Funding Ref. No. (UFOPLAN) 206 22 300

Environmental Research Plan of the
Federal Ministry for the Environment,
Nature Conservation and Nuclear Safety

Strategies for implementing the requirements of Article 11 (3) l of the Water Framework Directive aimed at preventing and minimising the consequences of unexpected water pollution arising from technical installations

Part I – Introduction / Summary

by

Hamburg Institute for Hygiene and Environment

and the

University of Leipzig

Institute for Infrastructure and Resource Management

COMMISSIONED BY THE

FEDERAL ENVIRONMENT AGENCY

Umwelt Bundes Amt
Für Mensch und Umwelt

Hamburg/Leipzig September 2009

Institut für Hygiene und Umwelt
Hamburger Landesinstitut für Lebensmittelsicherheit, Gesundheitsschutz und Umweltuntersuchungen

UNIVERSITÄT LEIPZIG
IIRM umwelttechnik umweltmanagement

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Imprint

Published by: Federal Environment Agency (UBA)
Wörlitzer Platz 1
D-06844 Dessau-Roßlau
Tel.: +49 340 2103-0

Client: Federal Ministry for the Environment,
Nature Conservation and Nuclear Safety (BMU),
represented by the Federal Environment Agency (UBA)

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Final Report – Part I

Introduction / Summary

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1 Starting point

As a "framework directive", the Water Framework Directive (WFD) seeks to bring together all individual acts of legislation and international conventions relating to water utilisation and water conservation. It applies to all types of waters within the territory of the Community, i.e. surface waters (rivers, lakes, transitional waters and coastal waters) and groundwater. With the entry into force of the WFD, waters in the EU are to be *managed* in accordance with a single legal framework. A new aspect is the fact that waters are no longer to be managed within the boundaries of administrative units (nation states, administrative districts etc.), but at the level of river basin districts (catchment areas). The goal of such management is to achieve good ecological status and good chemical status in the natural waters of the Community by 2015 or, in the case of heavily modified water bodies, to achieve good ecological potential and good chemical status.

One major instrument for achieving the goal is programmes of measures which together form part of the management plans. The Water Framework Directive distinguishes basic measures, which satisfy the basic standard to be complied with, and supplementary measures, which may have to be planned and taken in addition in order to achieve good status. The basic measures also include *"...any measures required to prevent significant losses of pollutants from technical installations, and to prevent and/or to reduce the impact of accidental pollution incidents for example as a result of floods, including through systems to detect or give warning of such events including, in the case of accidents which could not reasonably have been foreseen, all appropriate measures to reduce the risk to aquatic ecosystems.*" (Art. 11 (3) l WFD).

There are also other provisions of relevant Community law which are concerned primarily or incidentally with installation-related water conservation measures or protection against other harmful events relating to bodies of water. As a rule, these are not superseded by the WFD, but are expressly included in the list of basic measures for achieving environmental goals. The directives mentioned here by the WFD include the Directive on Major Accidents (Seveso Directive, 96/82/EC), the Environmental Impact Assessment Directive (85/337/EEC), the Directive concerning Urban Wastewater Treatment (91/271/EEC), and the Directive concerning Integrated Pollution Prevention

and Control (IPPC Directive, 96/61/EC). Whereas serious accidents are the central control focus of the Seveso Directive, Article 3 of the IPPC Directive, for example, also contains demands that Member States shall take the necessary measures to provide "…that the competent authorities ensure that installations are operated in such a way that a) all the appropriate preventive measures are taken against pollution, in particular through application of the best available techniques; … e) the necessary measures are taken to prevent accidents and limit their consequences;" and that in accordance with Article 14 "…the operator ... informs the competent authority ... without delay of any incident or accident significantly affecting the environment".

This means that obligations under other existing Community provisions may be appropriate measures within the meaning of the Water Framework Directive. However, it is not clear whether measures under these provisions are adequate for the purposes of Article 11 (3) l WFD, – or to put it another way: Do the demands arising from Article 11 (3) l WFD in fact go any further than the relevant existing Community rules and agreements? Is it possible that Article 11 (3) l WFD is essentially to be understood as a "review assignment" aimed at detecting and filling any remaining "legal loopholes that need closing"?

Since even small installations can give rise to substantial water risks, handling of substances dangerous to water in installations ("installation-related water conservation") is subject to separate regulation under water law in Germany. In view of this fact, Germany has made every effort in international river basin commissions and in bilateral agreements on the management of transboundary watercourses to ensure the acceptance and application of fundamental principles of installation-related water conservation by the other parties as well. As a result, elements of installation-related water conservation have found their way into various agreements, programmes or guidelines of international river basin commissions. This is a good starting point for transboundary management of bodies of water at the river basin level under the WFD. Here too, however, it is necessary to examine whether the existing decisions and measures implemented ensure adequate protection in accordance with Article 11 (3) l WFD, or whether there is a need for additional action; also, where appropriate, what simple additional technical or organisational elements are suitable for meeting the material requirements of the planned measures. In doing so, it would seem sensible to focus on implementation requirements and ways and means of implementation, since it has to be assumed that from a purely legal point of view, the provisions of the WFD have been transposed into the legal systems of the Member States.

The definition of the objectives of the WFD is based on an immission-oriented approach. All initially abstract goals, such as *protection of ecosystems*, *promoting sustainable use of water*, *long-term resource conservation* etc. are given more *concrete* shape by means of definitions of the *targeted water status* – which is ultimately to be *"good"* from both a chemical and an ecological point of view. What is or is not *"good"* is defined on an immission-oriented basis. For chemical parameters, this means that the status of the individual body of water is characterised by means of concentration levels for the body in question, and achievement of the objective is tied to compliance with a (concentration-based) environmental quality standard.

By contrast, the assessment of water pollution in accident management situations is geared to emission-oriented criteria. The seriousness of the accidental pollution is evaluated partly on the basis of a selection of physical, chemical and toxicological properties (water hazard classes, R phrases), and partly on the basis of the absolute *substance quantity* that has escaped into the water (warning and emergency thresholds, water risk index etc.), which must however be known for this purpose. It is not possible to transport this information directly into the immission-oriented, concentration-based assessment scheme of the WFD. Neither has there been any examination of the extent to which criteria and priorities for substance assessment in the WFD are compatible with those in accident management. What are the consequences with regard to achievement of the environmental objectives of the WFD if a given quantity of substance A finds its way into a specific body of water? For example, when does the *early warning* required under Article 11 (3) l WFD have to be given, and how does one obtain the necessary data? Are there any approaches to solving such problems?

The Water Framework Directive requires the inclusion of cost-effectiveness and proportionality considerations in connection with programmes of measures (but not only these). When it comes to taking precautions against events that only occur rarely, if at all, this is a complex question. Is there any potential here for approaching the issue in a verifiable manner?

2 Problem and solutions

The requirements for the implementation of Article 11 (3) l WFD raise a large number of questions which were only touched on in the previous section and which need to be answered. However, it would far exceed the scope of a limited R+D project, for example, to examine all installation-related measures in the Community and ascertain whether they satisfied the requirements of Article 11 (3) l WFD from a material and legal point of view, and examine which would have to be added and how. Neither would it be possible, for example, to re-evaluate the ecotoxicological relevance of substances having special regard to water pollution incidents. Similarly, it will not be possible within the framework of this project to develop a practical theory on the cost-effectiveness of precautionary measures with regard to the requirements of the WFD.

Given the existing framework conditions, it makes sense to tackle the subject on the basis of examples of structural solutions that already exist or are derived by the project itself, while confining the research to a clearly delimited field and outlining the design of the solutions by means of examples demonstrating their basic principles. Certain aspects relating to the subject, such as details of precautions against flood risks, for which a separate directive is currently pointing the way and for which separate R+D projects have been carried out or are still in progress, will only be touched on marginally; similarly, for example, there will be no specific focus on the groundwater path.

The resulting approach was divided into three packages:

1. Inventory of past and planned activities in the international river basin commissions for the Elbe, Oder, Danube and Rhine, assessment of the technical and organisational aspects of compliance with the requirements of Article 11 (3) l WFD; analysis of deficits;

2. Development of an action concept with suggested solutions for implementing the requirements of Article 11 (3) l WFD based on the findings of the inventory and its assessment; in this connection ways of investigating cost-effectiveness are also considered;

3. Comparison and coordination of results, exchange of experience through international cooperation between experts in the form of workshops, Internet representation, presentation of results to the EU Commission etc.

3 Summary of findings

In the limited space available, this summary can only provide a general overview of the results. At the same time, it also serves as an introduction to the later sections of this final report.

3.1 Inventory

One significant finding to emerge from the inventory is that *individual solutions exist somewhere* for nearly all measures identified as important for implementing Article 11 (3) l WFD (see Part III, Chapter 4 and Chapter 6 et seq.). What tends to be missing is an organised arrangement and interlinking of these individual measures under a common “Water Framework Directive umbrella”. This is true of several “dimensions”: from a technical point of view, in the supra-regional/international and inter-departmental cooperation between the units affected by the WFD. It was evident from the WFD concept at an early stage that the water resources administrations with their originally regional and national structures would initially face major organisational challenges at the start of the river basin oriented management planning, and a suitably early start was made on work to find solutions. The strongly immission-oriented character of the WFD as a whole and especially of its goal definitions was largely responsible for the fact that in Germany, as in other Member States, the “classic” water resources administration departments were entrusted with the task of lead managing both its legal transposition and its practical implementation. However, the emission-oriented ambitions of the WFD, including “shipping accident precautions”, seem to have been perceived in many places as no more than a secondary consideration, with the result that there appears to have been a failure to appreciate the full extent of the responsibility and the binding nature of the legal involvement of public departments as regards management planning

under the WFD, including those concerned with installation monitoring and disaster control. Here it would seem desirable to step up inter-departmental cooperation.

On the immission side, the *systems to detect or give warning of such events* which are required by Article 11 (3) l WFD either do not exist at river basin level (Oder, Danube) or are not integrated in the international warning and emergency plans (Rhine, Elbe). This means that illegal discharges or inputs unnoticed by the polluter may not be detected, and little is done to trace sources and identify the causes. Existing early warning measuring networks are usually run on a local basis and serve to protect local uses (e.g. drinking water abstraction) from upstream inputs. Neither are there any criteria for assessing the extent to which immission-oriented findings should give rise to warnings. While plant operators in principle have a duty to notify events dangerous to water to the competent – usually local – authority, at river basin level there is generally a lack of up-to-date information on installations that present potential hazards with regard to the WFD quality objectives. Such knowledge is needed not only for averting danger if an incident occurs, but also in preventive risk management. It would be equally important to have information about potentially affected objects of protection throughout the river basin district. Solutions to these and other deficits identified are presented in Part III of the final report. To this end as well there is a need for intensification of cooperation between departments and administrative regions. In most cases intelligent technical solutions are available, but there tends to be a lack of organisational and communications-based *networking*, and in some cases of the financial resources provided.

3.2 Action concept

The inventory revealed that for most of the questions raised, isolated solutions existed which differed by region and organisation. However, the degree of implementation and the measures implemented in the various river basins, Member States, regions etc. display extreme differences and cannot be determined in detail from outside. This meant that it was not possible to draw up something like an EU-wide deficit list leading to a general ranking of priority measures that need to be implemented to satisfy the requirements of Article 11 (3) l WFD. Instead, an action concept was developed for use in individual determination of the necessary measures and their priorities.

Proposed measures were drawn up on the basis of a risk management flow chart for the surface waters path (“safety chain”). The “safety chain” is based on a chronological

causal flow chart for a possible event, from strategic precautions through damage containment to after-care measures. It has been broken down into six more differentiated action levels with the aim of identifying individual measures relevant to Article 11 (3) l WFD. These suggested measures are allocated in tabular form to the categories of the safety chain.

Whereas in principle the differentiated scheme of the safety chain claims to cover all essential risk management action fields in the surface waters path, this is expressly not true of the suggested measures. These should only name measures that can be deduced (solely) from Article 11 (3) l WFD. In the final analysis, however, such a delimitation is hardly possible, since the additional actions necessary under Article 11 (3) l WFD for a measure based on other legal provisions could not be understood without any mention of the underlying basic measure.

The proposed catalogue of measures is *not* a list of measures to be worked through as a matter of routine, but should rather be seen as a check list for determining the need to include measures in the management plan for the relevant river basin pursuant to Article 11 (3) l WFD. Whether such a need exists and which of the measures may be involved depends on the results of the individual check. It may vary considerably between the different river basin districts, member states and administrative units. However, all measures pursuant to Article 11 (3) WFD are “basic” and represent “minimum requirements”. Thus if the scrutiny of the catalogue of measures reveals a need for action, measures must follow.

The tables of measures show examples of the implementation of each of the proposed measures. The examples are based on a review of past and planned activities in the international river basin commissions of the Elbe, Oder, Rhine and Danube. Where there are no examples available in this field, other examples are used, largely from German law. The implementation examples may take the form of measures actually put into practice, but may also relate to laws, guidelines, implementation recommendations, technical rules, safety recommendations etc. In most cases they are not a “complete package” for the measure in question, but only cover parts of it. The examples are only intended as a guide, i.e. they make no claim to present a complete picture of completed implementations in the EU region. Neither do they claim to offer the best solution for the individual measure proposed, but they may provide an indication of solutions that work in practice.

3.3 Final report

The final report on this project consists of three parts. Each of the three parts is designed, with limitations, to be read and understood on its own. There is therefore a certain intentional redundancy in the introductory sections.

While Part I provides an introduction to the project and a global summary of the results, Part II, entitled "*Action concept – Suggested measures for implementing Art. 11 (3) l WFD*" contains a guide to working through the implementation requirements of Article 11 (3) l WFD. This "action concept" has the character of a "checklist": it contains the graphic "safety chain" scheme already described, with the measures and implementation examples appended in tabular form, but without detailed explanations or reasons.

Part III, by way of explanatory notes to the "action concept", shows the results of the research, indicates its place in the WFD context, evaluates the solutions found, and presents the project's own suggested solutions, where these are regarded as necessary. A historical view of the legal aspects of the subject is followed by a discussion of the requirements of Article 11 (3) l WFD. Then the results of the inventory are evaluated and placed in the context of Article 11 (3) l WFD, and the deficits identified are described. This is then used as a basis for deriving a version of the "safety chain" scheme which is regarded as suitable for the needs of the project. These implementations of individual sub-links of the "safety chain", which are regarded as model examples, are named and – where necessary – described. Any project solutions that are not described in this form in the literature are discussed in greater detail. Implementation examples which are well documented externally are only explained, citing sources, as far as is considered necessary for a clear picture of how they fit into the context.