

DANUBE POLLUTION REDUCTION PROGRAMME

NATIONAL REVIEWS 1998 ROMANIA

TECHNICAL REPORTS

Part C: Water Quality

Part D: Water Environmental Engineering



**MINISTRY OF WATERS, FOREST AND ENVIRONMENTAL
PROTECTION**



in cooperation with the

**Programme Coordination Unit
UNDP/GEF Assistance**



DANUBE POLLUTION REDUCTION PROGRAMME

NATIONAL REVIEWS 1998 ROMANIA

TECHNICAL REPORTS

Part C: Water Quality

Part D: Water Environmental Engineering

**MINISTRY OF WATERS, FOREST AND ENVIRONMENTAL
PROTECTION**

in cooperation with the

Programme Coordination Unit

UNDP/GEF Assistance

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: <ul style="list-style-type: none">- 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 Reviews data which are 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 Reviews 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 **Romanian National Reviews** were prepared under the supervision of the Country Programme Coordinator, **Mr. Octavian Ceachir**. The authors of the respective parts of the report are:

- Part A: Social and Economic Analysis: **Ms. Mihaela Popovici**
- Part B: Financing Mechanisms: **Ms. C. Rosu and Ms. Manea**
- Part C: Water Quality: **Mr. Liviu Popescu**
- Part D: Water Environmental Engineering: **Mr. Petru Serban**

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.

The Ministry of Waters, Forests and Environmental Protection

The UNDP/GEF Danube Pollution Reduction Programme,
Danube Programme Coordination Unit (DPCU)
P.O.Box 500, 1400 Vienna – Austria
Tel: +43 1 26060 5610
Fax: +43 1 26060 5837

Vienna – Austria, November 1998

Part C

Water Quality

Table of Contents

1. Summary.....	1
1.1. Updating Evaluation and Ranking of Hot Spots.....	1
1.2. Updating, Analysis and Validation of Water Quality Data.....	2
2. Updating of Hot Spots	3
2.1. General Approach and Methodology	4
2.1.1. Evaluation of Existing Hot Spots.....	4
2.1.2. Deletion of Existing Hot Spots	6
2.1.3. Addition of Hot Spots	6
2.1.4. Ranking of Hot Spots	6
2.1.5. Map of Hot Spots	10
2.2. Municipal Hot Spots (MHS).....	17
2.2.1. High Priority (HP).....	18
2.2.2. Medium Priority (HP)	19
2.2.3. Low Priority	19
2.3. Agricultural Hot Spots (A-HS)	41
2.3.1. High Priority (HP).....	41
2.3.2. Medium Priority (MP)	41
2.3.3. Low Priority (LP).....	41
2.4. Industrial Hot Spots (I-HS).....	54
2.4.1. High Priority (HP).....	54
2.4.2. Medium Priority (MP)	54
2.4.3. Low Priority (LP).....	54
3. Identification of Diffuse Sources of Agricultural Pollution	81
3.1. Land under Cultivation	81
4. Updating and Validation of Water Quality Data.....	87
4.1. Index of Water Quality Monitoring Records	87
4.2. Data Quality Control and Quality Assurance	97
4.3. Data Consistency, Compatibility and Transparency	100
4.4. River Channel Characteristics.....	100
4.4.1. Network.....	100
4.4.2. Channel Cross Sections.....	127

4.4.3. Gradients	131
4.4.4. Flood plains	131
4.4.5. Wetlands.....	142
4.4.6. Erosion and Degradation.....	147
4.5. Dams and Reservoirs.....	147
4.6. Other Major Structures and Encroachments.....	152
4.7. Major Water Transfers.....	153
4.8. Preferred Sampling Stations and Data Sets.....	154
4.9. Water Discharges	155
4.10. Sediment Discharges	155
4.11. Suspended Sediments Concentrations for 1994 - 1997 Reported as Completed.....	160
4.12. Water Quality Data	161
4.12.1. Nitrogen.....	162
4.12.2. Phosphorus	162
4.12.3. COD	162
4.12.4. Heavy Metals.....	162
4.12.5. Oil and Other Hazardous Chemicals.....	162
4.12.6. Special Linkages	163
5. Brief Overview of Legal and Institutional Framework for Water Quality Control.....	167
5.1. Laws and Policies.....	167
5.2. International Conventions Ratified by Romanian Parliament	168
5.3. International Agreements Signed by the Romanian Ministry of Environment	168
5.4. International Agreements the Romanian Ministry of Waters, Forests and Environmental Protection Intents to Adopt/Sign in the Future.....	169

List of Annexes

1. Annexes of Chapter 2

- Annex 2.1.5.1 Romanian Relief Cross Section
- Annex 2.1.5.2. Map of Romania with Hot Spots (Scale 1:1.000.000)

2. Annexes of Chapter 3

- Annex 3.1. - a, b, c, d, e Maps with Irrigated Surfaces
- Annex 3.1.1. Table with Index of Water Quality and Discharges Records

3. Annexes of Chapter 4

- Annex 4.5.1. Hydrological Map (Scale 1:2.000.000) Including the Main Reservoirs from Romania
- Annex 4.8.1. Gauging Stations Located Upstream and Downstream by the 71 Hot Spots from Industrial, Agricultural and Municipal Hot Spots - High Priority and Medium Priority (similar to Annex 3.1.1)
- Annex 4.8.2. List of the National Rivers Authorities from Romania (Filiala of RAAR) which are responsible for Water Quality National Monitoring System (WQNMS)
- Annex 4.12.1. Romanian Water Quality Standard 4706 / 88

List of Tables

- 2.1.1.1.** Preliminary matrix for Hot Spots selection and evaluation
- 2.1.1.2.** Criteria and weight factors for ranking Hot Spots
- 2.1.1.3.** Specific prioritization criteria for new activities - industry target group
- 2.1.1.4.** Matrix for Hot Spots ranking
- 2.2.1.** Municipal Hot Spots cumulative
 - 2.2.1.1.** Municipal High Priority Hot Spots
 - 2.2.1.2.** Ranked position of Municipal High Priority Hot Spots
 - 2.2.2.1.** Municipal Medium Priority Hot Spots
 - 2.2.2.2.** Ranked position of Municipal Medium Priority Hot Spots
- 2.2.3.1.** Municipal Low Priority Hot Spots
- 2.3.1.** Agricultural Hot Spots cumulative
 - 2.3.1.1.** Agricultural High Priority Hot Spots
 - 2.3.1.2.** Ranked position of Agricultural High Priority Hot Spots
 - 2.3.2.1.** Agricultural Medium Priority Hot Spots
 - 2.3.2.2.** Ranked position of Agricultural Medium Priority Hot Spots
 - 2.3.3.1.** Agricultural Low Priority Hot Spots
- 2.4.1.** Industrial Hot Spots cumulative
 - 2.4.1.1.** Industrial High Priority Hot Spots
 - 2.4.1.2.** Ranked position of Industrial High Priority Hot Spots
 - 2.4.2.1.** Industrial Medium Priority Hot Spots
 - 2.4.2.2.** Ranked position of Industrial Medium Priority Hot Spots
 - 2.4.3.1.** Industrial Low Priority Hot Spots
- 3.1.1.** Destination of agricultural area
- 3.1.2.** Total area with irrigation facilities
- 3.1.3.** Fertilizers used in Romania - 1994, 1995, 1996
- 3.1.4.** Total agricultural production
- 3.1.5.** Soil erosion intensity
- 3.1.6.** Live stock - 1994, 1995, 1996
- 4.1.1.** List of WQNMS station of the 1st order

- 4.2.1. International Programs for Interlaboratory comparison by the Romanian laboratory, more or less frequently
- 4.2.2. Results obtained in the EQUATE Interlaboratory exercise
- 4.3.1. List of determinants and the main characteristics of the TNMN activity related to the laboratory performances improving
- 4.4.1.1. Description of the main river characteristics from Romanian hydrological network
- 4.4.2.1. Main hydrological characteristics of Danube gauging stations
- 4.4.2.2. Main hydrological characteristics of main tributaries gauging stations before confluence
- 4.4.4.1. Main flood plains
- 4.4.5.1. Main wetlands
- 4.4.6.1. Bank erosion characteristics within the Romanian rivers
- 4.5.1. Main reservoirs from Romania
- 4.6.1. Major embankments existing in operation
- 4.7.1. Main water transfer systems characteristics
- 4.10.1. Data referring to the sediment discharges and transported by the Danube in the main gauging stations related with TNMN quality stations

NOTE: The numbers allocated to the tables, figures and annexes are connected to the numbers of the chapters where those belong in which the last figures are the number of table / tables.

List of Abbreviations

AAFS	Academy of Agriculture and Forestry Sciences
AEWS	Accident Emergency Warning System
BAT	Best Available Technique
BEP	Best Environmental Practice
BOD₅	Biochemical Oxygen Demand in five days
BOT	Build - Operate - Transfer
CEE	Central and Eastern Europe
CEEC	Central and Eastern Europe Countries
COD	Chemical Oxygen Demand
CPC	Country Program Coordinator
DRPC	Danube River Protection Convention
EAP	Environmental Action Plan
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECE	UN Economic Commission for Europe
ECU	European Currency Unit
EEC	European Economic Commission
EIA	Environment Impact Assessment
EIB	European Invest Bank
EPA	Environmental Protection Agency
EPDRB	Environmental Program for Danube River Basin
EPS	Environment Protection Strategy
EU	European Union
G - 24	The Group of 24 industrialised nations (members of OECD)
GD (GO)	Government Decision (Order)
GEF	Global Environment Facility
GIS	Geographical Information System
IBRD	International Bank for Reconstruction and Development)
IFI	International Financing Institution(s)
ISIC	International Standard for Industrial Classification

IUCN	The World Conservation Unit
K	Potassium
l/s	Liters per second
LEP	Law of Environmental Protection
LW	Law of Waters
m	meter
m³ / s	cubic meters per second
km	kilometre
MAF	Ministry of Agriculture and Food
MAV	Maximum Allowable Value
ME	Mining Extraction
MECU	Million European Currency Units
MH	Ministry of Health
MIC	Ministry of Industry and Commerce
MLIM / SG	Monitoring Laboratory and Information Sub- Group under EPDRB will become MLIM / EG under the DRPC
MO	Ministerial Order
MP	Ministry of Privatisation
MPWTP	Ministry of Public Works and Territory Planning
MT	Ministry of Transportation
MWEP	Ministry of Water, Forests and Environmental Protection
MWG	Monitoring Working Group
LMWG	Laboratory Management (LM) Working Group
IMWG	Information Management Working Group
N	Nitrogen
NA	Not Available
NAP	National Action Programme
NCS	National Commission for Statistics
NEAP	National Environmental Action Programme
NGO	Non - Governmental Organisation
NS	Not Significant
O&M	Operation and Maintenance
OECD	Organisation for Economic Co-operation and Development
OMR	Official Monitor of Romania
P	Phosphorus

PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated Biphenyl's
PCU	(Danube) Programme Co-ordination Unit
p.e.	Population equivalent
PHARE	EC Programme of assistance for economic restructuring in the countries of Central and Eastern Europe
REIE	Research and Engineering Institute for Environment
RAAR	National Water Authorities in Romania co-ordinator of WQNMS - Water Quality National Monitoring System) (SNMCA in Romania)
RS	Romanian Standard
SAP for DRB	Strategic Action Plan for the Danube River Basin
sq. km	square kilometres
SS	Suspended Solids
TACIS	EC Program of transfer of know-how to the New Independent States and Mongolia
TDS	Total Dissolved Solids
TNWP	Technical Norms of Water Protection
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development
USEPA	United States Agency for Environmental Protection
WQNMS	Water Quality National Monitoring System -SNMCA in Romania
WWF	World Wide Fund for Nature
WWT	Wastewater Treatment
WWTP	Wastewater Treatment Plant

Glossary on Water Quality

Adsorption	The surface retention of solid, liquid or gas molecules, atoms or ions by a solid.
Agrochemical	All chemicals used in agriculture (pesticides, herbicides, fertilisers, etc.).
Alluvial	Made of soil and sands deposited by rivers or floods.
Anaerobic	Breakdown of organic matter in the absence of free or dissolved oxygen often facilitated by specific bacterial strains.
Anoxic	Lacking oxygen.
Aquifers	Permeable geological formation of water-bearing rock, sand, soil or gravel which can supply water in usable quantities, for example to wells or springs.
Atmospheric deposition	The process whereby solid or dissolved inorganic or organic substances are deposited via atmospheric conditions, e.g. rain, at ground level.
Audit, environmental	An industrial management tool: a systematic, documented, periodic and objective evaluation of the performance of the organisation, management system and processes of a company for protection of the environment.
Autonomous utilities	Utilities, e.g. for providing water services, which have defined legal responsibilities and are self-financing.
Bank-filtered water	Aquifers in the alluvial zones of gravel and sand deposits along rivers.
Basel Convention	Convention on the control of transboundary movements of hazardous wastes and their disposal (1998).
Bed-Load	Material (slit, sand, gravel) moving on or immediately above the streambed.
Best Available Techniques (BAT)	Latest stage of development (state of the art) of processes emphasising the use of non-waste technology, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste. It is applied to industrial and other point sources of pollution.
Best Environmental Practice (BEP)	Application of the most appropriate combination of sectoral environmental control strategies and measures. It is applied to non-point sources of pollution such as agriculture.

Biochemical Oxygen Demand (BOD)	A measure of the quantity of oxygen used in the biochemical oxidation of carbonaceous and nitrogenous compounds in a specified time, at a specified temperature and under specified conditions. The standard measurement is made for five days at 20°C and is termed BOD ₅ . BOD is an indicator of the presence of organic material in the water.
Biodiversity	The sum total of different species of flora and fauna in a given region, area or habitat.
Biota	Living organisms, including animals, plants and bacterial in a given ecosystem.
Builder	Means any substance intended to maintain alkalinity, and/or bind dissolved metal ions (soften the water), and/or keep the soil in suspension, increasing the effectiveness of the detergent, it includes substances such as phosphate, NTA, EDTA, zeolite sodium citrate and sodium silicate.
Catchment	The area of drainage basin of a river.
Chemical Oxygen Demand	A measure of the quantity of oxygen used in the chemical oxidation of compounds in a specified time, at a specified temperature and under specified conditions.
Collecting system	A system of conduits, which collects and conducts urban wastewater.
Command and control	Regulatory instruments in environmental policy. These are characterised by their imperative nature (e.g. emission standards), unlike economic instruments that are voluntary and offer incentives.
Commercial bank	Privately owned banks operating check or current accounts, receiving deposits, taking in and paying out notes and coin, and making loans.
Commercial terms	See Market terms.
Concessional funds/assistance	Monies lent out at less than the market rate of interest.
Conference of the Parties	A meeting of the contracting parties (governments) to an international convention.
Consumer	Means a household, commercial establishment or institutional facility.
Convention, international	A form of treaty or international agreement concluded between Contracting States in written form, establishing rules expressly recognised by the Contracting States and governed by international law.
Cost accounting	Accounting is the system of organising, maintaining and auditing the financial records of a company (or an individual). Cost accounting refers to the initial data and procedures that are used to build up the accounts. In principle, these will refer to the actual prices paid (historic cost accounting). In order to take into account the effect of inflation (which requires that renewal of materials or machines that are written off need to be replaced

with more expensive materials/ machines) other methods exist (inflation accounting) that allow to reflect in the records the depreciation in real terms of the assets.

Credit risk	The probability that a borrower will not repay a lender according to the agreed upon terms.
Danube Environmental Programme	A programme of co-operation established by Danubian countries, bilateral and multilateral donors, international organisations and NGOs.
Debt	A sum of money or other property owed by one person or organisation to another.
Debt for nature/environmental swap	A debt reduction technique in which there is the exchange by a debtor country of parts of its external debts for environmental or nature protection improvements.
Debt services	A payment of interest on a debt that is an amount in addition to the debt amount itself.
Decentralisation	A process in the organisational development of an entity with specific environmental responsibility whereby the responsibility is delegated and performance and penalties defined.
Declaration	A non-binding statement of policy by a government or group of government (e.g. Odessa Declaration).
Denitrification	The process whereby nitrate is successively reduced to nitrogen, facilitated by bacteria in the presence of a carbon source and other nutrients.
Determinant	Description given to a substance subject to analysis in a laboratory for chemical biological or physical analysis or measurement for which a quantitative presence in the environment can be defined.
Discharge	The flow rate of a fluid at a given instant expressed as volume per unit of time (see stream discharge).
Domestic sewage	Wastewater from residential settlements and service, which originates predominantly from the human metabolism and from household activities.
Donors	Governments and organisation which contribute financially to the Danube Programme.
Dose	Is the quantity of detergent recommended by the manufacturer for normal washing condition to obtain the desired performance in standard washing machines.
Ecological agriculture	See Organic farming.
Ecology	The study of the relationships of organisms to their environment.
Economic instruments	Instruments of environmental policies in which a change in technology incentives or products is encouraged through financial incentives (either subsidies, taxes, price differentiation or market creation).

Economically viable	An economic activity operating in a market of other buyers and sellers that generates revenues sufficient to cover all the fixed and variable costs of production and a profit large enough to induce the firm to remain in the market.
Ecosystem	A natural unit consisting of living and non-living parts interacting with each other, formed by the organisms of a natural community and their environment.
Ecu	European Currency Unit - the unit of account of the European Union based on a weighted average of the currencies of the member countries of the European Union. The rate of 1 ECU=1.20 USD was used for preparation of this report.
EDTA	Means ethylene diamminotetra-acetic (also known as ethylene dinitrilotetraacetic acid) or any of its salts.
Emission	Release of substances from a source.
Emission limit	A numerical limit set on the emission of a substance from a source.
Enteroviruses	Viruses indicative of domestic sewage and a high risk of disease if not controlled or eradicated.
Environmental dynamic	Natural or man-made processes or forces which change the state of the environment.
Environmental quality standard	The requirements which must be fulfilled by a given environment or part thereof (e.g. air, surface water, groundwater).
Epidemiology	The science of epidemics or the spread of disease or organisms which cause disease.
Equity	The residual value of a company's assets after all outside liabilities, other than to shareholders, has been allowed for. Equity is the amount left for the borrower if the asset is sold and the lender repaid.
Erosion	A natural physical process where either wind or rain and surface water run-off loosen and remove soil particles from land surfaces which are often deposited in rivers and lakes.
Eutrophication	The process of over-fertilisation of a body of water by nutrients producing more organic matter than the self-purification processes can overcome.
Export credits	Preferential treatment, often in the form of short-term loan financing at preferential rates to the purchaser, for firms that sell their products abroad, compared to firms that sell in the home market.
Fecal coliforms	Bacteria common to the digestive tract of human beings and animals. Indicative of domestic sewage and a high risk of disease if not controlled or eradicated.
Fecal streptococci	Bacteria indicative of human and animal excreta and a high risk of disease if not controlled or eradicated.

Fees	A charge for professional service.
Fertiliser	Any substance containing calcium, nitrogen, phosphorus, potassium and microcompounds used on land to enhance the growth of vegetation; it may include livestock manure, the residues from fish farms and sewage sludge. A component necessary for plant growth.
Financial intermediary	Institutions which hold balances of, or which borrow from individuals and other institutions, in order to make loans or other investments. They serve the purpose of channelling funds from lenders to borrowers.
Fiscal measures	Legal requirements involving finance, e.g. taxes.
Fines	See economic instruments.
Function	See Water use.
GDP	Gross Domestic Product - a measure of the total flow of goods and services produced by the residents within the country over a specified period, normally a year.
GNP	Gross National Product - GDP plus the income accruing to domestic residents from investment abroad less income earned in the domestic market accruing to foreigners abroad.
Goals	Used as a synonym for objectives or aims; also a set of levels of water pollutants or water quality parameters to be attained in water quality management programmes; sometimes referred to as objectives, or guide values.
Grant funds	Monies given to an individual or institution with no expectation or requirement of repayment at time in the future.
Groundwater	All subsurface water.
Guarantees	A commitment by a third party, possibly another financial institution but often a national government, to repay a loan in the event that the borrower is unable to do so.
Gypsum	Calcium-sulphate-hydrate.
Habitat	The natural environment of an animal plant.
Harmonisation	The process by which governments brings their legislation and policies into compatibility with each other.
Hazardous substances	Substances that have adverse impact on living organisms, e.g. toxic, carcinogenic, mutagenic, teratogenic, and harmful for the environment.
Heterotrophic growth	In a water pollution context, this will mean growth of organisms - bacteria and fungus - based on the consumption of organic material and oxygen. Contrary to autotrophic (plant) growth which process oxygen and organic matter.
'Hot spot'	A local land area, stretch of surface water or specific aquifer, which is subject to excessive pollution and which, requires specific action to prevent or reduce the degradation caused.

Hydrocarbons	Petroleum products.
Hypoxia	Condition where oxygen levels are reduced or lower than desirable to support life.
Immission	The concentration of pollutants in a surface water (see environmental quality standards).
Income-tax incentives	Fiscal measures related to the taxation of private incomes.
Industrial wastewater	Wastewater that is discharged from premises used for carrying on any trade or industry, other than domestic wastewater and run-off rain water.
Integrated water management	A participatory planning, decision making and implementation process that takes into account the specific water quality and quantity requirements of all users and uses.
Inter-calibration	A means by which the accuracy and readability of results produced by two or more measuring devices can be assessed.
Joint ventures	Economic activities undertaken by partners with joint involvement in the financial, managerial and production process aspects of the firm(s); partners may be from different sectors e.g. private firms, government ministries and financial institutions.
Karstic water	Groundwater found in the heavily fissured exposed limestone rock formation very common in the Danube river basin.
Landfill	Disposal of solid waste materials at land bases sites.
Laundry detergent	Means any substance intended for use in automatic laundry machines, based on surfactant and builders, formulated or manufactured to enhance the cleansing action of water. Includes laundry soaps as well as powder and liquid synthetic laundry detergents.
Leachate	Liquid which has percolated through a substrate (e.g. soil, ore, waste dump, etc).
Load	Quantity of a substance or material carried or transported by a river (and its associated hydrological processes).
Market-based instruments	See Economic instruments.
Market terms	The interest rate, maturity structure and other relevant characteristic of a loan that result from the interaction between potential lenders and potential borrowers in a market. The nature of competition and pricing is determined by the structure of the market, most importantly number and size of the buyers and sellers involved in the market.
Microbiological	Pollution with microorganisms - such as viruses, bacteria, protozoa, etc. - that might cause diseases in humans or animals.
Micro-pollutants	Organic or inorganic substances such as PCB, dioxins, cadmium, mercury, etc. That will create negative health impacts or adverse ecological change even when present in low concentrations.

Mineral oil	One of the products of fossil hydrocarbons.
Nitrate	NO ₃
Non-budgetary incentives	Financial encouragement's which do not affect the budget.
Nutrient	A substance, element or compound necessary for the growth and development of plants and animals.
Organic farming	Agriculture production system where each farm is considered as a whole where all components - soil minerals, organic matter, micro-organisms, insects, plants, animals and humans - interact without the use of synthetic fertilisers.
Pathogens	Disease- causing.
Penalty	A punishment (e.g. a sum of money) for the violation of a law, rule or contract.
Pesticide	Substance that kills organisms injurious to man or to the plants and animals upon which he depends for food, fibers and shelter.
Phytoplankton	Collectively, all the microscopic plants, such as certain algae, living unattached in aquatic habitats.
Phytoplankton bloom	An excessive growth of Phytoplankton.
Plankton	Minute plants (Phytoplankton) and animals (zooplankton) which either have relatively small powers of locomotion or drift in the water subject to the action of waves and currents. The chief constituents of phytoplankton are unicellular algae. The zooplankton consists of various organisms including protozoa, small crustaceans and various invertebrate larvae.
Point source, non-point source	A localised discharge of pollutants (e.g. from an industrial plant); diffuse pollution in a catchment area (e.g. agricultural run-off).
Polluter Pays Principle	Principle that the polluter should carry the costs of the measures required diminishing or cleaning up pollution.
Pollution	The discharge, directly or indirectly, of compounds from sources into the environment in such quantity as to pose risks to human health, living resources or to aquatic ecosystems, damage to amenities, or interface with other legitimate uses of water.
Population equivalent	No uniform definition exists. Used as a measure of water pollution load based on figures of an average "pollution production" of one person in one day. Often-used figures are: (BOD ₅) 60g per day; total nitrogen 12g per day and total phosphorous 2.5g per day.
Primary treatment	A one-step treatment process of urban waste water by a physical or chemical process involving settlement of suspended solids.
Programme Co-ordination Unit (PCU)	Unit with a specific co-ordinating role established under the Environmental Programme for the Danube River Basin.

Reach	A length of a river the exact distance of which may or may not be specified.
Recurrent costs	These are costs that vary directly and predictably with the rate of output, e.g. labor costs, raw materials costs, energy costs (also known as variable costs or operating costs).
Regional	In this document, either a group of countries or a subnational geographic area depending on the context in which the phrase is used in the text.
Rehabilitation	Improvement of a visual nature to a natural resource or, putting back infrastructure into good condition or working order.
Restoration	Return of an ecosystem to a close approximation of its condition prior to disturbance.
Restructuring	Any change in the organisation and method of financing an entity with responsibility for environmental management or with the to emit pollution into the environment.
Revenues	Gross income accruing to a firm through the sale of its output.
Secondary treatment	Treatment of waste water by a process generally involving biological treatment with a secondary settlement or other process.
Secretariat International	A formal operating Unit established under the Danube River Protection Convention (see Annex IV, Art.7 of the DRPC).
Sediment	Solid fragmental material originating from weathering of rocks or by other processes, deposited by air water or ice, or that accumulated by other processes such as chemical precipitation from solution or secretion by organisms.
Sediment load	The amount of sediment passing a cross section of a river or stream, in a specified period of time (see also Betload).
Silt-loess layers	Deposits of fine sediments, which collect at the interface between the river bank/bed and the water column. These layers perform an important role in maintaining water quality in shallow groundwater close to the river.
Species	Group of related individuals with a common hereditary morphology, chromosomic number and structure, physiological characteristics and way of life, separated from neighbouring groups by a barrier, which is generally sexual in nature, and occupying a definable geographic area.
Stakeholder	A person who holds a sum of money deposited by the buyer in a transfer of ownership of land or a building; the deposit will be paid to the seller only if the buyer agrees, and vice versa. Or, a person, organisation or subgroup of an organisation that have a common interest in a project or activity.
Subcatchment	Part of a catchment.

Subsidies	Grants to suppliers of goods and services or individuals; a subsidy has the object of keeping prices below the cost of production.
Sunk capital	The amount of an organisation's funds that has been spent and is therefore no longer available to the organisation, frequently because it has been spent on either unrealisable or valueless assets.
Surfactant	Or "surface-active agent" means any substance, which is intended to reduce surface tension thereby helping water to penetrate fabrics, and to surround and remove soils.
Sustainable development	The use of resources in such a way that the possible needs of future generation is not seriously affected.
Tariffs	A tax imposed on a good imported in a country. It may be specific (x \$ per good) or ad valorem, which means a certain % of the value of the imported goods.
Tariffs policy	Policies that affect the tariffs for certain goods or the overall pattern of tariff rates.
Task Force (Danube Programme)	The supervisory body that oversees and provides overall direction to the Environmental Programme for the Danube River Basin.
Tax	A tax is a sum of money that a local or national authority imposes on incomes (income tax), properties (property tax), sales (sales tax), profits (profit tax) or the creation of waste and/or pollution waste (waste/pollution tax). Taxes can be specified as a rate (e.g. income, profit or sales taxes are generally x% of taxable income, profit or sales) or as a fixed amount for a certain unit (e.g.. pollution taxes can be expressed as x\$ per ton of waste or pollutants emitted in the air, water).
Tax incentive	A tax incentive will lower the taxes to encourage certain behaviour, products, production processes, location,...It will either lower the tax rate or fixed amount or it will lower the taxable income or profit.
Toxic substances	Substances which cause harm to living organisms.
Tributary	A river which ultimately flows into the Danube River.
Twinning agreement	An agreement of international co-operation and exchange between similar organisation or institutions (e.g. towns, cities, national parks).
Urban wastewater	Domestic sewage or a mixture of domestic sewage with industrial wastewater and/or run-rain water.
Water charges	See Fees.
Water quality criteria	A scientific requirement on which a decision or judgement may be based concerning the suitable of water quality to support a designated use.
Water quality standard	See Environmental quality standard.

Water uses

Water used for a number of purposes: Water supply for drinking water, irrigation, and industry (including food production), as a recipient of waste water from the public sector, industry and agriculture, for transport, for energy productions, as flood protection, for recreation, riverine and other ecosystems, and biodiversity; often referred to as "functions".

Water users

Public and municipal sector, agriculture and fisheries, industry, transport and energy.

1. Summary

As it was planned, even from the beginning of the Environmental Programme of the Danube River Basin and later by the Danube River Protection Convention, a Strategic Action Plan (SAP) and a Strategic Action Implementation Plan were produced and many of the projects proposed have already been finalised and implemented. In the countries the National Environmental Action Plans (NEAP) were also produced, including the one in Romania in 1995, based on the main findings from SAP and, after approval by the Government, has become work documents for specialised institutions in respective countries. The actual SAP's, as well as the SNAP's were completed with the option that it would be revised regularly, at least every three years.

Starting from this background, the GEF / UNDP - Danube Pollution Reduction Programme was set up in 1997 with the clear tasks of the revision of SAP, the re-elaboration of National SAP's, the revision of the Transboundary Analysis and the amendment of the Danube Water Quality Model (DWQM). In the elaboration process of the Romanian National Review, the Guidelines and the Table of Content, which were agreed within the last GEF - UNDP - DPRP - workshop in Budapest, January 1998, were utilised.

1.1. Updating Evaluation and Ranking of Hot Spots

The general approach and methodology that was applied to update, evaluate and rank Hot Spots was based mainly on the methodology applied within the National Environmental Action Plan (NEAP = PNAPM) and in parallel on the recommended methodology. This methodology is described in detail in chapter 2.1. What should be mentioned from the beginning is that, the first lists of Hot Spots that were used for next steps of evaluation and ranking, were the lists of municipal and industrial main discharges (covering 75 % from total national discharged volume within the country in the Danube basin area), lists produced by the EMIS - EG in the frame of the Environmental Programme of the Danube River Basin (EPDRB). From the total number of 55 municipal discharges and 133 industrial (including agricultural) discharges based on the selection from other national or international assessments (previous SAP, NEAP - 95, NEAP - 97 and so on) these two groups of Hot Spots were classified in Municipal Hot Spots, Agricultural Hot Spots and Industrial Hot Spots and than based on the assessment of values for loads, impact on the receiver, problems created, affect on other users and / or ecosystems. Those Hot Spots were then categorised in High, Medium and Low Priority Hot Spots and in each of those categories (less for Low Priority) the ranked places were identified.

As a result of this complex process were identified and described 10 High Priority and 2 Medium Priority Hot Spots for Municipal category, 4 High Priority and 6 Medium Priority Hot Spots for Agricultural and 23 High Priority plus 26 Medium Priority Hot Spots for Industrial category.

For all of the above mentioned Hot Spots, the ranking procedures were applied and in a number of 3 Ranked position of Hot Spots tables, the respective Hot Spots were placed. All these Hot Spots together with upstream and downstream gauging / sampling stations were shown on a hydrological 1: 1,000,000 map. In order to have the possibility for impact evaluation, to create the conditions for sizing this impact and to make an appropriate comparison for ranking, all the necessary data and information were organised in tables consisting of 56 columns (for Municipal Hot Spots) and 32 columns (for Agricultural and Industrial Hot Spots), using EXCEL Software facilities. The typical data collected are: discharged pollutant loads, receiver and effluent flows, quality control gauging / sampling station, water quality category upstream and downstream (for 3 years), water quality indicators affected in receiver, characteristics of problem created in receiver, possible downstream users of the receiving waters, nature of implication of Hot Spots to the respective problem, transboundary or internally problems created and / or transferred, and so on.

1.2. Updating, Analysis and Validation of Water Quality Data

In order to facilitate the Transboundary Analysis and to calibrate / validate the Danube Water Quality Model for the benefits of riverine countries, in parallel with the data gathering for Hot Spots impact assessment, a great number of data were collected.

In respect to this all the necessary data for identification, evaluation and location of diffuse sources pollution from agriculture were included in tables and graphs according to the requirements. The total land, the total available land, the irrigated surfaces, crop volumes, size and differentiation between the types of used chemicals were presented with values from 1994 -1996 years. The available data for fertilisers, animal grazing and intensive animal farming were also collected and included in the report together with data referring to erosion, climate and weather from the 3 mentioned years.

In the chapter 4, the most relevant data for the years 1994 - 1996 were collected and organised in a computer accessible format (EXCEL table). Those are referring to the Water Quality National Monitoring System (WQNMS) as a main resource for the necessary data in this report, the organisational and institutional frame in which this system is working was also presented.

Special attention was paid to the Quality Control and Quality Assurance System or procedures that are applied in Romania and, based on this, an impression and evaluation about the reliability and comparability properties of the data can be obtained. Also information about the data consistency, comparability and transparency were included and interpreted in the respective chapter.

The River Channel characteristics for the Danube and for tributaries from the catchment area where the Hot Spots are located were collected and organised again in the same EXCEL format table, constituting in fact a consistent data base with about 95,000 - 100,000 data included. These are cross-sectional hydrological data, gradients description graphs for the Danube and other 10 tributaries, flood plains, wetlands, erosion and degradation phenomena description with name, location and size numbers of these events or places.

The main dams and reservoirs larger than 20 million cm (about 85) were included with their main characteristics in the report. Major water transfer as well as other major structures and encroachments like the main channels between Danube and Black Sea were presented together with their main physical and hydrological characteristics.

A number of 142 sampling stations were established in the Danube and the tributaries based on the five conditions imposed by the guidelines and report content for all 79 identified Hot Spots. For all those 142 sampling stations located upstream and downstream by the Hot Spots, were selected and organised in the Annexes 3.11 – 1, like water discharge and quality data etc, on 10 - 13 columns tables. With regard to the water discharges, sediment discharges, suspend sediment concentration, the existing data for 1994, 1995 1996 years were collected and recorded in the dedicated tables or in the Annexes 3.11 - 1 nearby the water quality data.

In addition to this large volume of data gathering, organising, storing in a computer accessible format (EXCEL) a number of pages are dedicated to the Legal and Institutional Framework for Water Quality Control as well as to the glossary of terms, List of Abbreviations and References recording, that were used for covering, as good as possible the tasks and content of the National Review.

2. Updating of Hot Spots

The “Strategic Action Plan for Danube River Basin” (SAP) has been developed as a framework for regional actions, to improve environmental management in the area.

The four strategic goals of the Action Plan were derived from the objectives of the “Convention on Co-operation for the Protection and Sustainable Use for the River Danube”, this convention being signed between Danubian countries and the European Union as well; these goals are:

- Improvement of aquatic ecosystems and biodiversity in the Danube River Basin (DRB) and the reduction of pollution loads entering the Black Sea;
- Maintaining and improving the quality and quantity of water in the DRB;
- Control of damage from accidental spills;
- Development of regional co-operation in water management.

It was stated that those goals can only be achieved by means of integrated and sustainable management of the waters of the DRB.

To reach the above mentioned goals, a number of measures necessary to be taken were established and clearly specified in the Strategic Plan for the DRB:

- Reduce the negative impact of activities in the DRB and on the riverine ecosystems and the Black Sea;
- Maintain and improve the availability and quality of water in the DRB;
- Establish control of hazardous from accidental spills;
- Develop regional water management co-operation.

Based on those goals and measures, a number of strategic directions were identified, the main targets to which the actions should be addressed and the short and medium term actions were developed for each of the mentioned goals and measures.

Comprehensive lists of sites of “hot spots” have been drawn up within the Danube countries. Based on evaluation and description of hot spots, a Strategic Implementation Action Plan was then developed and the work has started with this.

In order to update the water-related hot spots, the following basic elements and information have been considered:

1. previous inventories for SAP of Danube River Basin;
2. monitoring activity – integrated approach of the emissions / immissions / priority pollutants / target groups / environmental themes / environmental (water) problems;
3. National Environmental Action Programme with the main inputs from Environmental Protection Agencies and different Ministries;
4. Annual Synthesis concerning Water Quality Protection in Romania – issued by Romanian Water Authority.

2.1. General Approach and Methodology

Based on the Strategic Action Plan and on the annual outputs provided by National Environmental Action Program a general methodology for the Hot Spots assessment and updating has been elaborated.

2.1.1. Evaluation of Existing Hot Spots

For the main target groups (industry, agriculture, population) the following phases have been applied:

- general screening at the level of each hydrographic basin – preliminary inventories of the hot spots;
- selection of the hot spots;
- evaluation of the hot spots;
- ranking (score system).

A preliminary matrix for the hot spot selection and evaluation is presented in Table 2.1.1.1.

Table 2.1.1.1. Preliminary matrix for hot spot selection and evaluation

MAIN CRITERIA	POINTS (SCORE)		
	high priority	medium priority	low priority
A. Dilution	10	5	1
B. Impact magnitude	10	5	1
C. Pollution of the receiver	10	5	1
D. Risk for accidental pollution	10	5	10

$TOTAL = A + B + C + D$

For the accidental pollution a more detailed list with the criteria and weight factors is presented in Table 2.1.1.2.

Table 2.1.1.2. Criteria and weight factors for ranking the hot spots related to the accidental pollution

CRITERIA	SCORE	
	high (i)	medium (ii)
1° INTEGRATED RISK ASSESSMENT		
1.1. Risk for environment and biodiversity		
1.1.1. soil and surface water acidification	2	1
1.1.2. eutrophication	2	1
1.1.3. soil and water contamination	4	2
1.1.4. nuclear contamination of waters and soil	40	20
1.2. Risk for human health		
1.2.1. human health	20	10
1.2.2. other (sonic pollution etc.)	2	1
1.3. Risk for agriculture		
1.3.1. plant contamination	4	2
1.4. Risk for external safety		
1.4.1. major disaster – high risk	10	5
1.4.2. accidents – medium risk	4	2
1.4.3. incidents – low risk	2	1
2° RISK DIMENSION		
2.1. Geographical scale		
2.1.1. international (transboundary)	4	4
2.1.2. national	3	2
2.1.3. regional	2	1
2.1.4. local	1	0,5
2.2. Temporal effects		
2.2.1. urgent – immediate actions	3	1,5
2.2.2. long term effects	2	1
2.3. Pollution sources have a contribution to risk in proportion of:		
2.3.1. major – more than 50%	10	5
2.3.2. moderate 10-50%	3	1,5
2.3.3. minor less than 10%	1	0,5
3° EMISSION CONTINUITY REGIME		
3.1. high	2	1
3.2. medium	1	0,5
3.3. low	0,5	0

(i) long term activity

(ii) medium or low term activity

It should be underlined that the ranking system presented in the tabs. 2.1.1.1 and 2.1.1.2 represents a preliminary phase for the evaluation of the existing hot spots which has to be related with the next steps.

2.1.2. Deletion of Existing Hot Spots

For some activities – especially in the framework of the “industry target group” taking into consideration the privatization process constraints, a series of specific criteria have been considered in order to reevaluate the status of the hot spots such us:

1. uncertainty of financial support;
2. significant decrease of the activity (more than 50%) in comparison with the previous year;
3. specific programme for the activity change.

However for such situation the conformation programmes in accordance with the environmental permits should be very tightly followed.

2.1.3. Addition of Hot Spots

For new activities, which have a consolidated position, the following specific pre-evaluation approach has been applied (tab. 2.1.1.3).

Table 2.1.1.3. Specific prioritisation criteria for the new activities - industry target group

Nr. crt.	CRITERIA	points (max)
1.	Environmental impact (priority areas, regional ecological programmes)	15
2.	Financial/economical statue (1997) cost/benefit analysis	12
3.	Importance of the activity for the sustainable development strategy of Romanian economy	10
4.	Management and institutional capacity building	8
5.	Possibility of integrated project for the environment quality protection (water/air/soil)	3
6.	Privatisation process	2
7.	TOTAL	max 50

It should be mentioned that these six main criteria are used for the hot spot project selection in addition to the environmental impact assessment.

2.1.4. Ranking of Hot Spots

Overall a general matrices for the hot spots ranking has been selected (table 2.1.4.1). The prioritization is based also on a score, specific for each activity with a relevant impact to the environment (water quality related) taking into consideration the both main characteristics: (i) emission and (ii) immission.

Table 2.1.4.1. Impact evaluation matrix

SEC TOR	Par ameter	Characteristics CRITERIA	CLASSIFICATION SCORE (POINTS)			
			I	II	III	IV
0	1	2	3	4	5	6
E M I S S I O N S	A ⁰	DILUTION (Q _i / Q _e)	Medium 1	Low 5	Non-acceptable 10	Increasing risk 30
			$\Delta > 50 : 1$	$10:1 < \Delta < 50:1$	$5 : 1 < \Delta < 50 : 1$	$\Delta < 5 : 1$
	B ⁰	EFFLUENT QUALITY	Medium 1	Low 5	Non-acceptable 10	Increasing risk 30
	b ₁	•BOD ₅ (mg/L)	< 60	> 60 < 120	> 160	> 300
	b ₂	•COD (mg/L)	< 100	> 100 < 750	> 750	> 1500
	b ₃	•NH ₄ (mg/L)	< 20	> 20 < 100	> 100	> 200
	b ₄	•phenols	< 0.1	> 0.1 < 0.5	> 0.5	> 1.0
	b ₅	•oil (mg/L)	< 0.4	> 0.4 < 3.0	> 3.0	> 6.0
	b ₆	•toxic (mg/L)	< 0.1	> 0.1 < 0.5	> 0.5	> 1.0
	b ₇	•specials (mg/L)	1.25 AC	2 AC	5 AC	10 AC
		(AC = admitted concentration at discharging point in GA Agreement) B ⁰ = Σ b _i				
C ⁰	QUANTITY OF DISCHARGED POLLUTANTS	UNITS	SCORE			
c ₁	•BOD ₅	for each discharged 100t / year	1.5			
c ₂	•suspended solids	for each discharged 100t / year	1.0			
c ₃	•nitrogen	for each discharged 100t / year	1.0			
c ₄	•phosphorus	for each discharged 100t / year	5.0			
c ₅	•others	major emissions	30			
		medium emissions	10			
		low emissions	1			
		C ⁰ = Σ c _i				
D ⁰	CONTINUITY AND LEVEL OF POLLUTION SOURCE PRODUCTION (IMPACT TERM)	- unknown - minor 1	- probable - low - short-term 5	- confirmed - medium - medium-term 10	- confirme d - high - long-term 30	
E ⁰	RISK AT ACCIDENTAL POLLUTION	Low (control capacity exists) 1	Medium 5	Critical 10	Extreme 30	

0	1	2	3	4	5	6		
↑	F ⁰	RISK ON AQUATIC ENVIRONMENT		Low	Medium	Critical	Extreme	
	I	F.1. Natural and biological diversity F.1.1. Eutrophication	1	5	10	30		
					- international risk	- international risk		
		F.1.2. Decreasing of D.O. concentration			- less urgent	- urgent (on transboundary)		
		M	F.1.3. Decreasing of buffer capacity F.1.4. Associated pollution to sediment and suspended solids		- regional risk	- regional risk		
				- less urgent	- urgent			
	S	F.2. Harmful effects F.2.1. Toxicity F.2.2. Persistent F.2.3. Accumulation (bio) F.2.4. Carcinogenic and mutagenic effects		- local risk	- local risk			
				- less urgent	- urgent			
	$F^0 = \sum F_i$							
	O	G ⁰	RISKS ON USAGE		Low	Medium	Critical	Extreme
G ₁		Effects on human health	5 - minor	10 - low	40 - medium / high	80 - at a large scale - high		
		G.1.1. Drinking water pollution	- at working place	- at working place	- regional	- international		
		G.1.2. Other effects	- less urgent	- local	- urgent	- urgent		
G ₂		G.1.3. Nr. of affected inhabitants	- over 10,000	- over 100,000	- over 500,000	- over 1,000,000		
		Agriculture (including livestock)	- idem	- idem	- idem	- idem		
G ₃	Irrigation's	+	++	+++	++++			
G ₄	Fishery	+	++	+++	++++			
G ₅	Others	+	++	+++	++++			
$G^0 = \sum G_i$								
↓	H ⁰	IMPACT MAGNITUDE		Low	Medium	Severe	Extreme	
	H ₁	Modification of quality class	15	20	25	40	50	75
			from III rd class degraded to III rd	from II nd to III rd	from I st to II nd	from II nd to degraded	from I st to III rd	from I st to degraded

0	1	2	3	4	5	6
↑ I M M I	H ₂	Length of affected stretches / average flows (L) (Q m ³ / s)	25	50	75	100
			10 ... 15 km	15 ... 30 km	30 ... 100 km	over 100 km
	H ₃	Pollutant dispersion capacity	C ⁰ x 1 Villages	C ⁰ x 2 medium towns	C ⁰ x 3 big cities + industry	C ⁰ x 4 natural lakes Danube Delta Black Sea
			Low 5 - high attenuation capacity	Medium 25 - medium attenuation capacity	High 50 - low attenuation capacity	Extreme 80 - very low attenuation capacity
S S I O N S ↓	H ₄	Decreasing of attenuation capacity pollution in receiver (affectation of supportability degree) - selfpurification				
	H ⁰ = Σ H _i					
TOTAL SCORE : A + B + C + D + E + F + G + H						

- (i) concerning the emission the following primary characteristics are considered:
- A – the dilution ratio (water receiver flow/effluent discharge) based on four ranges starting from 50:1 (moderate impact) to Δ<5:1 (high impact); this ratio is one of the basic parameter for the point discharges ranking.
 - B – the quality of the effluent characterized by significant pollutants such as BOD₅, COD (Cr), N-NH₄, phenol index, oil, toxic/hazardous chemicals (heavy metals, pesticides etc.) and other special pollutants.
 - C – the discharged loads expressed in t/y for BOD₅, suspended matter, total nitrogen, total phosphorous and others.
 - D – the process continuity (short, medium, long term).
 - E – the risk for the accidental pollution; this characteristics should be also related with the table 2.1.1.2.
- (ii) concerning the immissions there are three main considered characteristics as follow:
- F – the risk to the aquatic ecosystems mainly due to the eutrophication process, depletion of the dissolved oxygen concentration, decrease of the buffering capacity, associated pollution with the suspended matter and sediments, hazardous effects (toxicity, persistence, bio-accumulation, carcinogenic, mutagenic etc.).
 - G – the risk to the water users – drinking water supply, agriculture, irrigation, fisheries etc.

H – impact magnitude expresses by four parameters: quality class deterioration, lengths of the affected stretch, pollutant dispersion and selfpurification negative effects.

Relation obtains the overall score for the ranking of hot spots:

$$S(\text{score}) = A + \Sigma B + \Sigma C + D + E + \Sigma F + \Sigma G + \Sigma H.$$

As it was recommended in the Guidelines for this report, the selection of the Hot Spots has started from the list that was organised by the EMISS / EG for each country. For Romania, there were two lists, one for Municipal Hot Spots with a total of 54 Hot Spots and another one so called “Industrial Hot Spots” which has included also the agricultural point sources with a total number of 136. From these 2 lists, there were created 3 categories of Hot Spots - municipal, agricultural and industrial and for every one a first estimation was done. As a result of these, three groups of Hot Spots were created as High, Medium and Low Priority based on a number of criteria, like :

- inclusion on another Hot Spots list. In this report were analysed Strategic Action Plan from 1993, National Action Plan for Environmental Protection (PNAPM), first report produced in 1995, second revised report produced in 1997 and one table produced for internal purposes (table 2.2). The inclusion of one Hot Spot or more from those lists and the problem created as impact, was used for this judgement (columns 3, 4, 5, 6 in the Hot Spots tables);
- the characteristics of problems created in the area, as well as in the receiver was another criterion for the first grouping and selection;
- the levels of loads discharged as well as the dilution capabilities of the receiver were also used in parallel with the impact created in receiver showed by the changing of the water quality category in the downstream sampling station against the upstream sampling station for every Hot Spot.

A number of 3 selected tables were created for every category of Hot Spots with High, Medium and Low Priority Hot Spots included. These tables were organised using EXCEL Software. Detailed description of the tables and their content will be presented in the next chapter.

2.1.5. Map of Hot Spots

For presenting the Hot spots (HS) on the map, in the case of Romania, where more than 98% of the country is included in the Danube catchment area a hydrological map of the country with the scale 1 : 1.000.000 was used

On the same map, there are also included all upstream and downstream sampling stations for each HS included.

For the 3 groups of HS, were used 3 geometrical figures coloured in different colours circle for municipal HS (with one diameter for High Priority and empty for Medium Priority), square for industrial HS (with one diagonals for High Priority and empty for Medium Priority) and hexagon for agricultural HS (with one diagonals for High Priority and empty for Medium Priority). For identification, the same number was used for one HS in the cumulative table (with all HS from each category : municipal, industrial, agricultural) in the ranked list of Hot Spots (High Priority, Medium Priority and Low Priority) and also on the map. So the geometrical figures representing different HS have attached the corresponding numbers from the tables.

The same procedure was applied for sampling stations presented on the map and the number attached to the sampling station line across the river were is located and is representing the code number from the Water Quality National Monitoring System Network list (WQNMS) which is attached to the chapter 4.1 (table 4.1.1). The same code number for each station is also in each of

the Annexes 3.11 - 1 that belong to the respective station. A legend with the significance of the figures and numbers is attached in the left down and right up corners of the map. Attached to this map, there are two drawings representing Romanian relief across-section from West to East and from North to South (figure 2.1.5.1.).

The table 2.1.5.1. was created to facilitate the connections between the hot spots included in the map and between the tables (annexes 3.11-1) with the name /codes of hot spots and also with the sampling stations (names and codes applied on the map for this stations) Also this table has information about the water quality in the respective sampling stations.

The Quality Categories I, II and III as well as D are referring to the Romanian Surface Water Quality Standard no. 4706/1998 (which is attached in Report at the end). The character D it means that for one or a number of analysed parameter the value obtained is higher than the allocated maximum limit (MAL) from the third category

D= overlimit or in a large acceptance degraded for one or more quality parameters.

The values of concentrations are simple means of measured concentrations.

The reported concentration is referring only to the mineral N with his forms. The organic N is used based on the estimation of the percentage from the total N (18-20%) values, which were found out in a number of researches and projects with internal or international co-operation work. The measurements (analysis) are made on non-filtered homogenous phase of water sample, not in sediments or suspended maters. Kjeldahl methods are applied only in the case of research analysis because of the lack of equipment. In the case of P there are two analysis done: orthophosphate and total P and methods are described in table 4.3.1.

Table 24. MAIN POLLUTANT LOADS ISSUED BY POPULATION OF ROMANIA IN THE DANUBE RIVER BASIN

RIVER BASINS	POPULATION CONNECTED TO SEWAGE SYSTEM (thous.)	WASTE WATER FLOW DISCHARGED / OF WHICH TREATED (l/s)	TOTAL N (tons/year)	TOTAL P (tons/year)	BOD ₅ (tons/year)
DISCHARGED ON THE ROMANIAN TERRITORY					
1. JIU	652.8	5,349 / 1,148	1,730.0	486.6	12,314.0
2. OLT	1,043.6	7,349 / 5,142	1,470.0	413.5	17,691.0
3. VEDEA	111.0	865 / 848	76.6	21.6	1,759.0
4. ARGES	2,205.6	19,003 / 1,649	6,568.0	1,847.0	42,718.0
5. IALOMITA	848.5	8,412 / 5,221	1,367.0	384.5	14,648.0
6. SIRET	814.2	7,639 / 7,251	627.0	176.3	13,001.0
7. PRUT	997.3	9,471 / 1,165	2,877.0	809.2	19,173.0
TOTAL ON THE INLAND waters discharging in the Danube River on the Romanian territory	6,673.0	58,088 / 22,424	14,715.6	4,138.7	121,304.0
DISCHARGED DIRECTLY INTO THE DANUBE RIVER					
8. DANUBE	950.4	6,859 / 1,622	2,466.0	639.5	17,846.0
TOTAL DISCHARGED IN THE DANUBE on the Romanian territory	950.4	6,859 / 1,622	2,466.0	639.5	17,846.0
DISCHARGED INTO THE BLACK SEA					
9. DOBROGEA	437.2	4,299 / 2,577	728.1	204.8	7,584.0
TOTAL DISCHARGED INTO THE BLACK SEA	437.2	4,299 / 2,577	728.1	204.8	7,584.0
DISCHARGED OUTSIDE ROMANIAN TERRITORY					
10. SOMEŞ	760.7	5,782 / 4,424	944.2	265.6	12,699.0
11. MUREŞ	1,024.6	7,799 / 6,004	1,259.0	354.2	17,085.0
12. CRIŞ	306.9	3,046 / 1,870	499.7	140.6	5,306.0
13. BANAT	484.6	3,960 / 3,052	594.6	167.2	8,079.0
TOTAL DISCHARGED OUTSIDE ROMANIAN TERRITORY	2,576.8	20,587 / 15,350	3,297.5	927.6	43,169.0
TOTAL DISCHARGED in the rivers and Black Sea	10,637.4	89,833 / 41,973	21,207.2	5,910.6	189,903.0

Table 2.1.5.1.

Hot Spots - INDUSTRIAL HIGH PRIORITY

Ser.No. of HS	Discharger Name Of Economic Unit	Receiver River / Main Catchment Area	Name Of Upstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category in Respective Station			Name Of Downstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category In Respective Station		
					'94	'95	'96			'94	'95	'96
0	1	2	3	4	5	6	7	8	9	10	11	12
7	Phoenix Baia Mare	Sasar / Somes	Am. Baia Sprie	27	I	I	I	Baia Mare	28	D	D	D
13	Petrom Suplac de Barcau	Barcau / Cris	Av. Suplacu	53	II	III	II	Parhida	54	II	II	II
16	Sometra Copsa Mica	Tamava Mare / Mures	Am. Medias	70	II	II	II	Am. Blaj	71	D	D	D
17	Azomures Tg. Mures	Mures / Mures	Glodeni	57	I	I	II	Ungheni	58	II	II	II
46	Doljehim Craiova	Jiu / Jiu	Racari	131	II	II	I	Podari	133	II	II	II
55	Arpechim Pitesti	Dambovnica / Arges	Ref. Station		I	I	I	Suseni	195	II	III	III
56	Petrobrazi Ploiesti	Prahova / Ialomita	Cornu	221	II	II	II	Tinosu	222	D	D	D
65	Letea Bacau	Bistrita / Siret	Frunzeni	253	D	D	III	Av. Iac Bacau	256	II	D	D
70	Fibrex Savinesti	Bistrita / Siret	Straja	252	I	I	I	Frunzeni	253	D	D	III
71	Pergodur P. Neamt	Bistrita / Siret	Straja	252	I	I	I	Frunzeni	253	D	D	III
76	Sidex Galati	Siret / Siret	Sendreni	287	II	III	II	Reni	L 0380	II	II	II
77	Antibiotice Iasi	Bahlui / Prut	Podu Iloaiei	302	D	D	D	Holboca	303	D	D	D
79	Siderca Calarasi	Danube / Danube	Chicau - Siliistra	L0280	II	II	II	Grindu - Reni	L0430	II	II	II
87	Somes Dej	Somes Mic / Somes	Am. Cluj	18	I	I	I	Salatiu	19	II	III	II
93	Indagra Arad	Mures / Mures	Am. Arad	90	II	II	II	Nadlac	91		II	
100	Oltchim Rm. Valcea	Olt / Olt	Am. Rm. Valcea	162		I		Dragasani	163		II	
119	Sinteza SA Oradea	Cris Repede / Cris	Am. Oradea	50		I		Cheresig	51		II	
120	Clujana Cluj	Somes Mic / Somes	Am. Cluj	18	I	I	I	Salatiu	19	II	III	II
121	Colorom Codlea	Vulcanita / Olt	Ref. Station	Up 121	I	I	I	Av. st. ep. Colorom	DW 121		D	
122	Favior Orastie	Orastie / Mures	Costesti			I		Av. Orastie			III	
125	Celohart Braila	Danube / Danube	Chicau - Siliistra	L0280	II	II	II	Grindu - Reni	L0430	II	II	II
129	Mampel Tg. Mures	Mures / Mures	Glodeni	57		II		Ungheni	58		II	

Hot Spots - INDUSTRIAL MEDIUM PRIORITY

Ser.No.of HS	Discharger Name Of Economic Unit	Receiver River / Main Catchment Area	Name Of Upstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category in Respective Station			Name Of Downstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category In Respective Station		
					'94	'95	'96			'94	'95	'96
0	1	2	3	4	5	6	7	8	9	10	11	12
12	E.M. Borod	Borod / Cris										
22	Siderurgica Timisoara	Cerna / Mures	Teliucu Superior	86		I		Santuhalm	87		III	
23	E.M. Coranda Certej	Certej Mures	Certej Abrud	Up 23				Am. confl. Mures	Dw 23		D	
24	E.M. Rosia Montana	Abrud / Mures	Ref. Station	Up 24				Am. confl. Aries	Dw 24		D	
26	Ind. Sarnei Campia Turzii	Aries / Mures	Buru	64		III		Luncani - Gligoresti	65		III	
47	Nitramonia Fagaras	Olt / Olt	Hoghiz	148	III	D	III	Fagaras	151	III	D	III
48	Romacril Rasnov	Ghimbasel / Olt	Am. Rasnov	144		I		Aval Bod	145		III	
50	Celohart Zarnesti	Barsa / Olt	Am. Zarnesti	143	I	II	III	Am. confl. Olt	146	D	D	D
54	Dacia Pitesti	Doamnei / Arges	Darmanesti	184		I		Ciunesti	189		I	
57	Romfosfochim Valea Calugareasca	Teleajen / Ialomita	Gura Vitioarei	224	II	II	II	Moara Domneasca	225	D	D	D
60	Astra Romana Pitesti	Dambu / Ialomita	Dambu	Up 60		I		Goga	Dw 60		D	
61	Petrotel Teleajen	Teleajen / Ialomita	Gura Vitioarei	224	II	II	III	Moara Domneasca	225	D	D	D
66	Chimcomplex	Trotus / Siret	Am. Tg. Ocna	259		II		Adjud	260	II	III	II
72	Sofert Bacau	Bisritia / Siret	Frunzeni	253	D	D	III	Aval lac Bacau	256	II	II	II
73	Carom Onesti	Trotus / Siret	Am. Tg. Ocna	259	II	II	II	Adjud	260	II	III	II
80	Alum Tulcea	Danube / Danube	Grindtu - Reni	L0430	II	II	II	Sulina	L0480	I	I	I
81	CICH Tr. Magurele	Danube / Danube	Pristol Novo-Selo	L0090	I	II	I	Am. Arges	L0240	II	I	II
83	Romag Tr. Severin	Topolnita / Dunare	Bazias	L0020	I	II	I	Pristol Novo-Selo	L0090	I	II	I
89	Terapia Cluj	Somes Mic / Somes	Am. Cluj	18	I	I	I	Salatiu	19	II	III	II
91	Stratus Mob Blaj	Tarnava Mures	Am. Blaj	75		D		Mihalt	76	D	D	D
95	Nutrimur Iernut	Mures / Mures	Ungheni	58		II		Chetani	61	II	II	II
102	Ulcom Slobozia	Ialomita / Ialomita	Ciochina	230		II		Av. Slobozia	231		D	
103	Beta Tandareni	Ialomita / Ialomita	Av. Slobozia	231		D		Av. Tandarei	232	D	D	D
110	Spirit Ghidiceni	Barlad / Siret	Am. Barlad	267		II		Am. Tecuci	274		D	
126	Verachim Giurgiu	Danube / Danube	Av. Giurgiu	L0240 + 313	II	I	II	Am Arges	L0240	II	I	II
130	Comcem SA Calarasi	Danube / Danube	Chictiu - Siliistra	L0280				Am. Braila	317			

Hot Spots - AGRICULTURAL HIGH PRIORITY

Ser.No.of HS	Discharger Name Of Economic Unit	Receiver River / Main Catchment Area	Name Of Upstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category in Respective Station			Name Of Downstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category In Respective Station		
					'94	'95	'96			'94	'95	'96
0	1	2	3	4	5	6	7	8	9	10	11	12
22	Romsuintest Peris	Vlasia / Ialomita	Ref. Station	216				DN I Saffica	219			
111	Suinprod Independenta	Barlad Siret	Umbraresti	275		D		Sendreni	287	II	III	II
113	Comtom Tomesti	Bahlui / Prut	Podu Iloaiei	302	D	D	D	Holboca	303	D	D	D
115	Comsuin Ulmeni	Danube / Danube	Am. Arges	L0240	II	I	II	Sulina	L0280	I	I	I

Hot Spots - AGRICULTURAL MEDIUM PRIORITY

Ser.No.of HS	Discharger Name Of Economic Unit	Receiver River / Main Catchment Area	Name Of Upstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category in Respective Station			Name Of Downstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category In Respective Station		
					'94	'95	'96			'94	'95	'96
0	1	2	3	4	5	6	7	8	9	10	11	12
25	Combil Gh. Doja	Ialomita / Ialomita	Ciochina	230		D		Av. Slobozia	231		D	
29	Avicola Satu - Mare	Sar / Somes	Ambud	Up 29		II		Oar	Dw 29		II	
88	Agrocomsuin Bontida	Somes Mic / Somes	Am. Cluj	18	I	I	I	Salatiu	19	II	III	II
90	Comsuin Mofin	Crasna / Somes	Supuru de Jos	35		II		Berveni	36		II	
99	Comsuin Beregsau	Bega Veche / Bega - Timis	Pischia	98		I		Cenei	99		D	
116	Braigal Braila	Danube / Danube	Chiciu - Silistra	L0280 +317				Grindu - Reni	L0430			

Hot Spots - MUNICIPAL HIGH PRIORITY

Ser.No.of HS	Discharger Name Of Economic Unit	Receiver River / Main Catchment Area	Name Of Upstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category in Respective Station			Name Of Downstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category In Respective Station		
					'94	'95	'96			'94	'95	'96
0	1	2	3	4	5	6	7	8	9	10	11	12
5	Braila	Danube / Danube	Chiciu - Siliistra	L0280	II	II	II	Grindu - Reni	L0430	II	II	II
7	Iasi	Bahlui / Prut	Podu Iloatei	302	D	D	D	Holboca	303	D	D	D
17	Galati	Danube / Siret	Chiciu - Siliistra	L0280	II	II	II	Grindu - Reni	L0430	II	II	II
28	Craiova	Jiu / Jiu	Racari	131	II	II	I	Podari	133	II	II	II
30	Resita	Barzava / Timis	Crivaia	109	I	I	I	Moniom	110	II	II	I
31	Resita	Barzava / Timis	Crivaia	109	I	I	I	Moniom	110	II	II	I
32	Timisoara	Bega / Bega	Am. Timisoara	96	I	I	I	Otelec	97	D	D	III
33	Timisoara	Bega / Bega	Am. Timisoara	96	I	I	I	Otelec	97	D	D	III
34	Deva	Mures / Mures	Ghelmar	83	II	II	II	Branisca	88	II	II	II
43	Zalau	Zalau / Someș	Am. Zalau	Up 43		I		Borla	Dw 43		III	
44	Zalau	Zalau / Someș	Am. Zalau	Up 43		I		Borla	Dw 43		III	
52	Campulung	Targukui / Arges	Voina	185	I	I	I	Piscani	186	I	I	I
54	Bucuresti	Dambovita / Arges	Dragomiresti	209	II	II	I	Budesti	212	D	D	D

Hot Spots - MUNICIPAL MEDIUM PRIORITY

Ser.No.of HS	Discharger Name Of Economic Unit	Receiver River / Main Catchment Area	Name Of Upstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category in Respective Station			Name Of Downstream Sampling Station	Code No. within WQNMS or TNMN	Quality Category In Respective Station		
					'94	'95	'96			'94	'95	'96
0	1	2	3	4	5	6	7	8	9	10	11	12
18	Targoviste	Ialomita / Ialomita	Am. Targoviste	215	I	I	I	Baleni	216	I	I	I
23	Rm. Valcea	Olt / Olt	Am. Rm. Valcea	162	I	I	II	Dragasani	163	I	II	II

2.2. Municipal Hot Spots (MHS)

There are 545 localities provided with a centralised sewage system in Romania. Out of this number, 258 are cities and 287 villages. There are 9.1 million people connected to a sewage collection system out of which 8.7 millions live in cities. The total amount of wastewater flowing directly, or via wastewater treatment plants is 80 m³/s. Only 74 percent of this flow is treated. Out of 60 m³/s that is treated, 11 m³/s is treated only mechanically and 49 m³/s flows through the biological steps. There are 204 wastewater treatment plants in the country. There are 17 cities belonging to 11 counties placed along the left side of the Danube River, discharging directly about 537 thousand m³ waste water per day, that is 39.5 percent of the total flow of waste water discharged. About 470 thousand m³ per day of municipal wastewater are discharged untreated into the river. Out of the 17 cities along the river, 3 cities are harbours suitable for sea ships. In these cities (Braila, Galati, Tulcea) live about 670 thousand inhabitants.

No harbour along the river is provided with facilities to take over the wastewater from the ships.

In the following table, the load contribution of the main Romanian inland rivers issuing into the Danube River (1993).

Tributary rivers	Characteristics * (t/d)				
	SSM	BOD ₅	N _{total}	P _{total}	TDS
JIU	1750	77.8	17.88	5.0	3515
OLT	2433	69.1	5.62	1.2	9746
ARGES	944	163.9	36.5	10.7	2819
IALOMITA	2018	41.7	16.62	6.8	5706
SIRET	5498	108.9	15.81	6.5	12519

* The loads were calculated on the bases of the average values of concentration from 1993 and of multiannual flows.

The values from the above small table are with the tributaries that has the major contribution in the discharging pollutants like BOD, mineral N_{total}, total P, Suspended matters and total dissolved salts, and which were included in the previous National Review.

Within the table 2.4 the values for the loads were calculated on theoretical bases using the average agreed values for N and P applied for such estimation. In this table there are considered the population settlement from the catchment areas of the main tributaries then the population settlement which are discharging directly in the Danube as well as the settlement which are discharging in the rivers that are crossing first Romanian territory in the rest part of the country and then their waters arrive in the Danube.

According to the calculations based on the discharge per capita per year of 900 g P and 3,200 g N and taking into consideration the population connected to the sewage system as well as the effects of the existing waste water treatment plants, the load of the population in the tributary areas of the Danube River are presented in the table 2.4 bis of this National Review.

The Municipal HS group was organised in a cumulative table with a total of 55 towns included. From this table based on the selection criteria mentioned in the previous chapters, a number of 3 groups and attached tables were considered and organised for the second heading of ranking as High Priority (HP), Medium Priority (MP) and Low Priority (LP). The respective tables (2.2.1) have about 55 columns included in 4 pages and the information content is referring to the:

- number of HS (unique in all tables and maps for one HS);
- location as name of the town and discharger;

- receiver river / catchment area;
- previous list of HS and the place of HS on this;
- raw water load;
- current treatment;
- current capacity;
- total load discharged into receiving waters (t/year of BOD₅, COD, N, P and others if it is the case)
- final capacity proposed or estimated;
- information about possible construction of new or enlarging of existing wastewater treatment plant (WWTP);
- estimation of remaining pollution after new development;
- data about effluent and receiver flow;
- water quality category (I, II, III and D = degraded) and also the name of the sampling station upstream and downstream;
- water quality indicators affected in receiver by the respective HS;
- information about seasonal variation, root causes of emission (if exist);
- downstream users of water from the discharge point of respective HS;
- characteristics of problems created in receiver.

Based on the information gathered and organised in the tables mentioned above the ranking procedures were applied.

2.2.1. High Priority (HP)

From the number of 55 towns / discharges selected as covering about 75 % from the total municipal discharges (condition determined by the EMISSION / EG when they have organised the inventory of emissions) in this category were selected 10 HS (table 2.2.1.1.) Out of these, 7 were included and still are included in near all previous lists of HS, as well as in the last revised version of National Environmental Action Plan (PNAPM) finalised in December 1997. Based on the ranking procedures applied, the High Priority HS ranking is presented in the table 2.2.1.2. In these tables information about transboundary effects of respective HS is also included.

In the table 2.2.1/1, 2.2.2., 2.2.3., columns 8,9,10,11 indicate No treatment (8), Mechanical Treatment (9), Biological Treatment (10), De-nitrification step (11) and Phosphorous reduction step (11). The concept of this column as well as column 0, 1, 2, 7, 13, 14, 15, 16, 17, 18, 22, 23, 24, 26, 27, 28, 30, 31, 35 belongs to the EMISS/EG and should to be utilised by all expect from the Danubian countries (except maybe the R.F.Y., which are not included yet in the EPDRB activity).

The remarks from column 35 refer to the works that are necessary to be done to improve the treatment facilities. These notifications are based on the agreement from the EMIS/EG meetings (third and fourth) and they have this meaning:

- r – rehabilitation, upgrading
- e – extension
- n – new WWTP
- FS – Feasibility Study (necessary, in elaboration, approved)

In column 36 there are the approved values of flow from the permit for the respective discharge waste or without WWTP as it is the situation.

In column 44 (seasonal variation) the two indicators included are referring to the “flow” and “load” of the municipal discharges of the respective towns. In the case of flow, 1 is the number of a footnote. The content of this note is referring to the discharged flow that is reasonably stable in all seasons. For the loads the figures from the table are referring to the seasonal variability around the average values of some parameters (BOD₅, BOD, N, P) which are measured in the water discharged.

In column 46 the root causes of emissions, there is no further explanation because the reality is reflected by the figures presented in the previous columns which have been in fact a steady state situation for more than 10 years. In the last columns 52 the “Permanent” describes the duration of the effects and not the intensity. The intensity of the effect is difficult to be expressed as well as the sensitivity and critical features of the downstream users. This kind of more detailed analysis can be done specially in the phase of feasibility or pre-feasibility studies, for future actions with the selected hot spots. In this stage with the large number of hot spots and large area in which they are placed, this analysis was not done before, because of lack of resources: human, time and a clear methodology which at present were not applied in Romania except for specific particular projects.

The transboundary effects which were identified for those HS are the mixing of emissions from High Priority Hot Spots with clean water shortly before international waters of the Danube or tributaries. This is because near H.S. from High Priority List are located closed to the borders or near the points where the receivers are crossing the borders. It is the case of Braila, Galati, and Bucuresti, for the Danube and Zalau, Craiova, Resita, Timisoara for the receivers’ tributaries going over the border short after receiving the wastewater from those towns.

2.2.2. Medium Priority (HP)

From the total number of 55 for the Medium Priority (MP) were selected 2 towns (table 2.2.2.1.) According to ranking procedures the table 2.2.2.2. presents the results from this category, in which there are none with transboundary effects of pollution.

2.2.3. Low Priority

In this category are included the rest of the 55 hot spots after extraction of HP and MP hot spots. For this category the data and information included in the table 2.2.3.1. are not so complete and thus there was no ranking procedures applied for this group.

Hot Spots - MUNICIPAL

Tabel 2.2.1/2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
30	Resita	Bărzava / Bega-Timis		11		45	35.1	x						5,986	1475	1780.09	235	71.7				
31	Resita	Bărzava / Bega-Timis					61.1	x					100	10,420	162.97	284.47	122.52					
32	Timisoara	Bega / Bega-Timis	28	6	31		217.0	x						70,618	3241	3952	676	98				150
33	Timisoara	Bega / Bega-Timis	28	6	31		88.0	x	x				194	28,650	1149	1453	316	75				340
34	Deva	Mures / Mures				47	70.2	x					75	22,238	1026.3	1780	186.2	52.4				150
35	Turda	Mures					61.9	x					90	15,200	194.6	408.06	342.3	0.55				100
36	Alba Iulia	Mures					60.0	x					70	12,907	277.23	525.87	312.3					100
37	Hunedoara	Mures					81.5	x					160	5,560	118.84	155.085	38.85					200
38	Medias	Mures					17.4	x					70	3,154	223.51	304.05	41.69	11.26				70
39	Medias	Mures					46.1	x	x				70	8,350	163.2	182.66	195.44	15.88				300
40	Tg. Mures	Mures	37		39		153.0	x	x				300	11,000	1121	1305	290	22				320
41	Arad	Mures		55			196.0	x	x				260	26,450	1050	1454.5	278.2					250
42	Oradea	Cris	22	54	24		220.0	x	x				240	55,600	1941	2100	290					
43	Zalau	Zalau / Crasna				43	35.2	x						8,782	499.6	563.47	162.3	45.6				
44	Zalau	Zalau / Crasna		19			35.1	x	x				50	8,610	66.14	222.64	20.35					80
45	Bistrita	Somes					36.3	x						12,235	151.82	301.7	244.24					
46	Bistrita	Somes					51.4	x	x				54	17,360	202.5	412.6	343.46					90
47	Satu Mare	Somes					131.4	x	x				170	21,583	366.74	417.24	164.77					170
48	Baia Mare	Somes					149.9	x	x				200	31,197	267.06	328.73						200
49	Cluj	Somes	9		9		300.0	x	x				310	37,950	414	694	516					380
50	Alexandria	Vedea					59.4	x	x				90	9,682	276.8	365	109.05	9.6				135
51	Curtea de Arges	Arges	13	12	13		33.0	x	x				56	5,200	248	429	87	4				56
52	Campulung Muscel	r. Targului / Arges	8	13	8	46	45.0	x	x				80	8,360	388.6	706	82	23				80
53	Pitesti	Arges	24	10	25		197.0	x	x				280	55,700	1895	3738	475	37				280
54	Bucuresti	Dambovită / Arges		8			2,500.0	x						189,200	53330	70686	10872	2218				3,500
55	Predeal																					
	Sum						8,814.0						6,643	1,318,315	111428.45	132273.635	24026.81	3996.77				11,588

Ser. No	Discharger/ Location	Receiver River/ Cacherment area	DATE OR POSSIBLE DATE FOR STARTING OF CONSTRUCTION (MONTH/YEAR)			START OR POTENTIAL START OF OPERATION YEAR		COST ESTIMATE FOR TREATMENT PLANT (million D-MARKS)			ESTIMATED LEVEL OF REMAINING POLLUTION - T / year -						
			B	N/P	N/P	B	N/P	B	N/P	BOD	COD	N	P	OIL	OTHERS		
0			23	24	25	26	27	28	29	30	31	32	33	34			
1	Calarasi	Danube															
2	Giurgiu	Danube															
3	Tulcea	Danube								225							
4	Drobeta Tr. Sever	Danube								386							
5	Braila	Danube / Danube								360							
6	Botosani	Sitna- Prut								137							
7	Iasi	Bahlui / Prut	1997		1999				75.5	360	1158	203	25				
8	Barlad	Siret		1996				1999		185	179	53	6				
9	Vaslui	Siret		1996						240	294	46	4				
10	Onesti	Siret								60		30					
11	Roman	Siret								225	769	122					
12	Focsani	Siret								106	236	71					
13	Suceava	Siret								437	1690	110					
14	Piatra Neamt	Siret								198	760	105					
15	Bacau	Siret								1077		148					
16	Buzau	Buzau								1607	974	450					
17	Galati	Danube / Danube			1999					400	1120	232	18				
18	Targoviste	Ialomita / Ialomita								64	114	73	12				
19	Siobozia	Ialomita								425	290	93					
20	Ploiesti	Ialomita								2030	908	477	278				
21	Sf. Gheorghe	Olt								610	530						
22	Slatina	Olt								189							
23	Rm. Valcea	Olt / Olt							4	300	540	133	21				
24	Sibiu	Olt								9.2	1808	420					
25	Brasov	Olt								7.9	2050	30					
26	Petrosani	Jiu		1998				2000		700	55	60					
27	Tg. Jiu	Jiu								273	188						
28	Calova	Jiu / Jiu						2000		74	216	388	32				
29	Lugoj	Timis								172	136	105					

Hot Spots - MUNICIPAL

page 2 of 4

0	1	2	23	24	25	26	27	28	29	30	31	32	33
30	Resita	BÔrzava / Bega-Timis							40	108	43	7	
31	Resita	BÔrzava / Bega-Timis							96	227	74	12	
32	Timisoara	Bega / Bega-Timis			1989				650	1972	374	41	
33	Timisoara	Bega / Bega-Timis	1996						456	872	174	31	
34	Deva	Mures / Mures	1997		1999				210	624	123	21	
35	Turda	Mures							168	352	224		
36	Alba Iulia	Mures		1996		1998			190	415	234		
37	Hunedoara	Mures							79	38	22		
38	Medias	Mures											
39	Medias	Mures							133	62	145	7	
40	Tg. Mures	Mures							484	160	160	10	
41	Arad	Mures							620	210	160		
42	Oradea	Cris		1997		1998		2	1405	600	105		
43	Zalau	Zalau / Crasna							52	160	60	10	
44	Zalau	Zalau / Crasna	1997		1999				38	180	11	2	
45	Bistrita	Somes											
46	Bistrita	Somes		1996		1998			164	304	290		
47	Satu Mare	Somes							308	328	105		
48	Baia Mare	Somes							267	228			
49	Cluj	Somes		1997		1998			214	394	153		
50	Alexandria	Vedea		1997					131	107	73	48	
51	Curtea de Arges	Arges							104	200	52		
52	Campulung Muscel	r. Tirgului / Arges					1,3	3,6	152	424	45	5	
53	Pitesti	Arges						37,2	1060	1510	273	32	
54	Bucuresti	Dombovita / Arges	1991		1998				10600	14120	3363	444	
55	Predeal												
	Sum							87,9	32148	36472	9573	1124	

Notes on Hot Spots- MUNICIPAL:

1

- a- raw water load = in TPE, which is entering the waste water treatment plant (WWTP)
TPE - one thousand population equivalents (1 population equivalent = 60 g/d BOD)
- b-Type of waste water treatment:
 - NO - discharge via sewage system into the water, no treatment
 - MU - mechanical treatment
 - BIO - completely biological treatment
 - P - P-elimination
 - bP - biological P-elimination
 - chP - chemical P-elimination
 - N - N-elimination
- c- final capacity = capacity of the final reconstructed, upgraded or newly built WWTP
- d- estimated level of remaining pollution in t/a = pollution load expected to be discharged after reconstruction / upgrading or construction of new WWTP
- e- remarks
 - r - rehabilitation, upgrading
 - e - extension
 - n - new WWTP
 - FS - feasibility study (necessary, in elaboration, approved)

2

- for column 44 = 1 means discharger flow is relatively stable
- for column 45 = the included number are the variability of the loads around the values from column 17
- for column 47 = the numbers are the type of water users according from the EMISS tables and those are :
 - 1=food industry
 - 2=chemical industry
 - 3=pulp and papers industry
 - 4=fertiliser industry
 - 5=mining
 - 6=iron and steel industry
 - 7=metal surface treatment activities
 - 8=textile industry
 - 9=lether industry
 - 10=agriculture
 - 11=other industries
 - 12=drinking water supply

Ser. No	Discharger/ Location	Receiver River/ Catchment area	REMARK S *	Q effluent [m ³ /s]	Q receiver multianual average [m ³ /s]	Qef Qrec	WATER QUALITY CATEGORY		WATER QUALITY INDICATORS AFFECTED IN RECEIVER			
							UPSTREAM	DOWNSTREAM	D.O	REGIM	NUTRIENTS	OTHERS
0	1	2	35	36	37	38	39	40	41	42	43	
1	Calarasi	Danube	r + e, FS	0.268	5950	1/22/201						
2	Giurgiu	Danube		0.261	5920	1/22/682						
3	Tulcea	Danube	n, FS	0.228	2200	1/96/49						
4	Drobeta Tr. Severin	Danube	n	0.3664	5410	1/136/48						
5	Braila	Danube / Danube	n, FS	0.8796	4700	1/53/43	II (am. Braila)	II (Grindu-Reni)	BOD 2,8/4,3	NH4 0,25/0,35		
6	Botosani	Sitna- Prut	e/n, FS	0.775	0.39	1/1						
7	Iasi	Bahlui / Prut	r	1.6996	3.77	1/2	D (Podu Iloaiei)	D (Holboca)	BOD 40,6/44	NH4 2,55/5,87		
8	Birlad	Siret	r + e	0.317	6.62	1/21						
9	Vaslui	Siret	r + e, FS	0.2706	3	1/11						
10	Onesti	Siret	r	0.5	34.4	1/69						
11	Roman	Siret	r	0.2759	30.8	1/112						
12	Focsani	Siret	e	0.4462	16.7	1/37						
13	Suceava	Siret	r	0.9242	16.2	1/18						
14	Piatra Neamt	Siret	e	0.504	49.3	1/98						
15	Bacau	Siret	r	1.281	110	1/86						
16	Buzau	Buzau	r, FS	0.813	248	1/31						
17	Galati	Danube / Danube	n, FS	1.2129	4700	1/3875	II (am. Braila)	II (Grindu - Reni)	BOD 2,8/4,3	NH4 0,25/0,35		
18	Targoviste	Ialomita / Ialomita	r + e, FS	0.4122	6.66	1/16	I (am. Targoviste)	I (Baleni)	COD 3,2/4,2	P 0,05/20,086		
19	Siobozia	Ialomita	r + e, FS	0.2265	41	1/181						
20	Ploiesti	Ialomita	r + e	1.2874	8.6	1/7						
21	Sf. Gheorghe	Olt	r	0.2672	9	1/34						
22	Slatina	Olt	e	0.4765	147	1/308						
23	Rm. Valcea	Olt / Olt	r	0.669	123	1/184	I (am. Rm. Valcea)	II (Dragășani)	COD 22,4/35,5	P 0,07/0,2		
24	Sibiu	Olt	e, FS	0.9988	396	1/396						
25	Brasov	Olt	r + e	1.6204	4.57	1/3						
26	Petrosani	Jiu	e, FS	0.9703	11.2	1/12						
27	Tg. Jiu	Jiu	e, FS	0.564	25.6	1/45						
28	Craiova	Jiu / Jiu	n	1.3698	93.2	1/68	I (Racari)	II (Podari)	BOD 4,1/4,7	NH4 0,13/2,8		
29	Lugoj	Timis	r	0.2451	36.8	1/150						

0	1	2	44	45	46	47	48	49	50	51	52	53	54	55	56
30	Resita	BŌrzava / Bega-Timis													
31	Resita	BŌrzava / Bega-Timis	1	0.54-1.63						1 - 2 km		permanent		WS, irrigation	
32	Timisoara	Bega / Bega-Timis	1	0.6-2.45		12	0.02			1 - 2 km		permanent		WS, irrigation	
33	Timisoara	Bega / Bega-Timis	1	0.31-2.37						2 km		permanent	irrigation		
34	Deva	Mures / Mures	1	0.36-2.5						2 km		permanent	irrigation	yes	
35	Turda	Mures	1			1	0.01			2 km		permanent	WS, irrigation	yes	
36	Alba Iulia	Mures													
37	Hunedoara	Mures													
38	Medias	Mures													
39	Medias	Mures													
40	Tg. Mures	Mures													
41	Arad	Mures													
42	Oradea	Cris													
43	Zalau	Zalau / Crasna													
44	Zalau	Zalau / Crasna	0.9-1.4	0.81-1.19						1 - 2 km		permanent	WS, irrigation		
45	Bistrita	Somes				5	0.03			1 - 2 km		permanent	WS, irrigation		
46	Bistrita	Somes													
47	Satu Mare	Somes													
48	Baia Mare	Somes													
49	Cluj	Somes													
50	Alexandria	Vedea													
51	Curtea de Arges	Arges													
52	Campulung Muscel	r. Tirgului / Arges	1	0.43-1.81											
53	Pitesti	Arges				6	0.23			2 km		permanent	WS, irrigation		
54	Bucuresti	DŌmbovita / Arges	1	0.26-5.7						4 km		permanent	irrigation		
55	Preddeal		0												
	Sum														

Tabel 2.2.1.1.

Ser. No	Discharger/ Location	Receiver River/ Catchment area	DATE OR POSSIBLE DATE FOR STARTING OF CONSTRUCTION (MONTH/YEAR)		START OR POTENTIAL START OF OPERATION YEAR		COST ESTIMATE FOR TREATMENT PLANT (million D. MARKS)		ESTIMATED LEVEL OF REMAINING POLLUTION - T / year -						
			B	N/P	B	N/P	B	N/P	BOD	COD	N	P	OIL	OTHERS	
			23	24	25	26	27	28	29	30	31	32	33	34	
5	Bralia	Danube / Danube							360	920	130	13			
7	Iasi	Bahlui / Prut	1997		1999		75.5		360	1158	203	25			
17	Galati	Danube / Danube			1999				400	1120	232	18			
28	Craiova	Jiu / Jiu	1996		2000				74	216	368	32			
30	Resita	Bârzava / Bega-Timis							40	108	43	7			
31	Resita	Bârzava / Bega-Timis							96	227	74	12			
32	Timisoara	Bega / Bega-Timis							650	1972	374	41			
33	Timisoara	Bega / Bega-Timis	1996		1999				456	872	174	31			
34	Deva	Bega / Bega-Timis	1997		1999				210	624	123	21			
43	Zalau	Mures / Mures							52	160	60	10			
44	Zalau	Zalau / Crasna			1999				38	180	11	2			
52	Campulung Muscel	r. Târgului / Arges	1997				1.3		152	424	46	5			
54	Bucuresti	Dâmbovita / Arges	1991		1998				10600	14120	3363	444			
	Sum								13488	22101	5220	661			

Tabel 2.2.2.1.

Ser. No	Discharger/ Location	Receiver River/ Cachment area	PREVIOUS LISTS OF HOT SPOTS				Raw water load (TPE)	Current treatment				Current capacity of WWTP (TPE)	Waste water volume discharged Tm ³ /y	TOTAL LOAD DISCHARGED INTO RECEIVING WATERS T/year						FINAL CAPACITY (TPE)
			SAP 93	PNA PM 95	Tab 2.2	PNA PM 97		No	Bio	N	P			COD	BOD	PATHOGENS	OIL	OTHERS		
																			8	
18	Targoviste	Ialomita / Ialomita	34	4	5	8	X	X		100	13,000	15	16	17	18	19	20	21	22	
23	Rm. Valcea	Olt / Olt	29		45		X	X		150	21,100	849	902	240	49.3				140	
	Sum					174.0				250	34,100	1007	1093	371	78.3				150	
																				290

Place of municipal hot spots
from medium priority list

Tabel 2.2.2.2.

Place	DISCHARGER NAME	Transboundary
	OF ECONOMIC UNIT	transfer of pollution
1	Targoviste	
2	Rm. Valcea	

**Hot spots - MUNICIPAL
MEDIUM PRIORITY**

Tabel 2.2.2.1.

Ser. No	Discharger/ Location	Receiver River/ Cache ment area	DATE OR POSSIBLE DATE FOR STARTING OF CONSTRUCTION (MONTH/YEAR)		START OR POTENTIAL START OF OPERATION YEAR		COST ESTIMATE FOR TREATMENT PLANT (million D-MARKS)		ESTIMATED LEVEL OF REMAINING POLLUTION - T / year -						
			B	N/P	B	N/P	B	N/P	BOD	COD	N	P	OIL	OTHERS	
	1	2	23	24	25	26	27	28	29	30	31	32	33	34	
18	Targoviste	Ialomita / Ialomita							64	114	73	12			
23	Rm. Valcea	Olt / Olt					4		300	540	133	21			
	Sum								364	654	206	33			

2.3. Agricultural Hot Spots (A-HS)

Taking in view that a new chapter (3) was included in the content of the Part B referring to the “Identification of Diffuse Sources of Agricultural Pollution”, a large volume of information about this activity was included there. There are statistical information about land utilisation, crop production, fertilisers and chemicals used, as well as about animal production, and the surface of land used.

Near data, with reference to the point source of pollution from agriculture, some data and information were collected and entered in the tables corresponding to this category (table 2.3.1. - cumulative).

As was organised in the case of municipal HS, it was also done in this case of agricultural HS. The total number of agricultural HS selected is 28. The tables used for agricultural HS and industrial HS have a smaller number of columns (34) because of these 2 categories, there were no data available referring to the next extensions or new constructions of WWTP. Thus the columns 7 - 14 from municipal HS tables are out and also columns 22 - 34. The other columns with requested data are included.

Note: The code number for agricultural and industrial HS are obtained from a unique cumulative table, as it was produced by the EMIS/EG based on the agreed procedures

2.3.1. High Priority (HP)

From the total number of agricultural HS =28, 4 High Priority (HP) hot spots were selected (table 2.3.1.1.). Two of them are also included in the list of hot spots produced for National Environmental Action Plan (PNAPM), last version 1997. Those are HS Nr, 113 and 22, which are on the first and the second place in table 2.3.1.2. with ranking A - HS - HP. Also information about transboundary effects are included in the table 2.3.1.2.

The transboundary effects, like in the case of municipal H.S., are referring to the fact that emissions from the H.S. are discharging shortly before international borders.

2.3.2. Medium Priority (MP)

In this category -MP were selected 6 A-HS (table 2.3.2.1.). After ranking the places of this HS can be seen in the table 2.3.2.2.

2.3.3. Low Priority (LP)

All HS there were not included in the categories HP & MP are included in this last one (LP) group and table 2.3.3.1, and the information referred to those sources are less, because of the lack of reliable data to characterise better this agricultural units.

Hot Spots - AGRICULTURAL

Tabel 2.3.1.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/ MAIN CACHEMENT AREA	PREVIOUS LISTS OF HOT SPOTS			ECONOMIC SECTOR / NR.	Problems / ISSUES Type of problem	DISCHARGED POLLUANT LOADS t/year											
			SAP 93	PNA PM 95	PNA Tab. 2.2			PNA PM 97	COD	BOD	SSM	N	Fe	Mh	Cu	Pb	Zn	P	OTHERS
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
88	Agrocomsuin Bontida	Somes Mic/Somes-Tisa				agr.-10			637,6	352,0		620							
90	Comsuin Mofhin	Crasna/Somes-Tisa				agr.-10			298,8	49,5		91							
92	Suinprod Salcud	Mures				agr.-10			143,7	306,6		196							
94	Avicola Ungheni	Niraj/Mures				agr.-10			110,0	260,0		41							
95	Nutrimur Iernut	Mures				agr.-10			114,0	245,0		51							
96	Comsuin Periam	Mures				agr.-10			399,0	379,0		59							
97	Comsuim Birda	Bitzava/Bega-Timis				agr.-10			3.979,0	5.363,0		3.931							1,1 t/a Phen
98	Comseltest Padureni	Timis/ Bega-Timis				agr.-10			360,0	432,0		482							0,1 t/a Phen
99	Comsuin Beresgau	Bega Veche/Bega-Timis				agr.-10			2.247,0	3.043,0		1.629							
101	Combilcarim Cazanesti	Ialomita/Ialomita				agr.-10			1.428,0	2.709,0		3.082							
104	Suinded Dedulesti	BuzauBuzau				agr.-10			118,2	76,2		279	0,5						
105	Suinprod Siret	Siret				agr.-10			300,0	40,0		53							
106	Mark-Pork Vanatori	Putna/Siret				agr.-10			213,0	301,0		303							
107	Suintest Focsani	Argintu/Siret				agr.-10			172,0	32,0		110							
108	Martincom Martinesti	Cotatcu/Siret				agr.-10			58,3	72,0		70							
109	Agricola Bacau	Siret				agr.-10			429,0			131							
111	Suinprod Independenta	Birladei/Siret				agr.-10			412,0	481,0		323							
113	Comtom Tomesti	Bahluiet/Prut				agr.-10			49,7	15.768,0		29						720	
114	Prodsuis Stanilesti	Prut				agr.-10			214,6	208,0		88							
115	Comsuin Ulmeni	Danube/Dunube				agr.-10			260,0	575,0		10.231							
116	Braigal Braila	Danube/Dunube				agr.-10			733,3	485,6		1.179	1,6						
22	Romsuin Test Peri•	Viasia / Ialomita				agr.-10			25,1	38									
23	Integrat• Comsuim C•l•ra•i	Danube/Dunube				agr.-10													
25	Combil Gh. Doja	Ialomita / Ialomita				agr.-10			157,0	280,0		562							
26	Avicola Zal•u					agr.-10													
27	Suin Prod Suceava					agr.-10													
28	ISCIP Zal•u					agr.-10													
29	Avicola Satu Mare	Sar / Somes				agr.-10			4,2	2,4		3,3	1						31,12,1997
	Sum								12418,4	31924,4		25147,85	9411,5	15,1	15	16	17		

Hot Spots - AGRICULTURAL

Tabel 2.3.1.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/ MAIN CACHEMENT AREA	CHARACTERISTIC OF PROBLEMS CREATED IN RECEIVER					
			LEVEL OF TOXICITY OF THE LOADS	SIZE OF THE AREA AFFECTED	INTENSITY AND REVERSIBILITY OF THE PROBLEM	SENSITIVITY OF DOWNSTREAM USERS	SENSITIVITY OF TRANSBOUNDARY AREA	
	1	2	28	29	30	31	32	
88	Agrocomsuin Bontida	Somes Mic/Somes-Tisa	COD, BOD	2 km	permanent	water supply		
90	Comsuin Moffin	Crasna/Somes-Tisa	COD	1 - 2 km	permanent	water supply	yes	
92	Suinprod Salcud	Mures						
94	Avicola Unggheni	Niraj/Mures						
95	Nutrimur Iernut	Mures						
96	Comsuin Periam	Mures						
97	Comsuin Birda	Birzava/Bega-Timis						
98	Comseltest Padureni	Timis/ Bega-Timis						
99	Comsuin Beregsau	Bega Veche/ Bega-Timis	COD, BOD	5 - 10 km	permanent	WS, irrigation	yes	
101	Combilcarim Cazanesti	Ialomita/Ialomita						
104	Suinded Deulesti	Buzau/Buzau						
105	Suinprod	Siret						
106	Mark-Pork Vanatori	Putna/Siret						
107	Suintest Focsani	Argintu/Siret						
108	Martincom Martinesi	Cotaciu/Siret						
109	Avicola Bacau	Siret						
111	Suinprod Independenta	Birladei/Siret	BOD	2 km	Permanent	water supply		
113	Comtom Tomesti	Bahluiet/Prut	BOD	2 km	Seasonal			
114	Prodsuis Stanilesti	Prut						
115	Comsuin Ulmeni	Danube/Dunube	BOD, SSM	1 - 2 km	Permanent	water supply	yes	
116	Braigal Braila	Danube/Dunube	COD, BOD	1 - 2 km	permanent	WS		
22	Romsuin Test Peri	Vlasia / Ialomita	BOD, SSM	2 - 3 km	Permanent	fisheries, recreation		
23	Integrat Comsuim C•ra•i	Danube/Dunube						
25	Combil Gh. Doja	Ialomita / Ialomita	COD, BOD	2 km	permanent	WS, irrigation		
26	Avicola Zalu							
27	Suin Prod Suceava							
28	ISCIP Zalu							
29	Avicola Satu Mare	Sar / Somes	COD, BOD	1 km	permanent	water supply	yes	
	Sum							

Hot Spots - AGRICULTURAL HIGH PRIORITY

Tabel 2.3.1.1.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/ MAIN CACHEMENT AREA	PREVIOUS LISTS OF HOT SPOTS				ECONOMIC SECTOR / NR.	Problems/ ISSUES / Type of problem	DISCHARGED POLLUANT LOADS t/year										
			SAP 93	PNA PM 95	PNA Tab. 2.2	PNA PM 97			COD	BOD	SSM	N	Fe	Mn	Cu	Pb	Zn	P	OTHERS
111	Suinprod Independenta	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		Birladel/Siret					agr.-10		412,0	481,0	2.765	323							
113	Comtom Tomesti	Bahluiet/Prut					agr.-10		49,7	15.768,0	29	2.560						720	
115	Comsuin Ulmeni	Danube/Dunube					agr.-10		260,0	575,0	10.231	472							
22	Romsuin Test Peri*	Vlasia / Ialomita					agr.-10		721,7	16.849,1	38	3.355,0						720,0	
	Sum																		

Place of agricultural hot spots from high priority list

Tabel 2.3.1.2.

Place	DISCHARGER NAME OF ECONOMIC UNIT	Transboundary transfer of pollution
1	Comtom Tomesti	yes
2	Romsuin Test Peri*	
3	Comsuin Ulmeni	yes
4	Suinprod Independenta	

Hot Spots - AGRICULTURAL
HIGH PRIORITY

Tabel 2.3.1.1.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/ MAIN CACHEMENT AREA	CHARACTERISTIC OF PROBLEMS CREATED IN RECEIVER					
			LEVEL OF TOXICITY OF THE LOADS	SIZE OF THE AREA AFFECTED	INTENSITY AND REVERSIBILITY OF THE PROBLEM	SENSITIVITY OF DOWNSTREAM USERS	SENSITIVITY OF TRANSBOUNDARY AREA	
	1	2	28	29	30	31	32	
111	Suinprod Independenta	Birladel/Siret	BOD	2 km	Permanent	water supply		
113	Comtom Tomesti	Bahluiet/Prut	BOD	2 km	Seasonal			
115	Comsuin Ulmeni	Danube/Dunube	BOD, SSM	1 - 2 km	Permanent	water supply	yes	
22	Romsuin Test Peri*	Vlasia / Ialomita	BOD, SSM	2 - 3 km	Permanent	fisheries, recreation		
	Sum							

Hot Spots - AGRICULTURAL
MEDIUM PRIORITY

Tabel 2.3.2.1.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/ MAIN CACHEMENT AREA	PREVIOUS LISTS OF HOT SPOTS				ECONOMIC SECTOR / NR.	Problems / ISSUES Type of problem	DISCHARGED POLLUANT LOADS t/year									
			SAP 93	PNA PM 95	Tab. 2.2	PNA PM 97			COD	BOD	SSM	N	Fe	Mn	Cu	Pb	Zn	OTHERS
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
88	Agrocomsuin Bontida	Somes Mic/Somes-Tisa					agr.-10		637,6	352,0		620						
90	Comsuin Mofin	Crasna/Somes-Tisa					agr.-10		298,8	49,5		91						
99	Comsuin Beregsau	Bega Veche/Bega-Timis					agr.-10		2.247,0	3.043,0	1.629	818						
116	Braigal Braila	Danube/Dunube					agr.-10		733,3	485,6	1.179	892	1,6					
25	Combil Gh. Doja	Ialomita / Ialomita					agr.-10		157,0	280,0	562	96						
29	Avicola Satu Mare	Sar / Somes					agr.-10		4,2	2,4	3,3	1						31,12,1997
Sum									4086,9	4222,5	3384,6	2529,3	14,6	14	15	16	17	

Place of agricultural hot spots
from high priority list

Tabel 2.3.2.2.

Place	DISCHARGER NAME OF ECONOMIC UNIT	Transboundary transfer of pollution
1	Comsuin Beregsau	yes
2	Combil Gh. Doja	yes
3	Comsuin Mofin	yes
4	Agrocomsuin Bontida	yes
5	Avicola Satu Mare	yes
6	Braigal Braila	yes

Hot Spots - AGRICULTURAL
MEDIUM PRIORITY

Tabel 2.3.2.1.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/MAIN CACHEMENT AREA	CHARACTERISTIC OF PROBLEMS CREATED IN RECEIVER					
			LEVEL OF TOXICITY OF THE LOADS	SIZE OF THE AREA AFFECTED	INTENSITY AND REVERSIBILITY OF THE PROBLEM	SENSITIVITY OF DOWNSTREAM USERS	SENSITIVITY OF TRANSBOUNDARY AREA	
	1	2	28	29	30	31	32	
88	Agrocomsuin Bontida	Somes Mic/Somes-Tisa	COD, BOD	2 km	permanent	water supply		
90	Comsuin Mofin	Crasna/Somes-Tisa	COD	1 - 2 km	permanent	water supply	yes	
99	Comsuin Beregsau	Bega Vecse/Bega-Timis	COD, BOD	5 - 10 km	permanent	WS, irrigation	yes	
116	Braigal Braila	Danube/Dunube	COD, BOD	1 - 2 km	permanent	WS		
25	Combil Gh. Doja	Ialomita / Ialomita	COD, BOD	2 km	permanent	WS, irrigation		
29	Avicola Satu Mare	Sar / Somes	COD, BOD	1 km	permanent	water supply	yes	
	Sum							

Hot Spots - AGRICULTURAL
LOW PRIORITY

Tabel 2.3.3.1.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/ MAIN CACHEMENT AREA	PREVIOUS LISTS OF HOT SPOTS				ECONOMIC SECTOR / NR.	Problems / ISSUES / Type of problem	DISCHARGED POLLUANT LOADS t/year										
			SAP 93	PNA PM 95	Tab. 2.2	PNA PM 97			COD	BOD	SSM	N	Fe	Mn	Cu	Pb	Zn	OTHERS	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
92	Suinprod Sabud	Mures					agr.-10		143,7	306,6	196								
94	Avicola Ungheni	Niraj/Mures					agr.-10		110,0	260,0	41								
95	Nutrimur Iernut	Mures					agr.-10		114,0	245,0	51								
96	Comsuim Periam	Mures					agr.-10		399,0	379,0	172								
97	Comsuim Birda	Birzava/Bega-Timis					agr.-10		3.979,0	5.363,0	3.931	1.033						1,1 t/a Phen	
98	Comseltest Padureni	Timis/ Bega-Timis					agr.-10		360,0	432,0	482	229							0,1 t/a Phen
101	Combicarim Cazamesti	Ialomita/Ialomita					agr.-10		1.428,0	2.709,0	3.082	766							
104	Suinded Dedulesti	Buzau/Buzau					agr.-10		118,2	76,2	279	174	0,5						
105	Suinprod	Siret					agr.-10		300,0	40,0	53	111							
106	Mark-Pork Vanatori	Putna/Siret					agr.-10		213,0	301,0	303	75							
107	Suintest Focsani	Argintu/Siret					agr.-10		172,0	32,0	110	68							
108	Martincor Martinesi	Cotacui/Siret					agr.-10		58,3	72,0	70	13							
109	Agricola Bacau	Siret					agr.-10		429,0	131	693								
114	Prodsuis Stanilesti	Pрут					agr.-10		214,6	208,0	88	18							
23	Integrat Comsuim C••ra•i	Danube/Dunube					agr.-10												
26	Avicola Zai•u						agr.-10												
27	Suin Prod Suceava						agr.-10												
28	ISCIP Zaihu						agr.-10												
	Sum								7.609,8	10.852,8	8.700,9	3.527,2	0,5						

Hot Spots - AGRICULTURAL
LOW PRIORITY

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/MAIN CACHEMENT AREA	CHARACTERISTIC OF PROBLEMS CREATED IN RECEIVER				
			LEVEL OF TOXICITY OF THE LOADS	SIZE OF THE AREA AFFECTED	INTENSITY AND REVERSIBILITY OF THE PROBLEM	SENSITIVITY OF DOWNSTREAM USERS	SENSITIVITY OF TRANSBOUNDARY AREA
	1	2	28	29	30	31	32
92	Suinprod Salcud	Mures					
94	Avicola Ungheni	Niraj/Mures					
95	Nutrimur Iernut	Mures					
96	Comsuim Periam	Mures					
97	Comsuim Birda	Blizava/Bega-Timis					
98	Comseltest Padureni	Timis/ Bega-Timis					
101	Combilcarim Cazanesti	Ialomita/Ialomita					
104	Suinded Dedulesti	BuzauBuzau					
105	Suinprod	Siret					
106	Mark-Pork Vanatori	Putna/Siret					
107	Suintest Focsani	Argintu/Siret					
108	Martincom Martinesi	Cotatcu/Siret					
109	Agricola Bacau	Siret					
114	Prodsuis Stanilesti	Pрут					
23	Integrat Comsuim C•ra•i	Danube/Dunube					
26	Avicola Zalu						
27	Suin Prod Suceava						
28	ISCIP Zalu						
	Sum						

2.4. Industrial Hot Spots (I-HS)

The cumulative table with those HS contain also the agricultural HS, as it was produced by EMISSION - EG. The total number of HS contained in this cumulative table 2.4.1. is equal with 131 HS. From this table, more than 100 HS were used for analysis and ranking as industrial HS.

The available data and information requested and found were included in the 1 - 34 columns of the tables from HP & MP hot spots categories and less for the LP hot spots, because of the reasons mentioned before.

2.4.1. High Priority (HP)

All industrial HS selected based on criteria mentioned in the chapter 2.1.5. are included in the table 2.4.1.1. and then based on the ranking procedures they have got the places from the table 2.4.1.2.. From the total number of 23 HP hot spots, 12 are included in the National Environmental Action Plan (PNAPM) last version 1997. From the total 23 HS, 11 have been identified with transboundary effects.

As it was explained already in the chapter 2.2. and 2.3. with reference to the transboundary effects of the Industrial HS groups. The transboundary effects mean in fact the transboundary transfer of pollution in the international waters, which may affect different users from the downstream neighbour countries. It is the case of hot spots 2, 4, 17, in the east part of the country, the case of HS 7, 10, 11, 15, 19 and 20, in the west part of the country and the case of HS 6,16, in the south.

2.4.2. Medium Priority (MP)

All data and information referring to the 26 HS selected in this category are presented in the table 2.4.2.1. Based on the ranking procedures, table 2.4.2.2. was produced with the places of HS within this category. Out of this 26 HS, 6 have been identified with transboundary effects.

2.4.3. Low Priority (LP)

In the table 2.4.3.1. are included the remainder HS from this category (IHS) which have not been ranked because of the lack of minimum data for a good assessment.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/MAIN CACHEMENT AREA	PREVIOUS LISTS OF HOT SPOTS				ECONOMIC SECTOR / NR.	Problems / ISSUES / Type of problem	DISCHARGED POLLUANT LOADS t/year									
			SAP 93	PNA PM 95	PNA Tab. 2.2	PNA PM 97			COD	BOD	SSM	N	Fe	Mn	Cu	Pb	Zn	OTHERS
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	E.M. Turt	Somes-Tisa					mine-5		6.6		18	4.3	1.5	0.3	0.0	0.6		
2	E.M. Baia Borsa	Somes-Tisa					mine-5		43.8	10.4	787	4.1	5.8	2.5	0.4	8.5		
3	E.M. Rodna	Somes-Tisa					mine-5		6.7		33	0.4	0.3	0.1	0.1	0.0		
4	Silcotub Zalau	Somes-Tisa					Iron-6		15.9			0.6						
5	E.M. Baia Mare Est	Somes-Tisa					mine-5		66.3		294	4.8	37.6	0.5	0.6	3.2	3.2 t/a hydrocarbons	
6	E.M. Baia Mare Vest	Somes-Tisa					mine-5		140.0		526	41.1	26.7	1.5	0.5	8.1	1.2 t/a hydrocarbons	
7	Phoenix Baia Mare	Săsar / Somes-Tisa					mine-5		98.0		944	27.4		8.4	0.3			
8	Romplumb Baia Mare	Somes-Tisa					mine-5		16.5		55		1.4					
9	E.M. Brad-Bairza	Cris	3	3			mine-5				138	7.9	0.2	0.9	0.2	7.1	1086.4 t/a TDS	
10	E.M. Deva-Brusturi	Cris	20	21			mine-5				7	0.1	0.1	0.0	0.0	0.0	28.1 t/a TDS	
11	E.M. Borod	Borod / Cris					mine-5				44	0.2		0.4	0.0	0.1		
12	E.M. Borod	Borod / Crișul Repede					mine-5		2.4		16	0.1						
13	Petrom Suplac de Barcau	Barcău / Cris					oil-11		138.7		153							oil extraction
14	E.M. Voivozi	Cris					mine-5		1.8		43	0.2						
15	Petrom Marghita	Cris					oil-11		10.1		31							oil extraction
16	Sometra Copsa Mica	Târnava Mare / Mures	12	1	12		nonfer.met.-2				367	4.467	7.1	0.8		33.0	12.2	2.9 t/a Cd, CN
17	Azomures Tg.Mures	Mures / Mures	40	40			chim-2		2.6		920	1.641	4.8	0.5	1.3	0.0	0.5	UREA = 884 t/a, TDS = 11678 t/a
18	Appellum Zlatna	Mures	43	2			nonfer.met.-7				83							
19	E.M. Baia de Aries	Mures					mine-5				567	7.4			0.5	0.1	1.2	
20	E.M. Abrud	Mures					mine-5				1037	152.0	22.9	69.7		20.7	21.7 t/a Mg	
21	E.M. Zlatna	Mures			44		mine-5				907	4.9	0.1	0.0	0.0	0.1		
22	Siderurgica Hunedoara	Cerna / Mures					Iron-6				1877	74	36.5					
23	E.M. Coranda Certej	Certej / Mures					mine-5		1.3		269	2.8	7.5	0.1	0.1	2.8	13.8 t/a Mg	
24	E.M. Rosia Montana	Abrud / Mures					mine-5				273	26.0	16.7	0.1		0.8	14.2 t/a Mg	
25	E.M. Baia de Aries	Mures					mine-5				567	7.4			0.5	0.1	1.2	73.8 t/a Ca
26	Ind. Sarmel Campia Turzii	Arieș / Mures					Iron-6				408	35.4			8.4	0.0	3.8	0.2 t/a Cr
27	Metalurgica Aiud	Mures					Iron-6				367	1.6						
28	Mecanica Cujmir	Mures					Iron-6				172	6.2	0.3	0.5	0.0	0.3	1 t/a Cr	
29	Sidermet Calan	Mures					Iron-6				272	6	6.8					
30	E.M. Poiana Rusca-Teluc	Mures					mine-5		0.2		608	8.0			0.1	0.3		
31	E.M. Deva	Mures					mine-5		3.7	8.5	366	0.5	0.3	0.0	0.0	0.1		
32	Automecanica Medias	Mures					Iron-6		1.9	3.2	4	1	0.0	0.0	0.0	0.0		
33	Resial Alba Iulia	Mures					Iron-6		13.3	5.9	92	2						
34	Mina Deva	Mures					Iron-6				226	2.1	0.1	0.1	0.0	0.1	0.5	

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
68	E.M. Mecanica	Siret					mine-5		16.0	6.0	63		6.4		11.3		4.5
69	E.M. Tolovanu	Siret					mine-5		14.1	2.0	8		0.3	2.2	0.1		0.3
70	Fibrex Savinesti	Bistrita / Siret					chim-2		3,054.0	1,811.0	2,290	831					
71	Pergodur P.Neamt	Bistrita / Siret	23	45	25		pulp+paper-3		1,572.0	156.0	381	18	5.2				1.3 t/a P
72	Soferf Bacau	Bistrita / Siret	47				chim-2		139.0		241	380	11.3				
73	Carom Onesti	Trotus / Siret		23			chim-2		5.1	132.0	516				1.1		2.8 t/a Phen. 0.7 t/a Phen.
74	Rafo Onesti	Siret	21	26	22		petrochim-2			133.0	137						
75	Rulmentul Barlad	Siret					iron-6		57.3	50.2	80	9	0.8				0.1
76	Sidex Galati	Siret / Siret	15		15		iron-6		2,983.0		2,903	1,078	15.1				12.7
77	Antibiotice Iasi	Bahlui / Prut	19	58	20	85	chim.pharm.-2		64.3	40.4	34	12					3.6 t/a P
78	Fortus Iasi	Prut					iron-6		40.4	29.6	49	0	0.3				
79	Siderca Calarasi	Danube/Dunare	7		7	88	iron-6		21.2		337		6.4				8.1 t/a Phen. 0.4 t/a CN
80	Alum Tulcea	Danube/Dunare	36		38		nonfer.met.-7				4,227						215 t/a Mg, 48.2 t/a Al
81	CICH Tr. Magurele	Danube/Dunare	39		41		fertilizer-4		81.0		3,180	990	4.2				39 t/a P, 83 t/a Mg
82	I.M. Moldova Noua	Danube/Dunare					mine-5		2.7	1.5	938		2.1		3.5		2.5
83	Romag Tr. Severin	Topolnita / Dunare					chim-2		432.0	291.0	1,820	1					19 t/a P
84	Corapet Corabia	Danube/Dunare					textile-8		361.0		456						
85	Tamico Corabia	Danube/Dunare					leather-9		105.3		293						1.4 t/a Cr
86	Dunacor Braila	Danube/Dunare					textile-8		929.0	579.0	6,405						
87	Somes Dej	Somesul Mic / Somes-Tisa					chim-2		4,144.2	1,168.7		130					
88	Agrocomsuint Bonitida	Somes-Tisa					agr.-10		637.6	352.0	356	620					0.3 t/a Phen
89	Terapia Cluj	Somesul Mic / Somes-Tisa					chim.pharm.-2		1,858.3	475.0	284	284	0.6	0.1			Pharmaceutical Plant
90	Comsuint Mofnin	Somes-Tisa					agr.-10		298.8	49.5	110	91					wood industry
91	Stratus Mob Blaj	Tarnaave / Mures					furniture-11		647.6	343.9	441	55					
92	Suinprod Salcut	Mures					agr.-10		143.7	306.6		186					
93	Indagrara Arad	Mures / Mures					food-1		1,308.0	1,880.0	2,859	400					
94	Avicola Ungheni	Mures / Mures					agr.-10		110.0	260.0		41					
95	Nutrimur Iernut	Mures / Mures					agr.-10		114.0	245.0		51					
96	Comsuint Periam	Mures-Aranca					agr.-10		399.0	379.0	172	59					
97	Comsuint Birda	Bega-Timis					agr.-10		3,979.0	4,363.0	3,931	1,033					
98	Comsuint Padureni	Bega-Timis					agr.-10		360.0	432.0	482	229					1.1 t/a Phen
99	Comsuint Beregsau	Bega-Timis					agr.-10		2,247.0	3,043.0	1,629	818					0.1 t/a Phen
100	Oltchim Rm. Valcea	Olt / Olt					chim-2		1,870.0	737.0	11,607	548					0.6 t/a Phen
101	Combarim Cazanesti	Ialomita					agr.-10		1,428.0	1,709.0	3,082	766					31.12.1997
102	Ulcom Slobozia	Ialomita / Ialomita					food-1		221.0	350.0	640	16					
103	Beta Tandareni	Ialomita / Ialomita					food-1		589.0	655.0	473	70					
104	Suinded Dedulesti	Buzau					agr.-10		118.2	76.2	279	174	0.5				
105	Suinprod	Siret					agr.-10		300.0	40.0	53	111					
106	Mark-Pork Vanatori	Siret					agr.-10		213.0	301.0	303	75					
107	Suintest Focsani	Siret					agr.-10		172.0	32.0	110	68					
108	Martincorn Martinesti	Siret					agr.-10		58.3	72.0	70	13					
109	Agricola Bacau	Siret					agr.-10		429.0		131	693					
110	Spirit Ghidiceni	Barlad / Siret					food-1		941.2	805.0	885	202					
111	Suinprod Independenta	Siret					agr.-10		412.0	481.0	2,785	323					
112	Pyretus Falciu	Prut					food-1		36.0	35.0	44	9					
113	Comtom Tomesti	Prut					agr.-10		49.7	85.5	29	38					
114	Prodsuia Stanilesti	Prut					agr.-10		214.6	208.0	88	18					
115	Comsuint Ulmeni	Danube/Dunare					agr.-10		260.0	575.0	10,231	472					
116	Braigal Braila	Danube/Dunare					agr.-10		733.3	485.6	1,179	892	1.6				

Hot Spots - INDUSTRIAL

Tabel 2.4.1./4

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
117	Cement Plant Aleşd	Criş	1				cement-11			23	14.965							87.5 TDS
118	Carbosim Copşa Mică	Mureş	11	11														
119	Sinteza SA Oradea	Crişul Repede / Criş				92	chim-2						0.2			310	845	0.012 t/a CN ; 11 t/a Phen
120	Clujana SA Cluj Napoca	Someşul Mic / Someş-Tisa				93	lether-9											
121	Colorom Codlea	Vulcăniţa / Olt	10	25	10	84	chim-2		544	141	74	9	11.7		0.3			31,12,1997 0.28 Phen
122	SC Favor Blănuiri Orăştie	Mureş				94	lether-9											dfish. in WWTP Orăştie
123	Rafo Dărmăneşti	Siret					petrochim-2											
124	Goscom Roman	Siret																
125	Celohart Donaris Brăila	Danube/Dunare				83	pulp+paper-3			691								
126	Verachim Giurgiu	Danube/Dunare	17		18		chim-2		108		147	3						323 t/a Cl
127	Crescătoaria Periş	Ialomiţa				87												
128	UPS Govora	Olt / Olt					chim-2				2642	175						31/12/1997
129	Manpel Tg. Mureş	Sewage / Mureş					leather-9		189.2		157.7							4.1CN; 4.3 t/a Cr ³⁺ ; 41.8 t oil deterg 14.6
130	Comcem SA Calarasi	Danube/Dunare					chim-2		45		290							
131	SC Stimas Suceava	Siret																
	Sum								40,279.0	42,923.0	103,196.2	22,396	656.4	152.8	146.1			

0	1	2	19	20	21	22	23	24	25	26	27
39	C.S. Restia	Bega-Timis									
40	E.M. Ciudanovita	Bega-Timis									
41	E.M. Sasca Montana	Bega-Timis									
42	Semag Toplet	Dunare									
43	E.M. Petritia	Jiu									
44	E.M. Lupeni	Jiu									
45	E.M. Coroesti	Jiu									
46	Dolichim Craiova	Jiu / Jiu	0.4499	70 - 93.2	1/156 - 1/0	II (Răcari)		COD 8/9.2	NH4 0.132/8		
47	Nitratomia Fagaras	Olt / Olt	1.2097	55.5 - 72.4	1/46 - 1/60	III (Hogniz)		COD 19.7/19.9	NH4 1.05/1.65		
48	Romacril Rasnov	Ghimbasel / Olt	0.21	2.1 - 4.57	1/10 - 1/3	I (am. Rasnov)		COD 6.5/32	NH4 0.09/5.73		Fe 0.19/2.23
49	E.M. Capeni	Olt									
50	Celohart Zarnesti	Bistra / Olt	0.58	0 - 0.95	- 1/9	I (am. Zărnești)		BOD 732.9	NH4 73.23	Phen 1.023	Fe 1.6/15
51	Mecanica Mirsa	Olt									
52	Alro Slatina	Olt									
53	Aro Campulung	Arges									
54	Dacia Pitesti	Doamnei / Arges	0.2348	10.21 - 20.3	1/43 - 1/86	I (Dărmănești)		COD 6.5/8.7	NH4 0.12/0.45		Fe 0.17/0.28
55	Arpechim Pitesti	Dâmbovnic / Arges	0.394	0 - 1.12	- 1/5	I (Izvoare)		COD 7/17	NH4 75.3	Fen 70.06	Fe 70.25
56	Petrobrazii Ploiesti	Prahova / Ialomita	0.411	6.98 - 8.56	1/17 - 1/21	II (Cornu)		BOD 6.1/19.5	NH4 0.52/1.2	oil 0.18/5.23	Fe 0.51/0.63
57	Romfofochim Valea Calugareasca	Teleajen / Ialomita	0.0833	2.85 - 7.48	1/45 - 1/118	II (Gura Vitioarei)		BOD 6.1/25	NH4 0.25/15.4	Fen 0.006/0.033	
58	COS Targoviste	Ialomita									
59	I.M. Mija	Ialomita									
60	Astra Romana Ploiesti	Dâmbru / Ialomita	0.2862	1.9	1/7	I (Ref. Station)		BOD 729.5	NH4 78.76	oil 79.54	Fe 1.1, 0.7
61	Petrotel Teleajen	Teleajen / Ialomita	0.3713	2.85 - 7.48	1/8 - 1/20	II (Gura Vitioarei)		BOD 6.1/25	NH4 0.25/15.4	oil 0.14/3.85	Fe 0.28/1.83
62	Cord Buzau	Buzau									
63	Ductil Buzau	Buzau									
64	Gerom Buzau	Buzau									
65	Letea Bacau	Bistrita / Siret	0.5397	13.4 - 64.5	1/25 - 1/120	D (Frunzeni)		BOD 5.7/41.5	NH4 4.94/43.8		
66	Chimcomplex Borzesti	Trotus / Siret	0.1948	17.1 - 21.8	1/88 - 1/112	II (am. Tg. Ocna)		COD 17.5/18.3	NH4 0.29/2.52	oil 1.08/3.35	
67	S.P. Tamita	Siret									
68	E.M. Mestecanis	Siret									
69	E.M. Tolvanu	Siret									
70	Fibrex Savinesti	Bistrita / Siret	1.802	8.36 - 13.4	1/5 - 1/7	I (Straja)		COD 7.5/10.1	NH4 0.04/4.84		
71	Perigodur P.Neamt	Bistrita / Siret	0.2156	8.36 - 13.4	1/39 - 1/62	I (Straja)		BOD 3.9/5.7	NH4 0.04/4.84		
72	Sofert Bacau	Bistrita / Siret	0.2117	13.4 - 64.5	1/63 - 1/305	III (Frunzeni)		COD 10.1/78.1	NH4 4.9/43.8		
73	Carom Onesti	Trotus / Siret	0.1811	17.1 - 21.8	1/84 - 1/120	II (am. Tg. Ocna)		BOD 4.4/4.8	NH4 0.29/2.52	Fen 0.003/0.034	Fe 0.21/1.51
74	Raflo Onesti	Siret	0.1738								
75	Rulimentul Barlad	Siret									
76	Sidex Galati	Siret / Siret	1.9775	242 - 592	1/122 - 1/269	III (Sendrenit)		COD 17/19.5	P.0.094/0.14		Fe 0.33/0.8
77	Antibiotice Iasi	Bahlui / Prut	0.025	0.58 - 9.97	1/23 - 1/399	D (Postu Iloatei)		BOD 40.9/49.6	NH4 2.55/6.97	Fen 0.017/0.02	

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/ MAIN CACHEMENT AREA	CHARACTERISTIC OF PROBLEMS CREATED IN RECEIVER					SENSITIVITY OF DOWNSTREAM USERS	SENSITIVITY OF TRANSBOUNDARY AREA
			LEVEL OF TOXICITY OF THE LOADS	SIZE OF THE AREA AFFECTED	INTENSITY AND REVERSIBILITY OF THE PROBLEM	SENSITIVITY OF DOWNSTREAM USERS	SENSITIVITY OF TRANSBOUNDARY AREA		
0	1	2	28	29	30	31	32		
1	E.M. Turt	Somes-Tisa							
2	E.M. Baia Borsa	Somes-Tisa							
3	E.M. Rodha	Somes-Tisa							
4	Sicotub Zalau	Somes-Tisa							
5	E.M. Baia Mare Est	Somes-Tisa							
6	E.M. Baia Mare Vest	Somes-Tisa							
7	Phoenix Baia Mare	Săsar / Somes-Tisa	SSM, Fe	0.5 km	permanent	WS, irrigation			
8	Romplumb Baia Mare	Somes-Tisa							
9	E.M. Brad-Barza	Cris							
10	E.M. Deva-Brusturi	Cris							
11	E.M. Borod	Borod / Cris	Pb	2 km	permanent				
12	E.M. Borod	Borod / Crișul Repede	Fe, Pb	2 km	permanent				
13	Petrom Suplac de Barcau	Barcău / Cris	BOD, oil	2 km	permanent	WS	yes		
14	E.M. Voivozi	Cris							
15	Petrom Marghita	Cris							
16	Sometra Copsa Mica	Târnava Mare / Mures	SSM, Pb	2 km	permanent	WS			
17	Azomures Tg. Mures	Mureș / Mures	N, SSM	1 km	permanent	WS			
18	Ampelium Zlatna	Mures							
19	E.M. Baia de Aries	Mures							
20	E.M. Abrud	Mures							
21	E.M. Zlatna	Mures							
22	Siderurgica Hunedoara	Cerna / Mures	Fe	2 - 3 km	permanent	WS, irrig			
23	E.M. Coranda Certej	Certej / Mures	Fe	2 km	permanent				
24	E.M. Rosia Montana	Abrud / Mures	Fe, Mn	2 km	permanent				
25	E.M. Baia de Aries	Mures							
26	Ind. Sarnei Campia Turzii	Arieș / Mures	Fe, Cu	1 - 2 km	permanent	WS, irrig			
27	Metalurgica Aiud	Mures							
28	Mecanica Cujmir	Mures							
29	Sidermet Calan	Mures							
30	E.M. Poiana Rusca-Teliuc	Mures							
31	E.M. Deva	Mures							
32	Automecanica Medias	Mures							
33	Resial Alba Iulia	Mures							
34	Mina Deva	Mures							
35	Socomet Otelul Rosu	Bega-Timis							
36	E.M. Ruschita	Bega-Timis							
37	Ciocanul Nadrag	Bega-Timis							
38	UCMR Resita	Bega-Timis							

Hot Spots - INDUSTRIAL

0	1	2	28	29	30	31	32
39	C.S. Resita	Bega-Timis					
40	E.M. Ciudanovita	Bega-Timis					
41	E.M. Sasca Montana	Bega-Timis					
42	Sernag Toplet	Dunare					
43	E.M. Petrita	Jiu					
44	E.M. Lupeni	Jiu					
45	E.M. Coroesti	Jiu					
46	Dojchirn Craiova	Jiu / Jiu	BOD, COD	2 km	permanent	WS, irrigation	
47	Nitramonia Fagaras	Olt / Olt	BOD, N	2 - 3 km	permanent	WS	
48	Romacril Rasnov	Ghimbasel / Olt	COD, N	1 - 2 km	permanent	WS	
49	E.M. Capeni	Olt					
50	Celohart Zarnesti	Bistra / Olt	COD	1 km	permanent	WS	
51	Mecanica Mirsa	Olt					
52	Alro Slatina	Olt					
53	Aro Campulung	Arges					
54	Dacia Pitesti	Doamnei / Arges	COD, N, Fe	2 km	permanent	WS	
55	Arpechim Pitesti	Dambovcnic / Arges	COD, BOD	1 km	permanent	irrigation	
56	Petrobrazi Ploiesti	Prahova / Ialomita	COD, BOD	2 km	permanent	WS	
57	Romfosochim Valea Calugareasc	Teleajen / Ialomita	SSM	2 km	permanent	WS	
58	CO8 Targoviste	Ialomita					
59	I.M. Mija	Ialomita					
60	Astra Romana Ploiesti	Dambu / Ialomita	COD, Phen	2 km	permanent	WS, irrig	
61	Petrotel Teleajen	Teleajen / Ialomita	COD, Phen	1 - 2 km	permanent	WS	
62	Cord Buzau	Buzau					
63	Ductil Buzau	Buzau					
64	Gerom Buzau	Buzau					
65	Letea Bacau	Bistrita / Siret	BOD, SSM	2 km	permanent	WS, irrigation	
66	Chimcomplex Borzesti	Trotus / Siret	COD, Phen	1 - 2 km	permanent	WS	
67	S.P. Tarnita	Siret					
68	E.M. Mestecanis	Siret					
69	E.M. Tolovanu	Siret					
70	Fibrex Savinesti	Bistrita / Siret	BOD, COD, N	1 km	permanent	WS	
71	Pergodur P. Neamt	Bistrita / Siret	COD	1 km	permanent	WS	
72	Sofert Bacau	Bistrita / Siret	COD, N	1 km	permanent	WS	
73	Carom Onesti	Trotus / Siret	BOD, Phen	1 km	permanent	WS	
74	Rafo Onesti	Siret					
75	Rulmentul Barlad	Siret					
76	Sidex Galati	Siret / Siret	COD, N, Fe	2 km	permanent	WS	yes
77	Antibiotice Iasi	Bahlui / Prut	COD	1 km	permanent	WS	yes

Hot Spots - INDUSTRIAL

0	1	2	28	29	30	31	32
78	Fortus Iasi	Prut					
79	Siderca Calarasi	Danube/Dunare	COD, Fe	1 - 2 km	permanent	WS	yes
80	Alum Tulcea	Danube/Dunare	HM	1 - 2 km	permanent	WS, Fisheries	yes
81	CICH Tr. Magurele	Danube/Dunare	COD, N	1 - 2 km	permanent	WS	yes
82	I.M. Moldova Noua	Danube/Dunare					
83	Romag Tr. Severin	Topolnita / Dunare	COD	2 - 5 km	permanent	WS	yes
84	Corapet Corabia	Danube/Dunare					
85	Tamico Corabia	Danube/Dunare					
86	Dunacor Braila	Danube/Dunare					
87	Somes Dej	Someşul Mic / Somes-Tisa	COD	2 km	permanent	WS	
88	Agrocomsuin Bontida	Somes-Tisa					
89	Terapia Cluj	Someşul Mic / Somes-Tisa	COD, N	1 km	permanent	WS	
90	Comsuin Mofin	Somes-Tisa					
91	Stratus Mob Blaj	Târnavă / Mures	COD	1 - 2 km	permanent	WS	
92	Suinprod Salcud	Mures					
93	Indagrara Arad	Mureş / Mures	BOD, COD, N	1 km	permanent	WS	yes
94	Avicola Ungheni	Mures					
95	Nutrimur Iernut	Mureş / Mures	COD	1 - 2 km	permanent	WS	
96	Comsuin Periam	Mures-Aranca					
97	Comsuin Birda	Bega-Timis					
98	Comseltest Padureni	Bega-Timis					
99	Comsuin Beregsau	Bega-Timis					
100	Oltchim Rm. Valcea	Olt / Olt	COD, N, SSM	1 km	permanent	WS	
101	Combilcarim Cazanesti	Ialomita					
102	Ulcom Slobozia	Ialomita /Ialomita	COD, N	1 - 2 km	permanent	WS, irrig	
103	Beta Tandareni	Ialomita /Ialomita	COD, BOD	1 - 2 km	permanent	WS, irrig	
104	Suinded Dedulesti	Buzau					
105	Suinprod	Siret					
106	Mark-Pork Vanatori	Siret					
107	Suintest Focsani	Siret					
108	Martincorn Martinesti	Siret					
109	Agricola Bacau	Siret					
110	Spirit Ghidiceni	Bârlad / Siret	COD, N	1 - 2 km	permanent	WS	
111	Suinprod Independenta	Siret					
112	Pyretus Falciu	Prut					
113	Comtom Tomesti	Prut					
114	Prodsuis Stanilesti	Prut					
115	Comsuin Ulmeni	Danube/Dunare					
116	Braigal Braila	Danube/Dunare					
	Sum						

Hot Spots - INDUSTRIAL

0	1	2	28	29	30	31	32
117	Cement Plant Aleşd	Criş					
118	Carbosim Copşa Mică	Mureş					
119	Sinteza SA Oradea	Crişul Repede / Criş	COD, N, P, HM	1 km	permanent	WS	yes
120	Clujana SA Cluj Napoca	Someşul Mic / Someş-Tisa	COD, SSM, Cr	sewerage	permanent	WS	
121	Colorom Codlea	Vulcăniţa / Olt	COD	1 km	permanent		
122	SC Favor Blănuiri Orăştie	Mureş		sewerage	permanent	WS	
123	Rafo Dărmăneşti	Siret					
124	Goscom Roman	Siret					
125	Celohart Donaris Brăila	Danube/Dunare	COD, SSM	sewerage	permanent	WS	
126	Verachim Giurgiu	Danube/Dunare	COD, N	1 - 2 km	permanent	WS	yes
127	Crescătoaria Periş	Ialomiţa					
128	UPS Govora	Olt / Olt	SSM, N	1 km	permanent	WS	
129	Manpel Tg. Mureş	Sewage / Mureş	COD, SSM, Cr	sewerage	permanent	WS	
130	Comcem SA Calarasi	Danube/Dunare	COD, Phen	1 - 2 km	permanent	WS	yes
131	SC Stimas Suceava	Siret					
	Sum						

Ser No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/MAIN CACHEMENT AREA	PREVIOUS LISTS OF HOT SPOTS			ECONOMIC SECTOR / NR	Problems / ISSUES / Type of problem	DISCHARGED POLLUANT LOADS /year													
			SAP 93	PNA PM 85	Tab 22			PNA PM 97	COD	BOD	SSM	N	Fe	Mn	Cu	Pb	Zn	OTHERS			
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
7	Phoenix Baia Mare	Săsar / Someș-Tisa					mine-5	oil-11	96.0	138.7	153	27.4	8.4	0.3							
13	Petrom Supleac de Barcău	Barcău / Cris									944										
16	Sometria Copsa Mica	Târnava Mare / Mures	12	1	12		nonfer.met-2				367	4,487	7.1	0.8	33.0	12.2	2.9	0.9	0.9		
17	Azomures Tg Mures	Mures / Mures	40	40	40		chim-2		2.6		820	1,641	4.8	0.5	1.3	0.0	0.5		oil extraction		
46	Dolichim Craiova	Jiu / Jiu					chim-2				3,809	992								UREA = 884 Tg, TDS = 11878 Tg	
55	Apechim Pitesti	Dâmbovnic / Arges	25	557	27	80	petrochim-2				298.0	1,410	92	14.6	0.1					3.5 Tg P, 1 Tg CN, 0.9 Tg Phen	
56	Petrobrazi Ploiesti	Prahova / Ialomitia	28	28	89		petrochim-2				4,297.0	2,651								10.4 Tg Phenols	
65	Letea Bacau	Bistrita / Siret	2	40	2	82	pulp+paper-3				11,324.0	1,325	1,838							517 Tg P	
70	Fibrex Savinesti	Bistrita / Siret					chim-2				3,054.0	1,811.0	2,290	831							
71	Pergodur P Neamt	Bistrita / Siret	23	45	25		pulp+paper-3				1,572.0	156.0	381	18	5.2					1.3 Tg P	
76	Sidex Galati	Siret / Siret	15	15			iron-6				2,983.0	2,803	1,078	15.1						12.7 Tg Phen, 4.5 Tg P	
77	Antibiotice Iasi	Bahlui / Prut	19	58	20	85	chim.pharm-2				64.3	40.4	34	12						3.6 Tg P	
79	Siderca Calarasi	Danube/Dunare	7	7	88		iron-6				21.2	337	6.4							8.1 Tg Phen 0.4 Tg CN	
87	Somes Dej	Someșul Mic / Someș-Tisa					chim-2				4,144.2	1,188.7	130							31.12.1997	
93	Indagrara Arad	Olt / Olt					food-1				1,308.0	1,880.0	2,859	400						0.012 Tg CN, 11 Tg Phen	
100	Oltchim Rm Valcea	Crișul Repede / Criș					chim-2				1,870.0	737.0	11,607	548	0.2					310	845
119	Sinterza SA Oradea	Olt / Olt					chim-2														
120	Clujana SA Cluj Napoca	Someșul Mic / Someș-Tisa					chim-2														
121	Colonom Codlea	Vulcăntia / Olt	10	25	10	84	chim-2				544	141	74	9	11.7	0.3				31.12.1997 0.28 Phen	
122	SC Favor Blănuț Orăștie	Mureș					lether-9														dfish. in WWTP Oraștie
125	Celohant Donans Brăila	Danube/Dunare					pulp+paper-3				691										31/12/1997
128	UPS Govora	Olt / Olt					chim-2					2642	175								4.1 CN, 4.3 Tg Cr3+, 41.8 Tg deșeuri 14.6
129	Manpel Tg Mureș	Sewage / Mureș					leather-9				189.2		157.7								
Sum									18,569.5	23,149.4	34,863.0	12,230.6	92.5	1.3	10.1	343.3	870.5				

Place of industrial hot spots
from high priority list

Place	DISCHARGER NAME OF ECONOMIC UNIT	Transboundary transfer of pollution	
		Transboundary	transfer of pollution
1	Letea Bacau		
2	Celohant Donaris Brăila	yes	
3	Colonom Codlea		
4	Antibiotice Iasi	yes	
5	UPS Govora		
6	Siderca Calarasi	yes	
7	Petrobrazi Ploiesti		
7	Phoenix Baia Mare	yes	
8	Apechim Pitesti		
9	Manpel Tg Mureș		
10	Sinterza SA Oradea	yes	
11	Clujana SA Cluj Napoca	yes	
12	SC Favor Blănuț Orăștie		
14	Sometria Copsa Mica	yes	
15	Petrom Supleac de Barcău	yes	
16	Dolichim Craiova	yes	
17	Sidex Galati	yes	
18	Oltchim Rm Valcea	yes	
19	Indagrara Arad	yes	
20	Somes Dej	yes	
21	Fibrex Savinesti	yes	
22	Pergodur P Neamt		
23	Azomures Tg Mures		

Tabel 2.4.1.2.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/MAIN CACHEMENT AREA	CHARACTERISTIC OF PROBLEMS CREATED IN RECEIVER					SENSITI- VITY OF TRANS- BOUN- DARY AREA
			LEVEL OF TOXI- CITY OF THE LOADS	SIZE OF THE AREA AFEC- TED	INTENSITY AND REVER- SIBILITY OF THE PRO- BLEM	SENSITI- VITY OF DOWN- STREAM		
	1	2	28	29	30	31	32	
7	Phoenix Baia Mare	Săsar / Someș-Tisa	SSM, Fe	0.5 km	permanent	WS, irrigation		
13	Petrom Suplac de Barcau	Barcău / Cris	BOD, oil	2 km	permanent	WS	yes	
16	Sometra Copsa Mica	Târnava Mare / Mures	SSM, Pb	2 km	permanent	WS		
17	Azomures Tg Mures	Mures / Mures	N, SSM	1 km	permanent	WS		
46	Doljchim Craiova	Jiu / Jiu	BOD, COD	2 km	permanent	WS, irrigation		
55	Arpechim Pitesti	Dâmbovnic / Arges	COD, BOD	1 km	permanent	irrigation		
56	Petrobrazi Ploiesti	Prahova / Ialomita	COD, BOD	2 km	permanent	WS		
66	Letea Bacau	Bistrița / Siret	BOD, SSM	2 km	permanent	WS, irrigation		
70	Fibrex Savinesti	Bistrița / Siret	BOD, COD, N	1 km	permanent	WS		
71	Pergodur P. Neamt	Bistrița / Siret	COD	1 km	permanent	WS		
76	Sidex Galati	Siret / Siret	COD, N, Fe	2 km	permanent	WS	yes	
77	Antibiotice Iasi	Bahlui / Prut	COD	1 km	permanent	WS	yes	
79	Siderca Calarasi	Danube/Dunare	COD, Fe	1 - 2 km	permanent	WS	yes	
87	Someș Dej	Someșul Mic / Someș-Tisa	COD	2 km	permanent	WS		
93	Indagrara Arad	Mureș / Mures	BOD, COD, N	1 km	permanent	WS	yes	
100	Oltchim Rm. Valcea	Olt / Olt	COD, N, SSM	1 km	permanent	WS		
119	Sinteza SA Oradea	Crișul Repede / Criș	COD, N, P, HM	1 km	permanent	WS	yes	
120	Clujana SA Cluj Napoca	Someșul Mic / Someș-Tisa	COD, SSM, Cr	sewerage	permanent	WS		
121	Colorom Codlea	Vulcănița / Olt	COD	1 km	permanent	WS		
122	SC Favor Blănuți Oraștie	Mureș		sewerage	permanent	WS		
125	Celohart Donaris Brăila	Danube/Dunare	COD, SSM	sewerage	permanent	WS		
128	UPS Govora	Olt / Olt	SSM, N	1 km	permanent	WS		
129	Manpel Tg. Mureș	Sewage / Mureș	COD, SSM, Cr	sewerage	permanent	WS		
	Sum							

**Hot Spots - INDUSTRIAL
MEDIUM PRIORITY**

Table 2.4.2.1.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/MAIN CACHEMENT AREA	PREVIOUS LISTS OF HOT SPOTS				ECONOMIC SECTOR / NR.	Problems / ISSUES Type of problem	DISCHARGED POLLUANT LOADS t/year									
			SAP PM 93	PNA PM 95	Tab. 2.2	PNA PM 97			COD	BOD	SSM	N	Fe	Mn	Cu	Pb	Zn	OTHERS
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
12	E.M. Borod	Borod / Crişul Repede					mine-5		2.4		16	0.1						
22	Siderurgica Hunedoara	Cerna / Mures					iron-6				1,877	74	36.5					
23	E.M. Coranda Certel	Certej / Mures					mine-5		1.3		269	2.8	7.5	0.1	0.1	2.8		13.8 t/a Mg
24	E.M. Rosia Montana	Abrud / Mures					mine-5				273	26.0	16.7	0.1	0.8			14.2 t/a Mg
26	Ind. Sarmei Campia Turzii	Arieş / Mures					iron-6				408	35.4			8.4	0.0	3.8	0.2 t/a Cr
47	Nitramonia Fagaras	Olt / Olt	14	14			fertil-4		674.0	225.0	424	1,253	0.5					31/12/1997
48	Romacril Rasnov	Ghimbaşel / Olt					chim-2		73.0	26.0	42	9						31/12/1997
50	Celohart Zarnesti	Bistra / Olt	42	4	43		chim-2		842.0	335.0	112	40						31/12/1997
54	Dacia Pitești	Doamnei / Arges					iron-6		427.6	216.0	370	94	3.3		0.2	0.0	0.2	8.9 t/a P
57	Romfoschim Valea Calugareasca	Teleajen / Ialomita	40		42		chim-2				1,366	11						3.2 t/a P, 6261 t/a TDS
60	Astra Romana Ploesti	Dâmbu / Ialomita					petrochim-2			738.0	1,155							3.7 t/a Phen.
61	Petrotel Teleajen	Teleajen / Ialomita	33	33	35		petrochim-2			835.0	1,679							9.4 t/a Phen.
66	Chimcomplex Borzesti	Trotuş / Siret	4		4		petrochim-2		506.0		448	22						0.17 t/a Phen.
72	Sofert Bacau	Bistriţa / Siret		47			chim-2		139.0		241	380	11.3					
73	Carom Onesti	Trotuş / Siret			23		chim-2		5.1	132.0	516				1.1			2.8 t/a Phen.
80	Alum Tulcea	Danube/Dunare	36		38		nonfer.met-7				4,227							215 t/a Mg; 48.2 t/a Al
81	CICH Tr. Magurele	Danube/Dunare	39		41		fertilizer-4		81.0		3,180	990	4.2					39 t/a P, 83 t/a Mg
83	Romag Tr. Severin	Topolniţa / Dunare					chim-2		432.0	291.0	1,820	1						19 t/a P
89	Terapia Cluj	Someşul Mic / Someş-Tisa					chim.pharm.-2		1,858.3	475.0		284	0.6	0.1				Pharmaceutical Plant
91	Stratus Mob Blaj	Târnave / Mures					furniture-11		647.6	343.9	441	55						wood industry
95	Nutrimur Iernut	Mureş / Mures					agr.-10		114.0	245.0		51						
102	Ulcorn Slobozia	Ialomita / Ialomita					food-1		221.0	350.0	640	16						
103	Beta Tandareni	Ialomita / Ialomita					food-1		589.0	655.0	473	70						
110	Spirit Ghidicepi	Bârlad / Siret					food-1		941.2	805.0	885	202						
126	Verachim Giurgiu	Danube/Dunare	17		18		chim-2		108		147	3						323 t/a Cl-
130	Comcern SA Calarasi	Danube/Dunare					chim-2		45		290							
Sum									7,552.1	5,664.3	20,862.1	3,553	120.6	24.3	9.9			

**Place of industrial hot spots
from medium priority list**

Tabel 2.4.2.2.

Place	DISCHARGER NAME OF ECONOMIC UNIT	Transboundary transfer of pollution
1	Terapia Cluj	yes
2	Alum Tulcea	yes
3	Romag Tr. Severin	yes
4	Verachim Giurgiu	yes
5	Comcem SA Calarasi	yes
6	CICH Tr. Magurele	yes
7	Celohart Zamesti	
8	Astra Romana Ploiesti	
9	E.M. Rosia Montana	
10	E.M. Coranda Certej	
11	Romacril Rasnov	
12	Petrotel Teleajen	
13	Romfosochim Valea Calugareasca	
14	Siderurgica Hunedoara	
15	Spirt Ghidiceni	
16	Ind. Sarnei Campia Turzii	
17	Stratus Mob Blaj	
18	Sofert Bacau	
19	Ulcom Slobozia	
20	Nutrimur Iernut	
21	Chimcomplex Borzesti	
22	Beta Tandareni	
23	Dacia Pitesti	
24	Nitramonia Fagaras	
25	Carom Onesti	
26	E.M. Borod	

**Hot Spots - INDUSTRIAL
MEDIUM PRIORITY**

Tabel 2.4.2.1.

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/MAIN CACHEMENT AREA	CHARACTERISTIC OF PROBLEMS CREATED IN RECEIVER					SENSITIVITY OF TRANSBOUNDARY AREA
			LEVEL OF TOXICITY OF THE LOADS	SIZE OF THE AREA AFFECTED	INTENSITY AND REVERSIBILITY OF THE PROBLEM	SENSITIVITY OF DOWNSTREAM USERS		
1		2	28	29	30	31	32	
12	E.M. Borod	Borod / Crișul Repede	Fe, Pb	2 km	permanent			
22	Siderurgica Hunedoara	Cerna / Mures	Fe	2 - 3 km	permanent	WS, irrig		
23	E.M. Coranda Certej	Certej / Mures	Fe	2 km	permanent			
24	E.M. Rosia Montana	Abrud / Mures	Fe, Mn	2 km	permanent			
26	Ind. Sarmel Campia Turzii	Arieș / Mures	Fe, Cu	1 - 2 km	permanent	WS, irrig		
47	Nitraonia Fağaras	Olt / Olt	BOD, N	2 - 3 km	permanent	WS		
48	Romacril Rasnov	Ghimbașel / Olt	COD, N	1 - 2 km	permanent	WS		
50	Celohart Zarnesti	Bistra / Olt	COD	1 km	permanent			
54	Dacia Pitesti	Doamnei / Arges	COD, N, Fe	2 km	permanent	WS		
57	Romfoschim Valea Calugareasca	Teleajen / Ialomita	SSM	2 km	permanent	WS		
60	Astra Romana Ploiesti	Dâmbu / Ialomita	COD, Phen	2 km	permanent	WS, irrig		
61	Petrotel Teleajen	Teleajen / Ialomita	COD, Phen	1 - 2 km	permanent	WS		
66	Chimcomplex Borzesti	Trotuș / Siret	COD, Phen	1 - 2 km	permanent	WS		
72	Soferit Bacau	Bisrița / Siret	COD, N	1 km	permanent	WS		
73	Carom Onesti	Trotuș / Siret	BOD, Phen	1 km	permanent	WS		
80	Alum Tulcea	Danube/Dunare	HM	1 - 2 km	permanent	WS, Fisheries	yes	
81	CICH Tr. Magurele	Danube/Dunare	COD, N	1 - 2 km	permanent	WS	yes	
83	Romag Tr. Severin	Topolița / Dunare	COD	2 - 5 km	permanent	WS	yes	
89	Terapia Cluj	Someșul Mic / Somes-Tisa	COD, N	1 km	permanent	WS		
91	Stratus Mob Blaj	Târnavă / Mures	COD	1 - 2 km	permanent	WS		
95	Nutrimur Iernut	Mureș / Mures	COD	1 - 2 km	permanent	WS		
102	Ulcom Slobozia	Ialomita / Ialomita	COD, N	1 - 2 km	permanent	WS, irrig		
103	Beta Tandareni	Ialomita / Ialomita	COD, BOD	1 - 2 km	permanent	WS, irrig		
110	Spirit Ghidiceni	Bârlad / Siret	COD, N	1 - 2 km	permanent	WS		
126	Verachim Giurgiu	Danube/Dunare	COD, N	1 - 2 km	permanent	WS	yes	
130	Comcern SA Calarasi	Danube/Dunare	COD, Phen	1 - 2 km	permanent	WS	yes	
	Sum							

Hot Spots - INDUSTRIAL
LOW PRIORITY

Tabel 2.4.3.1.1/2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
51	Mecanica Mirsa	Oil				Iron-6		42.8	22.2	41							0,11 t/a Cr
52	Alro Slatina	Oil				nonfer.met.-7		11.6		45							
53	Aro Campulung	Arges				Iron-6		52.4	24.8	54	4	0.0	0.0	0.0	0.0	0.0	0,8 t/a P
55	Arpechim Pitesti	Dambovnic / Arges	25	B57	27	petrochim-2		607.0	298.0	1.410	92	14.6	0.1				0,2 3,5 t/a P; 1 t/a CN; 0,9 t/a Hg, HCH, Cl, NH4+
58	COS Targoviste	Ialomită				Iron-6		66.2	69.6	1.543		4.2					
59	I.M. Mijle	Ialomită				Iron-6		1.0	1.1	23		0.1					
62	Cord Buzau	Buzau				mec.nef.-11				146		0.9					
63	Ductil Buzau	Buzau				mec.nef.-11				56		1.4					0,0 5,4 t/a Mg
64	Cerom Buzau	Buzau				mec.nef.-11		11.4		94		0.6					
67	S.P. Ternita	Siret				mec.nef.-11		234.0	10.0	445		2.7					Oil extraction
68	E.M. Mestecanis	Siret				mine-5		16.0	6.0	63		6.4					11.3 4.5
69	E.M. Tolovanu	Siret				mine-5		14.1	2.0	8		0.3					0.3
74	Rafin Onesti	Siret	21	26	22	petrochim-2			133.0	137			2.2	0.1			0,7 t/a Phen;
75	Ruimentul Barlad	Siret				Iron-6		57.3	50.2	80	9	0.6					0,1 0,6 t/a P; 0,2 t/a Cr
78	Fortus Iasi	Praul				Iron-6		40.4	29.6	49	0	0.3					
82	I.M. Moldova Noua	Danube/Dunare				mine-5		2.7	1.5	938		2.1					2.5
84	Corapet Corabia	Danube/Dunare				textile-8		361.0		458							
85	Tamico Corabia	Danube/Dunare				leather-9		105.3		293							1,4 t/a Cr
86	Dunacor Braila	Danube/Dunare				textile-8		929.0	579.0	6.405							
88	Agrocormsuln Bomlida	Somes-Tisa				agr.-10		637.6	352.0	356	620						0,3 t/a Phen
90	Comsuin Mothn	Somes-Tisa				agr.-10		298.8	49.5	110	91						
92	Suinprod Sakud	Mures				agr.-10		143.7	306.6		196						
94	Avicola Ungheni	Mures				agr.-10		110.0	260.0		41						
96	Comsuln Periam	Mures-Aranca				agr.-10		399.0	379.0	172	59						
97	Comsuin Birda	Bega-Timis				agr.-10		3.979.0	4.363.0	3.931	1.033						1,1 t/a Phen
98	Comsilest Padureni	Bega-Timis				agr.-10		360.0	432.0	482	229						0,1 t/a Phen
99	Comsuin Beregsau	Bega-Timis				agr.-10		2.247.0	3.043.0	1.629	818						0,6 t/a Phen
101	Comblacarim Cazanesti	Ialomită				agr.-10		1.428.0	1.709.0	3.082	766						
104	Suinded Dedulesti	Buzau				agr.-10		118.2	76.2	279	174	0.5					
105	Suinprod	Siret				agr.-10		300.0	40.0	53	111						
106	Mark-Pork Vanatori	Siret				agr.-10		213.0	301.0	303	75						
107	Suimest Focsani	Siret				agr.-10		172.0	32.0	110	68						
108	Marlincom Martinesi	Siret				agr.-10		58.3	72.0	70	13						
109	Agricola Bacau	Siret				agr.-10			429.0	131	693						
111	Suinprod Independenția	Siret				agr.-10		412.0	481.0	2.765	323						
112	Pyretus Falciu	Praul				food-1		36.0	35.0	44	9						
113	Comtom Tomesti	Praul				agr.-10		49.7	85.6	29	38						
114	Prodsuls Stanlesti	Praul				agr.-10		214.6	208.0	88	18						
115	Comsuin Ulmeni	Danube/Dunare				agr.-10		260.0	575.0	10.231	472						
116	Bralgal Braila	Danube/Dunare				agr.-10		733.3	485.6	1.179	892	1.6					
117	Cement Plant Alesd	Crș	1			cement-11			23	14.965							87.5 TDS
118	Carbostim Coșoa Mică	Mureș	11			petrochim-2											
123	Rafin Dărmănești	Siret															
124	Goecom Roman	Siret															
127	Crescătoaria Paris	Ialomită															
131	SC Silmas Suceava	Siret															
	Sum							15,488.6	15,229.3	51,743.8	6,876	456.8	113.2	111.5			

Hot Spots - INDUSTRIAL
LOW PRIORITY

Tabel 2.4.3.1./1

Ser. No	DISCHARGER NAME OF ECONOMIC UNIT	RECEIVER RIVER/ MAIN CACHEMENT AREA	CHARACTERISTIC OF PROBLEMS CREATED IN RECEIVER				
			LEVEL OF TOXICITY OF THE LOADS	SIZE OF THE AREA AFFECTED	INTENSITY AND REVERSIBILITY OF THE PROBLEM	SENSITIVITY OF DOWNSTREAM USERS	SENSITIVITY OF TRANSBOUNDARY AREA
		2	28	29	30	31	32
1	E.M. Tuft	Somes-Tisa					
2	E.M.Baia Borsa	Somes-Tisa					
3	E.M. Rodna	Somes-Tisa					
4	Slicotub Zalau	Somes-Tisa					
5	E.M. Baia Mare Est	Somes-Tisa					
6	E.M.Baia Mare Vest	Somes-Tisa					
8	Romplumb Bala Mare	Somes-Tisa					
9	E.M. Brad-Barza	Cris					
10	E.M. Deva-Brusturi	Cris					
11	E.M. Borod	Borod / Cris	Pb	2 km	permanent		
14	E.M. Voivozi	Cris					
15	Porrom Marghita	Cris					
18	Ampellum Zlatna	Mures					
19	E.M.Baia de Aries	Mures					
20	E.M. Abrud	Mures					
21	E.M. Zlatna	Mures					
25	E.M. Baia de Aries	Mures					
27	Metalgica Aiud	Mures					
28	Mecanica Cujmir	Mures					
29	Sidermet Calan	Mures					
30	E.M. Poiana Rusca-Teluc	Mures					
31	E.M. Deva	Mures					
32	Automecanica Meadias	Mures					
33	Resial Alba Iulia	Mures					
34	Mina Deva	Mures					
35	Socomet Otetul Rosu	Bega-Timis					
36	E.M. Ruschita	Bega-Timis					
37	Ciocanul Nadrag	Bega-Timis					
38	UCMR Rosta	Bega-Timis					
39	C.S. Resita	Bega-Timis					
40	E.M. Ciudanovita	Bega-Timis					
41	E.M. Sasca Montana	Bega-Timis					
42	Semag Toplet	Dunare					
43	E.M. Petritu	Jiu					
44	E.M.Lupeni	Jiu					
45	E.M. Coroesti	Jiu					
49	E.M. Capeni	Olt					

Hot Spots - INDUSTRIAL
LOW PRIORITY

	1	2	28	29	30	31	32
51	Mecanica Mirsa	Olt					
52	Alro Slatina	Olt					
53	Aro Campulung	Arges					
58	COS Targoviste	Ialomita					
59	I.M. Mija	Ialomita					
62	Cord Buzau	Buzau					
63	Ductil Buzau	Buzau					
64	Getom Buzau	Buzau					
67	S.P. Tarnita	Siret					
68	E.M. Mestecanis	Siret					
69	E.M. Tolovanu	Siret					
72	Sofert Bacau	Bistrita / Siret	COD _N	1 km	permanent	WS	
74	Rato Onesti	Siret					
75	Rulmentul Barlad	Siret					
78	Fortus Iasi	Pрут					
82	I.M. Moldova Noua	Danube/Dunare					
84	Corapet Corabia	Danube/Dunare					
85	Tarnico Corabia	Danube/Dunare					
86	Dunacor Braila	Danube/Dunare					
88	Agrocomsuin Bortida	Somes-Tisa					
90	Comsuin Mofin	Somes-Tisa					
92	Suinprod Salcut	Mures					
94	Avicola Ungheni	Mures					
96	Comsuin Periam	Mures-Aranca					
97	Comsuim Birda	Bega-Timis					
98	Comseltest Padureni	Bega-Timis					
99	Comsuin Beregsau	Bega-Timis					
101	Combilcarim Cazanesti	Ialomita					
104	Suinded Dedulesti	Buzau					
105	Suinprod	Siret					
106	Mark-Pork Vanatori	Siret					
107	Suintest Focsani	Siret					
108	Marticom Martinesi	Siret					
109	Agricola Bacau	Siret					
111	Suinprod Independenta	Siret					
112	Pyrethus Falciu	Pрут					
113	Comtom Tomesti	Pрут					
114	Prodsuis Staniesti	Pрут					
115	Comsuin Ulmeni	Danube/Dunare					
116	Braigal Braila	Danube/Dunare					
117	Cement Plant Aleşd	Criş					
118	Carbosim Copşa Mică	Mureş					
123	Rato Dărmăneşti	Siret					
124	Goscom Roman	Siret					
127	Crescătoria Periş	Ialomita					
131	SC Stimas Suceava	Siret					
	Sum						

3. Identification of Diffuse Sources of Agricultural Pollution

First of all, it should be mentioned that 99 % of Romanian inland waters are discharged in the Danube River and 1% directly into the Black Sea. The average multiannual flow of the Danube is 5,500 m³ / s at the gauging station Orsova, and this can be considered as entrance in the country, and 6,300 m³ / s at the entrance in the Danube Delta.

Having in mind that the actual Romanian economical reform has affected also the agriculture (by land privatisation), the available data at the moment can't reflect the requests of presenting those at the level of river basins or countries.

Due to the motives above mentioned, presented data cover the entire territory of the country as a whole.

3.1. Land under Cultivation

3.1.1. Area of the total land from Romania being in agricultural exploitation at the end of 1994 was 14797.5 thousand ha and in 1995 was 14797.2 thousand ha. The utilisation of this area is mentioned in table 3.1.1.

Table 3.1.1.

No.	Destination of agricultural area	Agricultural area thousand ha		Structure %	
		Total	of which private sector	Total	of which private sector
	1994	14797.5	10693.9	100	
1.	Arable	9338.0		63.1	
2.	Pastures	3378.4		22.8	
3.	Meadows	1493.7		10.1	
4.	Vineyards and nurseries	298.4		2.0	
5.	Orchards and nurseries	289.0		2.0	
	1995	14797.2		100	
1.	Arable	9337.1	7807.6	63.1	73.0
2.	Pastures	3392.4	1074.9	22.9	10.0
3.	Meadows	1497.7	1402.5	10.1	13.1
4.	Vineyards and nurseries	292.4	220.1	2.0	2.1
5.	Orchards and nurseries	277.6	188.8	1.9	1.8

3.1.2. The specific areas of intensive agricultural activities from the total agricultural land of Romania are mentioned in the table 3.1.2. Most of these areas are surfaces, which are provided with irrigation facilities. Regarding the location and the organisation of those irrigation systems, they are presented in a number of maps attached to this report. (Annexes of Chapter 3)

Table 3.1.2.

No.	Total area provided with irrigation facilities	Agricultural area thousand ha		Structure %	
		Total	of which private sector	Total	of which private sector
	1994	3502.2		100	
1.	Agricultural	3104.3		96.85	
2.	Arable	2929.1		91.38	
	1995	3211.1	2175.4	100	
1.	Agricultural	3110.1	2130.6	96.9	97.9
2.	Arable	2934.6	2062.0	91.4	94.8

The Great Romanian Plain which is bordered at the west by Carpathian Mountains in the Tr. Severin point, in North by the same mountains, in South by Danube and in West by Danube at Galati town point, has a number of 37 large irrigation systems which are covering 1973.41 thousand ha. Between Danube and Black Sea there are other 500 thousand ha in the region called central and South Dobrogea which is located between Danube and Black Sea.

The maps included in the Report (Map 4.4.4.1.) and which were organised for presenting the irrigation systems are referring to the main systems from the country which are located around Danube as main resource for water, and those systems are described and presented in this chapter.

3.1.3. The total production and use of fertilisers in the country are presented in the table 3.1.3. and the quantities presented are expressed in **active substance.(s.a.)**

Table 3.1.3.

No.	Chemical fertilisers [thousand tons]	1993	1994	1995
1.	Nitrogen based	346	313	306
2.	Phosphorus based	165	149	149
3.	Potash based	27	17	15
4.	Total	538	479	470
5.	Natural fertilisers Quantities (as s.a.) [thousand tons]	17,125	16,945	17,423

The ratio in which were applied the chemical fertilisers are:

- Nitrogen based - in average quantity (**arable ha land: 38 kg s.a.**)
- Phosphorus based - in average quantity (**arable ha land: 18 kg s.a.**)

The **pesticides** that were applied in 1994 are in the total of **14366.68 tones / year s.a.** (active substance) out of which:

- Insecticides: 2626.73 tons s.a.
- fungicides and bactericides: 7585.33 tons s.a.
- Herbicides: 4154.62 tons. s.a.