Danish Environmental Protection Agency, DANCEE

and

The Ministry of Environment of Latvia

DANCEE Project ref. No. M:128/023-004

Transposition and Implementation of the EU Water Framework Directive in Latvia

Technical Report No. 5

Specification of requirements for a data management/information system (TOR)

December 2003

Published : April 2004
Project : 30.4480.02

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List of Abbreviations

CIS	Common Strategy on the Implementation of the Water Framework Directive
CM	Cabinet of Ministers
DANCEE	Danish Co-operation for the Environment in Eastern Europe
DEPA	Danish Environmental Protection Agency
EEA	European Environmental Agency
EU	European Union
GIS	Geographic Information System
IAE	Institute of Aquatic Ecology University of Latvia
IT	Information Technology
LEA	Latvian Environmental Agency
LHMA	Latvian Hydro Meteorological Agency
MoA	Ministry of Agriculture
MoE	Ministry of Environment
PHA	Public Health Agency
RB	River Basin
RBD	River Basin District
RBM	River Basin Management
RBMA	River Basin Management Authorities
REB	Regional Environmental Board
SEI	State Environmental Inspectorate
SGSL	State Geological Survey of Latvia
ToR	Terms of reference
UML	Unified Modelling Language
WFD	Water Framework Directive (2000/60/EC)
WG	Working Group

List of explanation of technical terms

Client/server	Client/server describes the relationship between two computer programs in which one program, the client, makes a service request to another program, the server, which fulfils the request. In a network, the client/server model provides a convenient way to interconnect programs that are distributed efficiently across different locations. Computer transactions using the client/server model are very common. Typically, multiple client programs share the services of a common server program. Relative to the Internet, any Web browser is considered as a client program that requests services (the sending of Web pages or files) from a Web server in another computer somewhere on the Internet.
Data warehouse	A data warehouse is a central repository for all or significant parts of the data that an enterprise's various business systems collect. Typically, a data warehouse is housed on an enterprise mainframe server. Data from various online transaction processing (OLTP) applications and other sources is selectively extracted and organized on the data warehouse database for use by analytical applications and user queries. Data warehousing emphasizes the capture of data from diverse sources for useful analysis and access.
eXtensible Mark-up Language	XML (Extensible Markup Language) is a flexible way to create common information formats and share both the format and the data on the World Wide Web, intranets, and elsewhere. XML, a formal recommendation from the World Wide Web Consortium (W3C), is similar to the language of today's Web pages, the Hypertext Markup Language (HTML). Both XML and HTML contain markup symbols to describe the contents of a page or file. HTML, however, describes the content of a Web page (mainly text and graphic images) only in terms of how it is to be displayed and interacted with. XML describes the content in terms of what data is being described. XML is "extensible" because, unlike HTML, the markup symbols are unlimited and self-defined.
Meta information	Meta is a prefix that in most information technology usages means "an underlying definition or description." Thus, meta information is a definition or description of information.
Portal	Portal is a term, generally synonymous with gateway, for a World Wide Web site that is or proposes to be a major starting site for users when they get connected to the Web or that users tend to visit as an anchor site. There are general portals (e.g. Yahoo, Microsoft Network, etc.), and specialized or niche portals.

Relational Database Management System	A relational database management system (RDBMS) is a program with functionalities to create, update, and administer a relational database. An RDBMS takes SQL statements entered by a user or contained in an application program and creates, updates, or provides access to the database. Some of the best-known RDBMS's include Oracle's database product line, IBM's DB2, etc. The majority of new corporate, small business, and personal databases are being created for use with an RDBMS. Meanwhile, the idea of object-orientation has begun to contend with the RDBMS as the database management system of the future, sometimes in hybrid implementations.
ReportNet	The ReportNet: the European network of data collecting and reporting networks (EIONET, European Statistical System, etc) with complementary mandates and cooperating in a mutual beneficial way, aiming at streamlined data collection, reduced reporting burden, multiple use of data provided by Member States (see: Fig. 7 in Annex A).
SOAP	Simple Object Access Protocol (SOAP) is a way for a program running in one kind of operating system (such as Windows 2000) to communicate with a program in the same or another kind of an operating system (such as Linux) by using the World Wide Web's Hypertext Transfer Protocol (HTTP) and its Extensible Markup Language (XML) as the mechanisms for information exchange. SOAP specifies exactly how to encode an HTTP header and an XML file so that a program in one computer can call a program in another computer and pass it information; it also specifies how the called program can return a response. An advantage of SOAP is that program calls are much more likely to get through firewall servers (that screen out requests other than those for known applications).
Web services	Web services are services (usually including some combination of programming and data, but possibly including human resources as well) that are made available from a business's Web server for Web users or other Web-connected programs. Services previously possible only with the older standardized service known as Electronic Data Interchange (EDI) increasingly are likely to become Web services. Besides the standardization and wide availability to users and businesses of the Internet itself, Web services are also increasingly enabled by the use of XML as a means of standardizing data formats and exchanging data. XML is the foundation for the Web Services Description Language (WSDL).

List of references

/1/ Information development strategy of Ministry of Environment for 1997-2002. 1997. (Only in Latvian)

/2/ GIS-guidance on Implementing the GIS elements of the WFD (2002)

Table of contents:

1 Introduction

The present report is part of the reporting for the project financed by the Danish Environmental Protection Agency (DEPA):

Transposition and implementation of the EU Water Framework Directive in Latvia.

The report describes the present situation regarding information systems relevant for the WFD and proposes methods for technical gap analysis and specification of requirements for a future data management system.

The report is No. 5 in the following list of reports:

Technical reports:

- TR 1A: Typology of waters and procedure for characterisation of waters
- TR 1B: Classification and presentation of status of waters
- TR 2: Recommendations for the monitoring programs for surface, coastal and groundwater and CM Regulations on requirements for establishment of monitoring programs
- TR 3: Draft Action Plan on how to define ecological status of fresh and coastal water
- TR 4: Revision of the draft Regulation on WRUP
- TR 5: Elaboration of a specification of requirements and ToR for a data management/information system

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Outputs:

A: Draft legal acts for the transposition of Annexes II and V of the WFD
B: Assistance to MoE in preparation of information material on the WFD
C: Specification of requirements and ToR for a data management/information system

2 Summary

The component C of the project included the following tasks:

- Mapping of the existing databases and information systems in the environmental sector relevant for the WFD
- Listing of the WFD requirements to future information systems
- Elaboration of a procedure for gap analysis
- Elaboration of a procedure for development of a River Basin Information System (TOR)

To get an overview of the data management in the sector the main key stakeholders / data holders were identified as:

- Latvian Environmental Agency, (LEA)
- State Geological Survey of Latvia, (SGSL)
- Latvian Hydro Meteorological Agency, (LHMA)
- Institute of Aquatic Ecology, Latvia University, (IAE)
- Ministry of Health, MoH
- Ministry of Agriculture, MoA
- Latvian Fisheries Research Institute.

Two questionnaires were elaborated (ANNEX D, Questionnaire forms) and distributed to the main stakeholders. Additionally interviews were made with the LEA, SGSL, LHMA and IAE.

The information gathered by the interviews and returned questionnaires was interpreted and is presented in tables 1 – 9.

According to the information returned there are approximately one PC pr. employee except in LHMA and IAE, where there are about 2 employees pr. PC.
20-25% of the PCs are less than 2 years old, which indicates that a running renewal of the equipment in the institution is taking place. (IT equipment is considered to have a lifetime on 3-5 years.)

The main institutions LEA, SGSL and LHMA are running their own web servers and have a staff dedicated for maintenance and development of databases and applications.

The institutions are mainly using Windows and Microsoft products in their office systems. Many databases in the institutions are based on spreadsheets, Paradox and Access while the main data holders as LEA, SGSL and LHMA have the main part of the data stored in Oracle environment.

An overview of the databases where elaborated with description of name, contents and database software and is presented in tables 5 - 8.

The WFD requirements were elaborated on sub topic level and compared with the findings done in the listing of the existing databases. A brief gap analysis was performed on sub topic level and is presented in the tables 10-15.

A procedure for technical gap analysis was elaborated and is presented in paragraph 9.

A procedure for development of a River Basin Management Information System was elaborated and proposed as a TOR in paragraph 10.

The project found that advanced Internet based applications were implemented in the sector for maintenance and presentation of environmental information and that the development of the IT sector in MoE has been done and fulfilled according to an IT Strategy for 1997 – 2002. A new strategy should have been elaborated in 2003 but has been postponed. The project will strongly recommend that a new strategy is elaborated, because it will optimise the development and can reduce the costs for the continuously and required development of IT in the MoE. A new strategy could be coordinated with MoH and MoA.

A data sharing policy should be elaborated that can secure smooth exchange of data between the involved institutions and ministries.

A preliminary analysis of the databases and comparison with the WFD requirements indicated that there are significant gaps in the data material. It is strongly recommended to perform a technical gap analysis to provide the administration with exact information of the gaps on parameter level. It is furthermore recommended to give attention to the fact that storage and maintenance of data from e.g. the planned biology monitoring might require structural changes in the present databases.

In Table 20 all GIS thematic layers that shall be elaborated and reported to the EU Commission is listed with description of reporting deadline. Even though most of the maps due to be reported in 2009 the project recommends that the thematic maps are produced as soon as possible due to the needs of analysis and planning by the RBMA.

The project recommends that the staff running and developing the databases and information systems should have allocated more human resources for maintenance and development purposes in order to fulfil the expected increasing demands for complex reporting and data processing

3 Stakeholders

The project has identified the main data holders in the WFD relevant environmental sector in Latvia as:

- LEA, Latvian Environment Agency
- SGSL, Geological Survey,
- LHMA, Latvian Hydrometeorological Agency
- Ministry of Health
- Ministry of Agriculture
- Institute of Aquatic Ecology, Latvia University
- Latvian Fisheries Research Institute

Other key stakeholders, which can be defined as information receivers and/or data providers are:

- The EU Commission
- The MoE of Latvia
- Central Statistical Bureau
- State Environmental Inspectorates
- Regional Environmental Boards
- HELCOM
- Enterprises
- Public

4 IT capabilities

Interviews of the key stakeholders and elaboration and distribution of a questionnaire (ANNEX D+E) has provided the project with information of IT capabilities and strategies at the key stakeholders. The sum of the findings retrieved from questionnaire is presented in the tables 1 – 4 and 9.

Table 1: No of employees and PCs

Institution	Employees	Number of PCs	
		Less than 2 years old	Older than 2 years
LEA	96	30	80
SGSL	85	18	67
IAE	40	4	20
LHMA	280	28	136
MoH, PHA (drinking and bathing water)	22	(22)	
MoA	190	60	130

Table 2: OS, LAN and web servers

Institution	Operation system(s) in use	Network implemented (type and capacity)	Web server(s)	Web site
LEA	Windows NT, Windows 2000, Windows XP	Ethernet 100Mb/s	(Yes) Microsoft IIS, Oracle Web Application Server, Oracle Internet Application Server, ESRI ArcIMS + Apache (Internet Maps Server).	http://www.lva.gov.lv
SGSL	Solaris, Windows 98/NT/2000/XP	Ethernet, 100 Mbit	(Yes)	http://www.vgd.gov.lv/
IAE	MS Windows, Linux	Local without server	(No)	http://www.hydroecology.lv/ (Hosted by external Internet provider)
LHMA	Windows (NT, XP, 2000, 98, 95) UNIX LINUX QNX	LAN, 2 MB	(Yes) MS Windows NT 4 Server	http:// www.meteo.lv/
MoH, PHA (drinking and bathing water)	Microsoft Windows	Ethernet	(No)	http:// www.sva.lv/
MoA	Windows 2000	Store type network. (capacity 512 users)	Windows 2000 Server + Apache, PHP	http://www.zm.gov.lv/

Table 3: Software policy

Institution	Software policy
LEA	Microsoft products for office applications, Oracle DBMS for database applications, ESRI products for GIS applications
SGSL	Open source, Microsoft products, Oracle, Borland, ESRI.
IAE	Linux, Microsoft, Adobe, etc
LHMA	Microsoft products, Oracle products, SCO products, QNX products, MicroStep - HDO products (Slovakia), OTT – MESSTECHNIK GmbH & Co products (Germany), HEDESELSKABET products (Denmark), CHMI products.
MoH, PHA	Microsoft products
MoA	MS Products and open source (web servers)

5 Existing databases

To get an overview of data related to the WFD a questionnaire II was developed (see (ANNEX D), discussed with and handed over to the stakeholders in Latvia. The questionnaires were filled in by the stakeholders and returned to the project (ANNEX E) and has been used to map available databases.

The main stakeholders in a future WFD environmental information system are foreseen to be the SGSL, LEA and LHMA. At present these 3 institutions cover most of the data relevant for reporting and administration according to the WFD, while a few databases with complementary and useful data are implemented and maintained by Ministry of Health, Ministry of Agriculture, Institute of Aquatic Ecology University of Latvia.

The main part of data is stored in Oracle databases in LEA, SGSL and LHMS. Some databases are connected to the Internet, allowing the users to retrieve information.

The databases are hosted in different administrative environments and they are implemented in geographic separate places. They are not organised/connected in a common network allowing retrieval and data combining on request. The databases do not share common code lists or standards. But generally the same software platforms are being used. In some cases of data exchange one institution has to make an official request for data and in other cases information can be retrieved on demand on the Internet.

There are some concerns about the quality of data obtained from data providers. The lack of competence at the staff that performs the sampling/measurements was raised as an example of one type of problem. It is critical and therefore it is proposed to increase the quality of data by strengthening the demands to all links in the data feed chain. Making procedures/manuals for measurement, sampling and data entry can do this. Additional training courses should be offered to all personal that feed the system with data/information. In addition semi automatic data validation functions could be implemented.

Latvian Environmental Agency, LEA

LEA is the main data holder on water environmental data. LEA runs the main part of its databases in Oracle environment. The users/data providers can maintain some databases by use of the internet while other databases are maintained by the employees in the LEA who receives information from the Regional Boards and enter data into the databases. The Regional Boards gather information/data and enter data into the central database in LEA by use of the Internet or send the data to LEA for upload into the databases.
LEA uses GIS technology and has implemented GIS tools in their applications. Services have been established that combine GIS tools with the databases and provide the users with thematic maps.

Table 4: Databases in LEA

Database name	Database	Database software
Inland Water Quality Monitoring	Information concerning the inland water quality monitoring.	Oracle 9i Data Base Server
Lake Passports (LP)	Information received during the inventory of lakes in Latvia.	Oracle 9i Data Base Server
Statistical Report Nr2-WATER on water abstraction, consumption, treatment and pollution	Information that is declared by enterprises (water users) for annual statistical report Nr2-WATER.	Oracle 9i Data Base Server
Water Use Permits (WUP)	Water use permits that are issued by regional environmental boards and to facilitate work of regional environmental inspectors (for instance: quick information search, allowed limits, monitoring conditions etc.).	Oracle 9i Data Base Server
Nature Protected Areas (Register)	Information for particular nature protection areas.	Oracle 9i Data Base Server
Laboratory Information Management System (LIMS)	Analyses (excluded biological tests!) made in the Laboratory and to facilitate work of Laboratory Department (for instance: management of man power and equipment resources, QC/QA, data reporting etc.)	Oracle 9i Data Base Server

LEA is responsible for monitoring and reporting on marine areas, but the work has been outsourced to The Institute of Aquatic Ecology on an annual contract. IAE performs the monitoring, data collection, data storage, data processing and reporting on the Transitional and Coastal waters. Paradox and Access databases are used for data storage. IAE performs monitoring on biology; data are stored and processed by use of spreadsheets (Excel). Biology databases are under construction, the works are expected to be finalised at the end of 2004. The Institute has established a homepage on a server by a local Internet provider where data collected is available for the public. Each year the Institute delivers a report to LEA and diskette with the collected data (Access/Paradox/Excel/Word)

Table 5: Databases Institute of Aquatic Ecology University of Latvia

Database name	Database	Database software
Hydrology-hydrochemistry of the Gulf of Riga and the Baltic Proper	Marine water quality database. (Marine monitoring, with nutrient levels, oxygen levels, temperature and salinity etc.).	Paradox/ SQL Server
Phytoplankton of the Gulf of Riga	Phytoplankton database.	Excel
Mesozooplankton of the Gulf of Riga and the Baltic Proper	Mesozooplankton database.	Excel
Heavy metals and organic carbon in sediments of the Gulf of Riga	Sediment database. (Heavy metals and supporting parameters monitoring in sediments.	Excel

State Geological Survey of Latvia
SGSL holds information on sub ground activities and resources. This includes databases with information on the groundwater wells/intakes.

Table 6: Databases in SGSL

Database name	Database	Database software
Urbumi	Groundwater database. (Wells, abstraction, water quality, deposits)	Oracle 8i
Būvmateriālu izejvielu atradnes	Natural resources (Deposits of different kinds of limestone, gypsum, dolomite, sand, gravel, boulders, clay, and quartz sand in Latvia).	Oracle 8i
Kūdras atradnes	Database of deposits of peat in Latvia.	Borland Paradox for Windows v. 7.0
Geofond	Reference database on unpublished reports for Latvia geology in the Archives of the SGSL.	Access

Army objects	DB include the information concerning with geology and geoecology of the former USSR military sites on Latvia's territory	Access

Latvia Hydro Meteorological Agency
LHMA samples data on water level, flow and temperature. Data is stored in Oracle databases and the agency has additional information on the physical characteristics (width, depth etc.) of the rivers but only in paper form. The agency has a database on precipitation. GIS is used for analysis and presentation, but it is not integrated with the databases. LHMA has digital maps of measuring stations, and for some watersheds but not covering all of Latvia.

Table 7: Databases in LHMS

Database name	Database	Database software
	Discharge database (Measured discharges, calculated daily discharges)	Paper 1877-1990, Oracle 1991-2002, Access 2003
	Discharge database (sum of precipitation for fixed periods)	Oracle 1895-2003 (partly), paper

Ministry of Health
The Ministry of Health is responsible for gathering and reporting on bathing waters and drinking water (spreadsheet/paper). The data is stored and processed by use of EXCEL spreadsheets. The database holds information since 1998.
Information on the bathing water quality is made available on the Internet.

Table 8: Databases in Ministry of Health

Database name	Database	Database software
Bathing water monitoring database	Bathing water quality database.	MS Excel
Drinking water monitoring database	Drinking water quality database.	MS Excel

Public Health Agency (PHA) proposed project together with Sanitary Inspection for bathing water information system to get financing from EU funds. Specialists in Ministry of Finance evaluate the project at present.

Public Health Agency (PHA) has proposed to develop a Drinking water information system in the framework of Phare project "Environment monitoring"(Desiree Number: LE.02.09.01) for Latvia. The Terms of Reference of Tender (LOT 2:

Drinking water monitoring) was prepared and is available in Ministry of Environment (Department of Investment).

Ministry of Agriculture

The Ministry of Agriculture has information collected in distributed databases. Most of the information is kept on paper form or in various spreadsheets, which makes it difficult to use in a common integrated system.

Table 9: Databases in MoA

Database name	Database	Database software
Cadastre database	The database holds information on hydrological constructions, their size, quantative and qualitive status, parameters, owners, users etc.	MS Excel; Microstation
Sealed plant protection products (PPP) in Latvia (within the period of one year)	The database holds information on all licensed sealers and importers of pesticides in Latvia and about the amount of pesticides, imported and sealed by each of them.	MS Access

The MoA has ongoing projects with the goal to establish an integrated information system in Latvia to support the management of different subsidies and payments of European Commission in agriculture sector – Integrated Administration and Control System (IACS). Rural Support Service that is subordinated to the MoA is responsible institution for the management of the subsidies and payments and therefore it will be responsible for overall maintenance of information system, as well.
At present time MoA receives relevant data from different sources (Central Statistical Bureau, contractual based field investigations etc.) and in different ways. As the result there is no one single information system for experts of MoA. The IACS will work as complex of databases that will be linked together and will comprise all information (number of livestock, use of fertilisers and crops etc.) necessary to be able to check the applications submitted by farmers.
The IACS will work as client-server architecture based information system powered by Oracle RDBMS with GIS elements. The GIS part of the IACS will work based on the field blocks (whole agriculture area of Latvia has been divided in field blocks that represent seamless land parcels used for agriculture) and real estate information from Land Cadastre. The data policy of IACS is not yet cleared but it is already known that data about particular farms will be information with restricted access. Therefore it is most probably that only aggregated information for different administrative units will be available for RBMA in future.
At the same time MoA has begun to develop the Land Reclamation Register with the main goal to support the management of all land reclamation works in Latvia. The register will store data about all reclamation ditches and drain-pipes. Data will be available as GIS layers, as well. A special coding system of ditches and drain-pipes was created that is based on the national coding of river sub catchments and therefore

fully compliant with the existing databases. Rural Support Service is responsible for developing and overall maintenance of the Land Reclamation Register.

Latvian Fisheries Research Institute
Latvian Fisheries Research Institute does the monitoring of fish in Salaca, Gauja, Venta and Daugava rivers. There are reports and attached Excel worksheets available in LEA about monitoring in Salaca River. There is no monitoring of fish in lakes, but there are investigations to prepare the regulation of industrial use of the lake for fish production (such investigations are on a contractual basis and paid by contracting party). There is a database of industrial fishing in Baltic Sea and near the shore, probably in excel format.

6 Digital infrastructure / telecommunication

The equipment and Internet connections at the main stakeholders have capabilities that enable to establish a system connecting the databases by use of the Internet. The key stakeholders LEA, SGSL and LHMA have equipment that is adequate to host a national system. If any bottleneck problems occur with the capacity it will be an economic issue rather than a technical issue to improve the capacity.

The present solutions made by LEA for data capture in the regions are based on thin clients. It reduces the demands to the capacity of the Internet connections and equipment at client side. But it is foreseen that future demands to monitoring and data processing will increase the demands to the reliability of the connections, capacity and tools at client side.

Table 10: Internet connection capacity

Institution	Capacity
LEA, Riga	2Mbps
LEA, Jurmala	1Mbps
SGSL	2Mbps
LHMA	1Mbps
MoH, PHA	
MoA	100 MB/S (in) / 1GB/s (out)
Lielriga REB	2Mbps
Other REBs	128Kbps

7 Architectural requirements to future information management system

An information system based on the Internet and distributed databases should be able to handle real time data, secure data reliability and store data only in one place.

The amount of data and data types to be managed will increase, and it is expected that much more data will be gathered by use of different kinds of online equipment and special electronic monitoring devices etc. Furthermore a system shall be prepared for use of processed information from online services, available from third part companies or organisations (e.g. EEA's ReportNet).

A system shall be able to exchange data both in a national and international environment, which is continuously changing. Therefore it must be prepared for adapting current international standards and language for exchange of data.

The users of data and the needs for further information will also increase. The ratification of the Aarhus Convention and the requirements of the WFD on public information and consultation (article 14) means that the system potentially has all citizens of Latvia as users.

The system will be a State Information System because it will facilitate performance of the defined national functions and therefore according to law "On State Information Systems" (chapter 10 part 2) user identity and access rights must be defined for all users to ensure information security. This also means that every user must have individual login name. This could be solved by electronic registration in the same way as done by LEA.

Complex reporting makes the exchange of data between the involved institutions (topic centres) the most important issue to be solved. Institutions need to co-operate and to share data to be able to make the required reporting.

Requirements to the architecture must

- Facilitate that data can be made publicly available
- Ensure that data is stored and available in only one place
- Be manageable by the competent institutions
- Support easy data-flows between the institutions
- Provide security and stability
- Create transparency
- Ensure scalability
- Meet reporting requirements according to national and European standards
- Be flexible to meet the demands of different data providers and suppliers

Future information systems must be available to provide services for external as well as internal users and the system must be available to use functions/services provided by other institutions, to limit the amount of software development. A system of such interconnected applications sharing data and functions can be implemented based on open standards and XML technology.

The XML technology is growing very fast, and there are ongoing works to establish XML formats, XML namespaces and XML Schemas for many, if not all the topics, which are going to be defined and implemented in the sectors analysed and described in this report. Furthermore XML is used for bridging between existing systems.

Another cornerstone is the possibility to establish web services that can be used for online data exchange or data processing. The use of the open standard SOAP (Simple Object Access Protocol) for web services is a growing technology that enables information systems to share common tools and data on the Internet.

The newest versions of development software have all built-in tools supporting SOAP and web services e.g. .NET from Microsoft has integrated such tools.

In the EU the ReportNet is under development. EIONET intend to establish common procedures for reporting purposes to avoid redundant and expensive development and to ensure uniform interpretation of the data. In the "Preparatory report for ReportNet, June 2002 it is described that the system will be based on:

> ***"Technology** nowadays helps to ease this process through the availability of an electronic infrastructure (the World Wide Web) that allows for distributed responsibilities and at the same time eases the integration of different web services through a common technical language (XML). To assure interoperability, the simple HTTP and SOAP protocols are used for communication. The essence of Reportnet functionality is to agree on standards on how to use XML, SOAP, and related mechanisms."*

8 Requirements for a future river basin management system

8.1 Requirements of the WFD

The purpose of the future river basin management system is to structure data on the water environment and provide tools, which will make the responsible authorities able to manage collected data on the water environment and address the requirement of the WFD. The articles of the WFD with the most extensive requirements on data handling and reporting is:

a) Article 5: Analysis of river basin (characteristics, impact of human activity, economic analysis)
b) Article 6: List of protected areas
c) Article 8: Operational programmes for the monitoring of water status
d) Article 11: Programmes of measures
e) Article 13: River basin management plans
f) Article 15: Reporting to the Commission, focus article 5, 8 and 13

Further the future river basin management system shall make it possible to inform the users in line with the requirements of:

g) Article 14: Public information and consultation

The administration, public information and reporting obligations according to WFD have been divided between the SGSL and LEA. SGSL is appointed to be responsible for development of river basin management plans and administration of the river basins while LEA will be responsible for all reporting to the EU Commission, HELCOM, etc.

It is mandatory that both institutions have unlimited access to all data and furthermore according to the WFD article 14 and the Aarhus Convention information shall be available for the public, as well.

To obtain such conditions a common policy of data sharing should be elaborated to remove administrative and economical obstacles between the involved institutions.

8.2 Data requirements

The WFD requirements to reporting have not been finalised yet but the Work Group 2.7 has developed a Guidance on Monitoring /1/ that to some extent indicates the future requirements for data sampling and processing. This reports defines basis data to be handled according to the WFD.
The requirements are listed in tables below specified at sub topic level. For each sub topic is indicated if a database is established and maintained by specification of institution and the name of the database. If no data/database is available it is marked with a (⁒). Subtopics marked *italic* is by this project not recommended to be implemented in the proposed monitoring programme**.**

8.2.1 Quality Elements for Rivers

Table 11: Comparison of elements required and data stored in existing databases

Main topic	Sub topic	Institution	Database
Biological	Invertebrate fauna	(⁒)	(⁒)
	Fish	Fish institute	
	Phytobentos	*LEA*	*Inland Water Quality Monitoring*
	Macrophytes	(⁒)	(⁒)
	Phytoplankton	*LEA*	*Inland Water Quality Monitoring*
Hydromorphological	Hydrological regime	LHMA	Clidata
	River continuity	(⁒)	(⁒)
	Morphological conditions	(⁒)	(⁒)
Specific synthetic pollutants	WFD priority list substances	(⁒)	(⁒)
	Other substances depending on catchment pressures	(⁒)	(⁒)
Specific non synthetic pollutants	WFD priority list substances	(⁒)	(⁒)
	Other substances depending on catchment pressures	(⁒)	(⁒)
Physico-chemical	Thermal conditions	LHMA	Clidata
	Oxygenation conditions	(⁒)	(⁒)
	Salinity	(⁒)	(⁒)
	Acidification status	LEA	Inland Water Quality Monitoring
	Nutrients conditions	(⁒)	(⁒)
	Other		

(⁒): No data/database is available.
Italic: This project does <u>not recommended</u> the subtopic marked to be implemented in the proposed monitoring programme

8.2.2 Quality elements for lakes

Table 12: Comparison of elements required and data stored in existing databases

Main topic	Sub topic	Institution	Database
Biological	*Invertebrate fauna*	*LEA*	*Lake Passports (LP)*
	Fish	LFRI	(⁒)
	Phytobentos	*LEA*	*Inland Water Quality Monitoring*
	Macrophytes	LEA	Lake Passports (LP)
	Phytoplankton	LEA	Inland Water Quality Monitoring
Hydromorphological	Hydrological regime	LHMA	Clidata
	Morphological conditions	LEA	Inland Water Quality Monitoring/ Lake Passports (LP)
Specific synthetic pollutants	WFD priority list substances	LEA	(⁒)
	Other substances depending on catchments pressures	LEA	(⁒)
Specific non synthetic pollutants	WFD priority list substances	LEA	(⁒)
	Other substances depending on catchments pressures	LEA	(⁒)
Physico-chemical	Thermal conditions	LEA	Lake Passports (LP)
	Oxygenation conditions	LEA	
	Salinity	LEA	
	Acidification status	LEA	
	Nutrients conditions	LEA	
	Transparency	LEA	

(⁒): No data/database is available.
Italic: This project does not recommended the subtopic marked to be implemented in the proposed monitoring programme

8.2.3 Quality elements for transitional waters

Table 13: Comparison of elements required and data stored in existing databases

Main topic	Sub topic	Institution	Database
Biological	*Invertebrate fauna*	*IAE*	*Under revision*
	Fish	(?)	(?)
	Macroalgae	IAE	Excel
	Phytoplankton	IAE	Excel
	Angiosperms	IAE	Excel
Hydromorphological	Tidal regime	IAE	Hydrology-hydrochemistry of the Gulf of Riga and the Baltic Proper
	Morphological conditions	(?)	(?)
Specific synthetic pollutants	WFD priority list substances	LEA	(?)
	Other substances depending on catchment pressures	LEA/IAE	-/Under revision
Specific non synthetic pollutants	WFD priority list substances	LEA	(?)
	Other substances depending on catchment pressures	LEA/IAE	-/Excel
Physico-chemical	Thermal conditions	IAE	Hydrology-hydrochemistry of the Gulf of Riga and the Baltic Proper
	Oxygenation conditions	IAE	
	Salinity	IAE	
	Nutrients conditions	IAE	
	Transparency	IAE	

(?): No data/database is available.
Italic: This project does not recommended the subtopic marked to be implemented in the proposed monitoring programme

8.2.4 Quality elements for coastal waters

Table 14: Comparison of elements required and data stored in existing databases

Main topic	Sub topic	Institution	Database
Biological	*Invertebrate fauna*	*IAE*	*Under revision*
	Angiosperms	IAE	(⁒)
	Macroalgae	IAE	(⁒)
	Phytoplankton	IAE	Excel
Hydromorphological	Tidal regime	IAE	Hydrology-hydrochemistry of the Gulf of Riga and the Baltic Proper
	Morphological conditions	(⁒)	(⁒)
Specific synthetic pollutants	WFD priority list substances	LEA	(⁒)
	Other substances depending on catchment pressures	LEA/IAE	/Under revision
Specific non synthetic pollutants	WFD priority list substances	LEA	(⁒)
	Other substances depending on catchment pressures	LEA/IAE	/Excel
Physico-chemical	Thermal conditions	IAE	Hydrology-hydrochemistry of the Gulf of Riga and the Baltic Proper
	Oxygenation conditions	IAE	
	Salinity	IAE	
	Nutrients conditions	IAE	
	Transparency	IAE	

(⁒): No data/database is available.
Italic: This project does not recommended the subtopic marked to be implemented in the proposed monitoring programme

8.2.5 Selection on Quality Elements for Groundwater

Table 15: Comparison of elements required and data stored in existing databases

Main topic	Sub topic	Institution	Database
Quantity	Level	SGSL	Urbumi
Specific synthetic pollutants	WFD priority list substances	LEA/PHA	Statistical Report Nr2-WATER /Excel
	Other substances depending on catchment pressures	LEA/PHA	Statistical Report Nr2-WATER /Excel
Specific non synthetic pollutants	WFD priority list substances	LEA/PHA	Statistical Report Nr2-WATER /Excel
	Other substances depending on catchment pressures	LEA/PHA	Statistical Report Nr2-WATER /Excel
Chemical	pH	SGSL/PHA	Urbumi/Excel
	Dissolved oxygen	SGSL/PHA	Urbumi/Excel
	Electrical conductivity	SGSL/PHA	Urbumi/Excel
	Ammonia (NH_4)	SGSL/PHA	Urbumi/Excel
	NO_3	SGSL/PHA	Urbumi/Excel

8.2.6 Quality elements for pressures of high significance

Table 16: Comparison of elements required and data stored in existing databases

Main topic	Sub topic	Institution*	Database*
Agriculture diffuse arable	Improved grassland, mixed farming Crops with intensive nutrient or pesticide usage or long bare soil periods		
Waste water	Municipal waste water primarily domestic		
Reduction in flow	Abstractions for potable supply		
Flow regulation	Hydroelectric dams Weirs		
Transitional and coastal management	Estuarine/coastal dredging Marine constructions, shipyards and harbours		

*: Information is not available/has not been collected.

Quality elements for pressures of medium significance

Table 17: Comparison of elements required and data stored in existing databases

Main topic	Sub topic	Institution*	Database*
Urban drainage (including runoff)	Urban areas (including sewer networks) Trunk roads Railway tracks and facilities		
Navigation	Harbours Dredge spill disposal into surface waters Shipping/navigation		
Waste water	Municipal waste water with a major industrial component Storm water and emergency overflows Private waste water primarily domestic		
Industry	Chemicals (organic and inorganic) Iron and steel Food processing Brewing/distilling Wood yards/timber treatment Construction Leather tanning Shipyards		

*: Information is not available/has not been collected.

Table 18: Comparison of elements required and data stored in existing databases

Main topic	Sub topic	Institution*	Database*
Contaminated land	Urban industrial site (organic and inorganic) Military sites		
Agriculture	Slurry Manure depots Land based fish farming		
Waste management	Operating landfill site Operating waste transfer stations, scrap yards etc.		
Manufacture, use and emissions from all industrial/agricultural sectors	Priority substances Priority hazardous substances Other relevant substances		
Reduction in flow	Abstractions by industry Abstractions by hydro-energy		
Other anthropogenic	Recreation Fishing/angling Introduced species		

*: Data is not available/has not been collected.

8.2.7 Register of protected areas

Topic	Description	Status
Drinking water protection areas	(i) areas designated for the abstraction of water intended for human consumption under Article 7;	Should be investigated. No central register.
Economically significant aquatic species protection areas (shellfish)	(ii) areas designated for the protection of economically significant aquatic species	Not implemented
Recreational waters	(iii) bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC	Ministry of Health
Nutrition-sensitive areas	(iv) nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive) and areas designated as sensitive areas under Directive 91/271/EEC (Urban Waste Water Treatment Directive)	Vulnerable zones; one appointed and ongoing. Sensitive areas; all of Latvia.
Habitat protection areas (FFH)	(v) areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (habitats) and Directive 79/409/EEC (Birds).	Ongoing – expected finished may 2004
Bird protection areas	as above	as above

Table 19: Comparison of elements required and data stored in existing databases

Topic	Institution	Database
Drinking water protection areas	(⁒)	(⁒)
Bathing water	PHA	Excel
Nutrition-sensitive areas	(⁒)	(⁒)
Protected nature sites (habitat and birds)	LEA	Nature Protected Areas (Register)

(⁒): No data/database is available.

8.2.8 Requirement for maps for reporting to the EU

The requirements for GIS maps in the WFD /2/ are limited as far as reporting to the EU is considered, but the fact that reporting GIS maps to the Commission are mentioned in the Directive proves the importance and stresses the weight placed on digital reporting to the EU.

Table 20: Maps required in the WFD

No.	Topic	Deadline	Deadline for reporting to the Commission
1	River Basin Districts and competent authorities	12 2003	06 2004
2	Water bodies and their types as identified during the initial characterization	12 2004	03 2005
3	Surface water monitoring network (stations)	12 2006	03 2007
4	Ecological status of surface water bodies	12 2009	03 2010
5	Ecological potential of heavily modified and artificial water bodies	12 2009	03 2010
6	Surface water bodies not complying with good status due to specific synthetic and non-synthetic pollutants	12 2009	03 2010
7	Ground water monitoring network (stations)	12 2006	03 2010
8	Quantitative status of ground water bodies	12 2009	03 2010
9	Chemical status of ground water bodies	12 2009	03 2010
10	Groundwater bodies subjected to an upward trend in the concentrations of pollutants and reversal of trend	12 2009	03 2010
11	Protected areas	12 2009	03 2010

Map 1 has been produced. Map 3, 7 and 11 could be produced based on information in existing or upcoming legal acts, but the rest of the maps will require an input of specialist knowledge from the River Basin Management Authorities to be completed. Hence these maps should be based on the initial characterization, to be done in 2004, and adapted for updating of status and trend information from database(s).

The digital maps are proposed to be elaborated on the basis of the digital national map in scale 1:50.000. But it should be investigated if other maps are better options and which maps are planned to be maintained by the map producing authorities.

The coordinate system should be the Latvian national standard coordinate system (LKS92). This system is easily converted to ETRS89 the recommended system for reporting to the Commission in the WFD GIS-guidance.

The file format for reporting to the EU has not been decided but at present ERSI-shape files are accepted and widely used in EU. The mid-term solution will probably use Geography Markup Language (GML) and the long-term probably Web-Mapping (Web Map Services).

Where existing codes are used and maintained today they should be included in the future code system. For some code lists there is an urgent need for unification and standardization on a national level. For reporting to the Commission a code starting with the two-letter ISO country code and followed by up to 22 characters are allowed. The characters should preferably be numbers and as short as reasonably.

Even though subcatchment areas, soil types and mechanical structure of soil, water abstractions sites, wastewater outlets (wastewater treatment plants), contaminated areas, hydroelectric dams and other important data sources are not required by the WFD (ANNEX F, GIS layers identified in guidance) it is considered that all these data are very important in a GIS system of RBM as supplementary data.

8.3 MoE, IT strategy

A strategy for data and information storage and sharing has been made in 1997 (ANNEX B). The strategy describes framework for information sharing, IT system development and education in the Environmental sector for the period 1997-2002. The strategy specifies the development and implementation of an Environmental Information System based on distributed databases, 6 topic centres and 8 regional centres (Regional Boards):

Topic centres:

- Latvian Environment Data Centre (now Latvian Environment Agency)
- State Geology Service
- Latvian Hydro Meteorological Agency
- *Building Department of Ministry of Environment Protection and Regional Development (now under the Ministry of Economics)*
- *Board of Municipalities Affairs (now under the Ministry of Municipalities Affairs and Regional Development)*
- *Tourism Board (now Tourism Development Agency under the Ministry of Economics)*

The goals in this strategy have been fulfilled, and today LEA connects to the data centres and gets information.

A new strategy was expected to be elaborated and published this year (2003), but because of cuts in the budget, it has not been possible to do this work.
It is strongly recommended to elaborate a new strategy. In our opinion it will reduce the required costs on IT equipment and tools. It is recommended that the potential integration of EIONET/ReportNet services is included in the IT Strategy analysis. The development of a new water basin information system must comply with the IT strategy specified by the MoE.

An integrated management system has been established for Land Register, Register of Enterprises, Register of Taxpayers and Register of Real Estate called the Mega System.

9 Gap analysis

In paragraph 5 the result of a brief gap analysis on sub topic level is shown. It is recommended to do a more specific gap analysis on technical level to reveal the exact gaps at data level. This gap analysis should include evaluation of the present database structures. It should be assessed if the structure is prepared for storage of all the information required by the WFD and monitored according to the future monitoring programmes.

Procedure for Gap Analysis at a technical level

Methodology for conducting and preparing a gap analysis on the existing databases and parameters compared to the requirements for future management of River Basin Districts.

The overall aim of carrying out a gap analysis is to identify gaps between requirements and present situation regarding data relevant for WFD. The methodology applied for gap analysis establishes whether there is compliance, partly compliance or non-compliance between the systems in question.

In the table below a conceptual approach for application of gap tables is shown. The table represents a methodology for identification of gaps.

Table 21: Conceptual approach for application of gap table

1	2	3	4	5	6
WFD requirement	Details of the requirement	Corresponding Latvian status	Details of the status	Compliance (full/partial)	If not. How to solve?
Database 1					
Parameter 1					
Method 1					
Map 1					
Attribute data 1					
And so on					

Column 1 refers to requirements and will serve as background for all gap analyses. In the table missing information in a cell in column 3 will represent a *gap* for which a solution has to be provided.

If a cell in column 3 can be filled in, a comparison between the corresponding cells in column 2 and 4 will show if there is full or only partial compliance (column 5) between requirement and status.

Column 6 refers to text on how to solve.

The main procedure will be to fill in gaps in gap tables and to implement the solving of identified gaps in the design of databases and information system.

The scope of the WFD is wide and the process of implementation is a continuously moving target raising challenges, which are widely shared by Member States and acceding Member States.

Focusing on the environmental data management issues includes data generator (monitoring – points/stations), data flow between institutions, data availability and format, end of pipe reporting, human resources and IT, legal binding responsibilities, etc. Integrated Water Management requires all sectors of water to work closely together. The methodology should be seen as a tool for screening and identification and a way of systemising information.

10 TOR

10.1 Background

The implementation of the WFD in Latvia requires revision of the legal acts in Latvia, revision of the monitoring programmes in the environmental sector, changed or in some cases increased administration burdens as well as new reporting obligations.

The purpose of the future river basin management system is to structure data on the water environment and provide tools, which will make the responsible authorities able to manage collected data on the water environment and address the requirement of the WFD. The articles of the WFD with the most extensive requirements on data handling and reporting is:

a) Article 5: Analysis of river basin (characteristics, impact of human activity, economic analysis)
b) Article 6: List of protected areas
c) Article 8: Operational programmes for the monitoring of water status
d) Article 11: Programmes of measures
e) Article 13: River basin management plans
f) Article 15: Reporting to the Commission, focus article 5, 8 and 13.

Further the future river basin management system shall make it possible to inform the users in line with the requirements of:

g) Article 14: Public information and consultation.

The future administration and reporting on the river basins requires interchange of information between several administrations and institutions in Latvia. The sharing of data and information across administrative borders, nationally and internationally, has to be intensive and to address the requirements of the WFD over the next couple of years.

The preliminary findings indicate that the existing databases do not fulfil all the requirements of the WFD, but need to be updated/revised and in some cases new databases should be developed and implemented in the environmental administration in order to comply with the future demands.

For historical reasons the monitoring, storage and reporting on ground water, surface water, coastal water etc. have been done in separate administrations, while the implementation of the WFD will require analysis/characterisation of river basins, development of monitoring programmes, programmes of measures, river basins management plans and reporting where information from different topic centres must be included and used in connection in order to perform the required analysis, planning and reporting.

A new water basin information system must be able to combine different sorts of data with powerful tools that can be used to analyse/process and report data. A first phase of the development of the system should focus on specifying which information the

system should be able to deliver. This work will include a mapping and specification of reporting obligation and user demands/requirement at all levels.
When the information/reporting requirements have been mapped efforts can be spend on architecture, design and programming of the necessary applications and databases.

A future water basin information system could be based on the present databases. A solution based on coupled data warehouses could integrate the existing and new databases in a common network, where it is possible to combine information and share common tools. This can optimise both development and maintenance costs.

The use of the existing databases requires revisions of the databases structures and user interfaces as well as development of data exchange functions for interoperation between the databases on the Internet.

Connecting the databases on the Internet makes the databases vulnerable for intruders and hackers. Therefore it is required that the security aspects are considered at the analysis and design phase and that data security is implemented in the information system. Encrypting the information and use of digital signature for some of the vital functionalities could be implemented in the communication between the servers and clients.

10.2 Latvian legal requirements

Information systems, databases and data processing in the environmental sector of Latvia must comply with requirements presented in the following regulations and laws:

- Law “On state information systems” (02.05.2002.)
- Regulation Nr.70 of the Cabinet of Ministers “Procedure for granting of the state importance computerized information system status and technical implementation requirements” (19.03.1996.) [formally expired on the 1st of December 2002]
- Regulation Nr.104 of the Cabinet of Ministers “Procedure for implementation of the integrated state importance information system (megasystem)” (14.03.2000.)
- Regulation Nr.106 of the Cabinet of Ministers “Security requirements of information systems” (21.03.2000.) [formally expired on the 1st of December 2002]
- Regulation Nr.141 of the Cabinet of Ministers “Procedure for archiving of recorded data and electronic documents of information systems” (02.04.2002.)
- Regulation Nr.222 of the Cabinet of Ministers “Rules of common classification system of economic information” (16.06.1998.)
- Law “On protection of data of physical persons” (23.03.2000.)

- Regulation Nr.40 of the Cabinet of Ministers "Mandatory technical requirements and organizational measures for security of personal data processing systems" (30.01.2001.)

- Draft Regulation of the Cabinet of Ministers "Security requirements of state information systems" (will substitute Regulation Nr.106 of the CM)

- Draft Regulation of the Cabinet of Ministers "Procedure for registration of state information systems" (will substitute Regulation Nr.70 of the CM)

- Draft Regulation of the Cabinet of Ministers "On compliance of state information systems technical requirements" (will substitute Regulation Nr.70 of the CM)

- Draft Regulation of the Cabinet of Ministers "Procedure for supervision of state information systems development projects"

- Law "On electronic documents" (31.10.2002.)

- Draft Regulation of the Cabinet of Ministers "Procedure for elaboration, designing, storage and circulation of electronic documents in state and municipality institutions and procedure for circulation of electronic documents between state and municipality institutions or between these institutions and physical and legal persons"

- The final report "Conceptual model of State geographic information system" of the contract between Ministry of Traffic and company "MikroKods" (May, 2003)

- National programme „Informatics" (approved by the Cabinet of Ministers 30.03.1999.)

- Principal positions of social and economic programme "e-Latvia" (approved by the Cabinet of Ministers 12.12.2000.)

- Plan of development measures of integrated state importance information system (megasystem) (approved by the Cabinet of Ministers 21.09.1999.)

- Latvian "e-Government" conception (approved by the Cabinet of Ministers 07.05.2002.)

10.3 EU directives and other international requirements

In addition to the WFD the functionality and contents of the information system should comply with the following EU directives and international conventions ratified by Latvia.

- Council directive 90/313/EEC of June 7 1990 on the Freedom of Access to Information on the Environment.

- Council Regulation (EEC) No 1210/90 of May 1990 on establishment of the European Environmental Agency and the European Environment Information and Observation Network (EIONET)
- Information Exchange Decision 77/795/EEC
- Requirements of the Aarhus convention for easy public access to information
- HELCOM

10.4 Objectives

The objective of the project is to design, develop and implement a River Basin Information System that can be used to administrate the river basin districts and water bodies according to the WFD directive.

At the end of the project the authorities in Latvia will be able to administrate and report to the Commission on the river basins according to the WFD by use of a GIS based information system that combines information stored in databases at key institutions in Latvia.

10.5 Outputs

The outputs from the project are:

a. A technical report with analysis of initial state of the present databases and information systems, mapping of potential users and specification of the information requirements of a new information system.

b. A background report and draft act with a specification of a common data sharing policy

c. A technical report defining the architecture and overall design of a River Basin Information System

d. A technical report with technical specification of requirements of the River Basin Information System

e. A River Basin Information System implemented

f. A technical report with system documentation and proposal for training courses

10.6 Scope of work

10.6.1 Activity A: Analysis of initial state of the present databases and information systems

a1: Identify stakeholders
a2: Specify which information shall be produced by the system.
a3: Map relevant databases
a4: Assess the current databases
a5: Prepare description of current workflow for each stakeholder

a6: Prepare description of current dataflow for each stakeholder
a7: Make analysis report

UML should be used for description of the present situation. Existing databases and information system should be described by use of UML class diagrams and the current workflow and data flow should be described by use of "Use cases" and Activity diagrams.

10.6.2 Activity B: Specification of Common Data sharing policy

The success of the information system depends on the possibility to share data across administrative borders without any sorts of administrative obstacles. Therefore a common policy of data sharing should be elaborated and approved by the involved authorities. (Law could enforce it).

Elaboration of data sharing policy includes as minimum:
b1: Identify existing policy or prepare policy for access and use of data for each stakeholder
b2: Prepare guidelines for data quality
b3: Prepare definition/specification of Exchange formats
b4: Prepare policy for use of common coding systems
b5: Prepare guideline for data security

A data sharing policy with essential third parties stakeholders should be elaborated which includes:
b6: Map/specify the interface to EIONET/ReportNet (present and future tools)
b7: Specify interface for data exchange with border regions that effect the basins of Latvia (Belarus, Lithuania, Russia, Estonia)

10.6.3 Activity C, Elaboration of a system architecture and design

The activity should result in an analysis and a proposal for the software architecture and technologies that can meet the specified system requirements and achieve the targets for the project.

c1: Specify an overall system architecture
c2: Decompose the system in sub systems
c3: Describe communication models

The description of the composition of the system should include UML class diagrams, component diagrams and sequence diagrams.

10.6.4 Activity D, Elaboration of a specification of requirements

The "specification of requirements" shall be used for the system developers and programmers in the programming and implementation phase. The specification shall include a description of all users, user interfaces, databases, input, output, functions and procedures in the information system.

d1: Elaborate list of users of the system
d2: Specify use cases for all identified primary users of the system
d3: Elaborate specification of workflows

d4: Elaborate specification of data flows
d5: Specify database structures
d6: Specify data exchange and data exchange formats
d7: Specify all functionalities
d8: List all potential risks

The databases should be described by UML class diagrams and ER diagrams. The functional requirements should be described with pre and post condition, input and output and description of functionality.

10.6.5 Activity E, Development of the Information system

Programming and implementation of the information system based on the specifications of requirements (Activity D).

e1: Elaborate a development plan with milestones
e2: Elaborate an accept test
e3: Develop system according to development plan. Including test and reviews of status at each milestone.
e4: Implement
e5: Test
e6: Approve

The test and approval of the system should be based on the accept test made in activity d2. The process e3-e5 should be continued until the specific functionality has been approved.

10.6.6 Activity F, Documentation and training

Elaboration of overall documentation of the system including:

f1: System diagram
f2: Data flow diagram
f3: Database structures

Elaboration of manuals

f4: Elaborate system administrators manual
f5: Elaborate user manual / on line help functionality
f6: Elaborate training courses for system administrators and super users

10.7 Staffing

The following staffing and size of inputs is proposed:

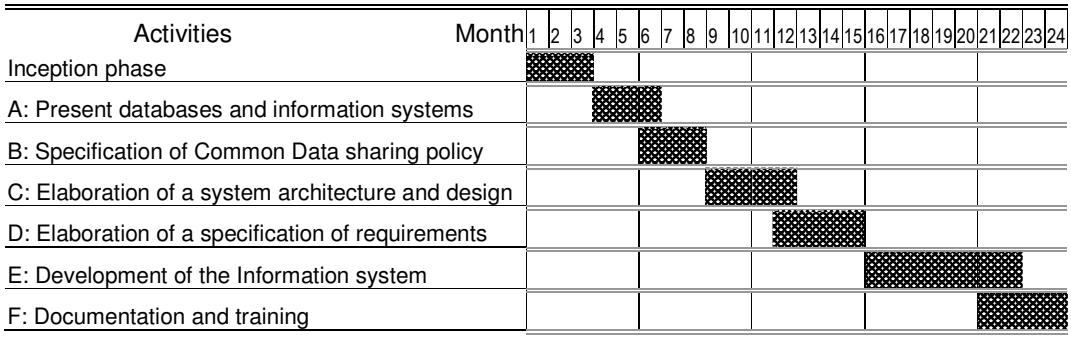
Position	**Size of input MM***
Project Manager, institutional and information management expertise	20
Information management expert(s) (1-2 experts)	20
GIS expert(s) (1-2 experts)	8
Programming expert(s) (1-3 experts)	20
Institutional and training expert(s) (1-2 experts)	6
Hydrology expert(s) (1-2 experts)	6
River biology, hydrology and chemistry expert(s) (1-2 experts)	6
Lake biology, hydrology and chemistry expert(s) (1-2 experts)	4
Transitional and coastal water biology, hydrology and chemistry expert(s) (1-2 experts)	4
Groundwater expert(s) (1-2 experts)	8
Expert in agriculture and other diffuse sources	4
Expert in wastewater and other point sources (1-2 experts	6
Models expert(s) (1-2 experts)	5
Total	**117**

*: One ManMonth equals 167 hours

10.8 Project Implementation Plan

The total project period is proposed to be 2 years.

The project implementation plan is outlined below:



The main purpose of the inception phase will be to assess the Project Document, the budget and the activity plan in close cooperation with MoE.

The first and foremost activity will be to revise the Project Document, detail the planning of the project activities and revise and detail the Project Activity Plan.

Activities A to F are described above.

11 ANNEX A, Key stakeholders

11.1 Latvian Environmental Agency

Source: http://www.vdc.lv/eng

LEA is responsible for reporting to the EU Commission on the following topics:

- Outlets from point sources

LEDC at EPA are running approximately 20 databases with client-server solutions. These are Oracle databases on Internet servers with a light client running java-script in MS Explorer. They are using Sun/Solaris on Internet servers and NT on other servers. ArcIMS and shape-files are used for GIS purposes.

At present common code lists are not coordinated on national level but cross tables are used when data are exchanged with other institutions.
National codes exist for river catchments (5.500), water abstractions from surface waters, water abstractions from groundwater, wastewater outlets and waste.

XML is not used very mush at EPA at present, but can be implemented by use of built-in procedures/functions/services available in Oracle.

On top of the database a web-based information system is established that produces reports on demand. A WEB GIS is connected to the database that makes the users able to get various thematic maps (e.g. one showing the Pollution of Nitrogen in water basins on annual basis fig).
LEA continues to evaluate and develop the information system by adding new services on the web both for data entrance and reporting purposes.

Wishes:
The demands for reporting to commission could be the minimum requirements for a management system and the needs for development of a River Basin Management Plan the maximum.

11.2 State Geological Survey of Latvia

The flow of data and responsible institutions are very complex concerning groundwater. SGS has data on chemical quality of groundwater, but there is no obligation to monitor small wells. The regional authorities issue the water resource use permits but the amount extracted is not monitored. The well should be approved or registered by SGS.

The improvement of quality of data has high priority. SGS has tried to train regional staff to improve quality of data, but built-in checking procedures would also be most valuable.

There are some problems with the coordinates of wells that need conversion from soviet system to LKS 92. The code of wells needs unification or restructuring.

The use of GIS is mainly ArcView 3.2 but the experience and knowledge on GIS was considered low. They used CorelDraw to colour maps but they thought that this was only optimal regarding print quality and not regarding data. They would like to use GIS a platform for joining together existing databases.

The development of data management was done step-by-step mainly by internal staff, but occasionally by external consultants.
At present most of their work has moved from DOS to Windows based systems and in the future a change to Unix will be expected.

Most data are transferred to an Oracle database.

The information management department has a staff of 26, but only 6 of these are IT-staff.

Information on SGSL

Source: http://mapx.map.vgd.gov.lv/geosystem/default.asp

Systematic geophysical investigations started in Latvia from late 1950s. Since that time, a considerable amount of data was collected during seismic, gravity, magnetic, electric, acoustic and other investigations, covering both the Latvian onshore area, the adjacent part of the Baltic Sea and the Gulf of Riga. The storage safety and formats of the existing data are different, depending on the vintage.
The State Geological Survey of Latvia carries out a step-by-step upgrading of the archive of the most important information. Today, a considerable amount of geophysical and related data is in digital format that is more accessible to the users.

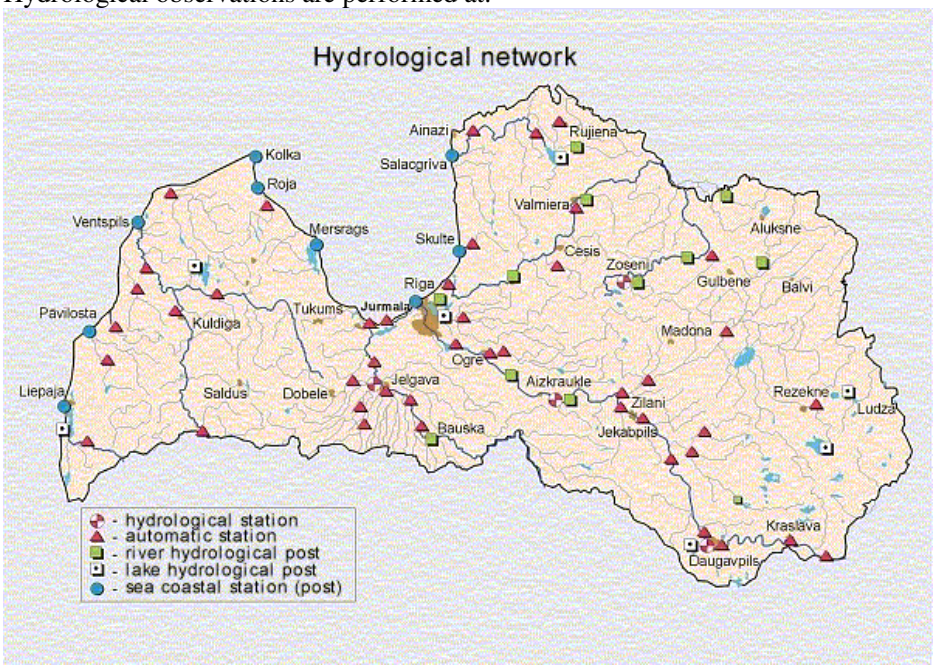
11.3 Latvian Hydrometeorological Agency

Source: http://www.meteo.lv/

LHA assist LEA on 11 surface waters monitoring stations and most of river flow observations.

11.3.1.1 Hydrological observations

Hydrological observations are performed at:



· 64 sites near Latvia's rivers, lakes and water reservoirs observing water level, water flow, water temperature and ice phenomena and thickness

· 10 sites located in the coastal zone of the Baltic Sea Proper and the Gulf of Riga that provide information of sea water level, water temperature, sea wave, and ice conditions.

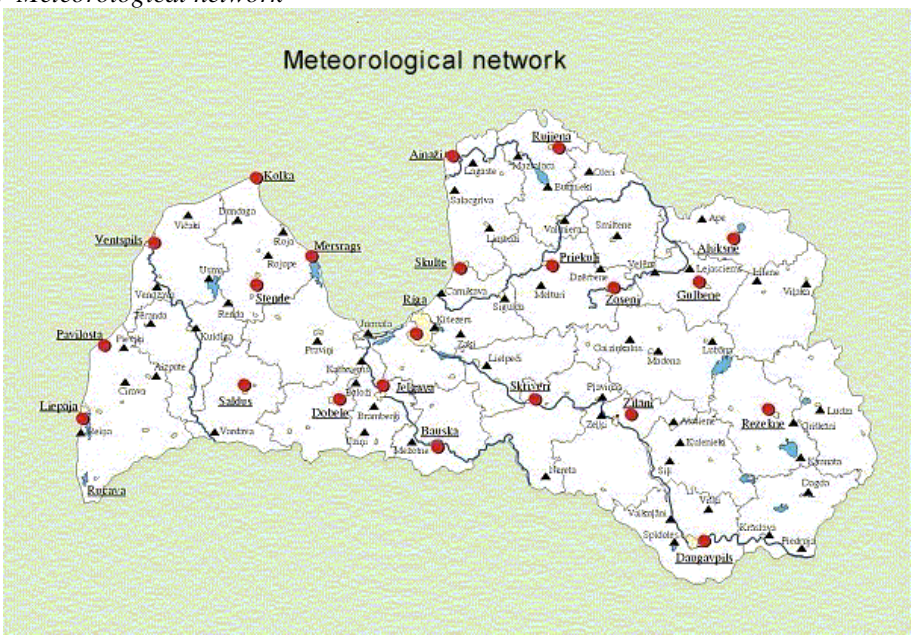
Measurement data loggers provide water level and temperature data in the real-time mode. Of 74 posts, 38 are provided with automatic sensors from the OTT HYDROMETRIE Company and mobile communication links.

Professionals from the Technical Department of LHMA carry out maintenance of the automatic stations, and the contemporary communication software HYDRAS 3 provides for validation and correction of the information collected.

Measuring of water flow in the large rivers, Daugava, Gauja, Aiviekste and Lielupe, is not an issue any more: the ADCP (acoustic Doppler current profiler) allows to acquire precise data on bed of rivers and water reservoirs, bottom of lakes, and river current information.

Current meters, SEBA Company, Germany, that are handled by three regional mobile teams of hydrologists, provide for current speed and water flow measurements in medium-size and small rivers, in summer and in winter.

11.3.1.2 Meteorological network



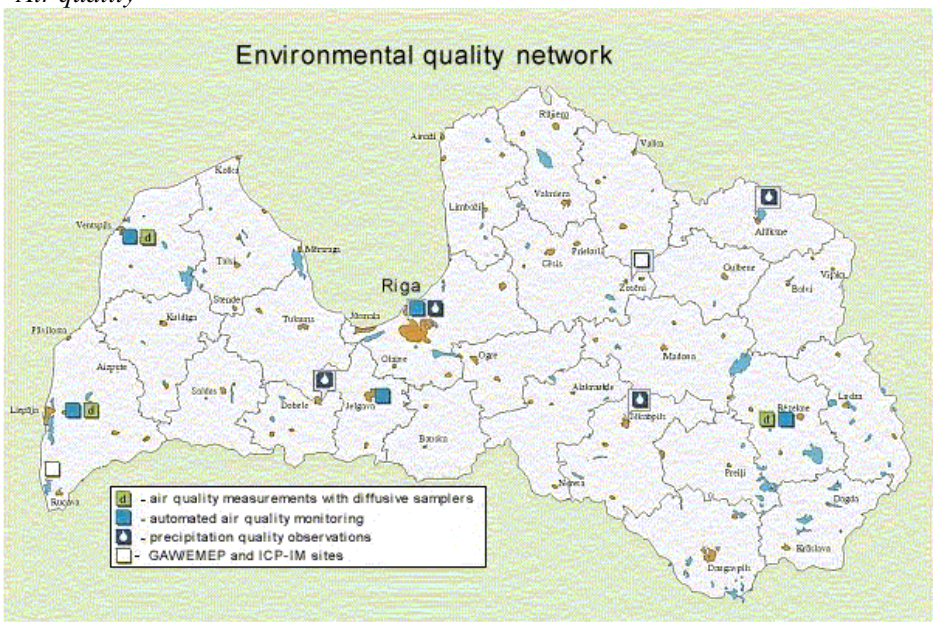
The meteorological network of 22 stations and 60 posts cover the entire Latvia's territory. The stations
are spaced 60 km apart, in compliance with international standards, to characterize in detail the weather and climate in Latvia.

The meteorological stations provide for the measurements of air temperature and humidity; atmospheric pressure; snow cover; wind speed and direction; status and temperature of soil; cloudiness; sunshine duration; total radiation, and atmospheric phenomena in the ground layer of the atmosphere.

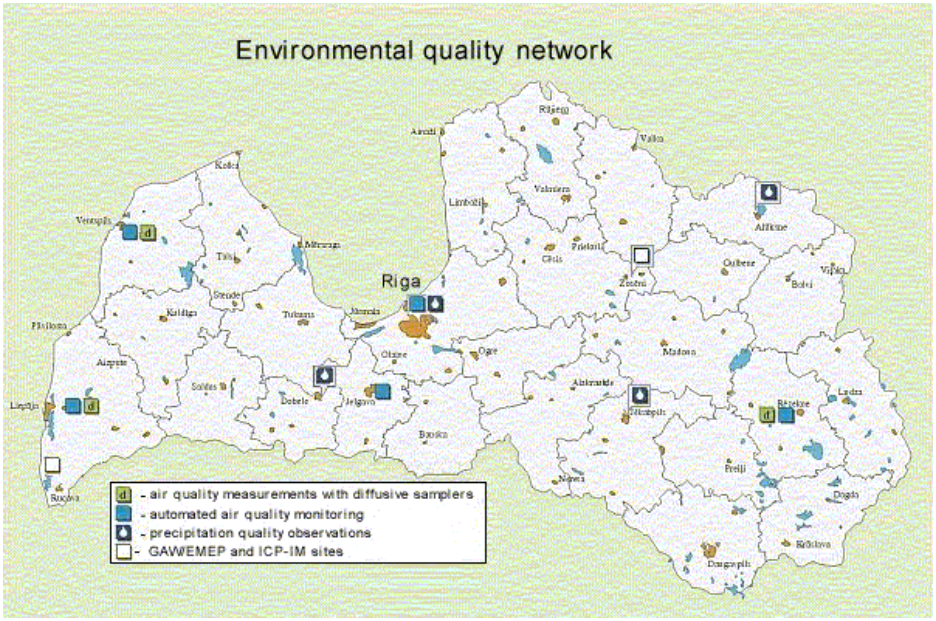
The meteorological posts carry out measurements of major variables: precipitation; snow cover; extreme air temperature, and special atmospheric phenomena.

Additionally, six stations of the 22 provide agrometeorological information on plant growth phases; status of cereals and root crops, their growth and augmentation of green; soil humidity, freezing and thawing.

11.3.1.3 Air quality



The LHMA runs ambient air and precipitation quality monitoring and assessment of air quality effects on ecosystems that are backed up by the international programmes:
· Background air quality monitoring implemented under the **GAW** (Global Atmosphere Watch) and **EMEP** (Co-operative Programme for the Monitoring and Evaluation of Long-range Air Pollutants in Europe) programmes.
· Evaluation of effects of long transported pollutants based on the monitoring of quality of the air, precipitation, surface water, groundwater and soil water, and the state of the ecosystem (forest, vegetation and soil) performed under the **ICP-Integrated Monitoring Programme**.
· Evaluation of acidification of surface waters due to air quality under the **ICP-Waters programme**.



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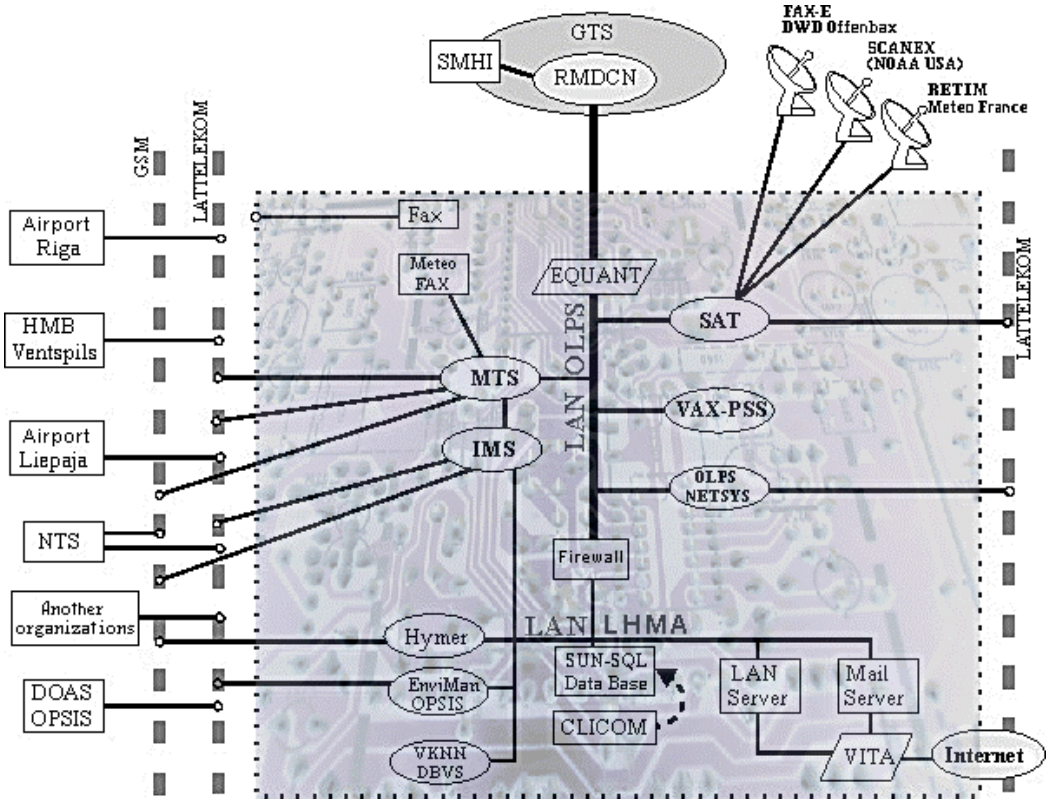
· Evaluation of effects of long transported pollutants based on the monitoring of quality of the air, precipitation, surface water, groundwater and soil water, and the state of the ecosystem (forest, vegetation and soil) performed under the **ICP-Integrated Monitoring Programme**.
· Evaluation of acidification of surface waters due to air quality under the **ICP-Waters programme**.

11.3.1.4 Telecommunication network



11.4 University of Latvia, Institute of Aquatic Ecology

Source: http://www.lu.lv/eng/dept/i_aqua.html

Branches of research:

- Hydrobiology
- Marine ecology

Main areas of research:

- Structure and functioning of ecosystem of the Gulf of Riga
- Monitoring of the Baltic Sea

11.5 University of Latvia, Institute of Biology

Branches of research:

- Biology

Main areas of research:

- Studies of resources of Latvia's nature, their rational use, environmental and ecological problems, nature protection
- Studies of life processes and biological productivity of plants and animals

11.6 State Land Service (Data provider)

SLS is the main provider of basis maps. The company has services that provide the ministries, agencies, enterprises etc. with digital maps and aerial photos.

LEA produce specific thematic maps and use those in connection with basis maps bought from SLI.

12 ANNEX B, IT strategy for MoE

12.1 Summary in English of present IT strategy for MoE.

"Conception of Informatics development strategy (1997. - 2002.) in Ministry of Environment Protection and Regional Development"

The conception describes the situation in 1997 (technical equipment, computer network, software equipment, GIS and digital maps, skills and training opportunities of users) and defines the evolution strategy for next 5 years (topic centres, computer network development, hardware requirements, Internet / Intranet services, software equipment, data flows, measures to support information security, training of users).

The conception defines that:
a) Environment Information System will be built as distributive information system with 6 central topic centres and 8 regional centres (they correspond to 8 regional environment boards) and it must operate according to requirements of the Regulation Nr.70 of the Cabinet of Ministers "Procedure for granting of the state importance computerized information system status and technical implementation requirements" to support full compliance to other state importance information systems.

b) The central topic centres will be the following:
Latvian Environment Data Centre (now Latvian Environment Agency)
State Geology Service
Latvian Hydrometeorological Agency
Building Department of Ministry of Environment Protection and Regional Development (now under the Ministry of Economics)
Board of Municipalities Affairs (now under the Ministry of Municipalities Affairs and Regional Development)
Tourism Board (now Tourism Development Agency under the Ministry of Economics)

c) High capacity Internet connections (at least 2 Mbps) to databases must be supported for main users in Riga and low/medium capacity Internet connections (at least 64/128 Kbps) for regional users.

d) IBM PC or compatible computers were stated as standard hardware equipment for all users in institutions under the Ministry and SUN servers or powerful PC computers must be used for database servers in the central topic centres.

e) The family of Microsoft products are recommended for users;

f) World Wide Web technology must be used very commonly to disseminate information between different institutions and to support public access to the databases;

g) The client-server technology must be used to develop data processing systems;

h) To collect spatial information (location, borders etc.) about environment polluters to ensure wide use of GIS for different decision makers.

13 ANNEX C, GIS report made by MoTraffic

13.1 Summary in English of GIS report made by MoTraffic.

"Conceptual model of State geographic information system"

The main goal of the document is to describe the conceptual model for acquisition, storage, processing and delivery of spatial information – geographic, cartographic and different imageries – to users to ensure accessibility and wide use of this information in government and for information services to customers (public and different organisations).

The main goals on development of national (state) geographic information system are:

- To ensure free access and wide use of actual spatial information for needs of citizens, municipalities, state organization, private companies, universities and scientific bodies;
- To reduce human, technical and financial resources for acquisition, maintenance and delivery of spatial information;
- To reduce significantly cost for customer services related to spatial information;
- To promote new technological solutions, IT services and scientific researches in the field of geographic information;
- To ensure opportunities for public to participate in decision-making procedure related to state of the environment;
- To support conditions of national geographic information that ensures accession to European Spatial Data Infrastructure and e-Government activities;

The goals can be achieved by implementing different technological, political and institutional measures that are described at conceptual levels.

Acquisition and maintenance of spatial information is very expensive processes therefore it is very important to use this information in as many as possible applications to reduce the cost for end users. The restricted access to spatial information is a very significant problem (obstacle) that does not allow the use to be very wide. The restricted access could be in the following ways:

- There are no metadata about spatial data – what data are available, who is the primary data holder, the content of the data, quality, spatial extent of the data layer etc.
- Delivery of the spatial data is usually in the form of stand-alone copies on CD-ROMs or tapes in different data exchange file formats. The file formats are associated to the specific GIS platforms therefore use of the data in other GIS platforms requires converting procedures. Any converting procedure arises significant loss of data content, data quality and even functionality even both GIS are operating on the same hardware or connected in one network.
- Spatial data refer to objects that in different GIS can be classified and identified in different way. It is a very significant obstacle to integrate such outsourced data and perform data joining and spatial analyses.

- Nevertheless most of spatial data in state organizations are maintained from state budget or foreign technical support (and therefore should be declared as public data), the data holders usually ask very high cost for data (the cost is very often declared as cost for service not for data)
- The costs for data and conditions of use are not defined very clear. Usually it is a matter of individual contracts between data holder and data customer. As the result of such an approach different price for different categories of customers (state organizations, municipalities, private companies, residents) can be applied for the same data. Sometimes such phenomena can occur even in regional offices of one organization.
- Only few of data holders offer access to the spatial data via Internet.

Overall access to the spatial data in Latvia could be characterised as unsatisfactory and unconformable to the present IT opportunities. One of the main reasons for this situation is lack of clear spatial data policy in Latvia.

Deeper analyses of the present situation in spatial data market shows that in only few cases digital spatial data are processed as part of GIS. Usually this data are stored for other purposes, for instance:

- Surveyors perform survey of real estate borders and use computers to make the plans (even guidance for survey requires to submit the final result (plan) in electronic way);
- The digital technologies are used in cartography to produce new maps;
- Territory planners use the digital technologies to display the new situation in virtual 3D views;
- Architects use the digital topographic plans to design the buildings and to georeference them to the ground relief and infrastructure.

In this way the perfect spatial data are created and they look very good because they full-fill all requirements of the application for which they were created but they are not applicable for GIS.

The typical problems are:

- There is no common coordinate system used (architects and planners used local/free hand coordinate systems);
- The data are not organized in layers;
- There are no common data storage and display specification and standards;
- Data have no correct topology (unclosed polygons, double lines) that is not visible with eyes;
- The spatial data and attribute data are separated and they exist as stand alone tables and are not joined together.

The problem of data quality restricts the usage of data. For instance: low quality of topographic map of Land Service in scale 1:50000 and non compliance to GIS requirements do not allow to use it as good reference data for other GIS databases. Therefore it can be used only as background information.

It is needed to elaborate a list of national strategies, regulations and standards for IT, GIS and Internet and include indication of where they are relevant in connection with environmental data management. It should be known if a national standard should be followed on specific topics. A policy on open-source software is also needed from national or ministerial level.

14 ANNEX D, Questionnaire forms

(1/4)

Questionnaire/Database

Topic	
Institution	
Database name	
Short description of the database	
Database type (paper, Access/Oracle/MS SQLServer/, …)	
Responsible person(s) for data	
Responsible person(s) for maintenance (run)	
Documentation for the database structure and software is elaborated and available?	*(if yes then where to obtain)*
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)*
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)*
The database is evaluated in previous report(s).	*(list reports)*
Policy on data sharing	*(Are data available for the public, other institutions, research engineers, scientists … ?)* *Ownership?*

(2/4)
If data is available in electronic form

User interface

	Is the User interface included in the database software?	
	Is the user interface made as a separate application?	*(if yes, please describe how is the application connected to the database)*
	Is the database implemented in a multi user system that allows many concurrent users?	
	Is it a stand alone application with only one user/operator?	
	Is data form the database available on the Internet?	*(if yes, please describe how)*
	Can the database be updated by use of the Internet?	*(if yes, please describe how)*

(3/4)
If data is available in electronic form

Structure and contents of the database

List of tables	(collect list if available!)	
ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	
	Amount of sites	
	Is a number system used (national code system)?	
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	
	Period	*(start year – end year)*
Parameters		
	List of parameters	
	Use of code list for parameters?	*(national codelists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	

Dataproviders

Who make the samplings and gather information?	
Who enter data and maintain the contents of the database?	

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	*(number of employees)*
System administrators	*(number of employees)*
Developers (IT)	*(number of employees)*

Use of the data

Users	*(please list the stakeholders of the database)*
Used for	*(please list the reporting where data from the database is used)*

(1/1)

Questionnaire/Institution

Institution	
Number of employees	
Number of PCs	(less than 2 years old /older than two years)
Operation system(s) in use	
Network implemented (type and capacity)	
Connection(s) to the Internet (capacity in/out)	
Web site	
Web server(s)	
Software policy	(open source, Microsoft products, etc..)

15 ANNEX E, Questionnaires returned

Questionnaires returned from stakeholders

(1/1)

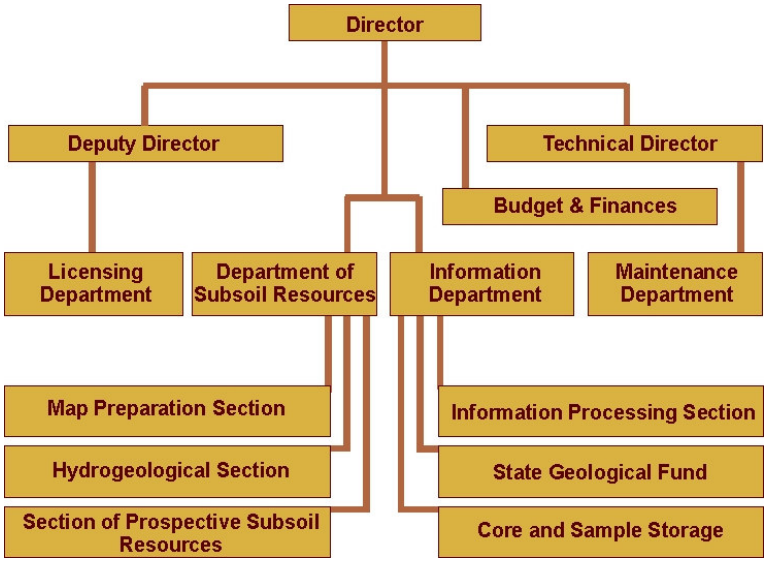
Questionnaire/Institution

Institution	Latvian Environment Agency
Number of employees	Administration & Technical staff (7 + 11) Information Department (39) Laboratory Department (39) Total: 96
Number of PCs	~ 30 (less than 2 years old) / ~ 80 (older than two years)
Operation system(s) in use	Windows NT, Windows 2000, Windows XP
Network implemented (type and capacity)	Fast Ethernet 100Mb/s
Connection(s) to the Internet (capacity in/out)	Jurmala Straumes iela 2 – 1 Mb/s Jurmala Osu iela 5 – 1 Mb/s Riga, Rupniecibas iela 23 – 2Mb/s (Database servers)
Web site	http://www.lva.gov.lv
Web server(s)	Microsoft Internet Information Server, Oracle Web Application Server, Oracle Internet Application Server, ESRI ArcIMS + Apache (Internet Maps Server).
Software policy	Microsoft products for office applications, Oracle DBMS for database applications, ESRI products for GIS applications

(1/1)

Questionnaire/Institution

SGSL is one of three thematic centres under the Ministry of Environment providing digital data preparation and exchange.



The geoscientific digital data is managed by Information Department. The preparation of geodata is carried out by other structural units of SGSL as well.

All geoscientific (geological) data are available to the public sector (*if we understand data managed by State Geological Fund*)

Institution	SGSL
Number of employees	85
Number of PCs	18/67 (less than 2 years old /older than two years)
Operation system(s) in use	Solaris, Windows 98/NT/2000/XP
Network implemented (type and capacity)	Ethernet, 100 Mbit
Connection(s) to the Internet (capacity in/out)	Privat line 1024 Mbit in/out
Web site	Yes, www.vgd.gov.lv
Web server(s)	Yes,
Software policy	open source, Microsoft products, Oracle, Borland ,ESRI.

(1/1)

Questionnaire/Institution

Institution	Institute of Aquatic Ecology, University of Latvia
Number of employees	40
Number of PCs	4/20
Operation system(s) in use	MS Windows, Linux
Network implemented (type and capacity)	Local without server
Connection(s) to the Internet (capacity in/out)	European academic net GEANT (theoretically 64 kb/s, however, connection is rather unstable recently)
Web site	www.hydroecology.lv
Web server(s)	
Software policy	Linux, Microsoft, Adobe, etc.

(1/1)

Questionnaire/Institution

Institution	LHMA
Number of employees	280
Number of PCs	28/136
Operation system(s) in use	Windows (NT, XP, 2000, 98, 95); UNIX; LINUX; QNX
Network implemented (type and capacity)	LAN, 2 MB
Connection(s) to the Internet (capacity in/out)	2 MB
Web site	www. meteo.lv
Web server(s)	MS Windows NT 4 Server
Software policy	Microsoft products, Oracle products, SCO products, QNX products, MicroStep - HDO products (Slovakia), OTT – MESSTECHNIK GmbH & Co products (Germany), HEDESELSKABET products (Denmark), CHMI products.

(1/1)

Questionnaire/Institution

Institution	Public Health Agency
Number of employees (only for drinking / bathing water quality)	2 employes in each regional branch office (10 branches) + 2 employes in the Central office in Riga
Number of PCs	Every employee has one PC
Operation system(s) in use	In most cases Microsoft Windows.
Network implemented (type and capacity)	Ethernet
Connection(s) to the Internet (capacity in/out)	Regional branches use Internet with dial-up connection for e-mail puproses. Central office has direct Internet connection.
Web site	www.sva.lv
Web server(s)	
Software policy	Microsoft products

(1/1)

Questionnaire/Institution

Institution	Ministry of Agriculture
Number of employees (only for drinking / bathing water quality)	190
Number of PCs	60 / 130
Operation system(s) in use	MS Windows 2000
Network implemented (type and capacity)	WPN, Store type network, capacity 512 users (not server)
Connection(s) to the Internet (capacity in/out)	100 Mb/s / 1Gb/s
Web site	www.zm.gov.lv
Web server(s)	1 server WIN 2000 OS, Appache PHP
Software policy	Microsoft products, open source (web server)

(1/4)

Questionnaire/Database

Topic	Inland Water Quality
Institution	Latvian Environment Agency
Database name	Inland Water Quality Monitoring
Short description of the database	The main goal of the database is to collect all information concerning the inland water quality monitoring (performed by Latvian Environment Agency) and to facilitate work of Agency specialists from Information Assessment Division. The database was originaly developed for Latvian Hydrometeorological Agency but later adopted for Latvian Environment Agency needs.
Database type (paper, Access/Oracle/MS SQLServer/, …)	*Oracle 9i Data Base Server*
Responsible person(s) for data	Staff of Laboratory Department
Responsible person(s) for maintenance (run)	Staff of Information Technology Division in collaboration with developer team from Institute of Solid-state Physics
Documentation for the database structure and software is elaborated and available?	*(if yes then where to obtain)*
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)*
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)*
The database is evaluated in previous report(s).	*(list reports)*
Policy on data sharing	Data are available for public because data are declared as environment data and the Arhus convention is applied. Access to the data for public is on request. It is not yet technically developed on-line data access for public users. There is only GIS test application available for years 2000 and 2001 http://imaps.vdc.lv/website/ukm_lv/.

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No.
Is the user interface made as a separate application?	The user interface is based on Oracle Business Intelligence tools (Oracle Discoverer) that can be accessed from Internet.
Is the database implemented in a multi user system that allows many concurrent users?	Yes
Is it a stand alone application with only one user/operator?	No
Is data form the database available on the Internet?	Yes. The entry point of the Oracle Discoverer application is http://ias.vdc.lv:7778/discoverer/plus .
Can the database be updated by use of the Internet?	No. Data are imported into the database from Laboratory Information Management System with stand alone application (Delphy technolgy).

(3/4)
If data is available in electronic form

Structure and contents of the database

List of tables	(collect list if available!)	See attachment hidrom.htm
ER-diagram	(collect diagram if any!)	See attachment hidrom.htm
Information on sites		
	Geographic related (co-ordinates)	"Center points" of the inland water quality monitoring posts
	Amount of sites	
	Is a number system used (national code system)?	Internal coding system of monitoring posts (GIS data are stored as Arc/Info coverages)
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	
	Period	*1991-2003*
Parameters		
	List of parameters	
	Use of code list for parameters?	Internal coding system
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	

Data providers

Who make the samplings and gather information?	Laboratory Department
Who enter data and maintain the contents of the database?	Laboratory Department

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	1 (vacant at the present time therefore all tasks are performed by developer)
System administrators	1
Developers (IT)	1

*There is no information about staff from the Institute of Solid state Physics.

Use of the data

Users	Specialists from Information Assessment Division
Used for	Water quality assessment reports

(1/4)

Questionnaire/Database

Topic	Inventory of Lakes
Institution	Latvian Environment Agency
Database name	Lake Passports (LP)
Short description of the database	The main goal of the database is to collect all information received during the inventory of lakes in Latvia.
Database type (paper, Access/Oracle/MS SQLServer/, …)	*Oracle 9i Data Base Server*
Responsible person(s) for data	Data providing: inventory performers (contract based work) Data input into database: Staff of Latvian Environment Agency
Responsible person(s) for maintenance (run)	Staff of Information Technology Division
Documentation for the database structure and software is elaborated and available?	Latvian Environment Agency
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)*
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)*
The database is evaluated in previous report(s).	*(list reports)*
Policy on data sharing	Data are available for public because data are declared as environment data and the Arhus convention is applied. Access to the data is in on-line mode. The data users must electronically register before to use them (registration and use is free of charge).

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	The user interface is based on JavaScript application that is loaded in Internet browser (client computer).
Is the database implemented in a multi user system that allows many concurrent users?	Yes
Is it a stand alone application with only one user/operator?	No
Is data from the database available on the Internet?	Yes. The entry point of the Web application is http://vdc2.vdc.lv:8998/ez_pas.html. User can search data for particular lake with different options / criterias (name, administrative area etc.).
Can the database be updated by use of the Internet?	No. The data into the database are imported by database administrator as soon as new data of inventory comes to Latvian Environment Agency.

(3/4)
If data is available in electronic form

Structure and contents of the database

List of tables	(collect list if available!)	See attachment ezeru_pases.htm
ER-diagram	(collect diagram if any!)	See attachment ezeru_pases.htm
Information on sites		
	Geographic related (co-ordinates)	"Center point" of lakes
	Amount of sites	More than 1000
	Is a number system used (national code system)?	
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	
	Period	*Data since 1972*
Parameters		
	List of parameters	
	Use of code list for parameters?	*No.*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	

Data providers

Who make the samplings and gather information?	
Who enter data and maintain the contents of the database?	Latvian Environment Agency

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	1 (vacant at the present time therefore all tasks are performed by developer)
System administrators	1
Developers (IT)	1

Use of the data

Users	Staff of Ministryof Environment, Regional Environment Boards, Municipalities, NGOs, students, scientists etc.
Used for	*(please list the reporting where data from the database is used)*

(1/4)

Questionnaire/Database

Topic	Water statistics
Institution	Latvian Environment Agency
Database name	Statistical Report Nr2-WATER on water abstraction, consumption, treatment and pollution
Short description of the database	The goal of the database is to collect all information that is declared by eneterprises (water users) for annual statistical report Nr2-WATER. The data of particular enterprises are used to produce summaries for national statistical year book, for questionnaires of EuroStat and other international bodies, to support reporting to European Commision.
Database type (paper, Access/Oracle/MS SQLServer/, …)	Oracle 9i Data Base Server
Responsible person(s) for data	Data declaring: Chief managers of enterprises Data checking and input into database: Environment inspectors of Regional Environment Boards
Responsible person(s) for maintenance (run)	Staff of Information Technology Division
Documentation for the database structure and software is elaborated and available?	Latvian Environment Agency
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)*
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)*
The database is evaluated in previous report(s).	*(list reports)*
Policy on data sharing	Data are available for public because data are declared as environment data and the Arhus convention is applied. Access to the data is in on-line mode. The data users must electronically register before to use them (registration and use is free of charge).

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	The user interface is based on JavaScript application that is loaded in Internet browser (client computer).
Is the database implemented in a multi user system that allows many concurrent users?	Yes
Is it a stand alone application with only one user/operator?	No
Is data form the database available on the Internet?	Yes. The entry point of the Web application is http://vdc2.vdc.lv:8998/2ud.html. User can search data for particular enterprise or get pre-defined summaries/reports with different options / criterias.
Can the database be updated by use of the Internet?	Yes. It is possible only for register users (login name/password/coputer IP address) and only for specified time period when the statistical data are collected (ussually February-May). When the time period expires the data editing mode is locked by Administrator of Latvian Environment Agency (the flag "No Editing" is set-up in Oracle database).

(3/4)
If data is available in electronic form

Structure and contents of the database

List of tables	(collect list if available!)	See attachment 2ud.htm
ER-diagram	(collect diagram if any!)	See attachment 2ud.htm
Information on sites		
	Geographic related (co-ordinates)	As point coordinates of enterprises, water abstraction sites and waste water discarges (treatment) sites
	Amount of sites	
	Is a number system used (national code system)?	National coding for enterprises, water abstraction sites and waste water discharges
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	
	Period	Since 2000
Parameters		
	List of parameters	
	Use of code list for parameters?	*(national codelists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	

Data providers

Who make the samplings and gather information?	Enterprises / Regional Environmental Boards
Who enter data	Regional Environmental Boards

and maintain the contents of the database?	

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	1 (vacant at the present time therefore all tasks are performed by developer)
System administrators	1
Developers (IT)	1

Use of the data

Users	Staff of Ministryof Environment, Regional Environment Boards, Municipalities, NGOs, students, scientists etc.
Used for	*(please list the reporting where data from the database is used)*

(1/4)

Questionnaire/Database

Topic	Water usage
Institution	Latvian Environment Agency
Database name	Water Use Permits (WUP)
Short description of the database	The main goal of the database is to collect all water use permits that are issued by regional environmental boards and to facilitate work of regional environmental inspectors (for instance: quick information serach, allowed limits, monitoring conditions etc.).
Database type (paper, Access/Oracle/MS SQLServer/, …)	Oracle 9i Data Base Server
Responsible person(s) for data	Data checking and input into database: Environment inspectors of Regional Environment Boards
Responsible person(s) for maintenance (run)	Staff of Information Technology Division
Documentation for the database structure and software is elaborated and available?	Latvian Environment Agency
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)*
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)*
The database is evaluated in previous report(s).	*(list reports)*
Policy on data sharing	Data are available for public because data are declared as environment data and the Arhus convention is applied. Access to the data is in on-line mode. The data users must electronically register before to use them (registration and use is free of charge).

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	The user interface is based on JavaScript application that is loaded in Internet browser (client computer).
Is the database implemented in a multi user system that allows many concurrent users?	Yes
Is it a stand alone application with only one user/operator?	No
Is data form the database available on the Internet?	Yes. The entry point of the Web application is http://vdc2.vdc.lv:8998/ula.html. User can search data for particular enterprise or get pre-defined lists of permits with different options / criterias (time period and administrative area).
Can the database be updated by use of the Internet?	No. Data are imported into the database automaticaly from the local databases (FoxPro) in Regional Environment Boards. The special client software based on Visual FoxPro 6.0 was developed to update / add / delete data to the local databases. The local databases daily are sent automatically to the FTP server of Latvian Environment Agency.

(3/4)
If data is available in electronic form

Structure and contents of the database

List of tables	(collect list if available!)	See attachment ud_atl.htm
ER-diagram	(collect diagram if any!)	See attachment ud_atl.htm
Information on sites		
	Geographic related (co-ordinates)	As point coordinates of enterprises, water abstraction sites and waste water discarges (treatment) sites
	Amount of sites	
	Is a number system used (national code system)?	National coding system for: Water abstraction sites; Waste water discharges sites;
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	
	Period	*Since 1998*
Parameters		
	List of parameters	
	Use of code list for parameters?	*Internal coding*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	

Data providers

Who make the samplings and gather information?	Regional Environmental Boards

Who enter data and maintain the contents of the database?	Regional Environmental Boards

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	1 (vacant at the present time therefore all tasks are performed by developer)
System administrators	1
Developers (IT)	1

Use of the data

Users	Staff of Ministryof Environment, Regional Environment Boards, Municipalities, NGOs, students, scientists etc.
Used for	*(please list the reporting where data from the database is used)*

(1/4)

Questionnaire/Database

Topic	Nature Conservation
Institution	Latvian Environment Agency
Database name	Nature Protected Areas (Register)
Short description of the database	The main goal of the database is to collect all relevant information for particular nature protection areas and make one central information search point at the national level.
Database type (paper, Access/Oracle/MS SQLServer/, …)	Oracle 9i Data Base Server
Responsible person(s) for data	Data declaring: data providers (officials from Adminstrations of Nature protected areas, Environment inspectors of Regional Environment Boards, scientists) Data input into database: Staff of Nature Protection Information Division
Responsible person(s) for maintenance (run)	Staff of Information Technology Division in collaboration with developer team from company DataPro.
Documentation for the database structure and software is elaborated and available?	Latvian Environment Agency
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)*
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)*
The database is evaluated in previous report(s).	*(list reports)*
Policy on data sharing	Data are available for public because data are declared as environment data and the Arhus convention is applied. Access to the data is in on-line mode. The data users must electronically register before to use them (registration and use is free of charge).

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	The user interface is based on JavaScript application that is loaded in Internet browser (client computer).
Is the database implemented in a multi user system that allows many concurrent users?	Yes
Is it a stand alone application with only one user/operator?	No
Is data form the database available on the Internet?	Yes. The entry point of the Web application is http://vdc2.vdc.lv:8998/iadt.html. User can search data for particular area or get pre-defined summaries/reports with different options / criterias.
Can the database be updated by use of the Internet?	No. The special stand alone application was developed by IT company DataPro based on Delphy technology to facilitate the data entry / update / delete for particular nature protected areas. The data updating can be done only from computers on whicht this application is installed (login name/password is required).

(3/4)
If data is available in electronic form

Structure and contents of the database

List of tables	(collect list if available!)	See attachment iadt.htm
ER-diagram	(collect diagram if any!)	See attachment iadt.htm
Information on sites		
	Geographic related (co-ordinates)	"Center points" of areas and borderlines (GIS data are stored as Arc/Info coverages)
	Amount of sites	546
	Is a number system used (national code system)?	Internal coding system for protected areas
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	
	Period	*1996-2003*
Parameters		
	List of parameters	
	Use of code list for parameters?	Internal coding
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	

Data providers

Who make the samplings and gather information?	
Who enter data and maintain the contents of the database?	Staff of Nature Protection Information Division

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	1 (vacant at the present time therefore all tasks are performed by developer)
System administrators	1
Developers (IT)	1

*There is no information about staff from the DataPro company.

Use of the data

Users	Staff of Ministry of Environment, Regional Environment Boards, Municipalities, NGOs, students, scientists etc.
Used for	*(please list the reporting where data from the database is used)*

(1/4)

Questionnaire/Database

Topic	Laboratory Analyses
Institution	Latvian Environment Agency
Database name	Laboratory Information Management System (LIMS)
Short description of the database	The main goal of the database is to collect all information about analyses (excluded biological tests!) made in the Laboratory and to facilitate work of Laboratory Department (for instance: management of man power and equipment resources, QC/QA, data reporting etc.)
Database type (paper, Access/Oracle/MS SQLServer/, …)	*Oracle 9i Data Base Server*
Responsible person(s) for data	Staff of Laboratory Department
Responsible person(s) for maintenance (run)	Staff of Information Technology Division in collaboration with developer team from Institute of Solid-state Physics
Documentation for the database structure and software is elaborated and available?	Latvian Environment Agency
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)*
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)*
The database is evaluated in previous report(s).	*(list reports)*
Policy on data sharing	All data from LIMS database are strongly confidential (it is bussiness information of customers) except data of inland water quality analyses that are exported to the database of inland water quality monitoring to provide public access. Access to LIMS database have only appropriate staff of Laboratory Department.

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No.
Is the user interface made as a separate application?	Yes. The LIMS application is based on Delphy technology.
Is the database implemented in a multi user system that allows many concurrent users?	Yes.
Is it a stand alone application with only one user/operator?	No.
Is data form the database available on the Internet?	No.
Can the database be updated by use of the Internet?	No.

(3/4)
If data is available in electronic form

Structure and contents of the database

List of tables	(collect list if available!)	See attachment lab_master.htm
ER-diagram	(collect diagram if any!)	See attachment lab_master.htm
Information on sites		
	Geographic related (co-ordinates)	No.
	Amount of sites	
	Is a number system used (national code system)?	
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	Every day
	Period	2002-2003
Parameters		
	List of parameters	
	Use of code list for parameters?	*(national codelists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	Yes.

Data providers

Who make the samplings and gather information?	
Who enter data and maintain the contents of the database?	

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	1 (vacant at the present time therefore all tasks are performed by developer)
System administrators	1
Developers (IT)	1

*There is no information about staff from the Institute of Solid state Physics.

Use of the data

Users	Staff of Laboratory Department
Used for	*(please list the reporting where data from the database is used)*

(1/4)

Questionnaire/Database

Topic	Groundwater
Institution	SGSL
Database name	**Urbumi**
Short description of the database	The base contains information on: - operational and abandoned wells (parametric, structural, exploration, drilled in the territory of Latvia), - Groundwater monitoring (levels and chemical composition), - Deposits and reserves of groundwater. Each well contains: - general data (co-ordinates of the location, drill year, city/town/parish, user and owner name, etc) geological data: geological section, stratigraphy and lithology - Results of geophysical research - Results of hydrogeological research: data on aquifer, levels and reserves of the ground-water, chemical composition and temperature of water, filtration parameters - construction Deposits and groundwater reserves contain: - general data (co-ordinates of the location, city/town/parish, user and owner name, diagram of water supply etc.) and basic data for the calculation of groundwater reserves.
Database type (paper, Access/Oracle/MS SQLServer/, …)	Oracle 8i
Responsible person(s) for data	T. Krutofal, T. Birgere, L. Stiebrinja
Responsible person(s) for maintenance (run)	N. Farafonov
Documentation for the database structure and software is elaborated and available?	*Yes (in Latvian), you may obtain it at SGSL*

Are there any ongoing projects that include development of databases or information systems?	*No*
Are there any planned activities on databases, data processing and information systems?	*Yes. We are planning to create interactive user applications that will automate the process of selecting and processing well data and their generalisation together with other types of research for the purposes of national and territorial planning, environmental protection, creation of geological, hydrogeological, forecast and other kinds of maps*
The database is evaluated in previous report(s).	*No*
Policy on data sharing	*We apply a three-level system of access to the data:* *1. Free access to the general data via Internet/Intranet .* *2. Internal (within the local network of SGSL) total access to the data* *3. Sanctioned selective access under separate agreement to a particular type of data* *Ownership- SGSL*

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	*Access to the database is made via specialized application developed by SGSL.*
Is the database implemented in a multi user system that allows many concurrent users?	*Yes*
Is it a stand alone application with only one user/operator?	*No*
Is data form the database available on the Internet?	*No*
Can the database be updated by use of the Internet?	*No*

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	Coordinates are stored in the original coordinate system (as a rule, that of the former USSR), and in Latvian LKS-92 system.
	Amount of sites	20000 wells 176 groundwater deposits
	Is a number system used (national code system)?	Different coding is used for data storage: mostly the internal of SGSL, and, in some cases, national code system.
Samples		
	What is the amount of samples/ site?	Information on samples is given in generalized fashion, without references to individual samples. Amount of information on different deposits varies greatly. Data for water samples are available from 1996.
	Sampling frequency?	Water sampling – once a year.
	Period	General data on deposits is available since approx. 1965 until now. The actual amounts and changes for

		producing wells and wellfields are systematic since 1998 until now.
Parameters		
	List of parameters	
	Use of code list for parameters?	*National code lists*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	Partly – yes

Data providers

Who make the samplings and gather information?	Sample and necessary drill data are supplied by the organizations drilling the wells. Information is collected by SGSL.
Who enter data and maintain the contents of the database?	SGSL

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	*10*
System administrators	*1*
Developers (IT)	*3*

Use of the data

Users	*SGSL*
Used for	*The data is used in all annual reports of SGSL, preparation of geological, hydrogeological maps and when calculating groundwater reserves etc.*

(1/4)

Questionnaire/Database

Topic	Building materials' deposits
Institution	SGSL
Database name	**Būvmateriālu izejvielu atradnes**
Short description of the database	Deposits of different kinds of limestone, gypsum, dolomite, sand, gravel, boulders, clay, and quartz sand in Latvia. Each deposit can be characterized by its location relative to other deposits; geographic coordinates and belonging to administrative units (these both are always present); references to primary reports on investigation; geomorphologic region, stratigraphic index of the usable layer, morphogenetic forms of the surface, tectonic structures; lithological characteristics; qualitative properties of the deposit (minerals and petrographic characteristics, chemical and granulometric composition, physical and mechanical properties); possible kinds of usage of the material; hydrogeological conditions; data on explored, evaluated and actual amount of the material; changes of actual amount (mining, additional exploration, etc.); licences given for mining; and saving zones of nature in the territory of deposit. The actual amount of information on different deposits varies very greatly.
Database type (paper, Access/Oracle/MS SQLServer/, …)	Oracle 8i
Responsible person(s) for data	S. Kondratjeva
Responsible person(s) for maintenance (run)	J. Freimanis
Documentation for the database structure and software is elaborated and available?	It is in the development process.
Are there any ongoing projects that include development of databases or information systems?	Database by itself is ready for online use, but the system to retrieve useful information from it is in the development.

Are there any planned activities on databases, data processing and information systems?	Yes. At present the general querying system is under development. In very near future all the printout system will be developed, and after that the database will be connected with cartographic systems.
The database is evaluated in previous report(s).	No
Policy on data sharing	The most general data is available for the public through Internet. Most of the data is for internal use by SGSL staff. Chosen deposits can be specified as intended for very limited access to information. *Ownership* SGSL

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	Yes. User interface is a *Windows* application – *CORBA* client, connected to *CORBA* application server (another *Windows* application). *CORBA* server is connected to *Oracle* database using *Microsoft ADO* and *Borland DBExpress* technologies. *CORBA* interface is provided by *Borland VisiBroker for C++ v.4.1*.
Is the database implemented in a multi user system that allows many concurrent users?	*Yes*
Is it a stand alone application with only one user/operator?	*No*
Is data form the database available on the Internet?	Limited part of information is available through Internet applications: cadaster of deposits, and the balance of deposits.
Can the database be updated by use of the Internet?	*No*

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	The database was designed without making ER-diagram
Information on sites		
	Geographic related (co-ordinates)	Coordinates are stored in the original coordinate system (as a rule, that of the former USSR), and in Latvian LKS-92 system.
	Amount of sites	2039 deposits at present, and it still grows.
	Is a number system used (national code system)?	Different coding is used for data storage: mostly the internal of SGSL, and in some cases national code system.
Samples		
	What is the amount of samples/ site?	Information is given in generalized fashion, without references to individual samples. Amount of information on different deposits varies very greatly.
	Sampling frequency?	Data on the actual amounts of minerals is for each year for those deposits

		where mining takes place. All the other information is occasional.
	Period	General data on deposits is since approx. year 1945 until now. The actual amounts and changes on usable deposits are systematic since 1998 until now (some occasional data is since year 1947).
Parameters		
	List of parameters	
	Use of code list for parameters?	No
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	No

Data providers

Who make the samplings and gather information?	All the data is obtained by private companies exploring and / or mining the deposits. The respective information is received by SGSL as required by Latvian law.
Who enter data and maintain the contents of the database?	SGSL

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	*6*
System administrators	*1*

Developers (IT)	*2*

Use of the data

Users	*SGSL*
Used for	The information from the database is used in order to supply the institutions of territorial planning with data on mineral deposits, as well as to satisfy the requests of data on the amount and qualitative properties of minerals made by companies and private persons. The geologic cartography is supported via providing data on minerals, and the annual balance of deposits is constructed using the database. The explorers of new deposits are supplied with information on the deposits already known. Some general information from the database is included into Annual Reports of SGSL.

(1/4)

Questionnaire/Database

Topic	Peat deposits
Institution	SGSL
Database name	**Kūdras atradnes**
Short description of the database	Deposits of peat in Latvia. Each deposit can be characterized by its belonging to administrative units, and location in respect to nearest towns, farms etc.; geographic coordinates; geomorphologic region; hydrologic conditions; nature above the depozit (forest, bush, etc.); area used for agriculture; area of peat fields and amount of peat in them; amount of different types of peat; technical characteristics of peat; amount of different categories of peat and their potential kinds of usage; references to the original reports of exploration; saving zones of nature in the territory of deposit; and the results of laboratory analysis of peat. The actual amount of information on different deposits varies very greatly.
Database type (paper, Access/Oracle/MS SQLServer/, …)	*Borland Paradox for Windows* v. 7.0
Responsible person(s) for data	D. Rutka
Responsible person(s) for maintenance (run)	J. Freimanis
Documentation for the database structure and software is elaborated and available?	Yes
Are there any ongoing projects that include development of databases or information systems?	No
Are there any planned activities on databases, data processing and information systems?	Currently no. In remote future this database must be transferred to *Oracle*, and its structure must be updated, in order to improve the possibilities.

The database is evaluated in previous report(s).	No
Policy on data sharing	Some information is partly available to public as the cadaster of peat deposits in the Internet. Most of the data is for internal use by SGSL staff. *Ownership* SGSL

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	Yes
Is the user interface made as a separate application?	No
Is the database implemented in a multi user system that allows many concurrent users?	*Yes*
Is it a stand alone application with only one user/operator?	*No*
Is data form the database available on the Internet?	Limited part of information is available through Internet application – cadaster of peat deposits.
Can the database be updated by use of the Internet?	*No*

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	The database was designed without making ER-diagram
Information on sites		
	Geographic related (co-ordinates)	Coordinates are stored in the original coordinate system (as a rule, that of the former USSR), and in Latvian LKS-92 system.
	Amount of sites	3607 deposits
	Is a number system used (national code system)?	Different coding is used for data storage: mostly the internal of SGSL, and in some cases national code system.
Samples		
	What is the amount of samples/ site?	Amount of information on different deposits varies very greatly. Data on individual samples are given for the results of laboratory analysis of peat, about 8 samples per deposit on the average.
	Sampling frequency?	There are no recurrent data in the database. All the information is

		given only as the latest data.
	Period	Laboratory analysis are from years 1981 - 1999. The data in the database have not been updated since 2000.
Parameters		
	List of parameters	
	Use of code list for parameters?	No
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	No

Data providers

Who make the samplings and gather information?	All the data is obtained by private companies exploring and / or mining the deposits. The respective information is received by SGSL as required by Latvian law.
Who enter data and maintain the contents of the database?	SGSL

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	*3*
System administrators	*1*
Developers (IT)	*2*

Use of the data

Users	*SGSL*
Used for	The database is used for more convenient everyday work in SGSL, in order to increase the productivity. Summary of information is

	published in the Annual Reports of SGSL.

(1/1)

Topic	
Institution	State Geological Survey of Latvia (SGSL)
Database name	***Geofond***
Short description of the Database bibliographic database on unpublished reports Geological Survey of Finland.	*Geofond* is an open reference database on unpublished reports for Latvia geology in the Archives of the SGSL. The time coverage of the reports is from 1937 to present. The database is updated continuously, and currently it contains more than 7200 records. The main DB fields are: Title, Author, Subject, Keyword, Geographical position and other.
Database type (paper, Access/Oracle/MS SQLServer/,)	Access
Responsible person(s) for data	Alda Reuta
Responsible person(s) for maintenance (run)	Georgij Konshin
Documentation for the database structure and software is elaborated and available?	Documentation for the database structure and software is available in the Information Department
Are there any ongoing projects that include development of databases or information systems?	No
Are there any planned activities on databases, data processing and information systems?	No
The database is evaluated in previous report(s).	No
Policy on data sharing	Data are Open to all users Ownership -SGSL

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	DB has no separate user interface..
Is the user interface made as a separate application?	DB has no separate user interface
Is the database implemented in a multi user system that allows many concurrent users?	No
Is it a stand alone application with only one user/operator?	Single-user database
Is data form the database available on the Internet?	Not yet
Can the database be updated by use of the Internet?	Not yet

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	
Information on sites		All these questions don't correspond to Reference database
	Geographic related (co-ordinates)	
	Amount of sites	
	Is a number system used (national code system)?	
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	

	Period	*(start year – end year)*
Parameters		
	List of parameters	
	Use of code list for parameters?	*(national codelists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	

Data providers

Who make the samplings and gather information?	Information department
Who enter data and maintain the contents of the database?	Information department

(4/4)
If data is available in electronic form
Staff/organisation for maintenance of database/ information system

Research engineers	1
System administrators	1
Developers (IT)	1

Use of the data

Users	DB have no the stakeholders
Used for	Data from the database are used in any reports, where the list of the previous reports is needed

Questionnaire/Database

Topic	
Institution	State Geological Survey of Latvia (SGSL)
Database name	***Army objects***
Short description of the Database bibliographic database on unpublished reports Geological Survey of Finland.	DB include the information concerning with geology and geoecology of the former USSR military sites on Latvia's territory
Database type (paper, Access/Oracle/MS SQLServer/,)	Access
Responsible person(s) for data	Alda Reuta
Responsible person(s) for maintenance (run)	Agris Lacis, head of Mineral resources Department
Documentation for the database structure and software is elaborated and available?	Documentation for the database structure and software is available in the Mineral resources Department
Are there any ongoing projects that include development of databases or information systems?	No
Are there any planned activities on databases, data processing and information systems?	No
The database is evaluated in previous report(s).	No
Policy on data sharing	Access to DB is restricted Ownership -SGSL

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	DB has no separate user interface..
Is the user interface made as a separate application?	DB has no separate user interface
Is the database implemented in a multi user system that allows many concurrent users?	No
Is it a stand alone application with only one user/operator?	Single-user database
Is data form the database available on the Internet?	No
Can the database be updated by use of the Internet?	No

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	Territory of Latvia, LKS-92
	Amount of sites	255
	Is a number system used (national code system)?	No
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	

	Period	1996 / 1999
Parameters		
	List of parameters	
	Use of code list for parameters?	*(national codelists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	

Data providers

Who make the samplings and gather information?	Information department
Who enter data and maintain the contents of the database?	Information department

(4/4)
If data is available in electronic form
Staff/organisation for maintenance of database/ information system

Research engineers	1
System administrators	1
Developers (IT)	1

Use of the data

Users	DB have no the stakeholders
Used for	Database are used by the organization interested in the data

(1/4)

Questionnaire/Database - 1

Topic	Coastal, transitional and marine
Institution	Institute of Aquatic Ecology, University of Latvia
Database name	Hydrology-hydrochemistry of the Gulf of Riga and the Baltic Proper
Short description of the database	Marine monitoring in the Gulf of Riga has been carried out from 1973 to 2002, with nutrient levels, oxygen levels, temperature and salinity etc. being measured. The measurements were performed within marine monitoring program by successive national responsible bodies. Sampling was done using research vessels 'Geofizikis' up to 1994, and 'Antonija' since 1995. Water samples for analyses were collected using Nansen batometers. After sampling to each sample has been assigned unique ID number. Those ID numbers are used in database as primary arrangement tool in parallel with chronological arrangement. Data in database are final values checked for analytical errors. However, at present state no analytically correct outliers are marked. Data base cover Gulf of Riga and Latvia's coastal part of Baltic Sea. Data are starting from 1973 and from once a year per station till 20 times a year per station.
Database type (paper, Access/Oracle/MS SQLServer/, …)	One copy Paradox, second copy SQL Server
Responsible person(s) for data	Juris Aigars
Responsible person(s) for maintenance (run)	Dagnija Fedorovica, Edgars Janusevskis
Documentation for the database structure and software is elaborated and available?	*No*
Are there any ongoing projects that include	*No*

development of databases or information systems?	
Are there any planned activities on databases, data processing and information systems?	*No*
The database is evaluated in previous report(s).	*No*
Policy on data sharing	*Publicly available on Internet*

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	Yes for SQL based database
Is the user interface made as a separate application?	*Query generates answer from dataset*
Is the database implemented in a multi user system that allows many concurrent users?	*Yes*
Is it a stand alone application with only one user/operator?	
Is data form the database available on the Internet?	*Yes, via query system either in graphical or numerical output*
Can the database be updated by use of the Internet?	*Yes, but this application is reserved for Administrator*

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	Not in a dataset
	Amount of sites	69
	Is a number system used (national code system)?	Yes
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	From once a year to 20 times per year
	Period	*1973-2002*
Parameters		
	List of parameters	temperature, salinity, oxygen, phosphate, total phosphorus, silicate, nitrite, nitrate, ammonium, total nitrogen, pH, chlorophyll
	Use of code list for parameters?	*(national codelists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	partly

Data providers

Who make the samplings and gather information?	Institute of Aquatic Ecology
Who enter data	Institute of Aquatic Ecology

and maintain the contents of the database?	

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	
System administrators	*2*
Developers (IT)	*(number of employees)*

Use of the data

Users	*Institute of Aquatic Ecology, Latvian Environment Agency, HELCOM/ICES, EEA*
Used for	*Annual reports of Latvia, HELCOM assessments, EEA reports*

(1/4)

Questionnaire/Database - 2

Topic	Coastal, transitional and marine
Institution	Institute of Aquatic Ecology, University of Latvia
Database name	Phytoplankton of the Gulf of Riga
Short description of the database	Studies of phytoplankton in the Gulf of Riga have been carried since 1975. 1975-1992 Samples were collected from 0 m and 10 m depth with bathometers. Formaldehyde was used for sample fixations. Since 1993 acid Lugol's solution is used for sample fixations. 1993-1998 According to Manual for Marine Monitoring in COMBINE Programme of HELCOM samples were collected from 0, 2.5; 5; 7.5 and 10 meter with bathometer and mixed together in one sample. The results were presented for integrated (0-10 m) water column. Since 1998 the counting program recommended by Manual for Marine Monitoring in COMBINE Programme of HELCOM is used. 1999-2002 According to Manual for Marine Monitoring in COMBINE Programme of HELCOM samples were collected with hose (0-10 m). Since 1997 data were send to Finish Institute of Marine Research homepage 'Algaline' (http://www4.fimr.fi/project/algaline/algaline.htm).
Database type (paper, Access/Oracle/MS SQLServer/, …)	Excell
Responsible person(s) for data	Juris Aigars, Iveta Ledaine
Responsible person(s) for maintenance (run)	Iveta Ledaine
Documentation for the database structure and software is elaborated and available?	*No*
Are there any ongoing projects that include development of databases or information systems?	*Yes, in-house*
Are there any planned	*Yes, in-house*

activities on databases, data processing and information systems?	
The database is evaluated in previous report(s).	*No*
Policy on data sharing	*Publicly available upon request*

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	*No*
Is the database implemented in a multi user system that allows many concurrent users?	*No*
Is it a stand alone application with only one user/operator?	
Is data form the database available on the Internet?	*No (partly in a form of reports)*
Can the database be updated by use of the Internet?	*No*

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	Not in a dataset
	Amount of sites	
	Is a number system used (national code system)?	Yes
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	From once a year to 20 times per year
	Period	*1975-2002*
Parameters		
	List of parameters	Phytoplankton
	Use of code list for parameters?	*(national codelists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	partly

Data providers

Who make the samplings and gather information?	Institute of Aquatic Ecology
Who enter data and maintain the contents of the database?	Institute of Aquatic Ecology

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	
System administrators	*1*
Developers (IT)	*1*

Use of the data

Users	*Institute of Aquatic Ecology, Latvian Environment Agency, HELCOM/ICES, EEA*
Used for	*Annual reports of Latvia, HELCOM assessments, EEA reports*

(1/4)

Questionnaire/Database - 3

Topic	Coastal, transitional and marine
Institution	Institute of Aquatic Ecology, University of Latvia
Database name	Mesozooplankton of the Gulf of Riga and the Baltic Proper
Short description of the database	Mesozooplankton data has been sampled with two types of vertically hauled nets- Juday net (mesh size 0.16 mm) in 1960-1998 and WP-2 net (mesh size 0.10 mm) since 1993 thus for five years some of the stations were sampled with both nets. Sampling according to HELCOM BMP requirements was started in 1993. Sampling in the Baltic Sea was fulfilled in 1960-1994 with Juday net and in 1993-1994 with WP-2 net. Using a plastic hose some coastal stations were sampled in 1999.
Database type (paper, Access/Oracle/MS SQLServer/, …)	Excell
Responsible person(s) for data	Juris Aigars, Anda Ikauniece
Responsible person(s) for maintenance (run)	Anda Ikauniece
Documentation for the database structure and software is elaborated and available?	*No*
Are there any ongoing projects that include development of databases or information systems?	*Yes, in-house*
Are there any planned activities on databases, data processing and information systems?	*Yes, in-house*
The database is evaluated in previous report(s).	*No*

Policy on data sharing	*Publicly available upon request*

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	*No*
Is the database implemented in a multi user system that allows many concurrent users?	*No*
Is it a stand alone application with only one user/operator?	
Is data form the database available on the Internet?	*No (partly in a form of reports)*
Can the database be updated by use of the Internet?	*No*

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	Not in a dataset
	Amount of sites	
	Is a number system used (national code system)?	Yes
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	
	Period	*1980-2002*
Parameters		
	List of parameters	Mesozooplankton
	Use of code list for parameters?	*(national codelists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	partly

Data providers

Who make the samplings and gather information?	Institute of Aquatic Ecology
Who enter data and maintain the contents of the database?	Institute of Aquatic Ecology

(4/4)
If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	
System administrators	*1*
Developers (IT)	*1*

Use of the data

Users	*Institute of Aquatic Ecology, Latvian Environment Agency, HELCOM/ICES, EEA*
Used for	*Annual reports of Latvia, HELCOM assessments, EEA reports*

(1/4)

Questionnaire/Database - 4

Topic	Coastal, transitional and marine
Institution	Institute of Aquatic Ecology, University of Latvia
Database name	Heavy metals and organic carbon in sediments of the Gulf of Riga
Short description of the database	Heavy metals and supporting parameters monitoring in sediments of the Gulf of Riga has been carried out from 1996 to 2002, with geochemical (aluminium, iron, manganese) and heavy (cadmium, chromium, copper, lead, mercury, nickel, zinc) metal and organic carbon levels being measured. The measurements were performed within marine monitoring program by national responsible bodies. Sampling was done using research vessels 'Antonija' once a year. Sediment samples were collected using Kajak gravity corer. After sampling top 6 cm (1996-1999) or 10 cm (2000-2002) of sediment core was sliced with step 2 cm and immediately frozen (-18 C). Strategy of sampling 1996 - first sampling locations (depth >20m) were chosen for sediment structure investigation. 1997-2000 sampling locations were combined with hydrological deepwater (>40 m) stations where fine-grained material (grain size <0.63 um) was 50%. Since 2001 according to ICES/HELCOM recommendation (EC MON 4/99, INF. 14/Item 4.1) point sampling strategy was changed to polygon sampling. Digestion for metal analysis 1996-1999 digestion with nitric acid in pressure bomb at 140 C. Since 2000 digestion with nitric acid in microwave oven closed system. Digested samples were analysed by atomic absorption spectrophotometer. Al, Cd, Cr, Cu, Fe, Mn, Ni, Pb, Zn by flame, Hg - cold vapour technique. Organic carbon was analysed since 2001 by elemental CHNS analyser. Data base cover Gulf of Riga. Data in database

	are final values with SD (since 2000).
Database type (paper, Access/Oracle/MS SQLServer/, …)	Excell
Responsible person(s) for data	Juris Aigars, Mintauts Jansons, Rita Poikane
Responsible person(s) for maintenance (run)	Rita Poikane
Documentation for the database structure and software is elaborated and available?	*No*
Are there any ongoing projects that include development of databases or information systems?	*Yes, in-house*
Are there any planned activities on databases, data processing and information systems?	*Yes, in-house*
The database is evaluated in previous report(s).	*No*
Policy on data sharing	*Publicly available upon request*

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	*No*
Is the database implemented in a multi user system that allows many concurrent users?	*No*
Is it a stand alone application with only one user/operator?	
Is data form the database available on the Internet?	*No (partly in a form of reports)*
Can the database be updated by use of the Internet?	*No*

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	Not in a dataset
	Amount of sites	
	Is a number system used (national code system)?	Yes
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	
	Period	*1996-2002*
Parameters		
	List of parameters	aluminium, cadmium, copper, chromium, iron, lead, manganese, mercury, nickel, zinc
	Use of code list for parameters?	*(national codelists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	partly

Data providers

Who make the samplings and gather information?	Institute of Aquatic Ecology
Who enter data and maintain the contents of the database?	Institute of Aquatic Ecology

(4/4)
If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	
System administrators	*1*
Developers (IT)	*1*

Use of the data

Users	*Institute of Aquatic Ecology, Latvian Environment Agency, HELCOM/ICES, EEA*
Used for	*Annual reports of Latvia, HELCOM assessments, EEA reports*

Comment: Several databases – heavy metals in biota, persistent organic pollutants in biota, poliaromatic hydrocarbons in sediments, macrozoobenthos, phytobenthos – are currently under revision. So for these datasets currently accurate information is not available.

(1/4)

Questionnaire/Database

Topic	Water flow and precipitation database
Institution	Latvian Hydrometeorological Agency
Database name	Clidata
Short description of the database	Measured discharges, calculated daily discharges, sum of precipitation for fixed periods.
Database type (paper, Access/Oracle/MS SQLServer/, …)	Water flow: paper 1877-1990, Oracle 1991-2002, Access 2003; Precipitation: Oracle 1895-2003 (partly), paper
Responsible person(s) for data	Staff of Observation Department
Responsible person(s) for maintenance (run)	Staff of Observation Department, Staff of Computer System Department
Documentation for the database structure and software is elaborated and available?	Computer System Department
Are there any ongoing projects that include development of databases or information systems?	No
Are there any planned activities on databases, data processing and information systems?	No
The database is evaluated in previous report(s).	No
Policy on data sharing	All measured data are available for the public. Calculated data are for sale according the price list regulated by government.

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	No
Is the user interface made as a separate application?	By Oracle Discoverer software users can order data from database
Is the database implemented in a multi user system that allows many concurrent users?	Yes
Is it a stand alone application with only one user/operator?	No
Is data form the database available on the Internet?	Partly
Can the database be updated by use of the Internet?	No

(3/4)
If data is available in electronic form

Structure and contents of the database

ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	
	Amount of sites	39 water flow stations, 90 precipitation stations
	Is a number system used (national code system)?	National code system
Samples		
	What is the amount of samples/ site?	Per year in average: 24 discharge measurements/site, 730 precipitation measurements/site
	Sampling frequency?	Discharge measurements: 2 times/month; precipitation measurements: 2 times/day
	Period	Water flow: 1887-2003; Precipitation: 1887-2003
Parameters		
	List of parameters	Daily discharge, measured discharges, amount of precipitation
	Use of code list for parameters?	National for water flow, both (national and international code list for precipitation)
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	Yes

Data providers

Who make the samplings and gather information?	Field teams – for measured discharges, Observers staff – for precipitation
Who enter data and maintain the contents of the database?	Observation Department - for data entering, Computer System Department - for data maintaining.

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	4
System administrators	1
Developers (IT)	No

Use of the data

Users	All Departments of LHMA
Used for	Monthly and yearly summaries, Eurostat, yearly reports to the Global Precipitation Climatology Project and BALTEX Project.

(1/4)

Questionnaire/Database

Topic	Bathing water monitoring
Institution	Public Health Agency (PHA)
Database name	Bathing water monitoring database
Short description of the database	The main goal of the database is to collect all information concerning bathing water quality to facilitate work of PHA specialists and to support public access to the information via Internet and annual reports. The database is operating on the base of regulation Nr. 300 of the Cabinet of Ministers "Requirements of hygiene and equipment of bathing places" (enforced since September 1, 1998).
Database type (paper, Access/Oracle/MS SQLServer/, …)	Separate MS Excel sheets from PHA regional branch offices (laboratories) that perform testing of bathing water quality.
Responsible person(s) for data	PHA regional branch offices
Responsible person(s) for maintenance (run)	PHA staff
Documentation for the database structure and software is elaborated and available?	The template of MS Excel worksheets are available (look attachment 18A_tab.xls). The template was developed by staff of PHA.
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)*
Are there any planned activities on databases, data processing and information systems?	Yes, it is proposed project together with Sanitary Inspection for bathing water information system to get financing from EU funds. The project is evaluated by specialists in Ministry of Finance at present.
The database is evaluated in previous report(s).	*(list reports)*
Policy on data sharing	The data are public available from PHA website.

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	MS Excel
Is the user interface made as a separate application?	No.
Is the database implemented in a multi user system that allows many concurrent users?	No, at present. In future it will be multi user system.
Is it a stand alone application with only one user/operator?	Yes, at present.
Is data form the database available on the Internet?	The data are available in PHA web site.
Can the database be updated by use of the Internet?	Not now, but will be possible in future.

(3/4)
If data is available in electronic form

Structure and contents of the database

List of tables	(collect list if available!)	
ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	
	Amount of sites	All bathing sites are in ANNEX 1 of regulation Nr.300 of the CM.
	Is a number system used (national code system)?	No.
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	2 times every month
	Period	Since 1998
Parameters		
	List of parameters	All parameters are in ANNEX 2 of regulation Nr.300 of the CM.
	Use of code list for parameters?	No.
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	No. It is not relevant to PHA work!

Data providers

Who make the samplings and gather information?	PHA regional branch offices
Who enter data and maintain the contents of the database?	PHA regional branch offices. PHA central office check the data quality.

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	*(number of employees)*
System administrators	*(number of employees)*
Developers (IT)	*(number of employees)*

PHA IT staff deals only with equipment and standart software maintanance. All IT developing work are contracting to IT companies.

Use of the data

Users	PHA central staff and regional branches.
Used for	Preparing reports and public awareness.

(1/4)

Questionnaire/Database

Topic	Drinking water monitoring
Institution	Public Health Agency (PHA)
Database name	Drinking water monitoring database
Short description of the database	The main goal of the database is to collect all information concerning drinking water quality to facilitate work of PHA specialists and to support public access to the information via Internet and annual reports. The database is operating on the base of regulation Nr. 235 of the Cabinet of Ministers "Requirements of quality and harmlessness of drinking water and procedure of monitoring and inspection" (enforced since May 31, 2003).
Database type (paper, Access/Oracle/MS SQLServer/, …)	Separate MS Excel sheets from enterprises (water suppliers) that perform operating monitoring and data about auditing monitoring performed by Laboratory of PHA (to check the operating monitoring).
Responsible person(s) for data	Enterprises (water suppliers) for actual and accurate data providing. Specialists of PHA regional branches for data entry.
Responsible person(s) for maintenance (run)	PHA staff.
Documentation for the database structure and software is elaborated and available?	The template of MS Excel worksheets are available (look attachment 18B_tab.doc). The template was developed by staff of PHA.
Are there any ongoing projects that include development of databases or information systems?	Yes, it is proposed to developed Drinking water information system in the framework of Phare project "Environment monitoring"(Desiree Number: LE.02.09.01) for Latvia. The Terms of Reference of Tender (LOT 2: Drinking water monitoring) was prepared and is available in Ministry of Environment (Department of Investment).
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)*
The database is evaluated in previous report(s).	*(list reports)*

Policy on data sharing	The data are public available. PHA summarises the monitoring data annualy and submit the report to Ministry of Health, Sanitary Inspection, Latvian Environment Agency and Food and veterinary Service. (Paragraph 34 in regulation Nr.235 of the CM) PHA once in tree years prepare public report about quality of drinking water in country. (Paragraph 35 in regulation Nr.235 of the CM) PHA support access to the data of water quality monitoring according to requirements of state information systems. (Paragraph 36 in regulation Nr.235 of the CM)

(2/4)
If data is available in electronic form

User interface

Is the User interface included in the database software?	MS Excel
Is the user interface made as a separate application?	No.
Is the database implemented in a multi user system that allows many concurrent users?	No, at present. In future it will be multi user system.
Is it a stand alone application with only one user/operator?	Yes, at present.
Is data form the database available on the Internet?	The data are available in PHA web site.
Can the database be updated by use of the Internet?	Not now, but will be possible in future.

(3/4)
If data is available in electronic form

Structure and contents of the database

List of tables	(collect list if available!)	
ER-diagram	(collect diagram if any!)	
Information on sites		
	Geographic related (co-ordinates)	No.
	Amount of sites	Water suppliers
	Is a number system used (national code system)?	No.
Samples		
	What is the amount of samples/ site?	
	Sampling frequency?	Look at ANNEX 2 of regulation Nr.235 of the CM
	Period	Since June 2003 (previous data were collected based on former regulations Nr. 63 of CM – 23.02.1999)
Parameters		
	List of parameters	Look at ANNEX 2 of regulation Nr.235 of the CM
	Use of code list for parameters?	MS Excel worksheets does not contain actual testing values – instead of values there are only number of samples that confirm or that are not compliant to quality criterias.
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	No. This information is available only in enterprises and is not collected in MS Worksheets. Minimal requirements are described in ANNEX 2 of regulation Nr.235 of the CM

Data providers

Who make the samplings and gather information?	Enterprises (water suppliers) – sampling; PHA regional branches – gathering information.
Who enter data and maintain the contents of the database?	PHA staff.

(4/4)

If data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	*(number of employees)*
System administrators	*(number of employees)*
Developers (IT)	*(number of employees)*

PHA IT staff deals only with equipment and standart software maintanance. All IT developing work are contracting to IT companies.

Use of the data

Users	PHA central staff and regional branches.
Used for	Preparing reports and public awareness.

(1/4)

Questionnaire/Database

Topic	Land reclamation
Institution	Ministry of Agriculture, Rural Support Service
Database/registry name	Register of Land Reclamation
Short description of the database/registry	The goal of the data base is to create the cadatre of the land reclamation in digital way to be able easy to detect the location of the hydrological constructions, their size, quantative and qualitive status, parameters, owners, users etc.
Database type (paper, excel/Oracle/MS SQLServer/, …)	Microstation Geographics, Excel
Responsible person(s) for data	Rural Support Service, Head of Land Reclamation division Ēriks Krēsliņš
Responsible person(s) for maintenance (run)	Four regional boards - Lielrīgas RLP - P. Guslens, Ziemeļkurzemes RLP – U. Mednis, Ziemeļvidzemes RLP – Dz.Zadraka, Aiviekstes MSVP – A. Sluckis
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)* The database is in the developing phase in all regional boards
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)*
The database/registry is evaluated in previous report(s).	*(list reports)* *Ziņojums Eiropas ziemeļvalstu ūdenssaimniecības speciālistu seminārā – Jūrmalā 2002.g., LLU Lauku inženieru fakultātes zinātniskitehniskajā konferencē 2002.g.*
Policy on data sharing	*(Are data available for the public, other institutions, research engineers, scientists ?)* Owners of the land reclamation constructions, state institutions have access *Ownership?* Rural Support Service

(2/4)
Only if data is available in electronic form

User interface

	Documentation for the database structure and software is elaborated and available?	*(if yes then where to obtain)* *In the phase of development.*
	Is the User interface included in the database software?	*In the phase of development.*
	Is the user interface made as a separate application?	*(if yes, please describe how is the application connected to the database) In the phase of development.*
	Is the database implemented in a multi user system that allows many concurrent users?	*In the phase of development.*
	Is it a stand alone application with only one user/operator?	
	Is data form the database available on the Internet?	*(if yes, please describe how)* *No*
	Can the database be updated by use of the Internet?	*(if yes, please describe how)* *No*

(3/4)
Italic only if data is available in electronic form

Structure and contents of the database/registry

ER-diagram	*(collect diagram if any!)*	
Information on sites		
	Geographic related (co-ordinates)	LKS - 92
	GIS maps exist	Yes
	Amount of sites	All agriculture area of Latvia
	Is a number system used (national code system)?	National coding system of water catchment areas.
Samples		
	What is the amount of samples/ site?	All agriculture area of Latvia that contains land reclamantion constructions
	Sampling frequency?	According needs
	Period	*(start year – end year)1997 up to now*
Parameters		
	List of parameters	
	Use of code list for parameters?	*(National code lists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	ir

Data providers

Who make the samplings and gather information?	Foure regional boards
Who enter data and maintain the	Foure regional boards

contents of the database/registry?	

(4/4)

Only if data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	*(number of employees)* *All employees of Land Reclamation division of Rural Support Service*
System administrators	*(number of employees* in each regional board
Developers (IT)	*(number of employees)* in each regional board

Use of the data

Users	*(please list the stakeholders of the database)*
Used for	*(please list the reporting where data from the database is used)* For needs of land reclamation cadastre, for construction, maintanance un repairing works of land reclamation systems, for evaluation of agriculture lands, for issue of technical regulations to establish other constructions and communications on reclamated lands, for the register of drains etc.

(1/4)

Questionnaire/Database

Topic	**Use of pesticides**
Institution	Ministry of Agriculture (State Plant Protection Service - SPPS)
Database/registry name	Sealed plant protection products (PPP) in Latvia (within the period of one year)
Short description of the database/registry	It contains information about all licensed sealers and importers of pesticides in Latvia and about the amount of pesticides, imported and sealed by each of them.
Database type (paper, excel/Oracle/MS SQLServer/, …)	Microsoft Access data base
Responsible person(s) for data	Leaders of regional departments of SPPS. They are gathering the reports from each of the licensed sealers and importers of pesticides
Responsible person(s) for maintenance (run)	Senior inspector of Division for Organization of Control of Circulation of PPP
Are there any ongoing projects that include development of databases or information systems?	*(if yes then list references to the projects)* Yes, it is the project of SPPS and it will include the development of big data base, which will include information from all departments of SPPS.
Are there any planned activities on databases, data processing and information systems?	*(if any please describe)* Development of new database, where will be information about the amount of sailed/used pesticides and about all licences for trade/import organizations of pesticides
The database/registry is evaluated in previous report(s).	*(list reports)* -
Policy on data sharing	*(Are data available for the public, other institutions, research engineers, scientists … ?)* Yes,data are available, but only if the official request is received from the data users. *Ownership?* SPPS

(2/4)
Only if data is available in electronic form

User interface

Documentation for the database structure and software is elaborated and available?	*(if yes then where to obtain)* no
Is the User interface included in the database software?	yes
Is the user interface made as a separate application?	*(if yes, please describe how is the application connected to the database)*
Is the database implemented in a multi user system that allows many concurrent users?	*no*
Is it a stand alone application with only one user/operator?	*yes*
Is data form the database available on the Internet?	*(if yes, please describe how)* *no*
Can the database be updated by use of the Internet?	*(if yes, please describe how)* *no*

(3/4)
Italic only if data is available in electronic form

Structure and contents of the database/registry

ER-diagram	*(collect diagram if any!)*	-
Information on sites		
	Geographic related (co-ordinates)	-
	Amount of sites	-
	Is a number system used (national code system)?	-
Samples		
	What is the amount of samples/ site?	The data base, that we have, don't contain any information about sampling procedure
	Sampling frequency?	-
	Period	*(start year – end year)* the period of one year
Parameters		
	List of parameters	
	Use of code list for parameters?	*(National code lists, international code lists)*
	Are all values/results described with information on unit, method used, Detection Limit or other attributes?	Yes, it is described with information on unit

Data providers

Who make the samplings and gather information?	Regional senior inspectors of Plant protection and quarantine are gathering information from businessmen's, but Senior inspector of Department for Control of Circulation of Plant Protection Products is gathering information

	from the regional inspectors
Who enter data and maintain the contents of the database/registry?	Senior inspector of Department for Control of Circulation of Plant Protection Products

(4/4)

Only if data is available in electronic form

Staff/organisation for maintenance of database/ information system

Research engineers	*(number of employees)* *-*
System administrators	*(number of employees)* *1*
Developers (IT)	*(number of employees)* *2*

Use of the data

Users	*(please list the stakeholders of the database)* State Plant Protection Service, Department for Control of Circulation of Plant Protection Products
Used for	*(please list the reporting where data from the database is used)* *-for the needs of SPPS* *-for answer on official request of the information from other state or private institutions*

16 ANNEX F, GIS layers identified in guidance

Layer Code	Layer	Definition	Attributes (see Data Dictionary for complete list)	Positional Accuracy
SW1	River Basin District	art 2, annex I, ii) River basin district means the area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is identified under Article 3(1) as the main unit for management of river basins.	Name of river basin district, European code	Recommended: 125 metres Minimum: 1000 metres
S2	River Basin, Sub-Basin	art 2, annex I, ii) River basin means the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta. Sub-basin means the area of land from which all surface run-off flows through a series of streams, rivers and, possibly, lakes to a particular point in a water course (normally a lake or a river confluence)	Name of the river basin district Name of the basin/sub basin National code European code	Recommended: 125 metres Minimum: 1000 metres
SW3	Main Rivers	Main rivers of the river basin district used for general overview (selection of rivers from SW4)	Name of river European ID of river	Recommended: 125 metres Minimum: 1000 metres
SW4	Surface Water bodies - rivers - lakes - transitional waters - coastal waters if applicable, indicated as artificial surface water body or heavily modified surface water body		Category (river, lake, transitional water, coastal water) Name European Code National Code	Recommended: 125 metres Minimum: 1000 metres
SW4a	Types of Surface Water Bodies, differentiated for each category		Type, number of values and underlying attributes can be different per category and between River Basin Districts	n.a. (linked to layer SW4)
SW4 b	Ecological status		European code of SW body Ecological status: High, good, moderate,	n.a. (linked to layer SW4)

Layer Code	Layer	Definition	Attributes (see Data Dictionary for complete list)	Positional Accuracy
			poor, bad	
SW4 c	Ecological potential	Classification of the ecological potential for each body of water (artificial water bodies or heavily modified water).	European code of SW body Ecological potential: Good and above, moderate, poor, bad	n.a. (linked to layer SW4)
SW4 d	Bad status or potential causes by (non-) synthetic pollutants.	annex V – 1.4.2-iii Those bodies of water where failure to achieve good status or good ecological potential is due to non-compliance with one or more environmental quality standards which have been established for that body of water in respect of specific synthetic and non-synthetic pollutants.	European code of SW body Non-compliant: true or false	n.a. (linked to layer SW4)
SW4 e	Chemical status	see above	European code of SW body Chemical status: Good or 'Failing to achieve good'	n.a. (linked to layer SW2)
SW5 a	Operational monitoring sites Inclusive monitoring sites for habitat and species protected areas	annex V - 1.3.2, V - 1.3.5	Name of site European code Country name or code	Recommended: 125 metres Minimum: 1000 metres
SW5 b	Surveillance monitoring sites	annex V - 1.3.1	Name of site European code Country name or code	Recommended: 125 metres Minimum: 1000 metres
SW5 c	Monitoring sites drinking water abstraction points from surface water	annex V - 1.3.5	Name of site European code Country name or code	Recommended: 125 metres Minimum: 1000 metres
SW5 d	Investigative monitoring sites	annex V - 1.3.3	Name of site European code Country name or code	Recommended: 125 metres Minimum: 1000 metres
SW5 e	Reference monitoring sites	annex II - 1.3 (iv)	Name of site European code	recommended: 125 metres

Layer Code	Layer	Definition	Attributes (see Data Dictionary for complete list)	Positional Accuracy
			Country name or code	Minimum: 1000 metres
GW1	Bodies of groundwater	Location and boundaries of groundwater bodies	Name of groundwater body ID of groundwater body	Recommended: 125 metres Minimum: 1000 metres
GW1 a	Quantative status of groundwater bodies	annexes V - 2.2.4, V - 2.5, VII - 4.2 Quantative status of groundwater bodies: Good: green Poor: red	European code of GW body Quantative status: Good or Poor	n.a. (linked to layer GW1)
GW1 b	Chemical status of groundwater bodies	annex V – 2.4.5, V – 2.5, VII – 4.2 Chemical status of groundwater bodies: Good: green Poor: red	European code of GW body Chemical status: Good or Poor	n.a. (linked to layer GW1)
GW1 c	Pollutant trend	groundwater bodies which are subject to a significant and sustained upward trend in the concentrations of any pollutant resulting from the impact of human activity (black dot). Reversal of a trend (blue dot)	European code of GW body Pollutant trend: Upward or reversed Confidence level of the trend	n.a. (linked to layer GW1)
GW2 a	Groundwater level monitoring network	annex V - 2.2	Name of site European code Country name or code	Recommended: 125 metres Minimum: 1000 metres
GW2 b	Operational monitoring network chemical	annex V - 2.4	Name of site European code Country name or code	Recommended: 125 metres Minimum: 1000 metres
GW2 c	Surveillance monitoring network chemical	annex V - 2.4	Name of site European code Country name or code	Recommended: 125 metres Minimum: 1000 metres

Layer Code	Layer	Definition	Attributes (see Data Dictionary for complete list)	Positional Accuracy
PA1	Drinking water protection areas	(i) areas designated for the abstraction of water intended for human consumption under Article 7;	ID or Name of protected area Protected area type	Recommended: 125 metres Minimum: 1000 metres
PA2	Economically significant aquatic species protection areas (shellfish)	(ii) areas designated for the protection of economically significant aquatic species;	ID or Name of protected area Protected area type	Recommended: 125 metres Minimum: 1000 metres
PA3	Recreational waters	(iii) bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC	ID or Name of protected area Protected area type	Recommended: 125 metres Minimum: 1000 metres
PA4	Nutrition-sensitive areas	(iv) nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive) and areas designated as sensitive areas under Directive 91/271/EEC (Urban Waste Water Treatment Directive)	ID or Name of protected area Protected area type	Recommended: 125 metres Minimum: 1000 metres
PA5	Habitat protection areas (FFH)	(v) areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (habitats) and Directive 79/409/EEC (Birds).	ID or Name of protected area Protected area type	Recommended: 125 metres Minimum: 1000 metres
PA6	Bird protection areas	see above	ID or Name of protected area Protected area type	Recommended: 125 metres Minimum: 1000 metres
PA7	Status of protected areas		ID or Name of protected area Status	n.a. (linked to layers PA1 – PA6)
D1	International borders (NUTS 0)			Recommended: 125 metres Minimum: 1000 metres
D2	Corine Landcover			
D3	Relief/Heights			
D4	Settlements (selection of NUTS	only for reference, so bigger settlements		

Layer Code	Layer	Definition	Attributes (see Data Dictionary for complete list)	Positional Accuracy
	4)			
D5	Transport			
D6	Ecoregions			Recommended: 125 metres Minimum: 1000 metres
D7	District of competent Authorities			Recommended: 125 metres Minimum: 1000 metres
D8	National borders (NUTS 1)			