

## Overall Plan of Operations

This annex outlines the Consortium strategy and the project team proposal for implementation of project activities based on the conclusions and recommendations gathered during the Inception phase.

### Result 1

*Increased capacities of the respective national authorities for hydrobiological, chemical and hydromorphological monitoring of water quality including groundwater; quality assurance procedures in laboratories in place.*

#### Activity 1.1

##### ***Review the national monitoring systems and tools for assessing data obtained from monitoring activities***

Activity completed as it was planned. Detailed information can be found in the Inception report body and Annex 8.

M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M1 0	M1 1	M1 2	M1 3	M1 4	M1 5	M1 6	M1 7	M1 8	M1 9	M2 0	M2 1	M2 2	M2 3	M2 4
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Year 3												Year 4											
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#### Objective

- This Activity was supposed to focus the remainder of the work. Its recommendations caused changes in the workplan of the whole project (see below) as well as changes in the planning of the next six-months planning period.

#### Outputs

- Task 1.1.1: Review of progress in monitoring and assessment programmes as well as in legal documents has been prepared for all six countries.
- Task 1.1.2: A gap analysis for each of the beneficiary countries highlighting how closely their monitoring and assessment programmes approximate the WFD requirements conducted
- Task 1.1.3: A legal and institutional gap analysis which highlights how principles, approaches and targets of WFD are provided for is done
- Task 1.1.4: Project Website established, see [blackseariverbasins.net](http://blackseariverbasins.net). This Project Website allows for the uploading and downloading of project reports, an events calendar, maps, and photos. It also allows the public free access to finalised reports endorsed by the Steering Committees and Contracting Authority, but may also have password protected areas for the distribution of draft reports for comment and minutes of meetings. The website includes a section that allows for the upload of data in a WFD compliant manner

#### Activity 1.2

##### ***Support the implementation of countries obligations under Danube and Water Conventions***

## Timing (Start/End)

In the Technical Proposal we focussed this support for the second half of 2013, once data is available from the joint field surveys, and as dictated by the ICPDR and Water Convention reporting cycles. On-going support to the beneficiaries for the remainder of the project as they require it was proposed. Now we propose to start this Activity a bit earlier, contacting the Secretariats of Conventions, on the one hand, and relevant beneficiaries, on the other hand, to check how we could support them by implementing this Activity

### Explanation:

This Activity is largely contingent on the successful completion of the joint field surveys that might fill in the gaps in the reporting required, as well as the collation of the existing data under Activity 1.1, and the baseline survey under Act. 2.3. Its key milestones will be the regular reports prepared by the beneficiaries to support their obligations under the ICPDR and Water Conventions.

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M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

### Objective

- Both the Ukraine and Moldova are Parties to the ICPDR's Danube River Protection, while five out of the seven beneficiary States (with Armenia and Georgia being the exclusions, and Georgia in the accession process) are Parties to the UNECE Water Convention. Both these treaties oblige their Contracting Parties to establish and maintain monitoring programmes on water quality and ecological classification processes. Moreover the Parties to both Conventions are obligated to exchange data and information with their co-riparian States.
- This Activity will examine the extent to which the Parties have complied with these obligations, the quality of the data provided and will provide support with respect to giving effect to these obligations where necessary. This support may be to provide the data required from the monitoring programmes established, as well as with respect to their obligations (under the Water Convention) to establish and maintain bilateral and multilateral programmes. For the countries with no participation in the UNECE Water Convention, the project will assist in developing national water strategies to stimulate their accession to the Convention

### Outputs

- An analysis of the Ukraine and Moldova's obligations under the ICPDR Convention, the extent to which these are being met, and actions required to provide the data and information required (DanubeGIS).
- An analysis of the Parties obligations with respect to the UNECE Water Convention, and the extent to which these are being met.
- Water Strategy papers (where needed) are submitted for approval to national jurisdiction/management institutions.
- Relevant data provided to the beneficiary states as it comes available; there is consequently an on-going support and interaction from the consultancy team.

## Tasks

### Task 1.2.1: An analysis and report on the Ukraine and Moldova's obligations under the ICPDR convention

#### Description

Both the Ukraine and Moldova are riparian to the Danube River Basin District, and are Parties to the Convention on Cooperation for the protection and Sustainable Use of the Danube River and are active members of the International Commission for the Protection of the Danube River (ICPDR). Article 9 of the Convention places obligations on the Parties with regard to monitoring and cooperating with respect to monitoring water quality as well as ecological and hydrological characteristics. In this regard both nations have committed themselves to managing their portion of River Basin District according to the WFD standards, and have participated in the development of the Danube River Basin District Management Plan – providing data and information in that regard.

More specifically, the ICPDR has established a WFD compliant TransNational Monitoring Network (TNMN), which includes sampling points in Moldova on the Prut River, in Ukraine on the Tisza and Latorica Rivers, and in the Ukrainian part of the Delta. This includes both monthly monitoring for physio-chemical parameters but also biannually for ecological characteristics. An important transboundary aquifer in Moldova is also monitored. These data are transmitted to the ICPDR. However, it is clear that both countries are struggling to comply to these requirements and important gaps in the data have been identified.

In addition the ICPDR has developed the DanubeGIS to comply with the central elements of the Water Framework Directive regarding data requirements on the basin-wide scale including all relevant monitoring aspects. Based on these requirements, the Danube River Basin (DRB) GIS provides a platform for exchanging, harmonising and viewing geo-information and related issues. It is a tool for reporting, management, and planning, while its system architecture remains as flexible as possible to be able to meet future needs. Main objectives of the system are:

- support WFD (and other) reporting and map making
- integration of existing and future information data sources to increase usage effectiveness
- optimisation of costs
- anticipate analysis and modelling functionality for future system expansion

This task will therefore examine the obligations of Ukraine and Moldova with respect to meeting and reporting these monitoring obligations, and where the potential problems with non-compliance lie. The project will then directly respond to these gaps, providing data from this project's activities were available, but also by aligning any possible actions on the Prut, or Tisza River with the needs of the TNMN and DanubeGIS. The ICPDR have already indicated that action on the Prut is required.

The existing interaction between the Ukraine and Moldova through the ICPDR will also be used as an example of best practice, and we will explore the possibility of peer-to-peer visits to spread this experience to the other beneficiary States.

### **Task 1.2.2: An analysis and report on the Beneficiaries obligations under the UNECE Water Convention**

#### **Description**

All the beneficiaries, with the exception of Armenia and Georgia, are Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. We also note that Georgia is currently in the processes of preparing the documentation for accession to the Convention. Article 11 of that Convention provides for the development of joint monitoring and assessment programmes. These must use an ecological classification process. However, it appears that few of the beneficiary countries are actually in compliance with this requirement. Article 13 provides for the exchange of information on inter alia the environmental condition of transboundary waters between riparian Parties. In this sense the obligations to the beneficiary States would be the subject of bilateral or multilateral agreements on their shared basins or lakes. However, the details of what and how information should be exchanged was left up to bilateral or multilateral agreements on shared water courses.

We will therefore examine the general obligations of all the beneficiaries under the Water Convention, and the extent to which they are fulfilling these obligations. The project team will also examine any relevant bilateral agreements on transboundary waters specifically with a view to extracting the obligations of the Parties. In this sense we also note that there are bilateral agreements between Georgia and Armenia, and Georgia and Azerbaijan with respect to the exchange of data which will also be included in our analysis. Similarly, Armenia has obligations towards Iran in this regard. The project will then directly respond to all these gaps, providing data from this project's activities were available, but at the least to highlight the gaps that exist. The project will also source data from the national databases that may also fulfil these obligations, but which have not been appropriately reported. This process will also influence the selection of the pilot catchments. In addition we anticipate that should Georgia and Armenia decide joining the Water Convention, the project team will look for the possibility of assisting the beneficiary institutions in drafting water strategy documents to guide through the accession process and approximate to legal requirement of the Convention.

We anticipate that this task will also include an element of capacity building around international water law and the duty to cooperate and share data. Course material will be prepared by the Team Leader, but would be jointly presented by the Team Leader and the country coordinators.



guidelines for the establishment of surveillance, operational and investigative monitoring. This outlines in some detail the elements that must be included for different types of water body, the frequency of sampling and the selection of monitoring points.

This listing is not repeated here; however our Key Experts will consistently refer to these guidelines when designing WFD compliant programmes for the pilot basins. In any event our Key Experts have extensive experience with the development of WFD monitoring programmes. This will ensure compliance not only with the technical requirements of the WFD but also the reporting requirements, such that the results from the pilot basins may be directly compared to similar water bodies in the EC. However, we will consistently work with experts in the beneficiary countries to ensure that the technical details of the monitoring programme and the establishment of reference conditions (Task 2.3.1) are consistent with the local ecological conditions / natural species composition and background water quality. In particular we will use existing data, as well as the data from the joint monitoring programmes to further refine the proposals to monitoring.

We note that the Terms of Reference indicates that none of the countries have monitoring programmes that respond to all these requirements. However, some chemical and ecological monitoring is / has been undertaken, sometimes in response to other programmes of support. The focus of this task will be to firstly identify the extent to which the beneficiary State is already monitoring the parameters and elements required, and to expand this to meet the WFD requirements. In particular we would note that there are no ecological reference conditions for the Caucasus – emphasising that the level of effort in this regard will differ between the pilot basins / sub-basins. On-going EC funded regional water project - the Kura Phase III however has started joint field surveys in three pilot transboundary sub-basins of the Kura River to test and implement the WFD compliant procedures of detecting reference conditions in the pilot areas; As a result the project will test the sampling protocols and operational procedures for identifying hydro-biological quality elements (micro-invertebrates), hydro-morphological quality elements and physico-chemical quality elements of assessing surface water quality in these pilot rivers. Our idea would be to continue these activities for mentioned pilot basins for one more cycle year (three times, depending on different levels of water discharge seasonally) once the Kura Phase III will over in February 2013 and, since the beneficiary monitoring institutions will receive enough practice to keep it going by their own, replicate these activities to the EPIRB pilot areas, with all elements of the surface water monitoring including groundwater.

### **Task 1.3.2: Training courses in WFD compliant monitoring prepared and presented**

#### **Description**

The Terms of Reference indicate that beneficiary countries have specifically requested capacity building activities with regard to WFD compliant monitoring programmes. This we will achieve both through formal training programmes outlining; the core principles around the various monitoring programmes, why certain parameters are included; and their practical application. The training will include modules on the country specific monitoring programmes designed. As such, these training courses will only be held once our Key Experts have developed the key components of the monitoring programmes in the second half of 2013.

The training programmes will be held in conjunction with the joint field surveys, so that a ‘Learning- by-doing’ approach can be adopted. Our Key features section has highlighted the rigor we will apply to designing these courses. We will also design competency tests to evaluate the trainees with respect to the ecological and hydro-morphological parameters. The training courses will be designed according to the pre-existing levels of competency as well as requirements. In countries where a high level of previous experience in biological monitoring already exists, the courses may focus on the specific requirements of the WFD, whereas where there is very little or no pre-existing experience training courses will have to be more comprehensive. It is nevertheless assumed that the beneficiaries will be able to identify trainees with at least a tertiary qualification in related fields.

The Water Framework Directive (WFD) introduces new ways of protecting and improving rivers, lakes, groundwater, estuaries and coastal waters. It provides a structure to develop a sustainable future for natural waters. The emphasis is on promoting aquatic environments that support balanced plant and animal communities. Healthy ecosystems indicate that good quality water is available for human use. Well planned use of these natural resources makes certain that a balance is struck between socio-economic requirements and environmental needs and ensures that high quality water is made available for drinking water, industry and agricultural and recreational use. In addition, the adoption of integrated river basin planning provides an opportunity to address other challenges such as climate change, sustainable development and other water-based activities in a more strategic and integrated manner.

Many of the region’s transboundary rivers may be threatened by over abstraction, pollution and unsustainable development. Rivers cross national and international boundaries and decisions taken upstream impact users further down.

To be able to effect these changes, monitoring programmes have to be developed to check the quality and quantity of the water. The quality components are monitored by chemical and hydrobiological sampling and analysis, therefore monitoring schedules need to be developed. These will define:

- i. Chemical and hydrobiological parameters.
- ii. Frequency of sampling.

iii. Sampling locations.

According to the WFD, the location of sampling points and the frequency of sampling depends on the type of monitoring.

Nevertheless, the project team will engage with the relevant tertiary education institutions with a view to advising them on options to include elements of the training in their course materials.

### **Task 1.3.3: Country specific on-going monitoring programmes are designed**

#### **Description**

We note that the Terms of Reference indicates that the countries may not be in a position to adopt all elements of the WFD into their plans. Some of these may be related to the monitoring requirements. However, in this case there is a risk that the pilot projects would serve primarily as demonstrations rather than pilots. We believe that this may compromise the contribution to the Purpose 1 and ultimately to the Overall Objective. Importantly in this regard, both the surveillance and operational monitoring programmes are intended to be on-going. This task will therefore aim to design monitoring programmes that could continue after the project is completed. This may address monitoring frequency (although it is noted that the minimum monitoring frequencies required by the WFD are already quite low), but more specifically the elements that will be monitored and perhaps the number of sites / water bodies that are monitored (particularly for areas outside the pilot basins).

Importantly, this need not compromise the requirements of the WFD, but rather will help the beneficiaries determine how they could continue the monitoring. For example if the project has been unable to train staff in fish monitoring (which only takes place every 3 years), then options to buy-in these skills when needed will be explored. This may be linked to other exchange programmes, internships or tertiary education institutions in the EC, and so could be done at relatively low cost. As such the thrust of this task will be to examine ways in which the countries could firstly maintain compliancy with the WFD, and secondly if compromises are necessary, which elements could be reduced to ensure that the core value of the WFD approaches remain.

As the Member Countries have monitoring programmes in place but are not fully compliant with the WFD, we will review these current programmes, process their data, and explore ways in which these programmes could be modified such that they would be harmonised with the WFD. It is envisaged that these modifications will be introduced gradually using a step by step approach so that the beneficiaries have the capacity to implement these changes.

The Countries have the facilities to analyse some of the chemical parameters which are limited and vary between different Countries. The current hydrobiological parameters are even more limited, but it is important that all countries are trained to initiate this monitoring system. Where there are gaps we will establish training workshops and field training exercises in the pilot areas to improve the capacity of the staff to undertake these new monitoring programmes. This will also be linked to tasks of 1.5 and 1.6 to also improve the capacities of the laboratories.

The initial steps to implement the new monitoring programme will include the following:

- i. Review the national current monitoring systems.
- ii. Agree with the individual countries which parameters could continue to be used from the results of activity of 1.4.
- iii. Use these parameters to estimate a simple classification of the pilot areas.
- iv. Agree with the individual countries which additional parameters could be included and excluded for an improved classification system more compliant with the WFD.

Ensure that there is at least one set of hydro-biological parameters included.

#### **Note:**

The development of biological monitoring programmes requires a range of skills from fish biologists, macroinvertebrate specialists, phytoplankton and phytobenthos specialists, and macrophyte specialists. While our Key Experts have a broad working knowledge of all these aspects, particular specialist inputs may be required in some cases. We will aim firstly to secure this expertise within the country, either from the State beneficiaries or from tertiary education institutions. However, if this expertise is not locally available, it may be necessary to appoint additional experts, first of all those involved in the UNDP-GEF Dnieper project. We have made provision for this in the task allocation and budgets.

## Activity 1.4

**Assist in the development of WFD-compliant tools for assessing data obtained from monitoring activities (ecological, chemical, hydromorphological classifications) and for using assessment results in RBMPs development (to be redesigned)**

### Timing: (Start/End)

This Activity will start in the autumn of 2012, and continue to mid 2013.

### Explanation:

This work was moved earlier in order to build greater clarity among the recipients regarding the needs for WFD complaint monitoring programmes, which are not clear until countries/basins accept WFD complaint assessment programmes. In this way the necessity of new monitoring activities (ecological, chemical, hydromorphological classifications) in the formats required will be better received, and included as part of the training programmes which will be organized within Activities 1.3 and 1.4 back-to-back with each other for representatives of all basins taking into account that actual assessment and monitoring programs could differ from each other in different basins (see recommendations of experts in Chapter 4 of Inception Report) .

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### Objective

- This Activity aims at linking the normative definitions of different classes in Annex V of the WFD to specific ecological/biological, hydromorphological and chemical characteristics as well as drafting guidelines on assessing the status of each water body and setting the water quality targets of RBMPs in each of the basins /beneficiary States

### Outputs

- Threshold values determined for each of the water body types and classes of the WFD.
- Draft guidelines on assessing the ecological, biological, chemical and hydromorphological status, using the threshold values and normative definitions of Annex V of the WFD – for each type of water body.
- Draft guidelines on setting the water quality targets of RBMPs
- A web based database compatible with the EEA and DG ENV database.

## Tasks

### Task 1.4.1: Determine threshold values and Ecological Quality Ratios for determining water body status for each type of water body

#### Description

Data merging from WFD monitoring programmes need to be assessed against specific classification criteria to determine the overall status of the water body as a narrative description of 'High', 'Good', or 'Moderate'. However, while Annex V of the WFD provides generic descriptors of these classes, the threshold values need to be specific to the local conditions. As such, this task will aim to determine which particular species compositions, flow conditions or chemical concentrations would constitute; 'High', 'Good' and 'Moderate' states in that particular country or region. We note that the conditions in most of the beneficiary countries may be similar (although they fall across 3 different ecoregions– Annex XI of the WFD). As such it may be possible to use similar threshold values between the pilot basins / sub-basins. The main intention of this task is to determine these thresholds specific to rivers, lakes, transitional waters and heavily modified surface water bodies in the pilot basins. In this way we will ensure that the narrative



descriptors of 'High', 'Good' and 'Moderate' are comparing apples with apples across all the beneficiary countries and the EU.

This work will include the assessment of chemical quality standards according to the methods laid out in Annex V of the WFD. Where the beneficiary countries do not have the laboratory capacity to undertake toxicity testing using the appropriate organisms, then these chemical quality standards may be adopted from EU countries with a similar biota and ecological condition. Similarly, we may adjust the resourcing between the pilot basins, as some may be able to adopt appropriate threshold values from similar water bodies from the neighbouring EU Member States.

In transboundary systems, intercalibration processes will be used to ensure that these interpretations are compatible across borders, this will be important in river systems that cross into EU Member States that have already established their classification systems. However, in these cases the existing thresholds will be used as a guideline. Our project team will apply particular rigor to this process as it will not only identify any gaps in the monitoring programmes that would have to be filled to produce the data required, but also because ultimately these threshold values convert data into WFD compliant information. This in turn forms the basis for formulating the Programme of Measures.

This task will also determine the threshold concentrations / water table levels for groundwater quantitative and qualitative status.

#### **Task 1.4.2: Draft guidelines on assessing the status of each water body and setting the water quality targets of RBMPs**

##### **Description**

This task will aim at producing easy to use guidelines for assessing the 'High', 'Good' or 'Moderate' status of each type of water body, based on the thresholds and Ecological Quality Ratios determined. These guidelines will link the normative definitions of each class in Annex V of the WFD, to the numerical thresholds determined in the previous task. The intention is to provide each of the beneficiaries with these country specific or regional guidelines which could be used on an on-going basis. These guidelines would be iteratively developed with the monitoring programmes described in Task 1.3.3 to ensure that the core monitoring required to classify water bodies is done.

Draft guidelines on setting the water quality targets of RBMPs would also be provided as part of the training materials and will be applied under the Activities in Result 2

#### **Task 1.4.3: Prepare a web based database system**

##### **Description**

It is important that the information emerging from the application of the classification system described in the above two tasks is captured and made freely available. This will not only ensure that this work contributes to the project Purpose, but also that this could serve as a basis for encouraging on-going work. This task will therefore aim at developing a web based database system compatible with the EEA database. This database will be used to house and make publically available all the data produced by this project.

This will initially be housed on the Project Website developed under Activity 1.1 so that all the stakeholders could access this, but it is hoped that the database could be migrated to national government websites as the project is closing. The task will therefore include examining which national databases or portals would be most appropriate to host the information on an on-going basis. This will help ensure that the system is also developed with existing national database and information exchange systems in mind. This action must therefore also include the identification of institutions that would maintain and add to the data produced by this project, taking cognisance of the existing capacity in each of the beneficiary States.

##### **Note:**

The development of biological monitoring and assessment programmes and using them in national/basin water management planning requires a range of skills from fish biologists, macroinvertebrate specialists, phytoplankton and phytobenthos specialists, and macrophyte specialists as well as water development managers. While our Key Experts have a broad working knowledge of all these aspects, particular specialist inputs may be required in some cases. We will aim firstly to secure this expertise within the country, either from the State beneficiaries or from tertiary education institutions. However, if this expertise is not locally available, it may be necessary to appoint additional experts. We have made provision for this in the task allocation and budgets.

## **Activity 1.5**

### ***Support the analytical quality control assurance procedure***

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#### **Timing (Start/End)**





### Category 1 : Internal Analytical Quality Controls (AQC)

These AQCs are controls which the laboratories can implement individually by establishing Shewhart Charts for most of their analysis. To establish the Shewhart Charts, the analytical method must be firstly validated to obtain its precision, accuracy and limit of detection. We could train staff on these procedures to produce these extra AQC results and to plot these on the Shewhart charts. These results are important as they provide verifiable data that the analysis has been carried out correctly and has met the precision and accuracy specifications of the analytical method.

It is envisaged that each laboratory will be fully trained in all these techniques. It is recommended that such training is undertaken as a priority.

### Category 2: External Inter-laboratory Quality Controls

Another way of checking the analytical results is to send identical samples to each of the participating laboratories and compare their analytical results, these are external analytical quality controls.

There are a number of such inter-laboratory schemes run by national and international organisations, such as the QUALCODanube scheme run by the ICPDR and the AQUACHECK scheme run by the UK's Water Research Centre. These organisations distribute the samples, and process the data using statistical techniques such as the Youden Plots, analysis of variance, and the chi squared test. The results are then sent to the participating laboratories advising them of the quality of their analysis and highlighting any problems.

These two AQC techniques can be used in parallel but it is advisable for the laboratories to establish a reliable internal AQC systems prior to participating in external schemes. The reasons for this are:

- i. The internal AQC's apply to every batch of analysis rather than to a very select batch.
- ii. The laboratory will have a better understanding of the specifications of their analytical methods.
- iii. The laboratory will have a greater confidence in their results, especially if they then compare themselves with other laboratories.

For the external AQC systems, it is recommended that we facilitate the inclusion of the national laboratories in the international inter-laboratory schemes. The advantage of such AQC systems is that it is normally impossible to manipulate the results, which could happen with internal systems. We would also assist by advising which parameters to analyse, and try to resolve any problems with the analysis that are highlighted within these schemes.

If required, we could establish a new inter-laboratory scheme for the 6 member countries. However this may not be sustainable after the Project has been completed, as maintaining such a scheme is time consuming and requires specialist expertise, which may not be available when the project is finished. It may be more feasible to participate in the current international systems that operate well, as they have dedicated statistical and analytical experts readily available to advise their participating laboratories, which is also a useful extra resource.

However, one type of simple regional inter-laboratory test that is recommended, which could be applied would be when two member countries work together on-site training monitoring transboundary pilot rivers. Each country could be submitted the identical sub-samples and then each could analyse for the same parameters carrying out the analysis in duplicate. The results could be processed using Youden Plots, which would compare the laboratories' results and determine whether there are any unacceptable systematic or random errors.

We could train the staff on the theoretical procedures for undertaking Youden plots and the field trip could be used as a practical exercise. It is hoped that this bi-laboratory procedure would motivate them to establish reliable internal AQC procedures to ensure they obtain accurate and precise results in the external tests, where the results would be compared statistically

## Activity 1.6

### *Assess the needs regarding laboratory infrastructure, equipment and training*

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#### Timing (Start/End)

This main part of this activity will start in the last quarter of 2012, and continue to the end of 2013. This will continue to be developed during the project by taking into account feedback from the pilot studies.



analytical load between several laboratories.

Where there are difficulties in using the equipment we will work on-site with the staff to try to resolve these problems. In addition we could undertake refresher training courses on specialised analysis or data processing to reinforce the skills of the laboratory staff. It has been noted that this kind of analytical gap analysis has already been done in the South Caucasus through support to the Kuru River basin. We will therefore apply this experience, as necessary, and prioritise the laboratories that urgently need this support.

Another solution could include the use of laboratories elsewhere in Europe to assist with certain priority pollutants or biological elements as part of an irregular, or even once off, reconnaissance assessment. In the Project incidental budget, allocation has been made for joint field surveys, which could be applied to support the laboratory costs. The ICPDR is also planning its Joint Danube Survey 3 for 2013, and this also poses opportunities for inter-laboratory collaboration that could be explored.

### **Task 1.6.2: Assessments of the capacity building needs of the physio-chemical monitoring programme**

#### **Description**

In parallel with the improving the technical capacities of the laboratories there will be a need to optimise these for the WFD compliant monitoring programmes. It has been noted that in particular, the beneficiaries may not have the analytical capacity to analyse some of the organic chemical priority parameters, which need to be analysed in very low concentrations. In this case, compromise solutions will have to be found in finalising the monitoring programmes, bearing in mind the potential sources of pollution, and the potential impacts on human health or protected areas.

One of the main groups of organic compounds that can pollute the raw river water and ground water are pesticides. As there are such a large number of different pesticides, it is expedient to monitor only the most likely ones. Therefore to address this, a desktop study could be undertaken within Activity 2.1 to review the following in the agricultural areas:

- 1) A list and locations of crops;
- 2) Pesticides associated with these crops;
- 3) Quantities of pesticides imported and purchased by the farmers;
- 4) Frequency of applications, and
- 5) Times and the locations where the pesticides are applied.

This information could be collated from data obtained from: the FAO, farmers, farmers unions, Ministry of Agriculture, and pesticide manufacturers & suppliers. From this data, a sampling and an analytical scheme could be drafted and implemented.

Similarly, an inventory of each effluent producer could be prepared to highlight the other possible toxic pollutants and to set up the appropriate sampling and analytical programmes.

These are tasks that could be undertaken in Activity 2.1 for the River Basin Analysis but would highlight the priority parameters that the monitoring programmes and consequentially the laboratories should focus on.

Once this has been done, we will undertake a capacity building needs assessment. This will set the minimum monitoring needs against the available analytical capacity determined by the previous task to determine where additional capacity needs to be built. This task therefore aims to put the most cost-effective use of the available analytical capacity determined in Task 1.6.1 into effect by ensuring that recommendations are understood by all stakeholders.

One way to address the analysis of some of the difficult priority pollutants could be to share this analysis between the member countries, such that each of them agrees to become a centre of excellence in the analysis of certain parameters. In this way most of the parameters could be analysed within the region so sharing the analytical load. In time these centres could also be developed as training centres for the region, so that eventually all countries would be able to increase their analytical capacities. Therefore the optimising of the analytical capacities of the laboratories would take place iteratively

## Result 2

*Increased technical capacities by means of development and implementation of River Basin Management Plans (RBMP) for selected rivers.*

### Activity 2.1

#### River Basin Analyses are undertaken

##### Timing(Start/End)

March 2012 / December 2012

##### Explanation:

This work sets the scene for the development of the river basin plans in the selected basins. It should start as soon as sufficient information is available from the pilot basins.

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##### Objective

- This activity will select / confirm the pilot basins for the river basin planning, and
- Collate all available information on the basins to develop a focussed approach to improving their status.

##### Outputs

- Reports signed off by the all the beneficiaries involved in the pilot basins confirming their selection and key focus of attention in these basins.
- River Basin Analyses for each of the selected basins.

##### Tasks

#### Task 2.1.1: Selection / confirmation of the pilot basins

##### Description

The Terms of Reference outline a number of basins identified by the beneficiaries as possible pilots, and that 5 pilot projects are required. Many of these – for example the Prut (Ukraine and Moldova), and the Pripjat (Belarus and Ukraine) already have a good baseline of data to support a River Basin Analysis and are seen as priorities by the riparian States and the ICPDR. In Georgia a number of rivers contributing to the Black Sea have been mooted as possible pilots, while in Armenia the beneficiary is expected to identify a basin by the start of the project. In Azerbaijan a number of basins have been proposed for possible action. There is consequently a mixture of firm decisions, strong suggestions, and possible considerations for the selection of the pilots. However, it is important that the project starts focussing its resources on the pilot basins as soon as possible.

We would therefore aim to assist the beneficiaries to finalise the selection of the pilot basins during the Inception Phase. This will be done by working with them to finalise a set of criteria to support the selection of the most appropriate basins. These criteria could include national priorities, the extent of environmental degradation, the likelihood of success (which is important if the action is to serve as a good example), and the availability of existing data. These criteria would also be proposed to the beneficiaries who have already made the decision, to serve as an affirmation of the selection and to ensure that all the beneficiaries are treated in the same way.

Once these basins have been selected a Report on the final selection will be prepared as part of the Inception Phase. This report will outline;

- The geographical extent of the pilot basin or sub-basin, captured on a GIS platform;
- Why it was selected and hence what the focus of the action would be;
- Special considerations for action in the basin;



## Tasks

### Task 2.2.1: Determination of River Basin Districts

#### Description

We have already proposed that the geographical extent of the pilot basin or sub-basins is defined as part of the previous Activity. This will help ensure consensus on what water bodies will be included in these pilot basins, and hence will be included in the Programme of Measures. However, the WFD defines a River Basin District as the area of land and sea made up of one or more neighbouring river basins, and their associated groundwaters and coastal waters which make up the main unit for the management of river basins.

In this sense, some of the pilot sub-basins will not constitute a complete River Basin District (Prut, Pripjat, and perhaps some of the South Caucasus sub-basins). This task will therefore describe the pilot sub-basins in the context of their larger River Basin Districts, or will describe the pilot basin as a complete River Basin District where relevant.

In the former case, special considerations that would affect the management of the whole River Basin District will be described, like the potential and downstream impacts (for example how the Prut pilot will coordinate with the wide Danube initiative), and upstream impacts (important if the pilot in Belarus / Ukraine does not include participation from Russia. These wider River Basin Districts will be captured on a GIS platform, where relevant clearly showing the geographical extent of the sub-basin which will be used as a pilot case.

### Task 2.2.2: Preliminary identification of water bodies

#### Description

A preliminary identification of the water bodies will be undertaken using the guidelines proposed in Annex II of the WFD and the relevant WFD Common Implementation Strategy guidelines. The first step in this process will be to determine the geographical extent of these water bodies based on all relevant considerations including but not limited to river reach types, human impacts, protected areas and use of the water bodies. However, we will take particular cognisance of the human and financial resource constraints of the beneficiaries as well as this project when determining the numbers of water bodies. (For example Austria has established 7244 river water bodies and 62 lake water bodies just for its portion of the Danube Basin – which poses a significant burden on both monitoring programmes as well as on the development of Programmes of Measures). We also note that water bodies could be grouped for the purposes of monitoring and the development of measures, allowing for sub-division later.

This task will include the initial characterisation of all these water bodies as rivers, lakes, transitional waters, coastal waters, or as heavily modified surface water bodies. Groundwater bodies will be characterised according to the geographical extent of the aquifer, as well as the potential pollution impacts on that aquifer. Groundwater dependent ecosystems will also determine specific groundwater bodies. It is assumed that Component B of this tranche of support will undertake the delineation and characterisation of the coastal waters.

### Task 2.2.3: Typology of water bodies

#### Description

The Terms of Reference call for the use of System A as outlined in the Annex II of the WFD, but including additional descriptors. System A provides for a simpler typology of water bodies based on Ecoregions as specified in Annex XI of the WFD, whereas System B provides for an obligatory set of factors plus optional factors. Our interpretation of the Terms of reference in this regard is therefore that System A should be used as a basis for characterising the water bodies, which should identify fewer water bodies, but that where additional information is available and where the resources of the project and beneficiaries allow, that further sub-division of the water bodies will be considered.

The final output of this process will be the full description and characterisation (typology) of each of the preliminary water bodies with respect to its abiotic factors.

### Task 2.2.4: Final identification of water bodies

#### Description

This task will set the initial characterisation of each water body in Task 2.2.2 against the typology descriptions in Task 2.2.3 with a view to either amalgamating or further sub-dividing the water bodies. Where the analysis of the abiotic factors shows that the initial water bodies show too much internal diversity, they may be further sub-divided, whereas adjacent water bodies with the same abiotic characterisation would be amalgamated.

The intention of this process is to arrive at a final selection of the water bodies that will be included in the RBMP. It is important that this final selection of the water bodies is endorsed by the beneficiaries as it will imply some post project actions to implement the measures that were not piloted.

### Task 2.2.5: GIS mapping of water bodies

#### Description

Once the final selection of the water bodies has been signed off our GIS expert will ensure that the geographical extent of, and the typology of each water body is captured in a GIS database. These GIS datasets will be uploaded to the project website in a manner that









**Objective**

- To develop Programmes of Measures for all water bodies where Good Ecological Status, or Good Ecological Potential is threatened.
- Basin wide Programmes of Measures focussed on Significant Water Management Issues and Groundwater bodies of basin wide importance.

**Outputs**

- Reports outlining the pressures and threats driving the impacts on the ecological condition of each water body.
- Reports outlining the national and basin wide Programme of Measures for each pilot basin.

**Tasks****Task 2.5.1: Pressures and threats identified.****Description**

The first step in the preparation of Programmes of Measures is to assess the pressures and impacts to those water bodies where Good ecological and chemical status or potential is threatened. This includes the collection of information on the magnitude of various human impacts on the system, particularly where these are the drivers behind changes to the ecological and chemical status. The GIS data collated in Activity 2.1 will also be used to examine any areas where extensive land use changes are threatening the ecological and chemical quality of rivers and wetlands. We will examine the various point and non-point source impacts on each water body, and set these against compliance to the existing national legislation and their total loads / impacts on the water body. We will also examine significant abstraction of surface and ground water (particularly for drinking water purposes), or other flow regulation activities, as well as any other anthropogenic impacts. This information will be used to identify and prioritise national measures, as well as to assess the significant morphological changes that drive the ecological state. This work will also examine the susceptibility of the water bodies to further change, due their particular sensitivity.

For ground water bodies we will examine any artificial recharge, rates of abstraction as well as the natural recharge to the aquifer. This will include an examination of the land use in the groundwater recharge catchment. Total abstractions from the groundwater body will be set against the total recharge. This will be used to assess likely threats to groundwater chemistry and groundwater levels, and to assess the surface groundwater interactions

Where river basins cross international borders Significant Water Management Issues (SWMI) will be identified. These are basin wide threats to ecological status, or where the cumulative impacts on the basin as a whole may be significant.

**Task 2.5.2: Water Quality Objectives/Targets set and Programmes of Measures prepared****Description**

Once the pressures and threats have been identified and quantified in each pilot basin, and water bodies at risk of not achieving their Environmental Objectives/Targets identified a Programme of Measures can be prepared. National Programmes of Measures will focus firstly on the enforcement of national legislation – where a lack of compliance drives the impacts on the resource. This might include the enforcement of point source discharge quality standards, or enforcement of legislated best practices for non-point discharges. This will be used to identify ‘basic measures’ aimed primarily at assisting the beneficiaries to enforce their legislation, but also to prioritise action in this regard. This might include measures to help recover the costs of water services to provide the resources to address the threats on an on-going basis<sup>1</sup>.

In some water bodies additional or supplementary measures may be required to realise ‘Good status’. If the beneficiary State remains committed to achieving good status. These may include the development of new legislative instruments specifying more stringent standards, economic and fiscal instruments to collect and ‘ring-fence’ financial resources to provide the funds to implement the measures, more stringent emission or abstraction controls or codes of practice and water demand management measures.

**Activity 2.6*****Implementation of selected measures from the programme for pilot projects***

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<sup>1</sup>This might prove particularly challenging in post-communist and poor communities. The ultimate polluter in many cases is the end water user, who may not be able to or unwilling to pay for water services. Many of the beneficiary countries are struggling to shift from a State sponsored water services to a public sponsored water services environment.





Various awareness raising activities, tested against the Communication Strategies, will be undertaken throughout the project remainder of the project. This will include (but not necessarily limited to);

1. Ensuring that the project website is consistently referred on all materials.
2. Various pamphlets, booklets and advertisements in the media.
3. River Days and schools competitions, along the lines of the Danube Day.
4. Education materials (drawing on the Danube School Box).
5. The publication of all reports on the Project website, including a summary version in the local languages.
6. Media events and press releases highlighting significant achievements.
7. Stakeholder meetings in support of the implementation of the pilot measures.

These events will profile the beneficiaries as key role players in this process, highlighting their role in securing the support, in ensuring the success of the actions, and their on-going responsibilities. The project team country leaders will play an active role in the arrangement of these events, ensuring that they are contextualised to that countries specific needs. They will also coordinate the translation of the materials into local languages.

**Note:**

It is assumed the many of the public events may be timed to coincide with other activities in the project, for example the joint field surveys, presentation of the River Basin Analyses etc. In these cases the resources allocated to these events include the logistical arrangements for involving the public.