



## WFD Compliance Monitoring Workshop

Chisinau, Republic of Moldova

20-21 November, 2013

### Meeting Minutes

Venue: Conference-hall, Hotel Europa  
16, Vasile Lupu Str., Chisinau, MD 2008, Moldova

#### Workshop background and objectives

WFD Compliance Monitoring Workshop in Chisinau was designed to address objectives of the project **Activity 1.4 - Assist in the development of WFD-compliant tools for assessing data obtained from monitoring activities**. Building on the outputs of the Batumi workshop in September 2012 the workshop objectives were the following:

- Report on monitoring programme (Ecological, Chemical, Hydro-morphological and Groundwater)
- Review short and long term development constraints, propose and agree next steps
- Review type and form of training required for remainder of the project
- Review classification systems and present proposals to resolve problems of integration
- (Explain purpose of Road-Maps and present initial findings)
- Present proposals for IMS
- Discuss methodology for pilot basin monitoring programme design

#### Participants:

##### Beneficiary institutions

##### ARMENIA

- Ms Liana Margaryan, Deputy Head of the Environmental Impact Monitoring Centre, Ministry of Nature Protection
- Mr Harutyun Yeremyan, Chief Specialist of the Hydrogeological Monitoring Centre, Ministry of Nature Protection
- Mr Edgar Misakyan, Head of Hydrography and Hydrometry Division, Armenian State Hydrometeorological and Monitoring Service, Ministry of Emergency Situations

##### AZERBAIJAN

- Ms Matanat Avazova, Deputy Director of National Monitoring Department, Ministry of Ecology and Natural Resources
- Mr Vasif Aliyev, Head of Laboratory of the National Monitoring Department, Ministry of Ecology and Natural Resources

- Mr Pasha Karimov, Senior Hydrogeologist of the National Geological Exploration Service, Ministry of Ecology and Natural Resources

#### BELARUS

- Ms Natalia Schegoleva, Head of Department of Analytical Control, National Centre of Analytical Control for Environmental Protection, Ministry of Natural Resources and Environmental Protection
- Mr Ihar Tsishchykau, Leading Engineer of Surface Water Monitoring Department, National Center for Radiation Control and Environmental Monitoring, Ministry of Natural Resources and Environmental Protection
- Ms Yuliya Mazurkevich, Head of Department of Planning and Hydrometeorological Programs, Ministry of Natural Resources and Environmental Protection

#### GEORGIA

- Ms Mariam Makarova, Head of Water Resources Management Service, Ministry of Environment and Natural Resources Protection
- Ms Marine Arabidze, Head of Environmental Pollution Monitoring Department, National Environmental Agency, Ministry of Environment and Natural Resources Protection
- Mr Irakli Kordzaia, Chief Hydrobiologist, National Environmental Agency, Ministry of Environment and Natural Resources Protection

#### MOLDOVA

- Ms Svetlana Stirbu, Deputy Chief of Environmental Monitoring Department, State Hydrometeorological Service
- Ms Valentina Iurcu, Chief of the Surface Water Quality Monitoring Centre, State Hydrometeorological Service
- Ms Natalia Ungurean, Hydrobiology Specialist, Surface Water Quality Monitoring Centre, State Hydrometeorological Service
- Ms Valentina Ceres, Chief of the Hydrology Forecast Division, State Hydrometeorological Service
- Mr Boris Iurciuc, Head of National Geological Fund Section, Agency of Geology and Mineral Resources
- Mr Victor Jeleapov, Hydrogeological Engineer, State Enterprise “Hydrogeological Expedition of Moldova”
- Mr Oleg Bogdevich, Institute of Geology and Seismology, Academy of Sciences of Moldova

#### UKRAINE

- Ms Tatiana Kuznietsova, Head of Hydrobiological Laboratory, Central Geophysical Observatory, State Meteorological Service
- Mr Kyryl Sereda, Coordinator of the Prut and Dnieper Basin Management Planning, Ministry of Ecology and Natural Resources
- Ms Nataliia Pyshnaja, Head of Groundwater Resource Accounting Division, State Scientific and Production Enterprise “Geoinform Ukraine”

#### **EU Delegation to the Republic of Moldova**

- Mr Henno Putnik, Attaché, Project Manager

#### **Human Dynamics Consortium**

- Ms Ivelina Dilovska, Project Director, Hulla & Co Human Dynamics KG
- Ms Nadya Boneva, Project Manager, Hulla & Co Human Dynamics KG
- Mr Timothy Turner, KE1 - Project Team Leader
- Mr Zurab Jincharadze, KE2 - Deputy Team Leader/River Basin Management Expert
- Mr Svetoslav Cheshmedjiev, KE3 - Biology/Ecology Expert
- Mr Bernardas Paukstys, KE5 - Groundwater Expert
- Mr Ralph Michael Jackman, NKE - Chemistry
- Mr Peter Rončák, Senior STE - Monitoring
- Mr Vahagn Tonoyan, CWME - Armenia
- Mr Aliaksandr Stankevich, CWME - Belarus



- Mr Victor Bujac, CWME - Moldova
- Ms Nataliia Zakorchevna, RBME - Ukraine
- Mr Ievgenii Grygorenko, EPIRB Office Manager – Ukraine

## Summary of Discussions

### DAY 1: 20 November 2013

The meeting was opened by **Mr Timothy Turner**, the Project Team Leader, who made statements regarding the importance of the workshop and the expected outcomes. Opening remarks on behalf of the Government of Moldova were made by **Mr Victor Bujac**, the Project CWME for Moldova, who also represented State Water Agency “Apele Moldovei” (Moldovan Water Agency), as the representative from the Ministry of Environment was unable to attend due to a busy schedule. In his speech, Mr Bujac highlighted the importance of the workshop for the Government of Moldova, as the country is preparing to sign an Association Agreement with the EU and aligning Moldova towards the EU/WFD monitoring practises. **Mr Henno Putnik**, representing Delegation of the European Union to Moldova, in his opening speech, highlighted the importance of harmonizing water legislation and monitoring standards in the project beneficiary countries with the European standards and norms. Mr Timothy Turner, concluding the opening session, presented the workshop Agenda and called for its adoption. The opening session was finalised by the round-table introduction of the project team and the workshop participants.

In his first presentation, **Mr Timothy Turner** outlined the workshop objectives and challenges for development WFD compliant monitoring, and the need for capacity building, training and development of classification and assessments systems. Mr Turner’s follow up presentation provided an overview of the main principles of the WFD, including the monitoring and classification systems, as well as further identification of water bodies and typology and analysis of pressures and impacts. He explained steps of basin planning and classification process, including setting targets to fulfil the Environmental Quality Objectives through selected programme of measures and to improve the status of ecological quality elements. Mr Turner discussed in brief each part of the monitoring and classification system that the project experts subsequently expanded on in their follow up presentations.

**Mr Svetoslav Cheshmedjiev**, the project Biology/Ecology Key Expert (KE3), presented Classification system of biological quality elements, particularly focusing on the analysis of macro-zoo benthos (MZB) communities by using the Rapid Biological Assessment (RBA) methodology for classification of surface water bodies. This methodology was successfully tested by the project monitoring teams at the last Joint Field Surveys in the pilot basins of Caucasus and Eastern Europe. Cost-effectiveness of the RBA, its full compliance with the WFD principles, multi-habitat site assessment, seasonal investigations and easy interpretation of results make it ideal for the countries with scarce hydrobiological data and human and financial resources. Mr Cheshmedjiev summarised the indicator and abundance taxa groups, RBA field protocols and sampling techniques. In addition, he outlined the RBA determination schemes and draft classification systems, and suggested based on macroinvertebrate quality element three river types: **Caucasian Black Sea River Types** (Chorokhi-Adjaristkali River Basin – GE); **Caucasian Kura-Aras and Prut River Types** (Akhurian-Metsamor sub-basins – AM; the Right Tributaries of the Central Kura – AZ; Prut river sub-basin – UA; Prut river sub-basin – MD); and **Upper Dnieper River Types** (Upper Dnieper River Basin – BY; Upper Dnieper River Basin – UA ). The presentation proved to be of great interest to the participants and generated an extensive Questions and Answers Session, discussing technical details of the RBA technique. The KE was asked how long it took to fill the field Protocols and how many JFS sampling locations were possible to assess per day. It was clarified that

filling of the JFS protocol takes about 40 to 50 minutes and depending on the distance and road conditions, 6-8 sampling locations could be covered per day. The KE said it was very important to prepare the "River Passports" for each sampling location to document existing condition of a given river section and revisit/revise it every 6 years. While working on the River Passports, it is possible to use existing historical data, as the special technical passports existed in the Soviet period (remark by **Ms Matanat Avazova, AZ**). Talking about the techniques of identifying Reference Conditions (RCs), the KE highlighted that these can be different for MZB from ones for other quality elements, like fish, phytoplankton, or macrophytes. Therefore, when the countries are ready to add other biological quality elements they should define Reference Conditions for other quality elements separately and adjust to the existing ones for MZB.

A question was raised by hydrobiologist from GE, **Mr Irakli Kordzaia** regarding suitability of calculating MZB species index on the field, versus sending samples to a laboratory for analysis. The KE said that it would be possible to calculate correct index in situ using RBA methodology, but initially and for identification of RC sites the teams are advised to verify the field assessment with the results in laboratories. The JFSs sampling sites were selected by using GIS as a result of delineation analysis and were qualified as surveillance, or operational monitoring sites. However, for further and more precise assessment, it is necessary to validate these data during over the next 3-5 years. The representative of Ukraine (**Ms Natalia Zakorchevna**) asked about strategy for covering data gaps in large river basins. The KE advised to establish smaller hydrobiological field assessment teams and identify relevant regional laboratories to move forward quickly, as introducing WFD compliant biological monitoring requires spending of significant amount of time and resources.

Further, on the question by Mr **Timothy Turner** regarding differences between the Rapid Biological Assessment and other relevant methodologies, as well as the time frame when the project can propose to establish RBA methodology in the beneficiary countries, the KE explained that: **i)** multi-habitat approach of biological assessment is a new EU standard and is commonly used for RBA. Other methodologies also use multi-habitat approach, although the techniques are different; **ii)** this system is completely open and could be calibrated/customized depending on the country resources and needs; **iii)** the project can propose to establish RBA methodology of hydrobiological classification immediately after the next JFS (June-July 2014); **iv)** the validation process will take another 3 years, but the countries will be able to use the system. However, re-assessment process should be scheduled for every 6 years afterwards. The following technical training is considered by the KE necessary to support RBA development :

- ✓ Detailed technical workshop on bio-monitoring methodology, either
  - One common training for all 6 countries,
  - Two regional workshops in the Caucasus and Eastern Europe, or
  - Direct country workshops focusing on MZB for RBA, combined with other biological quality elements and monitoring programmes
- ✓ Intensive JFS monitoring training on site
- ✓ Training on fish monitoring for Caucasus countries (tentatively Georgia)

Preliminary training program for biological monitoring will be drafted by the KE and forwarded to the project team and the beneficiary institutions for further review.

**Mr Peter Rončák**, the project NKE in monitoring and JFS, made a presentation on Biological Monitoring and Classification System including the development steps using the example of the Kura. He reported on the WFD requirements for determining biological status of water bodies. Application of biological monitoring in the Kura transboundary pilot sub-basins were also discussed. It was mentioned that, for this purpose, macroinvertebrate quality elements are specifically used as key indicators. Sampling methods applied in the Kura pilot sub-basins are similar to the ones presented by KE3: multi-habitat sampling, sub-samples or replicate samples for bottom substrata, kick and wash sampling, however, according in the Kura macroinvertebrate samples were processed, sorted and identified in laboratories, using available identification keys. The NKE clarified issues relating to main criteria for the selection and calculation of metrics (biological indices), as well as conditions affecting them - type variations, redundancy, seasonality



and fluvial types – in defining the EQRs. Finally, Mr Rončák described the steps in establishing Classification Schemes, including i) value settings for Reference Conditions; ii) setting of Ecological Quality Ratio (EQR) class boundaries; and iii) assessing biological status of water bodies, based on the Kura sub-basin JFSs. It was also mentioned that selected metrics (biological indices) should be consistent with the EU WFD definitions and sensitive to a range of pressures, to give an overall status for the relevant biological element. Therefore, the procedures for combining metrics (pressure related or multi-metric approaches) are used in the EU Member States.

In **Ms Tatjana Koltsova's (KE4)** absence **Mr Zurab Jincharadze**, the project DTL and River Basin Management Key Expert (KE2) presented Development of WFD Hydro-morphological (HM) Monitoring Programmes in the Pilot Basins. The presentation focused on different types of hydro-morphological monitoring and their complementary to biological monitoring in assessing the ecological status of surface water bodies. It also covered the hydromorphological (HM) parameters indicative to be measured under WFD, the pressures which HM quality elements respond and typical sampling frequency. KE2 has also briefly evaluated existing situations in terms of HM monitoring in the project countries and their compliance towards the WFD requirements. Further, Mr Jincharadze presented recommendations developed by KE4 for each pilot basin for establishing Surveillance and Operational Monitoring, their locations, additional OM stations and proposed HM quality elements to be measured.

During the follow up discussion, there were questions regarding the field site protocols and the exact indicators they include and if the river continuity, types and classes were included in the resulting maps. Mr Jincharadze confirmed that the maps presented were preliminary and further work would be needed to show the water bodies at risk. Mr Peter Rončák commented that the monitoring stations should serve multifunctional purposes, not only for HM operational monitoring.

The representatives of Moldova clarified that there are 11 automatic stations located on Prut River, from which data is received every 10 minutes and that they haven't been included on the preliminary maps.

Ukrainian representatives said that they will need more time to review this report and asked the project to provide more training on Hydromorphology monitoring, particularly the way the content of reporting protocols and the classification systems. The project TL and DTL suggested that such training could be provided as part of RBMP process.

The follow up presentation on the proposed methodology of hydro-morphological assessment and typology, based on the Kura pilot JFS results, was made by **Mr Peter Rončák**. He described WFD requirements when and how the HM quality elements are used to help to identify the water bodies at risk (before the WFD compliance monitoring is established) and those of "high status". It was mentioned that all HM quality elements are required to be monitored for Surveillance Monitoring, while for Operational Monitoring they are limited to most sensitive elements. In conclusion, Mr Rončák presented examples and results of the HM field assessment (including the identification of the main hydromorphological pressures) in the Kura pilot basins and made recommendations for a minor modification of the method currently is being used, considering country/basin specific requirements.

The next discussion session was dedicated to the Ecological Status Monitoring and Supporting Physical-Chemical Monitoring presented by **Mr Svetoslav Cheshmedjiev (KE3)** and **Mr Peter Rončák (NKE)**. The KE3 described assessment approaches for determining ecological status and the linkages with the physico-chemical classification system. Based on the JFS results the KE3 has proposed the following six type specific physico-chemical classification schemes, built on the 10 parameters (Dissolved Oxygen, pH, EC, N-NH<sub>4</sub>, N-NO<sub>2</sub>,

TN, P-ortho-PO<sub>4</sub>, TP, BOD<sub>5</sub>) for the pilot basins:

1. **Mountain 'stone' river types:** Chorokhi-Adjaristkali RB - GE; Akhurian and Agstef RB - AM; Ganjachay, Shamkirchai, Tovuzchay, Agstafachay - mountain parts in AZ; North Carpathian rivers of Prut RB - UA
2. **Semi-Mountain 'gravel' river types:** semi-mountain parts of Chorokhi-Adjaristkali RB - GE; Akhurian and Agstef RB - AM; Ganjachay, Shamkirchai, Tovuzchay, Agstafachay - mountain parts in AZ; North Carpathian rivers of Prut RB - UA
3. **Plain river types with fine substrata:** Dnieper RB - BY/UA; Prut River without the tributaries - MD
4. **Temporary (seasonal) rivers:** temporary and flood rivers - AM/AZ; Metsamor River - AM; meandering organic type rivers at very high altitudes - AM/AZ; small left tributaries of Prut River - UA/MD
5. **Naturally oligotrophic type of lakes:** Arpi Lake - AM; reservoirs in mountain and semi-mountain zone - AZ
6. **Plain shallow type of lakes:** Kiev Reservoir, Dnieper RB - UA; Reservoirs/lakes in Dnieper RB - BY; Prut RB reservoirs and temporary lakes - MD

Mr Cheshmedjiev recommended: i) to develop criteria for additional physico-chemical parameters, such as oxygen saturation, COD and other basin specific pollutants (turbidity, Cu, Zn, As, etc.); ii) to develop validation programme for biological reference conditions, typology and inter-calibration (3-5 years); iii) review and improve the classification system using reliable data in every 6 years.

The presentation by Mr Peter Rončák focused on ecological status assessment in the Kura transboundary pilot basins, where 15 indicative parameters were monitored (water temperature, Dissolved Oxygen, Oxygen Saturation, BOD<sub>5</sub>, COD, total suspended solids, NO<sub>3</sub>, NH<sub>4</sub>, SO<sub>4</sub>, total mineralization, pH, As, Cu, Zn). The NKE discussed relationships between the biological quality element (macroinvertebrates community) and the physico-chemical parameters and ways to establish type specific Environmental Quality Standards (EQS) and calculating EQR boundary values for the Kura pilot sub-basins. For this purpose, it is recommended to use at least 3 year data sets both biological and physico-chemical parameters.

The follow up Q/A session generated discussion on frequency, technical capacity, financial means and cost-effectiveness of the Ecological Status Monitoring, importance of customising list of quality elements by adding basin specific indicative parameters, such as radioactivity for instance (raised by the Belarussian delegation), or any other specific pollutants, etc. At the end of this session, the meeting facilitator summarised the Day-1 discussion results and suggested that the presentation on Information Management Systems (IMS) would move to Day-2.

## **DAY 2: 21 November 2013**

The meeting was opened by reviewing Day-1 findings. The meeting facilitator (Mr Timothy Turner) summarised the Day-1 and reminded participants of the following points:

- a detailed training program for the remaining period of the project is to be drafted on Rapid Biological Assessment (RBA), delineation and typology of water bodies and hydro-morphological assessment techniques, ecological status assessments and EQR development ;
- RBA methodology will be used in parallel of multi-habitat biological methodology practiced in the Kura JFS pilots;
- a RBA based methodology for biological monitoring will be ready within the project life-time, thus participating countries will be able to launch MZB based biological monitoring immediately after the project ends;
- methodology for ecological status monitoring needs to be tested and clarified;
- upgrade existing delineated and typology reports to optimize river types and number of water bodies by customizing classification schemes from System A to System B.

The presentation by **Mr Zurab Jincharadze** (KE2) on the ways to develop Information Management System (IMS) and Web Based Water Portal for the project pilot basins promoted intense discussions among the participants. The KE2 gave overview the types of digital data which exist, either by the project (through the JFSs), or available from the beneficiary institutions (tabular monitoring data in Excel and MS Access formats;



GIS shapefiles and Geo-Data Base layers and datasets of monitoring results, georeferenced information, etc.). He highlighted the reasons and solutions for standardizing existing data and information in a common database system. Mr Jincharadze described advantages of the data standardization for the 'decision support systems' and showed the several examples of successful implementation of such approach. One such example is the WISE (The Water Information System for Europe), which is part of the EEA SEIS (Shared Environmental Information System). Among other tools, the WISE widely uses internet map viewer tool that visually demonstrates chemical, biological, and ecological and groundwater status of water bodies, linked with supplementary data and reports. Another example is the Dniester GIS portal that also is based on the Web-GIS technology.

The following Q/A session and comments from participants demonstrated that although the benefits of the proposed IMS and on-line data sharing mechanism is highly appreciated and understood, some countries find it still premature and would like to see more customised decision support systems/tools (similar to the Water Cadastre Information System, also presented by KE2) to be developed to make more use of existing national data for water resources management. Concerns were also expressed on maintenance and ownership of IM systems after the end of the project. Therefore, it was decided that the project will modify its proposal and apply a country-by-country, or sub-regional approach for the EPIRB IMS in order to support the decision making process.

**Mr Michael Jackman**, the project NKE in Chemistry, made a presentation on capacity building for the Chemical and Physico-Chemical Monitoring. Mr Jackman outlined the tangible outputs of his six missions by his approach of working together with the beneficiaries at the bench to customise the training for their individual requirements for monitoring, which was much appreciated, including:

- ✓ The training workshops submitted in each country on internal quality control systems. Laboratory accreditation and method validations. Owing to these most countries were now applying the important Shewhart control charts and many other important aspects of ISO 17025.
- ✓ The audit of the chemical analysis that was undertaken had also improved the recording systems for the countries which should be applied for the next JFS monitoring program.
- ✓ On the bench training for the development of OCP methods and the re-commissioning and operational training of unused instruments such as the fluorescence Spectrophotometer for oil analysis in Georgia and the on-site turbidity meter in Moldova.
- ✓ Assisting Georgia to repair their AAS so that they could analyse the heavy metals
- ✓ An audit trail of the water sampling also resulted in recommendations that should improve the sampling at the next JFS.

He reviewed monitoring objectives, laboratory standards and requirements for laboratory practice to be in accordance to the WFD and ISO 17025. . In summary, Mr Jackman proposed medium- (3 to 5 years), and long-term (5 to 10 years) capacity building and training programmes to make national laboratories compatible with the WFD requirements and summarised how this could be achieved.

Following to the presentation most of the participants commented positively on the results achieved, but also expressed some concern that only central laboratories had received training and also training subjects were not defined clearly from the beginning as the water monitoring management systems are complex. There are some national accreditation norms in Ukraine and Belarus that the laboratories are obliged to follow, and it was, therefore, noted that introducing different protocols and norms might be considered as irrelevant, though they had applied some new AQC systems which were found to be useful. Other countries (Azerbaijan, Armenia) expressed interest in strengthening the technical capacity of national laboratories with

advanced trainings.

**Mr Bernardas Paukstys**, the project Groundwater Key Expert (KE5), gave a presentation on Groundwater Monitoring Programmes and Classification Systems. Mr Paukstys commented on the existing programmes in each country and their compliance with the WFD requirements; presented results of the JFSs and follow up control sampling for classification of groundwater bodies (GWBs); discussed threshold values of GWBs at risk and measures to improve groundwater status; presented conceptual GW models for the Prut and Chorokhi river basins; and highlighted next steps for developing WFD compliant monitoring in the beneficiary countries. For the GW monitoring programme KE5 proposed 3 phases of modernization of existing networks: 1) from the end of the project, when the existing GW monitoring systems will be used; 2) short term (5 years) – amendment of national legislation to facilitate the development of monitoring networks; oblige polluters and water users to pay for operational monitoring; monitor the SW-GW interaction; establish threshold values for GWBs at risk; and 3) long term (10 years) development of monitoring plan – installing optimised and cost-effective WFD compliant Surveillance and Operational Monitoring networks.

The general discussion session which emphasised an importance of the GW monitoring and generated many questions and comments including, technical details for establishing proper GW monitoring network, modelling SW/GW interaction, possibility of using GIS as a conceptual modelling tool, prevention measures for diffuse sources of pollution in groundwater aquifers, monitoring of transboundary aquifers, influence of Climate Change on groundwater discharge regime, effect of fertiliser intensive agriculture (pesticides) on the quality of groundwater and time needed and cost for establishing SM and OM networks.

### **Summary of DAY-2 and meeting closure**

The meeting results and conclusions were summarised by the project TL and DTL. It was noted that the workshop had been very useful to:

- achieve common understanding between the project staff and beneficiary institutions on classification schemes and ways to establish WFD monitoring systems for biological/ecological, hydro-morphological, physico-chemical and groundwater monitoring;
- ways forward in the development of biological and ecological monitoring programmes based on EPIRB and Kura basin data;
- drafting proposals for a monitoring training programme;
- discuss the design gap filling JFS for SW and GW in pilot basins;
- agree on simplification of SW delineation and typology and classification systems ;
- proposals for development of the information management systems or decision support tools

Finally the workshop hosts (Ministry of Environment of Moldova) and the Team Leader thanked everybody for their very active and useful participation and closed the meeting.

Annexes:

---

**Annex 1:** Final Agenda of the monitoring workshop

**Annex 2:** List of Participants

**Annex 3:** Presentations of the workshop