Annual Report

2013

T. G. Masaryk Water Research Institute, public research institution

Prague 2014

Index

Introduction

In recent years, I regularly state in this introduction that previous year was characterized by high level of uncertainty and changes that directly or indirectly affected the T. G. Masaryk Water Research Institute, public research institution (TGM WRI, p.r.i. – Institute). Year 2013 followed up the previous years in this aspect: during the year the principal changes took place in external environment and inside the Institute.

These changes occurred on governmental level with consequent legislative elections and at the Ministry of the Environment of the Czech Republic where changes occurred on the position of minister and deputy ministers. The change at the Ministry of the Environment with direct impact on the water resource management was the designation of new director of the Department of Water Protection and consequent principal changes in staff. The changes occurred also in the other organizations collaborating with the Institute: Elbe River Board, state enterprise, Morava River Board, state enterprise and Directorate of Waterways. The uncertainty regarding the staffing in the external environment characterized also the Institute. During the 2013, I was in total four times authorized to direct the public research institution for fixed period of time.

Many changes occurred also in the Institute in 2013. The reference laboratories for components of the environment were reorganized and the Branch of Applied Ecology has a new management. The other changes occurred in the section of director and also in secretariats of the deputy directors. The contract with the new patent attorney was made. The new common accreditation of the reference laboratories for components of the environment and water technology was implemented. All these changes occurred consequently to processing of the new strategy of the Institute until 2020. The selected employees were evolved in the preparation of the strategy.

First informal meeting of experts in water resource management took place in cooperation with Heineken and SWECO Hydroprojekt in the Institute on 30th May 2013. The experts from different organizations had opportunity to discuss the current issues in the informal atmosphere. This meeting took place only two days before the onset of the flood that affected the considerable part of the Czech Republic including the Institute. The employees of the Institute evacuated the property of the Institute at safety places before the Institute was flooded. Thanks to that the damages on movable property were minimized; most importantly the data and information on current projects were saved. Despite this, the damages on property were above 22 million CZK. Nevertheless, the damages are repaired now and employees can continue in work on research projects. I would like to thank to all that participated in rescue of the property and repair of the flood damages.

The Institute participated in projects that were supported by Operational Programme "Environment", by State Environmental Fund and by other funds: Technology Agency of the Czech Republic, Grant Agency of the Czech Republic, Ministry of the Interior, Ministry of Agriculture, and Ministry of Culture. The Institute also participated in the international projects financed by European Union, e.g. the collaboration with Saxony partners in frame of the project financed by Goal 3. We succeeded in participation in many commercial contracts and projects that are only one financial source for possible co-financing of research projects.

The project Strategy of the Protection against the Negative Impacts of Floods and Erosion Phenomena by the Semi-natural Measures in the Czech Republic started and the subcontracts were put out to tender. The Institute participated in trade fairs Česká příroda, VOD-KA and at scientific workshops and conferences.

In conclusion, I would like to thank to all, who participated in 2013 in that T. G. Masaryk Water Research Institute, public research institution, performs the function of the national and international research centre in the field of water and waste.

Mgr. Mark Rieder
director of the public research institution

2 Information on Institute Bodies Members and Activities

2.1 Institute bodies and their members

a) Director: Mgr. Mark Rieder (authorized to manage the institution in 2013)

b) The Council of the T. G. Masaryk Water Research Institute, p.r.i.:
Ing. Petr Tušil, Ph.D., MBA (TGM WRI, p.r.i., Ostrava Branch) – chairman,
RNDr. Dana Baudišová, Ph.D. (TGM WRI, p.r.i., Prague) – deputy chairman,
Ing. Eduard Hanslík, CSc. (TGM WRI, p.r.i., Prague),
Ing. Anna Hrabánková (TGM WRI, p.r.i., Prague),
Ing. Jaroslav Beneš (Vltava River Board, state enterprise, Prague),
Ing. Rut Bízková (President of the Technology Agency of the Czech Republic, Prague),
Mgr. Vít Kodeš (Czech Hydrometeorological Institute, Prague).

Secretary of the Council of TGM WRI, p.r.i., is Ing. Michal Vaculík.

c) Supervisory Board of the T. G. Masaryk Water Research Institute, p.r.i.:
Ing. Jiří Červenka (Ministry of the Environment of the CR, Director of the Department of Internal Audit and Financial Inspection) – chairman,
Prof. Ing. Jiří Wanner, DrSc. (Institute of Chemical Technology, Prague, professor) – deputy chairman,
Ing. Milan Blažek (Ministry of the Environment of the CR, Director of the Department of Budget),
Doc. RNDr. Jakub Hruška, CSc. (Czech Geological Survey, research scientist),
Mgr. Jakub Čurda (Ministry of Agriculture of the CR, Head of the Water Management Policy Department),
Ing. Roman Dvořák (TGM WRI, p.r.i., the head of Centre for Assessing Proficiency of Laboratories – ASLAB).

Secretary of the Supervisory Board of TGM WRI, p.r.i., is Ing. Jan Rykl from TGM WRI, p.r.i.

2.2 The Report on activity of the Council of the T. G. Masaryk Water Research Institute, p.r.i., in 2013

The members of the Council of the T. G. Masaryk Water Research Institute, public research institution (TGM WRI Council), have not changed in 2013.

Six meetings of the TGM WRI Council took place in 2013. The most important conclusions of these meetings were as follows:

- TGM WRI Council approved the adjustment of the organizational protocol of TGM WRI, p.r.i., in 2013.
- TGM WRI Council discussed and approved the 2012 Annual Report in accordance with section 18, article (2), letter e) of Act No. 341/2005 Coll., about public research institutions, as amended.
- TGM WRI Council approved proposed budget of the institute for the 2013 period. Report in accordance with section 18, article (2), letter e) of Act No. 341/2005 Coll., about public research institutions, as amended. The budget was created as a balanced. Investment plan was also approved.
- The Minister of the Environment Mgr. Tomáš Chalupa assigned Mgr. Mark Rieder of managing TGM WRI, p.r.i. The effective date was 1st January 2013. The authorization was temporally

restricted until 28th February 2013. The Minister of the Environment Mgr. Tomáš Chalupa assigned Mgr. Mark Rieder of managing TGM WRI, p.r.i., in accordance with Act No. 341/2005 Coll., about public research institutions, as amended (the official title is "the person authorized to direct the public research institution"). The effective date was 1st March 2013. The authorization was temporally restricted until 31st May 2013. The authorization was extended until 30th September 2013. Consequently, the ministry assigned Mgr. Mark Rieder of managing TGM WRI, p.r.i., with no time restriction. The effective day was 1st October 2013.

- The proceedings are made from every meeting. After ten days of approval procedure by members of the TGM WRI Council the proceedings are at disposal to all employees in internal information database of the Institute.

Second year of activity of the newly elected TGM WRI Council was relatively administratively challenging according to its rights and duties which were given to the Council by Act No. 341/2005 Coll., about public research institutions, as amended, particularly the legal duties regarding authorization of Mr. Mark Rieder as a director of the TGM WRI, p.r.i.

TGM WRI Council also discussed the possibilities of the participation of the Institute in national and international research projects at every meeting. TGM WRI Council also dealt with current status and development of selected economical parameters of the 2013. TGM WRI Council fulfilled all its duties in 2013. The duties are defined by the above mentioned act.

2.3 The Report on activity of the Supervisory Board of the T. G. Masaryk Water Research Institute, p.r.i., in 2013

In 2013, three meetings of the Supervisory Board took place on 16th April, 15th May and 20th November. The most important conclusions are listed below. Director of TGM WRI, p.r.i., Mgr. Mark Rieder participated in all meetings.

The Supervisory Board, after discussion, considered

- The Draft of 2012 Annual report and recommended its approval by the Council of TGM WRI, p.r.i., after including additional data,
- Results of economic activities of TGM WRI, p.r.i., in 2012 that are described in 2012 Annual Report with no objection.
- The Draft of the budget of TGM WRI, p.r.i., for 2013

The Report on activity of the Supervisory Board of the TGM WRI, p.r.i., in 2012 was processed and transferred to be included in 2012 Annual Report.

The Supervisory Board presented the Report about its fifth year of activity (from 1st June 2012 to 31st May 2013) to the founder and Mgr. Mark Rieder within the meaning of paragraph 19 article (1), letter l) of Act No. 341/2005 Coll., as amended.

The Supervisory Board also dealt with current issues of TGM WRI, p.r.i., activities, e.g. the project Strategy of the Protection against the Negative Impacts of Floods and Erosion Phenomena by the Semi-natural Measures in the Czech Republic, economic issues, damages caused by the flood in June 2013 and issues of centralized assignment of services and purchases.

3 Profile of the Institute

TGM WRI was included to the Register of public research institutions, administered by the Ministry of Education, Youth and Sports, on 1st January 2007.

The activities of the Institute are based on the founding deed of the public research institutions given by Provision No. 12/06 of the Ministry of the Environment from 12th December 2006, as amended by Provision No. 2/11 of the Ministry of the Environment on publication of the full wording of the founding deed from 31st May 2011.

Authorities of the Institute according to Article 16 of Act No. 341/2005 Coll., as amended, are as follows:

■ The Director is an official representative competent to make decisions within the framework of the public research institution, with the exception of issues in competence of the Council of the Institute, the Supervisory Board or the founder of the Institute.

■ Council of the T. G. Masaryk Water Research Institute, public research institution.

■ Supervisory Board of the T. G. Masaryk Water Research Institute, public research institution.

The main mission of the Institute is:

- the research of the status, use and changes of water ecosystems and their linkages with landscape and related environmental risks; waste and packaging management,
- professional support of the water protection; prevention of flood risks and waste and packaging management based on the above mentioned research.

Activities of TGM WRI are categorized into main activity and additionally activity according to the founding deed.

The main activity includes

■ hydrological, hydrogeological and hydraulic research ■ research of water resources, protection of water and protection of river basins ■ research in water chemistry, toxicology and radiology ■ research in water biology and microbiology ■ research of processes caused by water pollution and elimination of pollution ■ research of the status of water and water bodies and protection of aquatic ecosystems ■ research of methods for identification and evaluation of water status ■ research of ecological relations of water in a landscape ■ research of monitoring methods, field measurements and sampling techniques including technical instruments ■ research of methods in analytical chemistry including technical instruments ■ research of methods for information processing, development and use of databases including geographical information systems ■ economic research in relation to water and its use as a component of the environment ■ research in remediation of river systems and aquatic remediation of damaged landscape ■ research for selection of water biotopes suitable for renewal or remediation and management of databases of relevant sites ■ research for protection against harmful impacts of water ■ research in water management planning, water balance and use of water ■ research in waste management, composition and quality of waste, including dangerous waste and its impact on aquatic environment ■ research of risks of landfills and contaminated sites for the water environment ■ research of management of packaging and packaging waste ■ research, development, application and evaluation of technological methods for waste management including assessment of waste production and waste management ■ development of research infrastructure.

Within its additional activity the Institute ensures

■ expert opinions, positions, assessments and analyses in the area of the main activity ■ observations, field measurements, sample analyses, chemical analyses in the area of the main activity ■ international cooperation, activities in a framework of relevant thematic strategies in the area of the main activity ■ cooperation with universities, institutes of the Academy of Sciences and other research institutions in the area of the main activity ■ publishing and dissemination of information in the area of the main activity ■ proposing of parameters of good ecological status of water ■ proposing of programmes for reduction of pollution of surface water by dangerous harmful substances and priority dangerous substances ■ assessment of sensitive and vulnerable zones, as well as surface water suitable for life and reproduction of native fish species and other aquatic fauna, protected areas of natural accumulation of water and bathing surface water ■ proposing and monitoring of areas of natural accumulation of water in the area of the main activity ■ proposing protection measures for water resources ■ maintaining registry of watercourses and water reservoirs, protection zones of water supply reservoirs and water supply groundwater resources ■ maintaining thematic water management cartography ■ assessment and evaluation of surface water and groundwater regime in relation to status of use of water resources ■ determination of minimum residual flows and minimum groundwater levels ■ expert support to preparation of district river basin management plans ■ operation of reference laboratories for all components of the environment ■ proficiency testing of hydroanalytical laboratories for chemical, biological, microbiological, toxicological and radiochemical analytical methods and organizing intercalibration laboratory testing in the area of the environment ■ methodological guidance for hydroanalytical laboratories and unification of their practices ■ expert support to prevention of major accidents involving chemical substances and preparations, ■ participation in operating the permanent and emergency component of the national radiation monitoring network ■ development and operation of the evaluation system of status and potentials of water bodies and reference conditions of water bodies ■ establishment and operation of monitoring network for observation of surface water and groundwater except their quality ■ strategic and organizational provisions of activities for evaluation and assessment of status of surface water and groundwater ■ maintaining and updating registries of water of public administration information system ■ assessment of technologies and evaluation of operation of technological installations for water treatment and wastewater treatment ■ evaluation of effectiveness of remediation measures of river systems ■ expert support to the international cooperation of CR within the framework of bilateral and multilateral agreements and conventions in the area of water protection ■ preparation of background documents necessary for meeting the obligations towards the European Union and documents included in reports on implementation of directives in the area of water protection and waste management according to the requirements of the European Community ■ evaluation of waste management methods for individual waste types ■ operating the waste management information systems and maintaining registry of production and management of waste and packaging ■ evaluation of analytical methods and quality of waste, evaluation of efficiency of waste treatment technologies including dangerous waste ■ carrying out the function of the National inspection authority for proper laboratory practice ■ expert support to updating and evaluation of waste management plans ■ provision of information on the status of the environment in the area of waste management ■ carrying out the function of the expert institution for professional and registering activities■ operating the calibration center for hydraulic measurements ■ carrying out the function of the center for evaluation of competency for calibration of measuring instruments for water discharge in conditions of free water level ■ operation of a Testing laboratory for water management equipment.

Apart from the above listed functions, the Institute carries out also other activities according to Provision No. 12/06 of the Ministry of the Environment in compliance with the relevant Trade Certificates.

4 The Activity of T. G. Masaryk Water Research Institute, p.r.i., in 2013

Research activities of the TGM WRI, p.r.i., take place primarily as a part of the main activities of the Institute, with significant contribution of supplementary and other activities as specified in the Founding Deed of the Institute.

The core research activity of TGM WRI encompasses mainly the issues of research of the status, usage and changes of water ecosystems and their relations in landscape and connected environmental hazards, protection of the hydrosphere, flood prevention and waste and packaging management. Other important projects include a research of water quality, aquatic environments, use of water, and development of comprehensive proposals aimed at improvement of water quality and functioning of aquatic ecosystems. The research tasks are addressed in the frame of the Research and Development and Innovation Programme and in other projects. The overview of the most important projects is presented in the following description of individual research branches.

Branch of Hydraulics, Hydrology and Hydrogeology oriented in 2013 similarly as in the previous years (besides basic areas delimited by scientific disciplines in its name) on issues of environment protection. The branch focused mainly on the project Review of Groundwater Resources in CR: Hydrological Part and Geological support for the hydrogeological research in 2013.

The Department of hydrology deals with issues of climate change impact on water regime and water resources in CR. The department focused on mitigation of climate change impacts in the frame of several projects: Proposal of a System for Managing Emergency Situations Associated with Drought and Water Scarcity in the Czech Republic (Ministry of the Interior), Sustainable Use of Water Resources under Condition of Climate Change and The Support of Long-term Planning in Water Management Sector in Context of Climate Changes (Technology Agency of the CR, TA CR). Other project supported by TA CR is the Ensuring Quality of Tap Water Supplied to Small Municipalities from Local Sources.

The Department of hydraulics continued in research on the physical hydraulic model of the Děčín Barrage Weir and verification of Model Research of the Stilling Basin Floor. The physical model was also used for the verification of the rating curves of the Hněvkovice Reservoir. The project Development of a Tool and Methodology for Continuous Measurements of Snow Water Equivalent in the Field is focused on development of the device and its testing in different field and vegetation conditions, the processing of methodology of installation and operation of instrument and measurements of snow water equivalent. The shapes of hydrographs with mean return time ten thousand years were derived in EU COST project Activity FloodFreq. The study on the possibilities of enhanced retention effects of the Nechranice Reservoir was conducted consequently to the flood in June 2013 in collaboration with the Ohře River Board, state enterprise.

The Department of groundwater protection dealt with protection of groundwater quantity and quality. Besides the issues of groundwater quantity balance, the aspects of groundwater quality have been dealt with. The following projects supported by TA CR were successfully finished: The Progressive Technology of Environment Protection and Effective Water Management in Small Catchments and Protected Areas of Surface and Groundwater for Human Consumption: Assessment of Raw Water Quality and Its Use in Practice.

The Department of hydrogeology and contaminated sites dealt with i.e. border groundwaters. The research is going on in cooperation with Poland and Saxony respectively. The cooperation with Saxony is mainly in the frame of project GRACE which is supported by EU funds. Project GRACE is focused mainly on the issues of groundwater quantity in two selected transboundary areas.

Czech Calibration Station for Current Meters (accredited laboratory) provided the calibration of current meters and other measuring instruments including atypical ones.

Many important organizational changes occurred in **Reference Laboratory for the Environment Components and Waste** in January 2013. After the significant reduction of the number of employees, the Departments of basic chemical analysis, special inorganic and special organic chemistry were merged in one Department of hydrochemistry that carry out all the activities of original three departments.

The Department of hydrochemistry focused mainly on issues of drugs abuse. The project Determination of the Amount of Illicit Drugs and Their Metabolites in Municipal Wastewater – New Tool for Obtaining of Complementary Data on Illicit Drug Consumption in CR (Ministry of the Interior) continued. The new project New Drugs – Market Analysis, Epidemiology of Use and Identification of Preventive and Harm Minimization Strategies started in May 2013. The project is focused on so called new synthetic drugs. The Department has provided the analyses of samples for the other projects in TGM WRI and also for external costumers.

The Department of microbiology continued in projects supported by TA CR: New Methodical Approach to the Control and Evaluation of Bathing Waters and Optimization of Method for Detection of Assimilable Organic Carbon by Optic Detection. Also this department has provided the analyses of samples for the other projects in TGM WRI and also for external costumers.

The Department of hydrobiology participated in the project focused on hydrochemical monitoring of water quality influenced by mining and dumping activity in Ústí nad Labem Region. The department participated also in the project Microbiological Monitoring of Sludge Bed Waters. The employees of the department participated also in following projects: Research on the Intensification of Rural and Small Wastewater Treatment Plants by Non-capital Means supported by TA CR and The Methodology for Determination of Reference Conditions for the Individual Biological Components of Water Quality supported by State Environmental Fund.

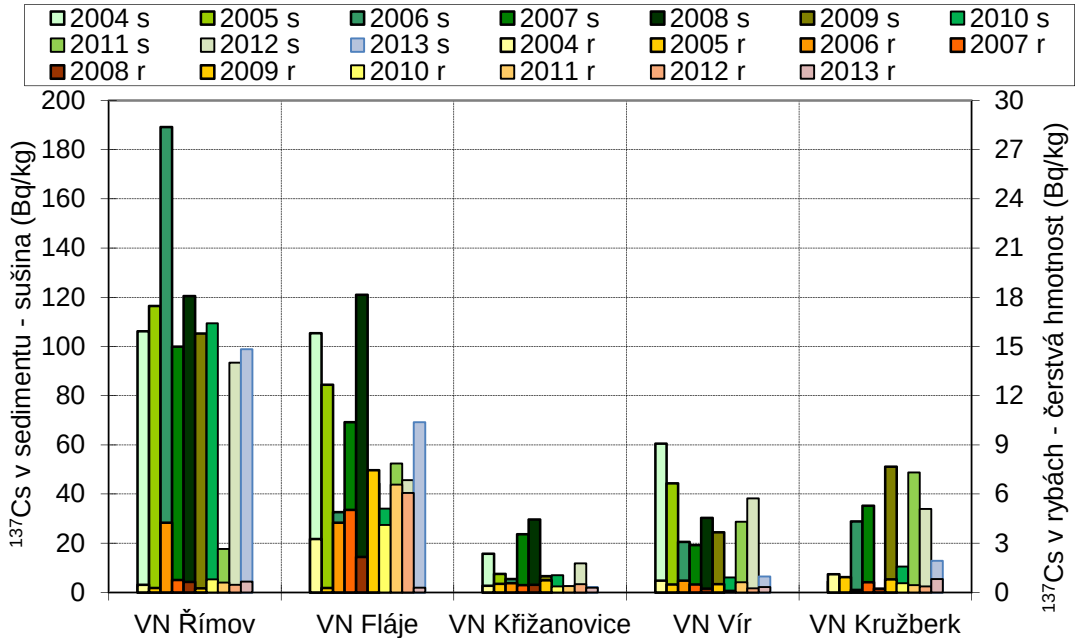

Fig. 1. The development of specific activity of caesium-137 in sediments and fishes in monitoring sites of the nationwide Radiation Monitoring Network; y-axis (left): caesium-137 in sediment – dry matter, y-axis (right): caesium-137 in fishes – fresh weight

The Department of radiology dealt with the studies focused on occurrence and behavior of natural and synthetic radionuclides below a source of pollution.

Reference radiological laboratory performs the activities of the permanent component of the national Radiological Monitoring Network in the normal and emergency radiological situation in cooperation with River Boards, state enterprises (Fig. 1); the activities are based on a contract between Ministry of the Environment and the State Office for Nuclear Safety.

Branch of Water Protection and Informatics is traditionally focused on support of research projects of the Institute including the support of public administration concerning informatics. The support is mainly via the development and operation of the Hydroecological Information System (HEIS VÚV) and providing the data sources of spatial data and operative technical support of users while working with the platform GIS.

The traditional activity is annual preparation of Summary water balance assessment of the main river basins of the CR according to the Decree of Ministry of Agriculture No. 431/2001 Coll., which provided the results of the analysis of the use of water resources and the water use requirements in terms of quantity and quality in spatial units that are not covered by the water management balances by the River Boards, state enterprises.

The project Jointly Used Groundwater on the Czech-Saxony Border (GRACE) continued in 2013. The project is supported by European Regional Development Fund via Program Goal 3 for support of cross-border activities between the Czech Republic and the Free State of Saxony. The Branch participated in projects for the government administration concerning the collaboration in International Commission for the Protection of the Elbe River and collaboration with Germany on transboundary waters in Saxony section of country borders. The support of international commissions continued (data and map outputs of the reporting of ICPER, ICPDR and ICPO). The reporting was a part of the project Support of International Activities that was realized for the Ministry of the Environment. The other important project was Accuracy Classification for Existing Delimitation of Flood Plain Areas in the Czech Republic, and Implementation of the Results in Delimitation Methodology. The Branch participated also in following projects: Emissions and Their Impact on Water Environment, Protected Areas of Surface and Groundwater for Human Consumption: Assessment of Raw Water Quality and Its Use in Practice (by assessment of raw water quality and its use in practice) and economic research for the project Safety Assessment of the Emergency Infrastructure Components – Drinking water. The employees of the Branch also processed the Water management balance of the current and prospective status of surface water quantities in the Vltava River Basin.

In 2013, **Branch of Water Technology** focused mainly on projects for the Technology Agency of the CR and for security research (Ministry of the Interior of the CR) in continuing or newly initiated projects. The commercial projects continued. The collaboration with the Microbiological Institute of Academy of Science of the CR on the project focused on fungal biofilms for wastewater bioremediation also continued. The projects supported by programme of National Agency for Agricultural Research dealt with removal of the specific pollutants at wastewater treatment plants.

The first version of the methodology of the procedure during the crisis situations was developed (transport and storage) in the project Safety Assessment of the Emergency Infrastructure Components – Drinking Water. The project is coordinated by the company CityPlan, s.r.o.

In the project Alternative Sources of Water in Municipalities during the State of Emergency – Exploitation of Original Local Sources and Springs, field and laboratory activities of case studies in selected municipalities (Děčín, Brno, Plzeň and Praha) were finished. The first version of certified methodology (protocol) was prepared; the methodology is the main output of the project.

The research project for the Technology Agency of the Czech Republic, which focuses on testing options for efficient non-investment intensification of small and rural wastewater treatment plants by using bioactive preparations, continued with long-term observation of operation of small and domestic wastewater treatment plant while testing contamination removal effectivity. The verification of the testing methodology started at the other rural wastewater treatment plant.

In 2013, the two projects (started in 2012) supported by the Technology Agency of the CR continued. The projects are focused on optimization of technology of extensive procedures of wastewater treatment and on solution of extraordinary effective wastewater treatment using combination of technological elements. The pilot plants were constructed and their operation started. The research project focused on optimization of technological solution of extensive methods of wastewater treatment continued in the other branch of the TGM WRI.

The project supported by the Ministry of Agriculture (programme of National Agency for Agricultural Research) is focused on the removal of residual concentrations of drugs from wastewater. The verification of the new technology of wastewater treatment was finished. The technology removes drugs more efficiently. The verification of the method was carried out on pilot model in the test hall of Testing Laboratory for Water Technology in TGM WRI in Prague.

In 2013, the Testing Laboratory for Water Technology and Environment Components (formerly Testing Laboratory for Water Technology) continued working in similar extent as in previous years. The Laboratory is accredited according to the standard CSN EN ISO/IEC 17025 by Czech Accreditation Institute under number 1492. Testing Laboratory of Water Equipment (a part of the Testing Laboratory) carried out tests of the effectiveness of small wastewater treatment plants for the purposes of their certification in 2013. The testing was carried out according to the procedure laid down in standard CSN EN 12566-3+A1. Other tests of water management facilities were carried out. Some wastewater treatment plants were tested by the procedures reflecting the client requirements. In 2013, the tests of light liquid separators were carried out (procedure laid down in standard CSN EN 858-1, chap. 8.3.3 + change A1). The grease trap testing was carried out according to the procedure laid down in standard CSN EN 1825-1, chap. 8.5.

In 2013, **Brno Branch** focused on broad spectrum of issues mainly on the floods issues. The activities within the two projects supported by the Ministry of Culture continued. The first one is focused on identification of significant areas with cultural and historical values threatened by natural and anthropogenic stresses including floods. The other evaluates area inundated by construction of water reservoirs. The employees of the branch participated in project Evaluation of the Floods in June 2013, specifically in the evaluation of the activities of the stakeholders of flood protection and specification of their social impacts and health impacts.

The Department of water management processed the flood risk maps for selected areas of the Morava River and the Thaya River catchments as a part of fulfillment of requests of Flood directive 2007/60/EC. Simultaneously, the department carried out the expert support of flood risk mitigation. Specifically, they collaborated with the Faculty of Civil Engineering of the Brno University of Technology on processing the data base of the flood risk management plans.

The department participated in (already mentioned) project Identification of Significant Areas with Cultural and Historical Values Threatened by natural and anthropogenic stresses supported by programme NAKI (Ministry of Culture). The natural and anthropogenic impacts are monitored (floods, erosion and landslides, the industrial activity and transport infrastructure). The study on determination of contamination potential and consequent treats to cultural monuments by the microorganisms from the water environment is involved in the project. The project is carried out in cooperation with National Heritage Institute and with support by experts from the other organizations (The Transport Research Centre, Czech Geological Survey, and Mendel University in Brno). From the obtained results follows that the most of the buildings is classified as threatened by two different impacts, however some of them are classified as threatened by almost all the defined impacts.

The objective of the project Inundated Cultural and Natural Heritage of Southern Moravia is to evaluate the social-cultural and ecological continuity of the area totally changed by water management structures. The case studies are the most important structures: the reservoir system of the Nové Mlýny reservoir, Vranov reservoir and Brno reservoir.

Important project in programme is concerned with issues of watercourses drying in climate change period (ALFA programme TA CR) has two main objectives: to create a map of watercourses vulnerability of complete dry-out based on a model of abiotic data and to develop the retrospective method of complete dry-out events identification. The method is being based on taxonomic and functional analysis of macrozoobenthos. The analysis will include metrics quantifying the frequency and extent of dry-out. The expected outputs will allow identifying the areas that are under the risk and with direct to effective protection measures.

The Methodology of Assessment of benthic invertebrates biological component for big unfordable rivers was finished. The methodology will respect the requirements of the Directive 2000/60/EC. The resulting methodical approach which is currently under the process of certification will be used in evaluation of base data sets for the preparation of the second (and follow-up) river basin partial plans.

Other important research is focused on issues related to waste water treatment including development of new technologies and optimization of technologies that are already used.

Very interesting topic is the review of historical development of occurrence of fishponds in CR and potential of their renovation as a component of comprehensive solution for landscape water management.

The staff of the branch also ensured the tasks arising from the activities of the committees focused on cooperation in transboundary waters with Slovak Republic and Austria. Simultaneously, they ensured the expert support to the participation of CR in the International Commission for the Protection of the Danube River.

The commercial activities were e.g. organization of inventory surveys in the frame of Natura 2000 implementation in areas administrated by Nature Conservation Agency of CR. Specifically, the small protected areas were investigated in Beskydy Protected Landscape Area and Skalická Morávka National Natural Monument was also investigated (Fig. 2)

Fig. 2 Light trap in Skalická Morávka National Natural Monument

The expert activity of the **Ostrava Branch** is focused on monitoring and evaluation of the physico-chemical and biological characteristics of the processes ongoing in the hydrosphere. The branch deals with the improvement of the systems for evaluation of the relations between emissions from pollution sources and the status of the waters, the tasks for the state administration and partial issues of the waste management. The NAVARO project – Development of Tools for Early Warning and Response in the Area of the Protection of Surface Waters continued in 2013. The third stage of the project focused on the draft of the sampling system and selection of the optimal analytic methods for the rapid detection of the causes of the emergency situations. The work on development of specialized database software has started. The software is intended to deepen

effectiveness of the components involved in the resolution of the pollution accidents, terrorist attacks or criminal activity with an impact on the quality of surface waters.

The project Documentation, Passportization, Archiving and Conversion Proposals of Chimney Water Tanks as a Threatened Group of Industrial Heritage Sites in the Czech Republic continued. The localization of smokestacks with water tanks in the Czech Republic was carried out. The complete structural-historical research on site was finished for the first ten existing buildings and the photographic documentation of listed buildings has been done. Beta version of specialized maps of factory chimneys and water reservoirs was created. The project results were presented to the professionals and general public.

The employees of the branch participated also in the following projects of TGM WRI: Development of Technologies for Road and Other Paved Areas Storm Water Runoff Cleaning, Determination of the Amount of Illicit Drugs and Their Metabolites in Municipal Wastewater – New Tool for Obtaining of Complementary Data on Illicit Drug Consumption in the Czech Republic, Phosphorus in Catchments etc.

Centre for Waste Management finished the project The Possibilities of Using Information and Data Sources from Waste Handling Sector as a Tool for Identification and Solution of Unauthorized Waste Handling in 2013. The outputs of the project are two manuals: Cross-border Shipments of Waste (August 2013) and Manual for Inclusion of Wastes in the "Green List" (November 2013). The both documents are available for the public on the website www.ceho.cz in the Solved Projects folder. The great attention was paid to the project The Analysis of Material Flows of Waste Electrical Equipment and Possibilities of Increase of Their Recycling and Reuse (programme BETA of TA CR). The project objective is the detailed analysis of material flows of waste electrical equipments (WEEs) using the monitoring of current collection and processing of electric and electronic equipments (EEEs). The first year of the project was focused on analyses of the determination of the average useful life of EEEs and analysis of current collection of EEEs including the analyses of illegal or semilegal flows of WEEs in the bulky waste, mixed municipal waste, at the illegal landfills, during the purchase of secondary raw materials and illegal export from the Czech Republic. The new results are presented, confronted with results of the other experts and new information is obtained at the conferences "Waste Forums". The unique conference co-organized by the Centre for Waste Management is the "Waste analytics" (second year in 2013). The results are also presented in research journals.

The collaboration continued on the project The Upgrade and Expansion of the Teaching Aimed at the Environmental Issues on Faculty of Science of Masaryk University in Brno. The whole-day seminar was prepared for students. It was focused on news in the waste management legislation. The employees of the centre also participated in activities of expert organizations, e.g. Council for Waste Management and Technical Working Group for the Processing of Waste.

Branch of Applied Ecology continued the project Monitoring of Catadromous Migration of the European Eel (*Anguilla anguilla*) supported by Ministry of Agriculture of CR in 2013. The project is unique regarding its extent; the automated radio-tracking telemetry was applied in the Czech Republic for the first time. The results demonstrated the critically low success of Eel during its reproductive migration to Sargasso Sea in river network of the Czech Republic and necessity of immediate remedial and management measures.

Therefore, the branch started the detailed research of turbine mortality in 2013. The turbine mortality is one of the most important negative factors connected to the operation of hydropower plants. The research is carried out in the framework of the related project The Analysis and Solutions of the Environmental Risks of Operation of Small Hydropower Plants in Connection with Water Organisms (BETA programme, TA CR).

The project Numerical and Functional Analysis of Aquaculture Sector including Recreational Fishing Focused on the Increase of Competitive Ability of the Czech Republic and Improvement of

Status of Water Ecosystems (OMEGA programme, TA CR) concentrates on harmonization of aquaculture and recreational fishing sectors with protection of water ecosystems.

The four-year project The Determination of Portion of Erosive Phosphorus in Eutrophication of Threatened Bodies of Stagnant Surface Water was finished in 2013. The employees of the branch collaborated on this project. The methodology Evaluation of Vulnerability of Water Reservoirs by Sediment and Eutrophication Conditioned by Erosion of Agriculture Soil was proposed. The summary results of the project were prepared to be published in the extensive monograph.

The two projects are supported by the Technology Agency of the CR. The project The Methods of Optimization of the Proposed Measures in Watersheds of Reservoirs Leading to Effective Decrease of Their Eutrophication is focused also on the economic efficiency of the suitable mitigation measures. The project Optimization of Large Wood Structures for Stream Restoration and Semi-natural Stream Regulation focused on the technical parameters of such structures and anti-erosive measures in streams. The first types of proposed wooden structures were tested on the physical model of river channel. Their impact on changes of channel during the different flow regimes was monitored.

The project Erosion Washout: Increased Possibility of Danger for Population and Water Quality in Connection with Expected Climate Change is carried out in collaboration with the Czech Technical University in Prague (started in 2012, supported by Ministry of the Interior). The project focuses on the modeling of critical points in the area of the Czech Republic, where the municipalities, critical infrastructure and water and terrestrial ecosystems are threatened by soil erosion and sediment transport.

The impact of water discharge from the Dukovany Nuclear Power Plant on changes in water quality of Dalešice-Mohelno reservoir system was assessed in the framework of a special contract.

Long-term project carried out in cooperation with Šumava National Park evaluated the increasing coverage of submerged macrophytes in a part of the Vltava River and chemism of the tributaries with the occurrence of contaminated sites. Two employees of the branch are coauthors of rescue program of the freshwater pearl mussel (*Margaritifera margaritifera* L.). The program was approved in the end of 2013. The nationwide mapping of six species of European importance (water water beetles, mollusks, fishes) supported by the Operation programme "Environment" continued. The new localities of thick shelled river mussel (*Unio Crassus*) have been found. The two methodologies for the implementation of the Water Framework Directive (2000/60/EC) and creation of the river basin management plans were finished (The Methodology for Determination of Reference Conditions for the Individual Biological Components of Quality and The Methodology for Evaluation of Ecological Potential of Heavily Modified and Artificial Water Bodies – Category River). The employees of the branch participated also in many other projects.

ASLAB – Centre for Assessing Proficiency of Laboratories is a part of TGM WRI, p.r.i. ASLAB is authorized in accordance with the mandate of Ministry of the Environment to carry out the state delegated powers:

- Organization of intralaboratory proficiency testing in the field of environmental laboratory analyses,
- Assessment of professional competence of hydro-analytic laboratories in the area of environmental research and protection in accordance with the quality management system CSN EN ISO//IEC 17025 and
- Acting as a National Inspection Authority on good laboratory practice in the area of chemical substances and chemical preparations in accordance with the Act No. 350/2011 Coll. and Regulation No. 219/2004 Coll., as amended.

Significant proportion of ASLAB activities falls to proficiency testing (PT) that forms the fundamental level of external supervision over hydro-analytic laboratories. In 2013, 372 laboratories from CR and Slovakia participated in testing.

ASLAB organized 11 PT projects in chemistry and radiology in 2013. 265 laboratories participated. Four interlaboratory comparisons of tests in microbiology, hydrobiology and ecotoxicity were organized and 53 laboratories participated. Four PT projects were cancelled due to lack of candidates.

In accordance with new and forthcoming legislation concerning new testing methods or references to such methods ASLAB elaborates methodologies of proficiency testing in these new areas with the aim to implement them in the programmes of ASLAB. ASLAB prepares the laboratories for the changes that follow from the new legislation.

ASLAB granted the Certificate on Good Laboratory Practice to 18 newly assessed laboratories in 2013. 49 such certificates were in force by 31st December 2013. In the area of good laboratory practice, by 31st December ASLAB checked four testing devices.

ASLAB activities include also cooperation in development of new regulations and together with Ministry of the Environment cooperation in preparation of new legislation in the area of management of chemicals. Representatives of ASLAB participated in meetings of technical groups and provided comments on drafts or translations of technical standards. ASLAB prepared summary information on the practical use of standards during field works for decision making about requirements concerning new standards. The representative of the National Inspection Body participated at the meeting of the working group Good Laboratory Practice of EOCD beside the usual activities (inspections, consultations, lecturing).

In the context of its activities the T. G. Masaryk Water Research Institute, p.r.i., also participates in public tenders and seeks opportunities to apply the expertise of its divisions. TGM WRI participated in the public competitions from one provider with a total of 13 of the proposed projects in the framework of the announced tenders and programmes realized according to Act No. 130/2002 Coll. The Institute succeeded with 7 projects (54% success).

Additionally, 71 business opportunities were found on the internet. The opportunities were proposals of commercial contracts based on different calls and public procurements. Sixteen proposals have been prepared after consultation and from this number 14 contracts have been obtained. Other 24 possibilities of obtaining the projects from a direct offer, besides these found by specialized department, were discussed by research managers. The number of 22 contracts has been obtained based on these personal consultations of research managers.

TGM WRI, p.r.i., was awarded the certificate of conformity of quality management system with the requirements of CSN EN ISO9001:2009 in the subject area covered by the activities provided for in the founding deed in 2011. That is very important for winning the projects. Implementation of quality management system improved the effectiveness of management which is reflected in increased efficiency of investing of means and sources and improvement of customer services.

Communication with a costumer has a positive impact on improvement of process management. Targeted feedback is an information source that allows to satisfy better the needs of a costumer. The internal quality management system was evaluated in 2013. The objective was to determine the extent of its implementation for securing its continual suitability, adequacy and efficiency.

Concerning the new certification after the three years, it was necessary to review all internal regulations regarding the quality system (marked Q). Nine from the 41 regulations were updated and submitted to new publication including the Quality Manual. The "Quality Policy" was reviewed. It specifies the general intensions and direction of further development in this area.

Evaluation of results of research projects and research and development projects and other projects and contracts for 2013 is based mainly on eligible research results in the RIV (Czech

Registry of information on research outputs) database, but also other important outputs of expert activities.

4.1 Main activities

4.1.1 Publications in Journals

In 2013, the employees of the Institute were authors or coauthors of 45 contributions in scientific journals. The absolute majority of these contributions were published in peer reviewed journals. Ten contributions were published in journals with IF (e.g. Environmental Technology, Journal of Hydrology and Hydromechanics, International Journal of Nuclear Energy Science and Engineering, Journal of Environmental Radioactivity, Water Resources Management, Environmental Monitoring and Assessment etc.). The published results were created mainly in the framework of the Research and Development and Innovation Programme.

4.1.2 Monographs

In 2013, a monograph by Kožíšek, F., Paul, J., Datel, J.V. – Ensuring the quality of drinking water in small water supply systems (in Czech) was published in TGM WRI. The employees of TGM WRI participated in preparation of two other monographs: Waste characteristics and recovery and Microbial ecology of water.

The researches of TGM WRI participated in preparation of nine chapters of seven other monographs published by e.g. Nova Publishers New York, Springer Verlag Berlin-Heidelberg, GeoScience Publisher Reiskirchen, Germany, etc.

4.1.3 Results with legal protection and technically implemented results

In 2013, a patent was awarded to detritus continuous sampler that operates of the principle of the pressure of running water. Sedimentation of particulates is going on in sedimentation container. The electrical connection is not required to operate the equipment. The gradient in the water flow is not necessary for operation of the equipment.

Furthermore, the two utility models were registered: the liquid sampler and the fixture of the RFID antenna in the fish ladder. Five functional samples were created: the fixture of the RFID antenna in the semi-natural fish ladder, the sampling container for storm water runoff, semi-automatic sampler of percolation and the device for continuous measurements of snow water equivalent.

4.1.4 International cooperation in research

The project Jointly Used Groundwater on the Czech-Saxony Border (GRACE) continued in 2013. The objective of the project GRACE is protection of water sources and identification of causations of dropping of groundwater levels in two cross-border areas Hřensko–Křinice/Kirnitzsch a Petrovice–Lückendorf–Jonsdorf–Oybin. The outputs will be common strategies of protection of groundwater in the two areas. The project is supported by European Regional Development Fund via Programme Objective 3 for support of cross-border activities between CR and the Free State of Saxony.

The part of the project ETZ "Polder Soutok – Renaturierungskonzept" is carried out in cooperation with Austrian company Via Donau and Morava River Board, s. e. The project is focused on using the space above the confluence of the Rivers Morava and Dyje for flood protection including the realization. The informal cooperation with the Austrian experts continued after the completion of the Czech-Austrian projects Dyje-Thaya and ProFor.

Other activity was focused on collaboration with Comenius University Bratislava in the frame of the Mobility programme, work in the UNESCO FRIEND Low Flow and Drought group and also cooperation with NORMAN association in the frame of the prioritization of new compounds.

4.1.5 Presentation at international meetings of experts

The employees of the Institute participated in international experience exchange. They participated in organization of international conference International Interdisciplinary Conference on Land Use and Water Quality – Reducing Effects of Agriculture (Haag, Netherlands).

They participated in 24 international conferences and had 30 oral presentations, conference proceedings or posters. The most important conferences were e.g. Bay State Groundwater Forum (Brookline, Massachusetts, USA), conference OMICS – Hydrology & Groundwater Expo 2013 (Raleigh, North Caroline, USA), Sustainable development of Energy, Water and Environment systems (Zagreb, Croatia), 7th International Phosphorus Workshop (Uppsala, Sweden), 8th Conference on Extreme Value Analysis (Shanghai, China), 17th International Symposium on Health-Related Water Microbiology (Florianopolis, Brazil), International Scientific Conference Radiation, Ecology and Man-made Risk Factor (Gomel, Belorussia), Catchment and Flood Risk Management 2013 (Bratislava, Slovakia), 4th Conference on Small and Decentralized Water and Wastewater Treatment Plants (Volos, Greece), Symposium for European Freshwater Sciences (Münster, SRN) and many others.

4.1.6 Important national meetings of experts

In 2013, employees of TGM WRI, p.r.i., organized e.g. the conference Radiological Methods in Hydrosphere, the workshops on issues of removal of the specific pollutants from waste water, evaluation of impacts of application of biotechnological preparations on the functionality of wastewater treatment plants and on optimization of the proposed measures in watersheds of reservoirs leading to effective decrease of their eutrophication. They participated in organization of conferences: Water Reservoirs 2013, Analytics 2013 and Flood Protection 2013.

Employees of TGM WRI, p.r.i., participated in organization of seminars: Consultation days for radiology laboratory workers, Microbiological seminar for water management laboratories and two runs of the course Sampling for water management and inspection laboratories.

Public could get acquainted with the scientific issues that are resolved in TGM WRI, p.r.i., at 14 seminars organized at Prague, Brno and Ostrava in 2013.

The employees of TGM WRI, p.r.i., had 68 presentations (oral and posters) at 42 national conferences and seminars: e.g. Drought and How to Face it, Adolf Patera Workshop 2013, Flood Protection 2013, Water Reservoirs 2013, VODA 2013, Water and Landscape 2013.

4.2 Additional and other activity

4.2.1 Methods and results reflected in standards and legislation

The Institute staff was also significantly involved in the preparation of guidelines, legislation and standardization in 2013.

Regarding legal directives and methodological documents the Institute staff participated e.g. in preparation of the Resolution of the Czech Government on Operation of Flood Commissions, the Components of the Integrated Safety System of the CR and Other Stakeholders of Flood. For the Ministry of Agriculture and the Ministry of the Environment, several materials have been prepared: Methodology for Comprehensive Processing and Evaluation of Data on Quality of Raw Ground and

Surface Water and Methodological Manual for Sampling, Field and Laboratory Analyses and Evaluation of Water Quality in Natural Bathing Establishments and Bathing Surface Waters. Other six materials processed in 2013 are under certification.

The staff of the Institute participated in the preparation of standard CSN 757613 Water Quality – Determination of total volume activity Beta using the fast method and revision of the standard CSN 75 0176 The Nomenclature of Water Microbiology. They evaluated in total 16 standards in the frame of cooperation with Technical Standards Committee 104.

4.2.2 Consulting and expert activity including support for the state administration

Consulting and expert activity is an important form of the direct application of research results. This activity included preparation of 37 expert reports and three expert studies in 2013. Consulting services were permanently provided in various areas for local authorities, non-governmental organizations, and specialized laboratories and also for the public. Example of such activity is the consulting in the area of using of artificial wetlands and extensive technologies of the water treatment etc.

The support of the state administration was focused on tasks especially for Ministry of the Environment: the operation and publishing of data of selected databases of information system ISVS-VODA, information support for processing of evaluation of the risk of environmental damage in the field of water protection, determination of emission limits via combined approach and evaluation of the eutrophic state of the important water reservoirs in the Czech Republic for the period 2010–2012 for Ministry of Agriculture.

The staff of the Institute was involved in reporting for the EU, the European Environmental Agency, and also in preparation of statements and orders for the need of state administration and local authorities etc.

The employees of the Institute are significantly active in international commissions – International Commission for the Protection of the Elbe River, Standing Committee for Saxony of the Czech-German Commission for Transboundary Waters, International Commission for the Protection against Pollution of the Odra River, Commission for Transboundary Waters with Poland and International Commission for the Protection of the Danube River. The staff of the Institute is involved in many expert groups within these commissions and also in preparation of the documents for their meetings.

4.2.3 Other activities

An important part of the activity of the Institute includes also collaboration with universities. The staff of the Institute presented a series of lectures at e.g. Faculty of Environmental Sciences of Czech University of Life Sciences, Faculty of Natural Sciences of Charles University, Faculty of Natural Sciences of Masaryk University, Faculty of Civil Engineering of Czech Technical University, VSB-Technical University of Ostrava and Faculty of Natural Sciences of Ostrava University. The employees of the Institute provide consultations and are supervisors of dissertation and diploma theses (Faculty of Natural Sciences of Charles University, Czech University of Life Sciences, Masaryk University, Technology University in Brno, Institute of Chemical Technology Prague etc.). Students can participate in excursions organized by the staff of the Institute and they can participate in practical training in the Institute.

The e-learning teaching materials are processed for the needs of students and teachers: The River Landscape and Its Ecosystems, Water Quality and Water Treatment and Extensive technologies of Water Treatment.

Many materials were prepared for the needs of expert public and practitioners: e.g. the outputs of transboundary projects Dyje-Thaya and ProFor, Cross-border Shipments of Waste, Manual for

Inclusion of Wastes in the "Green List". The data were prepared for a multimedia presentation dealing with the importance of river wood in the ecosystem of a watercourse for the exposition House of Nature of the Litovelské Pomoraví Protected Landscape Area. The certified map Current Status of Historical Fishponds in the Czech Republic was prepared etc.

The staff is also active in national and international professional organizations and scientific associations – Czech National Committee for Hydrology, Czech Meteorological Society, Czech Hydrogeologists' Association, International Association of Hydrogeologists IAH, nitrate committee EC etc. Ms. Šárka Blažková, Ing., DrSc., is a member of editorial boards of the journals: Hydrological Processes and Hydrological Sciences Journal.

4.3 Economic issues

In 2013, the economy of the Institute has been influenced by negative impacts as in previous years. Problems persisted with fulfillment of revenues mainly in the area of the main activity. Some of the key projects did not start regardless the reason. Despite the fact that the work had been done, there were client payment issues in some projects.

The economy of the Institute has been considerably influenced by the flood in June. However, the damages have been repaired, the smooth performance of the Institute has been secured and insurance claims for all the costs regarding the repair of flood damages were submitted during the second half of the year. Simultaneously, the claim for subsidy was submitted at Ministry of the Environment. The subsidy was intended to cover the costs related to repairing the flood damages and not covered by the insurance company. The claim was assessed positively according the information available by the date of processing the annual report. However, the approval process has not been finished yet and the grant decision has not been issued yet.

Payment of the insurance claim and expected subsidy from Ministry of the Environment has a positive impact on net economic result in 2013. They lowered the impacts of the costs related to the flood damages on the Economy of the Institute.

Economic measures remained in force especially in the field of human resources: the number of employees was lowered in all the research branches, which were not by sufficient income.

More emphasis was put on minimization of the overhead costs. The economy of the Institute has been considerably influenced by further significant reduction of institutional support and continuously growing demands of providers for co-financing. The impact of VAT has a recurring negative effect: consequently to claim a tax deduction by ratio coefficient the tax burden and costs of the Institute increase.

The economic result of main activity was net loss. We succeeded in compensation of the loss by a positive economic result in the area of additional and other activity (Fig. 3).

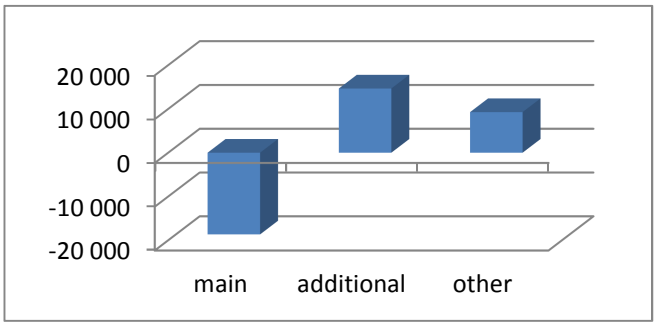

Fig. 3. The structure of economic result by activity (CZK thousand)

The budget of CZK 163,500 thousand for 2013, was created balanced in accordance with Act No. 341/2005 Coll. on public research institutions.

Total revenues amounted in 2013 to CZK 180,662 thousand (Fig. 4) and costs reached CZK 175,397 thousand (Fig. 5). Consequently, the total outcome of the Institute's activities was represented by the end-of-year result of 5,265 thousand CZK in surplus. The proposal to transfer the whole positive outcome in 2013 in reserve was submitted to the relevant bodies of the Institute.

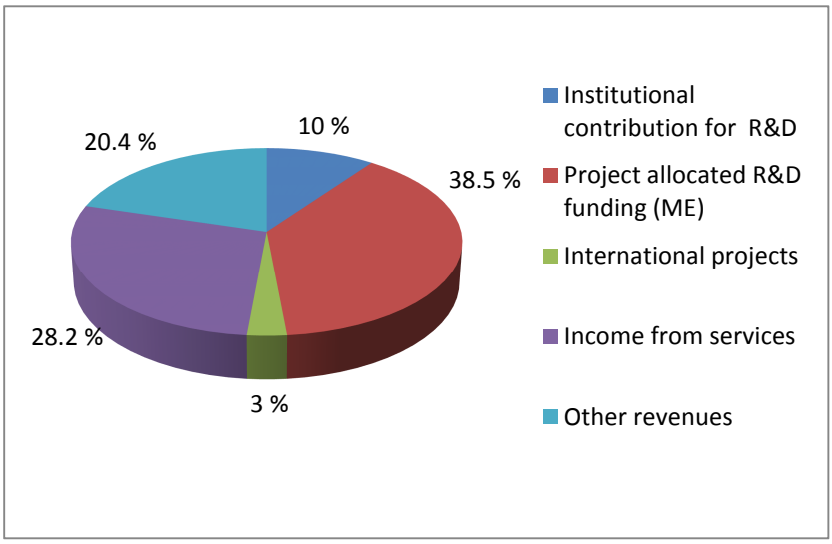

Fig. 4. Revenue structure

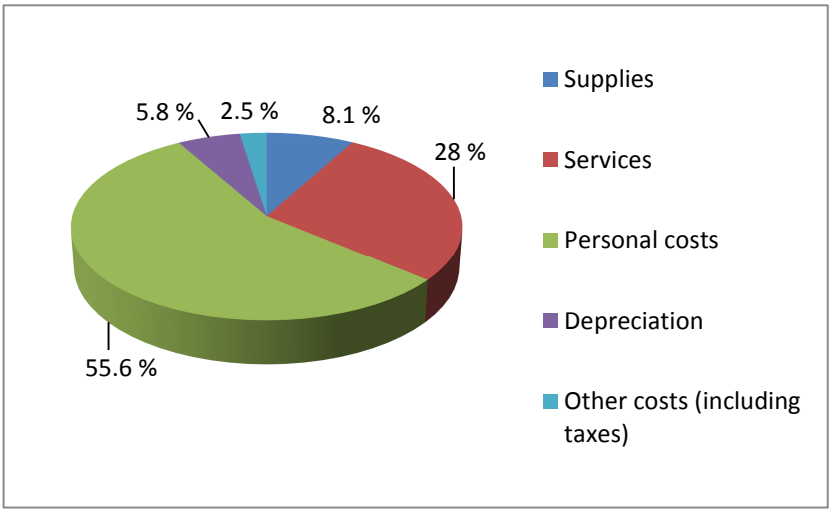

Fig. 5. Cost structure

5 Other Requested Information

5.1 Information on measures for elimination of imperfections of management and their fulfillment

No measures to elimination of imperfections of management were assigned.

5.2 Information on things that come to pass after the balance sheet day and are important for fulfillment of the purpose of the institution

No things important for fulfillment of the purpose of the institution come to pass after the balance sheet day.

5.3 Activities in a field of environmental protection

Regarding the fact that the type of activity of the Institute is closely connected with topical environmental issues, its operation is focused primarily on this sector: mainly on research of aquatic ecosystems and their relations in landscape and connected environmental hazards and on issues of waste and packaging management.

The Institute lays stress primarily on care of the environment and permanently sustainable development. This care includes the effort of energy saving. The waste is separated to full extent, vegetation is cared about and other relevant activities take place.

5.4 Activities in employment relationships

In 2013, the organizational changes took place to increase the efficiency of the Institute. The changes leaded to the lowering of employees number. The number of 209.98 employees worked in TGM WRI, p.r.i., in 2013 (average registration recounted number). The research and expert employees constituted 86% and operational employees constituted 14% of the total employees number.

Table 1. Employees structure according to age and sex – physical state by 31st December 2013

Age	men	women	total	%
up to 20 years	0	0	0	0
21–30 years	21	10	31	13.08
31–40 years	37	26	63	26.58
41–50 years	23	25	48	20.25
51–60 years	20	38	58	24.47
61 years and more	27	10	37	15.62
total	**128**	**109**	**237**	**100**

The average age is 46.53 years, the men average age is 45.86 and women average age is 47.31 years.

Table 2. Employees structure according to a length of employment and sex – physical state by 31st December 2013

Duration	men	women	total	%
up to 5 years	49	27	76	32.07
6–10 years	27	27	54	22.78
11–15 years	26	21	47	19.83
16–20 years	16	12	28	11.82
over 20 years	10	22	32	13.50
total	**128**	**109**	**237**	**100**

Table 3. Employees structure according to achieved education and sex – physical state by 31st December 2013

Education level	men	women	total	%
basic school	0	3	3	1.26
apprenticeship	6	3	9	3.79
secondary technical	0	1	1	0.42
completed secondary general	1	1	2	0.84
completed secondary technical	20	37	57	24.06
follow up courses	1	0	1	0.42
university	74	54	128	54.02
doctoral	26	10	36	15.19
total	**128**	**109**	**237**	**100**

5.5 Organizational units abroad

T. G. Masaryk Water Research Institute, p.r.i., has no organizational units abroad. It is a delegate of CR in the Global Water Partnership – Central and Eastern Europe organization.

5.6 Supposed development of the organization in 2014

It can be expected that also the 2014 year will be economically more challenging mainly from point of view of winning contracts of all kinds. It is a consequence of cost-saving measures implemented by the government of CR in the frame of economic reform and slower national economic take-off.

TGM WRI, p.r.i., will focus its activity on tasks following from its fundamental mission, i.e. mainly on:

- research of aquatic ecosystems and their relations in landscape and connected environmental hazards and on issues of waste and packaging management,
- expert support for the state administration in the field of hydrosphere and waste and packaging management, based on performed research.

The activity of the Institute is focused not only on continuing research projects, grants, commercial projects, but mainly on winning of other projects in the frame of all relevant calls and competitions. The attention is focused of projects financed from resources of EU and also national funders supporting the research and development in sector of water and waste. It's necessary to focus with exceptional intensity on commercial contracts: the only source of financial funds for already absolutely generally requested co-financing in grants.

6 List of Projects in 2013

Title	Project manager	Client
Branch of Hydraulics, Hydrology and Hydrogeology		
The evaluation of current and potential future drought periods in small and medium catchments in the Czech Republic and in the Slovak Republic	Ing. M. Hanel, Ph.D.	Ministry of Education, Youth and Sports
Critical source areas of phosphorus in watersheds as the decisive factor of transport – a trial of the expression of the dependence on the source areas of runoff and the way of land management	Ing. Š. Blažková, DrSc.	Ministry of Education, Youth and Sports
Uncertainties in Water Footprint and new way of work with predictions of climate models	Ing. Š. Blažková, DrSc.	Ministry of Education, Youth and Sports
Proposal of a system for managing emergency situations associated with drought and water scarcity in the Czech Republic	Ing. R. Vlnas	Ministry of the Interior
Sustainable use of water resources under condition of climate change	Ing. A. Vizina	Technology Agency of the CR
Protected areas of surface and groundwater for human consumption: assessment of raw water quality and its use in practice	Ing. A. Hrabánková	Technology Agency of the CR
Development of a tool and methodology for continuous measurements of snow water equivalent in the field	Ing. A. Kulasová	Technology Agency of the CR
The progressive technology of environment protection and effective water management in small catchments	doc. RNDr. Z. Hrkal, CSc.	GIS-GEOIND – Technology Agency of the CR
Support of long-term planning in water management sector in context of climate changes	Ing. M. Hanel, Ph.D.	Technology Agency of the CR
Ensuring the quality of drinking water supplied to small municipalities from local sources	RNDr. J. V. Datel, Ph.D.	Technology Agency of the CR
The methodologies of evaluation of the chemical and quantitative state of groundwater bodies for the 2nd cycle of River basin plans in the Czech Republic	RNDr. H. Prchalová	State Environmental Fund
The identification and evaluation of state of the areas delimitated according to the Article 7 of the Water Framework Directive	Ing. A. Hrabánková	State Environmental Fund
The literature review – the evaluation of drought and its impacts on water resources	Ing. A. Vizina	Ministry of Agriculture

Constraining continuous simulations of flood frequency using mapping saturated areas to constrain prediction uncertainties	Ing. Š. Blažková, DrSc.	Grant Agency of the CR
Hazard assessment of dangerous landslides and glacial lake outburst floods, Cordillera Blanca, Peru	Ing. P. Bouška, Ph.D.	Institute of Rock Structure and Mechanics AS CR – Grant Agency of the CR
Headwaters retention potential with respect to hydrological extremes: the verification of hypothesizes on outflow formation by model MIPs in comparison with the other models	Ing. Š. Blažková, DrSc.	Charles University – Grant Agency of the CR
The determination of flow capacity of the weir of the small hydroelectric plant Ružbašská Miľava	Ing. J. Šepeľák	RFB, s.r.o., Košice
The influence of the water reservoirs on 2013 flood	Ing. P. Balvín	BFG Koblenz
Review of groundwater resources in the Czech Republic: Hydrology documentation for Activities 2, 4 and 6	Ing. L. Kašpárek, CSc.	Czech Geological Survey
The Hněvkovice Reservoir: The evaluation of the rating curves	Ing. O. Motl	Elbe River Board, state enterprise
Operation of the Czech Calibration Station for Current Meters	Ing. L. Ramešová	Joint contract
Water management balance of the current and prospective status of groundwater quantities in the partial catchments of the Upper Vltava, Lower Vltava, Berounka and other Danube tributaries	RNDr. H. Prchalová	Vltava River Board, state enterprise
Water management balance of the current and prospective status of groundwater qualities in the partial catchments of the Upper Vltava, Lower Vltava, Berounka and other Danube tributaries	RNDr. H. Prchalová	Vltava River Board, state enterprise
Water management balance of the current and prospective status of groundwater in the partial catchments of the Upper Vltava, Lower Vltava, Berounka and other Danube tributaries – hydrological data	Ing. M. Hanel, Ph.D.	Vltava River Board, state enterprise
The Přelouč II navigation step: The modeling research of the transfer of ice over the upper head of the lock	Ing. O. Motl	Pöyry Environment, a. s.
Model research of the stilling basin floor of the navigation step Děčín on the section physical model	Ing. J. Šepeľák	Directorate of Waterways
The Partial River Basin Management Plans of the Upper Vltava, Berounka, Lower Vltava and other Danube tributaries – groundwater	RNDr. H. Prchalová	Sweco Hydroprojekt, a. s.

Review of groundwater resources in the Czech Republic – geological support for the hydrogeological research of Area 3	doc. RNDr. Z. Hrkal, CSc.	AQUATEST, a.s.
The Partial River Basin Management Plan of the Upper and Middle Elbe and Partial River Basin Management Plan of the Lusatian Neisse and other Oder tributaries – groundwater	RNDr. H. Prchalová	AgPOL, s.r.o.
The study on the possibilities of enhanced retention effects of the Nechranice Reservoir	Ing. P. Balvín	Ohře River Board, state enterprise
The Partial River Basin Management Plan of the Morava and tributaries of the Váh, The Partial River Basin Management Plan of the Thaya	RNDr. H. Prchalová	Pöyry Environment, a. s.
The processing of Partial River Basin Management Plan of the Upper Oder	RNDr. H. Prchalová	Pöyry Environment, a. s.
The completion of the Assignment security report Extension of the Temelín Nuclear Power Plant ETE 3,4 in parts Hydrogeology and Hydrology of surface waters	RNDr. J. V. Datel, Ph.D.	Nuclear Research Institute Řež
Expert activities	Ing. A. Hrabánková et al.	Joint contract
Reference Laboratory of Environment Components and Wastes		
New drugs – market analysis, epidemiology of use and identification of preventive and harm minimization strategies	Ing. M. Kvíčalová	Charles University – Ministry of Agriculture
Investigation of the impact of the Temelín Power Plant accident on contamination of the Vltava and Elbe Rivers up to boundary profile Elbe at Hřensko	Ing. E. Hanslík, CSc.	Ministry of the Interior
Determination of the amount of illicit drugs and their metabolites in municipal wastewater – new tool for obtaining of complementary data on illicit drug consumption in the Czech Republic	Ing. V. Očenášková	Ministry of the Interior
New methodical approaches to the control and evaluation of bathing waters	RNDr. D. Baudišová, Ph.D.	Technology Agency of the CR, ALFA
Optimization of method for detection of assimilable organic carbon by optic detection	RNDr. D. Baudišová, Ph.D.	Technology Agency of the CR, ALFA
Research of optimization possibilities of operation and of effectiveness increase of wastewater treatment from small municipalities using non-conventional technologies	Ing. E. Mlejnská	Technology Agency of the CR, ALFA
Support to activities of the permanent and emergency component of nationwide Radiation Monitoring Network	Ing. E. Hanslík, CSc.	Ministry of the Environment and State Office for Nuclear Safety

Monitoring and assessment of surface water and groundwater quality and its changes in relation to the impact of the Temelín Nuclear Power Plant construction and operation on its vicinity	Ing. E. Hanslík, CSc.	Czech Power Works
Microbiological monitoring of sludge bed waters	Ing. A. Benáková, Ph.D.	DIAMO, state enterprise
The revision of the CSN 750176-1 Water quality: Microbiology nomenclature	RNDr. D. Baudišová, Ph.D.	Sweco Hydroprojekt, a. s.
The processing of the documents for reporting according Article 15 of CD 91/271/EEC	Ing. E. Mlejnská	Ministry of the Environment
Content of radioactive substances in the Orlík Reservoir and its tributaries after commissioning of the Temelín Nuclear Power Plant – period 2013	Ing. E. Hanslík, CSc.	Vltava River Board, state enterprise
The evaluation of the results of inspection measurements of the changes in gamma radiation dose rate and the content of radioactive compounds in the vicinity of the buildings included in remediation programme of the Nuclear Research Institute Řež –2013	M. Novák	Nuclear Research Institute Řež
The research of detection and determination methods of radioactive contamination	Ing. E. Hanslík, CSc.	National Radiation Protection Institute
Expert activities	Ing. V. Očenášková et al.	Joint contract
Branch of Water Protection and Informatics		
Accuracy classification for existing delimitation of flood plain areas in the Czech Republic, and implementation of the results in delimitation methodology	Ing. H. Nováková, Ph.D.	Ministry of the Interior
Creation and maintenance of data sources, support of data and map outputs of the reporting: ICPER, ICPDR and ICPO	Ing. T. Fojtík	Ministry of the Environment
The support of the representation of the Czech Republic in activities of the International Commission for the Protection of the Elbe River (ICPER)	Ing. M. Kalinová	Ministry of the Environment
The support of the participation of the Czech Republic in activities of the Permanent Committee Saxony and Permanent Committee Bavaria of the Czech-German Commission for Cross-Border Water	Ing. M. Kalinová	Ministry of the Environment
Emissions and their impact on water environment	Ing. P. Vyskoč	National Agency for Agricultural Research
Jointly used groundwater on the Czech-Saxony border (GRACE)	Ing. M. Kalinová	SAB Dresden

The processing of water management balance of current and projected status of surface water quantity in subbasins of the Upper Vltava, Berounka, Lower Vltava and other Danube tributaries	Ing. P. Vyskoč	Vltava River Board, state enterprise
Branch of Water Technology		
A safety assessment of the emergency infrastructure components – drinking water	Ing. V. Šťastný	CityPlan – Ministry of the Interior
Alternative sources of water in municipalities during the state of emergency – exploitation of original local sources and springs	RNDr. J. Fuksa, CSc.	Ministry of the Interior
Research on the intensification of rural and small wastewater treatment plants by non-capital means	Ing. V. Šťastný	Technology Agency of the CR
Final treatment pools used with low intensity	Ing. F. Wanner	Technology Agency of the CR
Possibilities for removal of specific pollutants (PPCPs) at wastewater treatment plants	Ing. M. Váňa	National Agency for Agricultural Research
Fungal biofilms for wastewater bioremediation complementary to wastewater treatment plants	Ing. F. Wanner	Grant Agency of AS CR
Activities of the Testing Laboratory for Water Management Facilities	Ing. V. Jelínková	Joint contract
Sampling courses	RNDr. J. Fuksa, CSc.	Joint contract
Expert activities	Ing. V. Šťastný et al.	Joint contract
Brno Branch of the Institute		
Drying out of streams during climate change: Prediction of risk and biological indication of drought periods as new methods for water resources and landscape management	RNDr. P. Pařil, Ph.D.	Technology Agency of the CR
The anaerobic separator of suspended solids and nutrients	Ing. M. Rozkošný, Ph.D.	ASIO – Technology Agency of the CR
Development of technologies for road and other paved areas storm water runoff cleaning	Ing. M. Rozkošný, Ph.D.	DEKONTA – Technology Agency of the CR
Identification of significant areas with cultural and historical values threatened by natural and anthropogenic stresses	Ing. M. Forejtníková	Ministry of Culture
Inundated cultural and natural heritage of Southern Moravia	RNDr. H. Mlejnková, Ph.D.	Ministry of Culture
Expert support of the Czech Republic's participation in the International Commission for the Danube River Protection	Ing. S. Juráň	Ministry of the Environment
Cooperation with the Slovak Republic on transboundary waters	Ing. S. Juráň	Ministry of the Environment
Cooperation with Austria on transboundary waters	RNDr. H. Mlejnková, Ph.D.	Ministry of the Environment

The expert support for the mitigation of flood risks	Mgr. P. Štěpánková, Ph.D.	Ministry of the Environment
The perspectives of landscape management – innovation of landscape disciplines	RNDr. D. Němejcová	Mendel University
Flood Education and Research Centre	Mgr. P. Štěpánková, Ph.D.	Masaryk University Brno
Methodology of assessment of benthic invertebrates biological component for big unfordable rivers	RNDr. D. Němejcová	State Environmental Fund
Assessment of agricultural land in the areas of former fishpond systems with the aim of supporting sustainable management of water and soil resources in the Czech Republic	Ing. M. Rozkošný, Ph.D.	National Agency for Agricultural Research
ETZ Project Polder Confluence Renaturierungskonzept	Ing. M. Forejtníková	Via Donau – Österreichische Wasserstraβen-Gesellschaft
The VODAMIN Project – hydrochemical monitoring of water quality influenced by mining and dumping activity	RNDr. D. Němejcová	Ekomonitor
Creation of flood risk maps for the Morava River and the Thaya River catchments	Ing. L. Chlubna	Pöyry Environment, a. s.
The social impacts and health impacts of the floods in June 2013	Mgr. P. Štěpánková, Ph.D.	Czech Hydrometeorological Institute
The evaluation of the activities of the flood commissions, Integrated Safety System of the CR and other stakeholders of flood protection	Ing. S. Juráň	Czech Hydrometeorological Institute
Economic impacts of the floods in June 2013	Mgr. P. Štěpánková, Ph.D.	Czech Hydrometeorological Institute
The processing of data for the fulfillment of the reporting duties of the Czech Republic to EU – flood hazard mapping	Mgr. P. Štěpánková, Ph.D.	Ministry of the Environment
Monitoring of the impact of Dukovany Nuclear Power Plant on quality of water in the Jihlava River	RNDr. H. Mlejnková, Ph.D.	Czech Power Works
Inventory surveys in the frame of the implementation of Natura 2000 Network in the area administrated by Nature Conservation Agency of the Czech Republic	Mgr. J. Kroča	MOTT MACDONALD Praha
Expert activities	Mgr. J. Ošlejšková et al.	Joint contract
Ostrava Branch of the Institute		
NAVARO – The development of early warning and rapid reaction tools in the area of surface water protection	RNDr. P. Soldán, Ph.D.	Technology Agency of the CR

Documentation, passportization, archiving and conversion proposals of chimney water tanks as threatened group of industrial heritage sites in the Czech Republic	Ing. R. Kořínek, Ph.D.	Ministry of Culture
Support to the participation of the Czech Republic in the activities of the International Commission for the Protection of the Odra River against Pollution	Ing. L. Trdlica	Ministry of the Environment
Cooperation in transboundary waters with Poland	Ing. L. Trdlica	Ministry of the Environment
Preparation of technical documentation for the Waste Prevention Program of the Czech Republic	Ing. R. Kořínek, Ph.D.	Ministry of the Environment
The evaluation of chemical and ecological state of surface waters for purposes of creation of Second River Basin Plans	Ing. P. Tušil, Ph.D., MBA	Ministry of the Environment
Expert activities	Ing. I. Truxová	Joint contract
Centre for Waste Management		
Possibilities of using information and resources of waste management data as tool for identification and solution of unauthorized waste management	Ing. V. Hudáková	Ministry of the Interior
The analysis of material flows of waste electrical equipment and possibilities of increase of their recycling and reuse	Ing. V. Hudáková	Technology Agency of the CR, BETA
The upgrade and expansion of the teaching aimed at the environmental issues on Faculty of Science of Masaryk University in Brno	Ing. D. Sirotková	Masaryk University Brno
Expert activities	Ing. D. Sirotková	Joint contract
Branch of Applied Ecology		
Erosion washout: increased possibility of danger for population and water quality in connection with expected climate change	Mgr. P. Rosendorf	Ministry of the Interior
The development of the system for automated monitoring of influence of water management structures on the environment using the technology of passive integrators TROVAN	Mgr. L. Závorka	Technology Agency of the CR, ALFA
Optimization of large wood structures for stream restoration and semi-natural stream regulation	Mgr. P. Kožený	Technology Agency of the CR, ALFA
The methods of optimization of the proposed measures in watersheds of reservoirs leading to effective decrease of their eutrophication	Mgr. P. Rosendorf	Technology Agency of the CR, ALFA
Numerical and functional analysis of aquaculture sector including recreational fishing focused on increase of competitive ability of the Czech Republic and improvement of status of water ecosystems	Ing. J. Musil, Ph.D.	Technology Agency of the CR, OMEGA

The analysis and solutions of the environmental risks of operation of small hydropower plants in connection with water organisms	Ing. J. Musil, Ph.D.	Technology Agency of the CR, BETA
The methodology for determination of reference conditions for the individual biological components of water quality	Mgr. L. Opatřilová	State Environmental Fund
The methodology for evaluation of ecological potential of heavily modified and artificial water bodies – category river	Mgr. L. Opatřilová	State Environmental Fund
The evaluation of technical reports of pilot projects of Operational Programme Fishing	Ing. J. Musil, Ph.D.	Ministry of Agriculture
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The determination of portion of erosive phosphorus in eutrophication of threatened bodies of stagnant surface water	Mgr. P. Rosendorf	National Agency for Agricultural Research
Monitoring and whole-area mapping of species of European importance as a base for finishing of draft of the Natura 2000 Network in CR	Mgr. O. Simon	Nature Conservation Agency of the Czech Republic
The processing of the information sheets for individual surface water bodies in subcatchments of the Upper Vltava, Berounka, Lower Vltava and other Danube tributaries	Mgr. P. Rosendorf	Vltava River Board, state enterprise
The water management balance of the state of surface water quality – the Vltava River catchment etc.	Mgr. P. Rosendorf	Vltava River Board, state enterprise
Monitoring of the macrophyte community threatened by rafting in the Warm Vltava (section of the Vltava River)	Mgr. O. Simon	Protected landscape area Šumava
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Expert activities	Mgr. L. Opatřilová Mgr. O. Simon Mgr. M. Bílý, Ph.D.	Joint contract

ASLAB Centre for Assessing Proficiency of Laboratories		
Good laboratory practice	Ing. P. Finger	Ministry of the Environment
ASLAB accreditation	Ing. R. Dvořák	Joint contract
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Branch of the Economic, Operation and Technical Activity		
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