8,60	98,4	3,8	5,4	18	0,42	0,185	2,15	2,75	0,09	2,84	192	270
24.07.95	1,330	22,8	8,00	432	8,30	97,3	6,0	5,6	19	0,23	0,165	2,03	2,43			176	220
07.08.95	3,020	22,3	8,20	570	9,80	113,7	4,2	5,9	29	0,09	0,034	1,47	1,60	0,07	1,67	36	70
21.08.95	0,890	21,5	7,80	470	10,40	118,8	6,2	6,2	18	0,58	0,171	1,81	2,56			290	350
04.09.95	1,580	14,2	7,90	420	8,00	78,3	3,6	5,2	16	0,65	0,128	1,13	1,91	0,18	2,09	258	350
18.09.95	1,520	17,5	8,20	575	9,90	104,2	3,7	4,1	21	0,20	0,099	2,03	2,34			192	330
02.10.95	1,470	10,2	8,10	490	9,30	82,9	5,2	7,0	23	0,64	0,100	2,49	3,23	0,68	3,91	251	370
16.10.95	1,440	13,5	8,00	460	8,70	83,8	5,0	5,6	20	0,93	0,105	1,92	2,96			310	500
30.10.95	1,320	9,4	8,00	500	10,10	88,3	7,0	7,0	22	1,17	0,070	1,92	3,16			323	550
13.11.95	1,370	4,3	7,90	540	10,70	82,1	3,8	5,1	21	1,09	0,034	1,92	3,04	0,98	4,02	264	460
27.11.95	1,680	0,0	8,00	450	11,70	79,9	3,6	4,8	27	1,71	0,022	1,81	3,54			251	370
11.12.95	2,000	2,0	8,00	550	10,60	76,5	4,6	4,8	16	1,75	0,026	2,26	4,03	0,22	4,25	368	510
21.12.95	1,940	0,8	8,10	670	12,20	85,1	6,1	6,6	24	1,37	0,022	2,26	3,65			241	330
08.01.96	2,920	0,9	8,20	534	15,50	108,5	6,6	5,4	20	1,55	0,026	2,94	4,52	0,08	4,60	248	380
22.01.96	2,770	0,6	8,10	680	11,50	79,8	3,6	4,8	20	1,71	0,032	4,29	6,04			254	300
05.02.96	2,260	0,7	8,20	580	12,20	84,9	4,7	4,9	22	1,67	0,026	2,83	4,52	0,40	4,92	267	350
19.02.96	2,590	1,5	7,90	560	11,40	81,1	5,4	5,6	24	1,41	0,039	2,71	4,16			264	410
04.03.96	2,400	1,0	7,80	540	13,80	96,8	4,8	4,6	19	1,90	0,033	2,60	4,54	0,19	4,73	365	800
18.03.96	18,600	2,5	7,80	690	12,20	89,2	9,7	11,2	33	0,36	0,026	4,07	4,45			231	330
01.04.96	16,400	4,8	8,10	470	11,30	87,9	4,1	5,3	18	0,59	0,039	4,75	5,38	0,09	5,47	108	400
15.04.96	15,170	5,3	7,60	330	10,70	84,3	3,4	3,7	13	0,40	0,026	2,26	2,69			101	320
29.04.96	5,450	13,7	8,00	340	10,70	103,6	3,0	3,5	14	0,35	0,059	1,70	2,10			143	300
13.05.96	17,000	18,0	7,90	380	8,30	88,3	6,9	8,2	20	0,26	0,074	2,60	2,94	0,96	3,90	199	280
28.05.96	5,700	16,5	7,90	460	9,20	94,8	6,4	7,4	29	0,41	0,102	2,03	2,55			179	440
10.06.96	2,400	23,8	8,20	440	7,80	93,2	4,1	5,3	17	0,59	0,178	2,94	3,71	0,32	4,03	238	310
24.06.96	2,650	16,0	8,00	370	6,70	68,3	4,2	5,2	20	0,78	0,158	2,15	3,08			287	520
08.07.96	2,020	23,5	8,20	380	7,80	92,7	4,6	5,8	19	1,28	0,221	1,81	3,31	0,17	3,48	368	530

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
22.07.96	1,240	17,6	8,00	420	10,00	105,4	5,4	4,8	14	0,41	0,129	1,81	2,35			241	1050
05.08.96	1,600	16,0	7,90	670	8,60	87,6	5,4	6,5	33	0,37	0,058	2,03	2,46	0,44	2,90	140	320
21.08.96	1,060	18,9	8,10	410	7,00	75,9	4,0	3,8	17	1,32	0,193	2,15	3,66			502	2500
02.09.96	8,480	18,6	8,00	400	9,30	100,2	9,1	12,0	33	0,44	0,109	3,62	4,17	0,48	4,65	293	450
16.09.96	2,230	10,9	7,90	400	11,00	99,7	6,6	7,0	22	1,36	0,100	2,15	3,61			111	650
30.09.96	2,550	11,6	8,10	430	9,80	90,3	6,0	5,9	19	0,68	0,083	2,37	3,14			290	450
14.10.96	2,260	11,8	7,20	403	10,00	92,6	4,9	6,1	16	0,82	0,088	2,03	2,94	0,23	3,17	329	490
28.10.96	2,050	5,0	8,00	610	9,80	76,6	6,9	6,6	12	1,24	0,092	2,26	3,60			310	410
11.11.96	1,930	8,2	8,10	490	12,60	106,9	4,6	5,6	22	0,35	0,061	2,26	2,67	0,33	3,00	548	620
25.11.96	8,350	4,7	7,90	400	11,50	89,2	5,3	4,3	17	0,51	0,036	3,05	3,60			91	280
09.12.96	2,520	1,2	8,10	420	11,70	82,6	5,6	5,1	16	1,10	0,032	2,15	3,28	0,11	3,39	189	250
27.12.96	3,500	0,0	7,60	550	17,40	118,8	4,5	4,8	22	2,99	0,039	3,16	6,19			284	320
06.01.97	5,500	0,0	8,00	510	11,00	75,1	6,1	6,4	21	1,17	0,029	3,62	4,81	0,28	5,09	173	260
20.01.97	2,940	0,0	7,90	580	13,30	90,8	5,1	4,1	19	1,45	0,034	2,83	4,30			196	360
03.02.97	2,350	0,0	7,90	590	11,50	78,5	8,0	6,2	19	1,99	0,036	2,94	4,96	0,38	5,34	245	400
17.02.97	7,120	0,0	8,10	670	14,10	96,2	6,2	6,0	25	0,70	0,030	3,84	4,57			196	320
03.03.97	21,000	4,3	8,20	440	10,90	83,7	3,4	3,3	12	0,55	0,029	3,96	4,54	0,28	4,82	114	420
17.03.97	4,060	6,0	8,20	500	8,80	70,6	3,2	4,2	19	0,82	0,040	2,37	3,24			189	240
01.04.97	2,530	9,0	8,10	500	9,80	84,8	6,8	5,2	22	0,03	0,050	2,26	2,34	1,57	3,91	231	680
14.04.97	2,360	7,4	8,00	500	9,80	81,5	5,4	6,2	18	1,31	0,052	1,99	3,35			394	740
12.05.97	2,800	18,0	8,20	380	7,80	82,9	5,9	6,2	17	1,01	0,136	2,03	3,18	0,48	3,66	359	480
26.05.97	1,460	15,0	8,00	440	9,70	96,7	5,9	6,4	18	2,25	0,208	1,81	4,27			496	650
09.06.97	1,740	23,8	8,10	410	9,50	113,5	6,0	6,6	30	0,93	0,213	1,58	2,73	2,52	5,25	427	630
24.06.97	1,200	17,0	7,80	420	6,40	66,6	7,3	7,7	28	2,14	0,141	1,58	3,86			489	630
07.07.97		19,0	7,90	310	6,70	72,8	8,4	6,9	24	1,38	0,148	1,24	2,77	0,65	3,42	349	760
21.07.97		14,0	7,90	298	8,20	79,9	8,9	9,6	27	0,30	0,068	2,26	2,63			147	320
04.08.97	2,720	20,0	8,10	340	7,10	78,7	3,9	6,0	18	0,46	0,148	2,03	2,64	0,24	2,88	235	380
18.08.97	1,170	19,0	7,90	413	7,60	82,5	4,6	5,0	15	0,99	0,226	2,49	3,71			378	440
01.09.97	1,290	18,9	8,00	350	8,10	87,8	4,8	5,7	21	1,07	0,175	2,15	3,39	0,08	3,47	424	590
15.09.97	0,880	14,9	7,90	410	7,60	75,6	6,0	6,9	17	1,28	0,163	2,15	3,59			365	430
13.10.97	12,000	1,0	8,30	715	7,40	51,9	7,2	8,1	29	1,55	0,112	1,81	3,47	0,51	3,98	411	570
27.10.97	1,200	4,2	8,40	425	9,80	75,0	8,1	10,4	27	3,57	0,039	4,07	7,68			554	860
10.11.97	1,340	9,5	8,00	420	7,70	67,5	4,8	6,6	32	2,72	0,085	1,58	4,39	0,41	4,80	456	840

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
24.11.97	1,340	2,1	8,20	450	10,20	73,8	5,3	5,8	15	1,99	0,038	2,49	4,51			290	450
08.12.97	4,370	3,5	8,60	340	9,60	72,1	4,7	5,7	12	0,70	0,037	2,49	3,22	0,38	3,60	140	340
22.12.97	4,370	3,5	8,00	400	10,80	81,1		6,1	16	0,78	0,052	2,49	3,31			284	340

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al dis.	As dis.	B dis.	CN dis	Zn dis.	Hg dis.	Cd dis.	Cr dis.	Ni dis.	Pb dis.	Cu dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
10.01.94		30	1	40	45,7	15,1	12,0	4,8	0,76			0,00		1,1			20	0,20	0,2	0,1	6,0	3,1	4,2
24.01.94		60	2	50																			
07.02.94		100	0	90	42,1	13,4	14,0	5,0	0,71			0,00		3,0			30	0,10	0,1	0,3	3,2	0,6	4,5
21.02.94		140	2	90																			
07.03.94		70	2	30	36,9	12,6	14,0	4,8	0,18			0,00		3,0			20	0,10	0,2	0,4	4,0	0,7	4,5
21.03.94		10	2	70	29,7	9,7	10,0	3,8	0,09			0,01											
05.04.94		140	2	50	30,1	9,4	10,0	4,0	0,13			0,00		1,1			60	0,10	0,2	0,5	6,5	1,0	5,0
19.04.94		90	3	50																			
02.05.94		80	1	60	36,1	10,7	10,0	3,8	0,82			0,06		3,0			65	0,20	0,3	0,8	7,0	0,4	5,3
16.05.94		40	1	140																			
30.05.94		60	2	50																			
13.06.94		20	1	90	46,7	13,6	15,0	6,0	0,71			0,00		0,2			40	0,40	0,3	0,2	3,2	1,8	6,1
27.06.94		40	2	70																			
11.07.94		30	6	10	46,5	14,6	18,0	8,5	0,56			0,00		2,7			30	0,10	0,3	0,9	3,9	1,9	3,0
25.07.94				10																			
08.08.94		30	4	110	33,7	8,8	18,0	8,5	0,48			0,00	110	1,7			21	0,30	0,1	0,6	7,2	1,2	3,5
22.08.94																							
05.09.94		30	2	210	27,9	8,4	15,0	6,0	0,57			0,67	90	6,7			30	0,10	0,2	0,4	6,7	1,5	5,7
19.09.94		90	3	50																			
03.10.94		70	3	20	38,5	10,7	20,0	8,0	0,88			0,05	120	1,8			38	0,10	0,1	0,3	5,3	0,6	4,6
17.10.94				40																			
31.10.94				20																			
14.11.94		40	1	100	46,5	11,7	14,0	7,5	0,67			0,00											
28.11.94				200									60	2,1			40	0,10	0,3	0,6	4,0	1,0	7,0
05.12.94		120	2	180	33,9	14,1	17,0	5,5	0,78			0,22	120	3,0			78	0,10	1,5	0,3	1,0		0,9
19.12.94				180																			
09.01.95		100	1	130	42,9	14,0	20,0	6,5		0,75		0,00	100	1,5			30	0,10	0,1	0,2	4,0	0,7	4,6
23.01.95				50																			
06.02.95		70	1	90	43,3	11,7	17,0	5,5		0,60		0,00	80	2,8			25	0,20	0,1	0,4	3,2	3,0	4,6
20.02.95				20																			
06.03.95		50	2	20	39,1	12,1	9,0	4,8		0,84		0,00	90	3,0			20	0,10	0,3	0,1	2,9	5,5	2,5
20.03.95				40																			
03.04.95		20	2	50	48,2	19,6	18,0	5,5		0,22		0,00	70	2,8			14	0,10	0,2	0,1	3,0	4,0	2,3

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Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al dis. µg/l	As dis. µg/l	B dis. µg/l	CN dis µg/l	Zn dis. µg/l	Hg dis. µg/l	Cd dis. µg/l	Cr dis. µg/l	Ni dis. µg/l	Pb dis. µg/l	Cu dis. µg/l
18.04.95				10																			
03.05.95		10	1	40	34,5	9,5	9,0	3,4		0,20		0,09	40	2,6			20	0,10	0,4	0,2	4,0	7,0	2,9
15.05.95				10																			
29.05.95				10																			
12.06.95		20	2	10	39,0	7,5	8,0	7,0		0,74		0,00	70	4,0			35	0,10	0,1	0,2	2,8	1,8	2,8
26.06.95				10																			
10.07.95		40	0	50	58,0	14,8	18,0	5,5		0,31		0,00	80	1,8			40	0,10	0,7	0,4	6,0	3,6	5,0
24.07.95				60																			
07.08.95		10	1	50	60,0	23,0	30,0	7,0		0,22		0,00	50	1,7			30	0,10	0,2	0,5	2,2	4,0	3,0
21.08.95				90																			
04.09.95		30	1	20	47,5	14,4	20,0	7,0		0,50		0,00	65	4,0			20	0,10	0,2	0,3	3,2	2,0	0,9
18.09.95				10																			
02.10.95		70	3	80	54,7	15,9	24,0	7,0		0,46		0,05	85	3,0			40	0,10	0,1	1,0	2,7	2,5	3,0
16.10.95				50																			
30.10.95				80																			
13.11.95		30	2	50	50,4	11,2	22,0	6,5		0,35		0,00	70	2,8			70	0,10	0,3	0,9	3,0	2,0	2,7
27.11.95				60																			
11.12.95		30	4	40	50,7	18,8	22,0	8,5		0,49		0,22	65	1,9			50	0,10	0,3	1,1	3,5	3,2	3,4
21.12.95				40																			
08.01.96		30	1	35	49,0	17,0	17,0	6,0		0,49		0,00		2,5			20	0,10	1,6	1,2	3,2	7,3	2,8
22.01.96				20																			
05.02.96		380	2	80	68,0	19,0	22,0	6,5		0,36		0,04		3,0			20	0,10	0,8	1,3	5,0	7,3	5,1
19.02.96				200																			
04.03.96		60	1	120	61,0	18,5	24,0	7,5		0,01		0,03		2,7			25	0,10	0,5	1,6	4,4	9,5	13,5
18.03.96				50																			
01.04.96		10	1	60	52,0	14,0	18,0	10,0		0,01		0,00		1,8			30	0,10	2,0	1,8	6,0	8,5	3,8
15.04.96				50																			
29.04.96				60																			
13.05.96		10	2	70	40,0	14,2	15,0	5,5		0,00		0,00		1,5			40	0,10	0,5	1,7	5,0	4,5	4,0
28.05.96				70																			
10.06.96		20	1	50	44,0	13,0	18,0	5,5		0,11		0,02	64	2,7			30	0,10	0,6	0,7	2,4	0,8	5,2
24.06.96				80																			
08.07.96		10	1	60	41,0	10,0	19,0	6,5		0,45		0,02		3,0			30	0,10	0,7	1,9	3,0	1,7	1,9

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Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al dis. µg/l	As dis. µg/l	B dis. µg/l	CN dis µg/l	Zn dis. µg/l	Hg dis. µg/l	Cd dis. µg/l	Cr dis. µg/l	Ni dis. µg/l	Pb dis. µg/l	Cu dis. µg/l
22.07.96				70																			
05.08.96		20	1	10	70,0	24,0	30,0	11,0		0,01		0,00		1,6			80	0,10	0,4	0,6	4,0	1,6	4,0
21.08.96				18																			
02.09.96		50	1	130	41,0	10,0	17,0	9,5		0,64		0,00		1,5			50	0,10	0,5	0,5	2,8	2,4	3,5
16.09.96				80																			
30.09.96				60																			
14.10.96		20	1	70	47,0	15,0	19,0	6,5		0,14		0,02		2,0			80	0,10	0,2	0,6	3,5	1,7	2,2
28.10.96				50																			
11.11.96		30	2	60	53,0	20,0	24,0	6,0		0,01		0,03		1,7			30	0,10	0,4	0,4	2,7	1,6	2,5
25.11.96				100																			
09.12.96		10	1	50	55,0	13,0	19,0	6,0		0,29		0,02		2,6			70	0,10	0,3	0,2	2,2	2,7	2,7
27.12.96				60																			
06.01.97		41	2	90	61,0	14,0	17,0	6,0		0,25		0,35		2,1			45	0,10	0,8	0,7	3,4	3,0	4,0
20.01.97				60																			
03.02.97		20	3	90	68,0	25,0	26,0	6,5		0,01		0,36		0,9			55	0,10	1,6	1,3	4,3	2,7	2,4
17.02.97				40																			
03.03.97		20	4	90	48,0	19,0	16,0	4,4		0,01		0,26							1,3	25,0	0,1	2,1	2,6
17.03.97				80																			
01.04.97		70	2	190	59,0	23,0	20,0	5,5		0,08		0,20		1,6			35	0,10	0,6	1,9	4,3	2,4	3,8
14.04.97				130																			
12.05.97		40	1	190	45,0	13,0	17,0	4,8		0,35		0,00		3,0			40	0,10	1,6	0,8	2,6	3,7	3,9
26.05.97				60																			
09.06.97		50	3	170	50,0	15,0	22,0	7,0		0,73		0,00		1,7			25	0,10	0,8	0,9	3,1	3,5	2,7
24.06.97				1750																			
07.07.97		40	1	100	36,0	8,0	16,0	6,0		0,40		0,14		1,6			35	0,10	1,2	0,7	2,5	4,0	2,4
21.07.97				130																			
04.08.97		20	4	80	42,0	12,0	20,0	6,5		0,10		0,00		1,5			40	0,10	1,4	0,8	2,0	1,8	1,8
18.08.97				60																			
01.09.97		30	3	80	41,0	11,0	20,0	6,0		0,70		0,00		2,0			50	0,10	2,0	1,0	1,8	0,7	1,5
15.09.97				150																			
13.10.97		40	5	60	51,0	14,0	24,0	9,5		0,80		0,00		2,3			20	0,10	2,5	1,2	2,1	1,9	2,1
27.10.97				210																			
10.11.97		150	2	170	47,0	13,0	22,0	7,2		0,10		0,00		1,7			60	0,10	1,8	1,7	2,7	3,0	3,0

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al dis.	As dis.	B dis.	CN dis	Zn dis.	Hg dis.	Cd dis.	Cr dis.	Ni dis.	Pb dis.	Cu dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
24.11.97				110																			
08.12.97		30	2	50	46,6	10,6	13,0	4,2		0,20		0,00		1,4			70	0,10	1,3	1,3	1,8	2,5	4,0
22.12.97				130																			

Rába at Szentgotthárd rkm 202.6
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
03.01.94	10,900	1,6	7,34	357	13,20	94,2	3,5	3,6	15	0,21	0,006	4,97	5,19			39	360
11.01.94	11,700	4,9	7,93	382	12,00	93,6	3,4	2,6	13	0,30	0,033	4,52	4,85			46	120
18.01.94	8,300	3,5	8,05	402	12,40	93,2	2,9	2,1	11	0,24	0,067	3,34	3,65			33	80
24.01.94	7,000	1,2	7,71	435	13,50	95,3	1,9	2,0	9	0,27	0,036	3,25	3,56			33	90
01.02.94	6,400	3,2	7,95	443	13,10	97,6	2,4	1,9	13	0,14	0,067	2,64	2,85			23	110
08.02.94	6,300	4,0	7,58	470	12,00	91,4	1,8	2,0	15	0,09	0,091	2,60	2,78			33	100
16.02.94	5,000	0,1	8,02	431	14,80	101,3	2,4	1,7	9	0,13	0,009	2,73	2,88			20	80
22.02.94	5,400	0,2	7,96	481	13,50	92,7	3,4	4,0	16	0,31	0,064	3,16	3,54			3	70
02.03.94	5,700	7,5	7,62	427	12,30	102,6	3,1	2,5	13	0,12	0,052	4,05	4,21			16	90
10.03.94	5,300	9,3	7,68	466	12,70	110,8	2,6	2,1	13	0,03	0,049	2,76	2,84			13	100
17.03.94	4,700	10,8	7,30	477	7,20	65,1	2,3	2,7	14	0,02	0,021	2,28	2,33			20	80
24.03.94	4,800	8,6	8,09	490	11,70	100,3	2,5	3,0	17	0,02	0,040	2,21	2,28			20	110
28.03.94	4,500	8,7	8,02	475	9,70	83,4	2,9	3,0	20	0,12	0,033	2,37	2,52			95	270
07.04.94	5,500	8,3	8,01	451	11,10	94,4	5,1	3,5	18	0,05	0,033	2,21	2,29			7	60
13.04.94	22,700	6,4	7,14	290	11,50	93,2	5,3	16,0	44	0,16	0,030	7,01	7,19			62	270
18.04.94	11,600	9,7	7,84	381	10,60	93,4	3,9	3,0	14	0,30	0,049	3,48	3,82			42	150
26.04.94	6,900	13,9	7,92	417	9,90	96,3	3,1	2,5	13	0,09	0,052	2,60	2,74			42	160
03.05.94	5,500	13,6	8,10	463	9,50	91,7	7,9	3,1	16	0,11	0,067	2,67	2,84	3,79	6,63	55	130
09.05.94	4,700	15,0	7,92	481	11,30	112,6	5,3	3,1	17	0,03	0,043	2,40	2,47			16	180
17.05.94	4,600	18,0	7,89	451	9,60	102,1	3,4	3,4	15	0,02	0,027	2,15	2,19			7	130
23.05.94	4,700	18,1	8,23	509	10,60	113,0	3,6	3,8	20	0,01	0,024	1,99	2,02			7	90
31.05.94	8,900	15,0	7,49	460	9,10	90,7	5,7	5,5	20	0,17	0,082	4,52	4,77			82	160
07.06.94	6,100	15,1	7,83	482	7,50	74,9	2,3	5,8	20	0,13	0,100	12,43	12,66			62	210
15.06.94	8,200	15,1	7,84	487	9,40	93,9	3,8	5,5	19	0,11	0,079	11,98	12,17			59	210
22.06.94	6,800	20,0	7,83	469	8,40	93,1	6,9	4,8	18	0,09	0,094	3,16	3,34			68	400
29.06.94	5,900	23,8	8,02	510	9,40	112,4	9,2	5,7	23	0,09	0,033	1,92	2,04			20	310
04.07.94	3,900	24,4	7,73	497	8,30	100,4	7,2	5,5	21	0,04	0,043	3,16	3,25			46	120
02.08.94	4,000	23,5	8,02	502	8,20	97,4	7,1	5,1	21	0,10	0,021	1,67	1,79			23	410
09.08.94	5,200	24,3	8,08	434	8,90	107,4	7,5	5,8	25	0,08	0,012	1,08	1,17			36	250
16.08.94	4,800	19,8	8,07	382	7,80	86,1	6,7	6,6	22	0,08	0,052	3,39	3,52			85	310
22.08.94	4,600	21,4	8,05	376	8,30	94,6	2,8	5,5	21	0,01	0,046	3,16	3,22			29	200
30.08.94	9,700	19,3	8,04	465	8,50	92,9	2,8	4,5	21	0,02	0,012	2,15	2,17			46	160
06.09.94	5,500	18,5	8,00	372	8,30	89,2	3,4	6,1	16	0,02	0,000	2,21	2,24	3,59	5,83	85	230

Rába at Szentgotthárd rkm 202.6
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
13.09.94	4,100	19,0	8,20	495	9,10	98,8	3,4	3,2	17	0,03	0,003	2,12	2,16			49	140
19.09.94	5,100	14,8	8,10	429	9,30	92,3	2,9	3,9	22	0,09	0,027	2,10	2,22			72	210
21.09.94	4,100	14,9	8,15	427	9,50	94,5	1,8	3,5	19	0,07	0,024	1,94	2,04			68	140
27.09.94	3,500	18,5	8,12	522	9,00	96,7	4,0	2,6	18	0,01	0,003	1,29	1,30			20	110
03.10.94	4,300	18,3	8,02	486	8,60	92,0	2,9	3,8	21	0,05	0,021	1,40	1,47			62	320
12.10.94	3,900	8,8	8,14	488	11,10	95,6	2,8	2,4	14	0,04	0,018	2,21	2,27			36	120
17.10.94	3,500	9,0	8,15	544	10,70	92,6	2,1	2,8	21	0,02	0,021	1,85	1,90			39	110
25.10.94	3,600	8,6	7,63	408	10,00	85,7	8,3	11,0	35	0,02	0,061	3,84	3,92			20	560
31.10.94	8,200	10,5	7,90	362	10,40	93,4	4,8	5,7	20	0,14	0,046	2,71	2,90			46	200
02.11.94	6,200	9,6	8,03	401	5,80	51,0	0,3	3,9	18	0,12	0,043	1,94	2,11			33	120
08.11.94	4,500	8,8	8,06	487	10,40	89,6	2,3	3,3	17	0,16	0,067	2,10	2,32			29	100
14.11.94	10,800	8,2	7,93	384	11,20	95,1	4,4	6,5	21	0,22	0,015	4,29	4,53			46	240
16.11.94	8,000	8,5	7,92	435	10,90	93,2	3,8	3,7	17	0,12	0,018	2,94	3,07			36	130
22.11.94	5,700	7,6	7,93	501	11,10	92,8	4,2	2,1	13	0,29	0,043	2,49	2,82			36	110
30.11.94	4,600	5,9	7,99	469	11,60	92,8	3,9	2,2	13	0,27	0,061	2,19	2,52			20	90
06.12.94	3,300	4,0	8,02	495	13,10	99,7	2,9	2,4	14	0,40	0,046	2,03	2,48			26	100
13.12.94	4,900	4,8	8,03	475	12,40	96,4	3,6	2,1	14	0,18	0,040	1,79	2,00			7	90
15.12.94	4,300	4,0	7,97	475	12,50	95,2	3,3	2,3	14	0,20	0,036	3,10	3,33			39	120
03.01.95	5,500	0,6	7,92	385	13,80	95,8	2,7	2,9	15	0,20	0,015	3,39	3,61			42	120
09.01.95	3,500	0,0	7,88	439	14,40	98,3	2,3	1,9	11	0,22	0,046	3,16	3,43			13	70
18.01.95	3,200	0,0	7,84	499	14,30	97,6	2,1	2,1	14	0,31	0,021	2,94	3,27			26	80
23.01.95	4,200	1,2	7,89	587	13,60	96,0	2,6	5,0	21	0,55	0,018	2,26	2,83			33	100
30.01.95	6,500	2,6	7,88	416	11,40	83,6	2,4	3,4	15	0,16	0,030	5,20	5,38			49	150
08.02.95	10,800	3,6	7,98	459	12,00	90,4	3,9	2,8	16	0,24	0,027	2,94	3,21			62	180
13.02.95	6,200	3,3	7,89	470	12,40	92,7	3,5	2,8	14	0,18	0,033	2,49	2,70			42	90
22.02.95	8,200	4,6	7,72	417	12,30	95,2	2,6	2,2	16	0,13	0,018	3,84	3,99			55	90
27.02.95	32,300	4,1	7,54	283	12,10	92,4	5,3	18,0	45	0,16	0,027	3,39	3,58			55	370
06.03.95	29,100	4,6	7,60	289	11,60	89,7	4,9	15,0	47	0,09	0,024	4,75	4,86			59	320
16.03.95	8,400	4,9	7,61	475	12,00	93,6	2,7	2,2	12	0,20	0,067	4,43	4,70			29	80
21.03.95	11,600	6,3	7,79	378	11,80	95,4	5,8	4,2	16	0,18	0,024	3,39	3,59			0	90
28.03.95	9,300	7,1	7,70	396	11,40	94,1	3,7	2,5	12	0,17	0,030	2,98	3,18			0	100
03.04.95	7,700	8,5	8,08	447	13,50	115,4	5,4	2,0	13	0,02	0,030	3,39	3,44			16	30
11.04.95	7,400	9,6	8,15	425	11,60	101,9	2,9	2,6	14	0,02	0,027	2,37	2,42			20	30

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
19.04.95	6,500	10,8	8,00	448	11,50	104,0	4,0	2,5	13	0,02	0,036	2,03	2,09			0	50
24.04.95	9,100	15,8	8,12	487	10,90	110,6	5,1	4,1	19	0,03	0,064	2,28	2,38			3	90
02.05.95	6,900	14,3	8,02	409	8,80	86,3		4,4	17	0,29	0,100	2,26	2,65			23	50
09.05.95	5,400	16,8	8,21	507	9,70	100,6	4,8	3,8	20	0,02	0,091	2,92	3,02			0	110
17.05.95	4,200	14,2	7,86	417	9,30	91,0	3,1	3,7	16	0,07	0,055	2,28	2,41			7	170
24.05.95	3,600	16,1	8,03	449	10,00	102,1	5,7	3,3	15	0,05	0,043	2,55	2,64			26	120
30.05.95	4,000	22,2	8,41	443	13,50	156,4	10,2	5,9	23	0,02	0,024	1,58	1,63			0	120
13.06.95	16,500	15,6	8,09	412	9,80	99,0	3,2	6,7	22	0,16	0,085	5,88	6,12			68	630
15.06.95	16,100	15,3	7,94	393	9,30	93,3	3,3	6,9	22	0,16	0,058	4,75	4,96			59	130
21.06.95	10,000	18,8	7,95	414	9,40	101,7	3,5	3,0	12	0,07	0,055	2,94	3,06			52	100
27.06.95	11,600	14,7	8,03	447	9,30	92,1	3,1	3,7	16	0,11	0,052	2,67	2,83			46	70
28.06.95	10,300	17,1	7,89	439	9,90	103,3	4,1	3,4	13	0,09	0,052	2,58	2,71			39	40
05.07.95	13,000	19,7	7,80	370	8,10	89,2	5,4	9,7	30	0,11	0,122	4,97	5,20			59	460
02.08.95	3,600	21,5	7,96	392	8,60	98,3	3,7	4,8	17	0,06	0,015	2,28	2,36			52	230
08.08.95	4,200	22,5	8,40	399	11,60	135,2	7,7	4,5	17	0,02	0,009	1,20	1,23			7	220
16.08.95	3,600	18,5	8,09	423	9,10	97,8	3,5	3,0	12	0,00	0,003	1,97	1,97			42	130
21.08.95	8,200	17,9	8,09	405	8,90	94,4	3,5	3,2	15	0,10	0,033	2,55	2,69	1,87	4,56	75	190
30.08.95	6,900	14,1	7,91	318	9,60	93,8	3,8	9,9	30	0,32	0,033	3,77	4,13			52	250
05.09.95	10,300	14,7	7,92	309	9,80	97,0	5,4	12,0	36	0,22	0,046	2,33	2,59			65	640
13.09.95	4,200	16,0	8,18	426	8,60	87,6	2,1	2,8	16	0,02	0,046	2,44	2,50			23	100
18.09.95	7,600	14,6	8,16	394	9,00	88,9	1,6	4,6	14	0,05	0,024	2,44	2,51			46	190
20.09.95	20,600	14,4	8,18	456	10,20	100,3	3,4	6,0	18	0,08	0,018	2,78	2,88			49	370
25.09.95	8,100	14,2	8,11	468	9,80	95,9	3,6	2,4	11	0,03	0,015	2,37	2,42			36	110
03.10.95	6,100	11,5	8,09	518	10,30	94,7	1,7	2,2	14	0,11	0,243	2,49	2,84			13	80
11.10.95	4,600	15,6	8,13	548	9,40	94,9	4,3	2,6	12	0,11	0,073	2,15	2,33			46	120
16.10.95	4,200	13,7	8,08	605	10,30	99,7	2,5	3,8	20	0,28	0,167	2,12	2,57			26	50
19.10.95	3,700	12,5	8,00	588	9,80	92,3	3,5	3,8	18	0,16	0,128	2,55	2,84			13	80
26.10.95	4,000	7,9	8,04	561	11,80	99,4	3,9	3,2	16	0,02	0,021	2,26	2,30			26	50
30.10.95	3,700	8,4	8,02	532	11,30	96,4	2,8	2,9	11	0,02	0,033	2,51	2,57			16	80
08.11.95	3,000	5,2	7,95	601	11,90	93,5	4,1	4,0	24	0,05	0,012	2,28	2,34			13	60
14.11.95	3,900	6,0	7,87	726	11,20	89,9	4,2	4,3	27	0,12	0,040	3,25	3,42			20	60
20.11.95	3,600	4,7	7,93	692	12,00	93,1	3,1	4,0	26	0,16	0,055	3,25	3,47			36	100
27.11.95	2,900	2,6	7,83	674	12,80	93,9	2,2	2,7	22	0,29	0,027	3,10	3,41			13	80

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
29.11.95	3,700	3,2	7,99	658	11,10	82,7	3,1	2,9	20	0,46	0,033	3,21	3,70			7	120
05.12.95	3,400	1,8	7,92	752	12,40	89,0	3,4	3,4	27	0,31	0,052	3,71	4,07			26	90
12.12.95	4,200	1,4	7,95	542	14,10	100,0	4,0	2,1	14	0,30	0,024	2,37	2,69			26	100
08.01.96	4,900	0,1	7,90	484	13,60	93,1	3,7	2,5	15	0,42	0,030	3,28	3,73			26	120
15.01.96	10,500	3,3	7,73	441	13,20	98,6	4,6	3,5	18	0,04	0,049	4,75	4,83			49	110
17.01.96	7,300	1,9	7,86	467	13,70	98,6	5,1	3,6	19	0,48	0,049	4,45	4,98			39	100
23.01.96	5,700	0,3	7,86	533	13,10	90,2	4,0	2,6	16	0,96	0,027	2,83	3,81			20	80
29.01.96	5,200	0,0	7,96	576	13,40	91,5	3,5	2,5	17	1,30	0,040	2,87	4,21			33	60
06.02.96	4,400	0,0	7,97	516	13,90	94,9	3,8	1,8	15	0,83	0,033	2,92	3,78			36	100
20.02.96	5,500	1,0	7,98	496	13,60	95,4	3,9	2,9	16	1,27	0,030	2,60	3,90			55	150
26.02.96	4,600	0,2	7,92	540	14,40	98,8	5,0	2,8	19	1,37	0,046	3,21	4,62			36	110
06.03.96	4,900	2,1	8,16	485	15,10	109,2	4,9	2,5	13	0,28	0,021	3,34	3,65			42	120
11.03.96	5,200	2,1	8,09	812	13,10	94,8	5,3	4,2	22	0,42	0,030	3,73	4,18			10	90
19.03.96	13,400	4,8	7,89	379	12,60	98,0	5,3	8,2	28	0,37	0,033	7,46	7,86			39	380
25.03.96	24,300	5,8	7,88	333	12,30	98,2	8,3	7,8	24	0,24	0,027	6,33	6,60			39	350
02.04.96	12,000	4,1	7,97	393	11,90	90,8	4,6	3,5	16	0,43	0,036	3,98	4,44			46	170
10.04.96	24,800	7,4	7,91	342	11,90	99,0	5,0	5,9	19	0,16	0,021	3,80	3,97			33	290
16.04.96	16,500	7,0	7,99	358	12,10	99,6	3,7	3,0	7	0,15	0,018	3,41	3,58			39	130
24.04.96	16,000	13,0	8,02	375	10,30	98,1	3,8	2,1	9	0,12	0,033	2,76	2,91			33	110
02.05.96	13,200	14,0	8,02	392	9,90	96,5	2,2	2,1	9	0,08	0,043	2,49	2,61			26	110
08.05.96	8,900	14,8	7,95	421	9,40	93,3	4,1	1,9	9	0,04	0,036	2,51	2,58			26	120
13.05.96	20,100	14,0	8,05	360	9,80	95,5	7,4	5,2	19	0,17	0,049	2,35	2,57			36	230
21.05.96	30,000	15,0	7,91	375	10,20	101,7	4,4	10,8	34	0,13	0,052	5,42	5,61			62	450
30.05.96	12,000	15,4	8,03	399	9,90	99,5	4,9	4,3	14	0,05	0,040	4,34	4,43			42	160
05.06.96	8,300	19,8	8,13	453	9,30	102,7	4,8	2,9	9	0,03	0,033	2,80	2,87			49	130
11.06.96	6,400	22,6	8,20	432	10,30	120,3	6,4	3,4	16	0,02	0,021	1,99	2,03			7	90
19.06.96	5,200	21,2	8,21	481	9,30	105,6	3,0	3,3	20	0,04	0,024	2,21	2,28			0	80
26.06.96	8,200	15,7	8,06	429	9,30	94,1	3,2	4,5	15	0,12	0,061	3,14	3,33			42	150
03.07.96	57,000	16,7	7,69	269	8,60	89,0	4,8	31,7	50	0,19	0,052	6,55	6,79			42	880
09.07.96	12,400	19,7	8,11	409	9,50	104,7	4,1	2,8	15	0,08	0,040	2,78	2,90			39	120
16.07.96	6,900	22,0	8,11	450	8,60	99,2	7,1	3,1	16	0,03	0,033	2,37	2,44			36	120
23.07.96	5,500	17,8	8,15	503	10,70	113,3	4,5	3,1	17	0,02	0,024	2,53	2,58			10	80
30.07.96	5,100	22,1	8,36	469	9,70	112,1	4,0	3,4	20	0,01	0,015	1,97	1,99			33	120

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
06.08.96	4,400	19,1	8,08	415	10,10	109,9	3,3	3,5	13	0,08	0,027	2,03	2,14			46	130
13.08.96	14,900	18,9	7,88	281	8,70	94,3	7,0	13,3	32	0,16	0,024	2,46	2,64			82	790
22.08.96	4,700	22,0	8,41	432	9,90	114,2	3,7	3,2	14	0,03	0,021	1,79	1,84			33	100
27.08.96	5,200	18,9	8,21	490	8,70	94,3	3,1	3,2	17	0,01	0,043	2,58	2,63			29	70
04.09.96	23,100	16,7	7,97	303	9,40	97,2	5,8	15,8	36	0,12	0,033	2,85	3,00			85	630
10.09.96	8,200	14,8	8,07	416	10,10	100,2	4,5	2,9	10	0,06	0,024	2,42	2,50			46	120
17.09.96	7,200	12,6	8,14	468	11,00	103,8	3,4	2,3	8	0,02	0,024	2,37	2,41			62	110
24.09.96	46,000	13,5	7,79	275	8,60	82,9	4,5	33,9	75	0,13	0,027	3,89	4,05			46	940
02.10.96	9,700	13,5	8,06	448	10,30	99,2	4,2	2,5	12	0,08	0,027	2,60	2,70			29	80
08.10.96	12,400	14,6	8,09	374	10,30	101,7	3,8	5,2	15	0,06	0,024	3,07	3,16			49	150
15.10.96	8,300	12,9	8,17	436	10,80	102,6	3,4	2,3	11	0,05	0,024	2,26	2,33			20	70
24.10.96	20,400	8,5	8,11	392				4,1	16	0,05	0,012	2,51	2,57			16	160
29.10.96	13,100	9,6	8,03	415	11,90	104,6	3,0	2,3	13	0,12	0,015	1,79	1,92			26	80
06.11.96	8,700	11,0	7,88	477	10,90	99,1	2,8	2,2	10	0,11	0,027	2,98	3,12			33	80
12.11.96	7,200	11,3	7,91	450	11,00	100,7	3,4	2,0	14	0,05	0,021	2,69	2,76			36	80
04.12.96	5,800	2,5	7,86	472	13,50	98,7	4,5	2,2	20	0,13	0,018	2,08	2,23			36	80
10.12.96	5,100	2,5	7,88	472	13,60	99,5	2,9	2,7	16	0,37	0,024	2,67	3,06			36	90
14.01.97	4,400	0,2	7,69	454	14,20	97,5	4,3	1,6	14	0,75	0,027	2,46	3,24			36	80
21.01.97	4,200	1,0	7,74	483	13,70	96,1	2,5	1,8	12	0,71	0,030	2,55	3,30			46	80
28.01.97	4,400	1,5	7,71	456	13,60	96,8	3,6	2,0	17	0,50	0,027	2,87	3,39			59	110
05.02.97	3,600	0,0	7,92	463	14,10	96,2	3,3	1,8	16	0,30	0,015	2,33	2,65			52	90
11.02.97	4,500	0,6	7,96	482	13,50	93,7	3,9	2,3	17	0,96	0,027	2,92	3,90			65	110
18.02.97	6,500	2,8	7,84	387	13,40	98,8	5,3	3,1	14	0,22	0,021	4,52	4,76			82	140
25.02.97	5,500	5,8	7,79	410	11,30	90,2	3,4	2,1	11	0,24	0,024	2,80	3,07			26	80
05.03.97	4,800	6,3	7,92	438	12,80	103,5	3,2	2,3	14	0,22	0,018	2,37	2,61			33	90
11.03.97	4,100	6,7	7,80	523	12,20	99,7	4,0	3,0	22	0,87	0,046	2,42	3,33			39	80
18.03.97	7,200	7,1	7,76	510	11,10	91,6	3,8	2,1	20	0,51	0,027	1,74	2,28			3	80
25.03.97	4,800	5,5	8,03	474	12,10	95,8	4,6	2,5	19	0,40	0,036	2,42	2,86			16	50
03.04.97	4,970	9,6	8,20	461	12,30	108,1	4,4	2,9	19	0,14	0,043	2,08	2,26			16	70
09.04.97	4,800	8,5	8,06	472	12,20	104,3	4,7	3,0	18	0,13	0,021	1,65	1,80			16	80
15.04.97	5,060	7,6	7,95	546	10,00	83,6	3,9	3,8	26	0,64	0,049	2,37	3,06			16	60
22.04.97	5,500	8,5	7,97	556	14,20	121,4	3,8	3,6	24	1,36	0,049	2,40	3,80			26	100
29.04.97	4,970	11,6	7,48	525	10,70	98,6	5,8	3,8	25	0,75	0,064	2,15	2,96			26	90

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
07.05.97	4,970	16,5	7,61	533	10,20	105,1	7,9	6,4	33	0,41	0,134	2,01	2,56			29	130
13.05.97	4,400	18,0	7,34	473	8,70	92,5	6,4	5,4	37	0,16	0,119	2,01	2,29			16	90
21.05.97	3,900	22,4	7,67	597	6,80	79,1	3,4	5,9	35	0,04	0,076	1,45	1,56			16	120
27.05.97	4,500	16,9	7,70	525	8,40	87,3	4,2	6,7	26	0,11	0,076	1,58	1,77			26	120
04.06.97	4,400	19,0	8,26	593	10,30	111,8	6,9	5,5	30	0,04	0,043	1,29	1,37			16	130
10.06.97	3,200	21,2	8,12	590	13,10	148,8	10,6	7,7	35	0,04	0,049	2,15	2,23			16	170
17.06.97	23,000	19,4	7,59	400	7,60	83,2	6,5	34,1	94	0,23	0,109	2,89	3,23			52	3200
24.06.97	14,500	17,0	7,84	327	8,80	91,6	5,9	19,3	54	0,08	0,040	5,51	5,63			46	1140
03.07.97	6,400	20,5	8,18	476	8,30	92,9	4,0	4,1	18	0,16	0,076	1,94	2,18			88	190
08.07.97	5,300	15,7	8,08	387	8,50	86,0	3,0	5,6	21	0,21	0,046	1,85	2,11			46	200
15.07.97	11,700	19,7	8,12	422	8,20	90,3	6,7	6,1	23	0,11	0,061	2,12	2,29			49	270
22.07.97	7,800	17,5	8,24	392	9,50	100,0	3,5	4,4	16	0,07	0,033	2,53	2,63			29	150
29.07.97	9,800	18,3	8,09	392	8,80	94,2	5,4	7,5	25	0,14	0,046	2,73	2,92			62	360
06.08.97	12,600	18,2	8,21	414	8,80	94,0	2,5	6,0	18	0,20	0,033	2,55	2,79			39	230
12.08.97	8,400	18,3	8,09	383	9,40	100,6	4,6	3,8	13	0,04	0,018	2,19	2,25			36	160
21.08.97	9,100	18,6	8,05	341	8,80	94,8	5,1	6,4	18	0,05	0,024	2,10	2,17			42	220
26.08.97	7,500	18,7	8,16	466	8,80	95,0	2,4	3,0	13	0,04	0,015	2,19	2,25			20	90
03.09.97	5,800	19,2	8,11	482	9,20	100,3	5,1	3,1	17	0,04	0,021	2,44	2,50			39	110
09.09.97	12,800	17,7	7,95	364	9,30	98,3	3,3	7,0	22	0,20	0,033	3,50	3,74			42	340
16.09.97	9,300	14,8	8,10	393	9,80	97,2	4,9	5,8	22	0,04	0,015	3,44	3,49			49	220
23.09.97	5,700	13,6	8,19	498	9,90	95,6	2,7	3,1	17	0,04	0,015	2,08	2,13			16	80
30.09.97	4,900	12,2	8,17	530	12,20	114,1	3,1	2,9	16	0,04	0,015	2,44	2,49			16	70
08.10.97	4,400	13,5	8,08	551	9,70	93,5	3,7	4,0	19	0,05	0,018	2,06	2,13			16	90
14.10.97	5,200	11,2	8,22	572	9,90	90,4	3,3	3,3	19	0,16	0,082	1,65	1,89			26	70
21.10.97	4,900	8,0	8,11	557	10,90	92,0	4,0	3,0	21	0,04	0,024	2,37	2,44			26	70
28.10.97	4,200	4,9	8,10	633	12,70	99,0	3,6	4,1	26	0,04	0,027	3,03	3,09			20	80
05.11.97	4,200	4,1	8,12	541	13,30	101,5	4,2	3,3	23	0,07	0,021	2,31	2,40			16	70
10.11.97	5,300	8,0	8,05	610	9,90	83,6	3,4	4,4	25	0,06	0,027	2,08	2,17			26	80
18.11.97	6,000	6,1	8,16	415	11,60	93,3	3,6	5,1	20	0,18	0,033	2,94	3,15			20	130
25.11.97	5,700	2,8	8,14	474	13,30	98,1	3,4	2,2	13	0,12	0,018	2,44	2,58			16	60
03.12.97	12,300	6,5	8,00	376	11,50	93,5	5,4	7,8	26	0,13	0,030	5,88	6,04			42	250
09.12.97	6,400	3,7	8,10	412	12,90	97,4	6,0	2,6	10	0,15	0,018	3,25	3,42			16	60
16.12.97	6,000	1,8	8,11	443	12,90	92,5	2,9	2,4	12	0,23	0,027	3,28	3,54			20	90

Rába at Szentgotthárd rkm 202.6
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
03.01.94		0	5	0	46,5	10,0	16,0	3,6													
11.01.94		250	2	20																	
18.01.94		40	3	40						0,04		0,15	19								
24.01.94		0	3	20																	
01.02.94		930	1	40	60,9	11,7	18,0	4,2													
08.02.94		480	9	10																	
16.02.94		170	0	30						0,00		0,14									
22.02.94		0	4	70																	
02.03.94		480	5	20	57,9	9,5	22,0	4,0	0,51				87								14
10.03.94				20																	
17.03.94				10								0,09									
24.03.94				10																	
28.03.94		180	0	10	60,9	11,7	28,0	3,9	0,57			0,06	81								16
07.04.94				0																	
13.04.94				30																	
18.04.94				0																	
26.04.94		0	4	10	57,9	13,3	14,2	3,3	0,64			0,11	245								19
03.05.94		280	60	30	63,9	12,6	22,0	4,0	0,63			0,02	277								110
09.05.94				0																	
17.05.94				0																	
23.05.94		170	50	20	63,9	13,4	30,0	4,0	0,48			0,13	147								13
31.05.94				10																	
07.06.94				0																	
15.06.94				20																	
22.06.94		260	3	30	60,9	12,0	18,1	3,8		0,03		0,03									
29.06.94				10																	
04.07.94				0																	
02.08.94				10																	
09.08.94		120	0	0	56,9	12,5	17,0	5,1		0,04		0,01		56							
16.08.94				0																	
22.08.94				20																	
30.08.94				20																	
06.09.94		280	0	20	52,9	10,7	15,6	5,3		0,03		0,01		94							

Rába at Szentgotthárd rkm 202.6
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
13.09.94				30																	
19.09.94				20																	
21.09.94				20																	
27.09.94				20																	
03.10.94		210	1	20	60,9	12,4	33,0	5,3		0,01		0,02		46							
12.10.94				0																	
17.10.94				20																	
25.10.94				40																	
31.10.94				20																	
02.11.94				20																	
08.11.94				40																	
14.11.94				40																	
16.11.94		60	4	40	57,9	12,6	16,8	4,3	0,03			0,06									
22.11.94				40																	
30.11.94				20																	
06.12.94				20																	
13.12.94		0	4	0	63,9	12,4	21,0	3,3	0,03			0,10									
15.12.94				20																	
03.01.95		20	1	50	52,9	13,4	14,5	3,3		0,04		0,08		36							
09.01.95				50																	
18.01.95				50																	
23.01.95				20																	
30.01.95		70	2	30	55,9	12,6	18,4	3,1													
08.02.95				40																	
13.02.95				40																	
22.02.95				40																	
27.02.95		50	2	20	37,9	8,8	9,4	3,3		0,05		0,08		78							
06.03.95				30																	
16.03.95				40																	
21.03.95				50																	
28.03.95				50																	
03.04.95				20																	
11.04.95				40																	

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
19.04.95				30																	
24.04.95		260	6	30	60,9	13,0	25,0	3,2		0,14		0,01		18							
02.05.95				40																	
09.05.95				60																	
17.05.95				50																	
24.05.95		250	4	40	59,0	13,0	19,4	3,7		0,07		0,08		10							
30.05.95				30																	
13.06.95				20																	
15.06.95				30																	
21.06.95		100	2	40	60,0	11,3	15,9	3,0		0,03		0,03									
27.06.95				40																	
28.06.95				30																	
05.07.95				20																	
02.08.95				20																	
08.08.95		190	4	10	60,0	11,7	12,4	3,6		0,01		0,01		29							
16.08.95				20																	
21.08.95				40																	
30.08.95				20																	
05.09.95		260	6	0	41,5	8,2	12,0	4,6		0,04		0,01		40							
13.09.95				40																	
18.09.95				30																	
20.09.95				30																	
25.09.95				10																	
03.10.95		110	3	20	64,0	12,1	23,0	3,4		0,03		0,04		12							
11.10.95				20																	
16.10.95		10																			
19.10.95				20																	
26.10.95				30																	
30.10.95		150	4	40	64,0	12,1	23,0	3,7		0,06		0,06		20							
08.11.95				30																	
14.11.95				30																	
20.11.95				40																	
27.11.95		240	1	40	68,0	13,4	44,0	4,2		0,01		0,11		76							

Rába at Szentgotthárd rkm 202.6
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
29.11.95				40																	
05.12.95				40																	
12.12.95		10	3	40	59,0	13,0	28,0	3,5		0,01		0,12		17							
08.01.96				40																	
15.01.96		80	3	40	49,3	12,6	15,4	3,5		0,03		0,06		43							
17.01.96				40																	
23.01.96				20																	
29.01.96				30																	
06.02.96		40	2	10	64,0	14,7	29,0	2,5		0,07		0,18		45							
20.02.96				10																	
26.02.96				10																	
06.03.96		130	11	10	59,0	13,9	28,0	3,0		0,07		0,16		17							
11.03.96				0																	
19.03.96				10																	
25.03.96				40																	
02.04.96		350	1	40	52,0	11,7	16,0	2,6		0,03		0,17		34							
10.04.96				30																	
16.04.96				30																	
24.04.96				30																	
02.05.96		220	2	20	58,0	10,4	14,0	2,5													
08.05.96				30						0,08		0,14		47							
13.05.96				30																	
21.05.96				20																	
30.05.96				10																	
05.06.96				40																	
11.06.96		190	0	60	64,0	10,0	17,8	2,8		0,03		0,05		3							
19.06.96				40																	
26.06.96				30																	
03.07.96		80	1	60	35,0	8,7	6,8	3,7													
09.07.96				40																	
16.07.96				40						0,01		0,02		1							
23.07.96				40																	
30.07.96				0																	

Rába at Szentgotthárd rkm 202.6
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
06.08.96		70	0	60	58,7	12,0	14,4	3,2		0,04		0,02		3							
13.08.96				40																	
22.08.96				40																	
27.08.96				20																	
04.09.96		50	0	40	41,5	8,2	11,0	4,8		0,10		0,01		7							
10.09.96				0																	
17.09.96				20																	
24.09.96				0																	
02.10.96		50	0	20	61,0	11,7	21,0	3,1													
08.10.96				20																	
15.10.96				20																	
24.10.96				30																	
29.10.96				40																	
06.11.96				20																	
12.11.96		60	2	20	67,0	12,7	17,7	2,9													
04.12.96		90	2	10	60,0	12,0	25,0	3,0													
10.12.96				10																	
14.01.97				10																	
21.01.97				10																	
28.01.97				10																	
05.02.97			2	10	62,0	13,4	23,0	2,9		0,05		0,14		4							
11.02.97				10																	
18.02.97				10																	
25.02.97				10																	
05.03.97			2	10	57,0	13,2	22,0	2,9		0,11		0,15		1							
11.03.97				10																	
18.03.97				10																	
25.03.97				10																	
03.04.97				60																	
09.04.97		70	2	30	54,0	15,6	27,0	3,4		0,12		0,13									
15.04.97				30																	
22.04.97				30																	
29.04.97				20																	

Rába at Szentgotthárd rkm 202.6
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
07.05.97		210	2	30	63,0	14,7	38,0	3,8		0,11		0,04									
13.05.97				30																	
21.05.97				30																	
27.05.97				30																	
04.06.97		100	2	50	64,0	15,3	56,0	3,7		0,06		0,08		10							
10.06.97				20																	
17.06.97				10																	
24.06.97				10																	
03.07.97		90	2	30	64,0	10,8	30,0	3,3		0,02		0,01		4							
08.07.97				20																	
15.07.97				20																	
22.07.97				30																	
29.07.97				10																	
06.08.97			2	10	64,0	12,4	12,3	2,8		0,03		0,02		19							
12.08.97				10																	
21.08.97				10																	
26.08.97				10																	
03.09.97				20																	
09.09.97				30																	
16.09.97			2	20	53,0	12,4	16,5	3,6		0,09		0,02		18							
23.09.97				20																	
30.09.97				20																	
08.10.97			2	20	66,0	12,1	39,0	3,8		0,15		0,02		21							
14.10.97				30																	
21.10.97				30																	
28.10.97				30																	
05.11.97				30																	
10.11.97		70	2	30	67,0	12,1	49,0	4,8		0,22		0,01		22							
18.11.97				10																	
25.11.97				20																	
03.12.97			2	20	50,0	12,6	12,1	3,5		0,01		0,01		16							
09.12.97				30																	
16.12.97				40																	

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Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
03.01.94													
11.01.94													
18.01.94													
24.01.94													
01.02.94													
08.02.94													
16.02.94													
22.02.94													
02.03.94		0,10		0,3		2,1		0,1		0,4		2,9	
10.03.94													
17.03.94													
24.03.94													
28.03.94				0,2		2,3		0,5		1,3		3,1	
07.04.94													
13.04.94													
18.04.94													
26.04.94				0,0		1,8		1,4		0,0		2,7	
03.05.94				0,0		2,7		0,0		0,0		14,8	
09.05.94													
17.05.94													
23.05.94				0,2		3,1		1,8		0,0		3,5	
31.05.94													
07.06.94													
15.06.94													
22.06.94													
29.06.94													
04.07.94													
02.08.94													
09.08.94	2				0,1		0,7		4,0		0,5		16,0
16.08.94													
22.08.94													
30.08.94													
06.09.94	14				0,1		1,1		2,0		0,5		5,2

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Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
13.09.94													
19.09.94													
21.09.94													
27.09.94													
03.10.94	14				0,1		1,7		1,1				4,6
12.10.94													
17.10.94													
25.10.94			1,00										
31.10.94			1,00										
02.11.94													
08.11.94													
14.11.94													
16.11.94	22						0,9						1,2
22.11.94													
30.11.94													
06.12.94													
13.12.94	17												
15.12.94													
03.01.95	8		1,00		0,1		0,3		0,4		1,0		1,0
09.01.95													
18.01.95													
23.01.95													
30.01.95													
08.02.95													
13.02.95													
22.02.95													
27.02.95	2		1,00		0,1		0,6		5,6		1,0		3,0
06.03.95													
16.03.95													
21.03.95													
28.03.95													
03.04.95													
11.04.95													

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01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
19.04.95													
24.04.95	9		1,00		0,1		1,7		3,0		2,2		10,2
02.05.95													
09.05.95													
17.05.95													
24.05.95	2		1,00		0,0		0,6		1,1		0,5		3,4
30.05.95													
13.06.95													
15.06.95													
21.06.95	8		1,00		0,0		0,3		0,5		0,5		2,5
27.06.95													
28.06.95													
05.07.95													
02.08.95													
08.08.95	11		1,00		0,1		0,1		0,5		0,5		2,2
16.08.95													
21.08.95													
30.08.95													
05.09.95	12		1,00		0,0		0,4		3,4		0,5		6,5
13.09.95													
18.09.95													
20.09.95													
25.09.95													
03.10.95	9		1,00		0,0		0,7		1,9		0,5		0,9
11.10.95													
16.10.95													
19.10.95													
26.10.95													
30.10.95	15		1,00		0,0		0,7		0,5		0,5		1,5
08.11.95													
14.11.95													
20.11.95													
27.11.95	1		1,00		0,0		1,3		0,5		0,5		1,5

Rába at Szentgotthárd rkm 202.6
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
29.11.95													
05.12.95													
12.12.95	60		1,00		0,0		0,1		0,5		0,7		1,2
08.01.96													
15.01.96	100		1,00		0,0		0,4		0,5		0,5		1,0
17.01.96													
23.01.96													
29.01.96													
06.02.96	6		1,00		0,0		0,8		11,0		0,5		2,7
20.02.96													
26.02.96													
06.03.96	29		1,00		0,0		0,3		0,5		0,5		2,7
11.03.96													
19.03.96													
25.03.96													
02.04.96	9		1,00		0,0		0,5		0,5		0,5		2,9
10.04.96													
16.04.96													
24.04.96													
02.05.96													
08.05.96	37		1,00		0,1		0,1		0,5		0,5		
13.05.96													
21.05.96													
30.05.96													
05.06.96													
11.06.96	16		1,00		0,1		2,3		2,4		0,5		2,8
19.06.96													
26.06.96													
03.07.96													
09.07.96													
16.07.96	1		1,00		0,0		0,8		0,5		0,5		2,4
23.07.96													
30.07.96													

Rába at Szentgotthárd rkm 202.6
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Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
06.08.96	22		1,00		0,3		0,1		0,5		0,5		1,3
13.08.96													
22.08.96													
27.08.96													
04.09.96	5		1,00		0,1		1,1		1,7		0,5		4,0
10.09.96													
17.09.96													
24.09.96													
02.10.96													
08.10.96													
15.10.96													
24.10.96													
29.10.96													
06.11.96													
12.11.96													
04.12.96													
10.12.96													
14.01.97													
21.01.97													
28.01.97													
05.02.97	24		1,00		0,0		0,4		1,3		0,5		1,7
11.02.97													
18.02.97													
25.02.97													
05.03.97	8		1,00		0,1		0,1		4,0		0,5		1,6
11.03.97													
18.03.97													
25.03.97													
03.04.97													
09.04.97	33		1,00		0,0		0,3		0,5		0,5		3,7
15.04.97													
22.04.97													
29.04.97													

Rába at Szentgotthárd rkm 202.6
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
07.05.97	1		1,00		0,0		0,5		0,9		0,5		2,0
13.05.97													
21.05.97													
27.05.97													
04.06.97	1		1,00		0,0		0,4		0,5		0,5		4,5
10.06.97													
17.06.97													
24.06.97													
03.07.97	5		1,00		0,0		0,4		1,2		0,5		5,8
08.07.97													
15.07.97													
22.07.97													
29.07.97													
06.08.97	1		1,00		0,0		0,1		0,9		0,5		0,5
12.08.97													
21.08.97													
26.08.97													
03.09.97													
09.09.97													
16.09.97	6		1,00		0,0		0,1		1,8		0,5		4,3
23.09.97													
30.09.97													
08.10.97	28		1,00		0,0		0,5		2,2		0,5		2,2
14.10.97													
21.10.97													
28.10.97													
05.11.97													
10.11.97	23		1,00		0,0		0,6		4,0		0,5		3,3
18.11.97													
25.11.97													
03.12.97	16		1,00		0,0		0,4		1,3		0,5		4,2
09.12.97													
16.12.97													

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
12.01.94	878,000	6,1	7,93	353	12,00	96,5	2,8	3,7	7	0,09	0,026	2,94	3,06			36	170
24.01.94	559,000	2,2	8,50	326	13,50	97,9	4,2	2,7	6	0,10	0,012	2,12	2,24			26	140
31.01.94	399,000	4,0	8,27	375	12,50	95,2	1,0	4,0	8	0,08	0,021	1,60	1,70			26	50
07.02.94	429,000	6,5	8,21	372	12,10	98,4	1,6	2,8	9	0,04	0,006	1,81	1,85			39	280
21.02.94	321,000	2,5	8,20	390	12,60	92,1	3,8	3,0	8	0,16	0,015	1,60	1,78	0,87	2,65	13	100
07.03.94	438,000	8,2	8,23	370	12,20	103,5	2,7	3,4	6	0,05	0,012	2,10	2,17			23	60
21.03.94	462,000	10,3	8,31	328	11,40	101,9	2,2	4,0	7	0,02	0,009	0,95	0,97	1,49	2,46	10	70
28.03.94	524,000	10,5	8,01	318	9,80	88,0	2,0	4,6	10	0,02	0,015	1,56	1,60			88	100
12.04.94	485,000	11,7	7,92	353	9,80	90,6	3,0	4,1	13	0,02	0,014	1,55	1,58			29	230
26.04.94	533,000	14,0	8,03	302	10,40	101,3	2,4	3,1	9	0,00	0,025	1,65	1,67			10	60
10.05.94	557,000	14,4	8,16	280	10,30	101,3	2,3	2,8	6	0,02	0,012	1,38	1,41			3	140
24.05.94	559,000	17,9	7,98	244	9,40	99,8	4,7	3,4	8	0,02	0,011	1,08	1,11	0,56	1,67	16	80
07.06.94	535,000	17,6	7,92	242	9,00	94,9	3,5	3,8	8	0,02	0,015	1,24	1,28			33	260
21.06.94	554,000	21,4	8,10	266	9,00	102,6	3,9	4,6	10	0,00	0,016	1,51	1,53			29	100
27.06.94	505,000	24,0	8,33	323	9,60	115,2	5,5	5,1	12	0,00	0,009	1,11	1,12	0,70	1,82	29	30
11.07.94	485,000	21,3	8,40	247	8,60	97,9	1,4	2,6	6	0,02	0,012	0,99	1,02			29	50
25.07.94	425,000	24,7	8,25	337	9,80	119,2	2,8	5,2	14	0,02	0,012	1,02	1,04			78	80
08.08.94	349,000	25,1	8,45	280	12,60	154,4	5,1	3,2	8	0,00	0,008	0,50	0,51			7	50
22.08.94	484,000	25,0	8,56	250	8,30	101,5	2,0	4,3	9	0,00	0,010	0,93	0,94	1,13	2,07	26	180
06.09.94	440,000	21,6	8,08	270	8,30	95,0	1,0	5,7	11	0,02	0,015	1,22	1,25			29	60
19.09.94	755,000	17,7	8,12	230	8,50	89,8	1,6	4,1	10	0,02	0,009	0,97	1,00	1,29	2,29	23	60
04.10.94	464,000	16,9	7,44	302	9,70	100,8	5,2	3,8	10	0,05	0,011	1,22	1,28			29	70
17.10.94	308,000	12,2	7,37	299	10,40	97,2	2,2	2,5	7	0,06	0,009	1,22	1,29			23	110
31.10.94	716,000	11,3	7,88	276	9,00	82,4	3,4	4,2	10	0,05	0,020	1,81	1,88			26	240
21.11.94	477,000	8,8	8,06	299	10,40	89,6	3,1	5,0	14	0,02	0,020	1,72	1,76	1,38	3,14	29	100
06.12.94	315,000	5,8	7,36	336	11,20	89,4	4,7	3,3	8	0,10	0,024	1,34	1,47			39	50
12.12.94	389,000	6,4	7,60	312	12,00	97,3	6,5	2,9	7	0,07	0,026	1,62	1,71	1,07	2,78	29	120
10.01.95	381,000	1,8	8,20	325	12,50	89,7	5,7	3,8	8	0,10	0,024	2,26	2,39			52	130
24.01.95	273,000	3,5	8,28	370	11,70	87,9	3,0	3,4	9	0,19	0,023	1,76	1,97			65	290
06.02.95	338,000	5,0	8,10	350	10,20	79,7	6,0	3,0	7	0,18	0,024	2,37	2,58	1,11	3,69	52	60
21.02.95	444,000	7,3	8,18	330	10,40	86,3	2,7	4,4	13	0,07	0,024	2,37	2,47			36	90
07.03.95	732,000	6,2	7,96	280	10,10	81,5	3,4	6,4	17	0,11	0,053	2,26	2,42	0,77	3,19	36	230
20.03.95	456,000	7,0	8,25	340	10,60	87,3	5,0	2,6	8	0,02	0,017	2,21	2,25			65	100

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
04.04.95	406,000	9,0	8,19	304	10,60	91,8	3,6	3,4	10	0,05	0,023	2,03	2,10			72	120
18.04.95	436,000	9,4	8,25	325	10,40	90,9	5,8	3,3	9	0,03	0,015	1,72	1,76			33	70
02.05.95	518,000	13,8	8,33	291	8,20	79,5	3,2	3,5	9	0,01	0,015	1,33	1,36	0,94	2,30	23	60
15.05.95	629,000	15,2	8,29	270	10,40	104,1	3,5	4,0	10	0,02	0,024	1,22	1,27			33	90
29.05.95	500,000	20,1	8,21	300	12,20	135,5	5,9	3,5	10	0,03	0,021	1,36	1,41			33	110
06.06.95	599,000	18,3	8,14	273	9,30	99,5	3,2	3,2	6	0,01	0,015	1,18	1,20	0,43	1,63	23	50
19.06.95	761,000	19,8	8,18	245	7,00	77,3	2,7	3,6	6	0,03	0,023	1,22	1,27			49	110
03.07.95	695,000	21,1	8,26	260	9,00	102,0	2,1	3,6	11	0,02	0,012	2,69	2,72			75	210
17.07.95	518,000	22,6	8,21	259	7,80	91,1	1,6	2,4	7	0,02	0,010	2,19	2,23			55	160
07.08.95	375,000	24,7	8,50	280	9,20	111,9	2,6	3,8	11	0,09	0,008	1,81	1,90	0,95	2,85	39	90
21.08.95	326,000	20,2	8,30	280	8,20	91,3	4,0	5,7	11	0,07	0,009	2,26	2,34			130	200
04.09.95	464,000	16,1	8,20	260	8,80	89,8	5,3	4,0	8	0,08	0,012	1,40	1,49	1,01	2,50	68	80
18.09.95	#######	15,1	7,60	240	8,20	81,9	2,9	8,9	13	0,05	0,018	2,71	2,78			78	270
02.10.95	548,000	12,8	8,30	310	9,00	85,3	3,7	3,4	10	0,04	0,030	1,58	1,65			72	140
16.10.95	355,000	14,3	8,05	345	8,60	84,4	1,7	2,8	8	0,08	0,009	1,36	1,44			72	100
06.11.95	259,000	6,2	8,17	340	11,10	89,5	3,1	3,8	8	0,08	0,012	1,56	1,65	1,64	3,29	65	140
20.11.95	320,000	5,8	8,19	350	10,70	85,4	1,9	2,5	5	0,11	0,021	1,49	1,62			78	120
04.12.95	253,000	4,6	8,14	370	9,00	69,6	1,4	2,6	8	0,10	0,021	1,63	1,75	0,30	2,05	55	90
18.12.95	266,000	3,4	8,26	410	12,20	91,4	3,3	3,1	7	0,13	0,024	2,21	2,37			78	120
08.01.96	324,000	1,9	8,28	462	12,00	86,3	4,0	3,3	10	0,22	0,021	2,49	2,72			108	250
22.01.96	386,000	2,2	8,27	415	14,70	106,6	5,6	3,5	9	0,15	0,018	2,37	2,54			49	110
06.02.96	336,000	1,6	7,98	326	12,70	90,6	3,8	3,0	8	0,17	0,021	2,03	2,23	1,99	4,22	59	120
19.02.96	294,000	4,4	8,43	450	16,00	123,1	5,2	6,0	16	0,16	0,027	2,31	2,50			49	120
04.03.96	309,000	3,5	8,41	385	12,50	93,9	3,0	3,1	7	0,04	0,019	2,49	2,54	2,38	4,92	10	70
18.03.96	336,000	5,5	8,17	394	13,50	106,9	6,0	5,5	14	0,01	0,017	1,90	1,92			10	40
01.04.96	426,000	7,5	8,35	350	11,50	95,9	4,6	4,2	12	0,01	0,026	2,44	2,47			10	200
15.04.96	732,000	7,8	7,90	300	9,90	83,2	2,6	4,8	16	0,04	0,021	2,26	2,32			108	260
06.05.96	690,000	15,8	8,10	260	9,40	95,3	2,2	3,7	11	0,00	0,017	1,40	1,42	0,43	1,85	49	130
20.05.96	#######	16,4	8,00	270	7,90	81,2	1,0	3,6	9	0,01	0,026	1,90	1,93	0,44	2,37	46	140
03.06.96	670,000	20,4	8,22	270	10,30	115,1	2,8	4,5	12	0,00	0,012	1,27	1,28	0,57	1,85	39	180
17.06.96	443,000	21,6	8,20	260	9,40	107,6	1,9	4,5	12	0,02	0,012	0,99	1,02			33	400
25.06.96	755,000	19,5	8,30	344	8,60	94,4	2,7	4,1	14	0,05	0,014	1,04	1,10			29	170
08.07.96	#######	19,6	8,23	247	7,50	82,5	1,6	5,1	10	0,04	0,021	1,67	1,73			49	110

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
22.07.96	481,000	20,4	8,64	267	10,00	111,7	2,3	3,1	11	0,02	0,011	0,93	0,96			10	90
05.08.96	441,000	21,3	8,56	261	9,40	107,0	2,7	2,7	7	0,01	0,009	1,11	1,12	0,88	2,00	20	80
21.08.96	503,000	20,7	8,33	253	8,60	96,7	2,1	4,8	18	0,01	0,015	0,81	0,84			29	130
02.09.96	590,000	17,6	7,95	233	8,20	86,5	3,6	5,9	12	0,06	0,027	1,27	1,36	0,70	2,06	111	390
16.09.96	525,000	13,9	8,10	200	9,00	87,5	3,4	4,0	9	0,02	0,018	1,38	1,42			68	130
30.09.96	705,000	14,2	7,70	285	9,00	88,1	2,3	3,8	10	0,03	0,012	1,40	1,44			39	130
14.10.96	793,000	13,0	7,95	270	10,50	100,0	2,5	4,0	9	0,03	0,015	1,22	1,27			42	70
04.11.96	602,000	10,0	8,32	296	11,10	98,5	2,5	2,4	7	0,02	0,015	1,29	1,33	0,55	1,88	33	90
18.11.96	#######	9,2	8,35	270	10,70	93,1	2,9	2,9	5	0,03	0,023	1,49	1,55			130	200
02.12.96	821,000	4,4	8,29	290	11,20	86,2	2,6	2,8	7	0,06	0,015	1,54	1,61	0,59	2,20	49	90
16.12.96	590,000	5,7	8,24	320	12,00	95,5	4,6	4,0	11	0,12	0,030	1,92	2,07			68	200
07.01.97	408,000	1,6	8,07	380	11,00	78,5	2,0	1,6	5	0,16	0,018	1,99	2,16			36	60
20.01.97	396,000	2,6	8,19	390	12,50	91,7	3,6	2,5	5	0,12	0,021	1,94	2,08			49	80
03.02.97	369,000	2,5	8,33	390	13,20	96,5	6,8	2,8	6	0,12	0,015	1,74	1,87	0,58	2,45	39	120
17.02.97	515,000	4,4	8,19	362	13,10	100,8	6,0	4,5	8	0,10	0,000	2,49	2,59			49	180
03.03.97	357,000	9,0	8,28	380	12,70	110,0	4,9	3,0	8	0,04	0,018	1,88	1,93	0,10	2,03	29	130
17.03.97	322,000	9,2	8,25	395	11,60	100,9	6,1	2,3	9	0,02	0,017	1,54	1,58			10	90
01.04.97	310,000	9,0	8,13	375	11,30	97,8	2,5	3,3	8	0,03	0,014	1,51	1,56			78	110
14.04.97	338,000	10,2	8,12	349	10,90	97,2	2,6	2,9	8	0,02	0,014	1,42	1,46			20	90
05.05.97	334,000	17,3	8,55	329	10,70	112,1	2,8	3,5	11	0,02	0,020	1,29	1,33	0,57	1,90	39	120
26.05.97	605,000	16,9	8,17	252	8,10	84,1	1,0	3,8	10	0,07	0,020	0,99	1,08			33	120
02.06.97	378,000	17,2	8,10	270	9,50	99,3	2,6	3,5	10	0,05	0,009	1,02	1,07	0,58	1,65	29	70
23.06.97	845,000	19,8	7,99	223	6,90	76,2	1,4	4,0	13	0,06	0,024	1,18	1,26			68	240
07.07.97	583,000	18,6	7,97	230	8,10	87,2	2,6	2,6	5	0,05	0,013	0,86	0,92			59	100
21.07.97	655,000	19,0	7,88	245	7,60	82,5	1,1	5,8	12	0,06	0,016	0,97	1,05			59	560
04.08.97	748,000	19,6	8,15	243	7,50	82,5	2,7	5,2	12	0,05	0,024	1,13	1,21	1,09	2,30	68	300
18.08.97	448,000	21,8	8,28	271	9,30	106,9	2,6	2,7	7	0,02	0,012	0,86	0,89			59	110
08.09.97	410,000	21,6	8,20	250	9,40	107,6	5,1	2,2	7	0,02	0,011	0,81	0,84	0,68	1,52	39	80
15.09.97	386,000	19,2	8,20	280	8,00	87,2	1,4	3,0	6	0,05	0,010	0,99	1,05			68	90
29.09.97	424,000	17,3	8,20	263	9,10	95,3	2,8	2,6	8	0,05	0,008	0,95	1,00			59	180
13.10.97	324,000	14,8	8,30	290	6,10	60,5	2,9	2,5	5	0,06	0,008	1,02	1,09			39	80
03.11.97	217,000	7,2	7,90	355	11,50	95,2	3,4	2,4	8	0,16	0,012	1,18	1,34	0,64	1,98	29	60
17.11.97	437,000	8,9	8,10	310	10,70	92,4	4,4	4,0	13	0,08	0,024	1,58	1,68			39	110

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
01.12.97	296,000	7,0	8,30	340	10,90	89,7	4,9	3,3	12	0,09	0,026	1,51	1,63	0,45	2,08	39	50
15.12.97	390,000	5,7	8,30	350	11,60	92,4	4,0	4,8	12	0,12	0,032	2,03	2,18			59	110

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
12.01.94		90	2	60	60,1	17,4	8,2	2,5		0,09		0,02		99								10		0,80
24.01.94		90	2	60																				
31.01.94		90	4	60	64,1	34,3	9,3	2,5		0,09		0,04		62								12		0,00
07.02.94		80	6	80	60,1	28,5	9,3	2,6		0,07		0,04		31								19		0,10
21.02.94		100	2	90	60,9	12,0	8,8	1,8		0,04		0,05		95								6		0,60
07.03.94		90	2	64	68,1	6,8	8,9	2,4		0,05		0,04		31								30		0,46
21.03.94			6	126	50,5	12,0	8,0	2,2		0,06		0,02		18								2		0,22
28.03.94		130	4	20																				
12.04.94		40	3	110	49,7	21,3	8,1	2,5		0,11		0,04		28								4		0,18
26.04.94		40	3	110																				
10.05.94		50	10	80	42,5	17,4	7,6	1,7		0,07		0,00		38								5		0,08
24.05.94		0	5	50	45,7	18,4	7,1	1,3	0,34			0,04										8		0,32
07.06.94		60	5	70	46,5	17,9	7,7	1,8		0,05		0,01		21								8		0,20
21.06.94		80	6	60																				
27.06.94		120	2	52	40,1	14,5	7,5	1,8					298									26		0,02
11.07.94		210	2	150	41,7	15,1	7,8	2,0		0,01		0,01		20								38		0,16
25.07.94				50																				
08.08.94		30	2	20	45,1	13,0	9,0	2,6						46								8		0,01
22.08.94		40	4	100	41,7	10,1	7,6	2,3		0,06		0,05		22								8		0,00
06.09.94		100	9	60	46,7	9,6	8,0	2,7						18								8		0,02
19.09.94		180	4	40	41,7	10,1	7,0	1,7		0,36		0,05	193									30		0,09
04.10.94		50	4	94	43,3	16,3	7,4	2,4		0,04		0,02		84								25		0,09
17.10.94		80	0	96																				
31.10.94		50	10	22	49,7	18,4	7,5	2,8						35								14		0,00
21.11.94		100	10	40	55,3	13,9	7,9	2,9					300									68		0,05
06.12.94		110	3	50	57,7	32,3	9,8	2,9						82								32		0,05
12.12.94		100	2	48	56,9	15,4	8,8	2,7						40								5		0,05
10.01.95		170	6	118	51,3	12,5	8,8	2,7																
24.01.95				45						0,16		0,02		26								39		
06.02.95		130	8	46	54,9	23,8	9,7	2,8		0,45		0,01	95	95								60		
21.02.95				40						0,03		0,05		40								26		
07.03.95		120	6	130	46,8	15,0	7,8	3,2	1,30		0,24		790								58		0,10	
20.03.95				58						0,08	0,04			48								13		0,00

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
04.04.95		90	6	52	56,4	14,5	9,5	2,7																
18.04.95				84						0,10		0,00		35								11		0,02
02.05.95		100	2	80	40,0	10,6	7,6	2,0	0,32		0,05		160										0,01	
15.05.95				70						0,05		0,00		24								4		0,00
29.05.95		0	2	62	43,2	12,0	8,4	2,9																
06.06.95		10	4	98	36,8	11,5	7,4	2,4	0,16	0,04	0,05	0,02	335	53							16	12	1,20	0,20
19.06.95				70																				
03.07.95		250	4	50	35,4	9,1	7,3	2,4																
17.07.95				40						0,10		0,00		20								3		0,10
07.08.95		210	6	128	40,4	12,8	8,0	2,8	0,39	0,06	0,06	0,01	72	16							15	8	0,03	0,03
21.08.95				60																				
04.09.95		240	2	90	43,6	13,8	8,0	2,9	0,56	0,06	0,08	0,02	160	17							23	15	0,10	0,01
18.09.95				120						0,12		0,02		80								8		0,00
02.10.95		50	2	70	45,2	15,0	7,1	2,3																
16.10.95				20						0,05		0,02		12								15		0,05
06.11.95		50	4	50	54,9	16,2	10,9	2,4	0,29	0,09	0,06	0,05	77	21							80	50		
20.11.95				20																				
04.12.95		250	4	20	53,6	13,9	9,5	2,3	0,73	0,14	0,07	0,05	90	34							40	24		
18.12.95		150	2	60	52,0	20,2	12,3	2,4																
08.01.96		50	5	78	71,2	20,2	13,3	2,6																
22.01.96				40						0,06		0,02		34								11		
06.02.96		70	6	180	61,7	23,4	10,7	2,3	0,52	0,12	0,13	0,06	250	46							140	40		
19.02.96																								
04.03.96		50	2	90	60,9	16,9	11,4	2,3	0,36	0,10	0,05	0,03	150	46							20	19		
18.03.96				40																				
01.04.96		0	8	18	54,7	12,7	8,1	2,2																
15.04.96				38						0,03		0,01		30								9		
06.05.96		10	2	56	41,4	12,7	5,5	1,9	0,29	0,03	0,06	0,04	181	45							60	14		
20.05.96				38																				
03.06.96		0	2	84	39,8	11,7	5,3	1,9	0,26	0,04	0,03	0,01	210	20							7	6		
17.06.96				62																				
25.06.96		20	8	104	42,4	14,9	5,7	1,9																
08.07.96		0	1	22	37,5	16,4	5,5	2,4																

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
22.07.96				50						0,02		0,01		14								9		
05.08.96		10	4	30	45,6	9,6	6,9	2,1	0,15	0,02	0,04	0,02	67	38							40	12		
21.08.96				170																				
02.09.96		80	2	10	39,8	9,4	5,7	2,4	0,98	0,02	0,09	0,00	910	64							50	40		
16.09.96				80																				
30.09.96		200	8	80	46,1	14,5	5,9	2,3																
14.10.96		50	4	26	41,4	13,6	5,7	2,1																
04.11.96		0	2	68	46,1	13,6	5,7	2,0	0,20	0,02	0,03	0,03	82	12							40	19		
18.11.96				82																				
02.12.96		50	2	74	47,1	20,7	6,1	2,0	0,25	0,02	0,02	0,01	130	22							19	10		
16.12.96				20																				
07.01.97		50	5	80	59,6	13,6	9,7	2,2																
20.01.97				40						0,03		0,02		10								18		
03.02.97		50	1	60	60,4	13,6	9,0	2,0	0,21	0,02	0,03	0,02	78	11							42	29		
17.02.97				20						0,05		0,00		40								9		
03.03.97		150	7	50	62,6	13,2	9,2	2,2	0,28	0,03	0,03	0,02	110	15							15	10	0,10	0,10
17.03.97				30																				
01.04.97		50	2	34	59,6	19,8	9,3	2,0																
14.04.97				46																				
05.05.97		50	4	46	48,6	20,2	7,6	1,8	0,23	0,04	0,04	0,01	93	18							27	15	0,15	0,05
26.05.97				94						0,05		0,01		14								26		
02.06.97		50	1	84	53,7	9,3	6,3	1,9	0,27	0,03	0,05	0,02	77	8							26	22	0,14	0,10
23.06.97				76																				
07.07.97		30	0	18	33,7	12,7	15,7	6,4																
21.07.97				80						0,05		0,00		44								12		0,10
04.08.97		0	0	18	34,0	11,6	4,7	2,0	0,72	0,05	0,09	0,03	410	34							39	16	0,05	0,05
18.08.97				28																				
08.09.97		100	2	72	36,5	10,5	5,4	1,8	0,14	0,13	0,05	0,04	100	82							12	10	0,05	0,05
15.09.97				30																				
29.09.97				10	39,7	12,4	5,4	1,8																
13.10.97		0	1	10	42,5	18,1	6,6	2,0		0,02		0,02		20								14		0,05
03.11.97		0	2	60	51,0	16,7	9,7	2,2	0,20	0,07	0,05	0,03	65	22							33	24	0,05	0,05
17.11.97				50																				

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
01.12.97		50	4	30	47,9	15,3	8,2	2,3	0,20	0,02	0,05	0,04	36	15							27	19	0,05	0,05
15.12.97				25																				

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Date	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
12.01.94		0,1		0,5		1,2		1,4		0,9
24.01.94										
31.01.94		0,0		0,6		0,5		2,0		0,0
07.02.94		0,2		1,1		0,8		0,4		1,3
21.02.94		0,3		0,7		0,6		9,7		1,6
07.03.94		0,2		1,0		1,3		7,8		2,1
21.03.94		0,1		0,6		0,8		2,3		1,5
28.03.94										
12.04.94		0,0		0,4		2,7		6,3		4,6
26.04.94										
10.05.94		0,1		0,7		0,1		0,6		1,6
24.05.94		0,1		1,3		0,8		2,2		1,3
07.06.94		0,0		0,1		4,3		2,9		4,9
21.06.94										
27.06.94		0,1		0,9		1,6		1,7		3,7
11.07.94		0,0		0,9		0,1		1,6		8,3
25.07.94										
08.08.94		0,0		0,2		0,7				2,9
22.08.94		0,1		0,3		1,0		1,3		2,6
06.09.94		1,3		0,2		0,0		1,6		
19.09.94		0,0		1,0		0,4		9,6		6,4
04.10.94		0,0		1,0		0,1		1,2		1,7
17.10.94										
31.10.94		0,1		0,3		0,3		0,5		5,0
21.11.94		0,0		0,9		0,8		6,3		1,5
06.12.94		0,2		0,6		0,9		5,0		2,1
12.12.94		0,1		0,3		1,1		0,4		1,0
10.01.95										
24.01.95		0,2		0,5		1,4		1,6		5,0
06.02.95		0,1		0,3		0,2		2,5		6,5
21.02.95		0,1		0,9		1,7		3,2		5,8
07.03.95	0,3		2,4				12,1		13,0	
20.03.95		0,1		2,0		0,7		10,3		8,0

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Date	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
04.04.95										
18.04.95		0,1		0,7		3,4		1,5		2,5
02.05.95	0,1		1,2		1,3		2,8		4,8	
15.05.95		0,1		0,6		0,1		1,6		1,2
29.05.95										
06.06.95	0,0	0,0	1,2	0,5	4,8	2,1	6,0	5,1	6,8	5,1
19.06.95										
03.07.95										
17.07.95		0,0		0,8		0,0		0,0		1,2
07.08.95	0,1	0,0	0,9	0,8	0,8	0,6	6,8	5,0	2,7	2,3
21.08.95										
04.09.95	0,0	0,0	1,3	0,9	0,2	0,0	0,0	0,0	2,3	0,7
18.09.95		0,0		0,6		0,3		2,7		2,4
02.10.95										
16.10.95		0,0		0,9		0,7		0,0		0,7
06.11.95	0,1	0,0	3,0	2,9	0,8	0,5	2,3	0,6	1,9	1,3
20.11.95										
04.12.95	0,2	0,1	1,1	0,2	0,5	0,3	2,0	1,1	1,2	0,6
18.12.95										
08.01.96										
22.01.96		0,1		0,3		1,5		2,1		0,6
06.02.96	0,1	0,1	1,4	1,1	1,1	0,9	2,1	0,1	4,0	3,3
19.02.96										
04.03.96	0,1	0,0	0,4	0,3	1,1	0,8	2,2	1,0	1,2	0,9
18.03.96										
01.04.96										
15.04.96		0,1		0,0		0,0		2,0		1,1
06.05.96	0,1	0,1	1,3	1,1	0,4	0,4	2,6	1,1	2,6	2,4
20.05.96										
03.06.96	0,1	0,1	0,4	0,3	1,0	0,4	1,1	1,1	2,0	1,2
17.06.96										
25.06.96										
08.07.96										

Date	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
22.07.96		0,1		0,6		1,9		1,1		3,0
05.08.96	0,5	0,1	0,6	0,4	0,5	0,5	1,1	1,1	1,3	1,2
21.08.96										
02.09.96	0,1	0,1	1,8	0,6	2,0	1,7	3,3	1,1	3,3	1,5
16.09.96										
30.09.96										
14.10.96										
04.11.96	0,1	0,1	0,6	0,3	2,2	1,4	1,1	1,1	1,1	0,7
18.11.96										
02.12.96	0,1	0,1	1,1	0,7	1,0	0,4	5,2	2,0	2,4	1,1
16.12.96										
07.01.97										
20.01.97		0,1		0,5		0,5		1,8		2,2
03.02.97	0,1	0,1	1,0	0,4	2,3	2,2	2,8	1,6	1,0	0,8
17.02.97		0,1		0,4		0,8		1,1		1,4
03.03.97	0,1	0,1	1,9	1,0	1,8	1,1	2,7	2,5	1,6	1,5
17.03.97										
01.04.97										
14.04.97										
05.05.97	0,2	0,1	0,6	0,3	1,1	0,4	2,0	1,1	1,3	1,2
26.05.97		0,1		0,3		1,3		1,1		3,2
02.06.97	0,0	0,0	1,0	0,6	1,6	1,4	3,4	1,1	2,4	2,0
23.06.97										
07.07.97										
21.07.97		0,0		0,5		0,5		1,1		1,6
04.08.97	0,1	0,1	2,1	0,6	2,0	1,0	4,7	1,1	4,0	3,2
18.08.97										
08.09.97	0,1	0,1	0,6	0,4	1,6	1,4	1,6	1,4	1,1	1,0
15.09.97										
29.09.97										
13.10.97		0,0		0,3		0,4		1,1		1,4
03.11.97	0,0	0,0	0,8	0,3	1,6	0,8	1,9	1,1	1,4	1,4
17.11.97										

Dráva at Drávaszabolcs, rkm 68.0
01.01.1994 - 31.12.1997

Date	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
01.12.97	0,0	0,0	0,8	0,6	1,7	1,3	1,7	1,1	2,5	2,0
15.12.97										

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
03.01.94	197,000	1,0	7,28	261	13,60	95,4	1,0	1,4	3	0,23	0,008	1,82	2,06	0,14	2,20	49	160
17.01.94	200,000	3,3	7,54	234	12,25	91,5	0,8	1,0	3	0,05	0,011	1,38	1,43	0,17	1,60	23	60
31.01.94	133,000	0,2	7,52	281	14,76	101,3	2,0	2,4	7	0,02	0,011	1,73	1,77	0,33	2,10	59	150
14.02.94	133,000	0,7	7,29	270	14,51	101,0	0,4	0,6	2	0,06	0,011	1,66	1,73	0,27	2,00	26	30
28.02.94	211,000	4,4	7,37	248	13,58	104,5	0,8	1,0	3	0,01	0,011	1,29	1,31	0,09	1,40	26	70
16.03.94	649,000	5,9	7,70	203	13,92	111,4	4,2	5,6	12	0,02	0,041	1,16	1,22	1,28	2,50	46	50
28.03.94	676,000	4,9	7,41	252	14,18	110,6	1,0	1,4	3	0,02	0,014	1,25	1,29	0,01	1,30	42	70
11.04.94	348,000	6,3	6,92	226	14,76	119,4	1,2	1,6	5	0,04	0,008	1,38	1,43	0,07	1,50	16	30
25.04.94	401,000	12,0	7,30	241	10,94	101,8	1,2	1,9	6	0,19	0,010	1,08	1,28	0,12	1,40	23	50
09.05.94	230,000	11,0	7,28	209	11,40	103,6	1,2	1,8	5	0,07	0,007	0,97	1,05	0,05	1,10	26	40
24.05.94	593,000	18,2	6,80	163	9,92	105,9	4,8	6,4	16	0,04	0,013	0,76	0,82	0,08	0,90	52	60
06.06.94	274,000	16,0	7,32	240	10,94	111,5	2,8	3,1	8	0,05	0,008	0,87	0,93	0,07	1,00	26	70
20.06.94	236,000	17,2	7,47	223	10,07	105,3	1,9	3,5	6	0,02	0,012	0,73	0,76	0,14	0,90	46	50
04.07.94	103,000	24,3	7,36	266	13,80	166,5	4,2	6,6	11	0,06	0,014	0,94	1,02	0,08	1,10	75	100
18.07.94	61,700	22,7	7,08	269	7,99	93,5	2,0	2,6	9	0,00	0,007	0,94	0,95	0,05	1,00	10	30
01.08.94	42,900	25,5	7,39	450	8,42	104,0	1,5	1,8	6	0,01	0,007	0,59	0,61	0,19	0,80	0	40
15.08.94	44,900	18,5	7,34	326	11,47	123,3	0,8	1,1	3	0,02	0,007	0,77	0,79	0,01	0,80	26	40
29.08.94	58,300	16,9	7,26	317	8,55	88,8	1,5	1,8	3	0,01	0,013	0,62	0,64	0,06	0,70	13	30
12.09.94	45,500	21,0	7,35	324	9,39	106,2	1,4	1,7	4	0,00	0,005	2,73	2,74			13	20
26.09.94	55,200	18,2	7,30	294	9,98	106,6	1,0	1,4	4	0,01	0,006	0,64	0,66			62	120
10.10.94	602,000	14,2	7,00	203	10,85	106,2	9,7	17,9	56	0,00	0,004	0,93	0,94			290	300
24.10.94	55,000	7,0	7,17	314	12,50	102,9	0,2	0,3	1	0,02	0,001	0,96	0,97	0,23	1,20	10	20
07.11.94	80,000	5,5	7,21	296	15,66	124,0	1,1	1,2	5	0,01	0,004	1,00	1,02	0,18	1,20	13	30
21.11.94	135,000	3,9	7,30	234	14,05	106,7	2,4	3,1	8	0,02	0,007	1,11	1,13	0,07	1,20	29	220
05.12.94	49,900	0,0	7,50	365	13,65	93,2	0,9	1,1	3	0,04	0,006	1,01	1,06	0,14	1,20	29	40
19.12.94	148,000	0,6	7,62	282	13,48	93,6	1,1	1,7	4	0,01	0,005	1,21	1,23	0,10	1,33	7	10
02.01.95	537,000	3,2	7,94	178	12,23	91,1	1,5	2,6	8	0,04	0,006	1,65	1,69	0,07	1,76	42	60
16.01.95	77,300	0,0	7,34	199	13,91	94,9	1,3	2,3	9	0,04	0,006	1,40	1,45	0,05	1,50	13	20
30.01.95	382,000	2,2	7,69	215	12,30	89,2	2,0	3,1	8	0,02	0,012	1,52	1,55	0,08	1,63	20	50
13.02.95	234,000	1,4	7,76	230	13,00	92,2	1,0	1,5	3	0,01	0,006	1,39	1,40	0,17	1,57	29	40
27.02.95	667,000	4,4	7,80	189	12,70	97,7	1,9	3,3	10	0,02	0,007	1,29	1,32	0,28	1,60	39	50
13.03.95	222,000	6,4	7,81	211	12,29	99,6	1,2	1,8	6	0,01	0,005	1,74	1,75	0,08	1,83	20	50
27.03.95	290,000	4,7	7,85	239	12,40	96,2	1,0	1,5	5	0,01	0,010	1,13	1,14	0,18	1,32	29	40

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
12.01.94	1255,000	3,4	7,97	399	11,90	89,2	2,6	3,6	12	0,30	0,025	1,65	1,98	0,89	2,87	49	210
26.01.94	733,000	2,8	8,13	406	12,10	89,2	2,1	3,3	11	0,30	0,032	1,74	2,07	0,72	2,79	68	140
09.02.94	1205,000	3,8	8,14	446	11,60	87,9	3,0	3,4	10	0,27	0,039	1,79	2,10	0,46	2,56	59	110
23.02.94	703,000	2,0	8,10	406	12,80	92,3	2,6	3,4	10	0,28	0,041	2,06	2,38	1,07	3,45	88	200
09.03.94	1285,000	6,8	8,01	412	10,70	87,7	2,5	5,4	15	0,09	0,044	2,15	2,28	0,78	3,06	68	280
23.03.94	1455,000	6,0	8,00	297	10,40	83,5	1,7	4,4	13	0,09	0,033	1,76	1,88	0,69	2,57	121	230
06.04.94	1145,000	9,3	7,95	314	10,70	93,3	2,2	3,2	9	0,15	0,023	1,58	1,75	0,92	2,67	59	260
20.04.94	1785,000	12,1	8,12	305	8,50	79,3	1,3	3,4	12	0,08	0,026	1,79	1,89	1,23	3,12	39	180
04.05.94	1420,000	15,2	7,99	308	7,90	79,1	2,4	3,7	14	0,08	0,017	1,02	1,11	1,10	2,21	49	200
18.05.94	749,000	19,2	8,07	369	8,60	93,8	3,0	3,4	19	0,09	0,017	1,33	1,44	0,40	1,84	117	120
15.06.94	997,000	18,6	7,97	341	7,30	78,6	1,5	5,5	18	0,12	0,049	1,11	1,27	0,35	1,62	82	190
29.06.94	535,000	25,2	8,10	418	6,50	79,8	1,3	3,8	18	0,06	0,019	1,51	1,60	0,27	1,87	68	160
13.07.94	277,000	24,0	8,33	409	9,50	114,0	1,9	4,3	25	0,10	0,015	0,79	0,91	0,45	1,36	23	100
27.07.94	239,000	26,6	8,04	464	6,20	78,2	1,7	4,3	27	0,08	0,015	0,52	0,61	0,28	0,89	29	110
10.08.94	214,000	28,2	8,36	555	5,80	75,4	3,2	4,2	34	0,02	0,020	0,32	0,36	0,31	0,67	46	120
24.08.94	217,000	25,2	8,23	495	6,40	78,6	2,3	3,5	27	0,03	0,018	0,43	0,48	0,30	0,78	59	180
07.09.94	247,000	23,9	8,20	495	5,90	70,7	2,0	4,0	32	0,05	0,015	0,59	0,65	0,27	0,92	68	190
21.09.94	224,000	19,5	7,98	552	5,70	62,5	3,1	4,7	33	0,08	0,014	0,50	0,59	0,47	1,06	29	330
05.10.94	268,000	18,2	8,01	468	6,50	69,4	2,1	4,2	24	0,09	0,012	0,86	0,96	0,29	1,25	49	230
19.10.94	406,000	11,0	8,33	486	9,80	89,1	1,9	3,4	24	0,06	0,015	1,31	1,39	0,28	1,67	68	130
02.11.94	665,000	11,3	8,15	511	9,30	85,1	2,1	3,5	25	0,11	0,032	1,79	1,93	0,28	2,21	104	160
16.11.94	352,000	8,4	8,19	434	9,30	79,3	1,8	3,2	22	0,12	0,026	1,85	2,00	0,35	2,35	85	410
01.12.94	420,000	5,0	8,21	452	11,10	86,8	2,0	2,8	21	0,20	0,035	1,92	2,16	0,22	2,38	88	110
14.12.94	354,000	4,7	8,07	496	11,00	85,3	1,9	2,6	22	0,33	0,046	2,37	2,75	0,31	3,06	98	130
17.12.94	823,000	1,6	7,96	364	12,20	87,0	4,2	3,8	21	0,33	0,050	2,19	2,57	0,28	2,85	68	120
11.01.95	627,000	1,2	7,99	302	12,50	88,2	3,3	6,4	24	0,33	0,030	2,12	2,49	0,59	3,08	62	270
25.01.95	442,000	0,2	7,90	472	11,20	76,9	3,0	2,8	18	0,56	0,043	2,46	3,07	0,46	3,53	91	180
08.02.95	1165,000	3,2	8,01	306	11,70	87,2	3,0	6,1	22	0,16	0,049	2,42	2,63	0,41	3,04	20	200
22.02.95	1325,000	6,3	7,94	364	11,00	89,0	1,7	4,3	16	0,12	0,103	1,85	2,07	0,18	2,25	59	100
08.03.95	1700,000	7,3	7,79	274	10,00	83,0	1,4	6,0	20	0,10	0,021	1,65	1,77	0,83	2,60	62	210
22.03.95	774,000	7,3	8,00	380	10,10	83,8	0,9	3,6	20	0,06	0,024	1,85	1,94	0,78	2,72	39	220
12.04.95	1215,000	8,7	7,83	340	10,10	86,8	2,6	3,5	16	0,05	0,012	1,67	1,73	0,66	2,39	46	170
26.04.95	1295,000	13,3	7,93	294	9,80	94,0	2,5	4,0	14	0,06	0,009	1,20	1,27	0,37	1,64	39	110

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
10.05.95	1850,000	15,1	7,71	242	8,00	79,9	1,3	3,8	12	0,05	0,015	1,11	1,18	0,38	1,56	33	100
24.05.95	1450,000	15,2	7,71	274	9,20	92,1	2,2	3,7	14	0,06	0,015	0,72	0,80	0,35	1,15	49	70
14.06.95	1035,000	21,0	7,74	374	6,90	78,0	1,0	5,9	22	0,03	0,033	1,42	1,49	0,36	1,85	68	340
28.06.95	1006,000	21,2	7,73	386	6,80	77,2	1,0	5,9	28	0,10	0,036	1,20	1,34	0,32	1,66	88	290
12.07.95	679,000	25,0	7,78	366	7,40	90,5	2,5	4,4	20	0,07	0,021	1,36	1,45	0,32	1,77	128	388
26.07.95	335,000	26,7	7,98	428	8,60	108,6	3,3	4,5	20	0,01	0,012	1,11	1,13	0,24	1,37	29	290
09.08.95	263,000	25,4	7,67	420	6,90	85,0	5,0	5,9	24	0,07	0,006	0,27	0,35	0,32	0,67	39	140
23.08.95	236,000	24,3	7,79	441	5,90	71,2	3,9	5,4	27	0,02	0,024	0,57	0,61	0,36	0,97	29	70
06.09.95	447,000	19,2	8,02	424	8,20	89,4	2,2	4,6	23	0,04	0,018	0,57	0,62	0,38	1,00	68	160
13.09.95	642,000	18,9	7,85	470	7,20	78,0	1,6	3,9	20	0,06	0,030	1,33	1,43	0,34	1,77	68	90
27.09.95	453,000	17,2	7,93	438	7,70	80,5	1,3	3,9	19	0,10	0,012	1,60	1,72	0,48	2,20	108	120
11.10.95	480,000	15,8	7,82	494	8,50	86,2	0,9	3,5	22	0,03	0,018	2,03	2,08	0,26	2,34	68	230
25.10.95	390,000	12,2	7,65	436	8,60	80,4	1,1	3,0	19	0,06	0,012	1,31	1,39	0,35	1,74	121	210
08.11.95	573,000	6,2	7,98	458	10,40	83,9	1,9	3,4	19	0,12	0,012	1,02	1,15	0,38	1,53	111	110
22.11.95	1705,000	4,5	7,71	416	10,00	77,2	2,3	8,3	32	0,29	0,030	1,27	1,58	0,37	1,95	49	110
06.12.95	705,000	2,9	7,72	382	12,00	88,7	3,2	3,7	19	0,33	0,024	1,42	1,77	0,45	2,22	68	110
13.12.95	572,000	2,4	7,76	396	11,90	86,8	2,5	3,1	15	0,65	0,040	1,42	2,12	0,41	2,53	127	200
18.12.95	507,000	2,1	7,77	474	11,10	80,3	1,8	3,5	21	0,39	0,061	1,20	1,65	0,42	2,07	68	240
10.01.96	2290,000	1,4	7,46	308	10,80	76,6	2,1	5,0	20	0,27	0,024	1,36	1,65	0,29	1,94	39	270
24.01.96	977,000	0,2	7,64	448	12,60	86,5	3,0	4,2	22	0,35	0,024	1,92	2,29	0,31	2,60	72	190
08.02.96	601,000	0,0	7,70	535	11,80	80,5	2,5	3,0	22	0,57	0,024	1,54	2,13	0,25	2,38	52	170
21.02.96	603,000	1,6	7,60	520	11,90	84,9	2,5	2,7	18	0,71	0,027	1,67	2,41	0,24	2,65	82	140
06.03.96	510,000	1,2	7,48	595	11,80	83,3	3,0	4,1	26	0,69	0,030	1,92	2,64	0,27	2,91	91	100
20.03.96	1050,000	5,2	7,46	500	11,20	88,0	2,4	6,2	27	0,36	0,027	1,97	2,35	0,35	2,70	49	90
03.04.96	1120,000	6,8	7,45	484	10,50	86,0	2,2	6,9	26	0,19	0,040	2,31	2,53	0,28	2,81	82	230
17.04.96	1040,000	8,8	7,82	404	9,90	85,3	1,6	5,0	19	0,11	0,043	2,10	2,25	0,27	2,52	82	220
29.04.96	1180,000	15,2	7,87	358	8,30	83,1	1,5	4,8	18	0,07	0,030	1,72	1,82	0,22	2,04	49	180
15.05.96	1100,000	18,2	7,75	338	8,00	85,4	2,2	4,6	17	0,00	0,027	1,47	1,50	0,34	1,84	68	160
29.05.96	712,000	19,4	7,88	396	7,30	79,9	1,5	5,0	20	0,04	0,030	1,79	1,85	0,33	2,18	82	280
12.06.96	364,000	26,5	8,03	458	7,80	98,2	2,5	3,9	19	0,06	0,018	1,36	1,44	0,26	1,70	117	190
26.06.96	351,000	21,8	7,81	448	7,70	88,5	2,5	4,9	23	0,01	0,001	0,93	0,93	0,27	1,20	20	180
10.07.96	359,000	23,9	8,06	490	8,80	105,4	2,4	4,0	23	0,03	0,009	1,27	1,31	0,27	1,58	78	180
24.07.96	283,000	23,3	8,06	456	8,20	97,1	4,3	5,2	28	0,85	0,003	0,75	1,60	0,25	1,85	10	160

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
07.08.96	353,000	23,5	7,97	510	6,50	77,2	4,2	6,3	35	0,04	0,008	0,52	0,57	0,35	0,92	10	190
21.08.96	414,000	22,4	7,82	498	6,30	73,3	4,8	6,0	30	0,07	0,012	0,63	0,71	0,36	1,07	68	250
04.09.96	351,000	22,2	8,01	464	7,10	82,2	1,5	4,0	22	0,06	0,015	1,02	1,09	0,38	1,47	91	230
18.09.96	1040,000	14,4	7,98	412	8,10	79,6	2,2	6,7	28	0,09	0,021	1,04	1,15	0,25	1,40	59	520
02.10.96	1370,000	12,9	7,92	324	8,90	84,6	2,3	7,4	25	0,02	0,033	1,47	1,53	0,31	1,84	49	370
16.10.96	380,000	14,4	8,11	464	7,50	73,7	0,5	3,9	21	0,08	0,021	1,24	1,34	0,32	1,66	91	198
30.10.96	984,000	10,2	8,06	356	8,80	78,5	1,8	5,9	21	0,09	0,036	1,18	1,30	0,34	1,64	68	210
06.11.96	783,000	9,6	8,04	436	9,50	83,5	1,6	3,5	19	0,07	0,012	1,29	1,37	0,37	1,74	101	210
20.11.96	424,000	9,8	7,80	515	9,70	85,6	1,5	3,6	21	0,16	0,040	1,65	1,84	0,21	2,05	72	190
04.12.96	825,000	5,2	7,91	436	10,20	80,2	1,6	3,6	19	0,12	0,027	1,58	1,73	0,23	1,96	49	120
16.12.96	682,000	4,8	7,76	412	10,90	84,8	1,6	3,7	17	0,12	0,052	1,70	1,87	0,20	2,07	55	110
07.01.97	1170,000	0,2	7,91	430	12,40	85,1	6,2	7,4	25	0,37	0,021	1,65	2,04	0,35	2,39	62	420
22.01.97	736,000	0,6	7,88	510	11,80	81,9	2,0	4,4	22	0,35	0,033	1,92	2,30	0,04	2,34	55	400
05.02.97	505,000	1,0	7,98	570	12,00	84,2	2,1	3,1	20	0,44	0,021	1,99	2,45	0,35	2,80	62	130
19.02.97	1270,000	1,4	7,90	530	11,70	83,0	3,1	5,0	28	0,44	0,030	2,17	2,64	0,28	2,92	55	210
05.03.97	1580,000	5,2	7,88	374	10,40	81,7	2,3	13,5	36	0,15	0,027	2,35	2,53	0,40	2,93	16	700
19.03.97	814,000	6,9	8,00	478	10,50	86,2	2,3	3,7	19	0,12	0,021	2,12	2,26	0,27	2,53	85	150
02.04.97	633,000	7,2	8,06	510	10,90	90,2	2,3	3,3	20	0,06	0,027	1,94	2,03	0,22	2,25	82	170
16.04.97	729,000	8,4	8,09	410	10,90	93,0	1,9	3,4	14	0,08	0,012	1,45	1,54	0,28	1,82	49	180
28.04.97	2330,000	10,3	7,85	366	9,40	84,0	2,7	10,8	34	0,11	0,040	2,31	2,45	0,39	2,84	49	600
13.05.97	1950,000	15,6	7,89	284	8,60	86,9	2,1	5,9	21	0,06	0,021	1,49	1,58	0,23	1,81	49	620
21.05.97	1360,000	19,5	7,85	320	6,80	74,6	1,6	4,2	18	0,11	0,027	1,18	1,31	0,25	1,56	49	290
04.06.97	1120,000	18,0	7,94	346	8,30	88,3	0,9	3,7	17	0,06	0,012	1,40	1,48	0,24	1,72	46	100
18.06.97	1210,000	21,4	7,87	334	6,60	75,3	1,8	5,6	19	0,06	0,040	1,31	1,41	0,24	1,65	85	160
02.07.97	811,000	23,8	7,98	376	6,40	76,5	1,4	5,6	22	0,04	0,015	1,47	1,52	0,15	1,67	72	190
16.07.97	922,000	22,4	8,04	398	6,70	77,9	1,0	5,4	21	0,07	0,012	1,42	1,51	0,21	1,72	42	250
30.07.97	1290,000	20,8	7,81	354	7,00	78,9	0,8	5,7	21	0,05	0,027	1,24	1,32	0,37	1,69	65	130
13.08.97	1070,000	21,8	8,03	374	6,80	78,2	1,1	7,1	22	0,03	0,012	1,60	1,65	0,24	1,89	62	380
27.08.97	460,000	23,0	8,17	454	7,50	88,3	2,7	3,9	20	0,05	0,021	1,60	1,67	0,32	1,99	75	140
10.09.97	711,000	20,8	8,08	493	7,30	82,2	1,1	5,7	24	0,05	0,015	1,31	1,37	0,22	1,59	95	110
24.09.97	579,000	15,2	8,05	418	7,80	78,1	0,7	4,7	21	0,10	0,018	1,60	1,72	0,23	1,95	111	150
08.10.97	841,000	15,0	8,05	488	8,60	85,7	1,2	3,5	18	0,05	0,009	1,63	1,69	0,23	1,92	59	130
15.10.97	840,000	13,2	8,03	444	8,80	84,2	1,6	4,4	23	0,05	0,018	1,58	1,65	0,28	1,93	72	150

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
05.11.97	567,000	5,0	8,13	479	11,00	86,0	2,1	3,4	20	0,10	0,012	1,08	1,20	0,26	1,46	36	130
19.11.97	775,000	6,8	8,04	582	9,90	81,1	1,9	3,0	19	0,14	0,030	1,63	1,80	0,24	2,04	75	190
03.12.97	743,000	6,1	7,94	472	11,40	91,7	2,1	2,7	17	0,13	0,015	1,63	1,77	0,26	2,03	95	170
17.12.97	953,000	3,2	7,94	456	11,40	85,0	1,8	4,0	20	0,12	0,064	1,45	1,63	0,41	2,04	55	220

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
12.01.94		0	1	48	44,1	6,1	21,2	2,3		0,28		0,03		94							
26.01.94		130	0	390																	
09.02.94		60	2	12	48,1	7,3	27,6	3,5		0,11		0,03		130							
23.02.94		0	9	47																	
09.03.94		0	3	2	46,1	6,1	25,8	3,9		0,14		0,05	3800		5,0				1		50
23.03.94				2																	
06.04.94		0	2	27	36,1	5,5	16,6	2,7		0,09		0,01	1210		4,0						54
20.04.94				20																	
04.05.94		0	2	46	37,1	5,5	15,6	2,0		0,06		0,02		1961							46
18.05.94				20																	
15.06.94		730	1	10	39,3	10,1	18,4	3,9		0,08		0,01		870				390	3		
29.06.94				10																	
13.07.94		0	1	0	45,7	9,1	29,4	3,5		0,08		0,01		49				100			
27.07.94				35																	
10.08.94		0	2	25	52,9	10,5	49,7	3,5		0,05		0,01		34		3,0					
24.08.94				56																	
07.09.94		0	0	11	54,3	11,2	49,7	3,1		0,10		0,05		37		4,0					
21.09.94				19																	
05.10.94		0	4	24	51,5	12,5	35,0	3,9		0,11		0,03		13		1,0					
19.10.94				116																	
02.11.94		100	2	76	57,1	10,5	44,1	5,4		0,02		0,01		9		3,0		360	4		
16.11.94				2																	
01.12.94		0	2	20	52,9	9,5	40,5	4,3		0,08		0,02		5		1,0					
14.12.94				1																	
17.12.94				22																	
11.01.95		50	3	40	38,7	7,4	18,5	3,2	3,88	0,21		0,08		28		1,0					
25.01.95				80																	
08.02.95		150	14	40	40,1	6,9	17,5	3,0	2,87	0,10		0,01		17		1,0					
22.02.95			1	30	45,7	7,8	21,0	2,8		0,11		0,01		10		1,0					
08.03.95		100	1	10	37,1	5,6	13,0	2,0		0,07		0,01		24		1,0					
22.03.95				30																	
12.04.95		50	1	10	42,9	9,1	18,0	2,4		0,06		0,01		6		1,0					
26.04.95				20																	

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
10.05.95			1	20	32,9	7,4	10,0	2,0		0,10		0,01		8							
24.05.95		50		10																	
14.06.95		150	1	10	47,5	7,8	19,0	3,4		0,07		0,01		10				100	1		
28.06.95				20																	
12.07.95			1	20	45,7	8,7	21,0	3,0		0,08		0,01		8		2,0					
26.07.95		300		30																	
09.08.95		50	3	40	40,0	9,5	39,0	4,4		0,07		0,01		17							
23.08.95				20																	
06.09.95			2	10	48,6	11,3	34,0	3,9		0,04		0,01		8							
13.09.95		200		10														500	3		
27.09.95				10																	
11.10.95		50	1	10	59,0	10,4	40,0	4,8		0,05		0,01		7		5,0					
25.10.95				10																	
08.11.95		50	2	10	54,0	10,4	37,0	4,8		0,02		0,01		5							
22.11.95				10														300	2		
06.12.95		50	1	30	48,6	9,5	25,0	3,8		0,05		0,01		13							
13.12.95				70																	
18.12.95				40																	
10.01.96			3	30	40,0	6,9	20,0	3,8		0,06		0,04		12		1,0					
24.01.96		100		50														25	2		
08.02.96				70	64,0	13,9	39,0	3,6		0,08		0,12		7							
21.02.96		40	2	50																	
06.03.96				70	68,0	13,4	50,0	5,0		0,06		0,12		7							
20.03.96		60	1	50																	
03.04.96		20		60	59,0	12,0	34,0	4,2		0,04		0,01		9		1,0					
17.04.96			2	10														100	3		
29.04.96				20	45,0	8,5	22,0	3,0		0,06		0,01		9							
15.05.96				60																	
29.05.96		40	3	10																	
12.06.96			1	50	61,0	9,9	34,0	4,6		0,03		0,01		19							
26.06.96		80		40																	
10.07.96			1	10	60,0	14,1	40,0	5,5		0,05		0,01		10		5,0			5		
24.07.96		40		80																	

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
07.08.96		20		90	50,0	10,9	49,0	5,5		0,03		0,01		18				100			
21.08.96			3	50																	
04.09.96		20	2	50	57,0	9,9	26,0	3,8		0,02		0,01		12							
18.09.96				30																	
02.10.96			1	10	42,9	7,2	22,0	4,2		0,04		0,01		21		1,0					
16.10.96		20		10														75	4		
30.10.96				10																	
06.11.96		40	1	10	56,0	11,6	27,0	3,8		0,07		0,01		9							
20.11.96				10																	
04.12.96			1	20	51,0	10,0	30,0	4,0		0,03		0,01		9							
16.12.96		20		10																	
07.01.97				80	51,0	10,0	26,0	3,6		0,06		0,02		11							
22.01.97		40	3	10																	
05.02.97				50	69,0	11,4	38,0	3,6		0,05		0,07		5					2		
19.02.97		40	1	30														80			
05.03.97				10	45,7	9,7	22,0	3,6		0,04		0,01		16							
19.03.97		20	2	20																	
02.04.97				10	61,0	11,0	33,0	3,4		0,04		0,01		38		1,0			3		
16.04.97		20	1	10																	
28.04.97				10																	
13.05.97		40		10	37,2	6,6	14,5	2,2		0,06		0,01		10							
21.05.97			1	10																	
04.06.97				10														55			
18.06.97		60	1	10	41,5	6,5	15,0	3,0		0,14		0,01		15							
02.07.97				20															8		
16.07.97		180	1	10	50,0	8,8	24,0	3,6		0,08		0,01		8		1,0					
30.07.97				20																	
13.08.97				10																	
27.08.97		20	1	20	61,0	10,2	26,0	3,6		0,05		0,01		17				52			
10.09.97				10																	
24.09.97		20	1	10	56,0	10,3	24,0	4,0		0,05		0,01		15							
08.10.97				20																	
15.10.97		20	1	30	53,0	7,1	31,0	3,6		0,04		0,01		16		1,0			6		

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
05.11.97				30																	
19.11.97		20	3	20	67,0	13,8	42,0	4,2		0,06		0,02		8							
03.12.97				30						0,12		0,02		9				35			
17.12.97		20	1	10	45,7	18,1	29,0	3,6													

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
12.01.94	23		0,10		0,1		4,5		0,5		0,5		6,0
26.01.94													
09.02.94	23		0,10		0,2		2,5		2,5		0,5		
23.02.94													
09.03.94		0,20		0,5		7,0		11,5		13,5		29,0	
23.03.94													
06.04.94		0,10		0,4		5,0		3,0		6,5		15,5	
20.04.94													
04.05.94		0,20		0,2		3,0		1,0		5,0		12,0	
18.05.94													
15.06.94	20		0,10		0,6		4,5		19,0		5,5		16,0
29.06.94													
13.07.94	6		0,10		0,1		1,0		5,0		0,5		5,0
27.07.94													
10.08.94	11		0,10		0,1		1,5		1,0		0,5		3,0
24.08.94													
07.09.94	19		0,10		0,1		1,0		0,5		0,5		3,5
21.09.94													
05.10.94	18		0,10		0,3		0,5		0,5		0,5		2,0
19.10.94													
02.11.94	9				0,1		1,0		1,0		0,5		1,5
16.11.94													
01.12.94	14				0,1		0,5		3,0		0,5		8,0
14.12.94													
17.12.94													
11.01.95	10		0,10		1,0		1,5		0,5		0,5		3,5
25.01.95													
08.02.95	8		0,10		0,1		0,5		0,5		0,5		5,5
22.02.95	33				0,1		0,5		0,5		0,5		4,0
08.03.95	8				0,1		0,5		0,5		0,5		2,5
22.03.95													
12.04.95	12		0,10		0,1		3,5		1,0		0,5		3,0
26.04.95													

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
10.05.95	9		0,10		0,1		0,5		1,0		0,5		3,0
24.05.95													
14.06.95	12		0,10		0,1		1,5		4,0		0,5		5,0
28.06.95													
12.07.95	12		0,30		0,1		1,5		1,0		0,5		12,5
26.07.95													
09.08.95	10		0,10		0,1		2,5		2,0		0,5		4,0
23.08.95													
06.09.95	5		0,10		0,1		1,0		1,0		0,5		2,0
13.09.95													
27.09.95													
11.10.95	8		0,10		0,1		2,0		1,0		0,5		5,5
25.10.95													
08.11.95	12		0,10		0,1		7,5		0,5		0,5		2,5
22.11.95													
06.12.95	16		0,10		0,5		11,0		2,0		0,5		6,0
13.12.95													
18.12.95													
10.01.96	16		0,10		0,3		0,5		1,0		0,5		3,0
24.01.96													
08.02.96	34		0,10		0,2		4,0		1,5		0,5		4,0
21.02.96													
06.03.96	25		0,20		0,1		8,5		2,0		1,0		4,0
20.03.96													
03.04.96	17		0,20		0,1		5,5		1,5		0,5		7,5
17.04.96													
29.04.96	12		0,20		0,1		3,5		2,0		0,5		4,0
15.05.96													
29.05.96													
12.06.96	10		0,20		0,1		4,5		4,0		0,5		5,0
26.06.96													
10.07.96	7		0,20		0,1		5,5		2,0		0,5		4,5
24.07.96													

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
07.08.96	16		0,20		0,1		2,5		1,0		0,5		4,5
21.08.96													
04.09.96	5		0,20		0,1		1,0		2,0		0,5		2,5
18.09.96													
02.10.96	16		0,20		0,1		1,0		2,0		0,5		4,5
16.10.96													
30.10.96													
06.11.96	11		0,20		0,1		5,5		1,0		1,0		2,5
20.11.96													
04.12.96	7		0,20		0,1		17,0		0,5		0,5		3,0
16.12.96													
07.01.97	23		0,20		0,1		3,0		3,5		0,5		5,0
22.01.97													
05.02.97	30		0,10		0,2		7,0		0,5		0,5		5,5
19.02.97													
05.03.97	23		0,10		0,3		1,5		4,0		3,5		15,5
19.03.97													
02.04.97	5		0,10		0,3		7,5		2,0		0,5		5,0
16.04.97													
28.04.97													
13.05.97	6		0,10		0,2		1,5		2,0		0,5		8,5
21.05.97													
04.06.97													
18.06.97	29		0,20		0,1		3,0		3,0		1,0		5,0
02.07.97													
16.07.97	9		0,10		0,3		2,0		3,0		0,5		7,0
30.07.97													
13.08.97													
27.08.97	6		0,10		0,1		2,5		0,5		0,5		3,0
10.09.97													
24.09.97	10		0,10		0,1		2,5		1,5		0,5		9,0
08.10.97													
15.10.97	7		0,10		0,1		3,5		1,0		0,5		3,5

Tisza at Tiszasziget left bank rkm 162.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
05.11.97													
19.11.97	5		0,10		0,1		5,5		0,5		0,5		2,5
03.12.97	11		0,10		0,1		8,0		2,5		0,5		3,0
17.12.97													

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
10.04.95	480,000	7,6	7,76	201	12,33	103,1	1,0	1,4	4	0,02	0,004	1,15	1,18	0,03	1,21	62	110
24.04.95	732,000	10,0	8,00	161	11,30	100,3	4,0	6,9	20	0,04	0,018	1,05	1,10	0,28	1,38	48	68
08.05.95	511,000	10,3	7,82	234	10,32	92,2	1,0	1,3	4	0,01	0,016	0,90	0,92	0,07	0,99	271	310
22.05.95	474,000	13,2	7,81	174	10,65	101,9	1,8	2,3	10	0,05	0,005	0,70	0,76	0,33	1,09	51	74
06.06.95	243,000	17,5	7,81	181	10,12	106,5	1,1	1,3	5	0,00	0,001	0,58	0,58	0,03	0,61	49	81
19.06.95	139,000	11,3	7,87	224	10,30	94,3	2,1	2,4	9	0,10	0,014	0,72	0,83	0,06	0,89	46	60
03.07.95	190,000	21,0	7,96	248	10,20	115,4	0,8	1,1	3	0,00	0,006	0,88	0,89	0,00	0,89	31	140
17.07.95	118,000	21,9	7,84	244	7,98	91,9	0,8	1,3	3	0,02	0,006	0,68	0,71	0,01	0,72	14	55
31.07.95	63,200	24,7	8,08	319	8,90	108,2	0,2	0,3	1	0,01	0,004	0,58	0,60	0,01	0,61	29	32
14.08.95	51,000	24,4	8,30	371	7,72	93,3	1,5	1,9	5	0,02	0,015	0,09	0,13	0,01	0,14	27	120
28.08.95	78,900	18,2	8,19	374	10,51	112,2	0,9	1,2	4	0,09	0,006	0,51	0,60	0,01	0,61	45	46
11.09.95	183,000	15,3	7,96	272	11,00	110,4	6,1	9,4	30	0,00	0,011	0,67	0,68	0,08	0,76	40	42
25.09.95	104,000	10,2	8,35	268	10,09	90,0	2,4	3,4	11	0,01	0,008	0,05	0,07	0,00	0,07	10	14
09.10.95	104,000	13,6	7,78	285	10,30	99,5	2,8	3,4	9	0,00	0,012	0,74	0,75	0,03	0,78	12	14
24.10.95	53,600	7,4	7,96	303	11,76	97,8	2,0	2,6	6	0,04	0,003	0,65	0,69	0,02	0,71	16	19
06.11.95	112,000	3,0	7,93	302	12,99	96,3	2,0	2,5	6	0,01	0,011	0,80	0,81	0,03	0,84	16	19
20.11.95	732,000	2,7	7,83	182	11,58	85,1	6,0	10,4	28	0,05	0,011	1,16	1,22	0,02	1,24	140	142
04.12.95	153,000	1,5	8,03	285	13,19	93,8	2,0	2,4	6	0,01	0,003	1,01	1,02	0,03	1,05	40	45
18.12.95	81,300	0,4	8,00	284	13,10	90,4	0,8	1,0	2	0,01	0,004	1,06	1,08	0,02	1,10	25	30
02.01.96	370,000	1,4	7,89	342	11,58	82,2	6,4	10,9	30	0,00	0,006	1,15	1,16	0,02	1,18	77	80
15.01.96	205,000	1,0	8,04	355	12,74	89,4	3,2	4,5	10	0,10	0,012	1,13	1,24	0,02	1,26	11	20
29.01.96	110,000	0,0	7,90	339	13,80	94,2	0,1	0,2	1	0,00	0,003	1,43	1,43	0,05	1,48	29	30
12.02.96	70,600	0,0	7,96	394	14,40	98,3	1,0	1,6	5	0,03	0,005	1,24	1,28	0,04	1,32	12	55
26.02.96	68,500	0,3	7,85	312	12,60	86,7	0,5	0,6	2	0,00	0,008	1,13	1,14	0,04	1,18	64	110
11.03.96	58,900	0,3	8,06	359	14,70	101,2	0,1	0,2	1	0,01	0,010	0,75	0,77	0,02	0,79	149	170
25.03.96	125,000	3,0	7,74	265	12,70	94,1	1,0	1,3	3	0,01	0,010	1,10	1,12	0,08	1,20	31	34
09.04.96	229,000	3,5	7,76	198	11,60	87,1	1,4	1,8	4	0,01	0,010	0,91	0,93	0,03	0,96	155	190
22.04.96	285,000	9,4	7,86	187	10,20	89,2	1,6	1,9	6	0,01	0,007	0,66	0,67	0,26	0,93	22	42
06.05.96	268,000	9,5	7,83	200	10,00	87,6	0,9	1,4	4	0,02	0,006	0,51	0,54	0,08	0,62	25	227
20.05.96	161,000	16,5	7,80	274	9,20	94,8	0,8	1,2	3	0,04	0,005	0,19	0,23	0,05	0,28	18	186
03.06.96	89,600	17,2	8,37	275	8,40	87,8	1,1	1,4	4	0,09	0,015	0,64	0,74	0,05	0,79	25	74
17.06.96	68,500	12,4	7,94	263	7,94	74,6	1,2	1,6	4	0,09	0,009	0,79	0,89	0,08	0,97	84	108
01.07.96	73,700	17,0	8,16	262	8,79	91,5	1,9	2,2	5	0,06	0,060	0,70	0,83	0,09	0,92	40	71

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
15.07.96	60,300	20,4	8,25	308	9,50	106,2	1,1	1,4	4	0,02	0,004	0,66	0,68	0,11	0,79	12	59
29.07.96	99,900	22,5	8,18	287	9,79	114,1	1,3	1,9	3	0,02	0,011	0,64	0,67	0,10	0,77	27	47
12.08.96	60,500	17,9	8,05	297	10,20	108,2	0,9	1,0	3	0,05	0,003	0,34	0,39	0,13	0,52	22	30
26.08.96	69,300	18,6	7,85	309	10,40	112,0	1,2	1,8	5	0,04	0,006	0,27	0,32	0,05	0,37	33	45
09.09.96	583,000	14,3	7,77	204	8,97	88,0	5,1	8,3	20	0,06	0,020	0,85	0,93	0,09	1,02	147	162
23.09.96	188,000	13,5	7,90	278	9,28	89,4	1,4	1,8	4	0,02	0,008	0,10	0,12	0,40	0,52	31	44
07.10.96	121,000	8,6	7,70	279	9,78	83,8	0,5	0,7	2	0,01	0,004	0,48	0,49	0,07	0,56	25	38
21.10.96	367,000	10,1	7,91	197	10,03	89,2	2,8	3,8	7	0,02	0,013	0,73	0,76	0,05	0,81	31	39
04.11.96	159,000	14,1	7,80	251	11,20	109,4	0,4	0,6	2	0,02	0,003	0,71	0,73	0,10	0,83	40	61
18.11.96	87,100	9,9	7,94	263	11,70	103,6	0,4	0,6	2	0,01	0,006	0,71	0,72	0,04	0,76	25	39
02.12.96	175,000	4,2	7,66	250	12,68	97,1	0,4	0,6	2	0,02	0,010	0,69	0,72	0,04	0,76	127	188
16.12.96	239,000	4,1	7,89	203	13,02	99,4	1,9	2,2	5	0,01	0,011	1,00	1,02	0,38	1,40	22	38
29.12.96	288,000	0,0	7,94	393	13,91	94,9	1,4	0,5	2	0,09	0,005	1,29	1,38			42	
06.01.97	381,000	0,0	7,54	260	13,30	90,8	2,0	2,9	9	0,03	0,007	0,86	0,90	0,04	0,94	27	32
20.01.97	90,500	0,1	7,91	319	13,14	89,9	0,4	0,5	2	0,02	0,002	1,15	1,18	0,05	1,23	23	40
03.02.97	72,400	0,1	7,99	295	16,10	110,2	0,6	0,9	2	0,37	0,000	0,85	1,22	0,04	1,26	10	10
17.02.97	191,000	0,2	7,66	209	13,84	95,0	0,6	1,0	2	0,02	0,008	1,48	1,50	0,16	1,66	51	69
03.03.97	247,000	2,0	7,72	215	12,84	92,6	0,4	0,6	2	0,01	0,007	1,67	1,68	0,05	1,73	35	46
17.03.97	231,000	2,7	7,75	233	11,46	84,3	0,9	1,1	3	0,00	0,010	1,14	1,15	0,04	1,19	31	48
01.04.97	367,000	3,9	7,77	252	11,90	90,4	1,7	1,9	5	0,01	0,005	0,77	0,79	0,02	0,81	22	34
14.04.97	142,000	3,0	8,03	238	13,19	97,8	0,7	0,8	2	0,01	0,002	0,80	0,81	0,03	0,84	29	35
28.04.97	249,000	10,2	7,70	218	10,75	95,8	5,5	6,1	15	0,02	0,006	0,65	0,68	0,02	0,70	27	32
12.05.97	588,000	17,0	7,72	165	11,86	123,5	3,0	3,4	8	0,01	0,011	0,08	0,10	0,51	0,61	408	511
26.05.97	414,000	16,8	7,76	185	10,27	106,5	1,8	2,2	5	0,04	0,005	0,04	0,09	0,01	0,10	62	77
09.06.97	617,000	17,5	7,44	205	10,17	107,0	10,6	14,1	30	0,27	0,038	0,61	0,92	0,02	0,94	33	43
23.06.97	205,000	19,2	7,67	245	8,41	91,7	1,4	1,6	3	0,02	0,006	0,59	0,62	0,02	0,64	18	25
07.07.97	165,000	19,0	7,93	254	10,30	111,8	3,0	4,0	10	0,02	0,033	0,55	0,60	0,03	0,63	40	55
21.07.97	191,000	16,2	7,97	231	13,65	139,7	2,1	3,1	8	0,04	0,015	0,61	0,67	0,02	0,69	70	82
04.08.97	161,000	19,9	7,93	260	14,60	161,5	3,0	4,3	12	0,02	0,005	0,67	0,70	0,02	0,72	71	89
18.08.97	75,000	22,4	7,83	319	12,07	140,4	1,3	1,8	4	0,05	0,015	0,64	0,70	0,04	0,74	103	152
01.09.97	197,000	18,6	7,78	276	12,78	137,6	1,6	2,0	6	0,02	0,004	0,49	0,51	0,04	0,55	16	20
15.09.97	197,000	13,2	7,75	268	15,18	145,3	3,6	4,6	12	0,05	0,012	0,53	0,59	0,03	0,62	127	162
29.09.97	81,400	12,4	7,96	291	18,02	169,3	0,4	0,6	3	0,47	0,004	0,40	0,88	0,05	0,93	25	32

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
13.10.97	265,000	10,1	7,60	208	8,61	76,6	1,7	2,1	6	0,10	0,007	0,51	0,62	0,10	0,72	33	54
27.10.97	101,000	4,5	7,98	282	12,66	97,7	0,4	0,5	2	0,04	0,007	0,49	0,54	0,15	0,69	35	51
10.11.97	69,900	7,9	7,93	289	8,95	75,4	1,9	2,2	5	0,08	0,005	0,44	0,53	0,11	0,64	44	61
24.11.97	93,200	5,1	7,90	290	14,90	116,8	1,6	2,0	5	0,09	0,007	0,35	0,45	0,17	0,62	29	36
08.12.97	104,000	2,4	7,72	293	13,21	96,3	1,2	1,8	4	0,21	0,003	0,42	0,63	0,19	0,82	7	31
18.12.97	80,100	0,2	7,71	315	16,14	110,8	1,1	1,4	4	0,07	0,017	0,32	0,41	0,11	0,52	29	39

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
03.01.94		0	0	12	32,1	15,1	11,5	0,1	0,10	0,08		0,05	200								0
17.01.94		0	0	20																	
31.01.94		0	0	0	37,5	8,5	12,3	1,7	0,54			0,23	460								0
14.02.94		0	0	12																	
28.02.94		60	0	22	47,9	3,5	15,4	1,3	2,30			0,09	780						0		
16.03.94			0	24																	
28.03.94				21																	
11.04.94		0	0	18	34,3	3,5	9,6	1,6		0,06		0,04	309		0,3						0
25.04.94			0	10																	
09.05.94		0	0	14	24,2	9,5	9,5	0,8		0,00		0,09	205								0
24.05.94				13																	
06.06.94		0	0	6	34,3	6,9	8,6	1,5		0,11		0,01	97		0,1				0		0
20.06.94				4																	
04.07.94		0	0	6	38,7	2,6	13,6	2,4		0,14		0,02	384								100
18.07.94				10																	
01.08.94		0	0	5	52,9	8,8	14,8	2,5		0,20		0,04	123								0
15.08.94		0	0	8	40,1	3,5	9,0	4,4		0,24		0,01									
29.08.94		0	0	11	45,7	12,0	19,9	3,4		0,19		0,07									
12.09.94				14			18,2	2,5					100								0
26.09.94		0	0	8	44,3	9,2	14,8	2,6		0,34		0,03							0		
10.10.94		0	0	19	21,4	6,8	8,4	1,6		0,27		0,00	2606								100
24.10.94				17																	
07.11.94		0	0	10	40,1	7,8	15,2	1,1		0,08		0,17	147				640				10
21.11.94			0	11																	
05.12.94		0	1	17	88,6	8,5	17,2	2,1		0,19		0,02	189		0,0						
19.12.94				10																	
02.01.95		0	0	38	28,7	5,2	8,2	1,3		0,10		0,24									70
16.01.95				85																	
30.01.95				85																	
13.02.95		0	0	40	30,5	6,4	10,0	3,9		0,10		0,01									0
27.02.95				29																	
13.03.95				9			11,1	1,8													
27.03.95		0	5	34	33,5	3,6	9,9	2,0		2,34		0,04	2080		0,0						50

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
10.04.95				20																	
24.04.95		0	1	22	21,3	10,1	6,7	0,8		0,28				327							
08.05.95				16																	
22.05.95		0	0	77	32,7	1,9	8,0	0,2		0,21		0,32		100	3,0						
06.06.95				175																	
19.06.95		0	0	76	44,8	7,7	10,5	2,6		0,11		0,26		192			1120		0		
03.07.95				117			7,6	2,4													
17.07.95		0	0	49	34,3	5,2	12,4	2,6		0,03		0,12		34							
31.07.95				40			17,2	2,8													
14.08.95		0	0	16	31,5	8,7	16,3	2,2		0,04		0,10		72	0,0						
28.08.95			1	34																	
11.09.95		0	0	22	31,5	3,5	18,2	3,0		0,36		0,07		86	1,0						
25.09.95			0	30																	
09.10.95		0	0	44	31,4	3,5	13,4	1,8		0,30		0,05		20	1,0						
24.10.95			0	17																	
06.11.95		0	0	10	32,9	5,2	12,3	3,6		0,10		0,00		81							
20.11.95			0	10																	
04.12.95		0	0	26	32,9	3,5	12,1	2,0		0,18		0,01		20	2,0		470		0		
18.12.95			0	12			15,5	2,7													
02.01.96			0	10																	
15.01.96		0	0	14	31,5	5,2	11,5	2,5		0,43		0,12		65							
29.01.96			0	13																	
12.02.96		0	0	11	48,7	1,7	18,2	2,5		0,06		0,02		12							
26.02.96			0	17																	
11.03.96			0	100	38,6	6,9	21,8	1,2		0,10		0,02		35		5,2	290		0		
25.03.96				19			14,0	2,9													
09.04.96				18			9,2	2,3													
22.04.96			0	13	28,6	2,6	8,7	2,1		0,20		0,05		49		8,0					
06.05.96				9			9,5	2,1													
20.05.96			0	38	31,5	6,9	10,0	2,9		0,06		0,06		79		12,0					
03.06.96				11			12,1	2,7													
17.06.96			0	18	35,8	13,0	12,0	2,3		0,30		0,08		131			200		0		
01.07.96			0	20	42,9	8,7	19,3	3,7		0,06		0,02		11							

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
15.07.96				20																	
29.07.96				29																	
12.08.96			0	46	40,1	12,1	15,6	2,6		0,07		0,02		123							
26.08.96				18																	
09.09.96			0	30	28,7	7,0	7,6	3,0		0,03		0,01		688		14,0					
23.09.96			0	28																	
07.10.96			0	20	32,9	5,2	17,9	2,1		0,10		0,01		60							
21.10.96			0	39		2,9	9,7	2,9													
04.11.96			0	16	35,2	8,7	12,0	2,4		0,06		0,01		45		2,1	600		0		
18.11.96			0	16			13,9	2,6													
02.12.96			0	20	34,3	5,2	12,5	2,8		0,11		0,02		55							
16.12.96			0	8			9,3	2,6													
29.12.96																					
06.01.97			0	4	30,1	19,9	12,4	1,6		0,28		0,00		48		45,0					
20.01.97			0	3			16,1	1,6													
03.02.97			0	5	41,5	20,7	17,8	2,6		0,05		0,03		56							
17.02.97			0	4			11,0	2,8													
03.03.97			0	6	32,9	3,5	10,5	2,1	1,19	0,34	0,25	0,14		31							
17.03.97			0	4													1000		0		
01.04.97			0	3	28,6	6,1	10,9	2,1	1,20	0,40	0,22	0,10		47							
14.04.97			0	4			10,5	2,2													
28.04.97			0	10			9,1	2,2													
12.05.97			0	24	22,9	3,5	7,3	2,0		0,28		0,17		300		28,0					
26.05.97			0	11			7,6	0,8													
09.06.97			0	8	24,3	2,6	8,2	2,0	0,39	0,29	0,20	0,15		660							
23.06.97			0	4			9,9	2,2											0		
07.07.97			0	7	21,4	3,5	10,7	2,4	1,00	0,31	0,16	0,10		5		1,0					
21.07.97			0	10			9,8	2,4													
04.08.97			0	8	24,3	3,5	11,0	3,2		0,22		0,11									
18.08.97			0	16			22,2	3,6						92							
01.09.97			0	7	31,4	3,5	12,3	2,0		0,16		0,00		137							
15.09.97			0	14			14,6	2,2											0		
29.09.97			0	9			15,6	2,1													

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
13.10.97			0	16	42,9	10,4	8,9	1,9	3,14	0,33	0,90	0,15		88							
27.10.97				16			13,8	2,3													
10.11.97			0	17	38,6	16,5	15,7	2,6	0,31	0,06	0,12	0,05		220		0,2					
24.11.97				14			13,7	2,3													
08.12.97			0	19	35,8	8,7	14,9	2,4	0,34	0,08	0,06	0,01		12					0		
18.12.97				17			13,7	2,6													

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
03.01.94				0,2		0,2		0,7		0,1		1,5	
17.01.94		0,00											
31.01.94				0,6		0,3		1,6		3,2		1,7	
14.02.94		0,00											
28.02.94													
16.03.94													
28.03.94		0,00											
11.04.94		0,00		1,6		0,2		0,2		4,4		1,5	
25.04.94													
09.05.94		0,00		0,1		1,0		0,3		0,1		2,1	
24.05.94													
06.06.94		0,00		0,0		0,1		0,0		0,0		3,8	
20.06.94													
04.07.94		0,00		0,0		3,0		5,4		6,3		10,7	
18.07.94													
01.08.94		15,20		0,0		0,0		0,6		0,0		2,8	
15.08.94													
29.08.94													
12.09.94				0,0		0,1		0,7		0,0		1,5	
26.09.94													
10.10.94				0,3		0,4		5,3		15,6		12,6	
24.10.94													
07.11.94				0,1		0,4		0,0		0,0		0,2	
21.11.94													
05.12.94		0,00		0,0				0,2				5,1	
19.12.94													
02.01.95				0,0		1,3		2,2		5,0		7,9	
16.01.95													
30.01.95													
13.02.95				0,0		2,0		0,1		0,0		2,2	
27.02.95		1,00											
13.03.95													
27.03.95		1,00		0,0		2,5		2,3		2,0		1,8	

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
10.04.95													
24.04.95	720	1,00			0,4		3,2		7,3		16,0		3,8
08.05.95													
22.05.95	120	12,00			0,0		0,3		3,2		3,0		2,6
06.06.95													
19.06.95	50	1,00			0,3		10,5		5,1		11,0		4,6
03.07.95													
17.07.95	280	14,00			0,4		2,5		8,6		1,0		17,0
31.07.95													
14.08.95	310	17,00					2,2		8,3		1,0		7,5
28.08.95													
11.09.95	40	3,00			0,2		7,8		1,8		1,0		3,7
25.09.95													
09.10.95	39	4,00			0,2		10,0		2,3		1,0		2,3
24.10.95													
06.11.95	56	5,00			0,3		0,2		1,7		2,0		2,2
20.11.95													
04.12.95	104	12,00			0,1		0,8		1,1		1,0		0,5
18.12.95													
02.01.96													
15.01.96	81				0,2		2,4		2,4		1,4		2,1
29.01.96													
12.02.96	90				0,2		0,5		3,1		1,0		2,2
26.02.96													
11.03.96	130				2,0		1,4		0,9		5,0		2,7
25.03.96													
09.04.96													
22.04.96	25				0,1		0,4		1,9		10,0		2,9
06.05.96													
20.05.96	5				0,0		0,3		1,3		5,0		1,8
03.06.96													
17.06.96	45				0,8		0,5		1,3		1,0		2,3
01.07.96	88				0,3		7,6		2,4		1,0		3,3

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
15.07.96													
29.07.96													
12.08.96	24				0,7		1,6		2,0		6,0		3,5
26.08.96													
09.09.96	50				0,2		0,5		40,2		2,0		12,3
23.09.96													
07.10.96	46				0,3		0,2		5,7		5,0		2,6
21.10.96													
04.11.96	22				1,7		0,8		2,2		18,0		3,2
18.11.96													
02.12.96	104				0,4		0,7		2,9		3,0		4,9
16.12.96													
29.12.96													
06.01.97	43				0,4		1,2		6,2		1,0		2,6
20.01.97													
03.02.97	35				0,2		0,8		4,0		3,0		1,5
17.02.97													
03.03.97	27				0,7		1,5		1,5		6,0		1,7
17.03.97													
01.04.97	100		1,70		0,4		0,8		1,3		1,0		2,3
14.04.97													
28.04.97													
12.05.97	58		0,58		0,7		0,3		2,6		1,0		4,0
26.05.97													
09.06.97	35		0,30		0,2		1,8		3,1		3,0		5,2
23.06.97													
07.07.97	4		0,40		0,4		0,2		1,0		1,0		0,4
21.07.97													
04.08.97													
18.08.97	53		0,90		0,2		0,8		7,7		3,0		2,7
01.09.97	29		0,90		0,1		6,0		7,7		3,0		6,0
15.09.97													
29.09.97													

Tisza at Tiszabecs rkm 757.0
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
13.10.97	32		0,30		0,5		0,3		1,8		2,0		3,3
27.10.97													
10.11.97	53		0,50		0,2		0,4		1,1		4,0		4,8
24.11.97													
08.12.97	36		0,30		0,2		0,3		1,0		1,0		2,4
18.12.97													

Tisza at Tiszasziget middle, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
12.01.94	1255,000	3,4	7,95	384	12,30	92,2	1,5	2,9	12	0,26	0,027	1,72	2,01	0,82	2,83	59	170
26.01.94	733,000	3,2	8,18	395	12,30	91,7	1,6	2,8	9	0,26	0,030	1,51	1,81	0,70	2,51	68	120
09.02.94	1205,000	3,6	8,02	415	11,70	88,1	2,6	3,9	11	0,29	0,034	1,65	1,97	0,57	2,54	68	110
09.03.94	1285,000	6,8	8,04	377	11,00	90,1	3,5	4,4	14	0,08	0,034	1,97	2,08	0,73	2,81	49	90
23.03.94	1455,000	5,8	8,01	280	9,90	79,0	1,2	3,7	11	0,08	0,023	1,56	1,66	0,70	2,36	39	220
06.04.94	1145,000	9,4	7,99	305	10,40	90,9	2,0	3,1	9	0,09	0,032	1,54	1,65	0,80	2,45	59	150
20.04.94	1785,000	12,1	8,02	304	8,30	77,4	1,3	2,9	12	0,08	0,028	1,76	1,87	0,94	2,81	39	150
04.05.94	1420,000	15,4	8,02	310	7,80	78,4	2,4	3,6	12	0,08	0,017	0,99	1,09	1,00	2,09	49	150
18.05.94	749,000	19,4	8,06	376	8,70	95,3	2,4	3,4	17	0,08	0,014	1,40	1,49	0,40	1,89	117	120
15.06.94	997,000	18,6	8,00	314	6,40	68,9	2,4	4,5	17	0,09	0,037	1,20	1,33	0,26	1,59	68	260
29.06.94	535,000	25,2	8,14	407	6,60	81,0	1,4	3,8	19	0,04	0,023	1,45	1,51	0,30	1,81	88	260
13.07.94	277,000	24,4	8,35	409	9,60	116,1	2,1	4,6	26	0,10	0,014	0,81	0,93	0,44	1,37	23	60
27.07.94	239,000	26,6	7,95	459	6,60	83,2	1,3	3,9	28	0,09	0,012	0,52	0,62	0,24	0,86	29	110
10.08.94	214,000	28,2	8,33	557	6,00	78,0	3,5	4,3	34	0,02	0,026	0,29	0,34	0,30	0,64	91	130
24.08.94	217,000	25,6	8,25	496	6,60	81,7	2,5	3,4	26	0,08	0,019	0,36	0,46	0,30	0,76	91	180
07.09.94	247,000	23,9	8,14	565	6,30	75,4	2,2	4,2	33	0,03	0,015	0,52	0,57	0,50	1,07	205	370
21.09.94	224,000	19,6	7,99	552	5,70	62,7	3,6	4,4	33	0,08	0,014	0,50	0,59	0,30	0,89	29	330
05.10.94	268,000	18,5	7,97	468	7,00	75,2	2,9	4,6	23	0,15	0,020	0,79	0,96	0,28	1,24	72	120
19.10.94	406,000	11,2	8,27	485	10,00	91,3	2,3	3,8	24	0,06	0,015	1,42	1,50	0,21	1,71	68	470
02.11.94	665,000	11,4	8,16	447	9,20	84,4	2,2	3,3	22	0,11	0,032	1,49	1,63	0,32	1,95	137	160
16.11.94	352,000	8,4	8,19	440	6,60	56,3	2,0	3,5	21	0,12	0,025	1,70	1,84	0,32	2,16	85	240
01.12.94	420,000	5,0	8,19	438	11,00	86,0	1,8	2,9	20	0,16	0,031	1,99	2,18	0,20	2,38	78	100
14.12.94	354,000	4,4	8,11	466	11,50	88,5	2,0	2,6	20	0,28	0,045	2,06	2,38	0,25	2,63	121	150
22.02.95	1325,000	6,3	8,15	334	11,70	94,6	2,1	3,8	12	0,16	0,027	1,88	2,07	0,65	2,72	59	130
08.03.95	1700,000	7,3	7,91	270	10,30	85,5	1,2	6,1	20	0,06	0,024	1,24	1,33	0,81	2,14	49	260
22.03.95	774,000	7,0	7,96	350	10,80	88,9	1,5	3,8	15	0,05	0,021	1,65	1,72	0,97	2,69	49	220
12.04.95	1215,000	8,6	7,87	316	10,20	87,4	1,4	3,2	13	0,05	0,012	1,40	1,46	0,62	2,08	46	160
26.04.95	1295,000	13,2	7,96	394	9,90	94,7	2,3	2,9	10	0,05	0,009	1,29	1,34	0,37	1,71	39	90
10.05.95	1850,000	14,9	7,77	244	8,00	79,6	1,6	3,6	11	0,06	0,015	1,11	1,18	0,38	1,56	52	100
24.05.95	1450,000	15,2	7,73	270	8,40	84,1	1,2	3,9	13	0,08	0,012	0,75	0,84	0,37	1,21	68	70
14.06.95	1035,000	21,4	7,83	352	7,50	85,5	1,5	5,2	21	0,03	0,027	1,04	1,10	0,34	1,44	68	280
28.06.95	923,000	21,2	7,76	368	6,70	76,1	1,0	5,8	22	0,08	0,040	1,27	1,38	0,33	1,71	111	140
12.07.95	679,000	25,1	7,81	364	7,50	91,9	2,8	5,3	20	0,04	0,015	1,36	1,41	0,39	1,80	104	281

Tisza at Tiszasziget middle, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
26.07.95	335,000	26,7	8,04	406	8,70	109,9	2,8	3,7	19	0,03	0,012	1,18	1,22	0,21	1,43	39	170
09.08.95	263,000	25,5	7,76	412	7,10	87,7	5,6	6,0	26	0,06	0,006	0,27	0,34	0,34	0,68	49	90
23.08.95	236,000	24,6	7,74	432	6,60	80,1	4,5	4,8	27	0,01	0,021	0,47	0,50	0,30	0,80	20	90
06.09.95	447,000	19,1	8,08	430	8,40	91,4	2,2	4,3	24	0,04	0,030	0,77	0,84	0,37	1,21	82	90
13.09.95	642,000	18,9	7,86	414	7,30	79,1	1,4	3,8	19	0,04	0,024	1,38	1,44	0,33	1,77	88	140
27.09.95	453,000	17,2	7,92	428	8,20	85,7	1,2	3,6	19	0,05	0,015	1,51	1,58	0,38	1,96	91	130
11.10.95	480,000	15,7	7,89	434	8,70	88,1	1,1	3,1	19	0,02	0,027	1,54	1,59	0,25	1,84	91	180
25.10.95	390,000	12,2	7,74	440	8,70	81,3	1,2	3,0	18	0,05	0,024	1,51	1,59	0,31	1,90	121	260
08.11.95	573,000	6,6	8,07	432	10,20	83,1	1,4	3,3	17	0,08	0,009	1,11	1,19	0,32	1,51	88	170
22.11.95	1705,000	4,5	7,76	400	9,90	76,4	3,2	3,0	9	0,29	0,061	1,27	1,61	0,31	1,92	49	110
06.12.95	705,000	2,5	7,77	348	12,20	89,2	2,4	3,6	16	0,26	0,024	1,51	1,79	0,43	2,22	78	110
13.12.95	572,000	2,4	7,87	416	11,60	84,6	2,0	2,9	13	0,46	0,043	1,63	2,13	0,34	2,47	88	130
18.12.95	507,000	2,1	7,81	418	11,40	82,5	1,9	3,4	16	0,34	0,040	1,11	1,49	0,37	1,86	68	100
10.01.96	2290,000	1,4	7,57	286	10,60	75,2	1,7	6,1	19	0,27	0,018	1,31	1,60	0,31	1,91	39	320
24.01.96	922,000	0,2	7,63	412	12,60	86,5	2,7	4,2	21	0,36	0,024	1,88	2,26	0,31	2,57	72	180
08.02.96	601,000	0,0	7,68	510	11,80	80,5	2,4	2,8	20	0,63	0,024	1,85	2,51	0,30	2,81	59	160
21.02.96	603,000	1,6	7,66	510	12,00	85,6	2,3	2,4	18	0,64	0,058	1,88	2,57	0,27	2,84	91	120
06.03.96	510,000	1,3	7,56	570	11,90	84,2	3,0	3,1	22	0,57	0,097	1,94	2,62	0,28	2,90	91	140
20.03.96	1050,000	5,2	7,53	488	12,00	94,3	3,9	5,8	25	0,34	0,033	2,06	2,43	0,35	2,78	59	130
03.04.96	1120,000	6,4	7,59	468	10,60	85,9	2,1	6,9	26	0,19	0,046	2,60	2,84	0,33	3,17	101	180
17.04.96	1040,000	8,7	7,93	390	9,70	83,4	1,8	4,8	19	0,09	0,043	2,01	2,14	0,22	2,36	82	380
29.04.96	1180,000	15,2	8,05	352	8,60	86,1	1,9	4,3	17	0,03	0,018	1,65	1,70	0,25	1,95	68	160
15.05.96	1100,000	18,5	7,90	334	7,70	82,7	1,5	4,4	17	0,09	0,030	1,06	1,18	1,07	2,25	82	190
29.05.96	712,000	19,5	7,97	360	7,00	76,8	1,2	5,3	21	0,02	0,021	1,70	1,74	0,26	2,00	82	400
12.06.96	364,000	26,6	8,12	466	7,80	98,4	2,3	4,1	21	0,05	0,018	1,47	1,53	0,40	1,93	98	260
26.06.96	351,000	22,6	7,94	444	8,20	95,7	3,0	4,7	23	0,00	0,001	0,88	0,88	0,35	1,23	29	170
10.07.96	359,000	24,0	8,19	474	7,60	91,2	1,3	4,0	22	0,02	0,009	1,27	1,30	0,21	1,51	91	160
24.07.96	283,000	23,4	8,14	418	7,90	93,7	4,2	4,3	24	0,01	0,030	0,86	0,90	0,27	1,17	20	160
07.08.96	353,000	23,9	8,00	490	7,20	86,2	3,7	5,2	29	0,02	0,006	0,52	0,55	0,34	0,89	68	250
21.08.96	414,000	22,6	7,83	476	6,60	77,1	4,6	6,7	25	0,06	0,013	0,79	0,87	0,30	1,17	91	270
04.09.96	351,000	22,2	8,20	464	7,20	83,4	1,1	3,9	21	0,05	0,015	1,08	1,15	0,43	1,58	101	220
18.09.96	1040,000	14,2	7,97	404	7,70	75,4	2,1	7,3	28	0,07	0,018	0,90	0,99	0,24	1,23	68	430
02.10.96	1370,000	12,9	8,09	320	8,40	79,8	1,7	6,3	21	0,05	0,030	1,40	1,48	0,29	1,77	59	380

Tisza at Tiszasziget middle, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
16.10.96	380,000	14,2	8,16	430	8,70	85,2	1,3	4,0	19	0,11	0,018	1,02	1,14	0,25	1,39	199	216
30.10.96	984,000	10,2	8,10	334	8,70	77,6	1,5	6,0	14	0,06	0,027	1,15	1,24	0,30	1,54	59	210
06.11.96	783,000	9,6	8,04	408	9,30	81,7	1,4	3,5	17	0,07	0,012	1,15	1,23	0,48	1,71	82	180
20.11.96	424,000	9,9	7,85	476	9,90	87,6	1,5	3,1	18	0,09	0,018	1,42	1,54	0,20	1,74	91	180
04.12.96	825,000	5,2	7,94	428	10,20	80,2	1,7	3,8	17	0,20	0,027	1,36	1,59	0,24	1,83	49	150
16.12.96	682,000	4,8	7,83	376	11,00	85,5	1,5	3,8	14	0,10	0,055	1,74	1,90	0,20	2,10	52	110
07.01.97	1170,000	0,2	7,85	425	12,30	84,4	6,4	7,5	26	0,33	0,024	1,70	2,05	0,35	2,40	58	480
22.01.97	736,000	0,5	7,87	468	11,90	82,4	2,1	3,7	19	0,33	0,024	1,81	2,17	0,22	2,39	72	360
05.02.97	505,000	0,8	8,00	550	12,30	85,8	2,3	2,0	19	0,41	0,021	1,97	2,40	0,30	2,70	65	110
19.02.97	1270,000	1,4	7,92	510	11,60	82,3	3,0	5,2	25	0,44	0,027	2,15	2,61	0,37	2,98	95	210
05.03.97	1580,000	4,8	7,87	360	10,50	81,7	3,0	11,3	33	0,15	0,024	2,42	2,59	0,41	3,00	16	560
19.03.97	814,000	6,9	8,08	440	10,60	87,1	2,0	3,5	17	0,09	0,015	1,99	2,10	0,23	2,33	85	320
02.04.97	633,000	6,9	8,12	488	11,30	92,8	2,2	3,1	19	0,05	0,015	1,85	1,92	0,28	2,20	68	170
16.04.97	729,000	8,4	8,15	400	11,00	93,8	2,2	3,1	13	0,05	0,009	1,29	1,35	0,33	1,68	49	180
28.04.97	2330,000	10,1	7,95	356	9,30	82,7	2,6	10,4	30	0,16	0,033	2,21	2,40	0,39	2,79	49	460
13.05.97	1950,000	15,6	8,05	276	8,20	82,8	1,6	5,5	22	0,04	0,018	1,42	1,48	0,21	1,69	59	700
21.05.97	1360,000	19,6	7,92	294	6,60	72,6	1,7	4,1	16	0,16	0,027	1,06	1,25	0,27	1,52	68	230
04.06.97	1120,000	15,9	8,04	312	8,30	84,4	0,4	3,4	14	0,07	0,015	0,97	1,06	0,25	1,31	36	80
18.06.97	1210,000	21,4	7,89	310	6,40	73,0	1,5	5,2	18	0,04	0,021	0,97	1,03	0,35	1,38	78	130
02.07.97	811,000	23,6	8,00	368	6,50	77,4	1,4	5,0	21	0,04	0,009	1,38	1,43	0,32	1,75	68	170
16.07.97	922,000	22,6	8,03	378	6,70	78,2	0,7	5,5	20	0,05	0,012	1,47	1,53	0,26	1,79	68	180
30.07.97	1290,000	20,8	7,80	348	7,10	80,0	1,1	5,1	21	0,05	0,018	1,20	1,26	0,57	1,83	95	140
13.08.97	1070,000	21,8	8,11	360	6,90	79,3	1,2	7,0	21	0,02	0,009	1,58	1,61	0,24	1,85	85	300
27.08.97	460,000	23,0	8,17	446	7,40	87,1	1,9	3,8	20	0,04	0,024	1,56	1,62	0,24	1,86	85	120
10.09.97	711,000	21,1	8,13	452	7,30	82,7	1,0	5,9	24	0,04	0,018	1,29	1,35	0,21	1,56	65	110
24.09.97	579,000	15,2	8,07	404	8,10	81,1	1,0	4,5	20	0,07	0,015	1,29	1,37	0,22	1,59	101	120
08.10.97	841,000	15,2	8,13	466	8,60	86,1	1,3	3,5	18	0,05	0,009	1,49	1,55	0,26	1,81	62	150
15.10.97	840,000	13,2	8,03	430	8,90	85,2	1,4	4,4	22	0,05	0,012	1,60	1,67	0,26	1,93	59	150
05.11.97	567,000	5,0	8,18	428	11,50	89,9	2,6	3,5	18	0,08	0,009	0,97	1,06	0,27	1,33	29	140
19.11.97	775,000	6,8	8,03	538	10,00	81,9	1,7	2,9	20	0,14	0,030	1,63	1,80	0,22	2,02	104	310
03.12.97	743,000	5,9	7,94	422	11,10	88,8	1,6	2,7	15	0,13	0,009	1,45	1,59	0,23	1,82	101	140
17.12.97	953,000	3,3	7,92	428	11,60	86,7	2,3	3,8	20	0,12	0,018	1,22	1,36	0,22	1,58	52	230

Tisza at Tiszasziget middle, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
12.01.94	2,4	0	1	29	42,1	7,3	22,1	2,7		0,25		0,03		184							
26.01.94		0	0	31																	
09.02.94	1,0	0	2	20	46,1	6,1	23,0	2,7	1,61	0,11		0,02		155							
09.03.94	1,1	0	1	26	44,1	6,1	21,2	3,5	2,20	0,08		0,02	2790		5,0				1		60
23.03.94				2																	
06.04.94	1,7	0	4	27	36,1	4,9	16,6	2,7		0,09		0,01	1080		2,0						98
20.04.94				40																	
04.05.94	0,2	0	2	37	37,1	5,5	15,6	2,0		0,08		0,02		822							49
18.05.94				30																	
15.06.94		230	1	18	40,1	10,8	16,6	3,1	1,89	0,11		0,01		450				370	1		
29.06.94				10																	
13.07.94	0,8	0	2	20	45,7	8,6	27,6	3,9	0,22	0,08		0,01		13		3,5		100			
27.07.94				20																	
10.08.94	0,9	0	2	35	53,5	10,5	51,5	3,5		0,09		0,02		23		4,5					
24.08.94				42																	
07.09.94		0	0	6	56,5	10,8	50,6	3,9	0,23	0,13		0,05		82		3,5					
21.09.94				20																	
05.10.94		0	4	39	51,5	11,3	35,0	3,9	0,31	0,07		0,01		25		2,5					
19.10.94				86																	
02.11.94		60	2	85	54,3	10,5	34,9	5,1	0,48	0,30		0,01		16		3,5		290	4		
16.11.94				2																	
01.12.94		0	4	10	52,9	9,5	34,9	3,9	0,68	0,03		0,01		17		2,0					
14.12.94				1																	
22.02.95			4	20	42,9	7,4	17,0	2,2		0,06		0,01		10		1,0					
08.03.95		100	1	10	37,1	5,6	13,0	2,0	4,60	0,51		0,01		25		1,0					
22.03.95				10																	
12.04.95		100	1	10	42,9	8,7	15,0	2,4	1,90	0,08	0,09	0,00		9		1,0					
26.04.95				10																	
10.05.95		50	0	20	34,3	6,9	9,0	2,0	1,70	0,08	0,11	0,01		11							
24.05.95				10																	
14.06.95		150	5	10	46,1	8,3	15,5	3,4	2,60	0,04	0,20	0,01		12				200	1		
28.06.95				20																	
12.07.95			1	40	45,7	8,7	22,0	3,0	1,40	0,07	0,14	0,01		14		1,0					

Tisza at Tiszasziget middle, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
26.07.95		350		30																	
09.08.95		20	1	30	40,0	9,5	38,0	4,0	0,68	0,02	0,13	0,01		22							
23.08.95				20																	
06.09.95			1	10	48,6	11,6	35,0	4,2	0,31	0,03	0,04	0,01		13							
13.09.95		200		10														300	3		
27.09.95				10																	
11.10.95		20	1	10	51,0	9,5	33,0	4,2	0,31	0,03	0,04	0,01		5		3,0					
25.10.95				10																	
08.11.95		50	1	10	54,0	9,1	33,0	4,0	0,40	0,05	0,04	0,01		5							
22.11.95			1	10														300	3		
06.12.95		20	3	30	46,5	7,4	20,0	3,4	1,00	0,04	0,06	0,01		8							
13.12.95				40																	
18.12.95				30																	
10.01.96			4	20	37,2	6,9	17,0	3,6	4,50	0,07	0,18	0,03		11		1,0					
24.01.96		50		30														50	2		
08.02.96			2	60	61,0	14,3	37,0	3,4	0,76	0,04	0,16	0,12		8							
21.02.96		40	2	70																	
06.03.96			2	80	65,0	13,4	48,0	4,6	0,81	0,05	0,17	0,14		7		1,0					
20.03.96		40	2	50																	
03.04.96		20	3	40	56,0	12,1	32,0	4,6	4,10	0,04	0,18	0,01		9							
17.04.96			3	10														100	3		
29.04.96				10	44,3	8,9	21,0	3,4		0,06		0,01		4							
15.05.96			1	40																	
29.05.96		40		40																	
12.06.96			1	20	61,0	9,4	35,0	4,6		0,02		0,01		11							
26.06.96		80		30																	
10.07.96			1	10	61,0	11,1	38,0	4,8	1,30	0,05	0,10	0,01		10		2,0			2		
24.07.96		80		50																	
07.08.96		20	1	50	50,0	10,5	45,0	5,0	0,48	0,03	0,09	0,01		13				75			
21.08.96			3	50																	
04.09.96		20	1	40	59,0	9,9	38,0	4,0	0,33	0,04	0,08	0,01		12							
18.09.96				30																	
02.10.96			2	10	44,3	8,5	20,0	3,6	3,70	0,05	0,32	0,01		23		1,0					

Tisza at Tiszasziget middle, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
16.10.96		20		10														75	2		
30.10.96				10																	
06.11.96		20	1	10	54,0	9,1	22,0	3,2	1,10	0,03	0,08	0,01		10							
20.11.96				10																	
04.12.96			1	10	50,0	8,0	23,0	3,4	1,00	0,02	0,09	0,01		9							
16.12.96		40		10																	
07.01.97			2	100	51,0	10,0	25,0	3,8	5,30	0,10	0,34	0,03		2							
22.01.97		40	5	10																	
05.02.97			4	40	67,0	13,1	36,0	3,6	0,57	0,02	0,11	0,07		6					4		
19.02.97		40	1	30														110			
05.03.97			3	10	44,3	9,8	22,0	3,6	11,00	0,07	0,46	0,01		21							
19.03.97		40	1	20																	
02.04.97			1	10	59,0	11,9	31,0	3,2	1,10	0,05	0,08	0,01		34		1,0			3		
16.04.97		20	1	10																	
28.04.97				10																	
13.05.97		20	1	10	37,2	5,8	13,5	2,2	3,70	0,07	0,21	0,01		11							
21.05.97			1	10	40,0	4,9	14,5	2,6		0,15		0,01									
04.06.97				10														50			
18.06.97		20	1	10	41,5	6,5	14,5	3,0		0,23		0,02		35							
02.07.97				50															7		
16.07.97		140	1	10	50,0	8,8	22,0	3,5		0,08		0,01		11		1,0					
30.07.97				20																	
13.08.97				10																	
27.08.97		20	1	10	60,0	8,6	25,0	3,6		0,05		0,01		16				37			
10.09.97				10																	
24.09.97		20	2	10	51,0	13,8	23,0	3,8		0,05		0,01		19		1,0					
08.10.97				10																	
15.10.97		20	1	20	50,0	9,6	31,0	3,8		0,03		0,01		19		1,0			4		
05.11.97				30																	
19.11.97		20	1	20	67,0	9,2	39,0	4,2		0,09		0,01		13							
03.12.97				10						0,13		0,02		13				35			
17.12.97		20	2	50	54,0	11,2	25,0	3,6		0,10		0,02									

Tisza at Tiszasziget middle, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
12.01.94	25		0,10		0,1		2,0		0,5		0,5		6,5
26.01.94													
09.02.94	23		0,10		0,1		1,0		4,5		0,5		
09.03.94		0,20		0,3		4,0		7,0		8,5		20,5	
23.03.94													
06.04.94		0,40		0,3		3,0		1,5		6,0		12,0	
20.04.94													
04.05.94		0,20		0,3		3,0		3,5		5,0		11,5	
18.05.94													
15.06.94	10		0,10		0,9		1,0		23,0		1,5		34,5
29.06.94													
13.07.94	7		0,10		0,1		1,0		3,5		0,5		4,5
27.07.94													
10.08.94	36		0,10		0,1		1,5		0,5		0,5		2,5
24.08.94													
07.09.94	9		0,10		0,1		1,0		0,5		0,5		3,0
21.09.94													
05.10.94	9		0,10		0,5		0,5		2,5		1,5		4,5
19.10.94													
02.11.94	19				0,1		0,5		1,0		0,5		2,0
16.11.94													
01.12.94	14				0,1		0,5		1,5		0,0		3,5
14.12.94													
22.02.95	8				0,1		0,5		1,0		0,5		3,5
08.03.95	14				0,1		0,5		0,5		0,5		2,5
22.03.95													
12.04.95	15		0,10		0,1		0,5		1,5		0,5		2,5
26.04.95													
10.05.95	6		0,10		0,1		0,5		1,0		0,5		2,5
24.05.95													
14.06.95	11		0,10		0,1		1,5		3,0		0,5		4,0
28.06.95													
12.07.95	10		0,20		0,1		2,0		1,0		0,5		4,0

Tisza at Tiszasziget middle, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
26.07.95													
09.08.95	13				0,1		2,5				0,5		3,5
23.08.95													
06.09.95	5		0,10		0,2		1,0		1,0		0,5		2,5
13.09.95													
27.09.95													
11.10.95	5		0,10		0,1		1,0		0,5		0,5		3,0
25.10.95													
08.11.95	10		0,10		0,3		5,0		0,5		0,5		6,0
22.11.95													
06.12.95	12		0,10		0,1		5,0		0,5		0,5		3,0
13.12.95													
18.12.95													
10.01.96	13		0,10		0,6		0,5		1,5		0,5		3,5
24.01.96													
08.02.96	17		0,10		0,4		3,0		2,5		0,5		5,0
21.02.96													
06.03.96	25		0,20		0,1		4,5		2,0		0,5		4,0
20.03.96													
03.04.96	12		0,20		0,1		4,0		1,5		0,5		6,0
17.04.96													
29.04.96	8		0,20		0,2		3,0		2,0		0,5		5,5
15.05.96													
29.05.96													
12.06.96	16		0,20		0,1		5,5		6,0		0,5		6,5
26.06.96													
10.07.96	7		0,20		0,1		5,0		1,0		0,5		11,0
24.07.96													
07.08.96	13		0,20		0,1		1,5		0,5		0,5		4,0
21.08.96													
04.09.96	5		0,20		0,1		1,0		0,5		0,5		3,0
18.09.96													
02.10.96	17		0,20		0,1		0,5		1,0		0,5		3,5

Tisza at Tiszasziget middle, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
16.10.96													
30.10.96													
06.11.96	12		0,20		0,0		3,0		0,5		0,5		3,5
20.11.96													
04.12.96	5		0,20		0,1		8,0		0,5		0,5		2,5
16.12.96													
07.01.97	26		0,20		0,1		3,0		2,0		1,0		5,5
22.01.97													
05.02.97	35		0,10		0,1		3,5		2,0		0,5		6,0
19.02.97													
05.03.97	23		0,10		0,2		1,5		4,5		3,0		16,5
19.03.97													
02.04.97	14		0,10		0,1		5,0		2,5		0,5		5,0
16.04.97													
28.04.97													
13.05.97	5		0,50		0,1		1,0		1,0		0,5		3,5
21.05.97	7		0,10		0,1		2,5		1,0		0,5		3,5
04.06.97													
18.06.97	24		0,10		0,1		3,0		3,5		1,0		4,5
02.07.97													
16.07.97	8		0,10		0,1		1,0		5,5		0,5		3,0
30.07.97													
13.08.97													
27.08.97	10		0,10		0,2		2,0		1,5		0,5		3,0
10.09.97													
24.09.97	13		0,10		0,1		2,0		3,0		1,0		4,5
08.10.97													
15.10.97	8		0,10		0,1		3,7		2,0		1,5		3,5
05.11.97													
19.11.97	7		0,10		0,1		2,5		0,5		0,5		6,0
03.12.97	10		0,10		0,1		5,0		1,0		0,5		4,0
17.12.97	11		0,10										

Tisza at Tiszasziget right bank, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
12.01.94	1255,000	3,4	7,94	356	11,90	89,2	2,5	3,3	12	0,26	0,025	1,33	1,61	0,59	2,20	49	180
26.01.94	733,000	2,6	8,14	355	12,40	90,9	2,2	2,7	13	0,26	0,025	1,67	1,96	0,69	2,65	68	140
09.02.94	1205,000	3,6	8,05	398	12,20	91,9	2,5	2,9	10	0,30	0,035	1,56	1,90	0,72	2,62	68	110
09.03.94	1285,000	6,8	8,05	369	10,90	89,3	4,0	4,8	18	0,11	0,036	2,01	2,16	0,67	2,83	59	110
23.03.94	1455,000	5,8	8,04	301	10,50	83,8	2,5	4,7	14	0,16	0,025	1,40	1,58	0,62	2,20	68	240
06.04.94	1145,000	9,1	7,92	294	10,50	91,1	3,0	3,8	13	0,18	0,026	1,49	1,70	0,91	2,61	121	270
20.04.94	1785,000	12,1	7,97	305	8,00	74,6	1,6	3,5	14	0,08	0,033	1,79	1,90	0,86	2,76	49	200
04.05.94	1420,000	15,5	7,98	313	7,60	76,6	2,9	3,4	13	0,08	0,017	0,97	1,07	1,20	2,27	49	240
18.05.94	749,000	19,6	8,10	409	8,30	91,2	2,6	2,9	12	0,13	0,016	1,27	1,41	0,42	1,83	78	90
15.06.94	997,000	18,0	7,91	321	7,20	76,6	3,6	4,3	15	0,17	0,047	1,13	1,35	0,21	1,56	68	290
29.06.94	535,000	25,6	8,13	401	6,50	80,4	1,8	4,0	20	0,07	0,022	1,58	1,67	0,29	1,96	111	180
13.07.94	277,000	24,2	8,35	416	9,20	110,8	2,6	4,2	27	0,10	0,013	0,79	0,91	0,49	1,40	10	100
27.07.94	239,000	26,6	8,03	466	6,30	79,4	2,8	3,8	26	0,12	0,019	0,57	0,71	0,27	0,98	49	120
10.08.94	214,000	28,2	8,33	549	6,20	80,6	3,6	4,5	34	0,02	0,022	0,29	0,34	0,33	0,67	173	180
24.08.94	217,000	25,4	8,24	501	6,10	75,2	5,6	3,8	27	0,12	0,020	0,38	0,52	0,29	0,81	68	210
07.09.94	247,000	23,8	8,11	570	6,80	81,3	3,5	4,1	34	0,06	0,015	0,59	0,66	0,44	1,10	72	240
21.09.94	224,000	19,7	7,87	538	5,00	55,1	4,3	4,6	33	0,17	0,015	0,43	0,61	0,39	1,00	46	430
05.10.94	268,000	18,6	7,92	461	5,90	63,5	2,7	4,2	23	0,21	0,018	0,77	1,00	0,28	1,28	78	160
19.10.94	406,000	11,2	8,28	491	9,90	90,4	2,7	3,4	24	0,10	0,015	1,56	1,68	0,29	1,96	78	400
02.11.94	665,000	11,4	8,06	417	9,20	84,4	3,5	3,7	20	0,16	0,027	1,29	1,47	0,29	1,76	127	160
16.11.94	352,000	8,4	8,05	449	7,70	65,7	3,9	4,1	28	0,21	0,027	1,74	1,98	0,82	2,80	88	550
01.12.94	420,000	4,9	8,18	415	9,40	73,3	1,0	2,8	19	0,15	0,021	1,74	1,91	0,20	2,11	72	190
14.12.94	354,000	4,3	8,03	440	11,30	86,7	2,3	2,7	20	0,36	0,039	2,01	2,41	0,30	2,71	140	170
22.02.95	1325,000	6,3	8,10	326	11,40	92,2	1,9	4,0	12	0,15	0,033	1,65	1,83	0,58	2,41	68	100
08.03.95	1700,000	7,0	7,80	268	10,40	85,6	2,4	6,1	20	0,09	0,021	1,60	1,72	0,80	2,52	49	130
22.03.95	774,000	7,0	7,95	336	10,80	88,9	2,2	3,5	12	0,10	0,018	1,42	1,54	0,99	2,53	49	270
12.04.95	1215,000	8,6	7,86	316	10,30	88,3	2,5	3,4	13	0,07	0,012	1,42	1,51	0,75	2,26	55	220
26.04.95	1295,000	13,2	7,91	288	9,70	92,8	3,5	3,1	11	0,05	0,012	1,04	1,10	0,53	1,63	49	100
10.05.95	1850,000	15,0	7,75	244	7,70	76,7	1,8	3,9	14	0,10	0,015	1,06	1,18	0,39	1,57	46	90
24.05.95	1450,000	15,1	7,75	272	8,50	84,9	2,0	3,6	12	0,11	0,012	0,72	0,84	0,43	1,27	59	130
14.06.95	1035,000	21,8	7,89	330	7,20	82,7	2,5	4,5	16	0,05	0,024	1,22	1,29	0,33	1,62	68	230
28.06.95	923,000	21,2	7,70	362	6,90	78,4	1,6	6,5	20	0,15	0,040	1,31	1,50	0,29	1,79	117	200
12.07.95	679,000	25,4	7,90	364	7,10	87,5	3,6	4,8	22	0,03	0,015	1,36	1,40	0,44	1,84	67	142

Tisza at Tiszasziget right bank, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
26.07.95	335,000	26,7	8,09	398	8,30	104,9	2,6	4,0	18	0,01	0,012	1,02	1,04	0,21	1,25	20	150
09.08.95	263,000	25,4	7,71	414	6,40	78,9	6,2	6,3	29	0,12	0,006	0,27	0,39	0,29	0,68	39	140
23.08.95	236,000	24,6	7,83	457	6,40	77,7	5,4	5,1	28	0,01	0,018	0,61	0,64	0,16	0,80	29	90
06.09.95	447,000	19,1	7,97	426	8,30	90,3	3,3	4,7	25	0,07	0,021	0,81	0,90	0,37	1,27	68	140
13.09.95	642,000	18,9	7,85	416	7,00	75,9	1,4	3,5	18	0,05	0,018	1,38	1,44	0,40	1,84	88	140
27.09.95	453,000	17,3	7,90	412	8,10	84,9	1,3	3,7	18	0,08	0,009	1,49	1,58	0,41	1,99	101	140
11.10.95	480,000	15,7	7,88	416	8,50	86,0	2,5	3,3	16	0,18	0,018	1,40	1,60	0,30	1,90	111	170
25.10.95	390,000	12,3	7,66	438	8,50	79,7	1,5	3,0	19	0,09	0,018	1,42	1,53	0,31	1,84	121	170
08.11.95	573,000	7,0	8,04	422	10,20	84,0	2,0	3,2	16	0,12	0,018	1,24	1,38	0,44	1,82	121	140
22.11.95	1705,000	4,5	7,72	388	9,70	74,8	2,4	9,8	31	0,33	0,024	1,18	1,53	0,36	1,89	68	210
06.12.95	705,000	2,5	7,76	356	11,80	86,3	5,7	4,5	16	0,46	0,018	1,31	1,79	0,42	2,21	91	170
13.12.95	572,000	2,4	7,73	442	11,60	84,6	3,2	3,2	16	0,54	0,027	1,63	2,20	0,36	2,56	88	190
18.12.95	507,000	2,1	7,78	398	12,10	87,5	3,4	3,2	16	0,40	0,036	0,97	1,40	0,40	1,80	82	110
10.01.96	2290,000	4,1	7,48	284	10,80	82,4	2,2	6,0	18	0,30	0,036	1,33	1,67	0,32	1,99	55	260
24.01.96	922,000	0,2	7,54	398	12,60	86,5	5,9	4,9	25	0,44	0,018	1,81	2,26	0,28	2,54	78	240
08.02.96	601,000	0,0	7,68	505	11,70	79,9	3,2	3,1	22	0,66	0,024	1,83	2,52	0,27	2,79	55	230
21.02.96	603,000	1,4	7,64	496	11,80	83,7	2,6	2,9	17	0,64	0,018	1,63	2,29	0,27	2,56	52	160
06.03.96	510,000	1,2	7,55	550	11,90	84,0	4,0	3,7	23	0,71	0,024	1,74	2,48	0,30	2,78	82	130
20.03.96	1050,000	4,8	7,47	472	11,70	91,0	4,5	5,4	24	0,42	0,030	1,88	2,33	0,41	2,74	59	160
03.04.96	1120,000	6,4	7,44	434	10,70	86,8	3,1	9,2	29	0,23	0,033	2,31	2,57	0,34	2,91	82	260
17.04.96	1040,000	8,8	7,87	374	9,60	82,7	1,3	4,8	18	0,08	0,024	1,67	1,77	0,28	2,05	49	410
29.04.96	1180,000	15,2	7,87	358	8,60	86,1	3,0	3,5	16	0,15	0,027	1,76	1,94	0,27	2,21	82	210
15.05.96	1100,000	18,3	7,70	328	7,70	82,4	1,8	4,0	15	0,06	0,027	1,22	1,31	0,22	1,53	82	160
29.05.96	712,000	19,5	7,87	356	7,00	76,8	1,6	4,9	19	0,03	0,024	1,72	1,77	0,35	2,12	91	400
12.06.96	364,000	26,8	8,08	478	7,40	93,7	2,9	4,8	22	0,11	0,018	1,49	1,62	0,28	1,90	98	260
26.06.96	351,000	22,6	7,85	450	7,40	86,4	3,4	5,5	26	0,04	0,002	0,88	0,92	0,36	1,28	29	210
10.07.96	359,000	23,6	8,02	474	6,90	82,2	1,4	4,1	23	0,10	0,006	1,31	1,42	0,24	1,66	101	230
24.07.96	283,000	23,4	8,02	424	7,80	92,5	4,0	4,7	24	0,03	0,474	0,93	1,43	0,35	1,78	20	220
07.08.96	353,000	24,0	7,85	460	6,30	75,6	5,9	5,5	29	0,05	0,005	0,57	0,62	0,35	0,97	10	190
21.08.96	414,000	22,6	7,78	436	6,00	70,1	3,2	4,6	21	0,12	0,014	0,81	0,94	0,31	1,25	130	460
04.09.96	351,000	22,3	8,03	468	7,20	83,6	2,0	4,0	23	0,05	0,015	1,90	1,97	0,52	2,49	91	240
18.09.96	1040,000	14,6	7,99	398	7,60	75,1	2,2	6,4	24	0,11	0,021	0,77	0,90	0,23	1,13	82	280
02.10.96	1370,000	12,9	8,00	324	8,60	81,7	2,8	6,2	21	0,10	0,024	1,27	1,39	0,28	1,67	68	340

Tisza at Tiszasziget right bank, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
16.10.96	380,000	14,1	8,02	420	8,50	83,0	5,1	4,5	21	0,13	0,015	0,95	1,10	0,27	1,37	160	320
30.10.96	984,000	10,4	7,95	334	8,80	78,8	2,9	6,4	16	0,23	0,027	1,15	1,41	0,31	1,72	91	230
06.11.96	783,000	9,8	8,02	388	9,30	82,1	1,7	3,8	12	0,12	0,012	1,20	1,33	0,31	1,64	91	210
20.11.96	424,000	9,9	7,85	436	9,60	85,0	2,9	3,5	16	0,16	0,015	1,31	1,48	0,23	1,71	88	170
04.12.96	825,000	5,2	7,96	374	10,30	80,9	2,7	3,4	16	0,24	0,018	1,40	1,66	0,23	1,89	82	140
16.12.96	682,000	4,8	7,83	392	11,00	85,5	3,6	4,9	16	0,21	0,024	1,50	1,74	0,25	1,99	68	220
07.01.97	1170,000	0,2	7,75	424	12,10	83,0	4,8	6,6	23	0,39	0,021	1,56	1,97	0,33	2,30	68	400
22.01.97	736,000	0,5	7,81	452	11,90	82,4	3,2	4,4	19	0,38	0,021	1,85	2,26	0,24	2,50	75	470
05.02.97	505,000	0,9	8,02	525	12,20	85,4	4,5	4,4	22	0,61	0,021	1,74	2,37	0,32	2,69	78	240
19.02.97	1270,000	1,4	7,90	490	11,50	81,6	2,1	5,3	22	0,55	0,030	1,94	2,53	0,33	2,86	75	210
05.03.97	1580,000	4,8	7,79	354	10,60	82,4	3,7	11,0	34	0,26	0,021	1,85	2,14	0,40	2,54	16	580
19.03.97	814,000	6,9	7,97	422	10,70	87,9	3,6	3,7	19	0,22	0,012	1,90	2,13	0,25	2,38	91	300
02.04.97	633,000	6,8	8,05	476	11,40	93,4	2,3	3,1	17	0,10	0,015	1,83	1,95	0,22	2,17	68	160
16.04.97	729,000	8,6	8,13	398	11,30	96,9	2,8	3,3	14	0,07	0,006	1,27	1,34	0,29	1,63	59	470
28.04.97	2330,000	9,7	7,94	356	9,50	83,7	2,5	9,3	29	0,15	0,036	2,08	2,26	0,50	2,76	59	840
13.05.97	1950,000	15,6	7,95	268	8,20	82,8	2,2	5,0	19	0,05	0,024	1,33	1,41	0,22	1,63	49	750
21.05.97	1360,000	19,7	7,78	288	6,40	70,5	1,7	4,4	16	0,15	0,030	0,79	0,97	0,30	1,27	59	240
04.06.97	1120,000	15,0	7,87	288	8,00	79,7	0,6	3,5	12	0,06	0,015	1,20	1,28	0,23	1,51	55	150
18.06.97	1210,000	21,5	7,86	310	6,20	70,8	2,1	5,3	17	0,12	0,024	1,15	1,30	0,42	1,72	78	160
02.07.97	811,000	23,6	7,97	366	6,20	73,8	1,6	5,6	21	0,08	0,018	1,36	1,45	0,32	1,77	280	330
16.07.97	922,000	22,7	8,01	366	6,30	73,7	1,0	5,0	19	0,05	0,012	1,31	1,37	0,22	1,59	62	170
30.07.97	1290,000	20,8	7,89	346	7,10	80,0	1,3	4,6	18	0,08	0,015	1,13	1,22	0,69	1,91	95	150
13.08.97	1070,000	22,0	8,02	358	6,70	77,3	1,5	5,4	20	0,09	0,012	1,54	1,64	0,31	1,95	75	360
27.08.97	640,000	23,2	8,11	430	6,90	81,5	1,7	3,7	18	0,04	0,024	1,51	1,58	0,22	1,80	91	130
10.09.97	711,000	21,4	8,07	471	7,20	82,1	1,5	4,9	23	0,09	0,009	1,24	1,35	0,25	1,60	72	140
24.09.97	579,000	15,2	8,04	408	7,90	79,1	1,1	4,0	18	0,09	0,018	1,24	1,35	0,30	1,65	140	160
08.10.97	841,000	15,4	8,15	458	8,40	84,5	1,1	3,5	17	0,09	0,009	1,38	1,47	0,19	1,66	68	140
15.10.97	840,000	13,2	7,97	396	8,60	82,3	1,5	3,8	17	0,05	0,012	1,72	1,78	0,29	2,07	68	150
05.11.97	567,000	5,0	8,22	415	12,20	95,4	4,2	3,9	18	0,14	0,009	0,90	1,05	0,24	1,29	36	200
19.11.97	775,000	6,8	8,05	511	10,30	84,4	2,0	3,2	19	0,20	0,024	1,08	1,31	0,22	1,53	91	250
03.12.97	743,000	5,9	7,94	398	11,00	88,0	2,3	2,8	15	0,16	0,009	1,36	1,52	0,33	1,85	98	240
17.12.97	953,000	3,3	7,92	403	11,10	82,9	2,7	4,4	19	0,17	0,018	1,22	1,41	0,27	1,68	72	210

Tisza at Tiszasziget right bank, rkm 162.5
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
12.01.94		0	1	48	40,1	7,3	19,3	2,3		0,22		0,03		214							
26.01.94		100	0	22																	
09.02.94		0	1	13	44,1	7,3	22,0	2,7		0,08		0,02		175							
09.03.94		0	3	13	44,1	6,1	22,1	3,5		0,08		0,01	2820		4,0				1		110
23.03.94				5																	
06.04.94		0	2	25	34,1	6,1	15,6	2,3		0,12		0,01	1630		1,5						41
20.04.94				30																	
04.05.94		0	2	10	37,1	5,5	13,8	2,0		0,06		0,02	1244								46
18.05.94				40																	
15.06.94		100	1	20	41,5	11,3	16,6	3,1		0,11		0,01		526				270	1		
29.06.94				20																	
13.07.94		30	3	0	45,7	8,6	27,6	3,5		0,08		0,01		10		2,5		100			
27.07.94				20																	
10.08.94		0	2	24	52,9	10,8	51,5	3,5		0,05		0,01		35		4,5					
24.08.94				35																	
07.09.94		0	1	10	56,5	10,8	46,0	4,7		0,13		0,07		54							
21.09.94				17																	
05.10.94		0	4	29	51,5	13,0	36,3	5,4		0,06		0,01		31		3,5					
19.10.94				86																	
02.11.94		0	2	73	50,1	10,0	28,5	5,5		0,05		0,01		9		2,5		290	4		
16.11.94				2																	
01.12.94		0	3	5	51,5	8,6	33,1	3,9		0,04		0,01				2,0					
14.12.94				0										5							
22.02.95			1	20	42,1	7,4	17,0	2,2		0,13		0,01		9		1,0					
08.03.95		100	1	10	37,1	5,6	12,0	2,0		0,13		0,01		38		2,0					
22.03.95				20																	
12.04.95		100	1	10	41,5	9,5	14,5	2,4		0,05		0,01		5		1,0					
26.04.95				10																	
10.05.95		50	3	10	34,3	6,9	9,0	2,0		0,11		0,04		9							
24.05.95				20																	
14.06.95		100	1	10	44,6	8,8	14,0	3,2		0,05		0,01		6				200	1		
28.06.95				20																	
12.07.95			1	30	45,7	9,1	24,0	3,2		0,08		0,01		10		1,0					

Tisza at Tiszasziget right bank, rkm 162.5
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
26.07.95		600		30																	
09.08.95		20	1	40	40,0	9,5	38,0	4,0		0,05		0,01		17							
23.08.95				20																	
06.09.95			1	10	48,6	10,8	35,0	4,0		0,03		0,01		14							
13.09.95		150		10														300	3		
27.09.95				10																	
11.10.95		20	1	10	51,0	10,4	29,0	4,0		0,11		0,02		6		4,0					
25.10.95				20																	
08.11.95		50	2	10	52,0	12,6	32,0	4,2		0,06		0,01		3							
22.11.95				10														300	3		
06.12.95		150	20	50	43,6	8,7	24,0	3,4		0,12		0,03		34							
13.12.95				50																	
18.12.95				40																	
10.01.96			2	30	36,4	6,9	18,0	4,0		0,08		0,05		36		1,0					
24.01.96		50		60														50	2		
08.02.96				60	60,0	14,7	37,0	4,0		0,04		0,14		25							
21.02.96		60	2	70																	
06.03.96				100	64,0	13,4	47,0	4,4		0,03		0,17		7							
20.03.96		20	1	60																	
03.04.96		20		60	52,0	11,3	28,0	4,0		0,04		0,01		10		1,0					
17.04.96			3	10														100	4		
29.04.96				30	44,3	10,2	22,0	3,4		0,05		0,01		4							
15.05.96				20																	
29.05.96		60	1	30																	
12.06.96			1	70	61,0	9,9	36,0	4,6		0,03		0,01		18							
26.06.96		100		40																	
10.07.96			1	10	63,0	9,0	38,0	5,0		0,05		0,01		13		3,0			2		
24.07.96		40		60																	
07.08.96		40		70	51,0	10,9	41,0	4,8		0,03		0,01		10				125			
21.08.96			2	50																	
04.09.96		60	1	40	59,0	11,2	38,0	3,8		0,06		0,01		9							
18.09.96				40																	
02.10.96			3	10	45,7	6,8	21,0	4,0		0,04		0,01		19		1,0					

Tisza at Tiszasziget right bank, rkm 162.5
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Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al tot. µg/l	Al dis. µg/l	As tot. µg/l	As dis. µg/l	B µg/l	B dis. µg/l	CN µg/l	CN dis µg/l	Zn tot. µg/l
16.10.96		20		10														75	4		
30.10.96				10																	
06.11.96		40	1	10	51,0	10,0	21,0	3,6		0,05		0,01		15							
20.11.96				40																	
04.12.96			1	10	48,6	8,0	22,0	3,4		0,03		0,01		9							
16.12.96		160		10																	
07.01.97				110	51,0	9,6	24,0	3,4		0,09		0,01		24							
22.01.97		40	1	30																	
05.02.97				60	64,0	15,3	33,0	3,4		0,03		0,10		6					3		
19.02.97		20	1	30														110			
05.03.97				10	44,3	9,0	21,0	3,5		0,04		0,01		14							
19.03.97		20	1	50																	
02.04.97				10	58,0	11,5	31,0	3,2		0,06		0,01		15		1,0			5		
16.04.97		20	1	10																	
28.04.97				10																	
13.05.97		20		10	37,2	5,8	13,0	2,0		0,07		0,01		8							
21.05.97			1	10																	
04.06.97				10														36			
18.06.97		40	1	30	41,5	6,5	14,5	3,0		0,08		0,01		19							
02.07.97				30															5		
16.07.97		220	1	10	50,0	8,4	21,0	3,4		0,09		0,01		6		1,0					
30.07.97				20																	
13.08.97				20																	
27.08.97		20	1	10	60,0	10,2	23,0	3,6		0,04		0,01		11				40			
10.09.97				10																	
24.09.97		20	5	10	53,0	13,7	22,0	3,6		0,05		0,01		18							
08.10.97				30																	
15.10.97		20	2	20	48,6	8,8	26,0	3,0		0,04		0,01		14		1,0			3		
05.11.97				30																	
19.11.97		20	1	30	63,0	9,3	34,0	3,6		0,09		0,01		7							
03.12.97				10						0,11		0,02		10				25			
17.12.97		20	1	100	47,2	13,0	22,0	3,4													

Tisza at Tiszasziget right bank, rkm 162.5
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Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
12.01.94	27		0,10		0,1		1,5		0,5		0,5		6,0
26.01.94													
09.02.94	25		0,20		0,6		1,0		3,0		0,5		
09.03.94		0,20		0,3		3,0		7,0		8,0		18,0	
23.03.94													
06.04.94		0,10		0,1		1,5		3,5		2,0		9,5	
20.04.94													
04.05.94		0,20		0,1		1,0		3,5		2,5		11,0	
18.05.94													
15.06.94	10		0,10		1,1		2,5		17,0		2,5		26,0
29.06.94													
13.07.94	18		0,10		0,1		1,0		3,0		1,0		4,0
27.07.94													
10.08.94	12		0,10		0,1		1,5		2,0		0,5		3,5
24.08.94													
07.09.94									0,5				
21.09.94													
05.10.94	19		0,10		0,7		0,5		0,5		0,5		2,0
19.10.94													
02.11.94	13				0,1		0,5		4,5		0,5		3,0
16.11.94													
01.12.94	22				0,1		0,5		3,0		0,5		3,0
14.12.94													
22.02.95	11				0,1		0,5		0,5		0,5		3,0
08.03.95	8				0,1		0,5		0,5		0,5		3,0
22.03.95													
12.04.95	3		0,10		0,1		8,5		0,5		0,5		2,5
26.04.95													
10.05.95	4		0,10		0,1		0,5		1,0		0,5		2,5
24.05.95													
14.06.95	8		0,10		0,1		0,5		1,0		0,5		2,0
28.06.95													
12.07.95	8		0,20		0,1		2,0		2,0		0,5		3,5

Tisza at Tiszasziget right bank, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
26.07.95													
09.08.95	13		0,10		0,1		2,5		2,0		0,5		4,0
23.08.95													
06.09.95	5		0,10		0,6		0,5		1,0		0,5		2,5
13.09.95													
27.09.95													
11.10.95	8		0,10		0,2		1,0		0,5		0,5		4,0
25.10.95													
08.11.95	10		0,10		0,1		2,5		0,5		0,5		4,5
22.11.95													
06.12.95	12		0,10		0,1		2,5		0,5		0,5		1,5
13.12.95													
18.12.95													
10.01.96	16		0,10		0,1		0,5		1,0		0,5		2,0
24.01.96													
08.02.96	45		0,10		0,2		2,0		1,0		0,5		3,0
21.02.96													
06.03.96	30		0,20		0,2		2,0		2,0		1,0		4,5
20.03.96													
03.04.96	10		0,20		0,1		1,5		1,0		0,5		4,5
17.04.96													
29.04.96	7		0,20		0,1		2,5		1,5		0,5		3,0
15.05.96													
29.05.96													
12.06.96	10		0,20		0,1		5,0		1,0		0,5		3,0
26.06.96													
10.07.96	5		0,20		0,1		4,0		0,5		0,5		3,0
24.07.96													
07.08.96	14		0,20		0,2		1,0		2,0		0,5		3,5
21.08.96													
04.09.96	5		0,20		0,1		1,0		1,0		0,5		2,0
18.09.96													
02.10.96	14		0,20		0,1		0,5		1,0		0,5		3,0

Tisza at Tiszasziget right bank, rkm 162.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
16.10.96													
30.10.96													
06.11.96	8		0,20		0,1		1,0		0,5		0,5		2,5
20.11.96													
04.12.96	9		0,20		0,1		5,0		0,5		0,5		2,0
16.12.96													
07.01.97	23		0,20		0,1		2,5		1,0		0,5		5,0
22.01.97													
05.02.97	21		0,10		0,1		1,0		1,0		0,5		4,0
19.02.97													
05.03.97	28		0,10		0,2		2,0		12,0		4,0		18,0
19.03.97													
02.04.97	17		0,10		0,2		3,0		1,5		0,5		9,0
16.04.97													
28.04.97													
13.05.97	5		0,10		0,1		0,5		0,5		0,5		4,0
21.05.97													
04.06.97													
18.06.97	27		0,10		0,1		2,0		4,0		0,5		6,5
02.07.97													
16.07.97	7		0,10		0,1		0,5		2,5		0,5		3,0
30.07.97													
13.08.97													
27.08.97	11		0,10		0,1		1,0		0,5		0,5		3,5
10.09.97													
24.09.97	11		0,10		0,2		1,0		2,0		1,0		8,5
08.10.97													
15.10.97	5		0,10		0,1		1,0		0,5		0,5		3,0
05.11.97													
19.11.97	5		0,10		0,1		1,5		0,5		0,5		1,5
03.12.97	9		0,10		0,1		1,5		3,0		0,5		6,0
17.12.97													

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
05.01.94	32,100	3,4	7,81	427	12,30	92,2	8,1	4,7	21	0,36	0,043	3,71	4,11	1,44	5,55	91	210
11.01.94	60,200	4,6	7,68	356	11,10	85,9	4,4	10,2	30	0,45	0,040	3,28	3,77	0,93	4,70	124	240
17.01.94	47,900	3,8	7,81	334	12,20	92,4	3,1	5,0	11	0,23	0,024	2,49	2,74	0,96	3,70	62	70
24.01.94	21,500	2,3	7,67	358	16,10	117,1	9,2	3,8	14	0,34	0,030	2,67	3,04	1,51	4,55	42	110
02.02.94	13,100	1,8	7,64	405	12,50	89,7	5,7	2,7	11	0,42	0,030	2,60	3,05	0,31	3,36	95	210
09.02.94	13,100	5,5	7,70	380	11,80	93,5	4,7	3,2	11	0,35	0,033	2,64	3,03	1,11	4,14	82	110
16.02.94	14,900	0,2	7,91	411	14,90	102,3	5,6	2,6	10	0,27	0,015	2,71	3,00	0,40	3,40	29	70
23.02.94	10,000	2,0	7,73	386	13,00	93,8	4,5	2,9	10	0,23	0,026	2,26	2,51	1,29	3,80	29	100
03.03.94	14,100	8,0	7,83	351	12,00	101,3	4,7	3,1	10	0,23	0,030	2,17	2,43	0,64	3,07	62	130
09.03.94	17,800	7,0	7,75	315	11,90	98,0	7,3	3,6	11	0,18	0,027	2,03	2,24	1,08	3,32	49	150
16.03.94	29,500	8,6	7,85	283	11,20	96,0	5,2	4,7	12	0,16	0,027	1,72	1,91	0,59	2,50	101	140
23.03.94	20,600	5,5	7,48	271	11,40	90,3	3,7	3,4	13	0,50	0,027	1,76	2,29	0,91	3,20	59	80
28.03.94	22,100	6,2	7,69	330	12,30	99,2	6,0	3,4	11	0,34	0,030	1,58	1,95	0,95	2,90	88	220
06.04.94	35,200	7,7	7,68	275	9,40	78,8	7,5	4,8	20	0,19	0,030	3,55	3,77	0,49	4,26	29	50
13.04.94	175,000	7,6	7,33	262	8,60	71,9	11,6	23,0	144	0,33	0,052	2,64	3,03	4,22	7,25	65	1050
19.04.94	176,000	7,5	7,65	294	11,10	92,6	5,6	9,9	23	0,39	0,024	2,98	3,40	1,73	5,13	78	320
27.04.94	45,500	11,5	7,55	294	10,10	92,9	5,1	4,2	15	0,39	0,024	1,49	1,90	0,32	2,22	42	120
04.05.94	26,500	10,7	7,87	337	10,60	95,6	8,3	4,6	12	0,41	0,064	1,58	2,06	0,74	2,80	42	200
12.05.94	18,500	11,4	7,88	356	9,80	89,9	5,2	4,1	11	0,24	0,049	1,54	1,83	1,39	3,22	36	160
16.05.94	15,100	16,4	8,00	338	8,80	90,4	3,6	3,9	14	0,16	0,073	1,60	1,84	0,81	2,65	59	200
26.05.94	87,300	13,6	7,71	262	8,60	83,0	6,6	23,0	61	0,12	0,061	1,11	1,29	1,91	3,20	124	520
01.06.94	31,300	20,3	7,84	295	9,50	105,9	2,6	4,6	11	0,06	0,040	1,49	1,59	1,21	2,80	20	160
08.06.94	25,300	15,0	7,77	295	10,60	105,6	4,1	3,9	12	0,09	0,046	1,56	1,69	0,80	2,49	65	180
13.06.94	23,800	16,5	7,92	273	9,10	93,7	3,2	4,7	14	0,09	0,036	1,47	1,59	0,79	2,38	55	100
22.06.94	9,930	19,1	7,88	368	8,00	87,1	6,9	3,8	11	0,26	0,064	1,49	1,81	1,01	2,82	68	120
27.06.94	7,170	20,1	7,76	401	8,30	92,2	5,0	3,3	10	0,61	0,103	1,79	2,49	1,68	4,17	137	190
06.07.94	6,530	21,5	8,01	406	6,80	77,7	4,0	3,9	11	0,22	0,125	1,79	2,13	0,57	2,70	150	230
11.07.94	6,040	19,4	8,07	436	8,50	93,1	2,9	3,8	11	0,30	0,116	1,74	2,15	1,14	3,29	124	200
19.07.94	7,180	23,5	7,71	436	6,20	73,7	5,5	3,3	11	0,47	0,140	1,31	1,92	1,10	3,02	192	320
25.07.94	4,340	23,0	8,07	473	7,30	85,9	3,3	3,8	10	0,08	0,052	1,81	1,94	1,22	3,16	124	200
01.08.94	3,850	26,5	8,15	501	8,20	103,2	8,6	6,3	18	0,12	0,097	1,80	2,02	1,59	3,61	173	390
08.08.94	4,110	25,1	7,63	377	6,80	83,3	6,0	7,8	23	0,13	0,140	1,83	2,10	2,19	4,29	143	370
17.08.94	2,860	19,5	7,81	539	8,80	96,5	6,6	4,6	11	0,12	0,049	2,28	2,46	1,01	3,47	82	180

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
22.08.94	3,180	18,3	8,44	452	10,00	107,0	6,2	5,7	16	0,05	0,046	1,40	1,49	1,51	3,00	59	190
30.08.94	7,430	22,2	7,91	407	8,90	103,1	3,5	5,6	17	0,02	0,049	1,63	1,70	1,65	3,35	29	200
07.09.94	4,480	20,8	7,81	479	8,80	99,1	4,4	5,5	18	0,11	0,082	1,85	2,04	1,21	3,25	117	190
15.09.94	4,560	20,6	8,05	453	7,20	80,8	3,5	3,9	11	0,09	0,033	1,47	1,59	1,31	2,90	147	210
19.09.94	9,590	17,2	7,95	362	9,10	95,1	3,2	4,1	12	0,08	0,046	1,60	1,73	0,76	2,49	134	200
26.09.94	5,760	19,5	7,91	408	8,10	88,9	3,1	3,5	15	0,16	0,088	1,81	2,06	0,81	2,87	150	200
04.10.94	11,100	16,0	7,89	395	8,50	86,6	2,9	5,4	16	0,22	0,043	1,56	1,82	0,80	2,62	147	200
10.10.94	9,720	8,0	7,86	377	10,80	91,2	3,9	4,2	10	0,40	0,043	1,81	2,25	1,14	3,39	20	150
17.10.94	8,380	9,2	7,99	381	10,00	87,0	5,5	3,4	12	0,30	0,046	1,56	1,90	1,15	3,05	124	140
26.10.94	16,100	10,5	7,93	359	10,00	89,8	6,3	5,4	16	0,33	0,058	1,49	1,88	0,94	2,82	137	170
01.11.94	27,500	10,2	7,88	380	9,90	88,3	4,9	6,3	21	0,13	0,033	2,21	2,38	1,08	3,46	39	180
10.11.94	17,000	9,0	7,92	360	10,20	88,3	3,5	5,1	11	0,23	0,055	1,72	2,00	0,93	2,93	65	90
16.11.94	23,200	7,0	7,95	365	11,50	94,7	4,7	4,6	14	0,29	0,046	2,06	2,39	1,02	3,41	75	150
23.11.94	16,000	5,5	7,82	392	11,10	87,9	3,7	2,9	15	0,18	0,036	1,74	1,96	1,25	3,21	55	90
29.11.94	12,600	2,6	8,14	393	13,00	95,3	5,6	3,8	13	0,30	0,030	2,01	2,34	0,96	3,30	72	100
08.12.94	8,380	2,4	7,72	369	12,30	89,7	4,9	3,0	11	0,30	0,030	2,24	2,57	1,31	3,88	39	100
12.12.94	7,540	4,5	7,96	382	12,50	96,4	6,2	2,5	11	0,33	0,027	2,03	2,40	1,27	3,67	98	300
19.12.94	6,840	1,7	7,81	387	13,30	95,2	5,4	2,9	13	0,69	0,024	2,15	2,86	0,63	3,49	143	280
22.12.94	6,720	1,3	7,92	383	12,70	89,9	5,6	3,3	12	0,37	0,027	2,10	2,50	1,17	3,67	121	230
04.01.95	6,220	1,1	7,79	383	13,70	96,4	6,8	2,7	15	0,52	0,021	2,01	2,55	0,77	3,32	108	210
09.01.95	6,840	0,1	8,01	418	13,70	93,8	6,5	2,5	10	0,71	0,018	2,24	2,97	0,31	3,28	156	230
16.01.95	6,870	0,5	7,74	459	13,30	92,0	3,9	2,6	11	0,42	0,018	2,24	2,68	0,34	3,02	82	200
24.01.95	7,520	0,1	7,76	397	12,20	83,5	4,4	2,6	11	0,68	0,021	2,31	3,01	1,42	4,43	121	220
30.01.95	8,040	1,5	7,96	378	11,80	84,0	4,7	3,6	10	0,65	0,012	2,19	2,86	0,41	3,27	140	220
08.02.95	8,030	2,8	8,04	402	13,00	95,8	5,1	2,6	12	0,29	0,018	1,76	2,07	0,31	2,38	85	150
14.02.95	6,500	3,2	7,86	400	12,60	93,9	5,4	2,7	10	0,35	0,021	2,06	2,43	0,67	3,10	91	160
27.02.95	25,600	6,5	7,93	358	11,00	89,4	4,5	6,5	22	0,37	0,033	3,16	3,56	0,74	4,30	95	200
01.03.95	24,600	4,2	7,98	389	12,20	93,4	6,2	4,5	12	0,21	0,027	3,37	3,60	1,16	4,76	78	130
06.03.95	74,200	7,3	8,02	322	11,20	92,9	5,0	9,8	25	0,12	0,024	2,94	3,09	1,48	4,57	49	290
16.03.95	31,300	4,5	7,77	318	12,90	99,5	4,1	3,0	14	0,19	0,021	2,15	2,35	1,14	3,49	55	110
20.03.95	31,900	5,6	7,92	304	11,40	90,5	3,9	5,1	16	0,41	0,030	1,92	2,36	1,01	3,37	75	140
28.03.95	25,000	4,1	7,81	312	11,00	84,0	2,8	3,8	10	0,33	0,033	2,06	2,42	0,84	3,26	72	230
03.04.95	18,800	8,5	7,99	358	11,50	98,3	4,1	4,6	10	0,33	0,030	2,03	2,39	1,15	3,54	78	160

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
13.04.95	15,000	6,3	7,86	323	13,10	105,9	5,5	2,8	10	0,35	0,030	1,74	2,12	0,74	2,86	68	90
18.04.95	14,300	8,8	7,79	319	10,70	92,2	2,3	3,6	9	0,26	0,033	1,65	1,94	0,71	2,65	52	70
26.04.95	23,900	11,2	7,94	326	9,60	87,7	4,8	4,5	13	0,25	0,055	1,51	1,82	0,71	2,53	78	190
02.05.95	55,300	12,2	8,01	329	11,30	105,7	4,5	4,4	14	0,19	0,024	1,81	2,03	1,06	3,09	46	140
11.05.95	27,300	11,2	7,73	314	10,20	93,1	4,8	3,7	11	0,26	0,036	1,74	2,03	0,90	2,93	55	140
15.05.95	46,700	10,6	8,01	288	10,90	98,1	3,2	5,3	14	0,23	0,027	1,74	1,99	0,47	2,46	52	200
24.05.95	60,600	15,4	7,90	268	9,70	97,5	2,5	6,9	12	0,20	0,027	1,85	2,08	1,04	3,12	42	210
29.05.95	35,300	17,5	7,90	301	9,60	101,0	3,2	5,0	19	0,11	0,036	1,60	1,75	0,66	2,41	62	130
08.06.95	55,300	14,8	7,81	322	9,10	90,3	3,1	12,2	26	0,19	0,043	1,90	2,13	2,09	4,22	82	390
12.06.95	223,000	15,3	7,56	264	7,40	74,2	5,2	34,9	65	0,49	0,052	1,99	2,53	3,31	5,84	127	1240
22.06.95	39,900	16,9	7,84	369	9,00	93,5	2,8	4,6	13	0,10	0,040	2,21	2,36	1,03	3,39	49	140
26.06.95	34,200	17,2	7,93	366	9,70	101,4	2,3	4,6	12	0,25	0,064	1,97	2,28	0,77	3,05	65	140
03.07.95	25,000	17,0	7,64	375	8,00	83,3	2,5	5,8	18	0,26	0,094	1,88	2,23	1,24	3,47	62	130
10.07.95	21,900	20,0	8,10	359	8,60	95,3	1,9	3,9	10	0,16	0,073	1,74	1,98	0,73	2,71	65	150
17.07.95	18,800	19,6	8,01	389	7,80	85,8	2,8	6,1	23	0,07	0,091	1,79	1,95	1,00	2,95	78	170
24.07.95	11,100	22,9	7,86	437	5,80	68,1	3,0	3,2	9	0,37	0,164	2,08	2,61	0,63	3,24	95	180
01.08.95	7,600	20,5	7,87	465	7,50	84,0	4,9	3,5	11	0,31	0,091	2,06	2,46	0,79	3,25	82	150
07.08.95	9,410	18,8	8,03	495	7,60	82,2	2,4	4,2	15	0,43	0,134	2,12	2,69	0,76	3,45	137	200
14.08.95	6,480	19,2	8,02	495	7,70	84,0	3,4	3,5	14	0,24	0,082	2,15	2,47	0,72	3,19	72	180
22.08.95	8,000	20,5	7,82	476	8,40	94,1	3,2	4,2	17	0,33	0,094	2,28	2,71	2,34	5,05	101	240
28.08.95	9,000	20,1	7,61	418	7,90	87,7	3,3	6,6	15	0,30	0,094	2,21	2,61	1,14	3,75	104	230
04.09.95	11,100	13,6	7,87	418	9,30	89,8	3,3	3,3	12	0,27	0,064	2,08	2,41	0,98	3,39	91	240
14.09.95	11,300	16,2	7,74	375	8,80	90,0	2,1	5,8	13	0,30	0,070	2,06	2,42	0,72	3,14	101	190
18.09.95	9,810	16,0	7,84	393	9,40	95,8	4,5	4,6	14	0,24	0,067	2,01	2,32	1,08	3,40	68	210
28.09.95	13,600	15,8	7,72	426	9,70	98,4	2,2	4,6	11	0,39	0,036	1,70	2,12	0,39	2,51	82	180
03.10.95	8,400	9,8	8,14	452	10,60	93,6	2,5	3,4	10	0,30	0,049	1,94	2,30	0,80	3,10	108	160
11.10.95	8,000	17,2	7,93	471	10,20	106,6	3,0	5,6	15	0,23	0,043	1,79	2,06	0,62	2,68	98	170
18.10.95	8,400	13,2	7,80	493	9,80	93,8	6,0	4,7	17	0,27	0,049	1,54	1,86	0,84	2,70	111	160
26.10.95	7,600	6,8	7,90	490	11,80	96,7	5,1	5,3	17	0,68	0,036	1,97	2,69	0,68	3,37	98	130
30.10.95	6,120	8,7	7,81	491	10,70	92,0	3,6	3,6	14	0,64	0,052	2,31	3,00	0,69	3,69	130	170
09.11.95	6,480	2,2	7,95	490	13,10	95,0	3,4	5,8	16	0,46	0,024	2,21	2,70	1,03	3,73	108	140
13.11.95	6,480	3,9	8,01	478	12,40	94,2	3,6	3,1	12	1,33	0,030	2,31	3,66	0,50	4,16	183	240
22.11.95	8,000	0,8	7,87	430	13,20	92,1	4,0	4,2	11	0,61	0,027	2,08	2,71	0,26	2,97	156	200

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
27.11.95	6,120	1,0	7,98	467	13,00	91,2	2,8	3,4	12	0,93	0,021	2,37	3,33	0,57	3,90	143	200
06.12.95	10,000	1,8	7,97	458	13,30	95,4	4,3	2,5	11	0,50	0,027	2,37	2,90	0,58	3,48	153	190
11.12.95	10,700	3,6	8,02	428	12,20	91,9	3,6	2,8	11	0,40	0,024	1,74	2,16	0,43	2,59	137	200
18.12.95	6,840	2,2	7,84	474	12,80	92,8	4,5	2,3	14	0,49	0,024	2,37	2,89	0,59	3,48	183	240
20.12.95	9,620	3,5	7,94	469	12,50	93,9	4,3	2,6	10	0,32	0,024	2,60	2,94	0,81	3,75	163	200
03.01.96	11,800	0,0	7,95	446	13,00	88,7	4,2	3,8	11	0,70	0,021	2,26	2,98	0,68	3,66	108	160
08.01.96	9,470	0,0	7,99	526	13,30	90,8	4,0	3,4	18	0,84	0,021	2,55	3,41	0,41	3,82	186	260
15.01.96	11,600	2,8	8,07	468	13,90	102,5	5,1	4,0	13	0,57	0,024	2,53	3,13	0,90	4,03	111	190
22.01.96	9,450	0,0	7,87	522	13,70	93,5	4,4	3,6	14	0,68	0,021	2,78	3,48	0,61	4,09	127	170
29.01.96	11,700	0,0	7,79	469	12,80	87,4	6,3	5,0	19	0,68	0,018	2,33	3,03	0,44	3,47	124	160
06.02.96	9,760	0,0	7,90	522	13,30	90,8	4,1	2,6	13	0,71	0,024	2,53	3,26	0,34	3,60	114	180
15.02.96	10,100	0,2	7,80	514	12,40	85,1	3,8	4,2	15	0,78	0,021	2,15	2,95	0,54	3,49	137	190
19.02.96	11,800	0,0	7,82	517	12,90	88,0	4,2	3,2	14	0,78	0,027	2,64	3,46	0,32	3,78	156	210
26.02.96	8,610	0,0	7,99	473	13,70	93,5	4,6	3,3	11	0,68	0,021	1,92	2,62	0,31	2,93	130	170
04.03.96	6,030	1,8	7,89	543	14,20	101,9	2,8	4,1	13	0,77	0,024	2,64	3,44	0,41	3,85	153	220
13.03.96	6,700	2,6	7,86	510	13,60	99,7	7,1	3,6	17	0,65	0,027	2,33	3,01	0,82	3,83	130	190
19.03.96	40,200	2,2	7,87	463	12,70	92,1	10,7	11,7	35	0,56	0,049	4,07	4,68	2,00	6,68	170	590
25.03.96	36,300	3,8	7,42	393	12,20	92,4	5,2	6,2	21	0,29	0,040	3,93	4,26	1,26	5,52	95	200
02.04.96	29,300	4,2	8,00	423	12,50	95,7	5,0	3,7	11	0,23	0,027	6,85	7,10	0,35	7,45	78	140
11.04.96	62,800	6,8	7,90	274	11,80	96,7	3,2	5,1	19	0,12	0,021	1,75	1,90	0,34	2,24	39	130
15.04.96	42,500	5,0	7,77	310	12,40	96,9	5,7	4,3	19	0,20	0,018	2,21	2,44	0,72	3,16	39	90
22.04.96	34,200	12,0	7,79	295	10,40	96,8	3,5	3,4	11	0,25	0,030	1,88	2,15	0,69	2,84	46	90
29.04.96	37,100	11,0	7,85	290	10,60	96,3	2,9	4,2	14	0,33	0,046	1,49	1,87	0,73	2,60	49	100
09.05.96	51,800	15,5	7,75	268	9,20	92,7	2,8	7,4	21	0,30	0,052	1,72	2,07	1,23	3,30	68	230
13.05.96	63,700	14,2	7,85	280	9,30	91,0	2,4	6,3	20	0,17	0,030	1,47	1,67	0,92	2,59	46	160
22.05.96	42,900	14,0	7,97	305	9,40	91,6	2,2	7,0	18	0,24	0,030	1,72	1,99	0,65	2,64	59	150
28.05.96	42,800	13,0	7,90	320	10,40	99,1	2,4	4,2	15	0,31	0,058	1,72	2,09	0,51	2,60	68	120
05.06.96	28,400	20,0	7,78	307	8,50	94,2	1,1	8,6	23	0,17	0,043	1,60	1,82	1,44	3,26	59	250
10.06.96	15,900	20,5	7,77	365	8,80	98,5	3,9	3,8	9	0,25	0,070	1,88	2,19	1,26	3,45	85	150
19.06.96	14,800	17,5	8,02	352	8,60	90,5	2,2	3,4	11	0,19	0,064	1,63	1,88	0,51	2,39	68	310
24.06.96	15,900	15,9	7,84	333	8,20	83,4	3,2	8,6	24	0,15	0,103	1,90	2,15	1,26	3,41	98	350
03.07.96	17,800	17,2	7,86	341	8,30	86,8	1,8	4,8	13	0,11	0,070	1,65	1,83	0,78	2,61	85	160
09.07.96	13,600	17,1	8,09	380	7,90	82,4	1,3	4,7	12	0,10	0,064	1,74	1,91	0,30	2,21	104	220

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
16.07.96	9,090	18,6	7,90	396	8,10	87,2	2,8	4,2	18	0,09	0,070	1,84	1,99	0,40	2,39	101	220
23.07.96	9,010	17,8	7,88	390	9,40	99,5	1,5	3,0	13	0,10	0,058	2,01	2,17	1,01	3,18	82	140
29.07.96	6,090	19,9	7,98	422	7,70	85,2	1,5	3,4	12	0,17	0,070	1,99	2,23	0,54	2,77	143	200
05.08.96	12,800	16,4	7,82	373	8,80	90,4	5,7	7,2	16	0,29	0,122	1,99	2,40	0,78	3,18	140	260
13.08.96	6,630	17,8	7,83	402	7,60	80,5	3,8	5,4	18	0,19	0,097	2,06	2,35	0,90	3,25	124	280
22.08.96	6,030	15,8	8,25	415	8,00	81,1	1,6	2,7	14	0,09	0,073	1,79	1,94	0,98	2,92	140	520
27.08.96	7,230	20,0	7,89	381	8,30	92,0	3,5	4,5	13	0,12	0,064	1,85	2,04	0,55	2,59	137	230
03.09.96	28,300	17,0	8,00	289	9,00	93,7	3,3	7,0	19	0,13	0,046	1,33	1,51	0,84	2,35	85	140
11.09.96	15,100	12,0	7,80	328	10,00	93,1	2,8	4,5	17	0,23	0,067	1,60	1,90	0,47	2,37	91	190
18.09.96	14,700	11,0	7,95	318	10,30	93,6	3,3	3,8	10	0,16	0,049	1,79	1,99	1,27	3,26	88	120
24.09.96	24,700	11,8	7,89	332	9,00	83,4	5,0	4,9	12	0,31	0,091	1,81	2,21	1,02	3,23	140	300
01.10.96	18,400	12,3	7,93	344	10,50	98,4	3,7	4,0	14	0,09	0,055	1,72	1,87	0,44	2,31	78	130
10.10.96	14,300	12,0	7,92	363	10,80	100,5	2,9	4,8	12	0,11	0,061	1,56	1,73	0,77	2,50	78	120
15.10.96	10,500	10,0	7,96	412	10,00	88,7	2,8	4,0	10	0,11	0,064	1,81	1,98	0,23	2,21	75	130
24.10.96	10,100	8,8	8,00	436	10,70	92,2	3,2	3,8	11	0,12	0,052	1,88	2,05	0,60	2,65	78	90
28.10.96	8,950	6,1	7,93	484	10,90	87,7	2,6	4,6	15	0,19	0,030	1,90	2,12	0,58	2,70	72	110
07.11.96	8,140	9,1	8,01	454	11,70	101,5	2,8	5,0	18	0,12	0,046	2,06	2,22	0,70	2,92	85	120
12.11.96	8,440	8,0	8,10	422	11,80	99,6	3,7	3,3	12	0,20	0,067	2,12	2,39	0,51	2,90	91	130
20.11.96	17,100	10,0	7,98	350	10,10	89,6	4,0	5,4	14	0,16	0,064	2,01	2,24	0,45	2,69	104	160
26.11.96	29,400	3,3	7,92	326	11,80	88,2	4,1	4,1	14	0,27	0,043	2,08	2,39	0,45	2,84	62	90
02.12.96	19,200	4,0	7,89	353	11,40	86,8	3,7	3,3	14	0,27	0,024	1,94	2,24	0,56	2,80	62	130
09.12.96	12,900	2,0	8,03	374	12,90	93,1	4,6	2,6	12	0,66	0,033	2,31	3,00	0,60	3,60	101	170
16.12.96	16,400	3,2	8,06	414	12,40	92,4	5,3	4,0	11	0,34	0,046	2,37	2,76	0,60	3,36	82	150
18.12.96	16,400	2,8	8,11	398	12,60	92,9	4,0	2,9	12	0,26	0,027	2,24	2,52	0,51	3,03	82	110
08.01.97	26,700	0,0	7,98	435	13,40	91,5	4,8	2,4	10	0,33	0,049	2,26	2,63	0,35	2,98	85	110
13.01.97	15,900	0,0	7,78	450	13,00	88,7	4,3	3,8	12	0,46	0,036	2,51	3,00	0,90	3,90	104	180
22.01.97	15,000	0,0	7,85	470	13,40	91,5	4,2	3,6	14	0,33	0,033	2,44	2,81	0,56	3,37	88	140
27.01.97	10,000	0,2	7,73	535	13,80	94,7	2,1	2,6	11	0,35	0,021	2,37	2,74	0,24	2,98	88	140
04.02.97	11,700	0,0	7,83	437	14,10	96,2	5,2	2,6	11	0,32	0,040	2,19	2,55	0,45	3,00	104	120
10.02.97	8,400	0,0	7,81	452	13,60	92,8	4,2	2,8	14	0,30	0,027	2,49	2,81	0,28	3,09	95	170
20.02.97	8,400	1,0	7,92	501	13,30	93,3	4,4	3,6	14	0,46	0,027	2,60	3,08	0,53	3,61	82	130
25.02.97	23,300	3,1	7,79	445	12,00	89,2	7,4	7,4	18	0,37	0,061	3,03	3,45	1,54	4,99	127	330
05.03.97	20,400	4,0	7,88	427	12,40	94,4	4,1	3,8	16	0,30	0,027	2,58	2,90	0,78	3,68	65	130

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
10.03.97	17,000	4,9	8,12	422	13,00	101,4	5,0	4,2	18	0,26	0,036	2,28	2,58	0,46	3,04	72	140
19.03.97	14,100	3,5	7,87	421	12,20	91,7	3,1	2,9	12	0,20	0,033	2,17	2,41	0,38	2,79	75	150
24.03.97	14,100	4,8	7,98	411	14,00	108,9	4,8	2,8	10	0,21	0,027	2,12	2,36	0,43	2,79	65	100
03.04.97	11,300	11,0	7,99	394	11,00	100,0	4,2	3,6	13	0,29	0,046	1,88	2,21	0,79	3,00	72	140
09.04.97	9,620	5,6	7,95	415	12,70	100,9	6,2	3,8	13	0,27	0,046	2,01	2,33	0,31	2,64	68	100
16.04.97	9,620	6,8	7,94	416	12,20	99,9	4,2	4,4	16	0,28	0,040	1,85	2,17	0,59	2,76	75	140
22.04.97	8,800	7,8	8,06	419	9,50	79,8	2,6	3,2	9	0,10	0,033	1,83	1,97	0,73	2,70	78	130
29.04.97	9,620	15,0	8,12	421	9,50	94,7	3,5	4,4	14	0,26	0,082	1,70	2,03	0,81	2,84	134	170
06.05.97	10,900	16,0	7,80	407	8,80	89,7	4,8	5,4	24	0,33	0,079	1,94	2,36	1,27	3,63	137	210
15.05.97	10,500	18,2	7,73	375	7,60	81,2	2,5	3,8	13	0,53	0,091	1,56	2,18	0,57	2,75	166	200
21.05.97	11,300	19,4	7,95	355	8,20	89,8	3,0	5,6	16	0,32	0,088	1,79	2,19	0,89	3,08	143	230
28.05.97	14,000	14,5	7,96	349	9,90	97,6	3,2	4,1	10	0,39	0,070	1,67	2,13	0,41	2,54	104	180
03.06.97	7,600	15,9	7,86	408	9,80	99,6	3,7	3,3	12	0,37	0,070	2,19	2,63	0,34	2,97	121	170
11.06.97	11,800	18,5	8,08	366	8,20	88,1	6,2	5,4	12	0,47	0,085	1,70	2,25	0,80	3,05	140	210
17.06.97	9,200	18,1	7,93	354	9,00	95,9	4,6	5,4	13	0,17	0,070	1,74	1,98	0,80	2,78	101	240
26.06.97	14,100	20,8	7,77	308	8,70	98,0	5,1	8,1	20	0,31	0,058	1,67	2,04	0,98	3,02	140	270
30.06.97	9,600	22,5	8,00	383	8,00	93,2	4,8	4,4	11	0,31	0,067	1,58	1,96	0,48	2,44	137	200
03.07.97	21,000	18,2	7,83	300	8,20	87,6	2,3	7,4	16	0,07	0,049	1,31	1,43	1,25	2,68	95	260
09.07.97	25,600	16,2	7,98	309	8,70	89,0	5,0	8,2	19	0,10	0,046	1,56	1,71	1,06	2,77	101	260
17.07.97	18,800	15,5	8,01	309	8,90	89,7	2,0	5,3	12	0,26	0,033	1,63	1,92	0,59	2,51	82	170
21.07.97	81,500	18,4	8,00	286	9,40	100,8	2,0	7,9	19	0,12	0,021	1,49	1,64	0,58	2,22	52	180
28.07.97	40,400	15,0	7,80	321	9,20	91,7	1,9	5,8	14	0,19	0,021	1,29	1,50	0,59	2,09	26	120
04.08.97	41,600	16,5	7,91	348	9,40	96,8	5,7	5,8	17	0,75	0,030	1,54	2,31	0,38	2,69	72	150
14.08.97	22,200	17,1	7,80	333	9,40	98,1	2,9	4,4	13	0,07	0,027	1,33	1,43	1,76	3,19	49	110
18.08.97	16,400	18,3	7,91	362	8,60	92,0	2,0	5,1	13	0,07	0,036	1,79	1,89	0,65	2,54	46	150
27.08.97	9,620	17,2	7,90	412	8,60	89,9	2,7	3,3	11	0,22	0,033	2,03	2,29	0,62	2,90	101	130
01.09.97	8,000	18,2	8,13	416	9,40	100,4	2,7	3,4	12	0,08	0,043	2,17	2,29	0,58	2,87	91	130
11.09.97	9,200	13,0	7,86	428	9,70	92,4	2,9	3,8	13	0,26	0,049	1,97	2,28	0,47	2,75	101	170
16.09.97	8,000	13,3	7,95	395	9,50	91,1	2,0	3,6	10	0,12	0,036	1,38	1,53	0,65	2,18	101	120
24.09.97	7,600	12,0	7,97	445	9,50	88,4	2,1	2,7	10	0,09	0,033	2,10	2,22	0,72	2,94	85	110
30.09.97	7,600	10,8	7,91	438	9,90	89,5	4,1	3,4	14	0,14	0,030	1,88	2,05	0,69	2,74	72	120
06.10.97	7,600	11,2	7,90	438	9,10	83,1	2,5	3,7	9	0,09	0,046	2,08	2,21	0,64	2,85	85	140
13.10.97	7,200	13,0	7,88	415	9,20	87,6	3,8	6,2	15	0,12	0,049	1,54	1,70	0,93	2,63	33	140

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
20.10.97	5,400	7,0	8,02	507	11,80	97,2	3,9	4,2	9	0,26	0,036	2,40	2,69	0,17	2,86	82	120
28.10.97	8,000	3,6	7,95	456	13,00	97,9	4,0	3,7	11	0,22	0,027	2,19	2,44	0,27	2,71	85	120
03.11.97	5,100	3,0	7,92	474	12,80	94,9	4,4	3,6	12	0,20	0,030	2,24	2,47	1,55	4,02	75	120
11.11.97	8,400	9,3	8,02	384	10,30	89,8	3,8	5,0	15	0,23	0,036	1,72	1,98	0,82	2,80	75	140
20.11.97	16,400	3,8	7,90	364	13,00	98,5	4,1	4,6	12	0,25	0,027	2,26	2,54	0,49	3,03	62	90
25.11.97	26,700	4,0	7,99	363	11,70	89,1	5,6	8,7	21	0,38	0,043	2,69	3,11	0,33	3,44	111	240
01.12.97	35,900	7,0	7,90	394	11,30	93,0	4,1	5,4	18	0,20	0,033	2,83	3,06	1,28	4,34	82	130
08.12.97	25,000	3,5	8,02	359	11,80	88,6	2,1	3,4	11	0,17	0,033	2,35	2,55	0,86	3,41	65	90
15.12.97	18,200	3,4	7,93	367	12,60	94,4	3,7	4,2	11	0,19	0,027	2,17	2,39	0,82	3,21	65	110
18.12.97	21,000	0,2	8,01	439	14,20	97,5	4,0	2,3	11	0,24	0,030	2,49	2,76	0,32	3,08	65	90

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
05.01.94		260	0	37	60,7	16,2	15,1	4,6	0,63		0,11		345								188
11.01.94		130	0	8																	
17.01.94		30	0	18																	
24.01.94		50	0	22																	
02.02.94		0	0	24	59,3	16,7	14,0	3,6	0,18		0,12		492								66
09.02.94		30	0	35																	
16.02.94		70	0	36																	
23.02.94		80	0	21																	
03.03.94		40	0	18	52,9	12,0	18,7	4,4		0,08		0,05		145		3,0		120	0		
09.03.94				27																	
16.03.94				14																	
23.03.94				14																	
28.03.94				8																	
06.04.94		0	0	25	45,1	7,1	14,7	3,8		0,05		0,02		704							
13.04.94				21																	
19.04.94				10																	
27.04.94				23																	
04.05.94		70	0	30	50,3	10,6	14,3	4,3		0,00		0,03		308				100	0		
12.05.94				28																	
16.05.94				26																	
26.05.94				25																	
01.06.94		70	0	19	43,3	10,9	14,6	4,2		0,05		0,03		246		2,0					
08.06.94				33																	
13.06.94				34																	
22.06.94				24																	
27.06.94				29																	
06.07.94				31																	
11.07.94		10	0	20	61,5	15,3	17,8	5,1		0,25		0,08		134							
19.07.94				26																	
25.07.94				22																	
01.08.94				31																	
08.08.94		50	0	9	52,9	14,0	16,7	7,0		0,92		0,05		720							
17.08.94				15																	

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al tot. µg/l	Al dis. µg/l	As tot. µg/l	As dis. µg/l	B µg/l	B dis. µg/l	CN µg/l	CN dis µg/l	Zn tot. µg/l
22.08.94				13																	
30.08.94				11																	
07.09.94		100	0	2	66,5	15,0	12,9	6,2		0,24		0,08		37							
15.09.94				4																	
19.09.94				3																	
26.09.94				17																	
04.10.94		130	0	8	56,1	14,1	9,8	4,5		0,09		0,02		218		2,0		100	0		
10.10.94				21																	
17.10.94				21																	
26.10.94				39																	
01.11.94		60	0	11	53,9	15,9	9,6	4,1		0,00		0,00		82							
10.11.94				19																	
16.11.94				19																	
23.11.94				9																	
29.11.94				10																	
08.12.94				17																	
12.12.94		30	0	24	57,5	16,4	10,2	5,5		0,24		0,06		92		2,0		0	0		
19.12.94				24																	
22.12.94				25																	
04.01.95				5																	
09.01.95		40	0	7	63,1	18,1	12,8	4,6		0,09		0,08		149							
16.01.95				5																	
24.01.95				16																	
30.01.95				19																	
08.02.95		20	0	10	61,5	14,5	11,4	3,8		0,05		0,06		374							
14.02.95				17																	
27.02.95				16																	
01.03.95				19																	
06.03.95		20	0	41	48,1	11,1	8,8	3,6		0,58		0,08		1030		0,0		220	0		
16.03.95				56																	
20.03.95				2																	
28.03.95				71																	
03.04.95		30	0	21	51,5	15,1	9,9	2,8		0,05		0,07		108							

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
13.04.95				6																	
18.04.95				4																	
26.04.95				6																	
02.05.95		20	0	18	45,1	10,7	8,5	2,2		0,04		0,03		38							
11.05.95				19																	
15.05.95				10																	
24.05.95				50																	
29.05.95				14																	
08.06.95				13																	
12.06.95		10	0	7	36,1	13,6	11,9	7,0		0,44		0,02		303		0,0					
22.06.95				21																	
26.06.95				33																	
03.07.95				59																	
10.07.95		20	0	8	53,9	13,0	8,4	3,8		0,00		0,05		117							
17.07.95				10																	
24.07.95				50																	
01.08.95				31																	
07.08.95		10	0	20	66,1	20,2	14,6	5,9		0,12		0,13		17							
14.08.95				23																	
22.08.95				7																	
28.08.95				48																	
04.09.95		40	0	12	63,7	18,5	9,4	4,9		0,19		0,10		398							
14.09.95				25																	
18.09.95				14																	
28.09.95				18																	
03.10.95		20	0	41	66,4	24,0	10,9	5,0		0,09		0,05		39		1,1		50	0		
11.10.95				27																	
18.10.95				22																	
26.10.95				24																	
30.10.95				25																	
09.11.95				44																	
13.11.95		30	0	50	66,2	20,7	12,1	5,8		0,09		0,10		63							
22.11.95				46																	

Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al tot. µg/l	Al dis. µg/l	As tot. µg/l	As dis. µg/l	B µg/l	B dis. µg/l	CN µg/l	CN dis µg/l	Zn tot. µg/l
27.11.95				67																	
06.12.95				15																	
11.12.95		30	0	19	63,0	20,0	9,7	3,7		0,07		0,06		15		2,0		60	0		
18.12.95				17																	
20.12.95				34																	
03.01.96				40																	
08.01.96		20	0	19	74,6	20,8	15,4	7,2		0,00		0,10		20							
15.01.96				11																	
22.01.96				56																	
29.01.96				12																	
06.02.96		30	0	94	77,0	20,0	15,7	6,4		0,20		0,14		52							
15.02.96				42																	
19.02.96				63																	
26.02.96				46																	
04.03.96		20	0	72	80,0	22,0	15,1	6,4		0,00		0,17		19		1,8		50	0		
13.03.96				35																	
19.03.96				53																	
25.03.96				50																	
02.04.96		20	0	51	60,1	17,6	9,5	4,5		0,04		0,06		32							
11.04.96				20																	
15.04.96				35																	
22.04.96				37																	
29.04.96				32																	
09.05.96				30																	
13.05.96		30	0	20	43,3	9,8	8,2	2,5		0,13		0,03		61							
22.05.96				35																	
28.05.96				32																	
05.06.96				35																	
10.06.96		20	0	26	58,0	11,0	9,9	4,1		0,05		0,06		36		4,9		52	0		
19.06.96				28																	
24.06.96				9																	
03.07.96				22																	
09.07.96		20	0	32	58,4	13,2	9,1	4,9		0,04		0,05		32							

Sajó at Sajópüspöki rkm 123.5
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
16.07.96				48																	
23.07.96				36																	
29.07.96				17																	
05.08.96		20	0	46	53,9	14,1	9,3	5,5		0,09		0,03		103							
13.08.96				23																	
22.08.96				36																	
27.08.96				29																	
03.09.96		20	0	36	45,5	9,3	7,7	3,4		0,00		0,02		28							
11.09.96				30																	
18.09.96				26																	
24.09.96				50																	
01.10.96		3	0	28	55,0	12,0	8,4	3,4		0,04		0,02		36		3,7		50	0		
10.10.96				25																	
15.10.96				31																	
24.10.96				18																	
28.10.96				40																	
07.11.96				28																	
12.11.96		30	0	40	63,3	16,5	11,3	4,7		0,11		0,06		34							
20.11.96				32																	
26.11.96				20																	
02.12.96				28																	
09.12.96		70	0	27	58,9	16,2	11,4	4,7		0,04		0,07		28		2,0		50	0		
16.12.96				35																	
18.12.96				30																	
08.01.97				15																	
13.01.97		50	0	15	65,1	16,3	11,8	5,0		0,00		0,07		3							
22.01.97				31																	
27.01.97				11																	
04.02.97				37																	
10.02.97		30	0	27	66,0	19,5	11,8	5,1		0,05		0,09		7							
20.02.97				29																	
25.02.97				27																	
05.03.97				29																	

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
10.03.97		50	0	31	65,3	14,0	10,0	3,7		0,04		0,08		12		3,2		40	0		
19.03.97				21																	
24.03.97				20																	
03.04.97				35																	
09.04.97		70	0	30	59,4	18,9	10,8	4,2		0,12		0,11		9							
16.04.97				36																	
22.04.97				46																	
29.04.97				39																	
06.05.97		3	0	50	60,0	18,0	11,3	4,7		0,11		0,10		36							
15.05.97				25																	
21.05.97				22																	
28.05.97				22																	
03.06.97		50	0	26	61,2	15,2	11,5	3,9		0,07		0,10		57		2,5		50	0		
11.06.97				34																	
17.06.97				37																	
26.06.97				23																	
30.06.97				25																	
03.07.97				24																	
09.07.97		30	0	22	47,2	10,3	8,0	3,3		0,05		0,02		36							
17.07.97				22																	
21.07.97				13																	
28.07.97				27																	
04.08.97		90	0	9	53,8	11,2	8,0	3,6		0,00		0,03		15							
14.08.97				23																	
18.08.97				22																	
27.08.97				33																	
01.09.97		8	0	23	63,5	20,0	11,5	4,6		0,07		0,06		34							
11.09.97				21																	
16.09.97				26																	
24.09.97				29																	
30.09.97				35																	
06.10.97				25																	
13.10.97		50	0	61	61,0	18,0	10,3	6,3		0,08		0,06		18		4,2		0	0		

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
20.10.97				51																	
28.10.97				32																	
03.11.97				34																	
11.11.97		60	0	30	53,4	15,7	10,4	6,2		0,08		0,04		34							
20.11.97				37																	
25.11.97				58																	
01.12.97				29																	
08.12.97		20	0	14	53,9	16,4	9,3	3,6		0,00		0,04		13		2,9		50	0		
15.12.97				7																	
18.12.97				15																	

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
05.01.94		0,00		0,0		0,6		2,0		7,0		3,0	
11.01.94													
17.01.94													
24.01.94													
02.02.94		0,06		0,1		2,5		2,0		3,0		4,0	
09.02.94													
16.02.94													
23.02.94													
03.03.94	39		0,04		0,0		1,8		0,0		2,0		4,0
09.03.94													
16.03.94													
23.03.94													
28.03.94													
06.04.94	55		0,00		0,0		0,0		0,0		2,0		5,0
13.04.94													
19.04.94													
27.04.94													
04.05.94	74		0,00		0,0		1,4		0,0		0,0		4,0
12.05.94													
16.05.94													
26.05.94													
01.06.94	19		0,00		0,2		2,0		0,0		0,0		3,0
08.06.94													
13.06.94													
22.06.94													
27.06.94													
06.07.94													
11.07.94	46		0,05		0,0		0,7		3,0		1,0		4,0
19.07.94													
25.07.94													
01.08.94													
08.08.94	105		0,00		0,1		7,0		3,0		30,0		6,0
17.08.94													

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
22.08.94													
30.08.94													
07.09.94	40		0,06		0,1		1,8		1,0		0,0		3,8
15.09.94													
19.09.94													
26.09.94													
04.10.94	39		0,00		0,0		0,0		0,0		0,0		5,2
10.10.94													
17.10.94													
26.10.94													
01.11.94	30		0,05		0,1		0,0		1,6		0,0		10,3
10.11.94													
16.11.94													
23.11.94													
29.11.94													
08.12.94													
12.12.94	30		0,05		0,7		0,9		1,0		0,0		10,3
19.12.94													
22.12.94													
04.01.95													
09.01.95	20		0,00		0,1		0,7		1,8		0,0		5,5
16.01.95													
24.01.95													
30.01.95													
08.02.95	20		0,00		0,0		0,4		2,0		0,0		4,1
14.02.95													
27.02.95													
01.03.95													
06.03.95	30		0,00		0,0		2,0		0,0		0,0		3,9
16.03.95													
20.03.95													
28.03.95													
03.04.95	220		0,00		0,0		1,1		2,5		0,0		5,0

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
13.04.95													
18.04.95													
26.04.95													
02.05.95	170		0,00		0,0		0,8		1,3		0,0		5,9
11.05.95													
15.05.95													
24.05.95													
29.05.95													
08.06.95													
12.06.95	140		0,00		0,0		2,3		2,7		2,4		12,9
22.06.95													
26.06.95													
03.07.95													
10.07.95	120		0,00		0,0		0,5		0,0		0,0		5,1
17.07.95													
24.07.95													
01.08.95													
07.08.95	110		0,16		0,0		0,7		2,1		0,0		6,6
14.08.95													
22.08.95													
28.08.95													
04.09.95	140		0,00		0,0		1,5		1,1		3,8		5,2
14.09.95													
18.09.95													
28.09.95													
03.10.95	203		0,00		0,0		6,9		1,1		1,9		4,5
11.10.95													
18.10.95													
26.10.95													
30.10.95													
09.11.95													
13.11.95	90		0,05		0,1		1,0		0,0		1,9		9,3
22.11.95													

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
27.11.95													
06.12.95													
11.12.95	120		0,00		0,1		1,8		1,9		2,2		5,5
18.12.95													
20.12.95													
03.01.96													
08.01.96	58		0,00		0,0		2,2		1,0		2,2		6,9
15.01.96													
22.01.96													
29.01.96													
06.02.96	247		0,00		0,1		1,0		0,0		1,7		4,1
15.02.96													
19.02.96													
26.02.96													
04.03.96	214		0,03		0,1		0,9		1,0		3,0		4,6
13.03.96													
19.03.96													
25.03.96													
02.04.96	96		0,03		0,1		0,6		2,0		5,1		9,5
11.04.96													
15.04.96													
22.04.96													
29.04.96													
09.05.96													
13.05.96	122		0,03		0,1		0,8		1,2		2,0		6,5
22.05.96													
28.05.96													
05.06.96													
10.06.96	162		0,03		0,1		0,5		1,0		1,0		5,9
19.06.96													
24.06.96													
03.07.96													
09.07.96	91		0,03		0,1		0,5		1,7		1,0		6,4

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
16.07.96													
23.07.96													
29.07.96													
05.08.96	208		0,11		0,1		0,5		1,6		3,2		4,8
13.08.96													
22.08.96													
27.08.96													
03.09.96	108		0,19		0,1		0,6		1,6		2,0		7,0
11.09.96													
18.09.96													
24.09.96													
01.10.96	119		0,10		0,1		1,5		3,0		2,0		6,1
10.10.96													
15.10.96													
24.10.96													
28.10.96													
07.11.96													
12.11.96	73		0,10		0,1		0,5		4,1		2,2		5,4
20.11.96													
26.11.96													
02.12.96													
09.12.96	117		0,10		0,1		0,5		2,3		1,8		4,2
16.12.96													
18.12.96													
08.01.97													
13.01.97	115		0,10		0,1		0,5		1,0		1,5		4,1
22.01.97													
27.01.97													
04.02.97													
10.02.97	73		0,03		0,6		0,5		1,0		1,0		4,0
20.02.97													
25.02.97													
05.03.97													

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
10.03.97	118		0,03		0,2		3,0		1,2		2,3		7,1
19.03.97													
24.03.97													
03.04.97													
09.04.97	97		0,10		0,1		1,1		1,0		1,3		5,1
16.04.97													
22.04.97													
29.04.97													
06.05.97	95		0,03		0,1		0,5		7,1		2,1		6,1
15.05.97													
21.05.97													
28.05.97													
03.06.97	78		0,03		0,1		3,0		2,0		1,0		8,9
11.06.97													
17.06.97													
26.06.97													
30.06.97													
03.07.97													
09.07.97	94		0,03		0,1		0,5		2,4		1,0		3,8
17.07.97													
21.07.97													
28.07.97													
04.08.97	60		0,03		0,1		0,5		2,7		1,5		5,0
14.08.97													
18.08.97													
27.08.97													
01.09.97	153		0,03		0,1		13,5		2,5		1,8		6,5
11.09.97													
16.09.97													
24.09.97													
30.09.97													
06.10.97													
13.10.97	91		0,10		0,1		0,9		1,0		1,7		3,4

Sajó at Sajópüspöki rkm 123.5
01.01.1994. - 31.12.1997.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
20.10.97													
28.10.97													
03.11.97													
11.11.97	125		0,03		0,1		0,5		1,6		1,5		6,8
20.11.97													
25.11.97													
01.12.97													
08.12.97	64		0,03		0,1		1,1		1,3		1,1		6,4
15.12.97													
18.12.97													

Bódva at Hídvégardó, rkm 63.7
01.01.1994 - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
10.01.94	4,040	5,1	7,87	519	12,00	94,1	1,3	3,2	14	0,16	0,027	3,98	4,16			62	100
25.01.94	2,360	2,2	7,78	449	14,00	101,5	6,2	1,9	11	0,31	0,030	3,73	4,07			49	100
08.02.94	1,630	4,6	7,95	475	13,60	105,2	4,8	2,7	12	0,14	0,027	3,84	4,01			62	110
22.02.94	1,230	2,4	7,71	503	13,50	98,5	3,8	1,9	8	0,14	0,021	3,59	3,75			33	80
08.03.94	1,410	6,3	8,00	447	13,50	109,2	7,0	2,6	10	0,14	0,033	3,59	3,77			29	100
24.03.94	1,380	7,1	8,00	422	13,80	113,9	4,5	3,0	10	0,17	0,036	2,94	3,15			95	130
07.04.94	6,280	6,2	7,69	339	10,50	84,7	9,1	8,6	22	0,30	0,046	2,62	2,97			62	330
20.04.94	10,800	8,8	7,57	392	10,30	88,7	5,1	5,0	14	0,41	0,116	3,48	4,01			36	160
02.05.94	4,200	13,0	7,84	382	10,40	99,1	4,1	4,2	16	0,13	0,036	2,98	3,15			29	150
19.05.94	2,560	18,0	7,80	469	8,50	90,4	5,5	3,9	17	0,09	0,040	2,92	3,04			36	150
02.06.94	3,580	13,2	7,89	374	9,70	92,8	4,1	5,3	17	0,09	0,061	3,30	3,45			29	170
14.06.94	2,090	17,5	7,95	396	9,20	96,8	4,3	2,8	10	0,17	0,052	2,80	3,03			36	110
28.06.94	1,830	21,5	8,12	540	8,80	100,5	7,0	3,9	15	0,11	0,052	3,93	4,09			82	140
11.07.94	0,600	19,6	8,07	540	9,60	105,5	3,1	3,5	11	0,19	0,033	4,16	4,38			36	170
27.07.94	0,390	20,5	7,94	568	8,20	91,8	5,1	4,3	11	0,10	0,030	4,41	4,54			62	130
09.08.94	0,360	20,0	8,22	536	7,80	86,5	2,7	4,4	20	0,04	0,023	4,09	4,15			75	100
24.08.94	0,320	19,5	7,81	565	9,10	99,8	2,8	3,6	10	0,12	0,046	4,52	4,69			121	150
07.09.94	0,770	17,3	8,02	447	9,50	99,5	7,8	13,6	36	0,09	0,024	2,60	2,71			143	190
21.09.94	1,380	14,8	7,90	411	8,40	83,3	8,2	10,1	33	0,37	0,094	2,06	2,52			205	300
05.10.94	1,060	12,8	8,26	415	10,20	96,7	6,0	8,8	28	0,10	0,021	2,12	2,25			147	270
19.10.94	0,790	5,2	8,34	507	13,60	106,9	7,2	8,7	28	0,08	0,027	3,23	3,34			46	130
02.11.94	2,040	10,5	7,92	539	10,10	90,7	8,2	4,2	16	0,06	0,049	3,93	4,04			68	80
16.11.94	1,730	4,8	8,11	482	12,10	94,1	3,2	3,8	13	0,16	0,046	3,91	4,12			91	120
28.11.94	1,230	2,3	7,95	495	13,20	96,0	6,5	3,1	14	0,10	0,030	1,74	1,87			72	90
13.12.94	1,180	3,3	8,10	540	12,30	91,9	5,6	2,2	10	0,19	0,024	3,91	4,13			91	210
21.12.94	0,970	0,6	8,08	550	13,10	90,9	5,4	2,6	13	0,11	0,024	4,34	4,47			137	210
11.01.95	0,600	0,1	8,01	531	12,20	83,5	4,2	2,2	11	0,23	0,024	4,09	4,35			62	180
23.01.95	0,424	0,5	7,77	531	13,20	91,4	5,1	2,9	11	0,54	0,030	5,20	5,76			137	200
06.02.95	0,554	1,6	8,12	488	13,50	96,3	3,2	4,1	14	0,23	0,018	4,41	4,66			75	180
01.03.95	4,570	3,2	7,96	501	12,70	94,6	3,7	4,5	17	0,12	0,027	5,88	6,02			49	130
08.03.95	8,240	7,0	7,96	465	11,40	93,9	4,5	3,7	13	0,19	0,024	5,20	5,41			52	160
21.03.95	3,250	5,0	8,01	433	12,50	97,7	4,2	2,6	11	0,18	0,021	3,66	3,86			59	110
04.04.95	2,250	9,6	8,19	451	13,80	121,2	4,4	2,9	13	0,22	0,033	3,93	4,18			65	130

Bódva at Hídvégardó, rkm 63.7
01.01.1994 - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
19.04.95	2,035	10,4	8,14	369	13,30	119,1	2,0	4,5	10	0,19	0,046	6,10	6,33			46	70
04.05.95	8,690	9,2	7,94	338	11,30	98,3	3,1	5,3	18	0,20	0,021	2,49	2,71			36	150
18.05.95	3,880	12,0	7,80	375	11,10	103,3	4,3	3,8	14	0,18	0,033	2,76	2,97			49	230
30.05.95	2,500	17,3	7,93	374	8,80	92,2	3,9	3,4	16	0,13	0,058	2,33	2,52			85	130
13.06.95	25,800	16,5	7,76	299	6,70	69,0	5,6	23,7	56	0,65	0,064	3,89	4,60			88	920
27.06.95	6,960	14,0	7,61	400	8,50	82,8	3,3	9,6	22	0,25	0,061	2,26	2,57			75	330
12.07.95	2,120	20,0	7,82	474	8,70	96,4	5,0	3,7	11	0,13	0,040	3,66	3,83			82	160
25.07.95	1,495	18,5	7,85	508	8,90	95,6	1,3	4,4	11	0,16	0,027	3,68	3,87			78	150
08.08.95	1,270	19,5	8,09	515	8,30	91,1	2,1	6,6	18	0,11	0,033	3,68	3,83			49	220
21.08.95	0,616	23,0	7,80	634	8,50	100,0	4,3	3,8	23	0,08	0,018	5,42	5,52			29	150
04.09.95	3,080	13,4	7,69	492	8,80	84,6	7,4	8,7	23	0,17	0,027	3,55	3,75			46	170
20.09.95	2,120	9,5	7,78	471	8,70	76,3	1,5	4,1	18	0,13	0,033	3,37	3,53			65	170
04.10.95	2,120	14,5	8,01	462	11,10	109,4	5,0	5,1	29	0,19	0,015	2,37	2,57			29	150
17.10.95	1,570	13,4	7,99	544	9,40	90,4	5,7	9,1	21	0,18	0,030	3,71	3,92			33	170
31.10.95	1,140	9,2	7,76	505	10,70	93,1	5,1	3,6	20	0,52	0,061	4,75	5,33			147	180
15.11.95	1,300	4,2	7,87	496	12,10	92,6	3,7	4,2	12	0,19	0,030	4,52	4,74			65	130
28.11.95	1,235	3,0	7,93	472	13,30	98,6	4,6	2,4	8	0,57	0,030	4,50	5,10			153	180
13.12.95	1,170	3,0	7,88	466	13,40	99,3	3,9	2,6	11	0,23	0,030	4,52	4,78			108	150
19.12.95	1,140	3,0	7,97	540	14,20	105,3	4,7	2,8	16	0,33	0,027	4,52	4,88			117	150
09.01.96	1,020	2,3	7,94	521	13,80	100,4	4,0	3,1	12	0,53	0,027	4,45	5,01			46	160
24.01.96	0,673	3,0	7,92	570	14,00	103,8	3,7	2,6	14	0,30	0,018	5,90	6,22			52	90
06.02.96	0,502	0,6	7,83	560	14,00	97,2	6,0	3,4	21	0,52	0,024	5,81	6,35			95	160
19.02.96	0,493	2,0	8,00	554	13,50	97,4	4,4	3,2	14	0,44	0,027	4,84	5,30			59	110
05.03.96	0,650	1,6	7,73	561	14,10	100,6	4,7	4,1	16	0,99	0,036	5,60	6,63			65	170
18.03.96	7,060	3,1	7,61	387	12,20	90,7	4,7	10,7	32	0,92	0,046	6,64	7,61			91	320
02.04.96	4,890	5,4	8,05	460	11,80	93,2	3,3	3,0	10	0,15	0,030	6,92	7,09			39	110
17.04.96	7,030	8,3	7,86	343	11,80	100,4	3,2	4,0	15	0,37	0,021	2,76	3,14			39	120
29.04.96	5,520	13,8	7,88	295	10,20	98,9	7,7	8,2	24	0,32	0,043	2,12	2,49			59	230
15.05.96	12,300	16,6	7,80	392	8,50	87,7	7,0	9,4	29	0,05	0,052	2,92	3,02			26	280
29.05.96	5,290	11,5	7,84	334	9,80	90,1	2,2	5,9	12	0,10	0,036	2,53	2,67			49	170
12.06.96	2,120	22,0	7,95	448	9,30	107,3	2,8	4,2	13	0,10	0,085	3,25	3,44			85	190
25.06.96	2,480	15,7	7,98	383	9,40	95,1	5,5	6,2	15	0,08	0,049	2,87	3,00			75	170
08.07.96	1,470	21,3	8,03	420	9,90	112,7	3,3	4,2	12	0,05	0,070	3,59	3,71			104	180

Bódva at Hídvégardó, rkm 63.7
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
23.07.96	0,733	14,5	8,07	506	11,20	110,4	2,6	4,6	17	0,11	0,021	5,40	5,53			62	140
06.08.96	3,130	15,6	7,88	430	9,20	92,9	2,2	8,2	21	0,11	0,082	3,89	4,08			114	360
21.08.96	1,300	16,8	8,19	499	9,70	100,6	3,0	4,0	13	0,05	0,040	4,75	4,84			114	280
04.09.96	1,250	17,0	8,04	434	9,00	93,7	2,2	4,7	19	0,12	0,046	3,62	3,79			124	140
18.09.96	2,200	11,0	7,93	478	10,70	97,2	3,2	5,7	12	0,20	0,049	4,41	4,66			124	200
02.10.96	4,210	11,8	7,86	419	10,00	92,6	4,6	6,6	23	0,01	0,000	1,29	1,30			55	170
17.10.96	2,600	11,5	7,84	385	9,00	82,8	2,2	6,1	16	0,04	0,052	3,01	3,10			85	160
30.10.96	3,610	8,4	7,86	379	10,70	91,3	4,2	5,4	17	0,22	0,064	2,94	3,22			108	150
11.11.96	2,190	10,5	8,00	460	11,10	99,7	4,7	2,6	11	0,13	0,058	3,89	4,08			16	110
27.11.96	4,340	4,0	7,94	369	12,10	92,1	3,2	3,8	11	0,42	0,036	3,16	3,62			55	100
11.12.96	2,920	2,0	7,82	378	12,40	89,4	4,2	3,0	11	0,42	0,043	3,68	4,15			72	140
18.12.96	3,920	3,2	8,19	471	12,40	92,4	3,5	3,4	16	0,25	0,033	4,75	5,03			46	120
16.01.97	2,000	0,4	7,73	389	13,20	91,1	5,0	4,2	18	1,11	0,021	3,32	4,45			72	200
29.01.97	0,915	0,5	7,78	565	13,80	95,5	4,2	1,8	9	0,33	0,036	5,36	5,73			42	90
13.02.97	0,663	2,0	7,81	490	14,30	103,2	4,3	2,6	10	0,34	0,021	4,66	5,02			62	110
24.02.97	3,250	4,0	7,62	360	12,50	95,2	6,9	11,5	38	0,71	0,036	3,71	4,46			82	410
12.03.97	2,820	6,0	8,12	438	14,70	118,0	4,6	3,0	13	0,10	0,024	3,28	3,40			33	70
26.03.97	2,080	5,8	8,03	421	15,70	125,3	4,5	2,6	12	0,37	0,030	3,21	3,60			42	80
10.04.97	1,400	7,0	7,86	439	12,80	105,4	4,2	3,0	10	0,16	0,049	3,71	3,92			52	70
21.04.97	1,400	5,2	8,04	423	13,70	107,7	4,4	3,0	15	0,33	0,052	4,11	4,50			114	120
07.05.97	0,632	16,1	7,98	433	10,30	105,2	3,1	4,3	17	0,19	0,103	3,14	3,44			101	170
20.05.97	0,479	18,5	7,86	453	8,40	90,3	3,6	4,7	15	0,42	0,134	3,62	4,17			130	180
04.06.97	0,720	14,0	7,78	383	9,40	91,6	3,4	5,8	14	0,23	0,073	2,83	3,12			101	240
16.06.97	4,480	16,5	7,80	259	9,40	96,8	5,3	8,5	27	0,37	0,046	2,15	2,56			62	250
30.06.97	0,872	22,0	8,00	389	7,40	85,4	2,8	4,6	13	0,30	0,079	3,07	3,45			114	200
07.07.97	1,370	16,5	7,93	346	7,20	74,2	4,5	38,4	138	0,23	0,103	3,39	3,72			121	1600
23.07.97	11,100	15,0	7,84	359	9,40	93,7	2,9	5,9	16	0,15	0,021	1,92	2,09			42	150
05.08.97	10,500	17,5	7,87	361	8,30	87,3	1,7	9,5	21	0,13	0,024	1,74	1,90			42	220
18.08.97	4,200	17,4	7,98	420	9,00	94,5	2,4	5,2	16	0,06	0,030	2,49	2,58			16	270
03.09.97	2,200	18,0	7,94	463	9,00	95,7	3,4	6,0	15	0,14	0,021	2,71	2,87			65	120
18.09.97	1,810	14,0	7,92	444	9,90	96,5	2,8	6,4	21	0,08	0,018	2,10	2,20			39	150
29.09.97	1,190	11,5	8,02	465	10,80	99,3	3,4	7,0	19	0,12	0,027	2,42	2,56			55	130
15.10.97	1,020	9,0	7,93	483	10,70	92,6	5,7	8,2	22	0,33	0,027	2,55	2,91			49	180

Bódva at Hídvégardó, rkm 63.7
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
29.10.97	0,544	2,5	7,73	507	12,90	94,3	3,9	3,3	12	0,26	0,027	3,91	4,20			59	90
13.11.97	1,550	10,5	7,98	477	11,00	98,8	3,9	5,4	13	0,32	0,079	3,37	3,77			104	120
26.11.97	2,850	5,5	7,89	488	12,00	95,1	4,0	5,6	15	0,40	0,058	4,75	5,20			95	150
10.12.97	2,460	4,0	7,95	498	12,90	98,2	3,8	3,0	10	0,27	0,036	4,45	4,76			82	110
17.12.97	1,550	0,2	7,81	573	13,90	95,4	4,2	2,6	11	0,30	0,030	5,88	6,21			65	130

Bódva at Hídvégardó, rkm 63.7
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
10.01.94		30	0	8	97,2	12,8	15,1	4,9	0,56			0,12	340								370		0,06
25.01.94		20	0	9																			
08.02.94		0	0	0	81,0	12,5	18,0	4,9	0,22			0,05	200								67		0,08
22.02.94		0	0	44																			
08.03.94		0	0	8	76,2	8,1	21,4	6,3		0,10		0,02		45								92	
24.03.94				7																			
07.04.94		50	0	19	53,9	9,1	18,1	4,5		0,16		0,03		420								95	
20.04.94				9																			
02.05.94		100	0	12	66,1	8,8	16,9	4,5		0,04		0,03		1850								61	
19.05.94				20																			
02.06.94		0	0	2	64,3	10,1	15,3	5,1		0,14		0,03		240								11	
14.06.94				22																			
28.06.94				21																			
11.07.94		30	0	20	91,6	12,0	21,7	9,8		0,12		0,06		102								65	
27.07.94				4																			
09.08.94		120	0	3	89,6	14,0	20,0	9,8		0,04		0,03		221								60	
24.08.94				13																			
07.09.94		90	0	37	70,7	11,9	12,7	9,7		0,24		0,02		139								51	
21.09.94				3																			
05.10.94		50	0	10	65,1	10,9	15,2	9,5		0,18		0,00		483								30	
19.10.94				9																			
02.11.94		20	0	7	88,2	17,3	15,1	7,8		0,06		0,00		85								50	
16.11.94				20																			
28.11.94				21																			
13.12.94		140	0	14	76,4	18,1	13,8	5,0		0,15		0,04		150								40	
21.12.94				21																			
11.01.95		20	0	5	78,4	13,6	22,0	8,0		0,00		0,05		252								30	
23.01.95				3																			
06.02.95		30	0	2	74,9	13,1	18,1	5,6		0,00		0,05		94								30	
01.03.95				3																			
08.03.95		20	0	17	79,6	13,7	10,3	3,7		0,00		0,05		350								80	
21.03.95				4																			
04.04.95		20	0	5	76,2	15,2	12,3	3,7		0,00		0,05		70								90	

Bódva at Hídvégardó, rkm 63.7
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Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al tot. µg/l	Al dis. µg/l	As tot. µg/l	As dis. µg/l	B µg/l	B dis. µg/l	CN µg/l	CN dis µg/l	Zn tot. µg/l	Zn dis. µg/l	Hg tot. µg/l
19.04.95				7																			
04.05.95		30	0	16	63,5	12,5	8,4	2,2		0,05		0,04		35								110	
18.05.95				10																			
30.05.95				7																			
13.06.95		20	0	4	48,9	6,8	10,9	5,8		0,36		0,12		216								110	
27.06.95				7																			
12.07.95		20	0	3	83,4	9,1	11,4	4,3		0,00		0,10		23								110	
25.07.95				9																			
08.08.95		10	0	27	92,6	14,6	16,6	8,8		0,14		0,04		66								70	
21.08.95				4																			
04.09.95		70	0	29	95,2	9,2	11,1	5,6		0,16		0,11		90								640	
20.09.95				4																			
04.10.95		20	0	10	83,2	14,7	12,5	5,4		0,04		0,00		76								181	
17.10.95				9																			
31.10.95				10																			
15.11.95		40	0	15	75,8	15,2	15,0	4,8		0,16		0,06		62								130	
28.11.95				12																			
13.12.95		20	0	9	79,6	14,6	13,4	4,4		0,00		0,04		16								110	
19.12.95				11																			
09.01.96		20	0	12	82,0	12,2	17,9	6,1		0,10		0,07		107								162	
24.01.96				6																			
06.02.96		30	0	20	90,0	14,8	18,2	5,5		0,00		0,11		23								184	
19.02.96				15																			
05.03.96		30	0	4	91,2	16,3	15,1	5,4		0,16		0,16		489								124	
18.03.96				27																			
02.04.96		20	0	18	81,3	9,0	10,1	3,1		0,00		0,09		21								248	
17.04.96				20																			
29.04.96				18																			
15.05.96		20	0	11	71,1	6,2	12,0	3,1		0,00		0,03		33								140	
29.05.96				29																			
12.06.96		20	0	7	81,0	8,5	9,8	3,3		0,04		0,04		36								958	
25.06.96				5																			
08.07.96		20	0	10	68,1	9,8	11,9	4,2		0,00		0,05		25								224	

Bódva at Hídvégardó, rkm 63.7
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
23.07.96				12																			
06.08.96		0	0	16	71,8	12,3	10,3	6,3		0,07		0,04		79								126	
21.08.96				19																			
04.09.96		30	0	24	68,2	14,8	12,2	4,4		0,05		0,03		3								188	
18.09.96				28																			
02.10.96		1	0	25	68,7	11,6	11,7	4,5		0,13		0,03		205								62	
17.10.96				13																			
30.10.96				25																			
11.11.96		50	0	17	70,1	14,8	13,2	4,1		0,06		0,08		21								100	
27.11.96				31																			
11.12.96		12	0	10	60,4	11,0	10,4	3,2		0,04		0,09		16								87	
18.12.96				28																			
16.01.97		40	0	19	63,4	8,4	11,5	4,4		0,00		0,09		3								93	
29.01.97				6																			
13.02.97		60	0	18	78,1	13,4	17,1	4,0		0,00		0,14		14								133	
24.02.97				21																			
12.03.97		20	0	24	74,2	11,2	10,9	3,0		0,00		0,08		6								112	
26.03.97				21																			
10.04.97		20	0	15	72,7	11,7	12,8	3,4		0,00		0,11		8								98	
21.04.97				31																			
07.05.97		3	0	31	66,6	12,1	12,4	3,6		0,05		0,11		20								123	
20.05.97				30																			
04.06.97		10	0	34	57,5	15,2	13,1	3,5		0,05		0,04		38								55	
16.06.97				26																			
30.06.97				12																			
07.07.97		80	0	26	50,8	8,0	11,6	6,1		0,08		0,00		116								79	
23.07.97				16																			
05.08.97		60	0	24	61,9	8,0	8,9	3,0		0,04		0,03		19								88	
18.08.97				28																			
03.09.97		50	0	22	94,1	10,2	9,7	3,2		0,04		0,03		26								112	
18.09.97				23																			
29.09.97				72																			
15.10.97		30	0	34	85,4	10,6	11,0	4,2		0,00		0,05		18								76	

Bódva at Hídvégardó, rkm 63.7
01.01.1994 - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
29.10.97				24																			
13.11.97		30	0	20	78,6	13,0	12,3	5,8		0,04		0,07		27								138	
26.11.97				38																			
10.12.97		20	0	19	81,7	12,2	12,4	3,6		0,00		0,11		12								103	
17.12.97				19																			

Bódva at Hídvégardó, rkm 63.7
01.01.1994 - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
10.01.94		0,1		3,5		2,0		11,0		4,0	
25.01.94											
08.02.94		0,0		1,5		1,0		0,0		4,0	
22.02.94											
08.03.94	0,04		0,0		0,9		3,0		0,0		2,0
24.03.94											
07.04.94	0,00		0,0		2,0		3,0		5,0		5,0
20.04.94											
02.05.94	0,07		0,8		2,6		1,0		1,0		6,0
19.05.94											
02.06.94	0,00		0,1		8,0		1,0		0,0		3,0
14.06.94											
28.06.94											
11.07.94	0,04		0,3		0,9		0,0		2,0		3,0
27.07.94											
09.08.94	0,00		0,0		0,6		1,0		0,0		4,0
24.08.94											
07.09.94	0,09		0,1		0,8		1,0		0,0		4,4
21.09.94											
05.10.94	0,06		0,0		0,0		0,0		0,0		9,7
19.10.94											
02.11.94	0,13		0,0		0,5		1,6		0,0		10,1
16.11.94											
28.11.94											
13.12.94	0,07		0,3		0,6		1,0		0,0		67,0
21.12.94											
11.01.95	0,04		0,0		0,3		0,0		0,0		7,4
23.01.95											
06.02.95	0,13		0,0		0,7		1,1		0,0		5,8
01.03.95											
08.03.95	0,00		0,0		1,4		1,2		3,0		6,5
21.03.95											
04.04.95	0,00		0,0		1,2		2,6		0,0		4,9

Bódva at Hídvégardó, rkm 63.7
01.01.1994 - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
19.04.95											
04.05.95	0,10		0,0		0,0		1,5		0,0		7,7
18.05.95											
30.05.95											
13.06.95	0,00		0,0		2,8		6,1		0,0		10,9
27.06.95											
12.07.95	0,00		0,0		0,8		0,0		2,3		7,5
25.07.95											
08.08.95	0,21		0,0		1,7		0,0		0,0		6,2
21.08.95											
04.09.95	0,26		0,0		1,3		2,0		3,3		7,0
20.09.95											
04.10.95	0,00		0,0		0,6		1,3		2,3		4,7
17.10.95											
31.10.95											
15.11.95	0,00		0,1		1,3		3,4		3,5		8,4
28.11.95											
13.12.95	0,00		0,1		0,5		1,0		1,2		5,6
19.12.95											
09.01.96	0,04		0,1		1,4		3,1		4,9		8,7
24.01.96											
06.02.96	0,03		0,1		0,7		1,8		1,1		3,7
19.02.96											
05.03.96	0,03		0,1		1,0		2,7		4,3		13,4
18.03.96											
02.04.96	0,03		0,1		0,5		1,8		6,1		10,1
17.04.96											
29.04.96											
15.05.96	0,03		0,1		0,5		1,8		2,9		7,7
29.05.96											
12.06.96	0,03		0,2		0,9		1,4		7,0		18,2
25.06.96											
08.07.96	0,03		0,1		5,0		1,4		2,5		11,4

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
23.07.96											
06.08.96	0,15		0,1		1,0		1,7		3,3		5,8
21.08.96											
04.09.96	0,14		0,1		1,9		1,9		2,8		7,5
18.09.96											
02.10.96	0,16		0,1		2,7		1,0		3,5		5,7
17.10.96											
30.10.96											
11.11.96	0,10		0,1		0,5		2,1		1,9		3,7
27.11.96											
11.12.96	0,25		0,1		0,5		1,0		1,4		4,1
18.12.96											
16.01.97	0,10		0,1		5,4		2,5		2,1		3,4
29.01.97											
13.02.97	0,04		0,2		0,5		1,0		1,0		3,4
24.02.97											
12.03.97	0,07		0,1		1,4		1,2		1,8		6,1
26.03.97											
10.04.97	0,10		0,1		0,5		1,0		1,0		6,3
21.04.97											
07.05.97	0,03		0,1		0,5		2,2		1,8		7,3
20.05.97											
04.06.97	0,03		0,1		1,2		1,0		1,0		6,1
16.06.97											
30.06.97											
07.07.97	0,03		0,1		1,0		3,3		3,2		7,0
23.07.97											
05.08.97	0,03		0,1		0,5		3,2		1,6		4,7
18.08.97											
03.09.97	0,03		0,1		1,7		3,7		3,8		4,4
18.09.97											
29.09.97											
15.10.97	0,10		0,2		1,0		1,8		3,1		4,8

Bódva at Hídvégardó, rkm 63.7
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Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
29.10.97											
13.11.97	0,03		0,1		0,5		1,8		1,0		4,4
26.11.97											
10.12.97	0,03		0,1		0,8		2,4		1,0		6,0
17.12.97											

Hernád at Tornyosnémeti rkm 97.6
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP	Extr.
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	mg/l
10.01.94	17,500	5,2	7,74	539	10,00	78,6	8,3	4,7	15	1,55	0,070	3,41	5,04	0,36	5,40	287	320	
25.01.94	21,300	2,4	7,72	509	14,40	105,0	10,9	6,6	28	1,79	0,043	3,05	4,88	0,65	5,53	274	340	
07.02.94	13,800	3,6	7,62	554	10,50	79,1	7,2	5,5	18	1,94	0,070	3,10	5,11	2,05	7,16	359	520	
21.02.94	16,400	1,5	7,78	544	11,20	79,7	10,8	5,1	18	1,71	0,064	3,55	5,32	1,15	6,47	287	920	
07.03.94	18,900	7,0	7,69	466	9,70	79,9	8,9	6,6	20	0,72	0,070	3,32	4,11	1,89	6,00	153	310	
21.03.94	21,200	6,0	7,91	473	10,50	84,3	9,1	4,2	16	0,61	0,061	3,34	4,01	2,40	6,41	215	750	
05.04.94	66,300	8,5	7,76	379	11,00	94,1	7,8	9,2	24	0,30	0,076	2,94	3,31	1,81	5,12	62	460	
18.04.94	101,000	8,8	7,56	344	10,00	86,1	5,0	6,2	23	0,43	0,070	2,42	2,92	1,76	4,68	62	420	
03.05.94	46,900	11,0	7,60	383	9,80	89,1	7,9	4,6	14	0,31	0,076	2,94	3,32	0,88	4,20	108	320	
18.05.94	21,900	17,9	7,74	497	7,00	74,3	5,8	3,7	10	0,31	0,161	3,05	3,52	0,72	4,24	225	340	
02.06.94	35,200	14,7	7,95	422	8,40	83,2	4,3	4,3	13	0,22	0,131	2,83	3,17	0,84	4,01	140	220	
15.06.94	27,800	16,2	7,86	451	6,60	67,5	3,6	4,3	12	0,44	0,161	2,85	3,44	0,75	4,19	186	240	
28.06.94	19,500	20,9	8,30	458	8,40	94,8	11,2	5,9	23	0,13	0,122	2,33	2,58	1,63	4,21	33	250	
13.07.94	14,100	24,0	7,74	518	6,50	78,0	6,4	4,6	13	0,51	0,395	2,71	3,61	1,09	4,70	290	370	
27.07.94	13,700	23,2	7,90	468	5,40	63,8	1,4	5,0	13	0,29	0,274	2,49	3,05	0,88	3,93	319	450	
10.08.94	14,200	23,0	8,00	448	5,90	69,4	3,0	3,7	12	0,22	0,286	2,73	3,24	0,68	3,92	310	340	
24.08.94	12,800	20,9	7,96	527	4,90	55,3	4,5	5,5	13	0,39	0,334	2,76	3,48	1,48	4,96	323	380	
05.09.94	12,000	20,5	7,69	512	5,70	63,8	6,1	9,8	28	0,12	0,195	3,44	3,75	1,91	5,66	287	590	
20.09.94	10,700	18,1	7,79	602	6,30	67,1	2,6	4,4	17	0,22	0,143	3,59	3,95	1,07	5,02	267	300	
03.10.94	12,300	17,1	8,01	542	6,10	63,6	3,1	4,6	16	0,40	0,237	3,23	3,87	0,93	4,80	323	380	
19.10.94	11,300	7,8	7,85	580	10,10	84,9	7,8	3,0	12	0,70	0,192	3,68	4,57	0,87	5,44	326	350	
02.11.94	19,800	11,2	7,68	519	8,10	74,0	4,4	5,0	15	0,40	0,122	3,23	3,75	0,18	3,93	156	170	
15.11.94	11,600	4,3	7,99	575	9,60	73,7	6,7	4,6	17	1,24	0,097	3,55	4,89	0,35	5,24	254	280	
30.11.94	11,700	4,0	7,88	548	11,20	85,3	7,7	4,4	15	0,99	0,079	3,75	4,82	0,47	5,29	372	400	
13.12.94	12,500	4,9	7,95	654	9,20	71,7	7,5	4,1	14	2,02	0,076	3,32	5,42	1,01	6,43	401	550	
21.12.94	11,700	1,6	7,86	550	10,60	75,6	8,5	4,0	18	1,34	0,088	3,68	5,12	1,06	6,18	365	530	
10.01.95	12,600	1,0	7,98	579	11,10	77,9	9,3	4,0	14	1,52	0,052	4,11	5,69	0,25	5,94	323	470	
23.01.95	12,600	1,1	7,69	578	11,50	80,9	9,4	4,2	15	1,55	0,064	3,86	5,48	2,28	7,76	336	460	
06.02.95	12,500	2,9	8,00	581	12,00	88,7	10,6	4,7	19	1,45	0,061	3,93	5,45	0,51	5,96	368	440	
01.03.95	32,000	3,0	7,83	507	13,90	103,0	9,5	6,0	18	0,56	0,046	4,38	4,99	1,31	6,30	166	250	
06.03.95	63,500	6,5	8,01	408	10,60	86,2	6,9	7,9	25	0,33	0,033	3,96	4,32	1,19	5,51	108	340	
20.03.95	27,600	6,4	7,94	492	11,70	94,9	5,9	3,6	12	0,76	0,061	3,30	4,12	0,82	4,94	186	230	
05.04.95	27,100	8,8	7,86	489	10,10	87,0	9,5	5,1	17	0,58	0,073	3,10	3,75	1,21	4,96	192	280	

Hernád at Tornyosnémeti rkm 97.6
01.01.1994 - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP	Extr.
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	mg/l
20.04.95	35,600	11,5	7,73	381	9,20	84,6	6,5	5,8	22	0,52	0,073	2,87	3,46	1,20	4,66	160	280	
03.05.95	58,700	9,6	7,92	382	10,40	91,4	5,7	4,3	19	0,35	0,046	2,62	3,02	1,34	4,36	72	210	
17.05.95	38,100	10,6	7,98	363	8,50	76,5	4,4	3,8	11	0,38	0,079	2,55	3,01	0,58	3,59	153	270	
31.05.95	31,800	17,8	7,55	386	6,90	73,1	4,1	3,8	16	0,19	0,109	2,33	2,62	0,66	3,28	166	180	
14.06.95	167,000	17,3	7,63	325	7,60	79,6	7,2	11,4	36	0,29	0,091	2,71	3,09	1,28	4,37	82	420	
27.06.95	39,800	16,0	7,76	430	7,50	76,4	6,0	6,6	19	0,31	0,116	4,75	5,17	1,29	6,46	160	340	
12.07.95	28,600	23,5	7,85	450	6,80	80,8	3,6	4,8	17	0,25	0,128	2,89	3,27	0,89	4,16	183	290	
25.07.95	16,500	20,5	7,76	535	5,70	63,8	3,7	5,0	11	0,47	0,188	2,94	3,60	1,21	4,81	277	400	
08.08.95	12,300	20,8	7,78	579	6,40	72,1	2,7	4,2	12	0,27	0,222	3,05	3,54	1,19	4,73	333	420	
23.08.95	10,700	22,0	7,88	522	6,10	70,4	4,5	4,7	19	0,46	0,322	2,80	3,58	0,91	4,49	352	380	
06.09.95	115,000	14,0	7,84	386	8,30	80,9	6,6	14,2	47	0,38	0,049	3,12	3,55	2,43	5,98	101	770	
20.09.95	17,100	15,1	7,88	512	7,10	70,9	3,4	4,2	16	0,39	0,134	3,07	3,60	0,96	4,56	225	350	
02.10.95	14,100	12,9	7,69	532	7,40	70,3	4,8	3,8	13	0,60	0,188	3,14	3,93	0,87	4,80	274	340	
16.10.95	12,100	14,0	7,92	530	6,70	65,3	3,2	3,3	15	0,44	0,182	3,03	3,65	0,90	4,55	333	360	
30.10.95	12,600	11,0	7,69	534	7,70	70,0	5,7	4,2	17	0,74	0,125	2,83	3,69	0,67	4,36	293	350	
15.11.95	9,800	5,0	7,89	612	9,80	76,6	7,7	4,2	19	1,52	0,088	3,77	5,39	0,68	6,07	421	560	
27.11.95	12,400	0,7	7,91	593	10,70	74,5	6,0	4,6	16	1,55	0,055	3,66	5,27	0,87	6,14	359	500	
11.12.95	11,700	3,8	8,00	581	9,50	71,9	5,8	3,6	16	1,62	0,076	3,30	4,99	0,95	5,94	440	520	
20.12.95	11,700	1,5	7,96	596	10,20	72,6	3,8	3,8	15	1,63	0,058	3,77	5,46	0,65	6,11	417	490	
08.01.96	13,300	0,5	7,73	564	10,90	75,4	9,4	6,2	29	2,13	0,058	3,25	5,44	1,22	6,66	362	610	
23.01.96	12,500	0,1	7,91	631	13,00	89,0	6,6	3,4	12	1,45	0,076	4,32	5,85	0,45	6,30	310	350	
07.02.96	13,200	0,1	7,79	580	11,70	80,1	7,5	3,8	16	2,21	0,049	3,34	5,61	1,22	6,83	424	540	
21.02.96	12,100	1,6	7,73	601	9,50	67,8	7,9	8,9	42	2,88	0,106	2,96	5,95	1,31	7,26	427	590	
05.03.96	12,300	0,9	7,75	605	12,20	85,4	6,0	4,6	21	2,30	0,082	3,66	6,04	0,55	6,59	290	460	
18.03.96	32,000	3,2	7,58	399	13,30	99,1	9,8	27,2	83	1,50	0,082	4,32	5,90	3,22	9,12	251	650	
01.04.96	25,600	3,1	7,88	565	10,50	78,0	9,0	5,9	13	1,04	0,085	4,27	5,40	0,92	6,32	228	450	
17.04.96	37,700	6,0	7,74	449	10,80	86,7	6,7	5,4	20	0,77	0,085	3,46	4,31	0,93	5,24	140	240	
29.04.96	52,500	10,8	8,02	363	9,00	81,4	4,6	7,0	19	0,47	0,109	2,64	3,22	1,07	4,29	117	220	
14.05.96	57,300	16,5	7,75	341	8,50	87,5	6,4	23,7	74	0,17	0,112	2,67	2,95	4,93	7,88	130	930	
29.05.96	35,600	10,0	7,80	420	7,60	67,4	3,5	5,3	20	0,42	0,146	2,96	3,53	1,02	4,55	205	340	
12.06.96	20,200	23,0	7,89	471	6,60	77,7	3,6	6,0	16	0,44	0,261	3,37	4,07	1,14	5,21	248	410	
25.06.96	34,000	17,1	7,76	405	7,60	79,3	3,6	7,0	18	0,35	0,134	2,67	3,15	1,02	4,17	150	360	
08.07.96	22,900	21,3	7,92	470	6,00	68,3	3,5	4,2	10	0,25	0,216	3,12	3,58	0,36	3,94	251	300	

Hernád at Tornyosnémeti rkm 97.6
01.01.1994 - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP	Extr.
	m^3/s	°C		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	mg/l
22.07.96	16,900	17,5	7,96	473	6,90	72,6	4,8	3,8	13	0,39	0,249	3,53	4,16	0,96	5,12	245	310	
05.08.96	36,600	16,2	7,65	443	6,30	64,5	5,0	14,2	41	0,36	0,119	2,92	3,39	2,76	6,15	274	730	
22.08.96	17,700	19,4	7,87	519	5,60	61,3	5,1	5,8	15	0,21	0,228	3,64	4,08	0,88	4,96	277	480	
03.09.96	112,000	18,2	7,96	363	7,50	80,1	5,5	10,6	29	0,30	0,076	2,06	2,44	2,12	4,56	95	310	
18.09.96	48,500	12,0	8,15	423	9,90	92,1	4,8	5,2	14	0,44	0,085	3,07	3,59	1,10	4,69	140	220	
02.10.96	47,200	12,2	7,80	436	9,10	85,1	6,2	5,8	20	0,26	0,073	3,30	3,63	1,04	4,67	101	210	
15.10.96	21,700	13,7	7,85	529	8,30	80,3	6,5	5,4	14	0,53	0,164	3,16	3,86	0,27	4,13	222	350	
29.10.96	30,800	6,3	7,90	515	8,20	66,3	6,7	5,2	18	0,79	0,091	2,44	3,32	0,61	3,93	156	210	
11.11.96	20,600	12,5	7,95	507	9,40	88,5	3,7	3,6	17	0,38	0,112	3,01	3,50	0,81	4,31	199	270	
26.11.96	27,500	5,0	7,94	473	10,10	79,0	3,8	3,2	12	0,53	0,073	3,57	4,17	0,48	4,65	179	220	
11.12.96	20,400	2,8	7,97	493	11,40	84,0	5,9	3,3	11	0,74	0,058	3,93	4,73	0,28	5,01	222	300	
18.12.96	25,300	2,6	8,08	475	11,60	85,1	4,5	3,3	15	0,89	0,055	3,46	4,41	0,55	4,96	222	270	
15.01.97	14,500	0,8	7,86	580	13,00	90,7	5,3	4,9	17	1,45	0,076	3,82	5,35	0,24	5,59	274	320	
28.01.97	12,500	0,2	7,96	583	12,60	86,5	5,8	2,9	15	1,51	0,067	4,43	6,00	0,61	6,61	313	380	
13.02.97	12,300	2,0	7,93	572	12,40	89,4	4,5	3,0	14	1,08	0,055	4,27	5,41	0,35	5,76	310	370	
24.02.97	13,900	4,2	7,80	570	10,60	81,1	8,3	5,5	19	1,55	0,064	3,68	5,30	0,29	5,59	316	400	
12.03.97	20,500	5,0	7,94	510	10,90	85,2	5,8	3,1	23	1,18	0,070	3,01	4,26	0,60	4,86	231	280	
26.03.97	13,900	4,3	7,94	557	12,20	93,6	8,8	3,6	10	1,64	0,082	3,57	5,29	0,36	5,65	267	340	
07.04.97	17,100	3,0	8,00	501	11,20	83,0	4,1	4,2	14	0,68	0,064	3,10	3,84	0,83	4,67	199	300	
23.04.97	20,500	5,5	8,02	456	11,50	91,1	5,4	4,2	17	1,00	0,085	2,80	3,89	0,50	4,39	209	270	
05.05.97	27,100	13,2	7,69	436	8,30	79,4	6,1	4,8	18	0,67	0,106	2,80	3,58	1,33	4,91	170	310	
20.05.97	25,000	14,8	7,96	462	8,30	82,3	4,7	5,5	19	0,72	0,182	3,64	4,54	0,75	5,29	218	330	
02.06.97	28,500	12,5	7,65	464	8,70	81,9	4,2	4,2	12	0,76	0,152	3,16	4,08	0,89	4,97	196	350	
16.06.97	37,000	17,5	8,08	400	7,90	83,1	5,1	6,2	18	0,37	0,112	2,69	3,17	0,48	3,65	163	310	
30.06.97	16,200	24,0	7,96	472	6,90	82,8	5,3	5,8	15	0,33	0,207	2,94	3,47	0,43	3,90	293	430	
10.07.97	135,000	17,0	7,65	299	7,30	76,0	6,8	21,0	52	0,23	0,058	2,15	2,44	2,77	5,21	75	1230	
23.07.97	125,000	16,0	7,68	500	7,10	72,3	6,5	6,7	15	0,30	0,055	1,65	2,01	0,37	2,38	78	190	
04.08.97	178,000	17,0	7,89	365	8,60	89,5	2,7	8,5	20	0,13	0,043	2,24	2,41	0,91	3,32	68	270	
18.08.97	41,000	17,5	8,19	471	7,80	82,1	2,6	3,7	15	0,14	0,070	2,85	3,06	0,82	3,88	68	160	
03.09.97	21,700	19,5	8,05	505	7,80	85,6	3,0	4,2	13	0,40	0,134	3,21	3,74	0,18	3,92	166	270	
15.09.97	16,500	14,3	7,89	522	7,90	77,5	3,4	4,0	15	0,30	0,134	3,32	3,75	0,22	3,97	218	290	
29.09.97	14,600	12,2	8,02	576	10,00	93,5	4,0	3,4	11	0,20	0,125	3,62	3,94	0,32	4,26	228	270	
15.10.97	15,500	10,8	7,92	543	8,80	79,6	3,4	4,0	15	0,39	0,128	3,16	3,68	0,71	4,39	277	330	

Hernád at Tornyosnémeti rkm 97.6
01.01.1994 - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP	Extr.
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	mg/l
27.10.97	14,300	4,3	8,03	568	11,00	84,4	4,6	4,2	13	0,71	0,106	3,57	4,39	0,26	4,65	267	300	
12.11.97	16,900	10,0	8,01	552	8,80	78,1	4,1	4,4	11	0,63	0,128	3,53	4,28	0,33	4,61	241	270	
24.11.97	13,700	5,0	7,74	600	10,10	79,0	4,6	4,9	15	0,70	0,070	3,59	4,36	0,46	4,82	339	380	
10.12.97	18,700	3,2	7,98	545	11,20	83,5	4,2	3,0	11	0,75	0,076	4,02	4,85	0,59	5,44	310	330	
17.12.97	14,000	0,2	7,90	541	13,20	90,6	5,7	2,9	12	0,75	0,055	3,80	4,60	0,34	4,94	225	290	

Hernád at Tornyosnémeti rkm 97.6
01.01.1994 - 31.12.1997.

Date	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.	Cd tot.
	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
10.01.94	80	0	24	71,3	24,6	18,4	5,8	0,53			0,13	600								221		0,08		0,2
25.01.94	80	0	46																					
07.02.94	40	0	24	75,6	20,1	24,2	5,6	0,24			0,11	250								60		0,09		0,0
21.02.94	50	0	120																					
07.03.94	10	0	115	64,7	17,1	23,2	6,6		0,10		0,10		44		2,0		250	0			170		0,07	
21.03.94			88																					
05.04.94	10	0	22	52,3	11,6	16,2	3,8		0,07		0,00		1390								147		0,07	
18.04.94			40																					
03.05.94	30	0	19	53,3	15,4	19,3	4,7		0,06		0,03		635				210	0			101		0,04	
18.05.94			63																					
02.06.94	0	0	32	58,9	15,9	18,1	4,2		0,00		0,03		363		2,0						56		0,05	
15.06.94			32																					
28.06.94			29																					
13.07.94	40	0	67	67,7	17,3	23,3	5,4		0,08		0,21		120								110		0,07	
27.07.94			24																					
10.08.94	100	0	20	61,1	16,7	20,5	4,8		0,10		0,07		249								60		0,04	
24.08.94			7																					
05.09.94	100	0	17	65,7	19,3	22,9	7,5		0,10		0,00		150								51		0,12	
20.09.94			17																					
03.10.94	100	0	68	69,1	21,4	21,4	5,7		0,06		0,03		268		0,0		90	0			25		0,11	
19.10.94			10																					
02.11.94	0	0	64	68,9	20,8	24,2	6,5		0,00		0,06		202								30		0,00	
15.11.94			6																					
30.11.94			8																					
13.12.94	100	0	55	69,5	23,8	29,2	5,9		0,13		0,07		161		2,2		50	0			90		0,22	
21.12.94			47																					
10.01.95	10	0	20	79,2	22,5	29,4	5,8		0,00		0,10		248								50		0,04	
23.01.95			17																					
06.02.95	40	0	6	71,3	26,3	31,5	7,0		0,06		0,11		391								40		0,11	
01.03.95			27																					
06.03.95	40	0	125	56,9	19,8	13,4	5,0		0,20		0,09		850		0,0		200	0			80		0,00	
20.03.95			35																					
05.04.95	30	0	163	67,1	17,9	18,2	4,6		0,09		0,10		68								70		0,05	

Hernád at Tornyosnémeti rkm 97.6
01.01.1994 - 31.12.1997.

Date	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al tot. µg/l	Al dis. µg/l	As tot. µg/l	As dis. µg/l	B µg/l	B dis. µg/l	CN µg/l	CN dis µg/l	Zn tot. µg/l	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l
20.04.95			140																					
03.05.95	20	0	58	49,5	16,4	10,0	3,9		0,00		0,05		40								100		0,00	
17.05.95			54																					
31.05.95			109																					
14.06.95	10	0	10	45,9	11,4	11,9	5,0		0,24		0,02		149		0,0						190		0,00	
27.06.95			43																					
12.07.95	20	0	25	58,7	19,6	14,9	4,2		0,00		0,00		21								110		0,00	
25.07.95			40																					
08.08.95	30	0	35	77,0	26,9	29,2	6,2		0,00		0,03		36								90		0,27	
23.08.95			16																					
06.09.95	100	0	27	63,9	12,0	10,9	5,9		0,09		0,02		217								170		0,12	
20.09.95			48																					
02.10.95	20	0	86	74,5	24,3	22,1	5,3		0,05		0,05		28		1,9		90	0			221		0,00	
16.10.95			61																					
30.10.95			92																					
15.11.95	50	0	41	78,8	25,6	28,4	6,1		0,25		0,13		99								160		0,00	
27.11.95			94																					
11.12.95	20	0	23	77,3	24,4	25,0	5,0		0,05		0,10		18		2,0		100	0			143		0,00	
20.12.95			25																					
08.01.96	20	0	59	72,6	25,4	25,0	6,7		0,00		0,08		24								177		0,00	
23.01.96			112																					
07.02.96	20	0	65	76,0	23,6	25,2	5,6		0,12		0,12		152								224		0,00	
21.02.96			60																					
05.03.96	20	0	57	73,8	25,8	25,3	5,8		0,07		0,16		137		3,4		128	0			120		0,03	
18.03.96			75																					
01.04.96	20	0	88	72,7	23,2	19,6	6,2		0,00		0,14		74								152		0,03	
17.04.96			49																					
29.04.96			51																					
14.05.96	30	0	19	52,1	15,1	14,4	3,9		0,13		0,00		47								149		0,03	
29.05.96			64																					
12.06.96	30	0	52	65,3	18,5	16,5	4,6		0,00		0,02		37		2,9		91	0			155		0,03	
25.06.96			45																					
08.07.96	30	0	47	63,8	18,5	16,2	5,0		0,00		0,05		38								182		0,09	

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01.01.1994 - 31.12.1997.

Date	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.	Cd tot.
	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
22.07.96			51																					
05.08.96	40	0	52	59,1	20,4	20,1	7,9		0,14		0,02		265								169		0,15	
22.08.96			48																					
03.09.96	20	0	26	54,6	14,4	9,7	5,4		0,10		0,00		89								112		0,11	
18.09.96			35																					
02.10.96	4	0	35	63,4	18,2	12,9	4,3		0,10		0,04		117		2,0		50	0			101		0,10	
15.10.96			40																					
29.10.96			41																					
11.11.96	50	0	67	71,7	25,5	16,5	4,6		0,04		0,07		19								138		0,10	
26.11.96			26																					
11.12.96	30	0	37	66,7	22,4	16,4	4,6		0,04		0,08		24		2,0		60	0			123		0,17	
18.12.96			42																					
15.01.97	40	0	72	78,1	24,2	23,7	6,5		0,04		0,12		6								110		0,10	
28.01.97			56																					
13.02.97	20	0	48	84,6	20,2	23,5	5,0		0,00		0,09		5								126		0,03	
24.02.97			45																					
12.03.97	13	0	61	69,7	20,3	17,3	4,3		0,00		0,12		25		3,6		70	0			105		0,07	
26.03.97			57																					
07.04.97	30	0	68	65,3	22,5	17,3	4,5		0,04		0,08		8								124		0,14	
23.04.97			51																					
05.05.97	2	0	63	60,0	17,1	13,7	3,8		0,00		0,07		41								252		0,12	
20.05.97			51																					
02.06.97	50	0	54	64,1	21,5	14,6	4,1		0,00		0,06		70		2,0		30	0			100		0,03	
16.06.97			43																					
30.06.97			49																					
10.07.97	30	0	49	43,5	11,6	8,7	4,6		0,12		0,03		193								69		0,03	
23.07.97			41																					
04.08.97	40	0	15	53,1	13,9	9,6	3,9		0,06		0,00		36								77		0,03	
18.08.97			17																					
03.09.97	30	0	29	74,9	24,1	15,2	4,8		0,00		0,03		15								99		0,03	
15.09.97			31																					
29.09.97			146																					
15.10.97	30	0	39	74,0	24,5	18,1	6,2		0,00		0,07		22		3,9		40	0			220		0,10	

Hernád at Tornyosnémeti rkm 97.6
01.01.1994 - 31.12.1997.

Date	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.	Hg dis.	Cd tot.
	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
27.10.97			36																					
12.11.97	60	0	56	70,9	25,4	19,9	6,3		0,00		0,07		13								104		0,03	
24.11.97			66																					
10.12.97	30	0	35	72,4	23,8	17,7	5,0		0,00		0,08		23		3,5		120	0			151		0,03	
17.12.97			31																					

Date	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
10.01.94		8,2		3,0		6,0		7,0	
25.01.94									
07.02.94		1,7		8,0		0,0		5,0	
21.02.94									
07.03.94	0,2		2,2		5,0		3,0		7,0
21.03.94									
05.04.94	0,2		7,0		12,0		165,0		18,0
18.04.94									
03.05.94	0,1		2,8		5,0		2,0		9,0
18.05.94									
02.06.94	0,0		1,0		2,0		0,0		3,0
15.06.94									
28.06.94									
13.07.94	0,2		0,7		4,0		4,0		5,0
27.07.94									
10.08.94	0,0		5,5		0,0		0,0		4,0
24.08.94									
05.09.94	0,1		0,0		2,0		0,0		9,0
20.09.94									
03.10.94	0,0		0,0		3,0		3,0		6,8
19.10.94									
02.11.94	0,0		0,6		0,6		0,0		13,3
15.11.94									
30.11.94									
13.12.94	0,7		1,0		4,7		1,4		14,1
21.12.94									
10.01.95	0,0		0,8		6,3		0,0		9,2
23.01.95									
06.02.95	0,0		1,2		8,1		1,8		7,6
01.03.95									
06.03.95	0,3		2,5		7,0		0,0		6,6
20.03.95									
05.04.95	0,0		1,1		4,6		2,0		6,8

Hernád at Tornyosnémeti rkm 97.6
01.01.1994 - 31.12.1997.

Date	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
20.04.95									
03.05.95	0,0		0,7		3,3		0,0		6,3
17.05.95									
31.05.95									
14.06.95	0,0		4,0		3,4		2,8		11,3
27.06.95									
12.07.95	0,0		0,5		1,5		3,6		8,5
25.07.95									
08.08.95	0,0		1,1		3,5		0,0		7,3
23.08.95									
06.09.95	0,0		0,0		3,5		2,1		6,3
20.09.95									
02.10.95	0,0		0,5		2,6		2,3		5,6
16.10.95									
30.10.95									
15.11.95	0,1		2,2		4,9		3,3		15,8
27.11.95									
11.12.95	0,1		0,3		5,4		2,6		9,0
20.12.95									
08.01.96	0,0		1,7		7,6		1,1		8,7
23.01.96									
07.02.96	0,0		0,7		6,2		1,0		5,9
21.02.96									
05.03.96	0,1		4,2		5,8		3,8		7,4
18.03.96									
01.04.96	0,1		0,7		3,7		7,0		8,6
17.04.96									
29.04.96									
14.05.96	0,1		2,9		5,2		2,6		9,4
29.05.96									
12.06.96	0,1		0,5		1,0		2,4		6,6
25.06.96									
08.07.96	0,1		1,1		3,0		1,2		8,4

Date	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
22.07.96									
05.08.96	0,1		0,7		3,1		4,2		5,9
22.08.96									
03.09.96	0,1		0,9		4,1		1,0		8,4
18.09.96									
02.10.96	0,1		3,3		1,0		3,3		7,9
15.10.96									
29.10.96									
11.11.96	0,1		0,7		3,7		2,7		6,8
26.11.96									
11.12.96	0,1		0,5		4,9		2,6		6,6
18.12.96									
15.01.97	0,1		6,1		6,9		2,1		5,7
28.01.97									
13.02.97	0,1		0,6		3,0		1,0		7,2
24.02.97									
12.03.97	0,1		4,5		4,2		1,5		6,3
26.03.97									
07.04.97	0,1		14,5		7,8		1,9		9,6
23.04.97									
05.05.97	0,1		0,9		2,9		3,3		8,0
20.05.97									
02.06.97	0,1		1,3		3,3		1,0		7,2
16.06.97									
30.06.97									
10.07.97	0,1		5,4		8,6		2,4		6,2
23.07.97									
04.08.97	0,1		2,6		3,2		1,3		5,9
18.08.97									
03.09.97	0,1		0,6		3,5		1,0		6,4
15.09.97									
29.09.97									
15.10.97	0,2		0,9		3,2		2,1		5,8

Hernád at Tornyosnémeti rkm 97.6
01.01.1994 - 31.12.1997.

Date	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
27.10.97									
12.11.97	0,1		0,5		3,3		1,0		3,6
24.11.97									
10.12.97	0,1		0,9		2,8		2,0		8,0
17.12.97									

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
04.01.94	127,000	3,1	7,63	257	11,80	87,7	5,0	4,2	18	0,19	0,018	2,51	2,72			29	240
19.01.94	123,000	3,3	7,55	261	12,70	94,9	4,4	3,4	11	0,29	0,021	2,15	2,46			62	80
01.02.94	69,000	2,2	7,43	336	12,30	89,2	4,1	3,6	12	0,27	0,024	2,42	2,71			72	100
15.02.94	116,000	1,0	7,33	270	12,00	84,2	3,8	4,5	13	0,13	0,033	2,31	2,47			29	90
02.03.94	179,000	5,3	7,45	228	11,80	93,0	5,6	8,1	17	0,12	0,009	1,90	2,02			26	170
17.03.94	177,000	6,4	7,68	209	11,40	92,4	5,4	3,5	13	0,12	0,012	1,36	1,48			16	40
28.03.94	152,000	7,0	7,76	223	11,50	94,7	4,2	3,2	11	0,09	0,030	1,60	1,73			62	160
14.04.94	310,000	12,1	7,52	259	9,00	84,0	3,8	5,4	16	0,10	0,021	1,08	1,21			36	170
25.04.94	202,000	15,0	7,74	243	9,80	97,7	2,7	3,9	12	0,26	0,018	1,13	1,41			39	110
09.05.94	69,600	15,6	7,86	335	9,00	90,9	4,0	3,2	10	0,25	0,027	1,08	1,36			42	110
25.05.94	78,900	18,2	7,80	257	9,00	96,1	3,8	4,1	14	0,12	0,052	1,06	1,24			65	110
06.06.94	83,000	16,0	8,08	321	7,70	78,4	3,9	3,8	13	0,12	0,058	1,08	1,26			42	80
20.06.94	59,600	21,0	7,93	379	7,60	86,0	5,8	3,6	12	0,21	0,067	1,22	1,50			117	150
04.07.94	47,500	26,1	7,90	358	7,70	96,2	5,2	4,5	11	0,13	0,046	1,04	1,22			82	100
18.07.94	40,700	25,2	8,08	344	6,20	76,1	2,8	3,8	10	0,04	0,052	0,84	0,93			85	130
03.08.94	32,500	27,5	8,27	357	8,50	109,0	4,1	7,5	21	0,04	0,033	0,61	0,68			46	280
15.08.94	32,000	23,7	7,95	324	7,20	85,9	4,2	5,5	14	0,08	0,036	0,57	0,68			36	110
29.08.94	41,500	22,3	7,94	319	7,70	89,4	3,2	6,3	17	0,11	0,052	0,99	1,15			91	130
14.09.94	30,000	22,0	7,67	370	6,90	79,6	3,4	5,0	13	0,11	0,058	1,15	1,32			59	130
28.09.94	36,200	20,8	7,63	344	6,80	76,6	3,9	6,2	14	0,25	0,055	1,42	1,73			68	130
12.10.94	60,800	10,8	7,77	301	9,30	84,1	6,6	5,4	19	0,20	0,036	1,38	1,62			62	110
26.10.94	26,400	11,8	8,03	361	8,90	82,4	5,7	4,2	15	0,24	0,030	1,08	1,36			95	150
09.11.94	48,800	8,5	7,84	320	10,10	86,4	5,3	4,2	17	0,29	0,027	1,58	1,90			68	80
24.11.94	69,700	5,4	7,82	279	11,20	88,5	3,6	3,0	10	0,26	0,027	1,70	1,99			68	80
07.12.94	52,500	3,2	7,64	350	11,20	83,5	4,9	3,4	13	0,40	0,024	1,54	1,96			75	210
19.12.94	114,000	1,6	7,73	271	12,30	87,8	6,9	4,6	17	0,22	0,024	3,12	3,36			52	120
02.01.95	167,000	3,1	7,50	208	12,10	89,9	4,4	6,8	15	0,16	0,021	2,24	2,42			49	150
16.01.95	47,500	2,1	7,72	337	11,90	86,1	3,9	3,0	11	0,36	0,024	1,94	2,33			46	170
31.01.95	187,000	3,7	7,55	218	11,90	89,9	4,1	4,8	14	0,22	0,024	2,37	2,61			72	210
13.02.95	123,000	4,2	7,54	246	12,30	94,1	4,9	4,7	17	0,14	0,024	2,64	2,81			68	140
28.02.95	354,000	5,0	7,75	187	11,70	91,5	5,9	5,0	15	0,15	0,024	2,12	2,30			91	120
16.03.95	160,000	6,0	7,84	273	12,10	97,1	4,2	3,4	11	0,13	0,018	1,11	1,26			36	90
29.03.95	172,000	5,5	7,94	239	11,90	94,3	3,5	3,6	14	0,23	0,015	1,56	1,81			39	120

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
12.04.95	142,000	5,8	8,05	246	12,90	103,0	3,6	2,8	8	0,33	0,018	1,22	1,57			33	50
27.04.95	177,000	12,5	7,77	197	10,40	97,9	5,1	3,4	14	0,20	0,024	1,33	1,56			23	90
09.05.95	178,000	15,0	7,91	220	9,50	94,7	5,1	4,4	13	0,19	0,030	1,33	1,55			26	120
22.05.95	95,100	14,5	7,80	297	8,40	82,8	2,4	4,0	15	0,19	0,036	1,22	1,45			23	200
07.06.95	78,800	17,4	7,71	288	7,20	75,6	2,2	5,0	14	0,27	0,058	1,31	1,64			59	120
21.06.95	60,300	23,2	7,70	344	6,60	78,0	2,2	4,0	10	0,16	0,076	1,15	1,38			55	110
03.07.95	63,500	22,6	7,88	303	6,70	78,2	5,1	4,6	13	0,20	0,052	1,22	1,47			65	120
17.07.95	54,200	21,4	7,48	341	6,00	68,4	6,0	5,0	18	0,22	0,052	0,86	1,13			20	140
02.08.95	37,900	24,6	7,85	353	6,40	77,7	2,4	4,3	17	0,09	0,036	0,68	0,81			95	140
15.08.95	42,600	25,5	8,01	340	9,00	111,1	4,9	7,0	16	0,07	0,036	0,66	0,76			20	140
29.08.95	41,400	21,3	8,06	301	6,50	74,0	4,0	7,0	29	0,30	0,058	0,79	1,15			85	180
13.09.95	38,800	20,0	7,78	322	7,20	79,8	3,3	3,9	10	0,28	0,055	1,47	1,80			78	130
27.09.95	46,700	17,5	7,74	298	7,80	82,1	1,4	3,7	10	0,26	0,040	1,06	1,36			75	140
11.10.95	43,400	18,0	7,80	335	8,70	92,5	2,9	4,3	9	0,28	0,040	0,99	1,31			88	140
25.10.95	38,100	10,1	7,76	378	9,10	80,9	3,2	5,4	15	0,39	0,043	1,11	1,54			124	170
06.11.95	46,400	2,0	7,86	359	10,00	72,1	2,1	4,5	22	0,43	0,040	1,24	1,71			108	130
20.11.95	176,000	4,2	7,66	187	10,20	78,1	3,0	7,0	21	0,40	0,021	1,49	1,92			55	130
05.12.95	61,400	2,6	7,79	310	11,30	82,9	4,0	4,6	14	0,36	0,021	1,56	1,94			33	90
18.12.95	50,000	2,5	7,60	341	12,10	88,5	3,2	3,9	11	0,51	0,021	1,11	1,64			65	130
02.01.96	138,000	1,6	7,49	230	11,80	84,2	2,9	4,0	11	0,37	0,021	2,64	3,04			55	90
15.01.96	131,000	2,3	7,71	261	12,60	91,6	1,8	6,9	13	0,42	0,021	2,51	2,95			78	90
29.01.96	64,000	2,2	7,62	370	11,80	85,6	4,4	4,2	17	0,51	0,027	1,60	2,14			65	120
12.02.96	41,100	3,3	7,56	377	11,30	84,4	3,9	4,2	15	0,62	0,024	1,38	2,02			78	130
26.02.96	41,100	4,6	7,68	354	11,60	89,7	3,7	4,5	13	0,64	0,027	1,36	2,03			72	110
11.03.96	37,200	5,0	7,75	380	11,90	93,0	4,4	3,7	18	0,65	0,027	1,51	2,19			85	130
26.03.96	131,000	3,5	7,62	304	11,50	86,4	4,8	9,5	23	0,33	0,027	2,87	3,23			82	330
10.04.96	159,000	5,6	7,87	210	11,20	88,9	2,5	3,6	16	0,09	0,018	1,74	1,84			39	100
24.04.96	110,000	15,9	7,80	239	9,40	95,6	3,2	4,2	12	0,26	0,024	1,29	1,57			46	90
06.05.96	89,800	17,1	7,76	284	8,60	89,7	2,7	4,4	10	0,26	0,033	1,20	1,49			72	110
20.05.96	82,900	22,0	7,86	277	6,70	77,3	2,2	3,8	14	0,18	0,055	1,20	1,43			55	110
03.06.96	88,200	21,5	7,71	278	7,70	88,0	1,3	3,7	13	0,19	0,027	1,06	1,28			98	120
18.06.96	34,500	21,2	8,01	353	7,30	82,9	5,3	4,6	13	0,26	0,061	0,97	1,29			55	90
02.07.96	47,500	18,2	7,94	363	7,00	74,8	2,5	4,6	11	0,19	0,061	1,15	1,40			85	150

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
15.07.96	43,300	22,8	7,92	348	6,80	79,7	2,8	4,9	15	0,09	0,055	1,15	1,30			78	120
30.07.96	47,500	22,2	7,74	328	7,30	84,6	5,4	5,6	18	0,19	0,043	1,06	1,30			75	130
12.08.96	42,200	22,0	7,80	310	6,90	79,6	4,5	4,6	13	0,19	0,049	1,20	1,43			75	180
26.08.96	44,800	25,0	7,81	316	6,40	78,3	3,4	5,0	17	0,12	0,049	0,90	1,08			88	120
09.09.96	93,500	15,0	7,89	285	8,80	87,7	1,6	7,0	25	0,18	0,058	1,33	1,57			98	170
25.09.96	140,000	13,1	7,72	290	8,10	77,3	6,0	13,6	25	0,18	0,052	2,03	2,26			101	400
09.10.96	54,700	13,5	8,06	340	9,80	94,4	3,2	3,9	12	0,12	0,046	1,18	1,35			75	110
21.10.96	172,000	11,5	7,80	237	8,20	75,4	3,4	11,8	27	0,12	0,040	1,51	1,68			59	230
04.11.96	117,000	9,2	7,95	270	10,00	87,0	2,5	4,2	19	0,09	0,018	1,08	1,20			49	80
18.11.96	63,200	13,5	7,95	330	9,70	93,5	2,5	3,8	12	0,08	0,043	1,22	1,34			65	120
03.12.96	107,000	4,9	7,77	286	11,30	88,1	2,7	3,0	10	0,10	0,015	1,33	1,45			59	100
16.12.96	168,000	6,5	7,83	249	11,60	94,3	3,8	7,8	20	0,34	0,040	1,90	2,28			91	190
07.01.97	86,700	0,2	7,77	329	12,60	86,5	4,4	3,8	13	0,38	0,040	1,36	1,78			59	90
20.01.97	65,700	1,5	7,75	360	11,80	84,0	2,9	3,8	10	0,37	0,015	1,36	1,74			75	110
03.02.97	51,200	0,8	7,75	400	11,80	82,4	2,8	3,2	11	0,47	0,043	1,56	2,07			75	120
19.02.97	103,000	1,5	7,70	286	12,50	88,9	3,3	5,0	13	0,27	0,024	2,28	2,58			65	130
03.03.97	324,000	5,0	7,47	222	10,80	84,4	3,7	5,1	12	0,31	0,030	2,12	2,47			68	130
17.03.97	154,000	6,5	7,82	268	11,00	89,4	2,2	3,2	14	0,36	0,024	1,27	1,65			75	110
01.04.97	100,000	6,0	7,83	275	13,00	104,3	4,9	4,4	16	0,37	0,027	1,51	1,91			46	80
14.04.97	132,000	7,0	8,00	241	11,90	98,0	3,2	4,7	12	0,19	0,040	1,38	1,61			52	110
28.04.97	141,000	12,5	8,04	259	11,20	105,5	5,4	3,8	10	0,15	0,021	1,33	1,50			36	60
14.05.97	186,000	18,2	7,73	215	8,00	85,4	4,0	5,8	14	0,44	0,030	0,97	1,44			33	100
26.05.97	215,000	15,5	7,71	220	8,20	82,6	1,2	5,0	16	0,21	0,040	1,27	1,51			33	110
11.06.97	124,000	19,0	7,55	277	7,10	77,1	2,1	5,0	12	0,57	0,067	1,33	1,98			78	90
24.06.97	70,400	21,0	7,86	310	6,40	72,4	2,2	5,2	12	0,35	0,073	1,29	1,71			55	120
01.07.97	60,000	25,0	7,61	334	5,30	64,8	2,0	4,9	11	0,16	0,073	1,08	1,32			49	140
14.07.97	70,900	20,5	8,00	300	6,20	69,4	3,8	5,7	13	0,13	0,055	1,15	1,34			49	130
28.07.97	219,000	17,6	7,54	248	7,80	82,2	8,0	15,0	41	0,32	0,024	1,08	1,43			29	380
11.08.97	79,400	23,5	7,76	345	6,70	79,6	1,8	5,2	11	0,14	0,043	1,02	1,20			82	150
25.08.97	47,200	20,1	7,69	324	7,50	83,3	3,1	5,1	13	0,35	0,036	0,61	1,00			55	120
10.09.97	50,500	19,3	7,58	372	6,80	74,3	3,6	4,8	12	0,24	0,061	1,20	1,50			98	130
22.09.97	50,500	16,0	7,71	320	8,10	82,5	2,6	5,6	17	0,16	0,040	0,86	1,05			65	100
07.10.97	68,700	13,0	7,73	283	8,90	84,8	3,1	4,2	11	0,23	0,033	1,31	1,57			75	110

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
21.10.97	57,700	8,2	7,76	318	10,10	85,7	3,1	3,4	8	0,25	0,027	1,31	1,59			72	100
05.11.97	49,200	6,7	7,74	361	10,50	85,8	3,2	4,2	11	0,30	0,024	1,02	1,34			75	120
18.11.97	98,000	7,0	7,84	253	9,90	81,5	2,0	5,4	11	0,23	0,027	1,36	1,62			95	110
01.12.97	160,000	7,1	7,76	229	10,90	90,0	5,1	6,1	17	0,14	0,027	1,76	1,93			85	140
15.12.97	124,000	3,0	7,74	282	12,00	88,9	4,6	5,0	14	0,18	0,024	1,90	2,10			88	140

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
04.01.94		1340	0	11	41,3	10,6	16,1	4,3	0,75		0,07		425								113		0,05
19.01.94		60	0	11																			
01.02.94		50	0	14	48,9	10,6	18,2	4,0	0,05		0,06		60								41		0,08
15.02.94		150	0	31																			
02.03.94		50	0	4	39,3	5,1	15,4	3,3		0,06		0,00		158								109	
17.03.94				23																			
28.03.94				5																			
14.04.94		70	0	16	38,9	6,8	15,7	4,3		0,19		0,02		638								99	
25.04.94				7																			
09.05.94		0	0	30	51,7	9,1	18,0	3,7		0,40		0,06		139								150	
25.05.94				25																			
06.06.94		60	0	19	52,1	11,9	17,3	4,1		0,48		0,10		103								70	
20.06.94				18																			
04.07.94		20	0	19	55,9	9,4	19,4	4,9		0,20		0,08		53								90	
18.07.94				18																			
03.08.94		40	0	18	46,1	9,8	23,1	5,7		0,04		0,00		440								126	
15.08.94				22																			
29.08.94				8																			
14.09.94		10	0	19	54,3	9,5	19,4	5,8		0,00		0,00		148								45	
28.09.94				16																			
12.10.94		110	0	21	48,5	9,1	10,9	3,9		0,25		0,00		1183								33	
26.10.94				35																			
09.11.94		130	0	21	48,1	10,9	13,5	3,8		0,15		0,03		239								40	
24.11.94				24																			
07.12.94		80	0	16	50,3	11,8	16,1	4,0		0,00		0,05		126								30	
19.12.94				16																			
02.01.95		50	0	4	30,1	6,8	9,8	2,7		0,07		0,00		1050								40	
16.01.95				6																			
31.01.95				5																			
13.02.95		20	0	17	36,7	6,4	10,0	3,0		0,21		0,02		212								40	
28.02.95				19																			
16.03.95		40	0	29	41,7	8,8	8,3	2,5		0,00		0,03		630								150	
29.03.95				25																			

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al tot. µg/l	Al dis. µg/l	As tot. µg/l	As dis. µg/l	B µg/l	B dis. µg/l	CN µg/l	CN dis µg/l	Zn tot. µg/l	Zn dis. µg/l	Hg tot. µg/l
12.04.95		30	0	22	35,3	10,5	9,7	2,6		0,08		0,03		246								150	
27.04.95				27																			
09.05.95		30	0	29	36,7	14,0	8,7	2,8		0,00		0,02		48								120	
22.05.95				42																			
07.06.95		10	0	19	45,1	11,2	9,7	3,7		0,13		0,04		96								150	
21.06.95				14																			
03.07.95		10	0	15	45,1	9,7	11,6	3,4		0,00		0,12		26								80	
17.07.95				9																			
02.08.95		50	0	19	48,1	12,2	16,5	3,7		0,00		0,02		17								50	
15.08.95				20																			
29.08.95				15																			
13.09.95		70	0	24	57,7	11,3	15,3	4,1		0,00		0,03		252								66	
27.09.95				17																			
11.10.95		20	0	14	51,1	11,8	14,4	4,0		0,00		0,02		19								233	
25.10.95				12																			
06.11.95		80	0	41	53,2	12,7	14,3	4,2		0,05		0,04		31								177	
20.11.95				5																			
05.12.95		20	0	33	47,0	11,6	16,4	3,1		0,06		0,08		23								184	
18.12.95				34																			
02.01.96		30	0	35	32,3	8,3	10,3	2,9		0,13		0,04		396								92	
15.01.96				16																			
29.01.96				14																			
12.02.96		0	0	37	57,0	11,1	14,5	3,6		0,06		0,12		72								100	
26.02.96				11																			
11.03.96		40	0	13	58,2	11,2	15,3	3,5		0,05		0,11		34								244	
26.03.96				33																			
10.04.96		30	0	7	31,2	7,1	8,6	2,1		0,06		0,03		95								148	
24.04.96				18																			
06.05.96		20	0	16	44,8	9,2	10,8	2,6		0,04		0,03		17								79	
20.05.96				12																			
03.06.96		50	0	28	45,0	7,0	13,4	3,5		0,07		0,02		90								80	
18.06.96				23																			
02.07.96		20	0	22	54,6	10,9	13,7	3,8		0,00		0,02		23								115	

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
15.07.96				49																			
30.07.96				12																			
12.08.96		20	0	20	49,4	11,4	11,1	3,9		0,00		0,00		101								182	
26.08.96				32																			
09.09.96		20	0	15	39,7	11,1	11,6	4,7		0,16		0,00		122								73	
25.09.96				20																			
09.10.96		90	0	35	56,3	8,9	12,1	3,8		0,00		0,02		35								87	
21.10.96				16																			
04.11.96		40	0	21	41,6	10,0	8,9	2,9		0,08		0,02		81								76	
18.11.96				28																			
03.12.96		20	0	32	45,7	10,6	10,2	3,3		0,04		0,03		27								114	
16.12.96				32																			
07.01.97		70	0	22	52,1	10,9	12,5	3,0		0,04		0,06		13								63	
20.01.97				29																			
03.02.97		70	0	19	60,2	11,4	15,4	3,6		0,00		0,00		5								85	
19.02.97				15																			
03.03.97		40	0	21	32,1	6,9	8,4	3,2		0,16		0,04		102								74	
17.03.97				18																			
01.04.97		20	0	14	40,8	8,1	10,2	3,0		0,09		0,03		57								90	
14.04.97				21																			
28.04.97				16																			
14.05.97		10	0	46	33,3	6,3	8,8	2,7		0,17		0,02		110								61	
26.05.97				18																			
11.06.97		12	0	28	40,5	11,2	10,0	3,5		0,08		0,00		74								100	
24.06.97				47																			
01.07.97		60	0	52	50,8	10,3	12,4	3,9		0,04		0,06		76								80	
14.07.97				26																			
28.07.97				35																			
11.08.97		50	0	35	51,6	9,4	12,2	3,9		0,00		0,02		14								99	
25.08.97				63																			
10.09.97		30	0	15	56,6	13,0	14,4	4,5		0,00		0,03		18								99	
22.09.97				21																			
07.10.97		30	0	21	45,0	8,3	9,7	3,5		0,07		0,02		50								78	

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
21.10.97				29																			
05.11.97		30	0	74	51,9	13,4	15,5	3,7		0,05		0,08		28								51	
18.11.97				30																			
01.12.97		30	0	21	33,1	8,9	8,5	3,0		0,14		0,03		80								204	
15.12.97				13																			

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
04.01.94		0,2		1,1		0,0	1,0		3,0		3,0	
19.01.94												
01.02.94		0,2		2,2		0,0	1,0		2,0		5,0	
15.02.94												
02.03.94	0,04		0,0		6,1	0,0		9,0		5,0		7,0
17.03.94												
28.03.94												
14.04.94	0,00		0,0		2,0			4,0		3,0	3,0	
25.04.94												
09.05.94	0,04		0,6		1,6			0,0		1,0	6,0	
25.05.94												
06.06.94	0,00		0,2		0,0			0,0		0,0	4,0	
20.06.94												
04.07.94	0,08		0,3		1,9			8,0		0,0		8,0
18.07.94												
03.08.94	0,00		0,9		3,0			5,0		0,0		5,0
15.08.94												
29.08.94												
14.09.94	0,07		0,0		0,0			2,0		0,0		6,7
28.09.94												
12.10.94	0,00		0,0		0,5			1,0		2,0		8,1
26.10.94												
09.11.94	0,07		0,0		0,0			0,0		0,0		6,7
24.11.94												
07.12.94	0,00		0,6		0,4			1,9		0,0		15,9
19.12.94												
02.01.95	0,00		0,5		1,3			2,3		2,0		12,4
16.01.95												
31.01.95												
13.02.95	0,00		0,1		0,5			3,6		0,0		4,7
28.02.95												
16.03.95	0,00		0,0		0,5			1,1		0,0		8,7
29.03.95												

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
12.04.95	0,00		0,0		1,0			2,5		0,0		6,0
27.04.95												
09.05.95	0,10		0,0		0,0			1,3		0,0		9,4
22.05.95												
07.06.95	0,00		0,8		5,4			2,8		2,0		13,1
21.06.95												
03.07.95	0,00		0,0		1,7			0,0		6,9		4,8
17.07.95												
02.08.95	0,10		0,0		3,2			1,0		0,0		9,7
15.08.95												
29.08.95												
13.09.95	0,00		0,0		1,0			1,1		2,4		4,5
27.09.95												
11.10.95	0,00		0,0		0,7			0,0		1,0		6,1
25.10.95												
06.11.95	0,00		0,2		2,2			0,0		1,9		6,7
20.11.95												
05.12.95	0,00		0,1		0,5			6,3		2,8		11,1
18.12.95												
02.01.96	0,03		0,1		1,7			2,9		3,2		11,5
15.01.96												
29.01.96												
12.02.96	0,00		0,1		2,4			1,0		1,0		4,7
26.02.96												
11.03.96	0,03		0,1		0,5			1,0		4,9		5,8
26.03.96												
10.04.96	0,03		0,1		0,8			1,4		14,5		7,2
24.04.96												
06.05.96	0,03		0,1		1,0			1,0		3,3		3,9
20.05.96												
03.06.96	0,03		0,1		1,3			1,1		1,0		5,3
18.06.96												
02.07.96	0,03		0,1		1,3			1,0		1,0		5,8

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
15.07.96												
30.07.96												
12.08.96	0,07		0,1		0,8			1,0		4,8		7,4
26.08.96												
09.09.96	0,04		0,1		0,5			1,5		1,8		5,0
25.09.96												
09.10.96	0,19		0,1		0,6			1,8		3,1		7,2
21.10.96												
04.11.96	0,28		0,1		1,1			2,2		2,9		6,8
18.11.96												
03.12.96	0,20		0,1		0,5			1,0		2,1		4,5
16.12.96												
07.01.97	0,10		0,1		0,4			1,0		1,4		2,6
20.01.97												
03.02.97	0,05		0,1		1,3			2,8		1,0		4,1
19.02.97												
03.03.97	0,03		0,1		0,5			1,0		1,4		5,2
17.03.97												
01.04.97	0,10		0,1		13,4			1,3		1,7		8,0
14.04.97												
28.04.97												
14.05.97	0,03		0,1		0,5			1,0		1,1		7,7
26.05.97												
11.06.97	0,03		0,1		0,5			1,8		1,0		8,0
24.06.97												
01.07.97	0,03		0,1		0,5			2,5		2,5		4,1
14.07.97												
28.07.97												
11.08.97	0,03		0,1		0,5			2,8		2,1		6,5
25.08.97												
10.09.97	0,03		0,1		0,5			1,0		1,0		5,7
22.09.97												
07.10.97	0,10		0,1		0,5			1,0		1,4		6,1

Bodrog at Felsőberecki, rkm 46.0
01.01.1994 - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
21.10.97												
05.11.97	0,03		0,1		0,5			1,0		1,0		4,3
18.11.97												
01.12.97	0,03		0,1		3,5			3,2		3,1		8,7
15.12.97												

Szamos at Csenger, rkm 46.4
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
03.01.94	88,400	2,3	7,29	501	12,28	89,3	2,4	3,5	8	1,34	0,023	1,67	3,04	0,96	4,00	72	240
10.01.94	104,000	0,8	7,44	442	14,24	99,4	4,0	6,0	12	0,89	0,031	1,67	2,60	0,40	3,00	20	640
17.01.94	95,300	3,3	7,39	464	11,47	85,7	2,4	3,5	9	0,61	0,026	1,49	2,12	0,38	2,50	62	220
24.01.94	58,200	1,0	7,55	523	14,44	101,3	3,8	4,6	12	1,10	0,022	1,31	2,42	0,38	2,80	42	180
31.01.94	72,700	0,6	7,71	592	10,92	75,8	4,0	5,3	12	1,06	0,026	1,75	2,83	0,57	3,40	108	350
07.02.94	286,000	3,5	7,63	346	11,79	88,6	3,9	5,0	18	0,44	0,034	1,79	2,27	0,53	2,80	336	470
14.02.94	114,000	1,2	7,42	405	13,03	91,9	1,8	2,2	4	0,49	0,019	1,47	1,97	0,53	2,50	52	90
21.02.94	72,100	0,3	7,79	633	13,35	91,9	3,9	5,6	18	2,25	0,022	1,52	3,79	0,31	4,10	49	120
28.02.94	94,100	5,8	7,90	483	13,59	108,5	7,6	11,2	36	0,57	0,030	1,32	1,92	0,08	2,00	20	250
07.03.94	124,000	6,0	7,90	343	13,99	112,3	3,6	4,2	14	0,92	0,019	1,37	2,32	0,48	2,80	26	100
16.03.94	138,000	4,5	7,61	367	12,19	94,1	3,6	4,7	12	0,05	0,036	1,13	1,21	0,09	1,30	59	160
21.03.94	157,000	6,0	7,71	364	9,40	75,4	4,0	5,8	14	0,00	0,024	1,05	1,08	0,52	1,60	23	110
28.03.94	186,000	4,5	7,45	343	12,20	94,1	4,2	5,8	14	0,21	0,028	1,28	1,52	0,08	1,60	49	120
05.04.94	128,000	4,9	7,40	470	9,39	73,2	2,5	3,4	12	0,40	0,033	1,12	1,55	0,75	2,30	55	70
11.04.94	239,000	6,8	6,76	313	10,55	86,4	6,0	8,6	22	0,42	0,018	1,32	1,75	0,15	1,90	55	80
18.04.94	127,000	9,0	7,90	370	9,59	83,0	2,9	3,4	12	0,07	0,032	1,55	1,65	0,25	1,90	39	50
25.04.94	138,000	14,0	7,27	350	9,27	90,3	3,8	4,3	18	0,20	0,030	1,26	1,49	0,21	1,70	62	180
02.05.94	106,000	7,5	7,67	450	7,29	60,8	3,8	5,5	15	0,09	0,041	1,40	1,52	0,11	1,63	68	80
09.05.94	70,000	14,0	7,41	546	9,41	91,7	4,7	5,7	19	0,11	0,047	1,37	1,52	0,08	1,60	55	60
16.05.94	67,300	18,9	7,43	600	12,46	135,0	2,6	3,1	7	0,72	0,017	1,32	2,06	1,34	3,40	85	190
24.05.94	177,000	16,2	6,74	258	11,18	114,4	8,0	11,0	32	0,04	0,034	1,01	1,09	0,11	1,20	72	90
30.05.94	149,000	8,4	7,68	279	9,91	84,5	5,9	8,8	24	0,30	0,021	1,29	1,61	0,19	1,80	825	860
06.06.94	65,900	17,0	7,55	522	9,69	100,9	3,6	4,9	12	0,13	0,030	1,56	1,72	0,18	1,90	62	100
13.06.94	80,300	16,0	7,33	430	7,68	78,2	4,9	8,8	24	0,02	0,072	1,33	1,42	0,08	1,50	68	90
20.06.94	72,500	15,0	7,40	500	7,38	73,5	2,0	3,6	8	0,04	0,039	1,05	1,13	0,57	1,70	156	190
27.06.94	49,700	21,7	7,99		12,29	141,0	3,6	5,7	20	0,02	0,012	0,93	0,96	0,24	1,20	7	60
04.07.94	46,300	25,0	7,46	597	11,92	145,8	6,0	8,6	32	0,08	0,043	0,92	1,04	0,06	1,10	166	310
11.07.94	40,100	22,1	7,85	646	10,41	120,4	6,0	11,0	30	0,05	0,022	0,79	0,86	0,24	1,10	205	470
18.07.94	31,800	25,7	7,15	551	9,61	119,1	5,8	10,6	32	0,00	0,020	0,60	0,62	0,28	0,90	13	40
25.07.94	41,900	26,5	7,21	723	11,49	144,6	7,0	12,8	40	0,05	0,018	0,66	0,73	0,27	1,00	3	30
01.08.94	33,900	26,0	8,10	438	12,51	156,0	5,8	10,0	26	0,02	0,021	0,44	0,48	0,02	0,50	42	80
08.08.94	35,100	25,0	6,98	549	12,46	152,4	7,2	12,5	40	0,15	0,018	0,31	0,48	0,02	0,50	114	180
15.08.94	40,500	17,2	7,45	380	10,87	113,6	7,2	10,5	25	0,07	0,053	0,67	0,79			33	80

Szamos at Csenger, rkm 46.4
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
22.08.94	26,000	14,6	7,00	702	8,42	83,2	3,8	5,3	19	0,07	0,021	0,60	0,69	0,31	1,00	33	70
29.08.94	35,800	16,2	7,28	655	7,68	78,6	6,0	10,2	32	0,14	0,069	0,70	0,91	0,29	1,20	33	90
05.09.94	24,100	22,0	7,12	609	3,25	37,5	4,7	9,0	25	0,37	0,032	0,54	0,94			39	50
12.09.94	22,200	22,0	7,47	740	11,10	128,1	8,5	13,8	35	0,03	0,026	0,54	0,60			20	40
19.09.94	33,700	16,5	7,02	773	9,29	95,7	4,9	6,6	16	0,02	0,009	0,82	0,85			20	130
26.09.94	32,100	18,5	7,26	638	10,57	113,6	3,8	5,2	13	0,05	0,027	1,37	1,45			29	40
03.10.94	24,800	19,5	7,56	770	5,28	57,9	3,2	4,8	10	0,11	0,029	0,49	0,63			62	70
10.10.94	52,800	14,1	7,16	730	10,33	100,9	4,0	5,9	14	0,15	0,058	2,55	2,76			42	50
17.10.94	32,700	6,0	7,04	551	9,23	74,1	3,2	4,6	13	0,28	0,054	1,67	2,01			72	90
24.10.94	34,700	7,3	7,41	628	10,24	85,0	4,0	4,6	12	0,37	0,036	0,05	0,45	0,25	0,70	72	80
31.10.94	41,100	11,7	7,50	496	9,96	92,0	3,6	4,3	14	0,20	0,059	1,65	1,91	0,29	2,20	33	40
07.11.94	34,900	6,2	7,22	489	11,88	95,8	4,8	5,4	14	0,10	0,023	1,40	1,53	0,00	1,53	39	80
14.11.94	36,900		7,09	568	11,57		6,2	8,8	22	0,36	0,051	2,01	2,42	0,48	2,90	68	130
21.11.94	63,300	3,6	7,36	404	13,07	98,5	5,3	7,4	20	0,26	0,036	1,72	2,02	0,28	2,30	72	100
28.11.94	47,800	2,1	7,70	489	12,16	88,0	3,6	5,4	16	0,47	0,026	1,32	1,82	0,38	2,20	65	130
05.12.94	36,900	0,0	7,50	626	11,34	77,4	3,0	7,2	15	0,96	0,022	1,15	2,13	0,37	2,50	72	90
12.12.94	50,800	2,7	7,82	466	12,21	89,8	4,2	6,2	16	1,13	0,016	1,53	2,68	0,22	2,90	124	160
19.12.94	97,700	0,4	7,33	289	12,48	86,1	6,8	10,9	29	0,42	0,021	1,40	1,84	0,33	2,17	49	50
02.01.95	312,000	3,0	7,90	232	12,71	94,2	5,5	9,6	27	0,35	0,019	1,85	2,22	0,44	2,66	65	70
09.01.95	57,800	0,4	7,86	495	13,17	90,9	1,8	3,1	9	0,75	0,018	1,55	2,32	0,61	2,93	46	120
16.01.95	56,300	0,0	7,51	257	13,77	94,0	2,8	5,1	14	0,93	0,011	1,54	2,48	0,13	2,61	42	100
23.01.95	63,200	0,0	7,63	508	14,05	95,9	2,7	4,6	16	0,54	0,015	1,21	1,76	0,19	1,95	52	99
30.01.95	315,000	1,3	7,61	281	13,50	95,5	20,5	33,1	70	0,03	0,030	2,02	2,08	0,10	2,18	23	40
06.02.95	93,400	1,0	7,81	488	12,10	84,9	3,6	4,8	13	0,27	0,015	1,69	1,97	0,32	2,29	21	70
13.02.95	171,000	1,0	7,65	294	12,40	87,0	7,0	12,7	30	0,14	0,019	1,50	1,66	0,47	2,13	62	170
20.02.95	206,000	3,0	7,83	362	12,00	88,9	2,9	4,3	11	0,08	0,018	1,20	1,29	0,04	1,33	68	400
27.02.95	327,000	5,2	7,63	351	11,10	87,2	5,8	8,9	25	0,16	0,019	1,50	1,68	0,31	1,99	59	70
06.03.95	168,000	7,6	7,71	406	11,40	95,3	7,4	13,7	40	0,11	0,027	1,55	1,68	0,08	1,76	39	220
13.03.95	97,800	7,6	7,71	487	11,99	100,2	5,0	6,9	19	0,11	0,029	1,46	1,59	0,53	2,12	82	170
20.03.95	88,300	5,4	7,83	541	13,70	108,2	2,6	4,9	15	0,17	0,042	2,16	2,37	0,22	2,59	55	70
27.03.95	131,000	6,0	7,59	342	11,70	93,9	6,2	11,5	30	0,16	0,042	1,99	2,20	0,24	2,44	55	60
03.04.95	134,000	6,1	7,68	338	11,60	93,3	3,0	5,8	19	0,12	0,021	1,29	1,44	0,40	1,84	49	80
10.04.95	145,000	6,9	7,37	351	11,00	90,3	4,0	5,2	13	0,07	0,093	1,63	1,80	0,21	2,01	109	146

Szamos at Csenger, rkm 46.4
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
18.04.95	228,000	9,1	7,53	355	10,50	91,1	3,0	3,8	12	0,09	0,024	1,41	1,53	0,08	1,61	105	144
24.04.95	163,000	14,5	7,97	337	9,30	91,7	1,0	1,3	6	0,05	0,047	1,01	1,10	0,30	1,40	62	182
02.05.95	231,000	8,4	7,85	262	10,11	86,2	8,5	17,9	56	0,08	0,043	0,95	1,07	0,21	1,28	222	640
08.05.95	129,000	10,5	7,76	312	9,23	82,9	1,2	1,8	4	0,02	0,040	1,06	1,13	0,12	1,25	55	90
15.05.95	159,000	10,2	7,50	432	10,89	97,1	3,9	4,8	13	0,01	0,021	0,89	0,92	0,08	1,00	49	58
22.05.95	109,000	15,6	7,62	332	10,40	105,0	3,0	3,7	10	0,07	0,012	1,19	1,28	0,18	1,46	44	70
29.05.95	145,000	20,3	7,49	337	8,08	90,1	3,9	4,4	13	0,10	0,023	1,14	1,27	0,11	1,38	73	158
06.06.95	91,200	20,9	7,80	399	8,13	91,8	4,4	5,4	13	0,01	0,020	1,25	1,28	0,11	1,39	55	104
12.06.95	72,600	22,5	7,90	524	8,60	100,2	5,7	6,4	22	0,02	0,132	2,08	2,23	0,09	2,32	46	76
19.06.95	72,500	10,5	7,80	408	9,60	86,2	3,5	4,0	11	0,09	0,029	1,52	1,64	0,12	1,76	42	100
26.06.95	69,000	17,7	8,07	639	7,28	76,9	3,0	5,5	14	0,02	0,011	1,25	1,27	0,04	1,31	38	160
03.07.95	69,400	24,8	7,82	355	7,79	94,9	4,0	6,4	20	0,02	0,015	1,25	1,29	0,10	1,39	86	290
10.07.95	47,000	25,0	8,59	547	10,80	132,1	4,0	4,5	12	0,10	0,020	0,68	0,80	0,07	0,87	40	160
17.07.95	46,200	23,0	9,11	648	10,39	122,3	9,0	13,6	32	0,05	0,041	0,47	0,57	0,04	0,61	20	82
24.07.95	49,600	23,0	9,36	502	10,48	123,3	4,6	5,8	17	0,03	0,011	0,69	0,73	0,01	0,74	23	30
31.07.95	53,000	23,2	8,83	399	9,60	113,4	6,6	7,5	23	0,01	0,010	0,41	0,43	0,02	0,45	25	28
07.08.95	60,900	22,6	9,20	562	10,12	118,2	9,6	13,9	41	0,02	0,014	0,05	0,08	0,13	0,21	35	109
14.08.95	58,300	22,5	8,71	553	11,96	139,4	4,3	6,6	20	0,02	0,023	1,27	1,32	0,05	1,37	40	179
21.08.95	56,200	22,4	8,84	779	10,84	126,1	4,6	6,0	16	0,33	0,014	1,63	1,98	0,13	2,11	95	150
28.08.95	47,200	20,5	8,37	386	9,71	108,7	4,6	5,6	13	0,01	0,008	0,75	0,76	0,08	0,84	20	22
04.09.95	54,400	15,0	7,98	367	8,57	85,4	4,0	6,6	15	0,08	0,027	0,87	0,98	0,05	1,03	53	54
11.09.95	51,900	16,7	7,81	453	8,67	89,7	3,2	4,7	12	0,02	0,034	1,40	1,46	0,08	1,54	51	54
18.09.95	41,600	15,0	7,98	563	9,09	90,6	2,6	3,4	10	0,05	0,067	0,94	1,06	0,06	1,12	10	19
25.09.95	53,800	8,5	8,00	447	9,36	80,0	5,4	8,1	21	0,03	0,029	0,72	0,78	0,03	0,81	94	200
03.10.95	72,600	14,3	7,89	586	8,85	86,8	4,0	6,7	16	0,10	0,036	1,79	1,93	0,03	1,96	118	182
09.10.95	54,100	14,9	7,83	488	8,62	85,7	4,4	7,3	18	0,12	0,101	1,92	2,15	0,06	2,21	46	60
16.10.95	57,000	14,5	8,02	395	8,34	82,2	3,2	4,8	13	0,03	0,017	1,38	1,43	0,07	1,50	57	69
24.10.95	54,100	6,7	7,82	803	9,29	75,9	4,0	5,0	13	0,16	0,064	2,21	2,44	0,06	2,50	467	508
30.10.95	61,100	9,5	7,64	366	9,33	81,8	2,0	2,6	7	0,09	0,047	1,16	1,29	0,03	1,32	62	74
06.11.95	74,700	4,0	7,80	358	10,30	78,4	6,4	8,0	20	0,10	0,068	1,41	1,58	0,04	1,62	37	60
13.11.95	68,300	2,7	7,88	397	12,67	93,2	4,2	5,9	15	0,28	0,024	1,12	1,43	0,03	1,45	51	60
20.11.95	545,000	4,7	7,76	228	9,26	71,8	17,1	30,4	74	0,19	0,033	1,18	1,40	0,02	1,42	111	131
27.11.95	69,300	0,5	7,65	804	12,95	89,6	3,0	4,4	10	1,59	0,069	0,09	1,74	0,02	1,76	479	562

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
04.12.95	76,200	2,4	7,80	406	11,46	83,6	3,1	4,1	9	0,30	0,012	1,10	1,40	0,04	1,44	77	83
11.12.95	59,700	1,1	7,90	392	13,26	93,3	4,0	6,1	17	0,50	0,021	0,89	1,41	0,01	1,42	64	80
18.12.95	70,700	0,3	7,83	353	13,20	90,8	4,2	6,3	18	0,37	0,014	0,95	1,34	0,02	1,36	59	70
02.01.96	306,000	2,0	7,82	371	10,26	74,0	8,2	12,3	32	0,19	0,012	1,60	1,80	0,04	1,84	471	490
08.01.96	172,000	0,2	7,95	529	11,56	79,3	5,4	8,2	20	0,16	0,019	1,66	1,85	0,02	1,87	64	88
15.01.96	125,000	1,6	8,02	624	11,34	80,9	4,0	7,8	22	0,61	0,015	1,61	2,23	0,06	2,29	31	44
22.01.96	91,400	0,0	7,82	752	13,10	89,4	5,0	7,5	20	0,32	0,020	1,30	1,64	0,06	1,70	44	170
29.01.96	108,000	0,0	7,80	549	13,20	90,1	8,0	11,7	30	0,35	0,009	1,77	2,13	0,19	2,32	48	90
05.02.96	97,100	0,0	7,77	572	12,30	83,9	5,0	4,4	21	0,34	0,015	1,00	1,36	0,06	1,42	33	40
12.02.96	159,000	0,0	7,74	516	13,10	89,4	6,0	8,3	24	0,50	0,019	1,02	1,54	0,36	1,90	21	59
19.02.96	44,900	0,5	7,59	542	11,40	78,9	3,0	4,2	12	0,45	0,022	1,06	1,53	0,20	1,73	49	230
26.02.96	55,100	0,1	7,73	800	13,50	92,4	2,0	3,5	9	0,54	0,026	1,24	1,81	0,37	2,18	48	128
04.03.96	43,800	0,0	8,04	955	13,60	92,8	3,0	4,2	10	0,64	0,026	1,07	1,73	0,21	1,94	89	141
11.03.96	35,300	0,3	7,66	936	13,20	90,8	4,0	5,7	15	0,68	0,026	0,97	1,68	0,23	1,91	94	150
18.03.96	429,000	0,5	7,63	390	12,00	83,1	4,0	5,9	15	0,30	0,021	1,77	2,09	0,83	2,92	79	107
25.03.96	147,000	3,2	7,77	530	11,30	84,2	2,2	2,6	7	0,22	0,030	2,23	2,47	0,17	2,64	51	392
01.04.96	124,000	2,4	7,73	474	10,50	76,6	4,0	5,6	15	0,20	0,031	1,66	1,89	0,21	2,10	57	82
09.04.96	137,000	4,3	7,64	359	9,70	74,4	7,0	10,4	28	0,14	0,046	1,09	1,27	0,18	1,45	60	594
15.04.96	78,500	4,0	7,78	589	9,90	75,4	4,0	5,0	12	0,26	0,036	1,54	1,83	0,22	2,05	84	239
22.04.96	95,400	8,5	7,73	604	8,50	72,7	5,0	5,8	16	0,20	0,094	1,06	1,36	1,18	2,54	55	112
29.04.96	102,000	10,7	7,72	448	7,70	69,5	2,6	4,3	10	0,05	0,082	1,17	1,30	0,05	1,35	71	109
06.05.96	81,400	8,4	7,75	465	7,80	66,5	3,4	3,7	11	0,05	0,082	0,69	0,82	0,20	1,02	62	260
13.05.96	75,100	16,1	7,91	825	6,80	69,4	3,5	7,0	24	0,05	0,004	1,39	1,44	0,53	1,97	36	540
20.05.96	104,000	16,0	7,76	487	7,00	71,3	6,5	11,8	31	0,05	0,093	0,25	0,39	0,19	0,58	138	1213
28.05.96	56,000	12,1	8,12	684	8,60	80,2	3,0	4,1	12	0,02	0,020	2,10	2,15	0,73	2,88	42	120
03.06.96	46,400	19,2	8,10	578	7,80	85,0	3,5	4,6	11	0,15	0,026	1,66	1,83	0,41	2,24	112	360
10.06.96	36,600	24,9	8,33	755	10,10	123,3	6,1	7,4	20	0,02	0,027	0,23	0,28	0,04	0,32	60	174
17.06.96	42,200	14,5	8,45	463	10,60	104,5	5,2	6,7	17	0,04	0,025	0,96	1,03	0,16	1,19	32	150
24.06.96	52,400	20,6	7,99	932	7,10	79,7	4,5	5,4	15	0,26	0,011	0,13	0,40	0,66	1,06	36	50
01.07.96	89,600	18,0	7,74	320	7,27	77,3	9,2	11,2	35	0,16	0,074	1,38	1,62	0,15	1,77	77	104
08.07.96	56,200	25,2	8,30	616	8,70	106,8	9,9	13,4	22	0,13	0,028	1,58	1,74	0,17	1,91	62	70
15.07.96	41,300	19,6	8,28	637	12,30	135,2	7,2	9,1	28	0,03	0,017	1,35	1,40	0,13	1,53	29	64
22.07.96	37,500	19,0	8,19	846	9,00	97,7	5,0	8,0	22	0,05	0,019	0,93	1,00	0,12	1,12	25	80

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
29.07.96	47,500	20,5	7,94	539	9,28	103,9	4,0	5,8	15	0,03	0,020	0,76	0,81	0,18	0,99	27	52
05.08.96	41,200	20,6	8,10	507	7,60	85,3	5,0	8,2	20	0,04	0,024	0,54	0,60	0,19	0,79	44	70
12.08.96	23,600	16,9	7,90	725	9,40	97,7	5,0	7,0	20	0,07	0,012	0,31	0,39	0,17	0,56	22	31
21.08.96	33,400	19,3	7,89	556	9,29	101,5	4,6	5,8	18	0,21	0,031	1,64	1,88	0,12	2,00	39	60
26.08.96	31,600	19,3	8,14	697	10,00	109,3	6,2	9,0	31	0,06	0,042	0,70	0,80	0,10	0,90	79	96
02.09.96	21,300	21,4	7,91	732	4,40	50,2	4,3	6,0	12	0,10	0,023	0,97	1,10	0,19	1,29	33	47
09.09.96	106,000	15,2	7,55	470	7,92	79,3	4,5	6,0	16	0,21	0,047	1,16	1,42	0,06	1,48	75	89
16.09.96	116,000	12,0	8,04	375	6,30	58,6	6,8	10,9	28	0,06	0,059	0,75	0,87	0,06	0,93	51	72
23.09.96	89,900	14,3	7,72	334	7,93	77,8	3,0	3,8	8	0,05	0,034	0,92	1,01	0,13	1,14	46	60
30.09.96	115,000	12,2	7,65	323	9,11	85,2	5,0	7,0	18	0,02	0,023	0,92	0,97	0,17	1,14	64	75
07.10.96	56,600	10,4	7,71	456	7,72	69,2	2,8	3,4	9	0,05	0,046	1,06	1,16	0,12	1,28	88	96
14.10.96	47,100	12,2	7,94	600	8,29	77,5	2,8	3,8	8	0,09	0,068	1,27	1,42	0,55	1,97	86	91
21.10.96	542,000	9,6	7,67	445	8,89	78,1	10,2	15,7	40	0,09	0,039	1,22	1,34	0,11	1,45	116	140
28.10.96	88,300	8,0	7,90	505	10,44	88,2	3,0	3,8	8	0,09	0,033	0,96	1,07	0,12	1,19	57	65
04.11.96	66,100	13,5	7,84	495	9,40	90,6	4,2	5,1	13	0,12	0,045	0,89	1,06	0,06	1,12	66	84
11.11.96	53,300	8,0	7,76	544	11,17	94,3	3,0	3,8	8	0,09	0,051	0,77	0,91	0,10	1,01	68	79
18.11.96	45,700	10,2	7,78	569	10,10	90,0	2,2	3,0	8	0,12	0,051	1,07	1,25	0,12	1,37	64	74
25.11.96	67,300	7,1	7,85	615	10,51	86,8	3,0	4,7	10	1,32	0,058	1,84	3,21	0,19	3,40	122	174
02.12.96	98,200	4,1	7,60	444	12,23	93,4	3,6	4,2	11	0,16	0,036	1,02	1,21	0,17	1,38	75	120
09.12.96	91,000	3,9	7,77	542	12,57	95,5	3,0	4,2	14	0,17	0,035	1,10	1,31	0,13	1,44	96	140
16.12.96	212,000	4,0	7,71	335	12,28	93,5	8,0	12,4	29	0,12	0,042	1,25	1,41	0,07	1,48	69	81
29.12.96	88,800	0,0	7,95	594	11,07	75,6	2,9	4,5	13	0,26	0,016	1,21	1,49			73	
06.01.97	576,000	0,0	7,65	386	12,35	84,3	3,1	4,2	12	0,18	0,016	1,19	1,38	0,09	1,47	40	54
13.01.97	353,000	0,0	7,74	543	11,69	79,8	7,1	9,6	26	0,61	0,014	1,03	1,65	0,05	1,70	44	84
20.01.97	75,000	0,1	7,00	647	10,94	74,9	2,0	2,6	6	0,05	0,016	1,35	1,42	0,07	1,49	59	70
27.01.97	55,800	0,0	7,93	740	13,40	91,5	4,6	5,7	15	1,17	0,023	1,18	2,38	0,08	2,46	24	36
03.02.97	44,700	0,2	7,81	808	14,78	101,4	6,0	8,1	20	1,13	0,007	1,37	2,50	0,06	2,56	36	50
10.02.97	44,700	0,0	7,81	761	13,00	88,7	4,0	5,4	13	1,44	0,011	1,05	2,49	0,04	2,53	74	88
17.02.97	214,000	0,1	7,55	317	13,31	91,1	14,6	18,1	30	0,20	0,033	1,58	1,82	0,04	1,86	138	250
24.02.97	145,000	2,5	7,57	415	11,20	81,9	6,1	8,6	21	0,30	0,043	2,78	3,12	0,07	3,19	216	300
03.03.97	209,000	2,6	7,62	350	11,59	85,0	7,6	10,2	29	0,09	0,029	2,15	2,27	0,07	2,34	114	189
10.03.97	101,000	2,1	7,62	506	15,90	115,0	4,1	6,5	16	0,33	0,006	1,58	1,91	0,05	1,96	127	200
17.03.97	82,800	3,8	7,73	660	10,09	76,4	3,2	4,6	10	0,13	0,028	1,40	1,56	0,06	1,62	66	86

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
24.03.97	64,900	4,4	7,62	714	11,14	85,7	4,9	7,2	20	0,21	0,023	0,21	0,45	0,76	1,21	125	260
01.04.97	72,200	3,8	7,63	704	11,33	85,8	3,0	4,0	12	0,17	0,041	1,21	1,42	0,05	1,47	77	120
07.04.97	82,800	0,2	8,00	538	11,05	75,8	2,0	2,3	6	0,09	0,021	0,58	0,69	0,21	0,90	59	74
14.04.97	60,700	3,8	7,90	627	10,98	83,2	2,2	2,9	5	0,07	0,027	0,99	1,08	0,05	1,13	53	69
21.04.97	260,000	3,4	7,59	450	11,66	87,4	10,7	14,7	31	0,19	0,065	1,23	1,49	0,04	1,53	162	240
28.04.97	241,000	10,0	7,70	497	9,99	88,6	8,1	12,5	30	0,06	0,045	1,31	1,42	0,11	1,53	90	104
05.05.97	149,000	12,5	7,70	455	8,27	77,9	4,2	5,2	14	0,05	0,028	1,39	1,46	0,95	2,41	62	84
12.05.97	285,000	16,7	7,76	371	9,96	103,0	5,5	8,5	23	0,05	0,053	1,53	1,64	0,98	2,62	288	310
20.05.97	85,700	18,8	8,00	512	7,34	79,4	3,8	4,7	12	0,17	0,023	0,67	0,87	0,02	0,89	46	70
26.05.97	148,000	17,3	7,74	355	9,13	95,7	4,1	5,3	13	0,05	0,026	1,31	1,39	0,06	1,45	62	76
02.06.97	159,000	18,1	8,10	422	9,29	99,0	6,0	7,5	20	0,03	0,033	1,14	1,21	0,03	1,24	86	94
09.06.97	52,900	17,1	7,38	298	8,07	84,2	14,1	23,0	49	0,22	0,040	1,32	1,58	0,06	1,64	40	59
16.06.97	225,000	16,0	7,50	425	6,23	63,5	6,1	8,3	20	0,05	0,053	0,99	1,09	0,06	1,15	94	130
23.06.97	227,000	19,8	7,52	421	6,69	73,9	8,6	14,0	36	0,06	0,024	1,02	1,11	0,04	1,15	88	96
30.06.97	110,000	20,9	7,87	510	5,90	66,6	5,0	7,1	18	0,06	0,042	1,32	1,42	0,06	1,48	75	89
07.07.97	62,100	19,8	7,96	749	6,71	74,1	8,1	12,0	30	0,03	0,006	1,32	1,35	0,08	1,43	88	100
14.07.97	69,300	18,4	8,00	713	10,39	111,4	4,1	5,8	14	0,02	0,018	1,66	1,70	0,06	1,76	64	78
21.07.97	81,300	16,5	7,92	689	8,77	90,3	4,0	6,6	14	0,05	0,019	1,44	1,51	0,06	1,57	86	97
28.07.97	222,000	20,0	7,69	417	8,02	88,9	5,0	6,7	16	0,04	0,019	1,13	1,19	0,05	1,24	64	110
04.08.97	145,000	20,0	7,77	490	12,00	133,0	5,0	7,7	20	0,05	0,026	1,39	1,47	0,05	1,52	158	220
11.08.97	107,000	20,9	7,95	560	14,85	167,6	4,1	6,6	17	0,04	0,023	0,65	0,71	0,02	0,73	111	185
18.08.97	67,100	20,5	7,71	785	11,02	123,4	4,0	5,4	13	0,06	0,019	1,52	1,60	0,06	1,66	88	183
25.08.97	47,900	22,4	7,78	886	14,20	165,1	4,7	5,1	13	0,21	0,003	1,51	1,72	0,11	1,83	35	49
01.09.97	404,000	19,0	7,50	389	6,63	72,0	5,0	5,7	14	0,05	0,021	0,96	1,03	0,07	1,10	69	100
08.09.97	137,000	14,6	7,61	402	12,54	123,9	4,0	4,7	11	0,06	0,024	0,90	0,99	0,08	1,07	114	170
15.09.97	56,500	12,6	7,83	734	10,44	98,5	2,0	2,8	5	0,01	0,016	0,91	0,93	0,08	1,01	329	458
22.09.97	74,300	14,2	7,71	700	7,87	77,0	3,5	4,2	10	0,03	0,019	0,90	0,95	0,09	1,04	151	211
29.09.97	72,900	11,6	7,88	684	6,89	63,5	3,2	4,1	11	0,39	0,019	1,39	1,80	0,10	1,90	73	94
06.10.97	145,000	9,7	7,80	429	7,83	69,0	2,9	3,5	8	0,13	0,019	0,96	1,11	0,09	1,20	109	149
13.10.97	60,700	9,4	7,72	664	7,92	69,2	2,4	3,0	8	0,19	0,015	1,15	1,36	0,15	1,51	60	96
20.10.97	114,000	7,0	7,79	690	10,16	83,7	2,7	3,0	8	0,05	0,046	0,42	0,52	0,21	0,73	280	315
27.10.97	61,400	5,0	7,93	708	11,17	87,3	2,0	2,8	8	0,12	0,024	0,51	0,65	0,18	0,83	31	50
03.11.97	51,800	1,7	7,99	868	10,67	76,3	2,6	3,0	7	0,22	0,022	1,12	1,36	0,21	1,57	79	102

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
10.11.97	52,400	8,0	7,82	854	8,05	68,0	2,1	3,0	8	0,30	0,055	0,51	0,86	0,17	1,03	44	69
17.11.97	197,000	6,0	7,75	653	11,00	88,3	2,0	2,6	5	0,12	0,034	0,45	0,61	0,19	0,80	25	31
24.11.97	65,700	5,4	7,85	820	17,80	140,6	2,9	3,1	8	0,34	0,075	0,67	1,09	0,21	1,30	38	49
01.12.97	112,000	6,5	7,70	570	9,84	80,0	4,0	4,8	13	0,14	0,036	0,61	0,79	0,21	1,00	24	34
08.12.97	88,600	3,0	7,52	595	11,86	87,9	2,1	2,6	8	0,21	0,041	0,49	0,74	0,32	1,06	33	44
15.12.97	256,000	1,6	7,75	695	12,05	86,0	7,3	10,8	23	0,21	0,097	0,46	0,77	0,22	0,99	29	34
18.12.97	94,100	0,4	7,79	604	12,68	87,5	2,0	2,7	8	0,27	0,060	0,68	1,01	0,38	1,39	49	54
29.12.97	197,000	2,0	7,69	583	11,10	80,1	3,6	4,1	13	0,18	0,089	0,71	0,97	0,15	1,12	29	41

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
03.01.94		40	0	31	48,1	22,4	38,6	4,7	0,98	0,70		0,19	1100								400		
10.01.94		20	3	117																			
17.01.94		0	0	30																			0,00
24.01.94		0	4	0																			
31.01.94		20	2	325	57,7	35,9	56,8	5,7	1,95			0,65	620								200		
07.02.94		60	4	0																			
14.02.94		20	4	202																			0,00
21.02.94		260	4	75																			
28.02.94		380	6	65	65,3	22,9	53,3	4,5				0,43	2560						8				
07.03.94		0	4	0																			
16.03.94		0	4	56																			
21.03.94				55																			
28.03.94				15																			0,00
05.04.94		40	4	21	60,1	13,0	42,2	4,4	2,78	0,38		0,40											
11.04.94		20	6	57	50,1	10,5	18,1	3,7		0,37		0,30	4020		2,3						0		0,00
18.04.94				12	60,5	9,2	30,3	3,8		0,44		0,26											
25.04.94			6	8																			
02.05.94		0	6	0	50,1	19,9	10,4	4,0	0,52	0,31		0,21											
09.05.94			6	38									302										0,44
16.05.94				19																			
24.05.94				21																			
30.05.94			0	8																			
06.06.94		0	4	13	57,1	8,8	44,2	5,1	0,40	0,26		0,09	128		1,6				3		100		0,00
13.06.94			0	11																			
20.06.94				14																			
27.06.94				21																			
04.07.94		0	2	27	42,9	6,1	86,0	6,9	1,17	0,30		0,10	934								100		0,00
11.07.94		40	4	31						0,35		0,09											
18.07.94				30																			
25.07.94				26																			
01.08.94		60	4	24	44,5	9,5	80,8	8,0		0,32		0,11	638								100		0,00
08.08.94		80	4	40	58,7	6,9	93,2	9,2		0,37		0,08											
15.08.94		60	0	26	57,1	6,9	74,9	8,7		0,65		0,08											

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
22.08.94				20	52,9	6,1	70,4	6,2		0,32		0,06											
29.08.94		60	4	19	68,7	13,9	94,6	7,2		0,33		0,09											
05.09.94			2	22			64,1	6,6															
12.09.94				20			116,7	8,0					224								200		
19.09.94				22																			
26.09.94		0	4	26	52,9	11,4	79,5	6,5		0,43		0,13							6				
03.10.94				18																			
10.10.94		10	4	30	51,3	13,0	117,8	7,8		0,36		0,09	360								300		
17.10.94			6	26																			
24.10.94				29																			
31.10.94			6	22																			
07.11.94		0	2	20	51,5	13,0	41,5	4,4	1,50	0,21		0,65	356								260		
14.11.94				22	55,7	15,0	69,2	6,3	1,28	0,34		0,42											
21.11.94			4	31																			
28.11.94			6	61													400						
05.12.94		30	1	35	56,3	10,3	56,1	5,7	1,04	0,41		0,08	446										
12.12.94		60	4	35	51,5	9,5	46,1	5,0									820						
19.12.94				25													310		2				
02.01.95	1,6		0	119	34,3	5,2	13,2	3,1	8,90	3,25		0,45									800		
09.01.95				122						0,32		0,57											
16.01.95				157																			
23.01.95				170																			
30.01.95				163																			
06.02.95			0	12	30,5	2,7	28,5	5,3	4,45	0,50		0,06											
13.02.95		10	0	144	36,5	1,8	15,0	4,1		0,22		0,01									330		
20.02.95				32																			
27.02.95				309																			1,00
06.03.95		20	9	287	31,9	14,6	28,5	4,5	3,22	0,77		0,06											
13.03.95				53			28,7	4,5															
20.03.95				277			47,8	5,2															
27.03.95		40	4	90	44,1	7,3	17,3	3,7		0,40		0,04	1720		25,0						190		1,00
03.04.95		60	1	65	48,7	4,6	22,2	3,9	5,82	0,50		0,07											
10.04.95				69																			

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
18.04.95				162			19,3	2,9															
24.04.95		80	0	70	38,1	13,7	21,4	2,6		0,42		0,04		265								290	1,00
02.05.95		60	8	225	39,6	8,2	10,8	2,6	0,20	0,16		0,08											
08.05.95				249																			
15.05.95				162																			
22.05.95		0	6	62	49,8	14,1	28,7	3,1		0,23		0,16		215	17,0							140	19,00
29.05.95				93																			
06.06.95			1	508					3,06			0,08											
12.06.95				108																			
19.06.95		20	10	94	56,0	9,7	32,1	4,3		0,11		0,24		142			1980		10			70	8,00
26.06.95				136																			
03.07.95			2	371			25,0	4,1	5,70			0,18											
10.07.95				225			54,0	4,7															
17.07.95		100	2	50	51,5	5,2	74,4	4,9		0,04		0,26		112								210	5,00
24.07.95			6	184																			
31.07.95				350			43,2	3,9															
07.08.95			6	74	32,9	3,5	35,8	3,3	0,23	0,14		0,00											
14.08.95		6	10	16	48,7	8,4	48,4	4,0		0,06		0,19		84	5,0							310	9,00
21.08.95				300																			
28.08.95			4	198																			
04.09.95		20	5	204			29,2	3,8	0,96			0,04											
11.09.95		30	6	200	42,9	7,8	51,6	4,3		0,62		0,08		104	5,0							100	4,00
18.09.95			4	260																			
25.09.95			4	250			44,5	4,6															
03.10.95		80	6	200								0,17											
09.10.95		50	0	375	42,9	8,7	41,5	4,3		0,71		0,08		84	5,0							99	3,00
16.10.95			6	244																			
24.10.95			4	200			80,9	4,8															
30.10.95			2	156																			
06.11.95		50	6	168	34,3	4,3	32,6	4,3		0,18		0,00		109								238	1,00
13.11.95		0	6	100			36,3	4,1															
20.11.95			4	50																			
27.11.95			8	413			37,2	4,4															

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
04.12.95		50	8	86	42,9	8,7	43,2	4,8	0,05	0,03		0,03		77	18,0		790		0			184	6,00
11.12.95				60																			
18.12.95			8	75			10,2	3,5															
02.01.96			6	24					12,95		0,38												
08.01.96			8	36			42,3	4,5															
15.01.96		6	6	76	52,9	14,7	49,5	4,2		1,32		0,25		83								90	
22.01.96				48			57,8	4,3															
29.01.96				36			50,4	3,8															
05.02.96			6	33			52,6	3,8	3,48														
12.02.96		4	4	24	51,5	8,7	42,7	3,8		0,40		0,12		55								320	
19.02.96				33			46,0	3,9															
26.02.96				36			96,9	5,0															
04.03.96			3	21			85,5	2,5	2,04			0,46											
11.03.96			2	200	73,0	16,5	92,5	3,8		0,40		0,37		66		8,4	590		0			367	
18.03.96			0	74			29,4	3,8															
25.03.96				56			45,4	4,8															
01.04.96			4	57	65,8	13,0	37,7	4,6	5,89	0,51		0,21											
09.04.96				84			26,0	3,9															
15.04.96				64			49,3	4,4															
22.04.96			2	174	58,7	12,1	62,1	4,5		0,27		0,05		32		8,0						160	
29.04.96				151																			
06.05.96				112			46,7	3,7															
13.05.96				79			48,6	5,5															
20.05.96			4	151	51,5	12,1	28,5	4,6		0,11		0,15		128		21,0						36	
28.05.96				114			70,8	4,9															
03.06.96			2	117			59,3	5,1															
10.06.96				131			88,5	11,0															
17.06.96			2	99	37,2	14,7	49,4	3,8		0,05		0,01		95			430		0			43	
24.06.96				60			107,5	8,0															
01.07.96	2,0		6	40	42,9	10,4	21,2	4,3	7,87	0,04		0,01		174								86	
08.07.96				46																			
15.07.96				76																			
22.07.96				104																			

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
29.07.96				41																			
05.08.96	2,0		6	170	42,9	15,6	62,6	4,4	0,87			0,05											
12.08.96			0	107	51,5	13,9	76,5	7,3		0,12		0,02		324								141	
21.08.96				73			82,6	8,9															
26.08.96				82			72,8	7,3															
02.09.96			3	194			76,2	5,8														40	
09.09.96			4	88	44,8	16,7	48,1	5,3		0,11		0,03		532		44,5						211	
16.09.96			4	70			30,0	4,5															
23.09.96			6	60			25,3	4,2															
30.09.96			6	79																			
07.10.96			4	64	34,3	4,3	39,8	4,6		0,18		0,04		229								111	
14.10.96			4	28			60,5	5,0															
21.10.96			4	44			16,2	4,9															
28.10.96			4	100			24,7	4,9															
04.11.96			4	31	55,7	25,1	37,9	4,9	1,04	0,59		0,18		68		5,6	990		0			149	
11.11.96			6	120			49,6	5,1															
18.11.96			4	89			52,6	4,9															
25.11.96			4	74			57,8	5,4															
02.12.96			4	78	35,7	6,1	35,0	4,8	0,83	0,23		0,09		126								319	
09.12.96			6	81			30,0	4,5															
16.12.96			4	18			22,5	4,9															
29.12.96																							
06.01.97	1,6		4	20	42,9	8,7	25,9	4,1	1,20	0,72	0,10	0,07		70		45,0						244	
13.01.97			0	26			46,0	4,3															
20.01.97			4	26			46,0	4,3															
27.01.97			0	25			60,0	4,8															
03.02.97			4	29	38,7	21,9	92,0	5,6	6,76	0,21		0,07		87								320	
10.02.97			4	24			78,0	5,1															
17.02.97			4	19			26,0	4,6															
24.02.97			4	28			36,0	5,1															
03.03.97	0,8		4	25	44,4	7,8	19,8	3,8	6,00	1,53	0,93	0,63		92								95	
10.03.97			6	22																			
17.03.97			0	20													1000		0				

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
24.03.97			0	18			72,0	4,5															
01.04.97			6	29	58,7	21,7	71,0	4,2	4,00	1,80	0,90	0,50		50								460	
07.04.97			4	20			51,0	3,7															
14.04.97			4	27			62,0	4,3															
21.04.97			4	20			29,0	4,5															
28.04.97			6	14			31,0	4,6															
05.05.97			6	46			30,0	4,0															
12.05.97	1,0		4	61	42,9	4,3	22,0	4,1	0,66	0,35	0,25	0,17		380		28,0						84	
20.05.97			4	17			47,0	4,6															
26.05.97			6	16			19,5	3,0															
02.06.97			6	19			30,0	4,4															
09.06.97			4	19	35,7	4,3	11,6	4,4		0,97		0,48		530								60	
16.06.97			6	24			23,0	4,4															
23.06.97			4	12			27,0	4,8											0				
30.06.97			4	19																			
07.07.97	1,6		6	26	35,7	5,2	61,0	5,0	1,12	0,54	0,61	0,50		9		6,0						47	
14.07.97			4	24			57,0	5,7															
21.07.97			4	29			63,0	5,0															
28.07.97			4	32			46,0	8,7															
04.08.97			0	20	35,7	3,5	31,0	4,9		0,81		0,39		72								188	
11.08.97			4	23			35,2	4,8															
18.08.97			6	31			78,7	4,8															
25.08.97			3	41			86,0	5,6															
01.09.97			4	21	41,5	8,7	25,0	5,2		0,80		0,04		350								76	
08.09.97			6	65			31,0	5,4															
15.09.97			4	28			79,0	5,1											0				
22.09.97			6	25			59,0	4,9															
29.09.97			4	30			78,0	4,6															
06.10.97			4	50			26,0	4,4															
13.10.97		90	4	34	74,4	12,1	62,0	4,8		0,25		0,03		83								141	
20.10.97				35			28,0	4,9															
27.10.97				39			70,0	5,0															
03.11.97				39			3,5	4,9															

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
10.11.97		75	2	37	71,6	29,5	89,0	5,8		0,29		0,22		310		5,0						190	
17.11.97				44			75,0	5,4															
24.11.97				30			68,0	4,4															
01.12.97				36			46,0	5,5															
08.12.97		90	0	33	53,0	28,6	49,0	5,0		0,48		0,02		126					0			72	
15.12.97				39			34,0	4,7															
18.12.97				39			33,0	4,5															
29.12.97				22			35,0	4,6															

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01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
03.01.94		0,8		1,8		0,0	5,5		0,8		68,0	
10.01.94												
17.01.94												
24.01.94												
31.01.94		1,8		4,2		0,0	4,6		6,8		61,6	
07.02.94												
14.02.94												
21.02.94												
28.02.94												
07.03.94												
16.03.94												
21.03.94												
28.03.94												
05.04.94												
11.04.94		6,0		3,6			8,7		17,0		50,0	
18.04.94												
25.04.94												
02.05.94												
09.05.94												
16.05.94												
24.05.94												
30.05.94												
06.06.94		0,4		2,8			1,4		0,9		18,4	
13.06.94												
20.06.94												
27.06.94												
04.07.94		0,6		3,3			2,8		4,1		29,1	
11.07.94												
18.07.94												
25.07.94												
01.08.94		0,5		0,6			3,5		2,5		23,0	
08.08.94												
15.08.94												

Szamos at Csenger, rkm 46.4
01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
22.08.94												
29.08.94												
05.09.94												
12.09.94		0,7		1,8			3,8		2,0		27,0	
19.09.94												
26.09.94												
03.10.94												
10.10.94		2,4		2,6			7,3		2,6		46,4	
17.10.94												
24.10.94												
31.10.94												
07.11.94		1,1		4,9			3,4		3,9		34,2	
14.11.94												
21.11.94												
28.11.94												
05.12.94		3,7					0,8				60,0	
12.12.94												
19.12.94												
02.01.95		5,7		7,2			18,4		####		178,0	
09.01.95												
16.01.95												
23.01.95												
30.01.95												
06.02.95												
13.02.95		1,3		10,6			14,1		14,0		10,6	
20.02.95												
27.02.95												
06.03.95												
13.03.95												
20.03.95												
27.03.95		3,6		57,0			7,1		40,0		95,0	
03.04.95												
10.04.95												

Szamos at Csenger, rkm 46.4
01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
18.04.95												
24.04.95			2,1		0,0			10,7		5,0		19,0
02.05.95												
08.05.95												
15.05.95												
22.05.95			0,3		0,3			4,3		3,0		
29.05.95												
06.06.95												
12.06.95												
19.06.95			0,5		7,2			3,5		5,0		5,7
26.06.95												
03.07.95												
10.07.95												
17.07.95			0,6		0,6			4,9		1,0		6,4
24.07.95												
31.07.95												
07.08.95												
14.08.95			4,9		2,2			8,5		1,0		13,3
21.08.95												
28.08.95												
04.09.95												
11.09.95			1,0		7,1			2,4		1,0		8,4
18.09.95												
25.09.95												
03.10.95												
09.10.95			1,1		10,0			2,9		1,0		14,0
16.10.95												
24.10.95												
30.10.95												
06.11.95			0,3		0,8			1,7		1,0		6,2
13.11.95												
20.11.95												
27.11.95												

Szamos at Csenger, rkm 46.4
01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
04.12.95			1,4		0,8			4,1		4,0		64,6
11.12.95												
18.12.95												
02.01.96												
08.01.96												
15.01.96			1,2		2,4			2,4		1,4		20,3
22.01.96												
29.01.96												
05.02.96												
12.02.96			2,2		0,8			4,7		1,0		23,6
19.02.96												
26.02.96												
04.03.96												
11.03.96			2,1		1,2			4,9		5,0		72,0
18.03.96												
25.03.96												
01.04.96												
09.04.96												
15.04.96												
22.04.96			1,5		1,2			5,2		10,0		23,8
29.04.96												
06.05.96												
13.05.96												
20.05.96			0,4		1,1			3,8		2,0		9,5
28.05.96												
03.06.96												
10.06.96												
17.06.96			0,8		1,3			3,1		1,0		11,3
24.06.96												
01.07.96			0,3		1,5			4,8		1,0		8,1
08.07.96												
15.07.96												
22.07.96												

Szamos at Csenger, rkm 46.4
01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
29.07.96												
05.08.96												
12.08.96			0,7		5,2			3,4		6,0		14,6
21.08.96												
26.08.96												
02.09.96					2,2			5,3		2,0		12,9
09.09.96			1,1		1,2			6,5		7,0		37,0
16.09.96												
23.09.96												
30.09.96												
07.10.96			0,6		1,5			5,7		6,0		23,6
14.10.96												
21.10.96												
28.10.96												
04.11.96			1,7		1,4			2,2		18,0		59,2
11.11.96												
18.11.96												
25.11.96												
02.12.96			1,2		2,0			5,1		8,0		10,5
09.12.96												
16.12.96												
29.12.96												
06.01.97			1,7		1,2			6,2		1,0		28,0
13.01.97												
20.01.97												
27.01.97												
03.02.97			2,5		1,7			5,0		10,0		54,0
10.02.97												
17.02.97												
24.02.97												
03.03.97			0,4		2,0			2,0		6,0		14,0
10.03.97												
17.03.97												

Szamos at Csenger, rkm 46.4
01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
24.03.97												
01.04.97	0,90		1,4		1,0			1,5		1,0		26,7
07.04.97												
14.04.97												
21.04.97												
28.04.97												
05.05.97												
12.05.97	0,58		0,5		0,3			3,0		1,0		11,0
20.05.97												
26.05.97												
02.06.97												
09.06.97	0,30		0,3		1,7			3,5		2,0		10,6
16.06.97												
23.06.97												
30.06.97												
07.07.97	0,40		0,4		0,5			2,5		1,0		13,0
14.07.97												
21.07.97												
28.07.97												
04.08.97	0,90		0,3		0,9			7,7		3,0		11,1
11.08.97												
18.08.97												
25.08.97												
01.09.97	0,30		0,3		1,9			7,7		80,0		7,4
08.09.97												
15.09.97												
22.09.97												
29.09.97												
06.10.97												
13.10.97	0,30		0,6		0,3			1,8		2,0		0,3
20.10.97												
27.10.97												
03.11.97												

Szamos at Csenger, rkm 46.4
01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Cr VI µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
10.11.97	0,50		1,6		1,5			3,6		4,0		26,0
17.11.97												
24.11.97												
01.12.97												
08.12.97	0,30		0,7		18,0			1,7		1,0		18,0
15.12.97												
18.12.97												
29.12.97												

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01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
03.01.94	2,920	3,1	7,55	713	8,16	60,6	4,9	6,1	15	2,79	0,086	1,90	4,78	0,92	5,70	535	590
10.01.94	4,480	1,5	7,60	762	9,46	67,3	6,3	9,2	26	2,66	0,084	2,19	4,93	0,37	5,30	411	1120
17.01.94	2,920	3,4	7,61	454	4,18	31,3	7,5	9,9	22	2,56	0,080	0,83	3,47	0,73	4,20	668	790
24.01.94	4,140	1,0	7,83	797	7,70	54,0	7,0	13,4	42	7,72	0,070	1,15	8,94	0,46	9,40	267	1210
31.01.94	3,070	0,2	7,84	710	6,95	47,7	6,0	11,4	26	3,48	0,047	1,69	5,21	0,69	5,90	346	1090
07.02.94	6,590	5,0	7,62	611	8,07	63,1	2,0	2,6	5	4,09	0,074	2,55	6,71	0,79	7,50	339	760
14.02.94	5,690	0,5	7,59	589	10,42	72,1	7,6	10,5	38	2,95	0,045	2,28	5,28	0,62	5,90	352	650
21.02.94	3,630	0,8	7,80	774	10,44	72,9	7,0	10,7	24	3,30	0,043	1,69	5,04	0,26	5,30	205	360
28.02.94	7,920	6,0	8,12	586	8,54	68,5	7,9	15,2	48	1,41	0,092	2,99	4,50	0,60	5,10	228	480
07.03.94	6,050	7,0	7,61	741	7,11	58,5	4,2	5,2	13	1,98	0,047	1,60	3,63	0,57	4,20	336	690
16.03.94	4,440	4,6	7,95	706	9,50	73,5	6,0	7,9	28	0,68	0,083	2,00	2,77	0,53	3,30	544	630
21.03.94	4,010	4,0	7,94	700	13,16	100,2	7,6	11,1	20	0,18	0,084	1,85	2,11	0,99	3,10	492	1070
28.03.94	8,640	6,2	7,42	630	5,47	44,1	6,1	9,0	28	1,89	0,122	2,11	4,12	0,68	4,80	466	710
05.04.94	3,930	4,3	7,69	755	5,63	43,2	5,9	8,4	29	3,71	0,087	1,04	4,83	0,97	5,80	515	860
11.04.94	16,100	6,4	7,19	472	9,49	76,9	6,9	11,2	34	3,21	0,050	2,53	5,79	0,31	6,10	368	420
18.04.94	6,100	9,4	7,67	880	4,61	40,3	7,6	10,8	30	1,33	0,160	2,12	3,60	0,40	4,00	411	660
25.04.94	5,140	15,5	7,23	708	3,25	32,7	7,1	10,4	35	1,59	0,179	1,60	3,36	0,34	3,70	499	1120
02.05.94	3,020	6,9	7,64	729	6,31	51,8	4,6	9,0	24	1,10	0,198	2,28	3,58	0,17	3,75	303	390
09.05.94	2,660	13,0	7,59	828	3,96	37,7	7,6	11,0	36	2,28	0,253	1,81	4,34	0,36	4,70	681	1860
16.05.94	2,860	17,8	7,61	787	12,88	136,4	3,9	6,0	14	1,47	0,027	1,84	3,33	0,27	3,60	662	730
24.05.94	2,150	12,5	6,68	755	8,02	75,5	5,1	7,4	22	1,89	0,365	2,04	4,29	0,01	4,30	642	1000
30.05.94	1,390	7,5	7,64	773	5,59	46,6	4,6	9,6	39	4,64	0,316	1,09	6,04	0,36	6,40	52	500
06.06.94	2,500	16,7	7,91	900	6,14	63,5	6,0	12,2	31	0,50	0,042	0,43	0,97	0,23	1,20	365	790
13.06.94	2,300	14,1	7,75	827	5,45	53,2	5,4	9,9	28	2,15	0,770	1,67	4,59	0,11	4,70	792	1210
20.06.94	2,510	14,2	7,32	816	3,57	34,9	4,0	7,6	19	1,41	0,481	1,97	3,85	0,55	4,40	659	720
27.06.94	1,580	22,0	7,65	992	9,22	106,4	4,9	7,6	17	0,16	0,395	1,83	2,38			496	600
04.07.94	1,200	23,6	7,83	809	18,45	219,7	6,3	9,1	29	2,17	0,373	1,62	4,16	0,14	4,30	730	1170
11.07.94	1,450	20,3	7,57	782	5,72	63,8	4,8	9,0	30	0,54	1,223	3,02	4,79	0,01	4,80	707	1100
18.07.94	1,240	24,0	7,11	720	4,26	51,1	3,2	5,9	19	0,10	0,181	1,39	1,67	0,73	2,40	518	830
25.07.94	1,360	24,3	7,33	819	2,88	34,8	6,3	10,9	35	1,17	0,728	1,19	3,09	0,41	3,50	473	960
01.08.94	1,140	25,0	7,80	804	4,54	55,5	4,6	8,0	22	0,43	0,122	2,73	3,28	0,22	3,50	662	700
08.08.94	1,100	25,0	7,18	738	11,17	136,6	5,8	10,1	33	0,71	0,411	2,92	4,04	0,16	4,20	398	420
15.08.94	1,040	16,5	7,35	680	4,70	48,4	3,9	6,4	15	0,64	0,388	1,41	2,44	0,66	3,10	499	600

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
22.08.94	1,000	15,2	7,09	986	6,32	63,3	3,9	4,9	15	0,25	0,282	0,61	1,14	0,46	1,60	333	830
29.08.94	1,170	16,2	7,33	780	3,77	38,6	5,2	9,0	30	3,28	0,289	2,61	6,18	0,42	6,60	447	520
05.09.94	0,950	21,0	7,29	823	5,29	59,8	5,0	8,8	23	1,12	0,364	2,78	4,27			417	640
12.09.94	0,930	20,0	7,63	874	4,61	51,1	7,0	11,8	33	0,58	0,258	0,48	1,32			329	540
19.09.94	1,020	14,5	7,10	864	4,61	45,4	4,0	6,2	13	1,85	0,426	3,05	5,32			753	910
26.09.94	2,030	19,0	7,18	803	3,40	36,9	3,9	6,4	13	1,48	0,326	2,08	3,89			672	1400
03.10.94	0,990	18,5	7,42	953	3,47	37,3	4,8	6,5	16	0,54	0,310	1,97	2,82			509	690
10.10.94	1,220	10,5	7,30	935	3,95	35,5	3,0	4,2	14	2,98	0,207	2,40	5,59			659	790
17.10.94	0,990	7,4	7,16	818	1,71	14,2	5,4	8,8	20	1,51	0,532	0,75	2,79			577	680
24.10.94	0,990	6,2	7,10	787	0,85	6,9	7,6	12,2	31	2,83	0,628	2,28	5,74	0,76	6,50	897	1200
31.10.94	0,980	11,0	7,47	781	2,24	20,4	6,0	8,2	21	1,24	0,329	1,65	3,22	0,38	3,60	815	940
07.11.94	1,010	4,0	7,39	866	6,61	50,3	8,0	9,9	35	0,22	0,108	0,96	1,28	0,42	1,70	600	960
14.11.94	1,020	7,0	7,06	710	3,89	32,0	8,4	12,9	35	1,52	0,261	0,21	1,99	0,91	2,90	554	970
21.11.94	1,170	4,7	7,43	603	3,05	23,7	6,1	10,1	30	1,92	0,575	1,40	3,89	0,51	4,40	561	840
28.11.94	1,430	1,5	7,52	379	6,14	43,7	7,9	12,6	37	2,50	0,437	0,70	3,64	0,56	4,20	375	500
05.12.94	1,000	0,0	7,90	1044	1,54	10,5	10,2	14,8	40	2,02	0,049	0,12	2,19	0,41	2,60	290	340
12.12.94	1,410	3,1	7,75	851	5,47	40,7	12,6	18,0	50	3,32	0,376	1,24	4,93	0,57	5,50	636	840
19.12.94	1,370	1,0	7,32	723	6,77	47,5	15,6	23,8	58	3,05	0,052	1,75	4,86	0,58	5,44	342	490
02.01.95	3,250	2,7	7,97	665	8,19	60,2	8,0	14,0	44	1,76	0,093	4,17	6,03	0,38	6,41	261	1580
09.01.95	0,995	0,0	7,95	836	9,16	62,5	4,0	6,9	21	2,07	0,056	2,41	4,54	0,72	5,26	293	420
16.01.95	0,655	-0,4	7,49	759	6,86	46,3	3,5	5,9	13	5,44	0,064	4,68	10,18	0,37	10,55	610	690
23.01.95	0,995	0,0	7,62	821	5,98	40,8	3,1	5,6	17	2,91	0,105	1,22	4,23	0,58	4,81	717	1080
30.01.95	14,700	2,7	7,71	463	10,50	77,2	6,8	12,9	31	1,82	0,081	4,34	6,24	0,42	6,66	82	160
06.02.95	2,740	1,3	8,00	748	10,30	72,9	5,6	8,4	26	1,46	0,107	3,03	4,60	0,96	5,56	277	290
13.02.95	3,480	1,3	7,76	689	8,68	61,4	3,5	3,9	10	0,66	0,138	3,62	4,42	0,72	5,14	231	310
20.02.95	4,470	3,2	7,91	694	8,50	63,3	4,9	6,7	19	0,14	0,114	2,27	2,53	0,03	2,56	293	610
27.02.95	6,050	7,0	7,96	688	8,20	67,5	5,8	8,9	29	0,47	0,114	3,20	3,79	0,59	4,38	346	420
06.03.95	5,470	6,9	7,80	664	8,40	69,0	8,9	15,9	45	0,33	0,146	3,65	4,13	0,33	4,46	372	610
13.03.95	2,740	7,4	7,82	699	7,75	64,5	4,2	7,6	21	0,75	0,125	2,78	3,65	2,23	5,88	411	580
20.03.95	2,350	6,6	7,67	775	10,60	86,4	2,8	5,3	16	1,06	0,126	2,99	4,17	0,42	4,59	352	430
27.03.95	3,650	5,0	7,84	772	10,30	80,5	4,5	7,7	21	0,25	0,145	4,47	4,86	0,75	5,61	202	220
03.04.95	2,970	8,3	8,02	743	11,50	97,8	4,0	7,0	20	0,19	0,100	2,98	3,28	1,00	4,28	190	270
10.04.95	2,520	6,1	7,66	732	11,20	90,1	2,3	3,7	8	0,30	0,138	3,98	4,41	0,32	4,73	241	300

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
18.04.95	3,080	9,3	7,66	760	7,30	63,7	6,0	9,3	30	0,33	0,100	3,25	3,68	0,31	3,99	354	552
24.04.95	1,990	16,4	8,10	723	6,80	69,9	4,0	5,3	16	0,27	0,239	2,27	2,78	0,59	3,37	393	428
02.05.95	4,660	7,5	7,68	541	6,24	52,0	14,2	21,3	58	0,05	0,082	2,58	2,72	0,22	2,94	284	680
08.05.95	3,140	9,5	7,97	624	7,12	62,4	3,9	4,9	18	0,14	0,297	2,90	3,34	0,18	3,52	299	350
15.05.95	2,350	10,4	7,31	1716	8,27	74,1	5,0	5,9	22	0,10	0,142	3,12	3,37	0,18	3,55	355	644
22.05.95	3,820	14,1	7,67	737	2,07	20,2	4,0	6,2	18	0,30	0,179	2,74	3,22	2,14	5,36	360	756
29.05.95	2,350	22,7	7,73	760	4,65	54,4	3,6	6,5	20	0,21	0,182	2,94	3,33	1,10	4,43	377	900
06.06.95	2,800	19,8	7,92	674	5,18	57,2	4,9	6,7	20	0,12	0,157	3,77	4,05	0,17	4,22	336	612
12.06.95	1,790	22,7	8,12	798	7,00	81,9	6,9	7,8	25	0,02	0,124	2,94	3,08	0,14	3,22	395	506
19.06.95	2,040	10,2	8,01	755	7,10	63,3	5,8	7,0	20	0,15	0,215	2,89	3,25	0,14	3,39	424	900
26.06.95	1,690	17,0	8,10	775	5,82	60,6	4,0	6,9	19	0,12	0,128	2,85	3,09	0,07	3,16	411	1470
03.07.95	1,350	25,0	8,00	745	5,70	69,7	3,0	5,4	17	0,04	0,082	2,55	2,67	0,27	2,94	466	780
10.07.95	1,100	24,7	8,43	816	7,60	92,4	4,3	5,4	17	0,10	0,065	2,27	2,44	0,10	2,54	380	2220
17.07.95	0,831	20,1	7,82	720	7,86	87,3	2,0	3,0	9	0,05	0,060	2,14	2,25	0,22	2,47	349	1230
24.07.95	0,912	20,1	8,76	775	7,01	77,9	6,4	8,2	26	0,03	0,072	2,23	2,34	0,03	2,37	97	500
31.07.95	0,731	23,0	8,39	797	8,10	95,3	7,9	10,6	30	0,02	0,164	2,67	2,86	0,05	2,91	403	410
07.08.95	0,849	21,4	8,24	966	6,93	79,0	8,2	11,8	30	0,11	0,143	1,37	1,62	0,21	1,83	440	1600
14.08.95	0,601	20,5	8,40	869	7,11	79,6	4,1	6,2	20	0,19	0,176	3,21	3,58	0,10	3,68	484	1800
21.08.95	0,601	23,6	8,37	818	6,20	73,8	5,2	7,0	18	0,61	0,022	2,87	3,50	0,38	3,88	319	470
28.08.95	1,250	19,1	8,09	733	5,25	57,1	9,7	12,7	40	0,36	0,235	1,38	1,98	0,10	2,08	541	547
04.09.95	0,831	15,2	8,00	756	8,61	86,2	9,7	15,4	44	0,18	0,182	2,43	2,79	0,08	2,87	384	390
11.09.95	0,944	16,2	7,86	658	7,05	72,1	4,1	6,9	16	0,55	0,211	2,54	3,30	0,12	3,42	674	976
18.09.95	0,831	15,2	8,28	788	8,26	82,7	5,0	7,7	22	0,09	0,181	1,95	2,22	0,11	2,33	186	238
25.09.95	0,895	7,6	8,37	760	11,52	96,3	4,1	6,6	20	0,07	0,063	2,77	2,90	0,07	2,97	516	620
03.10.95	1,330	12,0	8,10	805	9,85	91,7	2,9	4,8	10	0,24	0,092	3,22	3,55	0,06	3,61	586	645
09.10.95	0,961	14,6	7,82	806	5,91	58,4	4,0	6,4	17	0,86	0,175	2,95	3,99	0,33	4,32	617	789
16.10.95	0,928	14,5	8,00	682	5,15	50,8	3,0	4,2	14	0,33	0,071	1,84	2,23	0,13	2,36	526	644
24.10.95	0,895	5,4	7,70	557	6,68	52,8	3,2	5,0	13	0,12	0,063	0,36	0,54	0,05	0,59	83	131
30.10.95	0,895	8,8	7,66	820	2,14	18,4	4,0	5,3	13	0,37	0,156	1,53	2,06	0,04	2,10	530	619
06.11.95	1,150	2,8	8,00	756	6,82	50,3	4,0	7,6	19	0,70	0,109	2,38	3,19	0,04	3,23	406	520
13.11.95	1,030	2,6	7,98	753	5,97	43,8	4,4	7,0	19	0,99	0,049	1,76	2,80	0,05	2,85	488	570
20.11.95	4,170	3,8	7,69	645	6,47	49,0	7,1	11,6	30	0,89	0,126	2,44	3,46	0,05	3,51	362	390
27.11.95	1,067	0,2	7,84	512	5,44	37,3	6,1	10,7	25	0,40	0,016	0,57	0,98	0,02	1,00	48	56

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
04.12.95	1,240	2,9	7,95	788	6,03	44,6	5,5	7,3	20	1,21	0,063	1,71	2,99	0,04	3,03	671	718
11.12.95	1,100	1,0	7,80	726	7,00	49,1	7,1	11,4	27	1,03	0,016	0,07	1,11	0,01	1,12	471	600
18.12.95	1,012	0,2	7,62	806	8,30	57,0	12,9	20,8	59	0,89	0,018	0,10	1,00	0,01	1,01	251	324
02.01.96	9,460	2,1	7,79	691	8,16	59,0	14,5	22,1	60	0,06	1,001	1,56	2,62	0,03	2,65	105	118
08.01.96	18,800	0,6	7,78	472	12,86	89,3	9,1	13,3	39	0,12	0,059	2,87	3,06	0,04	3,10	60	91
15.01.96	11,200	1,4	7,83	758	10,64	75,5	7,1	12,8	29	0,60	0,032	4,30	4,93	0,09	5,02	90	275
22.01.96	3,760	0,0	7,86	959	11,61	79,2	4,0	6,3	17	0,63	0,108	2,59	3,33	0,25	3,58	199	360
29.01.96	3,890	0,0	7,96	860	10,80	73,7	3,6	5,8	16	0,87	0,041	3,41	4,32	0,27	4,59	227	280
05.02.96	9,310	0,0	7,76	511	11,10	75,8	5,2	7,7	22	0,46	0,043	2,27	2,77	0,25	3,02	125	130
12.02.96	6,240	0,0	7,87	823	10,80	73,7	4,0	6,4	16	1,36	0,045	2,17	3,57	0,47	4,04	126	311
19.02.96	3,960	0,3	7,73	805	10,50	72,3	4,4	5,6	15	0,78	0,069	1,78	2,63	0,34	2,97	221	520
26.02.96	3,500	0,3	7,67	762	9,97	68,6	4,0	6,4	15	0,83	0,092	2,72	3,64	0,57	4,21	408	464
04.03.96	3,560	0,0	7,97	875	10,40	71,0	5,0	6,7	18	0,81	0,069	2,46	3,34	0,46	3,80	319	460
11.03.96	3,240	0,4	7,81	924	11,00	75,9	8,0	12,0	32	1,03	0,060	2,18	3,26	0,52	3,78	325	580
18.03.96	58,800	0,5	7,74	278	11,30	78,2	6,0	9,0	24	0,28	0,049	3,46	3,79	0,21	4,00	371	409
25.03.96	27,200	3,6	7,67	424	10,40	78,3	4,0	5,6	16	0,16	0,079	2,84	3,09	0,25	3,34	153	1164
01.04.96	16,500	0,6	7,83	496	9,40	65,2	6,0	8,0	20	0,20	0,071	2,85	3,13	0,43	3,56	145	255
09.04.96	5,180	4,7	7,94	690	6,90	53,5	5,0	6,8	17	0,26	0,116	2,51	2,89	0,24	3,13	199	395
15.04.96	5,570	3,8	7,91	699	9,20	69,7	4,0	5,6	13	0,37	0,068	2,46	2,90	0,34	3,24	231	338
22.04.96	4,150	4,9	7,96	697	7,10	55,4	4,0	5,6	15	0,31	0,130	1,89	2,33	0,26	2,59	273	460
29.04.96	3,690	10,2	7,93	735	5,20	46,4	4,0	5,2	13	0,35	0,116	1,86	2,33	0,17	2,50	269	365
06.05.96	3,760	7,9	7,79	716	4,80	40,4	4,4	5,6	17	0,38	0,185	2,28	2,85	0,17	3,02	373	510
13.05.96	4,660	16,1	8,00	825	3,70	37,8	7,0	10,7	36	0,23	0,106	2,28	2,62	0,19	2,81	414	696
20.05.96	7,330	18,5	7,72	642	3,80	40,8	6,5	8,3	28	0,23	0,252	2,27	2,75	0,27	3,02	264	745
28.05.96	2,680	13,0	8,18	792	4,60	43,8	4,3	6,5	20	0,21	0,301	3,05	3,56	0,10	3,66	373	668
03.06.96	2,560	17,3	8,03	744	4,00	41,9	6,0	7,4	19	0,47	0,261	2,39	3,12	0,22	3,34	502	708
10.06.96	1,930	25,0	8,18	850	4,80	58,7	5,1	6,2	16	0,41	0,553	2,05	3,02	0,12	3,14	623	1125
17.06.96	1,880	11,0	8,36	830	7,00	63,6	8,0	9,8	30	0,23	0,173	2,31	2,70	0,21	2,91	378	800
24.06.96	3,070	21,0	8,41	932	7,10	80,3	7,0	9,1	26	0,19	0,172	1,66	2,02	0,32	2,34	369	415
01.07.96	2,380	18,0	7,98	782	5,89	62,6	10,0	13,2	41	0,66	0,009	2,62	3,29	0,25	3,54	466	510
08.07.96	2,580	25,0	8,04	807	5,50	67,3	6,1	7,7	17	0,16	0,173	2,49	2,81	0,17	2,98	417	530
15.07.96	2,060	17,5	7,90	805	6,20	65,2	5,0	5,8	15	0,26	0,203	2,35	2,82	0,21	3,03	492	600
22.07.96	2,040	18,7	8,44	846	8,60	92,8	5,0	7,7	21	0,15	0,090	1,42	1,66	0,21	1,87	539	790

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
29.07.96	2,000	19,0	8,27	819	8,94	97,1	4,1	6,7	17	0,14	0,093	2,05	2,28	0,24	2,52	466	710
05.08.96	1,820	21,0	7,86	844	3,30	37,3	4,0	6,6	17	0,44	0,178	1,68	2,29	0,23	2,52	560	740
12.08.96	1,530	17,0	8,10	797	6,60	68,7	3,9	5,0	14	0,28	0,156	0,11	0,55	0,19	0,74	516	604
21.08.96	1,700	18,9	8,10	697	6,50	70,4	9,6	12,0	39	0,38	0,073	2,29	2,75	0,34	3,09	411	740
26.08.96	1,860	16,2	7,75	812	4,50	46,0	10,4	13,0	42	0,37	0,272	2,01	2,66	0,08	2,74	497	581
02.09.96	1,570	21,0	7,90	740	10,60	119,9	4,3	7,5	22	0,51	0,188	1,47	2,16	0,25	2,41	467	590
09.09.96	11,000	13,7	7,63	409	6,46	62,5	3,2	13,1	33	0,31	0,075	1,95	2,34	0,08	2,42	319	490
16.09.96	5,490	12,1	8,04	545	8,85	82,6	8,0	13,3	32	0,12	0,071	1,53	1,72	0,08	1,80	330	460
23.09.96	6,690	14,0	7,87	641	5,18	50,5	6,0	9,7	24	0,50	0,054	1,76	2,31	0,36	2,67	382	1351
30.09.96	27,700	12,0	7,68	437	7,25	67,5	5,2	8,2	22	0,15	0,076	0,70	0,92	0,25	1,17	166	190
07.10.96	3,660	10,2	7,80	772	5,49	48,9	5,0	7,5	24	0,63	0,129	1,36	2,12	0,17	2,29	306	460
14.10.96	2,560	10,1	7,80	732	6,09	54,2	6,0	8,6	22	0,67	0,112	1,71	2,49	0,87	3,36	419	632
21.10.96	54,600	9,4	7,44	286	6,29	55,0	12,6	19,8	50	0,12	0,118	2,45	2,70	0,18	2,88	511	612
28.10.96	18,000	8,2	7,80	588	7,06	59,9	6,0	9,8	26	0,02	0,019	0,13	0,16	0,10	0,26	86	99
04.11.96	5,370	10,4	7,62	784	3,86	34,6	5,0	7,2	20	0,05	0,010	0,03	0,08	0,20	0,28	86	94
11.11.96	4,620	7,5	7,78	888	3,86	32,2	4,1	6,8	20	0,24	0,236	1,08	1,56	0,14	1,70	258	318
18.11.96	3,850	10,0	7,65	782	1,70	15,1	5,0	7,6	20	0,37	0,011	0,26	0,64	0,27	0,91	268	343
25.11.96	5,390	7,0	7,87	805	7,50	61,8	7,5	4,5	10	0,87	0,049	1,82	2,74	0,29	3,03	362	450
02.12.96	22,100	4,2	7,30	429	9,72	74,4	12,7	25,3	65	0,16	0,077	2,46	2,70	0,25	2,95	192	250
09.12.96	22,400	4,1	7,44	623	11,18	85,3	5,1	7,2	20	0,11	0,023	0,49	0,62	0,21	0,83	82	165
16.12.96	42,000	3,6	7,77	265	12,23	92,1	6,9	11,8	30	0,17	0,076	2,04	2,28	0,15	2,43	96	375
29.12.96	22,300	1,0	7,70	664	9,39	65,9	4,9	5,6	18	0,27	0,035	1,36	1,66			208	
06.01.97	53,700	0,0	7,64	295	12,74	87,0	7,9	12,2	33	0,19	0,051	1,93	2,17	0,11	2,28	206	258
13.01.97	20,700	0,0	7,68	595	9,75	66,5	7,4	10,6	30	0,64	0,020	1,67	2,33	0,06	2,39	99	236
20.01.97	12,300	0,0	7,85	444	11,62	79,3	4,1	6,2	15	0,49	0,029	2,38	2,90	0,08	2,98	174	244
27.01.97	7,060	0,0	7,86	778	9,64	65,8	4,2	5,8	16	1,10	0,047	2,48	3,63	0,11	3,74	206	290
03.02.97	5,130	0,3	7,87	840	9,91	68,2	3,9	5,4	14	0,52	0,037	2,69	3,25	0,09	3,34	166	240
10.02.97	4,750	0,0	7,65	852	7,40	50,5	4,0	5,9	13	1,48	0,067	1,64	3,18	0,05	3,23	267	350
17.02.97	46,000	0,0	7,57	328	16,05	109,5	7,1	10,4	27	0,29	0,039	2,65	2,97	0,07	3,04	230	370
24.02.97	17,100	1,9	7,73	417	10,40	74,8	7,0	9,5	29	0,30	0,026	1,61	1,93	0,06	1,99	132	220
03.03.97	9,470	2,0	7,49	605	10,22	73,7	7,3	11,4	29	0,19	0,044	1,60	1,84	0,07	1,91	196	290
10.03.97	9,410	4,1	7,58	549	13,10	100,0	5,0	7,0	20	0,68	0,026	2,32	3,03	0,06	3,09	271	340
17.03.97	5,260	4,0	7,70	818	3,86	29,4	3,0	4,4	12	0,20	0,142	1,53	1,87	0,05	1,92	145	275

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
24.03.97	4,500	4,1	7,61	854	7,46	57,0	4,0	6,0	17	0,63	0,028	1,98	2,63	0,14	2,77	290	380
01.04.97	4,460	4,0	7,64	799	7,05	53,7	3,0	3,3	8	0,25	0,064	2,00	2,31	0,14	2,45	299	390
07.04.97	4,210	0,2	8,04	801	9,18	63,0	3,4	4,6	11	0,73	0,037	1,12	1,89	0,38	2,27	351	495
14.04.97	4,210	3,4	7,98	846	10,22	76,6	4,2	4,6	10	0,58	0,060	2,04	2,68	0,07	2,75	293	370
21.04.97	24,100	3,2	7,54	444	7,38	55,0	11,4	16,6	45	0,20	0,071	3,20	3,47	0,08	3,55	229	290
28.04.97	15,700	10,0	7,80	530	6,88	61,0	9,0	11,7	30	0,16	0,057	1,19	1,41	0,15	1,56	147	159
05.05.97	5,390	13,3	7,79	750	3,86	37,0	4,4	6,2	17	0,07	0,090	1,77	1,93	1,76	3,69	288	393
12.05.97	11,900	14,5	7,72	560	7,35	72,4	7,1	10,4	29	0,23	0,118	1,63	1,98	0,92	2,90	197	210
20.05.97	5,220	21,0	7,90	726	2,65	30,0	6,6	9,9	24	0,53	0,195	2,35	3,07	0,06	3,13	416	525
26.05.97	4,500	17,3	7,72	755	3,89	40,8	4,5	5,8	16	0,56	0,084	0,08	0,72	0,05	0,77	464	572
02.06.97	8,430	17,4	7,80	515	4,76	50,0	20,0	32,0	56	0,14	0,080	2,24	2,46	0,06	2,52	353	424
09.06.97	52,900	16,4	7,13	325	5,42	55,7	9,5	26,0	48	0,71	0,128	3,77	4,61	0,12	4,73	125	290
16.06.97	33,600	16,2	7,41	436	3,23	33,1	7,0	11,0	28	0,13	0,086	1,84	2,05	0,10	2,15	297	344
23.06.97	19,400	21,5	7,42	541	3,45	39,4	7,1	10,4	27	0,19	0,098	1,04	1,32	0,06	1,38	227	329
30.06.97	4,880	20,9	7,81	572	3,14	35,4	4,1	6,6	16	0,16	0,202	2,21	2,57	0,10	2,67	268	349
07.07.97	4,420	20,2	7,97	894	4,47	49,7	9,1	14,9	37	0,43	0,111	1,34	1,87	0,22	2,09	519	679
14.07.97	6,650	18,7	7,96	710	7,63	82,3	7,0	9,6	27	0,12	0,129	1,88	2,14	0,07	2,21	212	375
21.07.97	4,750	17,1	7,96	829	6,08	63,4	3,6	5,8	13	0,54	0,102	1,70	2,35	0,08	2,43	443	576
28.07.97	14,700	19,2	7,55	491	6,58	71,7	11,3	16,4	31	0,09	0,111	2,17	2,36	0,07	2,43	162	280
04.08.97	10,600	19,3	7,75	529	8,40	91,8	5,2	7,4	19	0,32	0,143	1,22	1,69	0,05	1,74	236	308
11.08.97	19,800	21,2	7,77	412	7,37	83,7	7,0	10,1	28	0,09	0,064	0,77	0,93	0,05	0,98	225	310
18.08.97	4,880	17,5	7,52	693	3,82	40,2	9,0	13,4	41	0,40	0,090	1,37	1,87	0,07	1,94	363	526
25.08.97	3,400	22,8	7,91	905	8,89	104,2	10,2	13,0	30	0,61	0,192	1,62	2,43	0,16	2,59	513	623
01.09.97	7,220	19,2	7,63	528	6,31	68,8	8,9	13,6	30	0,17	0,087	0,99	1,25	0,07	1,32	191	241
08.09.97	10,800	13,9	7,70	540	10,56	102,7	7,1	9,5	27	0,13	0,053	0,93	1,11	0,09	1,20	130	195
15.09.97	3,720	10,7	7,72	761	8,82	79,6	4,0	5,7	12	0,90	0,134	1,36	2,39	0,06	2,45	600	799
22.09.97	3,640	12,0	7,75	788	2,95	27,5	6,0	8,1	20	0,58	0,051	1,51	2,15	0,24	2,39	281	329
29.09.97	3,200	10,5	7,78	779	2,78	25,0	4,8	5,6	16	0,62	0,086	2,23	2,93	0,13	3,06	501	604
06.10.97	3,760	10,0	8,07	848	3,59	31,9	4,1	5,8	13	0,58	0,088	2,21	2,88	0,13	3,01	393	478
13.10.97	3,160	9,3	7,77	809	6,11	53,3	3,8	4,7	13	0,66	0,053	1,35	2,06	0,21	2,27	508	775
20.10.97	3,560	7,1	7,74	834	5,71	47,1	4,0	4,7	13	0,39	0,047	1,67	2,11	0,22	2,33	314	450
27.10.97	3,200	4,6	7,92	775	7,45	57,6	3,9	5,0	13	0,51	0,052	0,99	1,55	0,22	1,77	441	529
03.11.97	3,160	1,4	7,84	853	7,18	50,9	4,2	5,4	13	0,55	0,089	1,59	2,23	0,29	2,52	414	531

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
10.11.97	3,080	7,9	7,67	829	5,22	44,0	4,1	5,3	14	0,65	0,213	0,94	1,80	0,25	2,05	536	714
17.11.97	5,000	6,4	7,79	659	7,30	59,2	3,0	5,0	16	0,89	0,047	0,89	1,83	0,21	2,04	104	126
24.11.97	3,280	5,9	7,71	800	4,30	34,4	4,0	5,1	14	0,75	0,187	0,90	1,84	0,31	2,15	368	498
01.12.97	6,700	6,7	7,51	625	3,39	27,7	6,7	9,4	26	0,65	0,125	0,93	1,70	0,28	1,98	80	96
08.12.97	15,700	3,1	7,31	849	6,81	50,6	4,5	5,8	14	0,65	0,198	0,21	1,06	1,91	2,97	63	99
15.12.97	11,600	1,0	7,79	785	7,69	54,0	7,8	11,9	27	0,32	0,287	0,89	1,50	0,32	1,82	46	60
18.12.97	5,340	0,2	7,96	926	12,62	86,6	3,9	4,5	12	0,61	0,138	0,93	1,68	1,37	3,05	316	391
29.12.97	10,300	1,8	7,81	719	7,23	51,9	3,9	5,2	16	0,31	0,276	0,91	1,50	0,17	1,67	54	69

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
03.01.94		60	0	63	80,2	50,1	49,3	14,3	0,56	0,40		0,15	300								100		
10.01.94		60	6	120																			
17.01.94			6	180																			0,06
24.01.94		40	6	69																			
31.01.94		60	4	36	95,2	54,7	49,3	11,2	2,43			0,29	470								100		
07.02.94		80	6	15																			
14.02.94		40	6	93																			0,00
21.02.94		250	4	141																			
28.02.94		200	6	35	88,6	21,0	48,3	8,3				0,25	910						1				
07.03.94		0	6	30																			
16.03.94		60	6	46																			
21.03.94				91																			
28.03.94				9																			0,00
05.04.94		40	6	49	123,0	27,7	56,8	12,0	3,06	0,50		0,29											
11.04.94		60	8	59	72,9	13,9	38,8	8,9		0,83		0,38	2325		1,1						0		0,00
18.04.94				0	130,3	25,7	51,3	9,6		0,22		0,21											
25.04.94			8	24																			
02.05.94		20	8	45	88,8	29,4	55,7	10,2	0,71	0,60		0,22											
09.05.94			8	56									422								0		0,00
16.05.94				56																			
24.05.94				107																			
30.05.94			20	70																			
06.06.94		60	6	37	120,2	44,1	91,4	8,3	1,11	0,61		0,16	105		1,4				4		100		0,00
13.06.94			2	49																			
20.06.94				47																			
27.06.94				69																			
04.07.94		400	6	63	130,1	10,5	73,9	16,0		0,54		0,15	502								0		0,00
11.07.94		60	6	83						0,51		0,13											
18.07.94				89																			
25.07.94				71																			
01.08.94		0	4	78	113,0	12,0	74,9	16,0		0,47		0,16	720								0		7,70
08.08.94		60	8	82	113,0	22,5	80,8	14,4		0,45		0,12											
15.08.94		80	4	45	91,6	24,3	89,2	14,4		1,80		0,26											

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
22.08.94				41	114,4	19,1	82,2	14,0		0,40		0,10											
29.08.94		80	4	59	100,2	32,1	72,7	14,9		0,48		0,12											
05.09.94			4	49			80,1	16,0															
12.09.94				52			80,5	15,3					710								0		
19.09.94				57																			
26.09.94		40		58	84,2	23,3	73,3	16,7		0,52		0,14							2				
03.10.94				52																			
10.10.94		40	8	64	80,0	20,7	88,0	17,7		0,47		0,11	88								0		
17.10.94			6	70																			
24.10.94				75																			
31.10.94			8	80																			
07.11.94		20	3	41	98,8	26,0	77,0	14,3	1,26	0,22		0,14	511								50		
14.11.94				47	81,0	8,4	74,8	15,3	2,63	0,36		0,17											
21.11.94			6	55																			
28.11.94			8	173													1140						
05.12.94		50	4	46	104,8	21,8	73,3	12,0	1,19	0,57		0,13	292		2,7						100		24,80
12.12.94		80	6	88	93,0	21,6	82,2	15,4									1040						
19.12.94				66													770		4				
02.01.95	2,4	0	2	126	78,8	19,9	54,8	15,4	8,84	0,76		0,29									150		
09.01.95				146						0,20		0,31											
16.01.95				216																			
23.01.95				214																			
30.01.95				234																			
06.02.95			0	151	12,6	5,5	44,0	9,3	2,55	0,33		0,01											
13.02.95		60	0	264	80,8	13,7	39,0	9,6		0,17		0,73									5		
20.02.95				153																			
27.02.95				158																			1,00
06.03.95		40	9	1074	76,0	23,7	43,3	9,0	3,16	0,61		0,05											
13.03.95				231			54,7	9,6															
20.03.95				324			56,4	9,5															
27.03.95		60	4	379	101,6	19,1	44,0	9,4		0,55		0,10	2480		0,0						100		1,00
03.04.95		80	3	92	92,8	22,0	47,3	9,4	2,48	0,24		0,02											
10.04.95				344																			

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
18.04.95				595			39,6	9,8															
24.04.95		100	1	508	98,9	24,6	47,4	10,5		0,11		0,03		244								110	1,00
02.05.95		60	7	412	66,9	20,1	33,4	9,0	0,16	0,09		0,09											
08.05.95				302																			
15.05.95				324																			
22.05.95		0	8	134	121,4	32,0	60,7	12,1		0,09		0,08		100	5,0							210	52,00
29.05.95				1115																			
06.06.95			4	1452					2,87			0,15											
12.06.95				114																			
19.06.95		40	18	114	112,0	18,4	53,9	12,0		0,21		0,18		466			2230		12			60	8,00
26.06.95				176																			
03.07.95			4	1748			56,6	12,7	2,94			0,14											
10.07.95				412			67,9	11,9															
17.07.95		60	6	414	85,9	16,5	63,2	12,0		0,10		0,72		135								80	
24.07.95			18	386																			
31.07.95				260			68,4	13,2															
07.08.95			5	74	80,2	14,7	62,4	10,5	0,22	0,12		0,00											
14.08.95		8	18	44	84,4	18,2	68,9	11,3		0,08		0,54		54	4,0							110	3,00
21.08.95				913																			
28.08.95			8	336																			
04.09.95		40	17	325			63,7	11,5	1,38			0,10											
11.09.95		80	10	280	75,8	14,7	59,3	12,0		1,26		0,12		220	3,0							110	2,00
18.09.95			4	499																			
25.09.95			6	360			64,6	14,4															
03.10.95		40	8	320					0,56			0,03											
09.10.95		110	6	425	75,7	27,7	62,4	12,9		1,00		0,13		69	4,0							22	1,00
16.10.95			8	364																			
24.10.95			8	221			61,5	13,3															
30.10.95			8	206																			
06.11.95		110	8	239	75,7	16,5	63,8	15,4		0,09		0,00		206								76	2,00
13.11.95			8	144			75,2	17,1															
20.11.95			4	30																			
27.11.95			10	94			61,0	15,6															

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
04.12.95		50	10	380	82,9	16,5	58,8	12,2	0,86	0,28		0,10		66	2,0		930		2			139	36,00
11.12.95				100																			
18.12.95			10	109			27,7	3,6															
02.01.96			8	26					12,48		0,69												
08.01.96			10	86			20,2	7,1															
15.01.96		8	8	104	68,7	26,0	30,3	7,0		0,76		0,13		96								44	
22.01.96				97			47,5	7,9															
29.01.96				209			50,3	7,9															
05.02.96			8	176			21,6	6,2	1,59														
12.02.96		6	4	175	90,2	20,0	39,7	7,3		0,11		0,00		63								125	
19.02.96				183			52,3	8,8															
26.02.96				248			51,3	10,6															
04.03.96			4	123			56,7	9,3	1,36			0,03											
11.03.96			4	250	93,0	19,1	60,9	9,6		0,20		0,16		114			810		0			91	
18.03.96			0	96			10,7	4,9															
25.03.96				146			18,7	5,4															
01.04.96			6	130	91,6	15,6	25,7	5,8	2,67	0,10		0,09											
09.04.96				213			45,2	7,4															
15.04.96				291			45,8	7,3															
22.04.96			4	239	94,4	16,5	48,4	8,1		0,11		0,01		38								46	
29.04.96				214																			
06.05.96				105			52,1	9,5															
13.05.96				190			44,4	6,7															
20.05.96				221	77,3	21,7	25,6	7,3		0,08		0,03		160		22,0						33	
28.05.96				105			49,7	10,1															
03.06.96			4	152			53,7	10,9															
10.06.96				148			70,3	11,6															
17.06.96			4	160	63,0	18,2	71,5	7,8		0,16		0,01		216			740		2			42	
24.06.96				180			68,1	8,2															
01.07.96	3,4		4	74	114,5	27,7	65,9	13,1	3,17	0,09		0,02		248								639	
08.07.96				48																			
15.07.96				136																			
22.07.96				111																			

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
29.07.96				94																			
05.08.96	2,8		6	190	101,6	33,8	70,6	12,3	2,64		0,28												
12.08.96			2	190	87,3	25,1	64,1	11,1		0,16		0,04		408								39	
21.08.96				212			61,6	13,5															
26.08.96				150			66,7	12,1															
02.09.96			5	210			74,9	12,7	1,36		0,12											32	
09.09.96			6	100	42,5	18,8	21,4	11,2		0,17		0,05		764		27,8						49	
16.09.96			6	98			35,9	11,2															
23.09.96			4	89			49,9	12,7															
30.09.96			4	90																			
07.10.96			6	75	75,7	16,5	54,3	12,3		0,09		0,08		149								59	
14.10.96			6	69			51,0	11,8															
21.10.96			6	68			9,6	8,3															
28.10.96			4	150			24,9	7,1															
04.11.96			4	80	100,0	43,3	48,7	12,6	0,88	0,10		0,05		342		5,8	1160		0			64	
11.11.96			6	140			54,1	12,1															
18.11.96			4	100			52,9	12,3															
25.11.96			4	89			60,3	11,0															
02.12.96			4	120	72,9	17,3	23,6	8,8	0,31	0,13		0,07		85								54	
09.12.96			6	139			19,3	6,9															
16.12.96			6	30			10,4	6,1															
29.12.96												0,00											
06.01.97	1,8		4	37	35,8	10,4	13,1	4,7	2,15	1,50	0,31	0,18		112		4,5						47	
13.01.97			4	30			26,0	5,2															
20.01.97			6	40			26,0	5,2															
27.01.97			0	50			42,0	6,7															
03.02.97			6	39	30,1	18,2	60,0	8,9	1,97	0,14		0,04		71								32	
10.02.97			4	29			61,0	9,4									3000		0				
17.02.97			6	25			15,4	5,5															
24.02.97			4	24			22,0	6,0															
03.03.97	1,2		6	30	83,0	21,7	32,0	5,4	1,16	0,72	0,35	0,20		1000								2300	
10.03.97			6	30																			
17.03.97			6	22													2000		0				

Kraszna at Mérk, rkm 42.2
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
24.03.97			0	27																			
01.04.97			6	32	95,9	24,3	50,0	8,9	1,60	1,15	0,40	0,28		47								180	
07.04.97			4	21			55,0	8,2															
14.04.97			6	38			54,0	9,5															
21.04.97			6	21			17,7	5,6															
28.04.97			6	41			18,9	5,8															
05.05.97			6	63			45,0	7,6															
12.05.97	1,6		4	71	71,5	12,1	26,0	7,1	0,57	0,24	0,24	0,15		122		28,0						61	
20.05.97			4	25			36,0	9,1															
26.05.97			6	30			41,0	9,8															
02.06.97			6	26			23,0	8,0															
09.06.97			6	23	40,0	6,1	10,2	6,6		0,73		0,48		640								49	
16.06.97			6	29			16,0	6,9															
23.06.97			6	19			22,0	7,2											4				
30.06.97			6	23																			
07.07.97	2,0		6	39	38,6	7,8	47,0	10,2	1,40	0,78	0,63	0,56		5		16,0						15	
14.07.97	0,1		4	28			60,0	2,5															
21.07.97			6	42			51,0	8,9															
28.07.97			6	38			19,0	9,5															
04.08.97			3	27	38,6	6,1	20,0	7,9		0,72		0,47		113								154	
11.08.97			4	25			13,2	7,2															
18.08.97			6	39			36,1	3,7															
25.08.97			4	49			51,0	11,3															
01.09.97			6	31	81,5	16,5	23,0	7,6		0,31		0,10		172								86	
08.09.97			6	81			15,9	7,4															
15.09.97			6	37			53,0	11,2											8				
22.09.97			6	29			56,0	9,3															
29.09.97			6	40			58,0	10,1															
06.10.97			6	74			51,0	12,1															
13.10.97		120	6	41	107,4	17,3	60,0	8,7		0,12		0,03		59								80	
20.10.97			6	47			56,0	12,5															
27.10.97				47			49,0	10,2															
03.11.97				45			55,0	9,9															

Kraszna at Mérk, rkm 42.2
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.	Zn dis.	Hg tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
10.11.97		109	4	65	114,5	16,5	60,0	12,4		0,12		0,10		117		10,0						53	
17.11.97				61			40,0	9,8															
24.11.97				64			64,0	11,9															
01.12.97				61			33,0	15,0															
08.12.97		88	2	37	90,2	34,7	48,0	11,1		0,17		0,13		41					8			91	
15.12.97				50			35,0	8,9															
18.12.97				69			34,0	8,6															
29.12.97				39			26,0	8,3															

Kraszna at Mérk, rkm 42.2
01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
03.01.94		0,7		0,0		3,2		0,9		2,2	
10.01.94											
17.01.94											
24.01.94											
31.01.94		0,5		0,8		3,9		2,2		2,4	
07.02.94											
14.02.94											
21.02.94											
28.02.94											
07.03.94											
16.03.94											
21.03.94											
28.03.94											
05.04.94											
11.04.94		11,0		1,4		6,0		15,8		3,9	
18.04.94											
25.04.94											
02.05.94											
09.05.94		0,4		2,2		4,6		0,0		1,2	
16.05.94											
24.05.94											
30.05.94											
06.06.94		0,9		0,4		3,7		0,0		2,9	
13.06.94											
20.06.94											
27.06.94											
04.07.94		0,0		0,2		4,5		0,0		2,4	
11.07.94											
18.07.94											
25.07.94											
01.08.94		0,3		0,0		5,4		0,6		2,5	
08.08.94											
15.08.94											

Kraszna at Mérk, rkm 42.2
01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
22.08.94											
29.08.94											
05.09.94											
12.09.94		0,1		1,0		8,0		1,1		4,9	
19.09.94											
26.09.94											
03.10.94											
10.10.94		13,2		0,4		7,1		4,1		3,7	
17.10.94											
24.10.94											
31.10.94											
07.11.94		0,4		3,1		3,1		0,9		3,0	
14.11.94											
21.11.94											
28.11.94											
05.12.94		1,3								11,1	
12.12.94											
19.12.94											
02.01.95		1,2		3,7		12,1		21,0		19,1	
09.01.95											
16.01.95											
23.01.95											
30.01.95											
06.02.95											
13.02.95		0,0		3,2		2,5		0,0		3,2	
20.02.95											
27.02.95											
06.03.95											
13.03.95											
20.03.95											
27.03.95		0,0		8,3		7,3		5,0		7,0	
03.04.95											
10.04.95											

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
18.04.95											
24.04.95			0,1		0,3		22,0		0,0		2,3
02.05.95											
08.05.95											
15.05.95											
22.05.95			0,0		0,3		6,5		3,0		2,5
29.05.95											
06.06.95											
12.06.95											
19.06.95			0,3		4,4		6,3		12,0		3,3
26.06.95											
03.07.95											
10.07.95											
17.07.95			0,4		0,6		5,5		1,0		1,0
24.07.95											
31.07.95											
07.08.95											
14.08.95			1,5		2,2		3,3		1,0		5,0
21.08.95											
28.08.95											
04.09.95											
11.09.95			0,1		15,0		3,6		1,0		1,7
18.09.95											
25.09.95											
03.10.95											
09.10.95			0,2		10,0		6,6		1,0		2,4
16.10.95											
24.10.95											
30.10.95											
06.11.95			0,3		0,4		1,7		1,0		0,9
13.11.95											
20.11.95											
27.11.95											

Kraszna at Mérk, rkm 42.2
01.01.1994. - 31.12.1997.

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
04.12.95			0,2		0,8		4,6		1,0		2,3
11.12.95											
18.12.95											
02.01.96											
08.01.96											
15.01.96			0,2		2,4		2,4		1,4		2,5
22.01.96											
29.01.96											
05.02.96											
12.02.96			2,0		0,5		3,8		1,0		2,4
19.02.96											
26.02.96											
04.03.96											
11.03.96			2,0		1,1		2,9		5,0		3,6
18.03.96											
25.03.96											
01.04.96											
09.04.96											
15.04.96											
22.04.96			1,0		0,6		5,3		10,0		1,5
29.04.96											
06.05.96											
13.05.96											
20.05.96			0,4		0,6		4,7		5,0		2,6
28.05.96											
03.06.96											
10.06.96											
17.06.96			0,8		0,6		3,5		1,0		2,9
24.06.96											
01.07.96			0,7		3,4		4,8		8,0		4,2
08.07.96											
15.07.96											
22.07.96											

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
29.07.96											
05.08.96											
12.08.96			0,7		1,8		3,0		6,0		3,9
21.08.96											
26.08.96											
02.09.96					0,1		6,9		1,0		3,6
09.09.96			0,1		1,0		9,6		1,0		5,0
16.09.96											
23.09.96											
30.09.96											
07.10.96			0,3		0,4		5,7		5,0		2,3
14.10.96											
21.10.96											
28.10.96											
04.11.96			1,7		1,4		2,2		18,0		7,4
11.11.96											
18.11.96											
25.11.96											
02.12.96			0,4		0,4		7,0		3,0		6,5
09.12.96											
16.12.96											
29.12.96											
06.01.97			0,4		1,2		6,2		1,0		3,4
13.01.97											
20.01.97											
27.01.97											
03.02.97			0,2		0,8		4,0		12,0		0,8
10.02.97											
17.02.97											
24.02.97											
03.03.97			4,2		5,2		14,5		13,0		31,0
10.03.97											
17.03.97											

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
24.03.97											
01.04.97	0,52		3,4		0,8		1,7		1,0		2,2
07.04.97											
14.04.97											
21.04.97											
28.04.97											
05.05.97											
12.05.97	0,58		0,3		0,3		3,0		1,0		4,4
20.05.97											
26.05.97											
02.06.97											
09.06.97	0,30		0,1		1,7		5,2		2,0		6,0
16.06.97											
23.06.97											
30.06.97											
07.07.97	1,20		0,4		0,2		2,0		1,0		1,8
14.07.97											
21.07.97											
28.07.97											
04.08.97	0,50		0,3		1,3		7,7		5,0		4,5
11.08.97											
18.08.97											
25.08.97											
01.09.97	1,00		0,1		0,3		7,7		3,0		2,7
08.09.97											
15.09.97											
22.09.97											
29.09.97											
06.10.97											
13.10.97	0,30		0,5		0,3		2,3		5,0		2,2
20.10.97											
27.10.97											
03.11.97											

Date	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
10.11.97	0,50		0,2		0,8		4,0		4,0		2,8
17.11.97											
24.11.97											
01.12.97											
08.12.97	0,30		0,7		0,4		2,9		1,0		2,6
15.12.97											
18.12.97											
29.12.97											

Berettyó at Pocsaj, rkm 71.5
01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
05.01.94	5,200	3,7	7,60	455	10,90	82,3	2,7	5,8	24	0,41	0,026	1,47	1,91	2,01	3,92	72	490
19.01.94	5,400	2,1	7,45	519	12,10	87,5	4,3	5,4	26	0,30	0,121	1,63	2,04			82	450
02.02.94	5,540	2,5	7,70	442	11,80	86,3	3,7	4,4	20	0,57	0,042	1,31	1,92			121	230
16.02.94	4,650	0,1	7,45	570	12,20	83,5	2,8	4,2	21	0,57	0,031	1,30	1,91			59	160
02.03.94	8,940	4,8	7,70	430	10,10	78,5	4,5	4,3	19	0,32	0,038	1,70	2,06			108	190
16.03.94	5,910	8,5	7,70	429	10,00	85,5	3,0	3,7	13	0,26	0,094	0,90	1,26			59	170
30.03.94	7,360	8,5	7,60	359	10,40	88,9	3,5	6,0	19	0,19	0,066	0,89	1,15			49	290
06.04.94	5,960	10,4	7,65	409	9,70	86,9	2,7	5,0	15	0,18	0,043	0,70	0,92			52	140
20.04.94	16,800	11,0	7,15	312	8,00	72,7	2,9	14,4	46	0,30	0,080	1,30	1,68			75	640
04.05.94	4,750	13,0	7,40	410	8,60	81,9	2,6	5,8	24	0,19	0,095	1,18	1,46			78	150
18.05.94	3,120	20,0	7,20	488	7,60	84,2	4,8	5,4	17	0,14	0,121	1,28	1,54			62	190
25.05.94	2,960	20,0	7,10	498	6,30	69,8	2,7	5,7	27	0,17	0,189	1,47	1,83			49	220
15.06.94	4,900	19,7	7,25	343	7,00	77,1	4,0	10,2	35	0,19	0,138	1,32	1,65			114	160
29.06.94	2,100	23,5	7,55	620	6,70	79,6	4,8	5,4	22	0,17	0,202	2,36	2,74			20	150
13.07.94	2,660	21,0	7,60	546	8,80	99,5	3,5	6,4	25	0,12	0,112	2,04	2,28			49	210
27.07.94	1,500	22,1	8,34	800	8,60	99,4	3,5	5,4	16	0,33	0,176	2,24	2,75			46	150
10.08.94	1,210	20,5	8,10	856	7,30	81,7	4,2	7,4	23	0,23	0,114	1,02	1,36			65	420
24.08.94	1,210	19,4	7,85	799	7,90	86,5	2,7	4,9	17	0,20	0,036	1,06	1,30			36	100
07.09.94	1,110	19,0	7,90	770	6,70	72,8	4,2	5,8	20	0,50	0,307	2,15	2,96			23	130
14.09.94	0,970	19,6	7,13	881	7,30	80,3	2,0	6,2	19	0,19	0,080	1,48	1,75			36	100
28.09.94	1,300	18,2	7,80	676	7,00	74,8	5,0	6,2	27	0,07	0,196	1,68	1,95			209	210
12.10.94	1,620	9,0	7,32	580	9,50	82,2	4,7	5,4	14	1,70	0,121	2,04	3,86			98	280
26.10.94	1,190	10,3	7,19	835	8,20	73,3	3,2	4,0	16	1,05	0,107	1,88	3,04			104	150
02.11.94	1,410	11,1	7,63	778	7,10	64,7	6,1	7,2	23	2,23	0,115	1,76	4,11			104	290
23.11.94	1,610	5,3	7,45	590	9,90	78,0	4,4	6,2	20	1,53	0,042	1,32	2,89			39	180
07.12.94	1,380	1,8	7,50	763	12,00	86,1	3,9	4,4	16	2,90	0,031	1,06	3,99			29	70
21.12.94	1,500	0,0	7,39	603	12,30	83,9	4,4	6,1	22	2,60	0,035	0,93	3,57			20	40
23.12.94	1,390	0,9	7,99	737	11,50	80,5		5,1		3,72							
27.12.94	1,480		7,95	761	11,30			6,0		4,83							
28.12.94	1,520		7,65	697	12,30					9,56							
29.12.94	1,520		7,70	709						3,65							
02.01.95	5,120	3,8	8,18	331	8,90	67,4		17,3		1,66							
03.01.95	4,630	0,0	7,38	360	7,90	53,9	7,8	21,4	76	1,50	0,060	1,35	2,91			65	380

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01.01.1994. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
09.01.95	1,820	0,1	7,51	647	10,00	68,4	5,4	6,4	33	2,67	0,032	1,03	3,73			46	140
11.01.95	1,610	0,2	7,26	681	10,50	72,1		6,2		3,95							
13.01.95	1,950	0,0			9,80	66,9		6,2		3,22							
16.01.95	2,220	0,0			10,40	71,0		6,5		3,40							
18.01.95	1,910	0,0	7,57	858	9,10	62,1	5,0	7,2	37	4,20	0,059	1,18	5,44			65	150
24.01.95	1,810	0,0	7,13	877	7,20	49,1		6,9		3,08							
25.01.95	5,170	0,2	7,30					13,3		2,68							
27.01.95	18,200	0,3	7,60					15,2		1,27							
30.01.95	18,700	0,3	7,55							0,81							
01.02.95	7,460	2,0	7,60	397	10,70	77,2	7,1	9,9	36	0,95	0,092	2,36	3,40			95	
15.02.95	3,640	6,5	7,70	471	10,30	83,7	5,3	5,8	19	0,66	0,063	1,92	2,65			95	190
07.03.95	8,050	8,6	7,71	405	10,10	86,6	5,1	7,6	19	0,26	0,090	1,03	1,37			98	300
29.03.95	12,240	6,2	7,25	303	9,20	74,2	7,5	11,7	32	0,26	0,053	1,74	2,05			52	110
04.04.95	6,670	10,1	7,30	357	9,80	87,2	4,7	5,6	18	0,52	0,064	1,27	1,85			264	320
18.04.95	4,700	9,6	7,13	446	8,30	72,9	4,2	5,1	19	0,26	0,085	1,45	1,80			95	110
02.05.95	19,100	14,0	7,94	288	8,20	79,9	3,8	13,4	30	0,12	0,133	1,77	2,02			156	230
16.05.95	5,310	12,8	7,20	424	8,20	77,7	4,1	9,0	29	0,25	0,079	1,18	1,51			127	230
07.06.95	3,370	20,0	7,66	537	6,50	72,0	5,3	8,0	30	0,12	0,086	1,15	1,36			98	470
21.06.95	6,790	21,0	7,40	449	6,80	76,9	4,8	9,0	31	0,12	0,090	1,88	2,10			104	380
05.07.95	3,260	21,8	7,49	571	6,60	75,9	3,2	6,9	30	0,12	0,136	1,65	1,91			65	280
19.07.95	2,240	23,0	7,29	544	12,10	142,4	11,9	10,1	32	0,08	0,140	0,91	1,13			46	280
24.07.95	1,760	22,0	8,05	636	6,80	78,5		5,9		0,19							
26.07.95	1,590	22,0	7,50	697	6,50	75,0		5,1		0,56							
28.07.95	1,520	21,0	7,40	642	6,60	74,7		5,0		1,48							
30.07.95	1,390	22,0	7,60	680	8,60	99,2		5,9		0,26							
31.07.95	1,340	22,0	7,80	863	9,20	106,2		3,0		0,30							
02.08.95	1,450	21,0	7,70	736	6,80	76,9	5,3	7,0	28	0,12	0,233	1,44	1,80			39	260
03.08.95	1,300	22,0	7,61	655	9,30	107,3		6,0		0,23							
04.08.95	1,610	21,0	7,58	711	8,31	94,0		7,8		0,62							
07.08.95	1,520	21,0	7,37	769	6,50	73,5		8,5		2,56							
09.08.95	1,340	19,5	7,70	712	7,72	84,7		6,4		0,75							
14.08.95	1,540	18,0	7,70	570	7,00	74,4		7,0		1,54							
16.08.95	1,210	20,3	7,46	662	5,90	65,8	3,1	6,4	29	0,95	0,219	1,45	2,61			98	370

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
06.09.95	2,330	14,7	7,65	621	7,70	76,2	3,2	6,7	31	0,16	0,119	1,77	2,05			95	110
20.09.95	1,390	16,0	7,40	702	6,80	69,3	5,1	8,7	28	0,64	0,182	2,59	3,41			36	80
04.10.95	1,560	11,0	7,59	514	9,30	84,5	3,2	4,2	19	0,54	0,094	2,14	2,78			72	110
18.10.95	1,090	12,0	7,05	771	7,40	68,9	9,3	10,2	44	2,08	0,102	1,12	3,30			75	210
01.11.95	2,190	9,0	7,76	803	9,10	78,8	5,0	5,7	35	1,00	0,105	1,50	2,61			52	170
14.11.95	3,040	4,0	7,84	541	9,60	73,1	3,8	6,3	27	1,04	0,048	1,54	2,63			114	250
28.11.95	2,710	2,0	7,74	554	12,30	88,7	4,2	4,6	25	0,92	0,044	2,05	3,02			91	250
06.12.95	2,550	2,3	7,16	503	11,40	82,9	4,2	4,8	21	0,51	0,069	1,07	1,65			65	230
12.12.95	2,330	1,0	7,88	614	11,90	83,5	2,3	4,8	25	1,09	0,046	1,04	2,18			52	180
04.01.96	64,500	0,0	7,71	278	12,80	87,4	3,3	14,9	32	0,25	0,064	2,97	3,28			150	660
17.01.96	18,700	0,0	7,55	475	12,40	84,6	5,5	5,6	24	0,16	0,031	1,42	1,62			62	280
31.01.96	7,500	0,0	7,19	424	12,60	86,0	3,5	3,8	22	0,41	0,045	1,42	1,88			49	230
14.02.96	5,940	0,0	7,19	467	12,20	83,3	2,7	3,0	17	0,65	0,047	1,39	2,09			85	120
28.02.96	8,380	0,0	7,22	547	12,70	86,7	4,4	5,4	22	0,50	0,065	1,69	2,25			33	120
06.03.96	6,800	0,0	7,13	514	12,60	86,0	4,1	5,6	21	0,44	0,080	1,35	1,87			55	100
20.03.96	62,700	2,0	7,28	254	11,80	85,1	6,5	17,1	34	0,16	0,065	3,25	3,48			130	980
03.04.96	18,300	3,0	7,16	374	10,90	80,8	3,2	6,1	22	0,25	0,049	2,00	2,30			82	250
17.04.96	11,700	7,5	7,19	429	10,10	84,2	5,0	6,2	23	0,20	0,062	1,35	1,61			95	220
07.05.96	5,900	17,2	7,32	430	8,70	91,0	5,6	6,1	23	0,22	0,067	1,30	1,58			59	430
22.05.96	6,280	18,0	7,32	468	7,40	78,7	6,6	10,8	33	0,34	0,168	1,66	2,17			114	240
05.06.96	4,400	22,0	7,93	560	6,90	79,6	3,2	6,6	26	0,16	0,086	1,62	1,87			72	240
19.06.96	2,770	20,2	7,43	644	8,40	93,5	2,6	5,0	18	0,14	0,086	0,90	1,13			49	210
03.07.96	2,930	20,0	7,68	566	8,00	88,7	2,9	4,0	24	0,19	0,065	1,06	1,32			59	310
17.07.96	2,280	19,0	7,29	755	7,90	85,8	3,0	3,8	13	0,37	0,070	1,44	1,88			59	190
06.08.96	4,150	19,5	7,02	493	7,00	76,8	5,8	10,1	32	0,29	0,249	1,16	1,70			176	320
21.08.96	5,560	19,1	7,09	503	7,10	77,3	3,3	11,0	34	0,10	0,055	0,92	1,07			127	180
03.09.96	3,590	19,0	7,03	636	7,20	78,2	4,3	7,8	34	0,15	0,090	1,27	1,51			91	190
12.09.96	36,500	13,0	7,06	424	6,70	63,8	3,1	11,2	31	0,72	0,064	1,62	2,41			231	440
02.10.96	28,000	13,5	7,00	498	7,00	67,4	4,7	6,4	25	0,16	0,067	0,90	1,13			147	320
15.10.96	7,650	11,5	7,95	642	8,90	81,9	4,0	4,6	20	0,26	0,061	1,04	1,36			124	160
29.10.96	23,400	7,0	7,80	498	9,40	77,4	4,1	5,4	18	0,17	0,055	1,06	1,29			95	160
06.11.96	13,500	9,5	7,94	570	9,20	80,6	3,5	4,6	20	0,17	0,091	1,15	1,41			62	120
20.11.96	8,000	10,0	7,71	576	9,00	79,9	3,0	4,0	14	0,28	0,061	1,40	1,74			16	30

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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
04.12.96	57,400	4,0	7,60	256	11,10	84,5	6,5	16,0	40	0,16	0,030	1,58	1,77			108	450
18.12.96	48,500	1,5	7,60	300	11,60	82,5	5,7	11,4	26	0,18	0,030	1,22	1,43			68	140
08.01.97	79,000	0,0	7,76	280	13,10	89,4	3,2	6,2	24	0,22	0,021	1,49	1,73			108	260
22.01.97	26,500	0,0	7,67	477	12,00	81,9	3,0	4,2	18	0,23	0,024	1,38	1,63			52	120
05.02.97	10,900	0,0	7,70	587	11,40	77,8	3,5	5,1	22	0,34	0,027	2,01	2,38			26	160
19.02.97	35,000	1,0	7,95	402	12,20	85,6	5,2	5,8	20	0,11	0,033	1,81	1,95			59	170
05.03.97	20,200	6,0	7,80	471	10,40	83,5	3,8	4,0	18	0,24	0,040	1,99	2,27			52	150
19.03.97	11,200	4,3	8,07	513	11,20	86,0	3,5	3,5	15	0,22	0,027	1,74	1,99			49	110
02.04.97	9,080	8,5	7,86	505	11,00	94,1	3,5	5,1	17	0,09	0,024	1,29	1,40			39	100
16.04.97	8,500	7,0	7,86	495	11,80	97,2	3,2	4,4	18	0,16	0,024	1,42	1,61			36	100
23.04.97	26,700	5,0	7,60	297	10,40	81,3	4,0	5,6	19	0,16	0,036	1,11	1,30			42	190
14.05.97	8,600	21,0	7,53	412	6,50	73,5	2,8	5,2	19	0,16	0,070	1,08	1,32			72	248
29.05.97	6,100	13,5	7,88	501	8,10	78,0	4,6	5,4	20	0,22	0,061	2,37	2,65			59	215
04.06.97	10,600	14,5	7,73	375	7,90	77,9	6,8	6,8	21	0,10	0,049	1,13	1,28			95	271
18.06.97	106,000	21,5	7,37	200	3,90	44,6	10,4	21,8	49	0,34	0,091	1,60	2,04			143	1558
21.06.97	45,500		7,33	317	3,10			12,0		0,37							
02.07.97	9,620	21,5	7,70	562	4,20	48,0	3,9	6,1	23	0,18	0,182	1,45	1,81			78	368
15.07.97	6,580	23,0	7,80	583	7,40	87,1	2,8	5,0	24	0,43	0,140	2,17	2,74			443	609
06.08.97	15,800	22,0	7,71	396	5,70	65,8	3,9	11,5	28	1,53	0,182	4,52	6,23			81	420
27.08.97	4,450	19,5	7,80	610	7,40	81,2	2,7	5,0	22	0,16	0,061	1,49	1,72			117	256
03.09.97	7,800	20,0	7,66	447	7,50	83,1	6,8	9,5	28	0,13	0,058	0,97	1,16			89	509
17.09.97	5,560	15,5	7,66	540	8,10	81,6	4,8	6,4	28	0,16	0,061	1,27	1,49			74	250
01.10.97	3,900	11,0	7,70	580	9,10	82,7	2,4	3,8	19	0,27	0,061	1,13	1,46			42	91
15.10.97	5,200	11,0	7,67	519	8,60	78,2	4,5	6,5	27	0,27	0,058	3,73	4,06			62	197
29.10.97	4,650	2,0	7,82	582	10,60	76,5	5,3	6,2	28	0,45	0,033	1,33	1,82			53	220
04.11.97	4,250	3,0	7,76	670	8,90	66,0	1,6	3,4	20	0,40	0,036	1,24	1,68			39	260
19.11.97	4,600	2,0	7,74	685	10,70	77,2	3,8	4,8	23	0,47	0,046	1,20	1,71			83	177
02.12.97	8,150	7,0	7,78	694	9,40	77,4	3,9	7,1	32	0,33	0,061	1,54	1,92			123	239
16.12.97	16,900	2,0	7,52	444	11,30	81,5	3,3	7,1	29	1,30	0,052	1,62	2,97			109	500

Berettyó at Pocsaj, rkm 71.5
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	As tot.	B	CN	Zn tot.	Hg tot.	Cd tot.	Cr tot.	Ni tot.	Pb tot.	Cu tot
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
05.01.94	2,8	150	2	90	58,1	12,2	39,5	7,0		0,35		0,11											
19.01.94	5,5	480	2	130	60,1	13,4	38,5	8,5		0,18		0,07											
02.02.94	3,2	200	3	60	50,1	13,4	23,0	7,0		0,22		0,11											
16.02.94	2,5	300	3	40	66,1	12,2	49,0	6,0		0,19		0,54											
02.03.94	1,7	90	1	50	52,1	10,9	28,0	5,5		0,21		0,03											
16.03.94	3,8	320	1	10	48,1	10,9	38,0	5,0		0,25		0,15					21		0,0	4,0	12,0	53,0	7,0
30.03.94	1,6	100	2	60	38,1	10,9	33,0	6,0		0,21		0,16											
06.04.94	2,5	450	2	110	42,1	14,6	41,0	5,5		0,12		0,18											
20.04.94	3,4	550	4	10	34,1	8,5	22,0	6,5		0,24		0,03											
04.05.94	2,4	200	4	66	46,1	15,8	46,0	9,0		0,06		0,07											
18.05.94	1,6	230	2	9	54,1	15,8	52,0	11,0		0,30		0,34											
25.05.94	0,8	230	2	20	60,1	8,5	55,5	8,0		0,20		0,15											
15.06.94	4,8	390	2	10	36,1	7,3	34,0	6,0		0,42		0,06											
29.06.94	1,4	300	2	70	60,1	19,5	78,0	8,0		0,03		0,25											
13.07.94	4,0	70	2	70	42,1	13,4	50,0	8,0		0,03		0,26											
27.07.94	5,8	160	2	100	60,1	26,8	91,0	12,0		0,03		0,50											
10.08.94	4,2	100	9	160	64,1	31,6	90,0	11,0		0,15		0,70											
24.08.94	2,8	100	3	75	60,1	21,9	85,5	5,5		0,17		0,63											
07.09.94	1,2	280	11	29	68,1	19,5	80,0	11,0		0,23		0,59											
14.09.94	2,0	60	6	39	60,1	28,0	102,0	10,0		0,03		0,29											
28.09.94	1,2	150	2	35	64,1	21,9	66,0	11,0		0,33		2,38											
12.10.94	1,1	200	2	40	72,1	14,6	58,0	11,0		0,40		0,32											
26.10.94	1,4	40	4	20	76,2	14,6	100,0	12,0		0,34		0,32											
02.11.94	1,5	110	3	60	64,1	19,5	85,0	13,5		0,53		0,10											
23.11.94	1,4	320	2	140	46,1	17,0	72,0	11,0		0,02		0,11											
07.12.94	0,4	80	11	50	62,1	34,0	80,0	13,0		0,25		0,54											
21.12.94	3,8	400	6	40	66,1	31,6	63,0	9,5		0,24		0,55											
23.12.94																							
27.12.94																							
28.12.94																							
29.12.94																							
02.01.95	11,4																						
03.01.95	50,2	8800	20	18	32,1	12,2	53,0	8,5		0,26		0,27											

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Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al tot. µg/l	As tot. µg/l	B µg/l	CN µg/l	Zn tot. µg/l	Hg tot. µg/l	Cd tot. µg/l	Cr tot. µg/l	Ni tot. µg/l	Pb tot. µg/l	Cu tot µg/l
09.01.95	42,0	4000	13	378	58,1	19,5	73,0	18,0		0,18		0,68											
11.01.95																							
13.01.95	30,5																						
16.01.95	12,9																						
18.01.95	11,2	1580	19	140	60,1	24,3	80,5	13,5		0,47		1,21											
24.01.95	8,0																						
25.01.95	8,8																						
27.01.95	5,0																						
30.01.95	3,4																						
01.02.95	7,5	2200	20	125	64,1	26,8	23,0	5,0		0,43		0,10											
15.02.95	2,0	260	25	80	40,1	6,1	36,5	6,0		0,17		0,37											
07.03.95	1,8	50	4	57	40,1	7,3	24,5	5,5		0,23		0,02											
29.03.95	2,0	110	5	18	32,1	14,6	18,0	5,5		0,22		0,08											
04.04.95	2,5	170	1	125	40,1	8,5	24,0	6,5		0,05		0,06											
18.04.95	2,6	240	4	18	40,8	9,7	32,0	8,0		0,17		0,09											
02.05.95	0,8	90	8	10	35,4	9,1	13,0	4,0		0,14		0,16											
16.05.95	2,0	340	3	40	47,2	8,7	33,0	8,0		0,18		0,10											
07.06.95	1,6	40	5	10	40,8	9,5	46,5	8,0		0,08		0,05											
21.06.95	2,6	290	4	15	45,7	6,9	47,0	7,5		0,08		0,02											
05.07.95	0,3	90	3	22	52,9	8,7	50,0	7,0		0,22		0,13											
19.07.95	0,7	190	6	70	37,9	10,0	49,0	10,0		0,37		0,34											
24.07.95																							
26.07.95																							
28.07.95																							
30.07.95																							
31.07.95																							
02.08.95	1,1	100	4	78	28,6	3,6	84,0	9,0		0,06		0,14											
03.08.95																							
04.08.95																							
07.08.95																							
09.08.95																							
14.08.95																							
16.08.95	1,0	85	8	59	52,9	13,9	58,5	13,5		0,02		0,02											

Berettyó at Pocsaj, rkm 71.5
01.01.1994. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	As tot.	B	CN	Zn tot.	Hg tot.	Cd tot.	Cr tot.	Ni tot.	Pb tot.	Cu tot
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
06.09.95	0,9	1	10	70	42,9	9,5	67,0	6,5		0,08		0,31											
20.09.95	1,3	59	2	50	51,4	5,2	64,5	11,5		0,18		0,32											
04.10.95	3,0	10	1	50	45,7	14,7	44,0	9,0		0,10		0,31											
18.10.95	1,1	50	2	20	61,4	27,7	80,0	12,0		0,27		0,34											
01.11.95	1,1	75	4	60	60,0	50,3	82,0	8,5		0,13		0,69											
14.11.95	0,8	90	3	20	42,9	13,0	48,0	7,0		0,29		0,10											
28.11.95	1,4	230	6	80	45,7	12,0	60,0	7,0		0,14		0,24											
06.12.95	0,9	80	6	60	52,9	11,3	41,0	6,0		0,20		0,43											
12.12.95	1,0	200	5	50	42,9	16,5	56,0	7,0		0,21		0,20											
04.01.96	1,5	74	5	95	41,4	18,2	20,5	5,5		0,15		0,05											
17.01.96	1,1	300	5	80	51,4	14,7	25,0	5,5		0,18		0,04											
31.01.96	1,9	208	7	80	50,0	15,6	22,0	4,0		0,17		0,19											
14.02.96	1,2	100	2	110	54,3	11,3	34,5	6,5		0,29		0,11											
28.02.96	2,0	380	7	40	71,5	11,3	36,5	7,5		0,18		0,21											
06.03.96	1,0	260	9	60	94,3	24,3	35,0	6,5		0,09		0,32											
20.03.96	1,6	240	11	120	41,4	8,7	10,5	4,0		0,11		0,05											
03.04.96	1,7	156	11	140	38,6	11,3	19,5	7,0		0,12		0,07											
17.04.96		330	12	90	54,3	9,5	31,5	5,5		0,27		0,08											
07.05.96	1,0	250	10	80	47,2	19,1	29,0	6,0		0,15		0,09											
22.05.96	0,9	103	9	110	52,9	13,9	34,0	7,0		0,12		0,05											
05.06.96	1,4	90	10	95	60,0	18,2	54,0	7,5		0,17		0,20											
19.06.96	1,3	420	11	40	61,4	19,9	56,2	8,4		0,10		0,25											
03.07.96	2,1	115	6	50	52,9	20,9	52,4	5,9		0,12		0,31											
17.07.96	1,2	57	7	129	50,0	28,6	53,0	9,2		0,15		0,11											
06.08.96	1,8	279	4	95	41,4	13,0	50,9	9,3		0,40		0,13											
21.08.96	1,5	635	18	100	44,3	14,7	39,1	8,5		0,15		0,08											
03.09.96	1,9	635	12	100	44,3	14,7	61,8	9,0		0,18		0,12											
12.09.96	2,0	336	7	110	42,9	15,6	18,8	6,7		0,38		0,09											
02.10.96	0,9	100	6	100	57,2	17,3	25,3	2,5		0,15		0,27											
15.10.96	2,0	180	5	137	68,6	14,7	43,9	6,8		0,14		0,11											
29.10.96	4,3	500	5	140	54,3	15,6	25,8	5,8		0,23		0,11											
06.11.96	1,2	83	5	100	58,6	18,2	32,3	5,2		0,11		0,20											
20.11.96	2,7	19	9	110	67,2	24,3	41,1	6,1		0,17		0,16											

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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	As tot.	B	CN	Zn tot.	Hg tot.	Cd tot.	Cr tot.	Ni tot.	Pb tot.	Cu tot
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
04.12.96	1,2	112	9	123	37,2	7,8	12,8	5,4		0,43		0,09											
18.12.96	3,6	42	11	123	38,6	17,3	16,2	4,6		0,26		0,16											
08.01.97	3,0	168	10	111	35,7	8,7	11,5	4,3		0,30		0,07											
22.01.97	1,8	76	12	90	58,6	16,5	23,9	4,9		0,06		0,18											
05.02.97	4,0	115	11	110	75,7	15,6	38,1	5,5		0,08		0,62											
19.02.97	3,0	169	11	137	54,3	13,9	19,5	4,6		0,08		0,14											
05.03.97	2,0	111	15	100	64,3	7,8	27,1	5,1		0,15		0,35											
19.03.97	1,9	159	18	137	58,6	16,5	30,0	5,0		0,28		0,29											
02.04.97	2,7	205	3	200	54,3	16,5	31,3	5,0		0,41		0,23											
16.04.97	2,6	56	6	137	61,5	13,9	35,7	5,2		0,31		0,16											
23.04.97	2,1	46	5	210	34,3	9,5	16,9	3,6		0,16		0,11											
14.05.97	2,2	36	5	54	44,3	13,9	25,2	4,8		0,11		0,13											
29.05.97	2,1	44	8	65	52,9	17,3	28,9	6,1		0,21		0,35											
04.06.97	1,5	49	2	76	42,9	10,4	25,4	4,8		0,25		0,09											
18.06.97	2,5	155	4	51	22,9	7,8	11,3	6,8		0,64		0,66											
21.06.97																							
02.07.97	1,8	110	7	40	55,7	15,6	43,3	6,5		0,13		0,40											
15.07.97	2,1	69	19	243	57,2	12,1	48,5	6,4		0,06		0,33											
06.08.97	1,7	247	4	155	35,6	11,3	24,4	6,5		0,16		0,23											
27.08.97	2,6	103	4	39	61,5	13,0	50,5	6,2		0,07		0,45											
03.09.97	0,9	77	11	372	50,0	6,9	31,5	6,7		0,16		0,17											
17.09.97	2,0	116	7	54	51,4	13,0	48,9	7,0		0,11		0,16											
01.10.97	3,6	223	12	75	62,9	13,0	59,5	5,1		0,14		0,39											
15.10.97	2,2	201	15	91	57,2	13,0	44,2	7,7		0,14		0,05	60	50,0	583		63		4,0	5,0	5,0	50,0	6,0
29.10.97	2,2	470	9	107	57,2	17,3	48,9	7,0		0,16		0,49											
04.11.97	0,6	186	7	69	68,6	19,1	57,9	6,6		0,19		0,40											
19.11.97	0,5	125	10	60	75,7	19,1	66,1	7,2		0,39		0,21											
02.12.97	0,6	95	11	52	71,5	24,3	63,4	10,0		0,23		0,20											
16.12.97	0,6	322	12	26	50,7	14,3	23,6	4,0		0,28		0,34											

Maros at Nagylak, middle rkm 29.1
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
05.01.94	62,000	3,0	7,99	522	12,40	91,9	4,4	5,7	23	0,53	0,044	1,74	2,31			52	
12.01.94	84,000	4,3	7,78	636	11,70	89,8	3,9	4,4	13	0,69	0,052	2,37	3,12	0,37	3,49	65	
19.01.94	98,000	3,8	8,18	483	12,00	90,9	3,9	5,6	16	0,42	0,052	2,49	2,96	0,37	3,33	29	
26.01.94	90,000	3,9	8,27	632	12,70	96,4	3,3	4,8	12	0,47	0,065	2,12	2,66	0,61	3,27	68	
02.02.94	98,900	4,5	8,10	660	11,60	89,5	3,2	3,8	17	0,54	0,088	2,53	3,16	0,41	3,57	78	
09.02.94	85,300	6,0	7,90	781	10,50	84,3	3,8	4,4	14	0,29	0,100	2,24	2,62	0,27	2,89	68	
16.02.94	88,600	2,0	8,18	528	12,60	90,9	2,9	3,2	9	0,23	0,041	2,37	2,64	0,54	3,18	39	
23.02.94	78,000	2,3	8,13	681	11,80	85,8	2,6	3,1	11	0,40	0,046	2,19	2,64	0,61	3,25	68	
02.03.94	81,500	9,7	8,20	849	9,80	86,3	3,3	3,8	11	0,45	0,110	3,21	3,77	0,80	4,57	49	150
09.03.94	92,200	9,2	8,02	624	10,10	87,9	3,1	4,2	16	0,10	0,055	2,73	2,89	0,52	3,41	68	190
16.03.94	84,500	11,8	7,96	584	9,70	89,8	2,4	4,0	13	0,08	0,025	2,49	2,59	0,56	3,15	68	160
23.03.94	130,000	8,4	7,95	362	9,70	82,7	4,2	6,6	19	0,08	0,033	2,06	2,17	0,70	2,87	68	640
30.03.94	124,000	10,9	7,86	441	9,50	86,1	3,1	4,7	23	0,08	0,032	1,99	2,10	0,56	2,66	49	310
06.04.94	105,000	11,0	7,88	439	9,50	86,3	2,1	6,4	17	0,08	0,022	2,01	2,11	0,78	2,89	59	450
13.04.94	107,000	12,0	7,81	344	8,80	81,9	3,0	4,9	16	0,08	0,031	1,40	1,51	1,14	2,65	108	260
20.04.94	68,000	13,0	8,01	365	8,70	82,9	2,2	4,9	18	0,08	0,015	1,76	1,86	0,70	2,56	68	260
27.04.94	138,000	15,0	7,88	338	8,60	85,7	2,6	5,6	23	0,08	0,017	1,42	1,52	1,30	2,82	59	220
04.05.94	98,000	16,2	8,01	375	8,60	88,0	1,5	4,7	15	0,08	0,009	1,33	1,42	0,80	2,22	49	200
11.05.94	139,000	16,4	7,98	463	9,00	92,5	1,8	2,6	23	0,08	0,019	1,72	1,81	0,60	2,41	160	160
18.05.94	145,000	21,8	8,37	470	9,50	109,2	2,3	4,2	24	0,08	0,003	1,56	1,64	0,40	2,04	59	60
25.05.94	141,000	22,2	8,38	382	9,40	108,9	4,8	5,9	31	0,08	0,021	0,88	0,98	0,30	1,28	49	360
01.06.94	132,000	21,4	7,92	335	7,60	86,7	1,8	12,0	42	0,08	0,029	2,06	2,16	0,40	2,56	88	1010
08.06.94	103,000	18,0	8,04	418	9,10	96,8	2,4	4,6	30	0,08	0,009	1,40	1,49	0,30	1,79	88	280
15.06.94	182,000	19,2	8,00	334	7,80	85,0	2,3	6,4	25	0,11	0,026	1,45	1,58	0,60	2,18	121	400
22.06.94	183,000	21,8	8,09	352	7,50	86,2	2,0	5,3	21	0,02	0,036	1,72	1,78	0,50	2,28	59	270
29.06.94	119,000	27,0	8,12	466	7,10	90,2	2,0	4,0	23	0,03	0,012	2,01	2,05	0,27	2,32	98	180
06.07.94	96,200	26,4	8,07	627	6,50	81,7	2,5	3,6	35	0,11	0,009	1,20	1,32	0,41	1,73	49	120
13.07.94	95,000	23,6	8,36	535	11,80	140,5	4,2	5,4	41	0,10	0,012	1,02	1,13	0,47	1,60	10	100
20.07.94	93,700	26,0	8,16	477	4,20	52,4	6,9	6,3	40	0,07	0,018	0,57	0,65	0,54	1,19	20	200
27.07.94	97,000	26,4	7,85	568	8,70	109,3	6,3	7,1	40	0,12	0,015	0,95	1,09	0,28	1,37	10	160
03.08.94	68,000	25,7	7,99	591	8,70	107,8	7,8	8,7	45	0,02	0,009	0,90	0,93	0,27	1,20	10	120
10.08.94	71,000	27,5	8,12	602	8,90	114,2	8,6	9,1	63	0,02	0,012	0,16	0,19	0,34	0,53	13	140
17.08.94	65,000	23,8	8,18	591	9,40	112,4	5,9	7,0	51	0,02	0,015	0,41	0,44	0,28	0,72	10	120

Maros at Nagylak, middle rkm 29.1
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
24.08.94	55,000		8,09	618	7,50		5,1	6,2	48	0,04	0,010	0,59	0,64	0,52	1,16	10	280
31.08.94	58,900	23,6	7,95	693	9,60	114,3	6,8	6,9	59	0,02	0,015	0,59	0,62	0,46	1,08	10	110
07.09.94	52,900	24,4	8,43	719	11,50	139,1	6,8	8,6	68	0,04	0,015	1,06	1,12	0,45	1,57	26	240
14.09.94	48,000	23,0	7,94	674	9,00	105,9	6,9	11,5	71	0,02	0,010	0,25	0,28	0,48	0,76	7	100
21.09.94	50,700	17,3	8,12	920	10,20	106,9	7,9	7,5	72	0,05	0,015	0,70	0,77	0,53	1,30	3	200
28.09.94	73,900	22,0	8,49	700	10,80	124,6	6,7	8,5	75	0,05	0,015	1,65	1,71	0,33	2,04	46	160
04.10.94	65,600	19,9	8,08	595	7,40	81,9	6,4	7,2	49	0,93	0,019	1,15	2,10	0,46	2,56	26	170
12.10.94	84,600	12,6	8,09	699	10,10	95,3	4,4	4,8	45	0,22	0,016	2,60	2,83	0,44	3,27	16	80
19.10.94	71,200	12,1	8,13	689	10,50	97,9	7,1	6,2	44	0,55	0,043	3,71	4,30	0,33	4,63	29	670
26.10.94	69,300	11,0	7,92	840	9,80	89,1	4,6	5,0	50	0,70	0,027	2,71	3,44	0,28	3,72	36	140
02.11.94	64,700	15,0	7,97	704	10,20	101,7	5,2	5,6	43	0,62	0,059	2,44	3,12	0,29	3,41	72	150
09.11.94	61,100	11,3	8,01	967	11,50	105,3	6,9	5,1	66	0,64	0,027	3,75	4,42	1,45	5,87	20	180
16.11.94	62,000	6,3	7,96	862	10,30	83,3	7,7	6,8	62	0,73	0,068	2,53	3,33	0,34	3,67	72	530
23.11.94	64,300	5,7	7,94	761	10,80	86,0	6,6	5,8	52	0,93	0,049	4,99	5,98	0,35	6,33	88	210
01.12.94	60,500	3,9	7,92	698	11,50	87,3	9,7	6,5	52	1,13	0,075	2,64	3,85	0,34	4,19	10	320
06.12.94	60,500	3,6	7,93	575	12,30	92,7	4,6	3,7	36	0,48	0,031	2,28	2,80	0,33	3,13	46	110
14.12.94	65,800	5,8	7,82	576	10,50	83,8	3,0	3,4	34	0,53	0,057	2,46	3,05	0,41	3,46	82	130
19.12.94	132,000	3,5	7,69	611	11,50	86,4	4,8	5,9	45	0,40	0,063	2,67	3,13	0,34	3,47	46	50
27.12.94	68,800	2,6	7,69	467	11,70	85,8	6,1	7,3	45	0,81	0,037	2,19	3,04	0,35	3,39	82	250
04.01.95	76,600	2,3	8,03	599	11,60	84,4	2,6	3,8	38	0,51	0,061	2,42	2,98	0,22	3,20	68	140
01.02.95	183,000	3,6	7,80	580	11,50	86,6	5,5	7,5	42	0,68	0,061	3,55	4,29	0,64	4,93	39	270
01.03.95	196,000	8,8	7,83	486	11,10	95,6	4,0	7,2	31	0,06	0,014	2,37	2,45	0,71	3,16	75	120
12.04.95	163,000	9,3	7,79	396	10,00	87,2	2,7	3,9	24	0,11	0,015	2,35	2,47	0,72	3,19	62	180
10.05.95	233,000	16,3	7,79	330	8,20	84,1	1,6	4,7	19	0,05	0,018	1,65	1,72	0,45	2,17	52	220
07.06.95	371,000	20,4	7,51	410	7,20	80,5	4,1	35,5	95	0,13	0,046	1,45	1,62	1,02	2,64	39	1120
05.07.95	221,000	23,1	7,53	410	7,40	87,3	3,9	7,5	29	0,02	0,021	2,31	2,34	0,33	2,67	91	310
02.08.95	90,000	24,9	8,53	630	11,70	142,8	7,4	8,6	54	0,05	0,015	1,02	1,08	0,50	1,58	39	80
06.09.95	96,000	17,8	8,64	450	10,60	112,2	5,6	7,5	40	0,03	0,009	0,93	0,97	0,41	1,38	20	120
04.10.95	103,000	14,5	7,58	565	9,70	95,6	2,8	4,6	32	0,08	0,024	2,26	2,36	0,37	2,73	42	170
01.11.95	81,000	11,9	7,63	570	10,00	92,8	2,5	3,9	32	0,13	0,043	2,21	2,39	0,30	2,69	68	150
06.12.95	120,000	3,4	7,83	605	11,00	82,4	4,6	4,3	33	0,78	0,058	1,85	2,70	0,50	3,20	68	140

Maros at Nagylak, middle rkm 29.1
01.01.1994. - 31.12.1995.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe tot.	Fe dis.	Mn tot	Mn dis	Al tot.	Al dis.	As tot.	As dis.	B	B dis.	CN	CN dis	Zn tot.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
05.01.94		0	2	99																	
12.01.94		110	2	66	64,1	9,7	51,0	4,7		0,17		0,03		74							
19.01.94		0	1	38																	
26.01.94		110	3	29																	
02.02.94	0,3	0	2	27					0,67			0,06									
09.02.94		60	2	29	80,2	9,7	59,8	6,3		0,06		0,03		147							
16.02.94		0	1	11																	
23.02.94		0	10	27																	
02.03.94	0,3	0	2	42					0,56												
09.03.94				29	62,1	7,3	50,6	5,1		0,08		0,01	2180		5,0				1		100
16.03.94				29																	
23.03.94				9																	
30.03.94				27																	
06.04.94	0,9	0	2	19	46,1	5,5	36,8	3,5	3,80	0,05		0,01	890		4,5						48
13.04.94				30																	
20.04.94				20																	
27.04.94				29																	
04.05.94	0,4	0	1	29	38,1	4,9	26,7	2,7	1,86	0,08		0,02	742								101
11.05.94				46						0,06		0,02									
18.05.94				40																	
25.05.94				40																	
01.06.94		300		0	40,1	6,4	24,0	3,9	6,94	0,19		0,02							2		
08.06.94				20																	
15.06.94			2	10										313				290			
22.06.94				0																	
29.06.94				7																	
06.07.94			1	37					0,75	0,08		0,01									
13.07.94	0,1		1	10	54,3	7,8	44,2	2,7						15		4,5		100			
20.07.94				22																	
27.07.94				20																	
03.08.94	0,3		2	27																	
10.08.94		0		27	46,5	9,5	62,6	4,7		0,25		0,01		30		2,5					
17.08.94			1	30																	

Maros at Nagylak, middle rkm 29.1
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Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe tot. mg/l	Fe dis. mg/l	Mn tot mg/l	Mn dis mg/l	Al tot. µg/l	Al dis. µg/l	As tot. µg/l	As dis. µg/l	B µg/l	B dis. µg/l	CN µg/l	CN dis µg/l	Zn tot. µg/l
24.08.94				27																	
31.08.94				64																	
07.09.94		0	0	6	65,7	9,1	73,6	5,9	1,94	0,09		0,02		68		3,0					
14.09.94				79																	
21.09.94				110																	
28.09.94				70																	
04.10.94		0	1	35	54,3	11,3	60,0	6,3	0,78	0,14		0,02		24		1,5					
12.10.94				191																	
19.10.94				75																	
26.10.94				101																	
02.11.94		40	2	69	68,5	10,5	69,0	8,2	0,42	0,03		0,01		2		2,0		270	2		
09.11.94				14																	
16.11.94				7																	
23.11.94				42																	
01.12.94		10	4	56	72,1	11,7	69,0	7,8	0,48	0,04		0,05		8		2,5					
06.12.94			3	39																	
14.12.94				1																	
19.12.94				3																	
27.12.94				3																	
04.01.95			1	18					0,75	0,01		0,02									
01.02.95				70					4,74		0,37										
01.03.95		200	22	50																	
12.04.95			1	20	44,3	7,8	30,0	3,6	1,90	0,06	0,14	0,01		10		1,0					
10.05.95			1	10	40,0	6,1	22,0	2,4	2,20	0,05	0,22	0,01		17							
07.06.95		900	1	10					3,00	0,12	1,85	0,17									
05.07.95		300	2	20					4,40	0,08	0,24	0,01									
02.08.95		150	9	50					1,00		0,09										
06.09.95		50	1	10	49,3	7,8	39,0	4,4	1,30	0,04	0,14	0,01		19							
04.10.95		50	1	40					0,78		0,10										
01.11.95		50	1	10																	
06.12.95			1	60	66,0	8,7	48,0	5,0		0,03		0,01		7							

Maros at Nagylak, middle rkm 29.1
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Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
05.01.94													
12.01.94	30		0,20		0,1		14,0		1,0		0,5		5,0
19.01.94													
26.01.94													
02.02.94													
09.02.94	30		0,10		0,4		14,0		2,0		1,0		
16.02.94													
23.02.94													
02.03.94													
09.03.94		0,20		0,9		25,5		5,0		26,5		64,0	
16.03.94													
23.03.94													
30.03.94													
06.04.94		0,10		0,4		9,5		0,5		7,5		13,5	
13.04.94													
20.04.94													
27.04.94													
04.05.94		0,20		0,8		10,0		2,5		18,0		31,5	
11.05.94													
18.05.94													
25.05.94													
01.06.94													
08.06.94													
15.06.94	10		0,10		1,1		2,5		24,0		2,5		27,5
22.06.94													
29.06.94													
06.07.94													
13.07.94	4		0,10		0,1		4,5		3,0		0,5		5,5
20.07.94													
27.07.94													
03.08.94													
10.08.94	8		0,10		0,1		4,5		1,0		0,5		3,5
17.08.94													

Maros at Nagylak, middle rkm 29.1
01.01.1994. - 31.12.1995.

Date	Zn dis. µg/l	Hg tot. µg/l	Hg dis. µg/l	Cd tot. µg/l	Cd dis. µg/l	Cr tot. µg/l	Cr dis. µg/l	Ni tot. µg/l	Ni dis. µg/l	Pb tot. µg/l	Pb dis. µg/l	Cu tot µg/l	Cu dis. µg/l
24.08.94													
31.08.94													
07.09.94	9		0,10		0,2		2,5		2,5		0,5		4,5
14.09.94													
21.09.94													
28.09.94													
04.10.94	14		0,10		0,1		2,0		0,5		0,5		2,5
12.10.94													
19.10.94													
26.10.94													
02.11.94	16				0,1		5,0		2,0		0,5		2,5
09.11.94													
16.11.94													
23.11.94													
01.12.94	43				0,3		5,0		3,0		0,5		2,0
06.12.94													
14.12.94													
19.12.94													
27.12.94													
04.01.95													
01.02.95													
01.03.95													
12.04.95	8		0,10		0,9		9,0		0,5		0,5		5,0
10.05.95	13		0,10		0,3		1,5		1,0		0,5		3,5
07.06.95													
05.07.95													
02.08.95													
06.09.95	5		0,10		0,2		5,0		1,0		0,5		4,5
04.10.95													
01.11.95													
06.12.95	21		0,10		0,2		30,0		0,5		0,5		6,5

Maros at Nagylak,rkm 29.1
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
11.01.95	27,800	0,4	7,93	429	13,50	93,2	4,3	3,7	26	0,64	0,036	2,31	2,98	0,51	3,49	68	150
18.01.95	77,000	0,0	7,89	623	12,70	86,7	2,4	3,1	34	0,83	0,049	2,19	3,07	0,47	3,54	91	130
25.01.95	30,600	2,1	7,81	590	12,10	87,5	3,2	3,5	33	0,60	0,085	2,15	2,83	0,44	3,27	68	130
08.02.95	113,000	3,7	7,98	486	11,40	86,1	3,0	5,6	31	0,37	0,079	2,71	3,16	0,73	3,89	42	190
15.02.95	122,000	7,7	7,88	610	10,10	84,6	4,8	6,4	36	0,12	0,030	2,49	2,64	0,67	3,31	91	210
22.02.95	169,000	8,4	7,85	486	10,30	87,9	3,4	7,0	31	0,16	0,033	2,01	2,21	0,61	2,82	59	80
08.03.95	175,000	8,8	7,78	430	9,90	85,3	2,8	5,7	28	0,07	0,024	2,03	2,13	0,92	3,05	68	180
13.03.95	194,000	9,3	7,81	460	10,00	87,2	2,3	5,9	34	0,09	0,018	2,21	2,32	0,91	3,23	72	110
22.03.95	103,000	7,6	7,89	590	10,40	86,9	3,2	6,2	35	0,13	0,021	2,33	2,48	1,02	3,50	49	250
29.03.95	114,000	8,4	7,79	480	9,90	84,4	2,9	3,8	26	0,13	0,021	2,46	2,62	0,90	3,52	88	220
05.04.95	166,000	12,2	7,90	356	9,30	87,0	4,3	8,9	30	0,08	0,012	1,47	1,56	0,76	2,32	52	60
19.04.95	145,000	12,0	7,82	418	9,60	89,3	2,1	2,9	20	0,07	0,015	1,31	1,40	0,73	2,13	49	160
26.04.95	160,000	16,6	7,90	448	8,50	87,7	2,6	3,4	23	0,05	0,009	1,90	1,95	0,45	2,40	49	80
03.05.95	399,000	13,3	7,74	258	8,30	79,6	3,1	12,4	32	0,05	0,040	1,54	1,63	0,39	2,02	49	360
17.05.95	275,000	16,2	7,75	298	8,90	91,1	2,3	7,8	31	0,06	0,012	1,24	1,32	0,38	1,70	49	90
24.05.95	237,000	16,2	7,75	320	8,70	89,0	2,3	6,2	28	0,05	0,015	0,99	1,06	0,56	1,62	59	80
31.05.95	424,000	22,8	7,66	364	7,20	84,4	3,4	15,2	49	0,09	0,040	2,19	2,32	0,31	2,63	111	360
14.06.95	220,000	21,7	7,74	462	7,00	80,3	1,8	10,2	40	0,07	0,046	1,49	1,61	0,43	2,04	59	310
21.06.95	195,000	23,1	7,73	418	7,60	89,6	3,1	11,5	40	0,10	0,036	1,76	1,90	0,46	2,36	59	360
28.06.95	286,000	20,3	7,56	472	7,20	80,3	3,3	12,4	44	0,20	0,036	1,38	1,62	0,41	2,03	68	170
12.07.95	137,000	26,5	8,54	452	11,20	141,0	8,3	9,0	38	0,09	0,012	0,86	0,96	0,37	1,33	53	128
19.07.95	105,000	26,4	7,63	532	8,20	103,0	5,5	7,9	40	0,10	0,015	1,02	1,13	0,36	1,49	16	190
26.07.95	128,000	26,2	7,68	500	7,20	90,1	9,3	25,8	68	0,05	0,009	2,49	2,55	0,47	3,02	39	510
09.08.95	87,000	23,9	8,10	506	9,40	112,6	8,6	12,0	51	0,04	0,021	0,52	0,58	0,28	0,86	39	120
16.08.95	84,000	22,8	8,06	790	9,20	107,8	7,7	12,8	63	0,04	0,015	0,72	0,78	0,36	1,14	29	90
23.08.95	70,000	24,5	7,87	660	10,90	132,0	8,7	13,0	65	0,02	0,012	0,61	0,64	0,50	1,14	20	150
30.08.95	73,000	18,2	8,78	525	13,20	141,0	8,4	13,4	70	0,03	0,027	0,52	0,58	0,33	0,91	49	160
13.09.95	138,000	19,6	7,88	490	8,10	89,1	3,1	5,2	31	0,03	0,009	2,01	2,05	0,39	2,44	59	110
20.09.95	118,000	18,2	7,74	470	7,80	83,3	2,4	5,7	33	0,06	0,018	1,60	1,69	0,27	1,95	59	123
27.09.95	96,000	17,4	7,92	590	9,30	97,7	2,3	4,6	34	0,04	0,015	2,06	2,11	1,04	3,15	59	140
11.10.95	93,600	16,5	7,78	535	8,90	91,7	2,5	4,3	31	0,15	0,040	2,60	2,79	0,38	3,17	78	340
18.10.95	81,200	16,2	7,61	630	9,00	92,1	2,5	4,6	36	0,23	0,030	2,01	2,27	0,38	2,65	68	200
25.10.95	86,400	11,5	7,60	675	10,50	96,6	4,8	4,7	45	0,22	0,024	1,79	2,03	0,32	2,35	59	180

Maros at Nagylak,rkm 29.1
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
08.11.95	86,000	4,0	7,80	580	11,60	88,3	3,5	3,7	33	0,41	0,027	1,99	2,43	0,46	2,89	59	150
15.11.95	78,000	6,5	7,63	575	10,40	84,5	3,9	4,7	32	0,87	0,088	1,70	2,65	0,33	2,98	20	110
22.11.95	229,000	4,4	7,73	555	10,10	77,7	5,5	8,5	40	0,49	0,079	2,21	2,78	0,36	3,14	29	170
29.11.95	111,000	4,4	7,67	492	11,00	84,6	5,4	5,3	29	0,57	0,459	1,54	2,57	0,33	2,90	49	130
11.12.95	106,000	3,2	7,78	610	11,60	86,4	8,6	5,6	35	0,94	0,088	2,10	3,13	0,45	3,58	68	170
14.12.95	83,000	3,2	7,70	590	11,60	86,4	4,8	4,8	30	0,86	0,061	1,81	2,73	0,39	3,12	65	130
18.12.95	101,000	4,2	7,76	580	11,60	88,8	3,0	4,4	32	0,92	0,070	1,51	2,51	0,44	2,95	82	220
03.01.96	880,000	1,0	7,55	342	11,60	81,4	4,5	18,8	51	0,70	0,128	1,94	2,77	0,90	3,67	68	410
10.01.96	402,000	3,4	7,61	530	11,40	85,4	3,9	10,5	36	0,61	0,055	1,72	2,38	0,44	2,82	55	560
17.01.96	258,000	1,0	7,76	615	12,40	87,0	4,1	6,5	37	0,51	0,036	2,17	2,71	0,46	3,17	36	540
24.01.96	178,000	0,3	7,89	765	12,40	85,3	3,1	3,6	38	0,82	0,036	2,01	2,86	0,28	3,14	36	190
31.01.96	157,000	1,7	7,69	715	9,60	68,7	1,2	3,5	33	0,89	0,043	2,19	3,12	0,49	3,61	55	280
07.02.96	131,000	0,3	7,83	710	12,30	84,7	4,0	3,8	32	1,06	0,055	2,44	3,55	0,29	3,84	49	210
14.02.96	126,000	3,6	7,55	800	11,60	87,4	3,9	3,6	38	1,13	0,055	2,64	3,83	0,34	4,17	65	510
21.02.96	123,000	3,9	7,87	790	11,20	85,0	3,9	3,3	37	1,13	0,073	2,60	3,81	0,40	4,21	85	190
28.02.96	148,000	3,5	7,67	745	11,70	87,9	5,2	7,5	42	0,89	0,094	2,78	3,76	0,46	4,22	130	230
06.03.96	118,000	2,4	7,57	745	11,70	85,3	4,5	4,4	38	0,91	0,052	2,35	3,31	0,30	3,61	59	140
13.03.96	111,000	4,0	7,53	790	11,60	88,3	4,6	4,3	39	0,68	0,079	2,69	3,45	0,35	3,80	49	90
20.03.96	268,000	6,2	7,35	655	10,30	83,1	5,5	7,6	42	0,40	0,052	2,49	2,93	0,38	3,31	39	120
27.03.96	219,000	8,0	7,50	660	9,90	83,6	5,3	8,8	42	0,19	0,058	3,10	3,35	0,73	4,08	59	260
03.04.96	269,000	7,2	7,52	610	10,30	85,2	3,9	9,4	36	0,20	0,052	2,83	3,08	0,34	3,42	82	190
10.04.96	410,000	11,2	7,42	482	9,60	87,7	4,8	12,1	44	0,09	0,052	2,33	2,46	0,40	2,86	39	320
17.04.96	237,000	8,7	7,77	520	10,20	87,7	3,6	6,3	32	0,12	0,049	2,28	2,46	0,30	2,76	49	590
24.04.96	299,000	14,4	7,87	570	8,60	84,6	2,9	11,1	38	0,06	0,061	2,96	3,08	0,35	3,43	68	400
29.04.96	347,000	17,2	7,85	378	9,10	95,1	2,9	7,9	28	0,05	0,036	2,10	2,19	0,55	2,74	49	390
08.05.96	299,000	18,0	7,80	384	8,30	88,3	2,5	6,0	22	0,09	0,046	2,10	2,24	0,29	2,53	101	280
15.05.96	333,000	18,2	7,76	360	8,50	90,8	2,2	6,3	26	0,09	0,021	1,56	1,67	0,42	2,09	59	150
22.05.96	380,000	19,2	7,78	400	7,80	85,0	2,2	20,8	54	0,02	0,036	2,28	2,34	0,52	2,86	68	240
29.05.96	200,000	15,6	7,93	515	8,90	89,9	3,2	6,2	30	0,11	0,027	2,15	2,28	0,36	2,64	59	440
05.06.96	162,000	24,2	8,31	555	8,80	106,0	4,9	6,4	33	0,03	0,012	1,88	1,92	0,32	2,24	39	180
12.06.96	116,000	28,6	7,89	630	10,00	130,9	9,7	8,8	53	0,08	0,021	0,81	0,91	0,61	1,52	29	280
19.06.96	115,000	23,2	8,56	560	14,30	168,9	10,6	13,9	69	0,03	0,006	0,41	0,44	0,54	0,98	29	230
26.06.96	102,000	21,0	8,00	540	10,80	122,2	8,3	12,5	59	0,09	0,001	0,70	0,79	0,33	1,12	10	220

Maros at Nagylak,rkm 29.1
01.01.1995. - 31.12.1997.

Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
03.07.96	187,000	21,6	7,83	615	7,10	81,3	2,5	13,0	49	0,01	0,027	3,53	3,56	2,23	5,79	72	230
10.07.96	112,000	21,5	8,08	670	7,90	90,3	1,9	6,4	37	0,04	0,012	2,73	2,79	0,30	3,09	101	260
17.07.96	102,000	23,4	8,56	530	12,10	143,5	4,5	7,1	40	0,04	0,006	1,22	1,27	0,40	1,67	10	260
24.07.96	73,000	26,4	7,91	610	9,80	123,1	6,8	9,1	60	0,02	0,009	0,81	0,85	0,29	1,14	10	180
31.07.96	79,000	24,5	7,88	740	7,30	88,4	13,0	12,9	86	0,02	0,043	0,68	0,74	0,51	1,25	10	210
07.08.96	73,000	23,2	8,16	635	10,80	127,6	7,5	14,7	80	0,01	0,004	0,41	0,42	0,53	0,95	10	230
14.08.96	66,000	21,8	8,12	675	8,80	101,1	7,5	12,2	68	0,02	0,007	0,47	0,50	0,62	1,12	10	170
21.08.96	127,000	22,2	8,33	780	10,70	124,0	9,5	11,0	64	0,02	0,013	0,88	0,92	0,51	1,43	10	530
28.08.96	100,000	24,0	7,84	500	8,30	99,6	6,5	8,5	44	0,11	0,033	0,77	0,91	0,44	1,35	10	970
04.09.96	83,000	21,0	8,43	650	8,80	99,5	2,4	7,3	48	0,22	0,009	1,29	1,51	0,42	1,93	20	220
11.09.96	156,000	14,2	8,18	530	9,50	93,0	1,6	6,0	37	0,05	0,009	1,31	1,37	0,29	1,66	108	230
18.09.96	267,000	13,4	7,97	428	9,00	86,5	2,5	9,0	36	0,05	0,015	1,27	1,34	0,26	1,60	59	710
25.09.96	263,000	13,5	7,91	364	8,80	84,8	2,1	7,4	25	0,02	0,018	1,72	1,76	0,37	2,13	49	370
02.10.96	277,000	13,0	7,95	354	8,90	84,8	2,3	10,9	37	0,03	0,030	1,94	2,01	0,33	2,34	49	450
09.10.96	160,000	15,1	7,88	480	8,70	86,9	3,2	5,3	24	0,05	0,006	2,08	2,13	0,32	2,45	117	210
16.10.96	113,000	15,1	8,13	645	9,60	95,9	4,8	7,0	41	0,12	0,018	1,65	1,78	0,37	2,15	101	365
24.10.96	257,000	11,3	7,96	700	9,00	82,4	4,0	7,3	47	0,05	0,027	1,54	1,62	0,32	1,94	42	250
30.10.96	140,000	10,7	7,93	535	9,70	87,5	5,5	5,0	19	0,08	0,033	1,90	2,01	0,29	2,30	39	160
05.11.96	118,000	10,4	7,96	710	9,10	81,5	1,8	3,3	36	0,06	0,024	1,88	1,96	0,37	2,33	49	130
13.11.96	93,000	9,4	7,88	780	9,80	85,7		3,8	40	0,05	0,043	2,24	2,33	0,26	2,59	20	130
20.11.96	87,000	11,5	7,76	785	9,20	84,6	7,1	6,2	44	0,17	0,049	2,58	2,80	0,29	3,09	49	190
27.11.96	121,000	5,5	7,83	680	8,60	68,1	6,3	5,3	38	0,22	0,043	2,00	2,26	0,30	2,56	59	220
04.12.96	194,000	5,5	7,86	505	10,10	80,0	7,1	9,2	42	0,23	0,033	2,12	2,38	0,31	2,69	39	270
11.12.96	165,000	5,8	7,80	466	10,40	83,0	6,8	5,0	26	0,28	0,027	0,21	0,52	1,95	2,47	68	180
16.12.96	155,000	5,8	7,72	580	10,30	82,2	5,2	3,9	32	0,19	0,073	2,21	2,47	0,25	2,72	29	140
23.12.96	172,000	4,0	7,63	446	11,10	84,5	4,6	4,4	22	0,22	0,040	2,06	2,32	0,34	2,66	42	400
06.01.97	450,000	2,7	8,09	545	12,10	89,0	4,2	7,0	38	0,51	0,049	1,60	2,17	0,49	2,66	53	460
15.01.97	191,000	3,2	7,90	550	11,60	86,4	2,9	4,9	27	0,58	0,043	2,35	2,98	0,42	3,40	43	200
22.01.97	148,000	3,3	7,94	700	11,20	83,7	2,9	4,0	33	0,28	0,061	2,35	2,69	0,26	2,95	82	450
29.01.97	119,000	2,0	7,90	775	11,70	84,4	4,4	4,5	40	0,57	0,079	2,62	3,27	0,32	3,59	68	170
05.02.97	98,000	1,2	7,92	720	11,90	84,0	3,3	3,2	31	0,67	0,030	2,17	2,87	0,34	3,21	55	200
12.02.97	97,000	3,8	7,96	735	10,20	77,2	1,8	3,2	30	0,74	0,067	2,92	3,72	0,31	4,03	65	280
19.02.97	267,000	3,1	7,80	680	11,20	83,2	4,1	6,0	41	0,44	0,049	2,08	2,57	0,27	2,84	72	210

Maros at Nagylak,rkm 29.1
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
26.02.97	160,000	7,2	7,87	605	10,50	86,9	3,9	4,8	32	0,13	0,049	2,44	2,62	0,33	2,95	59	520
05.03.97	286,000	5,8	7,85	440	11,70	93,4	5,7	20,8	61	0,21	0,027	2,94	3,18	0,56	3,74	16	620
12.03.97	196,000	6,8	7,93	494	10,20	83,6	2,3	5,7	29	0,10	0,052	2,42	2,57	0,31	2,88	39	230
19.03.97	170,000	6,3	8,00	610	10,50	84,9	2,3	4,3	31	0,11	0,024	2,83	2,96	0,29	3,25	62	240
26.03.97	145,000	6,4	7,93	494	10,70	86,8	3,0	4,6	27	0,16	0,021	2,08	2,26	0,33	2,59	68	200
02.04.97	163,000	9,0	8,10	580	10,00	86,6	2,3	4,4	31	0,05	0,021	2,28	2,35	0,23	2,58	68	180
09.04.97	276,000	6,5	7,91	458	11,10	90,2	4,0	6,4	30	0,06	0,015	1,63	1,70	0,22	1,92	59	280
16.04.97	203,000	7,5	7,91	412	10,50	87,6	3,2	4,7	21	0,09	0,015	1,79	1,89	0,26	2,15	49	250
23.04.97	389,000	8,0	7,86	452	9,90	83,6	3,4	9,3	41	0,05	0,018	1,90	1,97	0,47	2,44	49	450
28.04.97	930,000	11,2	7,87	380	8,00	73,1	3,3	7,8	24	0,16	0,058	3,14	3,35	0,37	3,72	68	640
07.05.97	504,000	16,8	7,92	380	8,70	90,2	2,6	7,7	29	0,07	0,033	2,62	2,72	0,39	3,11	39	710
13.05.97	565,000	19,8	7,94	296	8,70	96,0	3,0	9,2	32	0,07	0,015	1,79	1,87	0,30	2,17	59	330
21.05.97	332,000	20,4	7,97	400	8,10	90,5	1,9	4,8	24	0,15	0,015	1,72	1,88	0,32	2,20	59	400
28.05.97	245,000	16,0	7,94	444	8,60	87,6	1,2	4,9	25	0,08	0,018	1,92	2,02	0,32	2,34	49	580
04.06.97	229,000	16,2	8,08	530	9,10	93,1	1,7	4,0	27	0,07	0,015	2,12	2,21	0,24	2,45	46	170
11.06.97	267,000	20,5	8,07	450	9,30	104,1	3,9	6,5	35	0,05	0,015	1,79	1,85	0,23	2,08	36	290
18.06.97	245,000	22,9	8,01	410	7,50	88,1	2,3	6,8	30	0,05	0,024	1,79	1,86	0,26	2,12	46	220
25.06.97	224,000	21,0	7,94	422	7,60	86,0	1,7	6,4	27	0,06	0,027	1,72	1,81	0,28	2,09	55	210
02.07.97	178,000	24,6	8,22	478	8,70	105,6	4,2	4,6	28	0,04	0,009	2,10	2,15	0,39	2,54	46	110
09.07.97	158,000	20,8	8,44	590	9,00	101,4	5,7	7,8	39	0,05	0,003	1,56	1,61	0,34	1,95	20	150
16.07.97	190,000	23,0	8,13	595	7,80	91,8	1,9	7,4	38	0,05	0,015	2,37	2,43	0,25	2,68	49	190
23.07.97	196,000	20,0	8,00	446	8,30	92,0	1,8	7,9	29	0,05	0,009	1,72	1,77	0,29	2,06	26	120
30.07.97	309,000	21,2	7,89	398	7,70	87,4	3,7	10,4	37	0,08	0,030	1,60	1,71	0,36	2,07	65	310
06.08.97	487,000	20,2	7,86	320	7,50	83,5	4,0	24,2	62	0,02	0,049	1,40	1,47	0,31	1,78	78	480
13.08.97	359,000	21,5	7,98	360	6,90	78,8	2,0	29,4	71	0,04	0,021	1,74	1,80	0,32	2,12	82	930
18.08.97	219,000	22,4	7,95	390	7,20	83,7	1,8	9,2	30	0,04	0,030	1,70	1,76	0,48	2,24	88	130
27.08.97	143,000	22,4	8,39	605	8,60	100,0	3,7	5,1	33	0,03	0,012	2,35	2,39	0,36	2,75	46	150
03.09.97	269,000	21,6	7,89	555	7,40	84,7	2,0	7,8	36	0,05	0,021	2,60	2,67	0,63	3,30	68	130
10.09.97	222,000	19,9	8,11	409	7,30	80,8	1,9	10,6	34	0,07	0,030	1,76	1,86	0,41	2,27	78	140
15.09.97	198,000	17,9	7,08	459	8,10	86,0	1,4	12,5	42	0,07	0,015	1,83	1,92	0,24	2,16	68	130
17.09.97	151,000	16,9	8,05	490	8,70	90,4	1,9	3,9	24	0,10	0,015	1,51	1,63	0,24	1,87	124	140
24.09.97	166,000	17,6	7,99	452	8,40	88,6	2,1	7,2	30	0,11	0,021	1,72	1,85	0,37	2,22	82	170
30.09.97	149,000	14,6	8,12	525	9,30	91,9	2,3	3,7	27	0,04	0,009	1,83	1,88	0,24	2,12	104	140

Maros at Nagylak,rkm 29.1
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Date	Q	Temp. (W)	pH lab.	Cond.	DO	DO sat.	BOD5	COD P orig	COD C. orig	NH4-N	NO2-N	NO3-N	N anorg.	N org.	TN	PO4_P	TP
	m^3/s	^oC		µS/cm	mg/l	%	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l
08.10.97	207,000	15,4	8,11	570	8,90	89,5	2,4	4,6	38	0,04	0,009	2,06	2,10	0,25	2,35	39	120
15.10.97	244,000	12,8	7,91	520	8,40	79,6	3,8	8,6	36	0,05	0,015	1,85	1,92	0,29	2,21	49	260
20.10.97	423,000	10,2	7,85	412	9,50	84,7	4,7	15,4	47	0,07	0,015	1,56	1,64	0,47	2,11	39	560
29.10.97	172,000	5,3	7,91	575	10,80	85,1	4,4	4,0	28	0,10	0,018	1,74	1,86	0,37	2,23	39	120
05.11.97	124,000	6,1	8,01	672	10,60	85,3	4,8	5,6	42	0,20	0,015	1,88	2,09	0,26	2,35	29	230
12.11.97	113,000	10,8	7,75	710	9,20	83,2		3,4	41	0,13	0,033	1,90	2,06	0,27	2,33	42	250
19.11.97	125,000	6,6	8,13	701	10,00	81,5	1,5	3,2	34	0,14	0,049	2,12	2,31	0,24	2,55	85	230
26.11.97	118,000	7,3	8,19	630	10,80	89,6	2,4	3,0	29	0,12	0,040	1,79	1,94	0,27	2,21	39	100
03.12.97	110,000	7,3	8,00	685	10,70	88,8	2,0	2,4	30	0,14	0,046	2,15	2,33	0,28	2,61	67	100
10.12.97	208,000	3,6	8,05	670	11,20	84,4	5,4	8,4	42	0,15	0,030	2,06	2,23	0,46	2,69	33	290
17.12.97	189,000	1,0	7,94	648	12,10	84,9	3,2	4,2	34	0,15	0,030	1,88	2,05	0,36	2,41	33	200
22.12.97	121,000	2,4	8,02	555	12,00	87,5	3,4	5,5	30	0,17	0,024	2,06	2,25	0,28	2,53	52	210

Maros at Nagylak,rkm 29.1
01.01.1995. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe dis.	Mn dis	Al dis.	As dis.	B dis.	CN	Zn dis.	Hg dis.	Cd dis.	Cr dis.	Ni dis.	Pb dis.	Cu dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
11.01.95				50	47,1	6,9	38,6	4,8	0,04		11	1,0			16	0,10	0,2	6,0	1,5	0,5	4,0
18.01.95		150		60																	
25.01.95				10																	
08.02.95				40	57,1	8,6	39,0	4,6	0,12	0,03	23	1,0			17	0,10	0,2	3,5	0,5	0,5	8,5
15.02.95		150	0	70																	
22.02.95				20																	
08.03.95				20	50,7	5,6	33,0	3,0	0,12	0,01	28	2,0			20		0,1	6,5	0,5	0,5	5,0
13.03.95				60																	
22.03.95				10																	
29.03.95				70																	
05.04.95		50	1	40																	
19.04.95				40																	
26.04.95				10																	
03.05.95		250	1	10																	
17.05.95		200		13																	
24.05.95				10																	
31.05.95				10																	
14.06.95				10	53,0	7,8	33,0	4,8	0,10	0,01	16		200	1	8	0,10	0,1	3,5	3,0	0,5	4,0
21.06.95				10																	
28.06.95				20																	
12.07.95				20	47,9	7,4	39,0	3,8	0,04	0,01	40	5,0			15	0,20	0,1	6,5	5,0	1,0	6,0
19.07.95				70																	
26.07.95				20																	
09.08.95				30	38,6	6,9	52,0	5,5	0,05	0,01	47				18	0,10	0,1	9,5	2,0	0,5	4,5
16.08.95				50																	
23.08.95				50																	
30.08.95				40																	
13.09.95				10									300	4							
20.09.95				10																	
27.09.95				20																	
11.10.95				10	55,0	7,4	39,0	5,8	0,04	0,01	12	4,0			7	0,10	0,1	6,0	0,5	0,5	6,0
18.10.95				20																	
25.10.95				20																	

Maros at Nagylak,rkm 29.1
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe dis.	Mn dis	Al dis.	As dis.	B dis.	CN	Zn dis.	Hg dis.	Cd dis.	Cr dis.	Ni dis.	Pb dis.	Cu dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
08.11.95				20	60,0	8,7	47,0	5,0	0,11	0,01	4				11	0,10	0,2	36,0	1,0	1,0	5,0
15.11.95				20																	
22.11.95				50									200	4							
29.11.95				80																	
11.12.95				70														39,0			
14.12.95		250		60																	
18.12.95				50																	
03.01.96		200	4	10														1,0			
10.01.96		150		10	62,2	11,7	42,0	5,8	0,04	0,02	20	1,0			17	0,10	0,2	3,0	0,5	0,5	3,5
17.01.96				30														3,5			
24.01.96				30									50	2				8,5			
31.01.96				60														51,5			
07.02.96		50	3	60	84,0	12,6	56,0	5,5	0,06	0,12	15				27	0,10	0,3	22,0	2,0	0,5	5,5
14.02.96				60														19,0			
21.02.96				40														21,0			
28.02.96				100														16,5			
06.03.96			4	50	89,0	15,6	66,0	6,5	0,04	0,11	7				39	0,20	0,4	23,5	2,5	0,5	8,0
13.03.96				110														36,5			
20.03.96				70														43,5			
27.03.96		200		40														14,5			
03.04.96			2	20	74,0	13,4	47,0	5,5	0,02	0,01	19	1,0			15	0,20	0,2	16,5	1,0	1,5	7,0
10.04.96		300		70																	
17.04.96				10									75	5							
24.04.96				10																	
29.04.96				40	44,3	8,1	27,0	3,8	0,04	0,01	15				7	0,20	0,2	14,5	2,0	0,5	5,5
08.05.96			1	30																	
15.05.96		120		70																	
22.05.96				20																	
29.05.96				40																	
05.06.96				70																	
12.06.96		380		40	64,0	9,0	64,0	6,5	0,05	0,01	37				11	0,20	0,1	10,5	2,0	1,0	8,5
19.06.96				60																	
26.06.96				10																	

Maros at Nagylak,rkm 29.1
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Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe dis.	Mn dis	Al dis.	As dis.	B dis.	CN	Zn dis.	Hg dis.	Cd dis.	Cr dis.	Ni dis.	Pb dis.	Cu dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
03.07.96				10																	
10.07.96		40		50	79,0	12,9	57,0	8,0	0,05	0,01	15	3,0		2	5	0,20	0,1	18,5	0,5	0,5	4,5
17.07.96				50																	
24.07.96				70																	
31.07.96				100																	
07.08.96		20	1	80	45,7	10,1	77,0	8,0	0,04	0,01	39		100		11	0,20	0,1	7,0	1,5	0,5	6,5
14.08.96				120																	
21.08.96				50																	
28.08.96				80																	
04.09.96			3	30	66,0	12,3	67,0	4,6	0,06	0,01	19				5	0,20	0,1	11,0	1,0	0,5	3,0
11.09.96				70																	
18.09.96		180		110																	
25.09.96				10																	
02.10.96				10	41,5	6,8	30,0	3,8	0,05	0,01	22	2,0			16	0,20	0,1	2,0	0,5	0,5	4,0
09.10.96				20																	
16.10.96				10									75	3							
24.10.96				30																	
30.10.96		100		10																	
05.11.96			1	30	76,0	11,3	60,0	4,8	0,08	0,01	16				11	0,20	0,2	28,0	0,5	0,5	4,0
13.11.96				40																	
20.11.96		180		30																	
27.11.96				30																	
04.12.96			1	10	56,0	10,0	37,0	5,0	0,08	0,01	19				15	0,20	0,1	12,0	1,5	0,0	4,5
11.12.96				10																	
16.12.96		300		20																	
23.12.96				60																	
06.01.97		200	2	120	63,0	9,8	39,0	3,8	0,09	0,02	15				17	0,20	0,2	10,0	2,0	0,5	5,0
15.01.97			6	130																	
22.01.97				30																	
29.01.97				30																	
05.02.97		140	27	30	80,0	11,2	66,0	4,4	0,05	0,05	6			3	42	0,10	0,3	18,5	1,0	0,5	4,5
12.02.97				40																	
19.02.97				20									100								

Maros at Nagylak,rkm 29.1
01.01.1995. - 31.12.1997.

Date	Extr. mg/l	Oil µg/l	Phenol µg/l	ANA det. µg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Fe dis. mg/l	Mn dis mg/l	Al dis. µg/l	As dis. µg/l	B dis. µg/l	CN µg/l	Zn dis. µg/l	Hg dis. µg/l	Cd dis. µg/l	Cr dis. µg/l	Ni dis. µg/l	Pb dis. µg/l	Cu dis. µg/l
26.02.97				20																	
05.03.97		100	2	10	50,0	10,1	33,0	4,2	0,05	0,01	19				20	0,10	0,2	1,0	4,5	2,5	15,0
12.03.97				20																	
19.03.97				20																	
26.03.97				40																	
02.04.97		60	1	10	67,0	10,5	44,0	4,0	0,07	0,01	22	1,0		3	19	0,10	0,2	15,0	1,5	0,5	4,5
09.04.97				180																	
16.04.97				40																	
23.04.97				30																	
28.04.97				10																	
07.05.97				10																	
13.05.97				10	37,2	5,8	19,0	2,6	0,12	0,01	17				5	0,50	0,1	5,0	0,5	0,5	4,0
21.05.97				10																	
28.05.97				10																	
04.06.97		60	1	60					0,32	0,11			180								
11.06.97				20																	
18.06.97				20	48,6	8,0	25,0	3,4	0,04	0,01	47				8	0,10	0,1	21,0	2,5	1,0	5,0
25.06.97				10																	
02.07.97		60	1	30					0,12	0,01				1	16			9,5		1,0	4,5
09.07.97				60																	
16.07.97				10	66,0	11,3	49,0	5,4	0,07	0,01	16	1,0			8	0,10	0,1	11,0	3,0	0,5	4,5
23.07.97				10																	
30.07.97				10																	
06.08.97		60	4	10					0,13	0,01					60					1,0	18,0
13.08.97				10																	
18.08.97				10																	
27.08.97				10	79,0	9,0	46,0	5,0	0,11	0,01	14		37		6	0,10	0,1	12,5	1,0	0,5	4,0
03.09.97		20	2	10																	
10.09.97			1	10																	
15.09.97				10																	
17.09.97				10																	
24.09.97				10	54,0	12,9	30,0	4,6	0,06	0,07	22				15	0,10	0,1	6,0	2,5	0,5	5,5
30.09.97		20	2	10																	

Maros at Nagylak,rkm 29.1
01.01.1995. - 31.12.1997.

Date	Extr.	Oil	Phenol	ANA det.	Ca	Mg	Na	K	Fe dis.	Mn dis	Al dis.	As dis.	B dis.	CN	Zn dis.	Hg dis.	Cd dis.	Cr dis.	Ni dis.	Pb dis.	Cu dis.
	mg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
08.10.97			3	20																	
15.10.97		20		10	59,0	9,4	37,0	5,0	0,06	0,01	20	1,0		1	7	0,10	0,2	13,0	0,1	1,0	4,0
20.10.97				10																	
29.10.97				80																	
05.11.97		60	12	30																	
12.11.97				40																	
19.11.97				30	77,0	9,8	56,0	4,8	0,08	0,01	12				23	0,10	0,1	29,5	2,0	0,5	
26.11.97				20																	
03.12.97		20	1	10					0,11	0,02	15		99		20	0,10	0,1	21,5	3,0	0,5	8,0
10.12.97				10																	
17.12.97				100	77,0	11,5	47,0	4,6													
22.12.97				10																	

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Part D

Water Environmental Engineering

Table of Contents

List of Abbreviations
on Water Environmental Engineering

Quantitative abbreviations

kg/a	kilogram per year
t/a	ton per year
m^3/s	cubic meters per second
m^3/d	cubic meters per day
t/a	tons per year
tm^3/a	thousand cubic meters per year

Qualitative abbreviations

BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand (chromate)
N	Nitrogen (total nitrogen)
NH_4	Ammonium ions
NO_3	Nitrate ions
TSS	Total Suspended solids

Other abbreviations

MFt	Million Hungarian Forints
HUF	Hungarian Forints
USD	USA Dollars
MERP	Ministry for Environment and Regional Policy
MTCWM	Ministry for Transport Communication and Water Management
NEP	National Environmental Program
WW	wastewater
WWTP	Wastewater Treatment Plant

1. Summary

1.1. National Targets and Instruments for Water Pollution Reduction

The Hungarian National Environmental Program has general guidelines for water pollution reduction. The most important goals are that Danube and Tisza should reach the Class III level in all important parameters, the further pollution of irrigation waters should be stopped. The harm on vulnerable ground water resources should be decreased by better control of land uses and environmental conditions on the surface. The pollution of nitrate and pesticides from diffuse sources should be decreased in groundwater and sensitive surface waters. These targets have not been turned into direct ambient water quality objectives for the touched river bodies yet.

The technical instruments as *Effluent Standards* were fixed in 1984. Law differentiated six categories depending on the sensitivity of the recipient and the interest on the water uses. As the system was set up fifteen years ago, it can not fully serve the today's needs. The Hungarian *effluent monitoring* system is connected with the regular effluent compliance control. The effluent data coming from this legal procedure of effluent control and fining give not enough information on the real pollution load from point sources. As there are no reliable direct information on diffuse source pollution also, the weakness of data on pollution load gives the major bottleneck of water quality management planning today.

The monitoring laboratories belong to analytical inter-calibration system, and some of them have been accredited according to the ISO requirements too. Their professional level, instrumentation and quality assurance is close to the needs now. The data on effluent quality is open for the public.

The National Guideline of MSz 12 749 as *In stream water quality standards* gives the general basis for classification of surface waters according their quality. There is no legal obligation for reaching water quality targets in the surface water stretches expressed according to these quality classes.

The legal tools as *licensing, wastewater fine, general environmental check-up, environmental supervision, legal possibility for stopping the questioned activity* are given by law. Their use is hindered by the eroded driving force of the fines connected to them, sometimes by the limited capacities of the involved authorities and by considerations of the further possibility on economic survival of the polluters.

1.2. Measures for Reduction of Water Pollution

1.2.1. Non-Physical Measures

The efficiency of the water protection is strongly affected by the existing legal possibilities of authorities involved in water pollution control. There is a common agreement on the necessity of development of the legal background and administrative capacities of these authorities. The actions connected to this issue are within the frame of the development program of Hungarian water legislation and the harmonization procedure with the EU environmental legislation.

There is an ongoing activity for the development of the national water legislation. Its basis will be the river basin and the integrated river basin management concept.

The proposed basic elements of the water quality management system can be summarized as

- Use related Water Quality Objectives (WQO), depending on the characteristic land uses and their water quality needs on the watershed,
- WQO-s should be harmonized with EC Directives,

- Clear transition of WQO-s into discharge standards,
- Prioritized, phased, achievable, affordable water quality management programs on watershed level, built up from local community wastewater management plans,
- Ownership for the objectives and improvement plans,
- Clear responsibilities and accountabilities,
- Efficient permitting and enforcement,
- Sound monitoring and reporting system,
- Simple, clear, efficient funding and charging systems,
- Adequate and technically competent staff for water pollution control,
- Legal framework to be given for the authority to provide and operate the system.

The crucial element of the concept is the full local involvement of all affected parties into a so-called Catchment Planning Commission for each catchment area. These Commissions would be responsible for setting up locally agreed WQO-s, for development management plans, preparation of annual reports on the progress of the local wastewater management plans. The Commission could work as a board drawn from representatives of all parties interested in water quality management on watershed level. The responsibility of the Commission covers water quantity and quality issues in order to provide an integrated approach to water resources management according to the EC Water Resources Framework Directive. It seemed to be unrealistic to follow strictly the full institutional consequences of the river basin approach immediately, it can be reached on a step by step approach in the future only.

The Environmental Charge would provide an assured revenue stream on a consistent basis. This charge would be levied on all dischargers according to the pollutant input allowed in their permits (giving possibility for them to apply for the decrease of their effluent standards when they want it). The environmental charge should cover the administrative costs of water quality management including the costs of the activity of regional water authorities and the Catchment Management Commissions. It could raise revenues for funding water protection investment programs also.

The water quality protection could not be managed without substantial contribution of the State. The State fund is needed for speeding up the pollution reduction programme, and for equalization of differences in affordability from local resources.

The EU-Directives will certainly have further impacts on water pollution control policy in Hungary connected with the ongoing legal harmonization procedure.

The majority of the EU directives have been built into the new proposal on Hungarian water protection legislation. The Framework Directive on Water Resources, the Nitrate Directive and the EU new agricultural policy, the Directive on integrated pollution prevention will likely result in further development in the national water protection policy. These possible new elements are

- The existing area distribution of the water- and environmental administration should be altered to a certain extent according to the river basin approach.
- Use related water quality objectives would be developed
- The existing effluent standards should be revised
- Register of protected waters should be set up
- The existing in stream monitoring system should be developed by putting the stress on monitoring based on bio-indication
- Specific local monitoring should be built up on protected waters, with specific regard for vulnerable groundwater resources.
- Watershed water quality management action programs should be launched

- Specific action programs could be started in areas where the nitrate concentration is higher than 50 mg/l from agricultural sources, additionally to the ongoing national program on protection of vulnerable groundwater resources
- The surface areas of vulnerable underground drinking water resources will belong to the protection should have priority against agricultural activities. This could have considerably effect on the existing agricultural production profile, or agricultural State subsidy system
- The introduction of the IPPC approach will generally change the existing effluent standards in the industry. The step by step approach is needed on this field
- The combination of the IPPC and in stream water quality approach can result considerable reduction of pollution in surface waters

1.2.2. Preventive Measures for Water Pollution Reduction

Having recognized that the shortages in environmentally sound wastewater management central programs were launched to reduce the pollution load mostly coming from municipal sources. These are:

National wastewater collection and treatment program

was started for communities with the aim of reaching the 67% level of canalization for 2010. This program goes as two parallel subprograms as

- S*ewage treatment program of Hungary* for the smaller settlements and the
- *Sewage treatment program of the Capital and the cities with county status.* The basic reason for differentiation is the difference in the financial capabilities and necessary investment costs of the villages and big cities.

Separate programs were launched for the protection of existing and future well-field areas, as:

- *Program on increasing the security of well-field areas in use* and the
- *Program on increasing the security of future well-field areas*

The reason for differentiation is that the responsibility for the drinking water resources relies on the user of the resource, and the State is involved via the Sate grants only. In case of future water resources the total responsibility relies on the State today.

Program on municipal waste management

was started also, as the big problems were understood on the environment and the human health hazard connected to the lack of sound waste management.

1.2.3. Remedial Measures

Centrally organized programs were started connected with several sensitive areas where the level of water contamination exceeds the tolerable level, or it is likely exceed it without a counteraction.

These are:

- *Protection program on Lake Balaton*
- *Program on the great Hungarian Plain*
- *Program on increasing the water management conditions in the Mid-Danube-Tisza Region.*
- *Reduction of the environmental damages at Szigetköz region*
- *Program on environmental remediation of contaminated areas belonging to State responsibility*
- *Program on the rehabilitation of the abandoned old mines*

- *National Environmental Health Action Program*
- *Program on National Ecological Network*

These programs are mostly based on State grants, as the own contribution of the municipalities, or other responsible parties is not higher than 20-50 % generally. There is a co-operation between the mentioned programs, as the application for grant of a community on wastewater treatment has priority development when it can be found on a vulnerable well-field area for instance.

1.3. Expected Regional and Transboundary Effects of Actual and Planned Measures

The transboundary effects of the Hungarian pollution reduction measures are determinated by the fact that the rivers leaving the country transport the pollution coming from countries, which are in upstream position compared with Hungary. The other important factor is that these rivers have big self-purification capacities.

The municipal point source pollution is regarded as the major factor of transboundary pollution from Hungary. The amount of treated wastewater led into surface waters will increase with the development of wastewater collection. The level of organic matters and microbial pollution will likely be decreased considerably with the decrease of the rate of untreated water led into the recipient. The nutrient load will likely stagnate due to the increase of wastewater treated biologically only on one hand, and decrease of the untreated wastewater at the other.

The industrial point source pollution could be kept on the existing level due to two contradictory tendencies. The industrial production will increase likely, which can increase the industrial water uses. The effluent standards would be strictened according to the IPPC approach.

The hazardous material content of the rivers with transboundary interest can be kept on low level also with the introduction of IPPC concept.

The agricultural diffuse pollution is low today due to the limited fertilizer and other chemical use. The possible intensification of agricultural production can cause increase in diffuse pollution as the pollution reduction in agriculture can be managed in indirect way mostly so it needs more time to reach pollution reduction again. This tendency can lead to the temporary increase of the nutrient load of surface waters in Hungary.

Further effort should be taken for increasing safety of the wetland areas and water related ecosystems with transboundary interest, as these areas have kept their nature close character due to the limited land uses connected sometimes with the used to be political uncertainties. Today there is a likely consequence of the increasing international co-operation in areas close to the national borders that the risk of damages increases for these important natural conservation areas (or areas worth for natural conservation).

2. National Targets and Instruments for Reduction of Water Pollution

2.1. Actual State of and Foreseeable Trends in Water Management with Respect to Water Pollution Control

2.1.1. The Major Problems of Water Pollution in Hungary

Danube

As it can be seen from Part C of the National Reiews, the quality of the Hungarian waters can be characterized by the strong dependency on the upstream land uses and activities, home pollution loads from public, industrial and agricultural sector, and natural self purification capacity of the different surface waters as recipients.

Danube comes with the used waters of the population living on the watershed in Germany, Austria Czech and the Slovakia Republics. The water quality is usually in the III class according to the Hungarian water quality classification system. The parameters of the oxygen balance show a relatively good picture, the concentration of nutrients is in the middle range. The phosphorus concentration is regarded as limiting factor from the point of view of eutrophication. The average concentration is around 0,3 mg/l, what is tolerable in flowing water, but it can cause eutrophication problems in standing, or slowly flowing water bodies in oxbows in the Szigetköz, Ráckeve-Soroksár and Gemenc region.

The Szigetköz gravel terrace area is a very important drinking water resource that is in close connection with Danube, and sensitive to the background pollution coming from the different activities of the population living on the terrace also.

Gyõr town lies at the eastern end of the Szigetköz area, along the Hungarian-Slovakian border section of the river. The level of wastewater treatment is mechanical only today. The number of the population is 227,000. The increase of the capacity of the treatment, extension of the treatment technology with biological unit, and sludge management is regarded as high priority.

Budapest gets its drinking water from the bankfiltered water of the Szentendre and Csepel islands, at the bank of Danube. There has been built a drinking water supply system with about 1.2 million m^3/d capacity. The actual daily consumption has decreased to 650,000 m^3/d, due to the tendency of decrease the State subsidy in the drinking water fee (See chapter B also!). The well-field area is very sensitive to the water quality in the river, so the water quality objectives should reflect this important water use. The drinking water quality requirements can be fulfilled via chlorinating only in the Szentendre area today. Iron and manganese removal and activated carbon treatment is needed at the Csepel Island, due to the background contamination connected with the intensive land uses on the Island.

The Ráckeve-Soroksár oxbow is a recreational area near to Budapest. The neighborhood is a popular suburban area. A clear demand can be experienced for the use of this water body for bathing, water related sports and angling. The latter can be fulfilled generally without any water quality conflict. The water quality in the oxbow is basically determined by the fact that the phosphorus content of Danube generally reaches the 0.3 mg/l level in this section of the river. This concentration is high enough for alga blooms in summer conditions in this practically standing water. Additionally this oxbow is a recipient of the South Budapest wastewater treatment plant with the capacity of 70,000 m^3/d. The plant is being extended with an advanced treatment technological unit.

The level of wastewater treatment is about 20 % today at Budapest. As it was discussed in Part C, the untreated wastewater strongly influences the microbiological water quality of Danube. The parameters of oxygen balance are acceptable here due to the high selfpurification capacity of Danube.

Dunaujváros is an industrial town 80 km downstream from Budapest with 57,000 inhabitants. The industrial waters are properly treated, but the town does not have any public wastewater treatment facility today. The problem belongs to the high priority class according to the priority classification system described in Part C, but the effect of Budapest overwhelms the pollution from the town (i.e. the water quality is worst in the upstream monitoring section than in downstream to Dunaujváros, as an overall balance of the selfpurification capacity of the river and the pollution load from the town).

The Gemenc area belongs to the Danube-Dráva National Natural Conservation Park, due to the specific water related ecosystem found there. This area suffers not mainly from the water quality, but the water quantity problems. The upstream interferences into the natural flow characteristics of Danube caused important changes of the life conditions of the biota. It is known that the Austrian dam systems decreased the gravel transport of the river. Additionally, big gravel mining activity was allowed in Budapest area. Consequently, continuous deepening of the riverbed can be experienced. This procedure endangers not only the bankfiltration water resources at Budapest, but also the natural life conditions of the valuable water related ecosystem of Gemenc and the Danube-Dráva confluence.

Tisza River

Tisza comes to Hungary as a clean river from Ukraine, but it is strongly loaded with the pollution carried by the Szamos, Kraszna from Romania, and in some cases as accidental pollution of the Bodrog from Slovakia Republic and Ukraine. The quality of the river is worst from this point, compared with Danube. Alga booms can be experienced in strong and long hot weather condition in the backwaters of the Tiszalök and Kisköre dams. The high alga content can cause problems for the Balmazujváros and Szolnok area, as the surface water serves as raw water for drinking water supply in these regions.

The Sajó was another mayor pollutant of Tisza one decade ago, due to the strong industrial activities on the watershed in Hungary and Slovakia Republic both. The water quality has improved for today due to the economic recession and change of the industrial production profile. There can be a danger of new pollution increase when the economic development speeds up again.

The reservoir of the Kisköre dam has become a natural conservation area owing to the valuable water related ecosystem developed there. The reservoir can be characterized as a shallow lake, or even as five shallow lakes in strong interrelationship with Tisza flowing through. Conflicts emerge in several cases with the harmonization of the different interests, especially between the natural conservation requirements and tourist development plans. This conflict seems to be manageable on its today's level.

The lack of wastewater treatment in Szolnok, with its 76,000 persons' population is a high priority problem according to our ranking system. Details can be found in chapter B.

Maros comes into Tisza with high level of pollution mostly from Rumania increasing the pollution transport of the river considerably directly above Szeged town. This problem has a transboundary character, as only 15% of the river length is found in Hungary.

Szeged town is an another high priority pollution source with its 166,000 inhabitants and total lack of wastewater treatment (see chapter C also!).

The fact that the reservoir of the dam of Tiszabecse in Serbian Republic is directly below the Maros-Tisza confluence and Szeged town, increases the sensitivity of the water body there. Extreme water quality conditions are not unusual here at summer. This issue has a transboundary nature.

Big shallow lakes

The vulnerable big shallow lakes cause high priority water quality problems too. The lake Balaton as popular tourist area worth for international interest is endangered by eutrophication. Today the problem is in the middle of public and professional interest. The limiting factor of the nutrient balance is the phosphorus. Strong efforts have been done for decreasing its load into the Lake, but the results show limited success due to the buffer capacity of the sediment and the limited outflow of the Lake. A pollution reduction program is being organized with international help on the Lake Balaton watershed. The major bottleneck of the program is the big number of the interested parties in the action program and the diversity of their interest. As the bigger pollution reduction investment projects mostly have been solved by the State for today, the problems of the smaller background settlements has remained back.

Velence Lake is a popular tourist and recreational resort on halfway between the Balaton and Budapest. It suffered from water quality problems connected with the limited fresh water supply of the Lake. The situation became so serious in the last several dry years, that the State had to interfere, and finance the costs of artificial water supply. This problem could emerge again depending on the water conditions in the Lake Velence.

Big pollution sources with small recipients

There are very characteristic surface water problems in areas where big towns have recipients with limited dilution capacity. Chapter C discusses them in point 2.1. and Figure C 2.1. gives the reference for them, so we account them briefly as:

Town/polluter	Recipient
Sopron	Ikva creek
Veszprém Nike industrial plant Székesfehérvár	Séd-Nádor water system
Oroszlány Tatabánya Tata	Általér creek
Kaposvár	Kapos river
Pécs	Pécsi Víz creek
Eger	Eger creek
Nyiregyháza	Lónyai Canal
Kecskemét	Excess water canal

We can state that

- All of the polluters have their wastewater treatment plant.
- Some of them should be modernized as at Sopron, Veszprém, Székesfehérvár, Eger
- Others work according to the authority requirements.
- NIKE produces very strong hardly degradable wastewater, which causes considerable pollution load even after the treatment. The wastewater treatment plant works with fairly good efficiency, but it needs to be modernized.

It is also common that the recipients are strongly loaded by nutrients, due to their low dilution capacity, and they endanger the downstream water uses. The ongoing activity, when authority starts to set up water quality objectives for the recipient listed above, would likely lead to strictening the existing effluent quality standards.

Groundwater resources

Hungary gains 95% of its drinking water from groundwater as it was discussed in Part A. More than 65% of this water resources is vulnerable (i.e. more or less dependent on human activities). The safety of these groundwater resources is a number one priority issue on national level in Hungary. It is clear that the transboundary effects of groundwater contamination are limited. In spite of this fact we have to discuss two important issues in cross-border context.

- The bankfiltered water resources of the Szigetköz and Budapest area are sensitive for accidental pollution coming from home and foreign upstream sources both.
- The ancient gravel terrace of the Maros is an important vulnerable water resource. More than 60% of this natural underground unit belongs to Romania. Its importance is increased by the fact that the alternative deep layer water resources have unacceptably high natural arsenic content in the region.

2.1.2. The General Picture of Water Pollution in Hungary

The following basic statements can be done if we want to characterize the actual situation in Hungary in the field of water pollution.

Industry

The Hungarian water authorities were relatively successful in the field of industrial pollution reduction in the last 30 years, due to the fact that industry has became relatively independent from the State. The new economic mechanism was introduced in 1968, when the owner of industrial plants basically remained the State, the responsibility for supply the population with goods retained with the State. The industrial factories have became independent in their market activities, and responsible for the economic results of their activities at the other hand (i.e. the State was not directly responsible for industrial water pollution.)

There was no possibility for building a new industrial plant without water treatment plant from that time. The authority was free for setting up effluent requirements according to its professional judgement, and build up point source pollution control systems at the existing industrial plants also. As a consequence today all the industrial factories have their own wastewater treatment or pre-treatment facilities. (Pre-treatment is needed when a factory is connected to public sewer.)

We can state that these facilities are not always good enough according to the existing pollution load, effluent requirements, etc., but the basic elements of the treatment technology exist usually. Perhaps we are not wrong when stating that water protection administration was relatively successful in the field of industrial pollution reduction.

The political and economical changes have given dramatic changes in the industrial profile and in the circumstances of pollution reduction also by the beginning of the nineties.

- The market of the industry changed as the used to be Soviet market practically collapsed owing to the financial problems in these countries.
- The big industrial centers were not able to accommodate themselves to the western market immediately, so they found themselves in economic crisis from one day to the other.
- The State was not able to rebuild the industry from the existing financing sources. Privatization started, what changed the product profile, the technology, working discipline in the old factories.
- It was another consequence of the privatization that the big factories dismantled into small limited companies. The changes of ownership were not always properly tracked by the environmental authority. The responsibility for water pollution can sometimes be lost easily along these rapid changes.
- All the Hungarian licensing procedure was build up with regard to big new industrial development projects, and to a smaller extent considering the possible changes inside existing plants. The legislative tools were not efficient enough for managing this situation. (As an example: the cultural building with theatre room of a big company was sold to a limited company, and they used the building as a pesticide storehouse for years, without any co-operation with the authorities.)
- Some big heavy industrial plants were not able to survive even via privatization. They had to stop their activities. The pollution decreased on one hand, but a new danger of contamination has emerged from the abandoned, corroded, not properly guarded facilities.
- The new industrial plants usually start their activity with good willingness to accept environmental regulation, especially when the majority owner is a big international company.

As a general consequence of the changes of industry the pollution decreased from industrial sources, but increased the risk of big environmental pollution incidents due to the lower level efficiency of water pollution control.

Municipal sector

The level of wastewater collection and treatment remained much behind the municipal water supply as it was described in Part A. This situation is a result of a contradictory development tendency that began on one hand with the old ages, when the need of wastewater treatment was not completely understood even in the case of big cities. On the other hand in the middle of fifties political decision was adopted to increase the life conditions of the population by launching waste housing programs. Easy loans were available with the requirement of bathroom in the houses. The housing program was accompanied with public water supply, but not with wastewater collection due to the high cost consequences. The increased water consumption resulted in bigger amount of wastewater infiltration, so the nitrate content of the remained individual wells settled on the shallow groundwater had become unacceptably high. This effect speeded up the public water supply too.

The unsustainable situation had become clear by the beginning of the eighties, and a decision was adopted what was very characteristic for that political system. The new houses could get the licenses for use only when proving the existence of closed wastewater storage tanks. Thousands of theoretically closed storage tanks were built at that time without any control capacity by the side of the licensing authority. The level of canalization remained behind the public water supply. The pollution of shallow groundwater was not a priority issue due to the usually good possibilities for good quality drinking water production from the deeper layers. In case, when the water resources were not so advantageous, long distance utility systems (so called regional systems) were built with no regard for the economic consequences of these types of solutions.

The costs of water production were strongly subsidized so the low cost drinking water production was not an important issue for the population. Wastewater collection was important for them only in case where there were no proper soil conditions or high level of the groundwater table hindered the wastewater infiltration. The results of these tendencies were shown in Part A, as the utility gap of 95% public water supply was compared with 43% wastewater collection.

It should be added that the phenomena of the so called utility gap have a misleading meaning, expressing inclusive a long term goal for 100 % canalization. The long-term target is 67 % wastewater collection according to the National Masterplan on Wastewater Management, and the remaining part of the population will manage their wastewater by environmentally sound individual facilities.

Agriculture

Distinction should be made when examining agricultural pollution, depending on the type of sources. The agricultural point sources are generally handled as it was described in the case of industrial sources. The authorities have the legislative tools and administrative capacities for controlling them.

There is no available statistical data on diffuse pollution from agriculture in Hungary. The drastic changes in ownership, State subsidy policy and market conditions connected with the political changes have resulted in uncontrollable situation in this sector these days. The most important tendencies of changes in the agriculture are as follows:

- The majority of the former co-operatives was turned into small privately owned agricultural lands via the compensation procedure, usually with a smaller land size than it would be necessary for economic cultivation, or to give a sound financial basis for a family. A tendency can be experienced nowadays as the former co-operative having turned into a share holding company rents the land from the new owners. The uncertainties of the ownership do not give good basis for investment programs. The lack of capital in agriculture is very characteristic. Loans are available, but the owner can not give enough guaranties. The high level of inflation (15 %/a in 1998) is disadvantageous for long term investments.
- The relatively high level of fertilizer utilization (400 kg/ha) in the eighties has dropped down to 40 kg/ha, as a consequence of the decrease of the State subsidy in agriculture. The same refers to other agrochemicals (pesticides herbicides) also.
- The rate of irrigated land has dropped down due to the lack of State subsidy also and the weak possibilities for investment into new irrigation machinery.
- The big animal farms with water dilution manure handling technologies having developed in the last decade mostly stopped their activities in connection with financial problems. The number of pigs and cows has dropped down to about half of the maximum level.

These tendencies resulted in big decrease in agricultural water pollution. There are some other factors, which have increased the risk of water pollution in agriculture:

- Small private animal farms appeared around the villages with not bigger capacity than 100 animals, without any license for their activity. The regional environmental authorities are not able to control them. The local environmental control is very weak owing to the limited administrative capacities, and certain counter interest can be experienced sometimes as local government is interested in short term economic development. It is not unusual that they use water feedlot cleaning technologies causing definite risk for drinking groundwater resources, or smaller creeks and canals.

- The soil amelioration activities has dropped dramatically due to lack of long term interest in soil protection, unsecured ownership conditions, shortages of personal knowledge, lack of State subsidy.
- The condition of the excess water collection canal systems is very poor today. This issue was very important in the Hungarian agriculture one hundred years ago as about 25 % of arable land areas is below the flood level with 1 % probability. Originally local water associations organized from the owners were responsible for their maintenance, but the bigger part of responsibility was taken away by the State later. The new owners do not really feel the importance of these drainage systems especially having the experiences of the several last dry years only.

The figures available on non point agricultural water pollution are estimations mostly based on literature, adaptation of other countries experiences, or by comparison of the total pollution load of the river and the amount of pollution load from the known point sources. There is an agreement among the involved parties that the importance of non point source pollution increases with the development of wastewater collection and treatment in other sectors. This statement is extremely important on the watersheds of the big shallow lakes. As an example it is estimated that 70 % of the total phosphorus load reaching Lake Balaton from the Zala watershed (about 30 % of the total Lake basin) is originated from agricultural diffuse sources.

2.2. National Targets for Water Pollution Reduction

The Hungarian National Environmental Program has general guidelines for water pollution reduction, as it was introduced in Part A, point 7.1.

- Danube should reach the Class III level, according to the MSZ 12749 water quality standard, regarding hazardous materials and microbiological parameters,
- Tisza should reach the Class III level in all parameters,
- The big lakes should reach the Class II level, and Chlorophyll-a should be less than 75 mg/m^3,
- The increase of salt and toxic material content should be stopped in irrigation waters. The limits of salty wastewater led to understanding that recipients should be strictened further.

These basic targets have not been turned into ambient water quality standards for the touched watercourses yet. As a consequence the effluent quality standards do not fully reflects the requirements coming from the national targets.

The safety of groundwater resources is also a number one national environmental issue. The basic targets of the National Environmental Plan are as follows:

- Measures should be taken for the sustainable use of available resources with on site disposal and higher recycling of purified used waters.
- The water balance between the use of groundwater and natural replenishment should be improved with better control of the water uses and other measures on areas with sinking groundwater table. The existing pressure decrease should be stopped by moderation of the exploitation of groundwater resources.
- The harm on vulnerable ground water resources should be decreased by better control of land uses and environmental conditions on the surface.
- The pollution of nitrate and pesticides from diffuse sources should be decreased.
- Special attention should be afforded for regions where the natural water quality (i.e. natural Arsenic content) of the drinking water exceeds the limits of the WHO Standard.

The programs attached to these targets are described in Parts A and B. As it can be seen three national wastewater collection and treatment program have been launched for communities, and a special one for big cities. Separate programs are elaborated for the protection of well-field areas. These programs are mostly based on State grants, as the own contribution of the municipalities is not higher than 20 -30 % generally. There are specific programs on several sensitive areas as Lake Balaton watershed, Szigetköz area, Great Hungarian Plain fully, or partly concentrated on water management issues. The other group of national programs is targeted on important environmental issues as the management of the environmental problems left behind by the used to be State owned factories, or Russian troops, decrease of the risk of municipal waste disposal, etc. These programs are fully counted and described in Part A and B.

2.3. Technical Regulations and Guidelines

2.3.1. Effluent Standards

The concentration limits fixed in the 3/1984 Governmental Decree on effluent discharge fines are regarded as effluent standards in Hungary. There are six categories differentiated in the Decree depending on the sensitivity of the recipient and the interest on the water uses. As the system was set up fifteen years ago, it can not fully serve the today's needs. There are proposals for its further development. The decree is introduced in Annex B.1 (ref.11.)

The regulation gives the possibility for setting up specific individual effluent standards depending on local conditions. Basically this possibility could give a good flexibility for the system. The problem is that the environmental authorities should be very cautious with this tool, because they are not always able to defend their decision in the case of an appeal, as there are no obligatory in stream water quality standards, or obligatory water quality targets in Hungary today. As a consequence, this possibility is used mostly not for strictening, but for loosening the standards written in the Decree.

The major problems with the regulation are in connection with the changes of importance of the water uses to be saved. There are area categories where the requirements are not strong enough compared with the basic environmental needs. The closed list of contaminant parameters in the Decree (i.e. in the case when a new chemical appears in the water body, the authority has limited possibility for fining.) can not give enough room for local considerations.

The Ministry for Environment has the opinion that the effluent standard and fining system should be differentiated in near future. The new effluent standard system should reflect the needs of the water quality target in the recipient on one hand, and the requirements of BATNEEC, or BAT depending on the type of pollution on the other.

2.3.2. Monitoring

The ambient water quality monitoring system is described in Part C, so we introduce here the Hungarian effluent monitoring system.

The effluent water quality control is based on the Governmental Decree on wastewater fine mentioned before. Consequently the effluent monitoring is connected to that Decree also. The laboratories of the regional environmental authorities check the effluent water quality from two to four times in a year, in the framework of a legal procedure. The sampling is normally carried out together with the water polluter as a part of the legal procedure. The sample is divided into two parts and shared. The polluter has the right for doing parallel analyses and to use the results in the case of a possible appeal.

There is possibility for self-monitoring on the basis of agreement with the environmental authority in case of having proper laboratory and professional basis. The big municipal wastewater companies commonly use this self-monitoring as they are prepared for these type of laboratory tests, in connection with the task of controlling the industrial and business companies connected to their sewer systems.

The environmental and self-monitoring laboratories belong to an analytical inter-calibration system, and some of them have been accredited according to the ISO requirements too.

There used to be uncertainties whether the data gained in the effluent monitoring procedure is open for the public or belongs to the polluter's privacy, and the polluter can decide on their use outside the legal procedure. The Ministry for environment has stated in February 1998 that these data are information with public interest on the state of environment, so they should be open and free for the public without proving any direct interest for having them. The environmental authorities are the so-called data owners, and hey are allowed to get the costs of multiplication only (Xerox, etc.).

There is a general agreement among the interested experts that the existing monitoring system is too weak compared with the professional needs. The limited number and reliability of the effluent monitoring data give the major bottleneck of the water quality planning procedures in Hungary. The major problems are:

- The 2-4 samples in a year can not give realistic picture on the pollution load from the given source.
- As the sampling goes with the co-operation of the polluter it is not impossible that he can do some measures inside the factory for improving the water quality temporarily in the time of sampling. Sometimes it is not too easy to find strong correlation between the measured effluent quality and the figures calculated from the pollution load change upstream and downstream to the point source pollution.

The proposals of development on effluent monitoring suggest to the Ministry for Environment that the self monitoring could be obligatory for the bigger polluters, the minimum number of sampling would be 12 up to 52 in a year. The existing capacity of the environmental laboratories would be maintained for controlling the self monitoring system, and serve the legal procedure described before.

2.3.3. In Stream Water Quality Standards

The National Standard of MSz 12 749 gives the general basis for classification of surface waters according their quality. This standard was introduced in Annex 1 of Part B. The evaluation guidelines give figures for "general" water quality taking into consideration the requirements of the important water uses in Hungary. The evaluation based on this guideline is proper for giving information for the decision-makers, but there is no legal obligation for reaching some water quality targets expressed in certain quality classes.

2.4. Expected Impacts of EU-Directives to Water Pollution Control

The majority of the EU directives have been built into the new proposal on Hungarian water protection legislation. The Urban Wastewater Directive was taken into consideration in the National Masterplan on Wastewater Management also. There are some other EU regulations which are expected to result further development in the national water protection policy. These are the Framework Directive on Water Resources, the Nitrate Directive, the EU new agricultural policy, the Directive on integrated pollution prevention.

The Framework Directive

The requirements of the Directive were integrated into the proposal on the development of the Hungarian water legislation described before. The basic goal was to avoid any contradiction with the EU Directive at that time. There remained some issue, which should be considered also.

- The existing area distribution of the water- and environmental administration does not follow consequently the river basin approach. Changes are not unlikely in the district areas of the regional water authorities.
- The "good water quality" has not been defined on the water bodies. Use related water quality objectives would be developed. This procedure would lead to the water quality target systems with obligatory legal force. As a consequence all the existing effluent standards should be revised.
- Reliable inventory should be developed and maintained on the emission sources causing harm for the water environment.
- The Register of protected waters should be set up according to the EU Directive that includes the groundwater resources, habitat of species with economic importance, recreational waters, bathing waters, water bodies sensitive for eutrophication, environmentally valuable water related biotops.
- The existing in stream monitoring system should be developed according to the attachment of the Directive. The existing chemistry oriented monitoring system should be altered to be closer to hidrobiology. This monitoring should be developed also in order to support the catchment planning procedure. Specific local monitoring should be built up on protected waters, with specific regard for vulnerable groundwater resources.
- The water protection would be based on watershed action programs. The actions, responsible parties, deadlines are to be fixed there. It can not be seen clearly now, who could be the responsible party in Hungary, as about 80 % of the water protection investment costs are born by the State now. We are willing to see the existing water protection programs as additional sector programs to the catchment management programs that should be developed.

The Nitrate Directive

This Directive requires specific action programs in areas where the nitrate concentration is higher than 50 mg/l from agricultural sources, in harmony with the EU framework directive. The examination of this Directive has just started in Hungary. The national legislation gives first priority to preventive protection of the vulnerable groundwater resources independently form their today's level of nitrate pollution. Decision is needed on the sensitive areas in Hungary according to the context of the Nitrate Directive. It seems to be likely that the protection of Hungarian drinking water resources needs stricter regulation compared with the EU Directive, and the existing care on groundwater in other areas should be increased further.

Harmonization with the EU agricultural policy

The agricultural activity is categorized into three groups as intensive, extensive and protection oriented activity according to EU guidelines. The designation of these categories has not happened yet in Hungary. It seems to be likely that the supply areas of the vulnerable underground drinking water resources will belong to the protection zones, where environmental protection should have priority against agricultural activities. This categorization could have considerably effect on the existing agricultural production profile, or on State subsidy system.

Introduction of the Directive on Integrated Pollution Prevention Concept

The industry is controlled according to the existing wastewater fine decree as it was described before. This decree relies on the end of pipe concept, affording minimal care to the procedures inside the factory. The introduction of the IPPC approach will likely completely change the existing situation. It seems to be likely that its adaptation can be done on a step by step approach.

The combination of the IPPC and in stream water quality approach can give the necessary level of protection for the Hungarian surface waters, and results in considerable reduction of pollution load reaching the surface waters from the industry.

2.5. Law and Practice on Water Pollution Control

2.5.1. Licensing

The activity of the water user should be based on water licenses in Hungary. A detailed documentation is needed for the license for construction to show the aim of the water use, the planned technology, where the water is needed, the effluent quantity, planned wastewater treatment technology, proposed effluent quality standards, the suggested recipient and all the other important facts what are relevant for decision making.

The licensing authority is the regional water directorate. All the interested other authorities have their role in the procedure. They give their statement what should be taken into consideration obligatorily by the water authority. The regional environmental authority gives the effluent quality standards for instance.

The investment program will follow the license strictly, or the license must be modified in the case of emerging new facts, or changes in the investment program. The license is valid for undecided time according to Hungarian law, but the licensing authority has the right for revision on water management-, or environmental ground. Compensation is possible when the change is done for the advantage of one other water user. There is no compensation when the change was a consequence of environmental needs.

Environmental impact assessment is obligatory for a specific list of activities by law (i.e. wastewater treatment plant with bigger capacity than 5000 m^3/d). The results of this procedure are settled down in an environmental permit.

There are small local objects as septage tanks and wells on shallow groundwater, which are not deeper than 30 m for individual use of the inhabitants that is subject of licenses given by the local government. The enforcement of this regulation is weak, due to the limited professional and enforcement capacity of these local authorities.

2.5.2. Enforcement Tools

The environmental and water authorities have several enforcement tools for controlling the activities of the water users, or polluters. These are the wastewater fine, the possibility for occasional general environmental check-up, environmental supervision and action program connected to that, stopping the questioned activity partly, or totally. We describe in this chapter these legal tools in more detail for the better understanding.

Wastewater Fine

We have mentioned that the 3/1984 Governmental Decree on the wastewater fine gives the possibility for fining the wastewater discharger in case of exceeding concentration of certain materials settled down in the water license. The fine comes from the pollution load calculated on the basis of the part of measured concentration, which is above the effluent limits in different parameters and the water quantity. The good estimation of water quantity is not always easy, as there hardly can be found measurement units at the wastewater outlet in Hungary. Consequently the estimation goes on the basis of water consumption, which is usually measured. The decree gives a multiplication factor from 0,1 up to 2,5 expressing the environmental interest on pollution reduction, harm caused by excess pollution. There is another multiplication factor, the so called “progressivity multiplier” which depends on the length of illegal situation (in years).

The driving force of the wastewater fine is limited due to the fact that the fine has never been comparable with the costs of pollution reduction. The bigger part of the collected money supports the Central Environmental Fund, the other 30% gives financial support for the touched local government (but without any obligation for using the money on water pollution related issues).

General Environmental Check-up

The environmental authorities have the right for launching complex environmental check-up in their jurisdiction. This thorough on spot examination covers all mediums and all fields of activities. The results of these actions are written into protocols, where the necessary measures and deadlines are usually fixed in the form of an action program.

Environmental Supervision

This tool is usually used when the general check-up mentioned before shows the probability of uttered danger on the environment. The environmental authorities have the right to oblige the “users of the environment” for contracting from they own financial source with accredited auditor companies. Detailed examinations come usually in these cases, where the real extent of pollution is investigated by drilling, sampling, analytical work and calculated mass balances.

The result of the accepted report is usually a remediation action program. This program is financed by the polluter with the control of the environmental authority, or that of the entitled auditor consultant. Financial help is available from the Central Environmental Fund on application basis.

This relatively new tool has came from the Environmental Bill in 1995. Its efficient use is hindered now by the lack of detailed regulation on some connected issues. It is not clear for instance, what should happen with a polluter who neglects to hire the auditor on the ground, that he has not enough financial source for the audit. Whether the pollution action program should be implemented when there is no any environmental grant for helping it.

Stopping the questioned activity

The environmental authority has the right to shut down partly, or totally the activity, which causes a proven danger for the environment, and the responsible polluter does not show enough capability, or willingness to implement the necessary countermeasures.

This tool can be used in extreme cases only, with special regard for the fact that in the case when the polluter loses its financial capacity in connection with the environmental burden and goes into bankruptcy the pollution remains back for the State at the very end of the procedure.

2.5.3. Development of the Water Legislation in Hungary

As it was mentioned the existing legal framework fails to address the problems of water protection properly. There is an ongoing procedure for the development of the national water legislation. MERP and MTTCWM adopted the concept in principle. The legal proposal is introduced in Annexes, so we give only a short summary here.

The basic element for water quality management and regulation is the river basin according to the proposed new water legislation. The new legislation targeted the application of the world-wide experiences of integrated river basin management to Hungarian circumstances.

The basic aims are to secure the institutional background for avoiding the deterioration of the receiving water qualities, determination of the desired water quality improvements, incorporation of the EC Directives, the development of a sustainable water quality protection strategy, specification of required effluent quality through a system of individual, time related discharge permits, effective enforcement to ensure permit compliance. Additionally a proposal was needed for a more efficient system of revenue collection for water pollution investments and for financing partly water protection control activities.

The basic elements of the water quality management system can be summarized as

- Use related Water Quality Objectives (WQO), depending on the characteristic land uses and their water quality needs on the watershed. The WQO-s should be harmonized with EC Directives,
- Clear transition of WQO-s into discharge standards,
- Prioritized, phased, achievable, affordable water quality management programs on watershed level, built up from local community wastewater management plans,
- Ownership for the objectives and improvement plans,
- Clear responsibilities and accountabilities,
- Efficient permitting and enforcement,
- Sound monitoring and reporting system,
- Simple, clear, efficient funding and charging systems,
- Adequate and technically competent staff for water pollution control,
- Legal framework to be given for the authority to provide and operate the system.

New institutional machinery is necessary to be developed what is capable to define the catchment management plans. The crucial element of the process outlined before the full local involvement so that the objectives and plans should be “owned” by the communities, industries, water users etc. affected by any resulting proposals. Catchment Planning Commissions would be established as new bodies having the responsibility on the implementation of the action plans for reaching the objectives for each catchment area. The financial basis of their activity would be a part of the water discharge fee collected in the watershed, and resources having won from the central funds by application.

These Commissions would be established by the responsible ministry, and accountable also to this Ministry. They would be responsible for setting up locally agreed WQO-s, for development management plans, preparation of annual reports on the progress of the local wastewater management plans. The Commission could work as a board drawn from representatives of all parties interested in water quality management. The responsibility of the Commission covers water quantity and quality issues both, in order to provide an integrated approach to water resources management according to the EC Water Resources Framework Directive.

It was experienced that the level of responsibility to be delegated to the Commissions is a sensitive issue for the existing administrative bodies, so the legal proposals limited themselves for the proposition of a partial river basin approach. It seemed to be unrealistic to follow strictly the full institutional consequences of the river basin approach immediately, it can be reached on a step by step approach in the future. As a consequence three regional environmental- and water authorities could help these associations with coordinative work and control the results of their activities in their authority jurisdiction.

The Environmental Charge would provide an assured revenue stream on a consistent basis. This charge would be levied on all dischargers according to the pollutant input allowed in their permits (giving possibility for them to apply for the decrease of their effluent standards when they want it). The real effluent load could be calculated on the results of self-monitoring. The environmental charge should cover the administrative costs of water quality management including the costs of the activity of regional water authorities, the Catchment Management Commissions. It could raise revenues for funding water protection investment programmes also.

It should be emphasized that water quality protection could not be managed without substantial contribution of the State. The State fund is needed for speeding up the pollution reduction programmes, for equalization of differences in affordability from local resources. The State funding philosophy should be based on the National Action Programme for Wastewater management, which is part of the National Environmental Programme. The subsidy mechanism should have a clear, auditable decision procedure with close monetary control.

3. Actual and Planned Projects and Policy Measures for Reduction of Water Pollution

3.1. Non-Physical Projects

As we described before clear concepts exist on the needs and directions of the development of legislative background of water protection in Hungary in connection with the economic and political changes and the requirements of the EU harmonization. We can describe this activity as the implementation of a well-defined non-physical programme on water quality protection.

There is a possible necessary non-physical project to accommodate the institutional administrative and financing structure to the new water legislation. It can be felt that the goals in this area are defined with much more little clarity.

Project proposal is available on the development of the national in stream monitoring system, prepared with the help of PHARE. This concept was prepared before the availability of the Draft EU Framework Directive, and the appearance of watershed management plans was not clear at the time of monitoring concept preparation. The further development of the proposal on surface water monitoring is necessary with regard the EU Framework Directive.

Other non-physical projects could be necessary for increasing local and regional awareness on water management issues. The watershed planning activity needs the real involvement of the different interest groups on the watershed. That is a common experience that the local interest hardly goes beyond the level of the drinking water fee today. It seems to be not unlikely that the professional capacities available locally will give the limiting factor in organizing the Watershed Planning Associations mentioned before.

The described non-physical projects are on the level of proposal today. A general water quality management strategy could put these projects under one umbrella.

3.2. Physical Activities for Water Pollution Reduction

There are different central programs on water pollution reduction in Hungary. Their targets are mostly well defined and differentiated, but they are not always strictly defined regarding their technical content and financial consequences. These programs are described in the chapter 7.1. of Part A. We try to explain their background instead of repeating them.

Generally we can find hot spots where there are intensive, hazardous activities in sensitive, vulnerable areas. We can describe them as

- hot areas, where the sensitivity of the water environment is high. These are the well-field areas of the vulnerable groundwater resources, catchment areas of the big shallow lakes, watercourses with high pollution load and small self-purification capacity.
- hot sectors where the level of water pollution reduction is well behind the acceptable level or the shortage of good management gives a considerable risk on water pollution. The public sector can be identified as a major hot sector, and the agriculture to a certain extent.

We have chosen the pollution sources to be included into the group where project files would be prepared from the list of national hot spots, where transboundary impact is possible. We call them as "very hot spots." It should be noted that the real transboundary harm should be proved later on some way of modeling, etc. The map showing these possible very hot spots can be seen as figure 2.2. in Part C.

The Hungarian central programs work basically on application basis. It means that the technical content is not defined, only the systems of priorities are fixed. The responsibility of the implementation relies on the applicant. The authority cannot oblige the polluter for application for the grant, but he can increase the interest via indirect interference. In case of deciding on the grant allocation the connection of the applicants with the hot areas and hot sectors are weighted in the judgement.

3.2.1. Reduction of Water Pollution from Municipalities

It is recognized that the shortages in sound wastewater management central programs were launched to reduce the pollution load mostly coming from municipal sources.

The national wastewater collection and treatment program is based on the National Masterplan on Wastewater Management. This program was launched for communities with the aim of reaching the 67% level of canalization for 2010. This program goes as two parallel subprograms as

- S*ewage treatment program of Hungary* for the smaller settlements and the
- *Sewage treatment program of the Capital and the cities with county status,*

There are some basic reasons for this differentiation. The financial capabilities of the smaller settlement are lower, so higher rate of State grant seems to be needed in order to start a sanitation program compared with the big towns. The investment capital need of the big cities is so high that even with a lower grant rate, they could dramatically decrease the possibilities of the smaller settlements in case of their joint management.

Separate programs were launched for the protection of existing and future well field areas, as:

- *Program on increasing the security of well field areas in use* and the
- *Program on increasing the security of future well field areas*

The reason for differentiation between these programs is that the responsibility for the drinking water resources in use relies on the user of the resource directly, and the State is involved via the sate grants only. In case there is no users of future water resources, the total responsibility relies on the state. These programs basically focuses on the diagnostical issues (i.e. to examine the existing and necessary level of information on the security of these well field areas, identification of pollution sources, the actions to be taken). The actions themselves are intended to be implemented from the sources of the different central funds in a latter step.

P*rogram on municipal waste management* was started also, as the big problems were understood on the environment and the human health hazard in the municipal sector, due to the lack of sound waste management. This program touches mostly the groundwater pollution reduction.

Table 3.1.-1: Summary of Recommended Projects for Municipal Hot Spots

Hot Spot Name, River & Location	Parameters & Values which Define the Problem	Ranking of the Problem	Name & Type of Project	Project Strategy & Targets	Parameters & Values which Define Project Benefits	Project Beneficiaries
Budapest Danube	Population:1886 000 p Sewerage: 90 % ww: 700 0000 m^3/d	Very high	North Budapest WWTP	Increase the capacity and treatment efficiency	200 000 m^3/d COD: 93 mg/l P: 4 mg/l	Population living downstream on the Danube
Budapest, Danube	Population:1886 000 p Sewerage: 90 % ww: 700 000 m^3/d	Very high	South Pest WWTP	Increase the capacity and treatment efficiency	120 000 m^3/d N, P removal	Water users downstream, Recreational area at RSD oxbow
Győr Danube	Population:127 000 p Sewerage: 88 % ww: 37 300 m^3/d	Very high	Győr Municipal WWTP	Increase the capacity and treatment efficiency, sludge management	80 000 m^3/d	Inhabitants of the town and neighboring settlements
Dunaujváros Danube	Population:57 000 p Sewerage: 96 % ww: 6 200 m^3/d	Very high	Dunaujváros Municipal WWTP	Build new WWTP	15 000 m^3/d Conventional biological treatment	Population living downstream on the Danube
Szolnok Tisza	Population:78 000 p Sewerage: 96 % ww: 13 700 m^3/d	Very high	Szolnok town sewer development	Extension of the sewer system	Build 25 km new sewer, with house connections	Inhabitants living on the unsewered areas in Szolnok
Szeged Tisza	Population:166 000 p Sewerage: 67 % ww34 700 m^3/d	Very high	Szeged Municipal WWTP	Build new WWTP	60 000 m^3/d sludge line: 4 000 m^3/d	Population living downstream on the Tisza

3.2.2. Reduction of Water Pollution from Agriculture

Prevention of Pollution from Agricultural Point Sources

The actions on water pollution reduction from agricultural point sources belong to the same categories with industrial point sources in Hungary. They are handled with usual authority tools. The owner of the pollution source is responsible for the effluent quality. He can give application for State grant form different central funds for the development of pollution reduction facilities. The applicant and the project will likely be judged as it was with an industrial project. There are no defined central agricultural point source pollution projects in Hungary now. The possible reason is likely in connection with the transition nature of agriculture and uncertainties connected with it. The idea of good agricultural practice is known, but it has not been built in into the Hungarian water pollution control policy. Further development is needed in this field, which covers the area of

- construction of storage tanks for liquid manure;
- correct use of manure according to capability of vegetation and cultivated land;
- agro-technical measures like improved live-stock practices;
- collection of effluents from storage of silageamong others.

It seems to be likely that a non-physical project would be useful for the clear definition of an agricultural point source pollution reduction program, and its implementation.

Prevention of Pollution from Agricultural Non-Point Sources

The level of pollution from agricultural non-point sources has decreased dramatically with the changes of the Hungarian agricultural profile. The fertilizer and pesticide use propped down to 10 % of the maximum level due to the decrease of the State subsidies on their use. The majority of the big animal farms were stopped due to economic reasons.

The relative importance of agricultural non-point source pollution reduction is increasing again today in Hungary, especially in the watersheds of the big shallow lakes, and in catchment areas of small creeks with intensive land uses. Our knowledge is limited on the real level of pollution load due to the weaknesses of the monitoring system and owing to the complexity of the problem itself.

We have not identified yet specific geographical areas (agro-ecological zones) and projects and policy measures that respond to different forms of agricultural non point source pollution. A separate program seems to be necessary to turn the invaluable, excess water endangered agricultural territories into forest in harmony with the ecological corridor and water related ecosystem protection programs of the national nature conservation agencies.

The pesticide use is on so low level that it would not be easy to reduce it further. Measures would be needed to prevent the unnecessary increase of use in future. The use of Lindane, DDT and other persistent pesticides, insecticides is prohibited in Hungary.

There is a central fund with the aim of helping arable land amelioration and erosion control. It works on application basis also. Direct program on erosion control with well-defined technical content does not exist in Hungary.

The idea of strengthening institutional capacities of agricultural pollution reduction exists in Hungary. It worked efficiently in the form of regional institutions for soil protection and pesticide control when the big co-operatives existed. These agencies have limited capacities today and they were not always able to accommodate themselves to the new changes in the ownership structure. The concept on organic farming and low input agriculture is known in Hungary. There are pilot areas for demonstration of the environmental advantages of the idea. The widening of the activity is hindered to an extent due to the shortage of economically feasible examples in Hungary.

Due to the facts mentioned before the expert team of the project came to the conclusion that there are no significant pollution sources with international possible effects in the agricultural sector in Hungary, so we have not proposed agricultural project to be included to the hot spot list.

Reduction of Water Pollution through Improved Land Management

There are centrally organized programs connected with several sensitive areas where the water contamination exceeds the tolerable level, or it is likely will exceed it without a counteraction. These programs concentrate on general environmental remedial measures, physical development of the region, and water protection has usually a separate, but important role in them. These programs are discussed in 7.1. chapter of Part A so we count them here only.

Protection program on Lake Balaton covers all field of environmental protection on the watershed. The major attention is paid for water pollution reduction. Wetlands are proposed there for diffuse source pollution control especially for runoff control in inner areas of the settlements and from agricultural lands.

Program on the great Hungarian Plain is a general environmental and physical development program. The protection of the oxbows of the Tisza River has specific importance there.

Program on increasing the water management conditions in the Mid-Danube-Tisza Region focuses on the water quantity issues mostly, but its implementation could serve water quality goals also.

Reduction of the environmental damages at Szigetköz region

One basic aim of this program to protect the water related ecosystems endangered by the Bős-Nagymaros dam system implemented partly and stopped later in connection with increased environmental risk. The program is strongly related with nature close river management.

Program on environmental remediation of contaminated areas belonging to State responsibility.

This program does not deal directly with surface water related issues. Priority is given to those remediation projects where groundwater or sensitive surface water is endangered.

Program on the rehabilitation of the abandoned old mines

This program focuses on old mine pit areas where the responsible person for their rehabilitation can not be found. The majority of these degraded areas are partly covered with water. The goal of the rehabilitation in most cases is to develop the area into a nature close wetland with considerable nature conservation and tourist value.

National Environmental Health Action Program

This program is in connection with healthy drinking water supply, and has some connection with the safety of water related ecosystems.

Program on National Ecological Network

This program will likely be in close connection with surface water protection later. In the firs phase the inventory of the valuable water related biotops were set up. Their condition is far from the required mostly. Some of them are especially endangered from the intensive land uses. Special attention could be afforded towards the wetland areas near to the border territories of the country. These areas were in relative safety due to the political uncertainties in the border regions. This situation has altered with the political changes and the danger of their destroy has increased.

These programs are mostly based on State grants, as the own contribution of the municipalities, or other responsible parties is not higher than 20 -50 % generally. There is a co-operation between the mentioned programs, as for instance the application for grant of a community on wastewater treatment development has priority when it can be found on a vulnerable well-field area.

The Hungarian national workshop on target oriented program management organized in the frame of this project came to the conclusion that there are important issues on the field of protection water, and water related ecosystems what can not be counted to one sector only as industry or municipalities. An example was discussed in detail as the rehabilitation of the wetland area at the Danube-Drava confluence and its neighborhood. This so-called "multisectoral" project is in connection with river management, water pollution reduction, natural conservation, agriculture and international co-operation, as the area belongs partly to Hungary and Croatia. There was a conclusion of the workshop, that this project proposal should be included into the group of hot spots with international importance.

3.3. Reduction of Water Pollution from Industries

As it was mentioned the pollution reduction of the industrial sector is acceptable compared with other sectors in spite of the fact that about 80 % of the controlled industrial plants exceed the effluent requirement in one parameter as a minimum. State grant is available for the non-compliant factories for further development on application basis. The interest of the industrial plants is not too high for these grants due to the low driving force of the Hungarian water pollution reduction enforcement system. It seems to be likely that a specific program should be launched in connection with the introduction of BATNEEC and BAT into the Hungarian water protection policy. The legal tool of the so-called technological effluent standard system is under development now.

There are no specific targeted national programs on the field of industrial water protection in Hungary today. The responsible regional environmental authority handles industrial water users individually with the existing administrative tools. The authority usually launches a complex environmental check-up in the case of exceeding significantly the effluent standards. The usual result is an action program prepared by the polluter and adopted by the authority. The authority checks not only the effluent quality, but the implementation of the action program also. The polluter can apply for grant or loan from the central funds, and it is not unusual that he gets a grace period on fining to allow him to afford more sources on pollution abatement.

The industrial WWTP-s are sometimes in obsolete condition due to their ages and the economic problems of the factories. It is not unusual that they were not able to follow the changes of the production profile, capacity, etc. Industrial pre-treatment program seems to be important in the case of industries connected to the municipal sewer system, with special regard for the heavy metal content of the WWTP-sludge and its possible use in agriculture.

The statistics on accidental water pollution shows that about 80 % of the events are connected with oil contamination. Special efforts should be taken for prevention of accidental pollution of the Hungarian water bodies. All the industrial plants causing considerable risk of pollution should have their accidental pollution prevention and response plan according to law. These plans were mostly prepared more than15 years ago, so they hardly reflect the actual conditions. Program seems to be necessary for the development of the industrial accidental pollution prevention plans.

The mentioned target oriented planning workshop emphasized the risk of oil pollution from shipping. The Hungarian historical data on accidental pollution do not support strongly this statement. The Danube international accidental pollution monitoring system (PIAC) has not reported events of this type. We would not propose specific interactions in this field.

The biggest oil refinery in Hungary at Százhalombatta belongs to our list of hotspots. The development of industrial water management system, industrial sewer reconstruction and a new WWTP construction seems to be necessary. This development could decrease the oil pollution load of the Danube considerably.

3.4. Reduction of Water Pollution from Dump Sites

3.4.1. Municipal Waste Management

Municipal waste collection and management belongs to the responsibility of the local governments in Hungary, as their basic (i.e. obligatory) task. Due to the constant financial shortages they looked for cheap solutions sometimes, and environmental safety was a secondary issue in the past. As a consequence the bigger part of the municipal waste dumps causes risk of pollution for the surface-, or groundwater.

The central funds regard the construction of environmentally safe new waste dumps as high priority. Usually specific advantages are given for applications from the regions where vulnerable groundwater resources can be found, or from the watersheds of sensitive surface waters, and where more than two settlements are involved in the development project. There is no central fund available for settlements where another waste dump was built (or is under construction) in the distance less than 15 km.

It is not unusual that illegal waste dumps can be found around the settlements in abandoned open pit mines and other remote places. The local governments try to control this tendency with limited success. The best counteraction is according to the experiences when the local government collects the waste fee as a lump sum, independently from the amount of waste collected from the site owners, and the amount of collected fee is set up on the level, which cover the legal waste collection and illegal waste dump remediation also.

3.4.2. Municipal Liquid Wastes

The municipal liquid wastes have specific importance in Hungary as the quantity is relatively high compared with western countries.

The gap between the level of public water supply and wastewater collection caused high increase of ammonium and nitrate in the wells settled on shallow groundwater in some settlements by the mid of seventies. The local authorities in case of new house construction since that time have prescribed closed wastewater storage tanks in order to tackle with this problem. The cost of wastewater transportation was too high, and the authorities were not able to check strictly these requirements. The inhabitants looked for cheaper – but not fully legal – solutions. Permeable storage tanks were built, where the local conditions made it possible. These solutions were unfeasible where the groundwater table was too high.

The liquid waste collected was transported in normal cases into designated areas, where the environmental risk was felt to be smaller. These dumping sites have not been safe completely, so they are counted as pollution sources to groundwater today.

It is a more serious issue when the liquid waste is dumped into small ditches and creeks illegally by the transporter, what is not totally unusual. The discovered events are handled as legal case, but the level of control is not high enough in this field due to the weaknesses of the local environmental protection. The liquid waste poured into the ditches appears as “diffuse” pollution from agriculture later. The necessary actions to handle these problems are

- increase the level of wastewater collection by municipal sewer systems,
- promotion the environmentally sound individual on site wastewater management facilities,
- Increase the level of control on liquid waste transportation.

Specific program seems to be necessary for increasing the rate of on site wastewater management facilities with special regard for the fact that about 30 % of the population will live on unsewered areas even on a long term basis in Hungary, according to the National Masterplan on Wastewater Management.

3.4.3. Hazardous Wastes

The hazardous waste management is strictly regulated in Hungary by law. All industrial wastes should be regarded as hazardous, unless the lack of harm has been proven. The activities that use dangerous substances, or can produce hazardous wastes are obliged to produce mass balances for their technologies. The technical standards of temporary storage inside the factory are regulated. Accredited contractor can do the transportation, with proper technical capabilities and strict administrative discipline. The long-term temporary storage is prohibited.

There are some environmentally safe regional hazardous waste deposition sites and a hazardous waste thermal decomposition plant in Hungary. There are efforts for construction new unites, but the strong opposition of the local population hinders the development.

The environmental authorities pay great attention towards this issue. They control the hazardous waste producers regularly.

Due to the fact that environmentally safe hazardous waste management is very expensive it is not unusual that illegal hazardous waste dumping issues come to light. These are legal cases when the original owner of the waste can be found. In another case the State bears the responsibility for the remediation.

Generally we think that the harm of water pollution from hazardous wastes is on the tolerable level in Hungary.

3.4.4. Pollution from Old Dump Sites

There are several examples of pollution from old industrial waste dumpsites from the time when the importance of environmental protection was not recognized. This issue has specific importance, as these pollution sources mostly endanger the groundwater resources, and the overwhelming part of Hungarian drinking water comes from underground water resources.

Specific State program was organized for the survey, localization and liquidation of these dump sites in 1997. This program is planned to be finished in 2005, with the yearly expenditure of 5 – 35 million USD. Foreign help was joined to this program from the financial resources of USTDA.

3.5. Special Policy Measures

We have described before the development of the Hungarian water legislation as a specific non-physical project. The new legislation will cover the whole area of water quality protection. The basis is the new environmental bill, the new bill on water management and the draft of the EU framework directive on the protection and sustainable use of water. The introduction of the basic elements of this new legislation can be found in **Annexes.** The major elements are

1. Designation of watersheds as water quality management units
2. Setting up use related and environmental Water Quality Objectives (WQO), depending on the characteristic land uses and their water quality needs and on basic environmental requirements on the watershed,
3. These WQO-s should be harmonized with EC Directives,
4. Methodology and regulation for clear transition of WQO-s into discharge standards,

5. Launch prioritized, phased, achievable, affordable water quality management programs on watershed level, built up from local community wastewater management plans,
6. Designate the ownership for the objectives and improvement plans to the Catchment Planning Committee,
7. Define clearly the responsibilities and accountabilities of these Catchment Planning Committees,
8. Build up efficient permitting and enforcement instruments,
9. Develop sound monitoring and reporting system on watershed level,
10. Introduce simple, clear, efficient funding and charging systems, base it with a sound revenue as the water discharge fee,
11. Ensure adequate and technically competent staff for water pollution control,
12. Give efficient legal framework for the authority to operate and control the system.

As it can be seen this is a complex legislative work, so priority should be given to the financial issues as water discharge fee and the development of the permitting system, together with the new effluent standards and to the tools of watershed management planning.

Further central programs would be needed to tackle with specific pollution reduction issues as

1. On site wastewater management program in the municipal sector
2. Development of a specific agricultural point source pollution reduction program, and its implementation.
3. Introduction of environmentally good agricultural practices into the agriculture, and to build it into the Hungarian water pollution control policy.
4. Environmental forestation program
5. National erosion control and land management program
6. Industrial pre-treatment program
7. Industrial accidental pollution prevention plans.

Table 3.3.-2: Summary of Recommended Projects for Industrial Hot Spots

Hot Spot Name, River & Location*	Parameters & Values which Define the Problem*	Ranking of the Problem*	Name & Type of Project (Structural or Non-structural)	Project Strategy & Targets	Parameters & Values which Define Project Benefits	Project Beneficiaries
MOL Company Százhalombatta Danube	Oil pollution reduction	Very high	Wastewater Development Programme	Decrease the oil pollution load Decrease the water use Build a new WWTP	Oil pollution load From 80 t/a to 20 t/a existing water use: 42 000	water uses downstream
NITROKÉMIA Company Balatonfűzfő Séd- Nádor water system	Strong organic matters, pesticides	Very high	WWTP reconstruction	Decrease the pollution load of the Séd-Nádor water system	COD toxic index	agricultural water uses (irrigation, fishponds) downstream
BORSODCHEM Company Kazincbarcika Sajó	Technological waters with high NaCl content	Very high	Desalination plant construction	Decrease the amount of industrial wastewater and the NaCl load of the Sajó	NaCl concentration	Agricultural water users downstream on the Sajó and Tisza river

Table 3.3.-3: Recommended Project for a "Multisectoral" Hot Spot

Hot Spot Name, River & Location*	Parameters & Values which Define the Problem*	Ranking of the Problem*	Name & Type of Project (Structural or Non-structural)	Project Strategy & Targets	Parameters & Values which Define Project Benefits	Project Beneficiaries
Danube –Drava confluence and its neighborhood	Biodiversity Wetland restoration	Very high	Danube-Drava region wetland rehabilitation programme	Wetland and water related ecosystem rehabilitation, Water pollution reduction, Forest reconstruction	Biodiversity	Population of the neighboring countries and event hat of Europe

4. Expected Effects of Current and Planned Projects and Policy Measures

There are several programs under implementation in Hungary as we introduced them in point 7.1. of Part A these programs go parallel, overlap each other to a certain extent. We are perhaps not wrong saying that some of them expresses priorities inside a bigger programme. In this context we can say that the Hungarian Masterplan for municipal wastewater management summarizes all the efforts in the field of municipal wastewater collection and treatment in Hungary for instance. The major part of the Lake Balaton Protection Program refers also to municipal wastewater protection, but with special regard for a specific catchment area, the Balaton watershed. It works so in practice that a settlement lying on the Balaton catchment has an advantage compared with other settlements when applying for grants to the central funds supposing that its goals fit into the National Wastewater Masterplan.

Due to the nature of the National Programs, it is not easy to give estimation of their effect on the water pollution reduction generally and even more problematic to judge its effects separately. The other common character of these national programs is that they do not express their benefits in pollution load reduction values. They refer to statistic data (i.e. the future rate of wastewater collection and treatment, etc.), time horizon of implementation and cost consequences. There are no estimations available regarding the future industrial water pollution. The same is valid for the agricultural water pollution with the difference that there is big uncertainty even on the existing level of water pollution also.

Altogether we are not in the position to give quantitative estimations on the possible reduction of nutrient emissions, hazardous substances pollution load, microbiological contamination of the ongoing and suggested central programs.

We have made our expert judgement on the pollution reduction coming from the implementation of the Municipal Wastewater Masterplan, supposing that all the effort related to the municipal wastewater management are summarized in this program. We would remain on the opinion that the pollution from industrial and agricultural pollution sources will remain in the existing level as general consequence of the different tendencies.

4.1. Reduction of Organic Materials

The total pollution load coming from the municipal sector (inhabitants and institutions together) can be estimated as 18 million personal equivalents (PE). Today its 44 % are connected to sewer, but only half of the collected wastewater is estimated to be treated with proper efficiency. Consequently today about 14 million PE (316 000 t BOD/a) pollutes the environment (partly the soil, groundwater and surface waters).

After the goals of the Masterplan will have been reached:

The level of total PE produced remains the same, the wastewater collection rate is 67 %, the other part is treated by environmentally safe individual systems. The total pollution load to the environment (supposing 90 % overall treatment efficiency) is 1,8 million PE (31 500 t BOD/a).

4.2. Reduction of Nutrient Emissions

We used the same basic estimations for the wastewater collection and treatment as it was mentioned in point 4.1. We supposed that half of the total collected wastewater will be subject of nutrient removal. The overall removal efficiency will be 80 % for phosphorus, and 72 % for total nitrogen. As a result of the calculation we summarize our estimation in the following table:

	Total produced t/a	**Existing load t/a**	**Future load t/a**	**Reduction**	
				Quantity t/a	**Rate %**
Phosphorus	23 000	21 700	9 200	12 500	58
Total Nitrogen	79 000	70 200	29 500	40 700	58

The rate between the water and soil pollution will depend on the individual decisions on the possible recipients in the future development projects.

4.3. Hazardous Substances

The available data on hazardous substances emissions are not enough for doing estimation on the existing level of pollution, and the possible reduction owing to the different control measurements.

4.4. Adverse Effects of Pollution Reduction

It is clear that the environmental balance of the planned water pollution reduction actions is positive to an overwhelming extent. One important adverse environmental effect can be mentioned. Namely the pollution load from the municipal sector to surface waters will increase to a certain extent due to the increased level of wastewater collection, even after efficient treatment processes. This issue is important in case of sensitive standing waters only. Consequently there is a required maximum level of wastewater collection in sensitive watersheds to be calculated on the basis of careful evaluation. This issue was examined on the Balaton watershed in Hungary. The conclusion was that

The soil should be regarded as recipient in case of small settlements, where there is no risk for pollution of groundwater resources.

The other adverse effect, which should be considered, is that a big part of the population on some watersheds is not able to bear the economic consequences of the increased level of water services. Surveys connected to World Bank projects gave the results that the costs of water services can reach the 5-7 % level of the income of the lowest income quartile population in big towns. We suppose that this rate can be the double of the mentioned in the case of small villages. We think, this level is hardly tolerable for the consumers. Specific efforts, low cost technical solutions, step by step development projects with minimum advance investments and economical service companies are needed to manage this problem.

4.5. Transboundary Effects

Hungary has two rivers where considerable pollution load leaves the country. The pollution loads of the upstream and downstream border sections are nearly the same on Danube due to its big self-purification capacity. We await that considerable decrease will occur after the discussed pollution reduction programs will be finished.

Important water related ecosystem, worth for interest even on European level could be saved at the Hungarian-Serbian border region in case of implementation of the Danube Drava rehabilitation project proposed on the project list.

There is a significant difference in the upstream and downstream water quality of the Tisza River due to the pollution load from Slovakia Republic, Romania and to the pollution with home origin. Significant improvement is awaited due to the project implementation at Szolnok and Szeged. Further improvements are needed in other riparian countries for reaching a tolerable water quality at the southern section of Tisza.

5. Cost Estimation of Programs and Projects

Recently the state continues to be the major investor in the area of wastewater treatment investments

Hungary's first priority among the water sector programmes (see Table 5.1.) is the Wastewater Treatment Programme. There has been elaborated a special decision of the Government about the support of mentioned programme. The Governmental support is manifested in form of subsidizing projects from ministerial budget and stimulating and supporting wide involvement of international financial institutions

The basis of our proposal on hotspots is the analysis of the water quality in Hungary, and the changes when the rivers enter and leave the country. The effects of pollution loads on ecosystem and human health are basically influenced by the self-purification capacity of the big rivers leaving the country. This is the reason why we can not speak about big changes in water quality of the big transboundary rivers in Hungary. The list of our hotspot proposal can be seen in Table 5.2.

The results of this ranking reflect the general situation in Hungary as the major tasks on water pollution reduction can be found in the municipal sector. We propose that 6 projects should belong to this category.

The biggest oil and chemical industrial plants belong to the industrial hotspots. They have their wastewater treatment facilities, but they have to be developed, or reconstructed mostly together with their industrial sewer systems. There is one industrial hotspot - the BORSODCHEM Company – where a special problem needs to be solved owing to the high salt pollution of the recipient.

We proposed 1 high priority hotspot with "inter-sectoral" nature. This proposal focuses on the rehabilitation of the water-related ecosystems in the Hungarian- Croatian transboundary region.

All these high priority hotspots are introduced in the Project Files attached to the summary report. We can conclude that the key issue of investment into water pollution reduction at the high priority hotspot is the bankability of the projects.

The cost estimation of the high priority hotspots is summarized in table 10. We can conclude that

Total for Project Portfolio:	Million HUF	33,018.00
	Million USD	160.94
Non-secured:	Million HUF	19,345.00
	Million USD	94.30
Secured:	Million HUF	13,673.00
	Million USD	66.64

Table 5.1. National Programmes of the Water Management Sector

Name of the national programme		Period of implemen-tation (years)	Preliminary volume of the programme 1 USD = 205.18 HUF	
			in Million HUF	in Million USD
1.	Sewage canalization and treatment programme of Hungary	1996 -2010	603,000.00	2,950.00
2.	Sewage treatment programme of the capital (Budapest) and the cities of county status	1995 -2010	80,000.00	3989.90
3.	Protection of ecological condition of Lake Balaton …..and improvement of water quality	1996 –2010	4,000.00 – 6,000.00 annually	19.50 – 29.24 annually
4.	Programme on protection of drinking water well-field areas (Phase I)	1996 -2004	9,200.00	44.80
5.	Programme on protection of drinking water well-field areas (Phase II)	1998 -2010	100,000.00	487.40
6.	Protection of future drinking water well-field areas	1994 -2003	4,780.00	23.30
7.	Programme on Great Lowland	1994 -2006	200.00 annually	0.90 annually
8.	Programme on water supplement of the hilly area of Mid-Danube-Tisza region	1998 -2006	350.00 annually	1.70 annually
9.	Programme on improving of conditions for RSDB-Decision of Government (Phase I)	1997 -1999	125.00 for three years	0.61 for three years
10.	Programme on improving of conditions for RSDB - Decision of Government (Phase II)	2000 -2003	1,200.00	5.90
11.	Catchment management planning programme (integrated land and water management)	1997 -2005	100.00 annually	0.50 annually
12.	Rehabilitation of oxbow lakes	1998 -2006	100.00 annually	0.50 annually
13.	National remediation programme of contaminated areas	1997 -2005	1,000 – 7,000 annually	4.90 – 34.00 annually
14.	Improvement of the quality of drinking water in Hungary	1998 -2010	50,000.00	243.70

Source: Central Budget, 1998.

Table 5.2. Anticipated/proposed Funding Scheme of Projects

Name of the project/allocation of capital cost	Equity of project owner	Central Environmental Fund	Water Management Fund	Public grant Central Budget	International grant/PHARE grant	International loan	Non-secured funding sources	
	Million HUF						Million HUF	Million USD
1. BUDAPEST NORTH Municipal WWTP	**2,602.00	0.00	0.00	**706.00	0.00	3,308.00	3,308.00	16.13
2. BUDAPEST SOUTH Municipal WWTP	**1,421.00	0.00	0.00	**1,434.00	0.00	2,867.00	2,867.00	13.97
3. DUNAÚJVÁROS Municipal WWTP	**645.00	0.00	0.00	**690.00	**387.00	**460.00	0.00	0.00
4. GYŐR Municipal WWTP	**520.00	780.00	0.00	***650.00	650.00	0.00	1,673.00	8.15
5. SZEGED Municipal WWTP	**480.00	227.00	171.00	**203.00	269.00	0.00	667.00	3.25
6. SZOLNOK Municipal WWTP	945.00	210.00	105.00	840.00	0.00	0.00	2,100.00	10.24
7. BORSODCHEM Industrial WWTP	**150.00	90.00	60.00	0.00	0.00	300.00	450.00	2.20
8. MOL Plc., Development of the Industrial WWT system	**4,000.00	500.00	500.00	0.00	0.00	0.00	6000.00	29.24
9. NITROKÉMIA Industrial WWTP	120.00	300.00	120.00	0.00	60.00	600.00	1,200.00	5.85
10. WETLAND AREA OF DANUBE-DRAVA ECOREGION	0.00	324.00	108.00	21.60	108.00	86.40	1,080.00	5.27
*****TOTAL FOR PROJECTS #1 - #10:**	**10,883.00**	**2,431.00**	**1,064.00**	**4,544.60**	**1,474.00**	**12,621.40**	**19,345.00**	**94.30**

Secured funding sources* * Partly secured funding sources*

6. Planning and Implementing Capacities

As we discussed before the law enforcement should be increased in Hungary as a basic element of the institutional capacity. New regulation is needed in the field of water quality planning, effluent standards related to the in stream water quality and to the technology used. The effluent monitoring capacity should be strengthened also via widening role of the self-monitoring and quality assurance.

Wastewater treatment should be obligatory for all municipal polluters also. Personal responsibility should be given for the water pollution caused. River basin organizations should be set up as holders of responsibility for the good quality of water. The awareness of public should be increased towards water quality issues.

The introduction of the wastewater discharge fee would be a major step on water quality protection, as it would increase the interest of polluters in pollution reduction.

The design capacity is basically available on the field of civil engineering in Hungary. The big State owned design institutes have gone into small private design enterprises. These companies are very active in the field of wastewater treatment plant and sewerage design. Design quality assurance should be increased. These planing bureaus are in good connection with the local governments, which are the most important stakeholders of the water pollution reduction. They have got experiences for co-operation with the foreign consulting companies, investors and donors. These small companies usually can not connect enough financial guaranty to their contracts.

There is a boom in the civil engineering construction sector in Hungary today, due to the considerable amount of State support in the field of municipal sewerage and wastewater treatment development. This situation has given the possibility for development of strong construction companies who are basically capable to solve all the emerging tasks. These companies are owned by foreign capital due to the privatization procedure going on in Hungary. The regulation for public procurement is in rule. The raw materials and machinery needed in the water protection business are available from home production and from imports. The choice of the contractor depends on the decision of the investor. It is not unusual that foreign goods are the winners of competition when value and price are evaluated together.

There are examples of international co-operation in running water service companies on concession basis. The experiences are limited of this type of co-operation due to the relatively short time spent in this field. It is a common experience that it is not too easy to find room for a long-term contract with fixed financial terms in the transition period of the water sector.

Annexes

The Trends of Development in the Hungarian Water Legislation

The hypothesis of the proposed new water legislation is that the basis for water quality management and regulation is the river basin. The river basin is the smallest natural unit of water protection where the needs of land uses can be taken into account, the possible conflicts of the water users and polluters, or that of the upstream and downstream water users can be understood clearly by all interested parties. The clear situation can assist reasonable and economic solutions for reducing water pollution and enable the interest of the parties for setting up the goals regarding water quality to be achieved on gradual, tolerable way, avoiding unaffordable economic burden to local inhabitants. The new legislation targeted the application of the worldwide experiences of integrated river basin management to Hungarian circumstances.

It is clear also that through the elements of the new water legislation should be based on the foreign experiences, caution is suggested towards brand new, untested legal solutions. The specific, Hungarian law enforcement experiences should be taken into consideration too.

An important component of the legislative work was the investigation of the potential environmental, economic and social impacts of different regulatory approaches in selected case study areas. Water management computer models calculated these impacts. Five significantly differing test sites were selected as case study areas, in order to give sound basis for nation-wide extrapolation of the results with the help of a PHARE project (DHV Hungary, 1996).

The basic aims are to secure the institutional background for avoiding the deterioration of the receiving water qualities, determination of the desired water quality improvements, incorporation of the EC Directives, the development of a sustainable water quality protection strategy, specification of the required effluent quality through a system of individual, time related discharge permits, effective enforcement to ensure permit compliance. Additionally a proposal was needed for a more efficient system of revenue collection for water pollution investments and for financing partly the water protection control activities.

The present National water quality management system has been found too inflexible to deal with such spread issues, thus leading to a need of local involvement into surface and groundwater protection. It is vital that local activities should fit into the National framework, in order to maintain the general consistency, and allow harmonization with EC Directives generally.

The basic elements of the water quality management system can be summarized as

- use related Water Quality Objectives (WQO), depending on the characteristic land uses and their water quality needs on the watershed;
- WQO-s should be harmonized with EC Directives;
- clear transition of WQO-s into discharge standards;
- prioritized, phased, achievable, affordable water quality management programs on watershed level, built up from local community wastewater management plans;
- ownership for the objectives and improvement plans;
- clear responsibilities and accountabilities;
- efficient permitting and enforcement;
- sound monitoring and reporting system;
- simple, clear, efficient funding and charging systems;
- adequate and technically competent staff for water pollution control;
- legal framework to be given for the authority to provide and operate the system.

Water quality objectives

The first EC Action Program for the Environment stressed the need of establishing quality objectives on Community level in 1973. The draft Water Resources Framework Directive proposes that a system of use related WQO-s should be developed covering all identified river catchments and aquifers. The water uses for which quality criteria has been developed are

- drinking water;
- bathing/recreational waters;
- irrigation;
- fisheries and ecological protection;
- general amenity.

Whilst use-related objectives are here advocated as the principal management approach it should be noted that in several cases these objectives on their own will not be sufficient to tackle serious pollution problems. In these cases an emission limit value approach is recommended connected with the Best Available Technology (BAT) especially in case of toxic substances.

Catchment based planning

The Watershed Water Quality Management Plan gives the basis for the approach outlined before. It is essential that catchment based approach is adopted in order to set up WQO-s on a comprehensive manner, taking into consideration the influence of upstream pollution for downstream water quality. This approach enables us to prioritize and phasing the investments and other actions throughout the catchment area. The catchment approach allows the incorporation of the effects to diffuse pollution sources, and the integrated evaluation of water quantity and quality issues in the management plan.

The catchment management plan gives the basis for

- local municipal sewerage plans and wastewater treatment for the settlements including the designation of sewerage and individual onsite zones;
- local water quality plans for industrial and commercial polluters with the definition of water needs, effluent characteristics, accidental pollution prevention requirements;
- local water quality plans for agriculture including measures covering priority farms and feedlots with focus on land use requirements, amelioration programmes, runoff control, use od chemicals, feedlot technology, manure disposal and utilization.

Monitoring and evaluation

The transition towards catchment based planning and integrated water quality management requires information available on catchment basis, and covers all relevant aspects. The project gave the following recommendations in this respect:

- reorganization of the existing surface and groundwater monitoring networks on catchment basis in order to support catchment planning;
- upgrading emission monitoring considerably so it may facilitate water quality management. General experience is that the existing emission monitoring system is the weakest point of the water quality planning;
- the improved effluent monitoring policy should contain higher rate of monitored discharges, higher monitoring frequency, proportional monitoring for larger polluters, extension of the self monitoring practice with authority control;
- data collection and systematic data change with all relevant institutions on the watershed such as land uses, water uses, meteorological data, public health information etc.;

- organization of one database containing all relevant information, by allocating the tasks and responsibilities regarding data availability and transfer;
- development of harmonized data quality assurance;
- regular overview of the catchment monitoring system.

The major part of the data needed on national level may be imported from the proposed catchment monitoring systems. This catchment monitoring can fulfil to much extent the data requirements of the local wastewater management plans also, but additional targeted surveys seem to be necessary in this case.

The Environmental Bill decides on the freedom of access to the environmental data. Lower level of regulation is awaited on the daily data use that can clarify the procedures.

Different water quality evaluation methods were proposed ranging from the development of the existing National Standards, development of a system for evaluation based on use related water quality requirements, toxicity index and function specific indexes for recipients with specific ecological function. Development of standardized evaluation methods for all methods was proposed.

Wastewater collection standards

At present there are no direct obligations for wastewater collection for the municipalities in Hungary. The local government is responsible for public wastewater management “depending on its abilities”, according to the regulations. In spite of this confusing regulation big local interest can be experienced for wastewater infrastructure development due to the advantageous State subsidy mechanism, which can not force the efficient technical solutions to appropriate extent.

The EC Urban Wastewater Directive requires the sewerage of the settlements with higher then 2000 population-equivalent, but does not give guidance on the necessary level of wastewater collection rate.

The optimum level of wastewater collection should be decided in the local wastewater management plan.

Emission standards

The adoption of the water quality objective approach leads directly to the establishment of appropriate emission standards to be referred for the quality, which is necessary to achieve in the receiving watercourse. We can calculate the permissible input from a discharge at a given point of the recipient by using standardized calculation techniques. The permissible load can be accepted by the watercourse taking into consideration the dilution and natural purification.

The EC Urban Wastewater Directive prescribes the minimum treatment requirements depending on the size of the settlements, setting up specific additional standards in case of recipient sensitive for eutrophication. The Hungarian water protection policy has adopted the concept of effluent standard based on technological considerations the reasonable and accessible production-, or abatement techniques.

It is usual that especially in case of recipient with high dilution capacity, the effluent limit based on the permissible load concept seems to be too lose compared to the basic treatment requirements settled down in the EC Urban Wastewater Directive, or in relating other technological effluent standards. The stricter requirement was suggested to follow, according to the combined approach in this case.

Non point source pollution assessment.

Diffuse pollution can hardly be directly monitored. It is usually estimated by deduction of point source load from total pollution calculated in the receiving water body. More reliable data could be awaited after having improved the point source monitoring system. Additional research work is needed also for the better estimation of diffuse pollution from agricultural sources and from urban runoff.

A part of the diffuse pollution load is a consequence of illegal activities as illegal septage disposal into small ditches and creeks, and uncontrolled sludge bypass to the recipient from wastewater treatment plants. More efficient authority control and more effective disincentive system can decrease the effect of this activity.

The stormwater overflow should also be monitored in case of sensitive recipient.

Institutional development

Having outlined the principles of the technical approach to be adopted it is necessary to examine the institutional machinery, which is capable to define the catchment management plans. The crucial element of the process outlined before is the full local involvement so that the objectives and plans should be "owned" by the communities, industries, water users etc. affected by any resulting proposals. It is clear that the objectives might be achieved when there are established new bodies as so called Catchment Planning Commissions for each catchment area.

These Commissions would be established by the responsible Ministry, and accountable also for the Ministry. They would be responsible for setting up locally agreed WQO-s, for development management plans, preparation of annual reports on the progress of the local wastewater management plans. The Commission could work as a board drawn from representatives of all parties interested in water quality management. The responsibility of the Commission covers water quantity and quality issues in order to provide an integrated approach to water resources management according to the EC Water Resources Framework Directive.

The catchment areas could be defined in a pragmatic way, taking into consideration land uses, administrative borders. Basically they could be small to give the possibility for clear understanding of the different interests for all interested parties, and the limitations of the administrative cost is also important on the other hand.

It was experienced that the level of responsibility to be delegated to the Commission is a sensitive issue for the existing administrative bodies, so the legal proposals limited themselves for the proposition of a partial river basin approach. It seemed to be unrealistic to follow strictly the full institutional consequences of the river basin approach immediately, but on a step by step approach in future.

Charging principles

The Environmental Charge would provide an assured revenue stream on a consistent basis. This charge would be levied on all discharges according to the pollutant input allowed in their permits (giving possibility for them to apply for the decrease of their effluent standards when they want it). There are different options regarding the target to be reached by the charging system as

- to cover the administrative costs of water quality management including the costs of the activity of regional water authorities, the Catchment Management Commissions;
- to raise revenues for funding water protection investment programmes. The overall level of charge in this option is the result of balancing between needs and social consequences;
- to provide incentive for the polluters to reduce pollution beyond the level allowed in the permit. The level of charge needs to be comparable with the incremental pollution reduction costs.

In the light of the consultations with the decision-makers, the system based on the combination of the first two options was proposed, taking into consideration that public affordability is a serious political issue today in Hungary.

State subsidies

It is clear form the experiences of other countries that water quality protection could not be managed without substantial contribution of the State. The State fund is needed for speeding up the pollution reduction programme, for equalization of differences in affordability from local resources.

It may be envisaged that the State funding philosophy should be based on the National Action Programme for Wastewater management, which is part of the National Environmental Programme. The subsidy mechanism should have a clear, auditable decision procedure with close monetary control.

Legal framework

In order to implement the proposals summarized above efficiently it is essential that clear legal framework exists and provides the authority to establish and operate the Water Quality Management System. There is a number of key issues to be addressed.

- The status of Water Quality Objectives should have the power of law as the foundation on which all improvement plans are based.
- The establishment of Catchment Planning Commission, their duties and responsibilities, financial sources of their activity.
- Determination of the transitional period and procedure for the introduction of the phased approach.
- The environmental charge should be recognized in law.
- Several other issues should be regulated as the connection between the Catchment Commission and the regional authorities, legal obligation for sewerage connection on sewered areas.

Enforcement and criminalization

The present Hungarian area category system fails to truly honor water quality objectives. It is therefore less suitable basis for the effective formulation of objectives, which is a prerequisite for formulating cost-effective sanitation.

The case studies also indicated that water quality objectives could hardly be achieved by sanitation plans only. In most areas non-point source pollution has an overwhelming influence on water quality and needs to be addressed. Cost-effective sanitation requires an integrated approach, which comprises the formulation of water quality objectives and the necessary water quality measures within river basin plans.

River basin planning may in theory and practice be best implemented by river basin authorities with far reaching tasks and responsibilities in the management of ground and surface waters.

However, since this would involve also far reaching reorganization, a procedural solution that enables the formulation of integrated plans, but allows their implementation and supervision by existing authorities and companies, i.e., the partial river basin approach was favored.

Based on the research in case of study areas, legal implications were determined. A transition towards a river basin approach was proposed and comprised various recommendations and elements. The most important of these recommendations is the installment of a planning body, the Catchment Planning Commission, that is served by the respective environmental inspectorate and has the responsibility to make water quality management for river catchment.

In order to facilitate and enable the formulation of cost-effective sanitation plans, a standard system was proposed that is based on the use-related water quality objectives. These objectives are related to minimum sanitation requirements that are harmonized with EU-directives.

It was also proposed to upgrade the existing fining system, adjusting it to today's prices and the newly proposed standard system, and to use it only as an incentive but not for revenue raising. Revenue raising should be done on the basis of environmental fees that will essentially cover the annual costs of capital depreciation, operation and maintenance. The water and sewage fee system should be simple to use in the short term built-in possibilities to differentiate it in future, so it may generate catchment specific incentives to pollution abatement as well.