



**Environmental Protection of International River Basins Project
Contract No. ENPI/2011/279-666**

**Surface Waters Monitoring Programme in
The Dnieper River basin**

Belarus

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1. INTRODUCTION

The two key environmental objectives of the Water Framework Directive (Directive 2000/60/EC; WFD) for surface waters are:

- to prevent deterioration of the status of all bodies of surface water;
- achieving good surface water status.

The status of surface waters is determined by both its *ecological* status and its *chemical* status.

Monitoring programmes and assessment is required in order to substantiate where the objectives are achieved. The surface water monitoring programme for the Dnieper (BY) River basin covers:

- surface water categories: rivers and lakes;
- the protected areas as defined in Article 6 of the WFD;
- artificial and heavily modified water bodies.

The structure and content of this monitoring programme represents the outcome of the activities conducted under the EPIRB Project as part of the River Basin Management Plans for the Dnieper (BY) River basin.

2. DEVELOPMENT OF WFD COMPLIANT MONITORING PROGRAMME

The monitoring programme outlined here is designed to meet the stated requirements of the WFD and related CIS Guidance Documents. The WFD sets out three types of monitoring programmes: surveillance, operational and investigative. These programmes will be explained further in the sections below.

In the process of monitoring programme development the data and information from the JFS-I, JFS-II and national monitoring programmes conducted in the Dnieper (BY) River basin were used. Furthermore, the Typology Report, the Pressure – Impact Analysis and Risk Assessment Reports were used as basic documents in selecting the sampling locations for the Operational Monitoring.

2.1 Surveillance Monitoring Programme of Surface Waters

The objectives of Surveillance Monitoring (SM) Programme for surface water are as follows:

- supplementing and validating the impact assessment procedure detailed in Annex II of the WFD,
- the efficient and effective design of future monitoring programmes,
- the assessment of long-term changes in natural conditions, and
- the assessment of long-term changes resulting from significant anthropogenic activities.

2.1.1 Sampling locations

The selection of sampling locations and the design of the SM programme is based on sub-networks each related to fulfil one or more of the main objectives of SM as presented above. The sub-networks of the SM programme for rivers include the following ones:

- **SM1:** to be representative of the overall surface water status;
- **SM2:** detection of long-term trends (the assessment of long-term changes in natural conditions and the assessment of long-term changes resulting from the anthropogenic activities);
- **SM3:** supplementing and validating risk assessments;
- **SM4:** Large rivers and significant cross border river and lake water bodies.

Note: 12 types of the surface water bodies were identified in the Dnieper (BY) River basin. However, only for 5 of them it was possible to find the sampling location with reference conditions and are included in the SM Programme of the pilot river basin.

The sampling locations for the SM Programme of the Dnieper (BY) River basin are summarized in the Table 1 and shown in Figure 1. All together 10 sampling locations were selected to be representative for the SM Programme.

Table 1 Surveillance Monitoring sampling locations in the Dnieper (BY) River basin (rivers)

| No. | River name | Character of WB | Expected status/potential | Location name | Risk category | SM sub-network |
|------------|-------------------|------------------------|----------------------------------|----------------------|----------------------|-----------------------|
| 1 | Volches | NWB | RC | Ustye | NR | SM1 |
| 2 | Ut | NWB | RC | Tereshkovichi | NR | SM2 |
| 3 | Greza | NWB | RC | Vyazma | NR | SM1 |
| 4 | Vabich | NWB | RC | Barsuki | NR | SM1 |
| 5 | Usha | NWB | RC | Usha | NR | SM1 |
| 6 | Drut | NWB | Good | Vyazma | NR | SM1 |
| 7 | Drut | NWB | Moderate | Krugloye | R | SM2 |
| 8 | Plavna | NWB | Moderate | Vysokaya Gora | R | SM1 |
| 9 | Dnieper | NWB | Good | upstrem Dubrovno | NR | SM2 |
| 10 | Dnieper | NWB | Good | Border BY/UA | NR | SM4 |

NWB means Natural Water Body

Regarding the SM Programme for lakes there were not identified any lakes to be monitored in the pilot river basin.

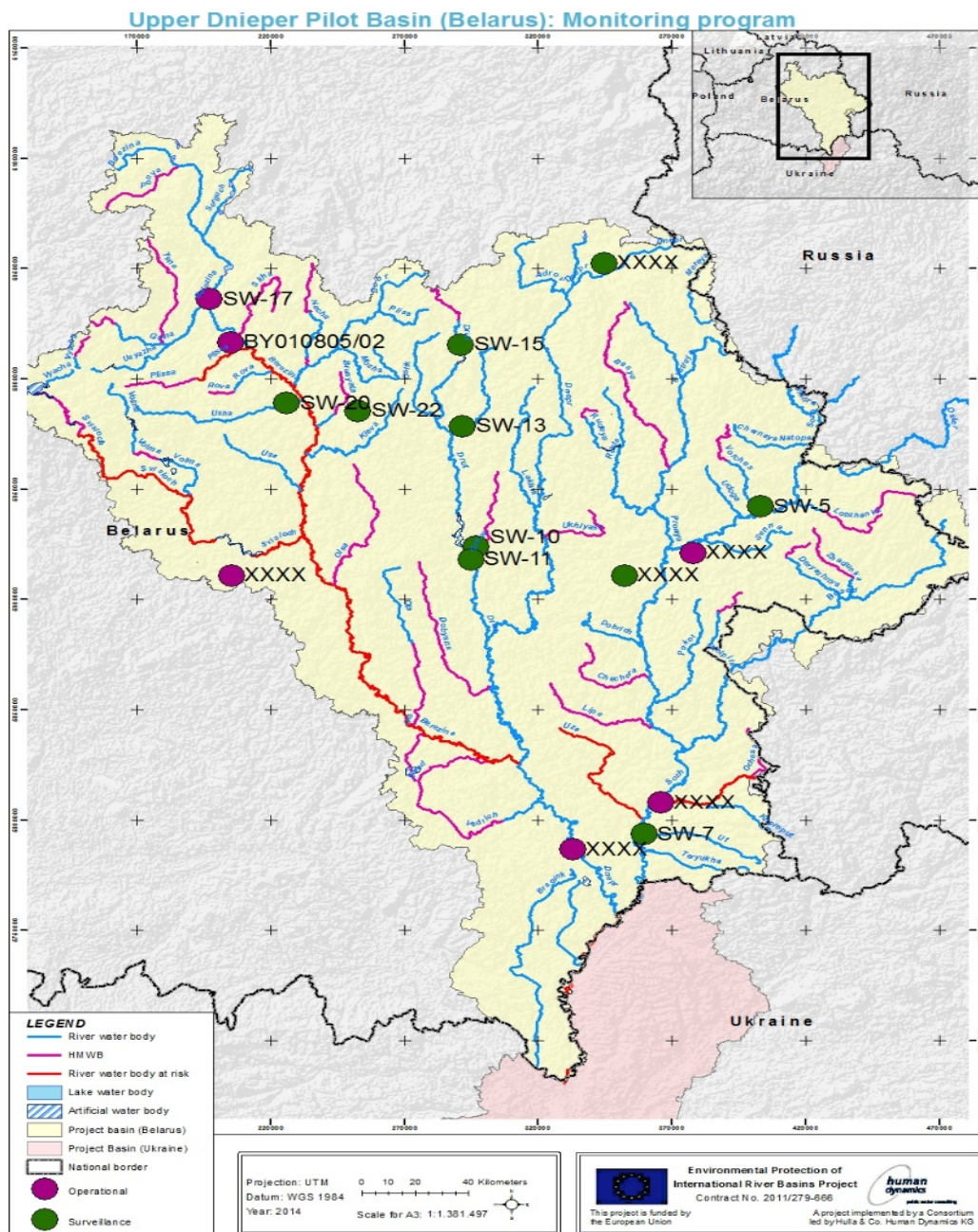


Figure 1 Sampling locations for the SW Monitoring Programme in the Upper Dnieper pilot river basin (BY). (Note: This map is the first draft, the final one will be developed after comments from the national team and based on the coordinates assigned to the sampling locations by the national experts).

2.1.2 Quality Elements

According to WFD Annex V.1.3.1, Surveillance Monitoring Programme shall be performed at each selected surveillance monitoring location for a period covered by a RBMP for (see Table 2):

- parameters indicative of all biological quality elements;
- parameters indicative of all hydromorphological quality elements;

- parameters indicative of all general physico-chemical quality elements;
- priority list pollutants which are discharged into the river basin or sub-basin;
- other pollutants discharged in significant quantities in the river basin or sub-basin (pilot river basin specific pollutants).

Sampling methods and devices based on the European Standards will be used in the monitoring programmes (exception ichthyofauna).

The **biological quality elements** incorporate for rivers:

Macroinvertebrates, Phytobenthos, Macrophytes and Fish;

for lakes:

Macroinvertebrates, Phytoplankton, Macrophytes and Fish.

The water samples will be identified for the abundance and composition for all biological quality elements up to Genus/Species level. Individual metrics (indices) will be applied to the biological quality elements (for ichthyofauna only migratory fish species will be described).

The **physico-chemical quality elements** include for both rivers and lakes:

General conditions;

Specific both synthetic and non synthetic pollutants.

EN, ISO and other international standards will be applied for the analysis of the water samples.

The **hydromorphological quality elements** will incorporate the following elements:

Hydrological regime;

River continuity;

Morphological conditions.

Hydromorphological field and assessment protocols as used during the JFS in the EPIRB project will be applied.

Table 2 List of the quality elements monitored for the Surveillance Monitoring Programme in the Dnieper (BY) River basin (rivers)

| | Parameter | Unit | SM |
|--|------------------|------------------------|-----------|
| Physico-chemical Quality Elements | | | |
| General conditions | | | |
| | Temperature | °C | X |
| | Dissolved Oxygen | mgO ₂ /l | X |
| | pH | pH units | X |
| | Conductivity | µS/cm | X |
| | Hardness | mg/l CaCO ₃ | X |
| | Colour | visual | X |
| | o-Phosphate | mg P/l | X |
| | Nitrate | mg N/l | X |
| | Ammonium | mg N/l | X |
| | Chloride | mg/l | X |

| | | | |
|---|---|------------------------|---|
| | Sulphate | mg/l | X |
| | Total suspended solids | mg/l | X |
| | Biochemical oxygen demand (BOD5) | mgO2/l | X |
| | Chemical oxygen demand (COD - dichromide) | mgO2/l | X |
| | Oil substances | visual | X |
| Other specific pollutants | | | |
| | Copper** | µg/l | X |
| | Radioactivity* | | X |
| Priority Substances and Certain Other Pollutants | | | |
| All 'Priority substances and certain other pollutants' that can be analysed with the existing laboratory capacity | | | X |
| Biological Quality Elements | | | |
| | Macroinvertebrates | Metrics | X |
| | Macrophytes | Metrics | X |
| | Phytobenthos | Metrics | X |
| | Fish | Migratory fish species | X |
| Hydromorphological Quality Elements | | | |
| | River morphological conditions | HM protocol | X |
| | River flow | Daily Mean Flow (m3/s) | X |

* in the sampling locations which are connected with Chernobyl

** to be monitored in the water bodies if there are discharged in the significant quantities

For more details see also the Appendix 1 of this report.

2.2 Operational Monitoring of Surface Waters

The Operational Monitoring (OM) Programme is focussed on monitoring the effect of supporting measures aimed at achieving the objectives of the WFD in the water bodies (possibly) at risk. It is designed to provide targeted information on the effectiveness of specific measures taken within the Dnieper (BY) River basin.

The objectives of OM programme are defined as follows:

- to establish the status of those bodies identified as being at risk of failing to meet their environmental objectives;
- to assess any changes in the status of such bodies resulting from the programmes of measures.

Because the protection of high and good status from deterioration is required by the WFD, OM programme must also provide information on whether the POMs, aimed at maintaining such status, are effective. Therefore, even water bodies that are not categorized to be at risk in the Risk Assessment Report prepared are included in the OM programme because measures are required to maintain them at their current high or good status regardless of existing risk category.

Risk Assessment Analysis has identified 12 water bodies “at risk” and 8 ones “possible at risk” in the Dnieper (BY) River basin. These results were transferred into the OM programme.

2.2.1 Sampling locations

Sampling locations for OM programme are assigned to one or more sub-networks each related to fulfil one or more of the main objectives of the OM programme.

The sub-networks of the OM programme for rivers include the following ones:

- **OM1:** to assess the effect of measures that have been aimed at improving the impact of individual and combined point sources (organic pollution, eutrophication impacts and priority substances);
- **OM2:** to assess effectiveness of the measures related to diffuse pollution sources;
- **OM3:** To assess effectiveness of measures to reduce hydromorphological alterations;
- **OM4:** To monitor high and good status sites currently not categorized to be at risk in order to assess the effectiveness of POMs aimed at maintaining high and good status water bodies;
- **OM5:** to monitor protected areas which are at risk.

Note: Several water bodies with the same type were identified to be “at risk” due to the same pressure type (sources of pollution). Therefore, some of sampling locations for the OM programme were selected to be representative for the group of water bodies.

All together 6 sampling locations for rivers were identified to be monitored under the OM for the Dnieper (BY) River basin and results are summarized in the Table 3.

Table 3 Operational Monitoring sampling locations in the Dnieper (BY) River basin (rivers)

| No. | River name | Character of WB | Expected status/potential | Location name | Risk category | OM sub-network |
|------------|-------------------|------------------------|----------------------------------|----------------------|----------------------|-----------------------|
| 1 | Berazina | NWB | Moderate | Below Borisov | R | OM1 |
| 2 | Svisloch | NWB | Moderate | Osipovich | R | OM1 |
| 3 | Berezina | NWB | Moderate | Mouth | R | OM1 |
| 4 | Udoga | NWB | Moderate | Cherikov | R | OM1 |
| 5 | Sozh | NWB | Moderate | Below Gomel | R | OM1 |
| 6 | Uza | NWB | Moderate | Berezovka | R | OM1 |

2.2.2 Quality Elements

In order to assess the magnitude of the pressure to which the surface water bodies are exposed in the Dnieper (BY) River basin those quality elements are monitored that are indicative of the identified pressures. The following quality elements will be monitored as relevant (see Table 4):

- parameters indicative of the biological quality elements, most sensitive to the pressures to which the water bodies are subject;

- all other specific pollutants discharged in significant quantities into the river basin or sub-basin;
- parameters indicative of the hydromorphological quality elements most sensitive to the pressure identified.

Table 4 List of the quality elements monitored for the Operational Monitoring Programme in the Dnieper (BY) River basin (rivers)

| | Parameter | Unit | OM |
|--|---|-------------------------------------|-----------|
| Physico-chemical Quality Elements | | | |
| General conditions | | | |
| | Temperature | °C | X |
| | Dissolved Oxygen | mgO ₂ /l | X |
| | pH | pH units | X |
| | Conductivity | µS/cm | X |
| | Hardness | mg/l CaCO ₃ | X |
| | Colour | visual | X |
| | o-Phosphate | mg P/l | X |
| | Nitrate | mg N/l | X |
| | Ammonium | mg N/l | X |
| | Chloride | mg/l | X |
| | Sulphate | mg/l | X |
| | Total suspended solids | mg/l | X |
| | Biochemical oxygen demand (BOD ₅) | mgO ₂ /l | X |
| | Chemical oxygen demand (COD - dichromide) | mgO ₂ /l | X |
| | Oil substances | visual | X |
| Other specific pollutants | | | |
| | Copper** | µg/l | X |
| | Radioactivity* | | X |
| Biological Quality Elements | | | |
| | Macroinvertebrates | Metrics | X |
| | Macrophytes | Metrics | X |
| Hydromorphological Quality Elements | | | |
| | River flow | Daily Mean Flow (m ³ /s) | X |

* in the sampling locations which are connected with Chernobyl

** to be monitored in the water bodies if there are discharged in the significant quantities

For more details see also the Appendix 1 of this report.

2.3 Investigative monitoring

The WFD includes a third type of monitoring called Investigative Monitoring (IM). The WFD states that this type of monitoring is required for situations when the surface water body is at risk with a very specific manner that causes of water bodies failing to achieve the required

environmental objectives under the WFD. The list of parameters in this case will be dynamic and its validity in time should be limited, in order to respond to new information on the potential risks posed by emerging pollutants and any others alterations. However, it is not expected to conduct the IM in the Dnieper (BY) River basin in this stage of the monitoring programme.

2.4 Frequency of monitoring programme

Sample frequency will vary depending on the monitoring programme and the individual sub-networks and the quality element. The WFD outlines the minimum requirements for frequency of monitoring, as it is presented in Table 5.

Table 5 Monitoring frequencies according to WFD Annex V.1.3.4

| | Rivers | Lakes |
|--|------------|----------|
| Biological quality elements | | |
| Phytoplankton | 6 months | 6 months |
| Other aquatic flora | 3 years | 3 years |
| Benthic invertebrate fauna | 3 years | 3 years |
| Fish | 3 years | 3 years |
| Hydromorphological quality elements | | |
| Continuity | 6 years | |
| Hydrology | continuous | 1 month |
| Morphology | 6 years | 6 years |
| Physico-chemical quality elements | | |
| Thermal conditions | 3 months | 3 months |
| Oxygenation | 3 months | 3 months |
| Salinity | 3 months | 3 months |
| Nutrient status | 3 months | 3 months |
| Acidification status | 3 months | 3 months |
| Other pollutants | 3 months | 3 months |
| Priority substances | 1 month | 1 month |

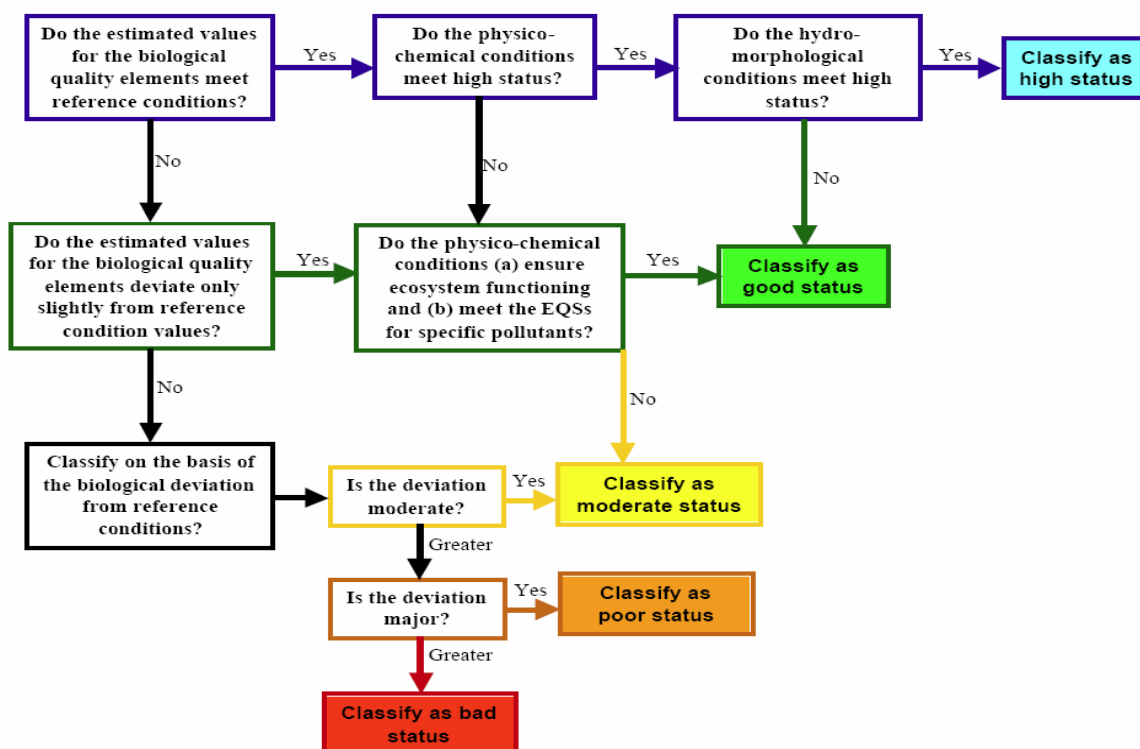
Long-term trend monitoring locations will require high frequency sampling. The sites required for supplementing and validating the risk assessment will be monitored with different frequencies depending on the importance of the risk, details of the frequency of monitoring required for each of the individual river sub-networks are given in Appendix 1 _EPIRB_River_MP_Dnieper_Belarus.

3. QUALITY CONTROL AND QUALITY ASSURANCE

It is important for the surface water monitoring programme to ensure that data generated by WFD physico-chemical and biological monitoring parts are reliable and representative. Furthermore, as it is known a data should allow the assessment of the impacts of Programs of Measures on the water body status. Therefore, Quality Management Programme should be prepared for all steps of the monitoring programme from sampling via analysis to the data management and interpretation. It is expected that sampling and analysis (physico-chemical and biological quality elements) will be conducted in accordance with ISO Standards (other International Standards) and laboratories will meet the requirements of the ISO 17025 Standard.

4. ECOLOGICAL STATUS ASSESSMENT

The WFD defines ecological status in the high, good and moderate classes for each of the ecological quality element for each of the surface water categories. It describes the biological and hydromorphological parameters and the physico-chemical and relevant pollutants required in the overall ecological assessment. The overall ecological status assessment is shown on the scheme below.



All biological quality elements must be taken into account when assigning water bodies to any of the ecological status or ecological potential classes. For each biological element the set of the metrics (or indices) will be selected to be indicative for the given pressures. The status of each of the biological elements for natural water bodies is determined by

measuring the extent of the deviation, if any, of the observed condition from the **reference condition** established for that type of water body. Reference conditions are the conditions established for the biological elements in the absence of pollution or disturbance (or at least minimum disturbance).

Ecological status assessment system will be expressed numerically as *ecological quality ratios* (EQR) in the range between 1 (high status) and 0 (bad status). The EQR scale for the assessment system for each surface water category is divided into the five classes by assigning a numerical value to each of the boundaries between the classes.

The physico-chemical and hydromorphological quality elements are supporting elements of the biological assessment for the purpose of the overall ecological status assessment. Therefore, based on the existing data from the JFS and national monitoring programmes statistical analysis will be conducted to express numerically boundary for the classes.

5. CHEMICAL STATUS ASSESSMENT

The chemical status of surface water bodies is linked with the WFD Annex X pollutants. The latest EU directive specifying both the pollutants (*‘Priority substances and certain other pollutants’*) and their environmental quality standards (EQS), is the Directive 2013/39/EU *“amending Directives 2000/60/EC and 2008/105/EC as regards Priority substances in the field of water policy”*.

The Directive 2013/39/EU has defined EQSs for in total 45 (groups of) substances, comprising four metals (cadmium, lead, mercury and nickel) and a wide array of organic micropollutants.

In principle, two (complementary) environmental quality standards are defined; both EQSs are to be met in order to qualify as ‘good chemical status’:

- annual average – environmental quality standard (AA-EQS), applying to the arithmetic mean of one year of data, with monthly sampling presumed;
- maximum concentration – environmental quality standard (MAC-EQS), applying to the maximum concentration in the annual set of data.

Annex 1

Recommended List of Standards and Guidelines

ISO 10870: 2012 Water quality - Guidelines for the selection of sampling methods and devices for benthic macroinvertebrates in fresh waters (ISO 10870:2012).

ISO 5667-1: 2007 – Water quality - Sampling - Part 1: Guidance on the design of sampling programmes and sampling techniques (ISO 5667-1:2006)

ISO 14996: 2007 – Water quality - Guidance on assuring the quality of biological and ecological assessments in the aquatic environment.

ISO 8689-1: 2000 – Water quality - Biological classification of rivers - Part 1: Guidance on the interpretation of biological quality data from surveys of benthic macroinvertebrates. (ISO 8689-1:2000).

ISO 8689-1: 2000 – Water quality - Biological classification of rivers - Part 1: Guidance on the interpretation of biological quality data from surveys of benthic macroinvertebrates. (ISO 8689-1:2000)

ISO 16150:2012 – Water quality - Guidance on pro-rata Multi-Habitat sampling of benthic macro-invertebrates from wadeable rivers.

ISO Project AQEM, 2002. Manual for the application of the AQEM System (Asterics 3.3.1, www.aqem.de)

EC, 2003. Guidance Document No. 7 Monitoring under the Water Framework Directive, Luxembourg: Office for Official Publications of the European Communities.

ISO 15843:2010 Water quality. Guidance standard on determining the degree of modification of river hydromorphology, CEN, 2010.

ISO 14614:2004 Water Quality - Guidance standard for assessing the hydromorphological features of rivers, CEN, 2004.

ISO Water Sampling Standards 5667 (series).

Appendix 1:

EU WFD compliance monitoring for the Dnieper Pilot Basin (Rivers)

List of Quality Elements for rivers

Sampling Frequency for rivers

EU WFD compliance monitoring for the Dnieper Belarus Pilot Basin (Rivers)

| No. | Water body number | River name | Character of water body | Expected status/potencial | Location | Latitude | Longitude | Area (km2) | Surveillance monitoring sites | SM1 Overall status | SM2 Long-term trends | SM3 Supplementing and validating IA | SM4 Large rivers and significant cross border RWBs | Operational monitoring sites | OM 1 Point Source Risk | OM 2 - Diffuse Risk | OM 3 - Hydromorphology | OM 4- Measures to protect High/Good Statu | OM 5 - Protected Areas | Risk category |
|-----|-------------------|------------|-------------------------|---------------------------|------------------|----------|-----------|------------|-------------------------------|--------------------|----------------------|-------------------------------------|--|------------------------------|------------------------|---------------------|------------------------|---|------------------------|---------------|
| 1 | | Volches | WB | RC | Ustye | | | | 1 | 1 | | | | | | | | | | NR |
| 2 | | Ut | WB | RC | Tereshkovichi | | | | 1 | | 1 | | | | | | | | | NR |
| 3 | | Greza | WB | RC | Vyazma | | | | 1 | 1 | | | | | | | | | | NR |
| 4 | | Vabich | WB | RC | Barsuki | | | | 1 | 1 | | | | | | | | | | NR |
| 5 | | Usha | WB | RC | Usha | | | | 1 | 1 | | | | | | | | | | NR |
| 6 | | Drut | WB | Good | Vyazma | | | | 1 | 1 | | | | | | | | | | NR |
| 7 | | Drut | WB | Moderate | Krugloye | | | | 1 | | 1 | | | | | | | | | R |
| 8 | | Plavna | WB | Moderate | Vysokaya Gora | | | | 1 | 1 | | | | | | | | | | R |
| 9 | | Dnieper | WB | Good | upstrem Dubrovno | | | | 1 | | 1 | | | | | | | | | NR |
| 10 | | Dnieper | WB | Good | Border BY/UA | | | | 1 | | | | 1 | | | | | | | NR |
| 11 | | Berazina | WB | Moderate | Below Borisov | | | | | | | | | 1 | 1 | | | | | R |
| 12 | | Svisloch | WB | Moderate | Osipovichi | | | | | | | | | 1 | 1 | | | | | R |
| 13 | | Berezina | WB | Moderate | Mouth | | | | | | | | | 1 | 1 | | | | | R |
| 14 | | Udoga | WB | Moderate | Cherikov | | | | | | | | | 1 | 1 | | | | | R |
| 15 | | Sozh | WB | Moderate | Below Gomel | | | | | | | | | 1 | 1 | | | | | R |
| 16 | | Uza | WB | Moderate | Berezovka | | | | | | | | | 1 | 1 | | | | | R |

Note: PR - possibly at risk
 NR - not at risk
 R - at risk

List of Quality Elements for rivers

| | | Surveillance monitoring site | Operational monitoring site | Protected Area site |
|---|----------------------------------|------------------------------|-----------------------------|---------------------|
| Physico-chemical quality elements | | | | |
| General conditions | | | | |
| | Temperature | °C | 1 | 1 |
| | Dissolved Oxygen | mgO ₂ /l | 1 | 1 |
| | pH | pH units | 1 | 1 |
| | Conductivity | µS/cm | 1 | 1 |
| | Hardness | mg/l CaCO ₃ | 1 | 1 |
| | Colour | visual | 1 | 1 |
| | o-Phosphate | mg P/l | 1 | 1 |
| | Total Phosphorus | mg P/l | | 1 |
| | Total Nitrogen | mg N/l | | 1 |
| | Nitrate | mg N/l | 1 | 1 |
| | Ammonium | mg N/l | 1 | 1 |
| | Chloride | mg/l | 1 | 1 |
| | Sulphate | mg/l | 1 | 1 |
| | Total suspended solids | mg/l | 1 | 1 |
| | Biochemical oxygen demand (BOD5) | mgO ₂ /l | 1 | 1 |
| | Chemical oxygen demand (COD) | mgO ₂ /l | 1 | 1 |
| | Oil substances | visual | 1 | 1 |
| Other specific pollutants discharged in significant quantities (basin specific) | | | | |
| | Copper** | µg/l | 1 | 1 |
| | Radioactivity* | | 1 | 1 |
| Priority Substances and Other Pollutants | | | | |
| All 'Priority substances and certain other pollutants' that can be analysed with the existing laboratory capacity | | | 1 | |
| Biological Quality Elements | | | | |
| | Macroinvertebrates | Metrics | 1 | 1 |
| | Macrophytes | Metrics | 1 | 1 |
| | Phytobenthos | Metrics | 1 | 1 |
| | Fish | Migratory fish species | 1 | |
| Hydromorphological Quality Elements | | | | |
| | Morphological Conditions | HM protocol | 1 | 1 |
| | River flow | Daily Mean Flow | 1 | 1 |
| | | | | 1 |

Note: for the Dnieper River basin Macrophytes are very important BQE (Macrophytes type rivers)

* in the sampling locations which are connected with Chernobyl

** to be monitored in the water bodies if there are discharged in the significant quantities

Sampling Frequency for rivers

Frequencies for Physico-chemical Quality Elements

| Operational Monitoring | | | |
|-------------------------------|---------------------------|---|--|
| OM1 | Point Pressure | 4 | times per year for general parameters and other pollutants discharged in significant quantities (basin specific) |
| OM2 | Diffuse Pressure | 4 | times per year for general parameters and other pollutants discharged in significant quantities (basin specific) |
| OM3 | Hydromorphological | 4 | times per year for general parameters |
| OM4 | High and Good status | 4 | times per year for general parameters (However, not all sites in this sub-network require physico-chemical parameters to be monitored) |
| OM5 | Protected areas (habitat) | 4 | times per year for general parameters |

Notes:

These are minimum sampling frequencies and more frequent sampling may be required depending on the confidence and precision required and the particular programme of measures that is being monitored under the Dniper Pilot river basin.

Surveillance Monitoring Network

| | | |
|--|----|--|
| General conditions and other specific pollutants | 12 | times per year |
| Priority Substances | 12 | times per year for one year in each 6-year cycle for priority substances |
| Overall status Sites | 12 | times per year for general parameters and other pollutants discharged in significant quantities (basin specific) |
| Long-term Trend Sites | 12 | times per year for general parameters and other pollutants discharged in significant quantities (basin specific) |
| Supplementing and Validating the IA | 6 | times per year for general parameters and other pollutants discharged in significant quantities (basin specific) |
| Large Rivers and Significant Cross Border RWBs | 12 | times per year for general parameters and other pollutants discharged in significant quantities (basin specific) |

Notes:

As a principle the sub-network with the most frequent requirement should be respected for the sampling frequency

Biological Quality Elements

Surveillance monitoring

| | Minimum Frequency | |
|--------------------|-------------------|------------------------------------|
| Macroinvertebrates | 2 | time per year in each 6-year cycle |
| Macrophytes | 1 | time per year in each 6-year cycle |
| Phytobenthos | 1 | time per year in each 6-year cycle |
| Fish | 1 | time in each 6-year cycle |

Operational monitoring

| | | |
|--------------------|---|------------------------------------|
| Macroinvertebrates | 2 | time per year in each 6-year cycle |
| Macrophytes | 1 | time per year in each 6-year cycle |
| Phytobenthos | 1 | time per year in each 6-year cycle |
| Fish | 1 | time in each 6-year cycle |

Hydromorphological quality elements

| | |
|--------------------------|-----------------------------|
| River flow | daily |
| Morphological conditions | 1 time in each 6-year cycle |