

May 2005

RECOMMENDATIONS FOR THE REDUCTION OF PHOSPHORUS IN DETERGENTS

FINAL INCEPTION REPORT





WORKING FOR THE DANUBE AND ITS PEOPLE



AUTHORS

PREPARED BY: WRc plc (Project number 14092-0)

AUTHORS: Carla Littlejohn Helene Horth

WRC plc Frankland Road, Blagrove, Swindon UK, SN5 8YF Phone Number 0044 - 1793 865000

TABLE OF CONTENTS

| 1. | Introduction5 |
|--------|--|
| 2. | Objectives6 |
| 2.1. | Objectives6 |
| 2.2. | Required Services6 |
| 2.2 | .1. Task 1 - Review existing legislation, policies and voluntary commitments on the reduction of phosphorus in laundry detergents across the EU and the Danube River Basin |
| 2.2 | .2. Task 2 - Compile and evaluate data on phosphorus containing detergents across the DRB in discussion with the Detergent Industry as well as associated production structures within the DRB |
| 2.2 | .3. Task 3 - Develop proposals for accomplishing a voluntary agreement between ICPDR / contracting parties (DRB countries) and the Detergent Industry7 |
| 2.3. | Risks to the project7 |
| 3. | Work programme |
| 3.1. | Inception stage9 |
| 3.2. | Task 1 - Review existing legislation, policies and voluntary commitments on the reduction of phosphorus in detergents across the EU and the Danube River Basin9 |
| 3.3. | Task 2 - Compile and evaluate data on phosphorus containing detergents across the DRB in discussion with the Detergent Industry as well as associated production structures within the DRB12 |
| 3.4. | Task 3 - Develop proposals for accomplishing voluntary agreements between ICPDR contracting parties and the Detergent Industry |
| 3.5. | Project outputs and timescales16 |
| 4. | Project organisation and staffing19 |
| ANNEX | 1 |
| Prelin | ninary list of project references |
| ANNEX | 2 |
| Prelin | ninary list of websites |

LIST OF TABLES

| Table 3.1 | DRB consultants and national experts for review of legislation, policies and | |
|-----------|--|-----|
| voluntar | ry agreements | .11 |
| Table 3.2 | Outputs and timeframes | .17 |
| Table 4.1 | DRP Task Force contact details | .20 |
| Table 4.2 | WRc team contact details | .20 |

LIST OF PICTURES AND GRAPHS

| Figure 3.1 | Milestones and key tasks | 18 |
|------------|--------------------------|----|
| Figure 4.1 | Project Team | 19 |

ABBREVIATIONS

| DRB | Danube River Basin |
|---------|---|
| DRP | Danube Regional Project |
| EG | Expert Group |
| EMIS EG | ICPDR Emissions Expert Group |
| EU | European Union |
| EU WFD | EU Water Framework Directive |
| GEF | Global Environment Facility |
| ICPDR | International Commission for the Protection of the Danube River |
| UNDP | United Nations Development Programme |

1. INTRODUCTION

WRC plc has been appointed by the United Nations Office for Project Services (UNOPS) (Reference 00036337, RER/03/G31) to develop recommendations for the reduction of phosphorus in detergents, which will be used as a basis for the negotiation of a voluntary agreement between the International Commission for the Protection of the Danube River (ICPDR) signatory countries and the Detergent Industry.

The contract requires a draft Inception Report within 3 weeks of the signature of the contract as the basis for discussion at the first Task Group meeting (Inception Meeting) with the UNDP/GEF Danube Regional Project (DRP) and ICPDR and to be amended as necessary.

This report fulfils that part of the contract. It contains details of:

- > The objectives of the project;
- > The tasks to be undertaken to fulfil the objectives; and
- > The outputs of the study.

The first draft was sent to the Contract Manager at UNDP / GEF Danube Regional Project and Members of the Task Force prior to the inception meeting on 2 May in Bonn. Issues for discussion were highlighted in the first draft and these and other issues were discussed at the Inception meeting.

The current final Inception Report has been revised in the light of the discussions at the Inception Meeting and further comments received from the Task Force on the amended final draft. It represents the agreed way forward.

2. OBJECTIVES

2.1. Objectives

Objective 1 of the DRP is: the creation of sustainable ecological conditions for land use and water management. This project contributes to output 1.8 of this objective, i.e. recommendations for the reduction of phosphorus in detergents.

The objective of the project described in the Terms of Reference of November 2004 (ToR) can be summarised as follows:

To develop proposals for the introduction of voluntary agreement schemes leading to a reduction in the level of phosphates used in (laundry) detergents across the Danube River Basin.

The specific objectives as stated in the ToR are to:

- > Assess the current use of phosphate builders in laundry detergents used within the Danube River Basin; and
- > To develop proposals for the introduction of voluntary agreements for phosphate reduction to be negotiated by the ICPDR / contracting parties and the Detergent Industry.

Whilst the recommendations for voluntary agreements will focus on domestic use of laundry detergents, reviews of current practice are envisaged to include industrial and domestic laundry detergent uses. A review of production structures in all Danube River Basin (DRB) countries will form an important part of the study.

The recommendations should be based on experiences of western European countries, in the context of related developments (policy and legislative) at the European Union level and take account of the institutional and economic capability of the DRB countries.

Whilst the ICPDR will be actively involved in promoting voluntary agreements, it is envisaged that these are to be reached between the detergent industry and individual DRB country governments.

2.2. Required Services

The ToR divides the project into three tasks:

2.2.1. Task 1 - Review existing legislation, policies and voluntary commitments on the reduction of phosphorus in laundry detergents across the EU and the Danube River Basin

The following sub-tasks will be undertaken to complete this task:

- a. Document DRB country legislation, policies and voluntary agreements concerning reduction of phosphorus content in laundry detergents;
- b. Review the relevant EU regulations applicable to the Danube countries;
- c. Review potential other legislation, measures and incentives to control the use of phosphorus in laundry detergents.

2.2.2. Task 2 - Compile and evaluate data on phosphorus containing detergents across the DRB in discussion with the Detergent Industry as well as associated production structures within the DRB

The following sub-tasks will be undertaken to complete this task:

- a. Compilation, review and evaluation of data on phosphorus-containing laundry detergents produced by the Detergent Industry and associated production structures and compare with national statistics and other relevant sources of information;
- b. Assessment of quantities of production and consumption, export and import of phosphate-based detergents in comparison with more environment-friendly forms;
- c. Assessment of the market outlook for different types of detergent (P-based and Pfree detergents) in each DRB country, including an assessment of the costs of substitution.

2.2.3. Task 3 - Develop proposals for accomplishing a voluntary agreement between ICPDR / contracting parties (DRB countries) and the Detergent Industry

The following task will be undertaken:

Develop background material and a template voluntary agreement to support the ICPDR's discussions with the detergent industry for the entire DRB.

2.3. Risks to the project

It should be noted that there are four areas that could potentially be impacted in relation to the development of voluntary agreements for controlling phosphates in detergents. These are:

- 1. The suppliers of phosphate to the detergents, food and agriculture industries;
- 2. The detergent producers;
- 3. The detergent suppliers; and
- 4. The detergent consumers.

This study deals with the development of proposals for entering into voluntary agreements with the Detergent Industry and, therefore, the focus is on the detergent producers. ICPDR has already established good relations with the Detergent Industry in previous discussions and has already obtained some data on the uses and production of phosphorus containing detergents, although some additional data and updates, if available, will be required.

However, consideration should also be given to other areas for the following reasons:

- > There are likely to be significant differences in the production structures of the Eastern DRB countries, as compared with the EU Member States. Washing techniques may be different, e.g. predominantly top-loading rather than front-loading. The former are cheap imports from Turkey and the Middle East and may be less suitable for non-P detergent use (e.g. settling, foaming?), although this trend may change in the near future. Closer links between washing machine producers and detergent producers may need to be encouraged.
- > There may be political pressure from the producers of phosphate for such agreements NOT to be initiated. After all, the detergent producers can change their business structure to incorporate production of alternative detergent builders. If the phosphate

producers lose a considerable component of their business, future production may not be viable;

- Detergent suppliers must be willing to actively distribute alternative detergent products to customers;
- Consumers must be willing to use the detergent products. The public may be reluctant to use non-phosphate products, if the perception is that the alternative detergent builder is less efficient than phosphate based products (see comment above on different washing techniques). Measures may be needed in order to encourage active participation in the agreements (e.g. consultation on environmental benefit, involvement of NGOs and consumer associations); and
- > The support of DRB governments will be needed. Whilst the heads of the ICPDR Water Management Delegations have subscribed to the process, governments may have more urgent priorities and may need convincing of the benefits.

The final risk to the project relates to the timely delivery of data for inclusion in the interim and final reports, and for use as a basis for proposals for voluntary agreements. Based on discussions at the Inception Meeting, a revised, more realistic time schedule has been prepared (refer to Section 3.5).

3. WORK PROGRAMME

3.1. Inception stage

The Inception meeting was held at the Federal Ministry for Environment, Nature Conservation and Nuclear Safety (BMU) in Bonn on May 2, 2005, where the draft Inception Report was discussed with the UNDP Contract Manager and Members of the Task Force (see below and also Table 4.1).

Those present at the Inception Meeting are listed below:

Peter Whalley, UNDP/GEF DRP - Contract Manager Mihaela Popovici, ICPDR – Technical Expert Joachim Heidemeier, UBA (chairman EMIS EG) Thomas Strathenwerth, BMU Knut Beyer, BMU Helene Horth, WRc plc – Project Manager

The draft Inception Report was amended accordingly and following further comments from the UNDP/GEF DRP Contract Manager and the Task Force. This final Inception Report represents the agreed way forward for completion of the tasks.

A preliminary review of the available data and information has been undertaken and lists of relevant reports and websites are provided in Annex 1 and 2, respectively. These are unlikely to be complete at this stage and some of the references may turn out not to be relevant.

→ Joachim Heidemeier will provide a report of a German study, which assesses successes and failures of voluntary agreements.

In addition, there is a similar study on voluntary agreements by the Commission, which has now been located (COM (2002) 416 – see Annex 1).

3.2. Task 1 - Review existing legislation, policies and voluntary commitments on the reduction of phosphorus in detergents across the EU and the Danube River Basin

This task has been broken down into three sub-tasks. However, in order to harmonise data collection, the information for each sub-task will be collated at the same time. The review will build on earlier work already available, focusing on updating to include any recent developments. The latest information relating to legislation, policy, voluntary commitments and other measures in the RBD countries will be achieved through contact with national experts and where the information cannot be obtained in this way, through the use of a small number of local consultants (sub-contractors). Update information from across the EU and internationally will be obtained through literature and Internet searches (refer to Annex 1 and 2). A comprehensive review of the relevant information will be undertaken and a summary of the situation in DRB and other countries prepared.

The focus will be on information necessary to back up the final outcome, i.e. the proposals for voluntary agreements.

The following provides an overview of the work to be undertaken for each of the sub-tasks.

a. Document DRB country legislation, policies and voluntary agreements concerning reduction of phosphorus content in detergents

Annex 8.2 of the DRP Project Brief (Phase 2) titled "Existing and Planned Policies and Legislation Relating to Pollution Control and Nutrient Reduction" (refer to 'key references' in Annex 1) provides an assessment of the existing and planned national policies and legislative reform requirements for all Countries within the Danube River Basin (DRB). As this document was prepared in 2000, the situation may have changed since this date.

It is not the intention to undertake a detailed analysis in order to re-do any of this existing information. Rather, it is proposed that national experts and a small number of consultants will be engaged to provide updates of the available information. Each consultant is expected to be able to provide the information for several countries. The focus for the latter will be on non-EU and, in particular, on non-Accession countries, where there is less readily available information (see also sub-task 1-b.). The selection of the Consultants will be made in close liaison with ICPDR (Mihaela Popovici) who will provide suitable contacts (experts from the DABLAS project team) and it is envisaged that they will work closely with ICPDR and WRc.

In order to avoid placing any unnecessary strain on project resources, the workloads of subcontractors will be kept to a minimum. This will be achieved by supplying the existing information for each country and providing simple means for updating this information, e.g. summary tables with scope for confirmation of data or making additional comments (update information), as appropriate. Update information on other RBD countries EU and Accession) may be obtained in a similar way through informal contact with national experts.

In addition to determining what policy, legislative and institutional changes have taken place since the preparation of the Annex 8.2 report in 2000, particular attention will be paid to local constraints and experience. This will include identification of relevant and novel approaches in other (non-detergent) areas, such as voluntary agreements, product legislation and labels, and charters. The purpose of this exercise will be to identify any existing 'cultures' on which to build to achieve voluntary agreements.

After an initial review, it is also proposed to decide, in consultation with the Task Force, whether any very brief case studies would be appropriate, in terms of countries and/or instruments, to support the proposals for voluntary agreements; for example, identifying the advantages and limitations of approaches to minimising detergent phosphate usage, and financial and institutional constraints which may limit the application of voluntary agreements in other (less affluent) countries and how the existing arrangements have worked in practice.

To achieve the above sub-task, a list of possible consultants (sub-contractors) and national experts and key decision makers within each of the DRB countries and the ICPDR, is required. WRc will work in partnership with the ICPDR to liaise with these contacts. The agreed list of contacts is included in the final Inception Report (Table 3.1)

| Table 3.1 | DRB consultants and national experts for review of legislation, policies |
|---------------|--|
| and voluntary | / agreements |

| Name | Country | Organisation | Telephone | E-mail | | | | |
|---------------------------|--------------|--|------------------|--------------------------------------|--|--|--|--|
| DRB National Experts (EU) | | | | | | | | |
| Richard Stadler | А | | | Richard.STADLER@lebensministerium.at | | | | |
| Irena Burhardt | DE | | | irena.burchardt@lfw.bayern.de | | | | |
| Doubravka Nedvedova | CZ | | | Doubravka_Nedvedova@env.cz | | | | |
| Zdena Kelnarova. | SK | | | kelnarova.zdena@enviro.gov.sk | | | | |
| Zsuzsa Steindl | HU | | | steindl@mail.ktm.hu | | | | |
| Erna Tomazevic | SI | | | Erna.Tomazevic@gov.si | | | | |
| DRB Consultants (poten | tial sub-cor | tractors, Accession | and non-Acce | ession countries) | | | | |
| Oana Tortolea | Romania | Center for Environmentally Sustainable Economic Policy (CESEP) | +407 22690227 | otortolea@yahoo.com | | | | |

b. Review the relevant EU regulations applicable to the DRB countries

Relevant EU and international legislation and agreements will be identified and a summary will be provided, showing which DRB countries are subject to which legislation/agreements. The state of implementation of these measures in the DRB countries will be assessed. The report prepared under the DRP project phase I and included as Annex 8.1 to the DRP Project Brief (Phase II) "*Existing and Planned Inter-ministerial Co-ordination Mechanisms Relating to Pollution Control and Nutrient Production*" will be a key starting point for this brief review (refer to 'key references' in Annex 1).

The situation is relatively straightforward for EU Member States, where compliance with EU Directives is required. Information on Accession countries may be obtained from Accession Agreements and Approximation Reports, which will provide details of the status concerning relevant EU Directives. ICPDR has already prepared a summary table for compliance / expected compliance dates for relevant EU Directives in RBD countries.

The Task Force requested a brief assessment of the relevance of Directive 73/404/EC on biodegradability of detergents and, in particular, to check any recent or on-going amendment.

c. Review the potential of other legislation, measures and incentives to control the use of phosphorus in detergents

Experience from countries other than those in the DRB will be important in identifying potential models for the DRB countries in the future. This sub-task will build on work reported in Glennie *et al.* (2002). This report included case studies from other EU countries, Switzerland and the US. The work was completed during 2000 and therefore is likely to require updating. Measures that could potentially be applied to DRB countries will be identified.

Information will be collected in a similar manner to that described for sub-task (a) (without the use of consultants) and assessed. The situations in the DRB countries (as described in Annexes 8.1 and 8.2 to the DRP Project Brief (Phase II) and including the results of sub-task 1-a) will be taken into account when potential measures are identified in order to ensure that only those that are applicable to the DRB situation are proposed.

Report

A draft interim report documenting the outcome of Task 1 (sub-tasks a-c) will be prepared and submitted to the Task Force by beginning of September 2005. A final interim report will be submitted following presentation of the report and discussions at the EMIS EG meeting in late September 2005, as well as any further comments from the Task Force. It is envisaged that the report will incorporate the following:

- 1. Mechanisms for reduction of detergent phosphates in DRB countries;
- Overview of existing and planned legislation, policies and voluntary agreements in DRB countries, including any novel approaches in non-detergent areas;
- > Brief case studies if considered appropriate;
- > Advantages, limitations and costs involved in implementation of voluntary agreements in DRB countries.
- 2. EU and international legislation and agreements restricting the use of phosphates in detergents
- > Overview of EU and other international legislation relevant to DRB countries;
- > Overview of EU and other international voluntary agreements;
- > Overview of other measures for limiting phosphates in detergents (e.g. incentives).

3.3. Task 2 - Compile and evaluate data on phosphorus containing detergents across the DRB in discussion with the Detergent Industry as well as associated production structures within the DRB

Task 2 has been broken down into the following three sub-tasks:

- a. Compilation, review and evaluation of data on phosphorus-containing detergents produced by the detergent industry and associated production structures, and comparison with national statistics and other relevant sources of information;
- b. Assessment of quantities of production and consumption, export and import of phosphate-based detergents in comparison with more environment-friendly forms;
- c. Assessment of the market outlook for different types of detergent (P-based and Pfree detergents) in each DRB country, including a brief assessment of the costs and benefits of substitution.

Due to the integrated nature of the above sub-tasks, they have been addressed collectively below.

The key issue for the successful completion of this task will be to establish satisfactory communication channels with the Detergent Industry. The WRc Proposal identified the need to identify, and initiate dialogue with, representatives from both the Detergent Industry and DRB national experts at an early stage to promote political buy-in and ownership of the final proposals.

The ICPDR has already established good communications and working relationships with the Detergents Industry. Therefore, to facilitate the consultation process, it is proposed that any

direct communication be undertaken by ICPDR, with support from WRc for the preparation of background material and attendance at meetings if required.

Information gathering will be carried out as for Task I using the same contacts as detailed in Table 3.1.

It is proposed that the aim of an initial meeting with representatives of the Detergent Industry will be to:

- > Provide an overview of the aims and objectives of this study and the long term goals;
- Discuss the industry concerns with voluntary agreements and identify other potential measures for reduction of detergent phosphates;
- > Request data on production, export, import and consumption of phosphate-based detergents in DRB countries (year 2000 production data has already been received by ICPDR, but more recent and complete data to be requested);
- Obtain information on production structures in DRB countries (there may be several small independent companies in some countries, which could make negotiations more difficult);
- > Obtain information on differences in washing techniques and regional differences in detergent composition in DRB countries, e.g. the use of top loading machines and the suitability of non-P detergents for these machines;
- > Discuss potential for expansion of production for alternative detergent builders, such as zeolites; and any possible links between Detergent Industry and washing machine manufacturers.

The discussions with the Detergent Industry should also address a broader perspective, such as product policy, eco-labeling, packaging and energy efficiency, and long-term dialogue with stakeholders.

A follow-up meeting may be needed to undertake further discussion and to obtain any outstanding data.

In parallel to collection of data from the Detergent Industry, national data will be obtained through consultation with DRB national experts to be used for comparison with data obtained from the Detergent Industry. Communication with national experts will be brief and carried out, where possible via e-mail and telephone interviews; some relevant information may also be obtained from the consultants (sub-contractors) used to complete Task 1. It is proposed that, following agreement on suitable national contacts, that WRc make direct contact with these experts, with support from ICPDR, should it be necessary.

The data supplied from the Detergent Industry and DRB national experts and consultants will be collated and reviewed to determine the following:

- > If the data provided by the Detergent Industry provides an accurate reflection of the production and consumption in DRB countries;
- > The proportion of use of phosphate-based detergents compared to more environmentally friendly forms in the DRB;
- > The potential for shifting to more environmentally friendly detergent builders;
- > The potential costs and benefits to the Detergent Industry of such a shift;
- > The potential costs and benefits to individual DRB countries of such a shift.

The comparison will be made between the production, consumption, export and import of phosphorus and phosphorus-free detergents on a country-by-country basis to identify where the greatest potential for further control lies.

Although it is assumed that industry costs will not be a factor in determining the feasibility of entering into voluntary agreements, it may be useful to have some background information concerning this. It is not intended to be an exhaustive exercise, rather to build on work already undertaken, e.g. by Glennie *et al.* (2002).

The potential costs and benefits to the individual countries of changing production to P-free detergents will be estimated. Potential benefits of substituting P-based detergents with P-free detergents will be determined based on the use of the different detergents in the individual countries. This will consider likely improvements in water quality and the cost of wastewater treatment to achieve similar results. Consideration will be given to the implications for trade and employment.

Other issues to be considered are the environmental impact of zeolite (discussed in Glennie *et al.*, 2002), effects on phosphorus contents of sludge from wastewater treatment plants, and effects on phosphorus content in storm water overflows.

Report

A draft interim report documenting the outcome of Task 2 will be prepared and submitted to the Task Force by beginning of September 2005. It should be noted that this deadline greatly depends on the timely provision of data from the Detergent Industry and the national experts and consultants.

A final Task 2 interim report will be submitted following presentation of the report and discussions at the EMIS EG meeting in late September 2005, as well as any further comments from the Task Force.

It is envisaged that the report will incorporate the following:

- 1. Production and use of phosphorus-based and alternative detergent builders in DRB countries:
- Overview of production structures, washing techniques and regional differences in detergent formulations;
- Overview of the current production and use of phosphate-based detergents (including import and export);
- > Overview of the current use of alternative (e.g. zeolite-based) detergents countries.

2. Industry and country costs and benefits associated with switching from phosphatebased to more environmentally friendly detergent builders:

- Comparison of production costs for phosphate-based and alternative (e.g. zeolitebased) detergents;
- Comparison of wastewater treatment costs for phosphate-based and alternative (e.g. zeolite-based) detergents;
- > Estimation of costs/benefits of using alternative detergent builders in DRB countries (country specific).

Any important background information for use in conjunction with Task 3 will be highlighted.

3.4. Task 3 - Develop proposals for accomplishing voluntary agreements between ICPDR contracting parties and the Detergent Industry

The following task will be undertaken:

Develop background material and a template voluntary agreement to support the ICPDR's discussions with the detergent industry for the entire DRB.

This task will need to take account of the different conditions in the DRB countries for the production and use of detergents and of other measures (e.g. increase in waste water treatment plant capacity as a result of the implementation of the EU Urban Waste Water Treatment Directive (91/271/EEC) in new Member States). The possibility of proposing nationally specific concepts for the introduction of voluntary agreements leading to phosphate control will be investigated and proposals developed as appropriate. This will draw upon the results of Tasks 1 and 2 described above, including consideration of successful elements and failures of other voluntary agreements (obtained from existing reports, e.g. German and EU studies).

Any recommendations will take account of country specific use patterns, the cost-benefit analysis, and the European and national regulatory framework. The focus of the recommendations will be on the best ways to develop voluntary agreement between the Detergent Industry and the Danube Basin States and how to overcome potential barriers to these agreements. These barriers could relate to political pressure (e.g. from the phosphate production industries) or public supply and consumption (e.g. ways in which to gain the participation of the public in such schemes).

These recommendations will provide details of potential self-binding agreements between the Detergent Industry and the DRB countries to put only phosphate-free detergents for household and industrial use on the market in the Danube Basin.

Final report

It is envisaged that the final report will be brief and highly focused on achieving voluntary agreements, consisting of the following main components:

- > A template agreement between the Detergent Industry and DRB country governments. As it is likely to require somewhat different approaches in different countries, the template may best be prepared in the form of a basic unit with building blocks to allow for adaptations to different countries or groups of countries, according to their different circumstances;
- > It will be accompanied by a clear set of arguments for negotiation, for example in terms of 'frequently asked questions' and 'answers' as related to the different building blocks;
- > A strategy for stakeholder involvement, e.g. consumer groups or environmental NGOs to take part in monitoring industry compliance with the agreement.

The proposals for achieving voluntary agreements between ICPDR countries and the Detergent Industry, together with selected background material will be presented as a first draft by end of October (or 2 weeks prior to the second Task Force Meeting). Following discussions at the meeting and feedback from the Task Force, it will be finalised by mid-December 2005.

The outcome of this project will form the background material for a workshop to be held after completion of the project. As there is no funding for the Consultant to attend such a workshop, it is envisaged the UNDP/GEF DRP will provide separate funding for detailed preparations, attendance and presentations. It may be possible to get sponsorship from the Detergent

Industry. It is envisaged that ideas for objectives, format, participants and target audience, programme, time and place will be discussed at the second Task Force Meeting (beginning of November 2005).

3.5. Project outputs and timescales

Following discussions at the Inception Meeting, the timescales have been revised to be more realistic in view of the fact that successful outputs will depend on contributions from national experts/consultants and the Detergent Industry.

The timescale for outputs needs to be co-ordinated with relevant ICPDR meetings, as follows:

- 1. ICPDR Meeting in June 2005: Task Force to inform Meeting of this project;
- 2. EMIS EG Meeting end of September 2005: Consultant (contract manager) to present results of Tasks 1 and 2;
- 3. ICPDR Plenary Session end of 2005 Task Force to present summary of project and discuss workshop (objectives, programme, participants, time and place);
- 4. Workshop first quarter of 2006 (final report of this project will form the basis);
- 5. ICPDR meeting in June 2006 discuss project outcome.

Major project **outputs** and their timing are summarised in Table 3.2. The timing of key tasks for each of these milestones is shown in Figure 3.1. Any problems, such as delays in receiving information from sub-contractors, national experts or the Detergent Industry, leading to potential slippage of the deadlines will be discussed with the UNDP/GEF DRB Contract Manager at the earliest opportunity.

| Outputs/Milestones | Date – 2005 | | |
|--|------------------|--|--|
| | | | |
| Draft Inception Report | 21 April | | |
| Inception Meeting | 2 May | | |
| Draft Final Inception Report | 12 May | | |
| Project Summary | 16 May | | |
| Final Inception Report (one week after receiving final comments) | end May | | |
| Report on existing legislation, policies and voluntary agreements (Task 1) | 2 September | | |
| Status report on phosphorus-based detergents (Task 2) | 2 September | | |
| Present Task 1 and 2 reports at EMIS EG Meeting | end September * | | |
| Proposal (first draft) for accomplishing voluntary agreements between the Detergent Industry and the ICPDR States (Task 3) | 28 October | | |
| Task Force meeting | early November * | | |
| Final Report | 16 December | | |

Table 3.2Outputs and timeframes

* date to be confirmed

Figure 3.1 Milestones and key tasks

| ID | Task Name | March | April | May | | June | July | August | September | October | November | December |
|----|---|-------|-------|----------|---|------|------|--------|--|----------|------------|----------|
| 1 | Inception Phase | | · | | | | | | | | | |
| 2 | Prepare Inception report | | | , | | | | | | | | |
| 3 | Submission of Draft Inception Report | | . ♦ | - | | | | | | | | |
| 4 | Inception meeting | | | ۰L | | | | | | | | |
| 5 | Submission of Final Inception Report | | | | 7 | | | | | | | |
| 6 | Submit project summary | | | | 1 | | | | | | | |
| 7 | Task 1 - Review existing legislation, policies and voluntary agreements | | | | | | | | | | | |
| 8 | Task 1 a) Document DRB Country Legislation | | | | | | | | 1 | | | |
| 9 | Task 1 b) Document EU and International Legislation and Agreements | | | | | : | : | : | - | | | |
| 10 | Task 1 c) Review other potential measures | | | | | | | | H. | | | |
| 11 | Task 1 Report | | | | | | | | ♦` | | | |
| 12 | Task 2 - Compile and evaluate data on detergents | | | | 4 | | | | | Y | | |
| 13 | Task 2 a) Compile data on phosphorus-based detergent use and production | | | | • | | - | | | | | |
| 14 | Task 2 b) Compile data on phosphorus-free detergents | | | | | : | | | | | | |
| 15 | Task 2 c) Assessment of market outlook | | | | | | | : | | | | |
| 16 | Status report | | | | | | | | ∮ | | | |
| 17 | Present task 1 and 2 reports at EMIA EG meeting | | | | | | | | 1 | | | |
| 18 | Task 3 - Development of proposals for accomplishing voluntary agreement | | | | | | | | 4 | | | |
| 19 | Task 3 a) Development of proposals for accomplishing voluntary agreements | | | | | | | | r time to the second se | | L. | |
| 20 | Draft Task 3 Report | | | | | | | | | Ļ | € <u>i</u> | |
| 21 | Task 3 b) Preparation of materials to support basin-wide conference | | | | | | | | L | | | |
| 22 | Task force meeting | | | | | | | | | | . | |
| 23 | Revise draft final report | | | | | | | | | | | |
| 24 | Submission of Final Report | | | | | | | | | | | • |

4. **PROJECT ORGANISATION AND STAFFING**

The project will be managed and led by Helene Horth, supported by a team of experts at WRc (Figure 4.1), including Tom Zabel as Technical Adviser.

The WRc project team will report to the Project Task Force. Relevant contact details are provided in Tables 4.1 and 4.2.

Local experts will provide specific support as required. These experts will be identified in partnership with the ICPDR and, if appropriate, employed and hired through the Danube Regional Project (DRP). Refer to Table 3.1 for national contacts/consultants.

Rosa Richards is no longer with WRc; she will be replaced by Lacey-Jane Davis to provide a supporting role for the project. A formal request to approve the change has been made and details of Lacey-Jane's experience has been provided. The Task Force accepted this change in support staff.



Figure 4.1 Project Team

| Name | Organisation | Telephone | E-mail | | |
|------------------|--------------|-------------------|---------------------------------|--|--|
| Mihaela Popovici | ICPDR | +43 1 26060 4502 | Michaela.Popovici@unvienna.org | | |
| Peter Whalley | UNDP/GEF | +43 1 26060 4023 | Peter.WHALLEY@unvienna.org | | |
| | DRP | | | | |
| Joachim | UBA | +49 340 2103 2780 | joachim.heidemeier@uba.de | | |
| Heidemeier | | | | | |
| Thomas | BMU | | thomas.stratenwerth@bmu.bund.de | | |
| Stratenwerth | | | | | |
| Knut Beyer | BMU | | knut.beyer@bmu.bund.de | | |
| Bernd Mehlhorn | European | | bernd.mehlhorn@cec.eu.int | | |
| | Commission | | | | |

Table 4.1 DRP Task Force contact details

Table 4.2WRc team contact details

| Name | Role | Telephone | E-mail |
|------------------|----------------------------------|-----------------------|---------------------------|
| Helene Horth | Project Manager +44 1494 883 802 | | horth h@wrcplc.co.uk |
| | | mob: +44 7966 336 732 | |
| Tom Zabel | Technical Adviser | +44 1628 485 478 | Thomas.Zabel@tesco.net |
| Sarah France | Technical support | +44 1793 86 5058 | france s@wrcplc.co.uk |
| Carla Littlejohn | Technical support | +44 1793 86 5018 | littlejohn c@wrcplc.co.uk |
| Ed Glennie | Technical support | +44 1793 86 5059 | glennie_e@wrcplc.co.uk |
| Lacey Davis | Technical support | + 44 1793 86 5019 | davis l@wrcplc.co.uk |

The UN contact in relation to contractual issues is: Lisa Gomer Chief, GLO/INT Division U.N. Office for Project Services The Chrysler Building, 405 Lexington Ave New York, NY 10174 Tel: 001 212 457 1880

The UN contact for submission of invoices is: Andrew Menz Global and Interregional Division UNOPS 11-13 Chemin des Anemones 1219 Chatelaine, Geneva Tel: +41 (0) 22 917 8556

Copies of all invoices should also be submitted to: Ivan Zavadsky UNDP/GEF Danube Regional Project Vienna International Centre, D0418 P.O. Box 500, A-1400 Vienna, Austria.

ANNEXES

ANNEX 1 Preliminary list of project references

ANNEX 2 Preliminary list of websites

ANNEX 1

PRELIMINARY LIST OF PROJECT REFERENCES

KEY REFERENCES

- 1. Popovici, M. (2003) Issue paper on the rationale for a phosphate ban in detergents, International Commission for the Protection of the Danube River (ICPDR) (Draft -1, IC/WD/173, 24-Oct-2003).
- Glennie, EB., Littlejohn, C., Gendebien, A., Hayes, A., Palfrey, R., Sivil, D. and Wright K. (2002), Phosphates and alternative detergent builders, Final Report for EU Environment Directorate, WRc, Swindon
- 3. International Commission for the Protection of the Danube River (ICPDR) (2000a), Existing and planned inter-ministerial co-ordination mechanisms relating to pollution control and nutrient reduction, *Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin,* Summary report in support of the project brief, UNDP/ GEF Assistance
- 4. International Commission for the Protection of the Danube River (ICPDR) (2000b), Existing and planned policies and legislation relating to pollution control and nutrient reduction, *Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin,* Summary report in support of the project brief, UNDP/ GEF Assistance
- 5. International Commission for the Protection of the Danube River (ICPDR) (2000c), Five year nutrient reduction action plan, *Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin,* Summary report in support of the project brief, UNDP/ GEF Assistance
- 6. International Commission for the Protection of the Danube River (ICPDR) (2000d), Reinforcement of NGO activities in project implementation and awareness raising, *Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin,* Summary report in support of the project brief, UNDP/ GEF Assistance
- 7. International Commission for the Protection of the Danube River (ICPDR) (2000e), Enhancing the international cooperation and legal provisions for reduction of nutrient input in the Danube River Basin, *Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin*, Summary report in support of the project brief, UNDP/ GEF Assistance
- 8. International Commission for the Protection of the Danube River (ICPDR) (2001a) Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin, *Project Brief for the Danube Regional Project* (*Phase 1*), UNDP/ GEF Assistance
- 9. International Commission for the Protection of the Danube River (ICPDR) (2001b) Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin, *Project Document (Phase 1)*, UNDP/ GEF Assistance
- 10. International Commission for the Protection of the Danube River (ICPDR) (2003a) Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary

Cooperation in the Danube River Basin, *Project Brief for the Danube Regional Project (Tranche 2)*, UNDP/ GEF Assistance

- 11. International Commission for the Protection of the Danube River (ICPDR) (2003b) Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin, *Project Document (Tranche 2)*, UNDP/ GEF Assistance
- 12. Senator (1996) Removal of phosphates from detergents in the Danube River Basin. Final Report Vol. 1 (ed. Ijjas, I), Environmental Programme for the Danube River Basin, PHARE programme, Project No. EU/AR/205/91
- 13. Soil and Water, (2004), Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin, *Mid-Term Evaluation of the UNDP/GEF Project*, Finland
- 14. UNDP-GEF (2002). UNDP-GEF Danube Regional Project, project implementation plan, phase 1 (2002-2003). Revision 10.4.2002)
- 15. COM (2002) 412 final, Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions, Environmental Agreements at Community Level within the Framework of the Action Plan on the Simplification and Improvement of the Regulatory Environment, Commission of the European Communities, Brussels, 17.07.2002.

ADDITIONAL REFERENCES

- Aidar, E., Sigaud-Kutner, TCS., Nishihara, L., Schinke, KP., Braga, MCC., Farah, RE. and Kutner, MBB. (1997) Marine phytoplankton assays: effects of detergents, *Marine Environmental Research* (43) no. 1/2 pp 55-68
- 17. Anderson, DM., Gilbert, PM. and Burkholder, JM (2002) Harmful algal blooms and eutrophication: Nutrient sources, composition and consequences, *Estuaries*, (25) pp 704-726
- 18. Andreottola, G., Bonomo, L., Poggiali, L. and Zaffaroni, C. (1994) A methodology for the estimation of unit nutrient and organic loads from domestic and non-domestic sources, *European Water Pollution Control* (4) no. 6, pp 13-19
- Blaschke, P., Schilling, C., Zessner, M.(2002a) daNUbs Nutrient management in the Danube basin and its impact on the Black Sea - Water balance calculation for two case study regions in Austria; accepted for: Third international conference on resources and environment, 22-26 July 2002, Dresden, Germany
- 20. Blaschke, P., Schilling, C., Zessner, M.(2002b): daNUbs Nutrient management in the Danube basin and its impact on the Black Sea -Water balance calculation for two case study regions in Austria; EGS XXVII General Assembly, Nice, France
- Bode, H. and Klopp, R. (undated) Nutrient removal in the river basin of the Ruhr a German case study, Practical implementation of nutrient guidelines; Water Science and Technology (44) no. 1, pp 15-24

- 22. Boers, PCM. and van der Molen, DT. (1993) Control of eutrophication in lakes: the state of the art in Europe, *European Water Pollution Control*, (3) no. 2, pp19-25
- 23. Boesch, DF. (2002) Challenges and opportunities for science in reducing nutrient overenrichment of coastal ecosystems, *Estuaries*, (25) no. 4B, pp 886-900
- 24. Bohme, M. (1991) Phosphates or replacers- the use of phosphate in detergents is still a great mistake, *GWF-Wasser/Abwasser* (132) no. 7, pp 368-375
- 25. Burton, M. (1992) Washing away the phosphate myths?, *Municipal Journal*, (24) pp 24-27.
- 26. Candinas, T. (1988) Ban on Phosphorus in detergents: the effects on the phosphorus elimination by sewage treatment plants, in Sewage Treatment and Use: New developments. Technological aspects and environmental effects (edited Dirkzwager, AH. and L'Hermite, P.), Elsevier Applied Science, Barking, pp 370-377
- 27. Carrera. J., Sarra, M., Lafuente, FJ. and Vincent, T. (2001) Effect of different operational parameters in the enhanced biological phosphorous removal process. Experimental design and results, *Environmental Technology* (22) no. 12, pp1439-1446
- 28. Cociasu, A., Dorogan, L., Humborg, C. and Popa, L. (1996) Long-term ecological changes in Romanian coastal waters of the Black Sea, *Marine Pollution Bulletin* (32) no. 1, pp 32-38
- 29. Cooper, P., Day, M. and Thomas, V. (1994) Process options for phosphorus and nitrogen removal from wastewater, *Journal of institution of Water and Environmental management* (8) no. 1, pp 84-92
- Conley, DJ., Markager, S. Anderson, J., Ellerman, T. and Svendsen, LM., (2002) Coastal eutrophication and the Danish National Aquatic Monitoring and Assessment program, *Estuaries* (25) no. 4B pp 848-861
- *31.* Council Directive (1991) 91/271/EEC of 21 May 1991 concerning urban waste-water treatment, Official Journal L 135 ,P. 0040 0052
- 32. De Jong, AL. and De Oude, NT. (1987) Detergents Industry, *Environmental Protection of the North Sea.* London, 24-27 March 1987, Paper 12, pp 20
- D'Elia, CF., Boynton, WR. and Sanders, JG. (2003) A watershed perspective on nutrient enrichment, science, and policy in the Patuxent River, Maryland: 1960-2000, *Estuaries* (26) no. 2A, pp 171-185
- 34. DeSena, M. (1999) Maryland Act pioneers comprehensive nutrient management, *Water Environment and Technology* (11) no. 5 pp 20-23
- Dwyer M., Yeoman S., Lester J., and Perry R. (1990). A review of Proposed non-phosphate detergent builders, Utilisation and Environmental Assessment. *Environment Technology*, (11), pp263-294
- 36. Earle, JR. (undated) The Three Rivers Project Water quality monitoring and management systems in the Boyne, Liffey and Suir Catchments in Ireland, 3rd World Water Congress: Integrated Water Resources Management, *Water Science and Technology* (47) no.7-8, pp 217-225

- 37. Ends Report (1990) Eutrophication the day of reckoning looms, *Ends Report*, no. 182, pp 16-19
- 38. Environmental Programme for the Danube River Basin (Undated), Nutrient balances for Danube Countries, Project EU/AR/102A/91
- 39. European Environment Agency (EEA) (1999) Nutrients in European Ecosystems. Environmental Assessment report No. 4. Office for the official publications of the European Communities
- 40. Farmer, AM (undated) Reducing phosphate discharges: The role of the 1991 EC urban wastewater treatment directive, Practical Implementation of nutrient guidelines, *Science and Technology* (44) no. 1, pp 41-48
- 41. Ferrier, RC. and Edwards, AC. (2002) Sustainability of Scottish water in the early 21st Century, *Science of the Total Environment* (294) no. 1-3 pp 57-71
- 42. Germanus, J., Krings, P. and Stelter N. (1995) Results of investigations concerning the presence of constituents of household detergents and detergent additives in East German rivers, *Acta Hydrochimica et Hydrobiologica* (23) no. 6, pp 289-297
- 43. Glasbergen P., (1998) Modern Environmental Agreements: A policy instrument becomes a management strategy, *Journal of environmental Planning and Management* (46) no. 6, pp 693-709
- 44. Greening, H. and Elfring, C. (2002) Local, state, regional, and federal roles in coastal nutrient management, *Estuaries*, (25) no. 4B, pp 838-847
- 45. Haddad, DE., Fitzgerald, DG. and Mills, EL. (2003) Understanding the consequences of the Great Lakes Water Quality Agreement and the Dreissend Mussel invasion on Oneida Lake, *Global threats to large lakes: Managing in an environment of instability and unpredictably*, p276
- 46. Halliwell, DJ., McKelvie, ID., Hart, BT. and Dunhill, RH. (2001) Hydrolysis of triphosphate from detergents in a rural waste water system, *Water Research* (35) no. 2 pp 448-454
- 47. Hamm, A. (1991) Further comments on phosphate replacers in household detergents, *GWF-Wasser/Abwasser* (132) no. 9 pp 491-499
- 48. Henze, M. (1997) Waste design for households with respect to water, organics and nutrients, *Water Science and Technology* (35) no. 1 pp113-120
- 49. Hartig, JH., Trautrim, C., Dolan, DM. and Rathke, DE. (1990) The rationale for Ohio's detergent phosphorous ban, *Water Resources Bulletin* (26) no. 2, pp 201-207
- 50. Harremoes, P., Bundgaard, E. and Henze, M. (1991) Developments in wastewater treatment for nutrient removal, *European Water Pollution Control* (1) no. 1, pp 19-23
- Hoffman, FA. and Bishop, JW. (1994) Impacts of a phosphate detergent ban on concentrations of phosphorous in the James river, Virginia, *Water Research* (28) no. 5, pp 1239-1240

- 52. Holas, J. and Konvickova, M. (1996) Legislative tools in the Czech watershed management policy, *Water Science and Technology* (33) no. 4/5, pp 39-44
- 53. Horan, N. (1992) Nutrient Removal from wastewaters, *Water and Waste Treatment*, (35) no. 2 pp 16-17
- 54. Horan, N. (1992) Reducing pollution by nutrient removal, *Water and Waste Treatment* (35) no. 10, pp 148-149
- 55. Jackson, JA. and Sees, M (2000) Rerating capacity of a constructed wetland treatment system, Wetland Systems for Water Pollution Control 2000 pp 435-440, *Water Science and Technology* (44) no. 11-12
- 56. Jankovic, DV., (1990) Studies on the contamination status of the Danube river basin waters, measures of protection, and rational exploitation of the water resources, *Water Science and Technology*, (30) pp 45-50
- Jeppesen, E., Sondergaard, M., Kronvang, B., Jensen, JP., Svendsen, LM. and Lauridsen, TL. (1999) Lake and catchment management in Denmark, *Hydrobiologia*, (395-396) pp 419-432
- 58. Jones, ER. and Hubbard, SD. (1986) Maryland's phosphate ban- history and early results, *Journal of Water Pollution Control Federation*, (58) no. 8 pp 816-822
- 59. King, A. (1993) Wastewater phosphate removal best option, *World Water and Environmental Engineer*, November 1993, p12
- Klein, G. (1992) Rationale and implementation of a strategy to restore urban lakes in Berlin: results after 10 years of phosphorous removal, *Water Pollution Research Journal of Canada* (27) no. 2, pp 239-255
- 61. Kohler J., (2001) Detergent phosphates and detergent ecotaxes: a policy assessment, University of Cambridge, prepared for CEEP
- 62. Kratch, K. Virginia Legislature considers helping Potomac Basin POTWs (1997), *Water Environment and Technology* (9) no. 2, pp 20-22
- Kroiss, H., Lampert, C., Zessner, M. (2001) Nutrient management in the Danube Basin and its impact on the Black Sea; ELOISE 4th open Science Meeting 5-7 September 2001 Rende, Italy; Book of Abstracts, p. 20-21
- Kroiss H., Zessner M., Lampert C. (2002a) Nutrient Management in the Danube Basin and Its Impact on the Black Sea ; Leading Edge Conference Series – SUSTAINABILITY IN THE WATER SECTOR; 25-26 November 2002, Venice Italy
- 65. Kroiss H., Zessner M., Lampert C. (2002b): Nutrient Management in the Danube Basin and Its Impact on the Black Sea; Proceeding EWA-conference "River Basin Management -From Experience to Implementation" Conference in Amsterdam 2-4 October 2002.
- 66. Kroiss H., Zessner M., Lampert C. (2003a): Nutrient Management in the Danube Basin and Its Impact on the Black Sea, *Journal of Coastal Research*, accepted for publication

- 67. Kroiss H. (2003) Managing nutrients in the Danube Basin; Water 21, April 2003
- Kvarnstroem, E., Schoenning, C., Carlsson-Reich, M., Gustafsson, M. and Enocksson, E. (undated) Recycling of wastewater-derived phosphorus in Swedish agriculture – a proposal, From Nutrient Removal to Recovery, *Water Science and Technology* (48) no. 1, pp 19-25
- 69. Lau, PS., Tam, NFY. and Wong, YS. (1995) Effect of algal density on nutrient removal from primary settled wastewater, *Environmental Pollution* (89) no. 1 pp 59-66
- 70. Leymann, G. (1991) The problem of substitutes with reference to phosphate free detergents, *GWF-Wasser/Abwasser* (132) no. 7, pp361-368
- 71. Linker, L. (1996) Models of Chesapeake bay, Sea Technology (37) no. 9, pp. 49-53,55
- 72. Maki, A., and Macek, K. (1978) Aquatic Environmental Safety Assessment for a nonphosphate detergent builder, *American Chemical Society* (12) pp 573-580
- 73. Millard, SP. (1996) Estimating a percent reduction in load, *Water Resources Research* (32) no. 6, pp 1761-1766
- 74. Moncheva, S., Dontcheva, V., Shtereva, G., Kamburska, G., Malej, A. and Gorinstein, S. Application of eutrophication indicies for assessment of the Bulgarian Black Sea coastal ecosystem ecological quality, Environmental Protection Technologies for Coastal Areas III pp 19-28, *Water Science and Technology* (46) no. 8
- Monti, M., Welker, C. and Fonda Umani, S. (1996) Effects of synthetic Zeolite 'A' and polycarboxylates on quality and quantity of diatom mucous exudates, *Chemosphere* (32) no. 9, pp 1741-1754
- Morse, GK., Lester, JN., and Perry, R. (1993) The environmental and economic impact of phosphorous removal from wastewater in the European Community, CEEP, ISBN 0 948411 08 2
- 77. Morse, GK., Lester, JN. and Perry R (1994) The environmental and economic impact of key detergent builder systems in the European Union, CEEP, ISBN 0 948411 09 0
- 78. Morse, GK., Perry R. and Lester, JN. (1995) The Life-cycle Environmental impact of key detergent builder systems in the EU, *The Science of the Total Environment* (166), pp179-192
- 79. Parry, R (1998) Agricultural phosphorus and water quality: a U.S. Environmental Protection Agency perspective, *Journal of Environmental Quality*, (27) no. 2 pp. 258-261
- Perkins, R. and Underwood, G. (2002) Partial recovery of a eutrophic reservoir through managed phosphorus limitation and unmanaged macrophyte growth, *Hydrobiologia* (481) no. 1-3, pp 75-87
- Qian, SS., Borsuk, ME. and Stow, CA. (2000) Seasonal and long-term nutrient trend decomposition along a spatial gradient in the Neuse River Watershed, *Environmental Science and Technology* (34) no. 21, pp 4474-4482

- 82. Rodda, DW., (1994) The Environmental Programme for the Danube river basin, *Water* science and Technology, (30) pp 135-145
- Sadick, T., Bailey, W., Tesfaye, A., McGrath, M., Daigger, G. and Benjamin, A. (undated) Full scale implementation of post denitrification at the Blue Plains AWT in Washington D.C., Design, Operation and Economics of Large Wastewater Treatment Plants, pp 26-39, *Water Science and Technology* (41) no. 9
- 84. Schaefer, W. (1990) Environment Ministry gets tough on phosphorus, *Water World*, (12), pp 53-54, 56
- Schleich, J. and White, D. (1997) Cost minimization of nutrient reduction in watershed management using linear programming, *Journal of American Water Resources association* (33) no. 1, pp 135-142
- 86. Shaffer, G. (1986) Phosphate pumps and shuttles in the Black Sea, *Nature* (321) no. 6069, pp 515-517
- 87. Shuyler, LR., Linker, LC. and Walters CP. (1995) The Chesapeake bay story, the science behind the program, *Water Science and technology* (31) no. 8, pp133-139
- 88. Siegrist, H. and Boller, M. (1999) Effects of the ban on phosphate in domestic detergents on sewage treatment in Switzerland, *Korrespondenz Abwasser* (46) no. 1 pp 57-65
- 89. Somlyody, L., Brunner, PH. and Kroiss, H. (1999) Nutrient balances for Danube countries a strategic analysis, *Water Science and Technology*, (40) no. 10, pp 9-16
- 90. Sonzogni, WC. and Heidtke, TM. (1986) Effect of influent phosphorus reductions on Great Lakes sewage treatment costs, *Water Resources Bulletin,* (22) no. 4, pp 623-627
- 91. Staneva, J. Kourafalou V., Tsiaras K., Stanev E. (2002) The response of the Black Sea ecosystem to changes in physical conditions and nutrient discharge from Danube River; International Conference on Oceanography of the Eastern Mediteranean and Black Sea: Similarities and differences of two interconnected basins, October 2002, Ankara, Turkey; Conference proceeding
- 92. Stapleton, CM., Kay, D., Jackson, GF. and Wyer MD. (2000) Estimated inorganic nutrient inputs to the coastal waters of Jersey from catchment and waste water sources, *Water Research* (34) no. 3, pp 787-796
- 93. Strauss P., Zessner, M., Blaschke, P., Buzas, K., Kosturkov, J., Postolache, C., Schilling, C., Vogel, B., Heinecke, U. (2002) Nutrient Management in the Danube Basin at the example of selected case study watersheds – processes and problems, accepted as oral presentation at the IWA specialised conference on diffuse pollution, Amsterdam, The Netherlands 30.09.2002-04.10.2002
- 94. Tornes, O. (undated) Implementation of EU discharge guidelines at IVAR's Regional Wastewater Treatment Plant of North Jaeren, Stavanger, Norway, Practical implementation of nutrient guidelines; *Water Science and Technology* (44) no. 1, pp33-39
- 95. WET News (1999) P is for Problem, (5) no. 21, pp 10-11

- 96. Wilson, H. (1999) Legislative challenges for lake eutrophication control in Europe, *Hydrobiologia* (395-396) pp 389-401
- 97. Wilson, R. and Jones, B. (1994) The phosphate report, Landbank Environmental Research and Consulting, ISBN 0 9525639 0 8
- 98. Xiuzhen, L., Jongman, RHG., Harms, WB. and Bregt AK. (undated), Spatial modelling of nutrient reduction in the natural wetlands of the Liaohe delta, China, Natural Wetlands for wastewater treatment pp 47-74, *Advances in Ecological sciences* (12)
- 99. Zessner, M., Fenz, R., and Kroiss, H., (1998) Wastewater Management in the Danube Basin, Water Science Technology (38) pp41-49
- 100. Zessner, M. and Kroiss, H. (1999) Retention and losses of nutrients in the hydrosphere of Austria, *Water Science and Technology* (40) pp 59-66
- 101. Zessner, M. and van Gils, J. (undated) Nutrient Fluxes from the Danube to the Black Sea, Environmental Protection Technologies for Coastal Areas III, *Water Science and Technology* (46) no. 8, pp 9-17
- 102. Zwolsman, JJG. (1994) Seasonal variability and biogeochemistry of phosphorous in the Scheldt estuary, South-west Netherlands, *Estuarine, Coastal and Shelf Science* (39) no.3, pp227-248

ANNEX 2

PRELIMINARY LIST OF WEBSITES

CEEP_Phosphates, Phosphates in detergents, background information <u>http://www.ceep-phosphates.org/Files/Document/74/eutrophication2003.pdf</u>

Czech Republic to ban phosphate detergents http://www.rivernet.org/prs05_02.htm#220305a

Removal of phosphate from detergents in the Danube Basin Study of eleven Danube Basin countries <u>http://icid.vit.bme.hu/newslet/erwg2/frmain.htm</u>

GEF STRATEGIC PARTNERSHIP ON THE DANUBE/BLACK SEA BASIN-framework brief http://www.gefweb.org/Documents/Council_Documents/GEF_C17/BS-DANUBE_FRAMEWORK_BRIEF_v4_final_.pdf

Intergovernmental Review of the GPA 2001 Template-<u>http://www.gpa.unep.org/igr/Reports/DANUBE-RIVER-BASIN.htm</u> Bulgaria-<u>http://www.gpa.unep.org/igr/Reports/bulgaria.htm</u>

Reducing Phosphorus in the Danube River Basin http://www.biopolitics.gr/HTML/PUBS/VOL6/HTML/ijjas.htm

The environmental impact (reduction in eutrophication) that would result from banning sodium tripolyphosphate (STPP) in household detergents http://europa.eu.int/comm/health/ph risk/committees/sct/documents/out202 en.pdf

JOINT ACTION PROGRAMME for the Danube River Basin January 2001 – December 2005 http://www.icpdr.org/pls/danubis/docs/FOLDER/HOME/ICPDR/JAP/JAP_2001.pdf

Statement by Mr. Tomáš Novotný, Deputy Minister of the Environment of the Czech Republic-Third meeting of the Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Madrid, 26-28 November 2003 http://www.unece.org/env/water/meetings/3mop/Czechrepublic.pdf

Danube Applied Research Conference, Sinaia (Romania), 14-16 September 1997, Programme & Book of Abstracts

http://www.rec.org/DanubePCU/docs/boa.doc

Czech Republic: A case study on commitments-related best practice or lessons learned in water http://www.un.org/esa/agenda21/natlinfo/countr/czech/caseczech.pdf

Austrian Interim-Report on the Implementation of the ICPDR - Joint Action Programme 2001 – 2005 for the years 2001-2003 <u>http://gpool.lfrz.at/gpoolexport/media/file/Interim-</u> <u>Report AT Aktionsprogramm der IKSD Zwischenbericht.pdf</u>

Sustainable Danube River and NGO Environmental Alliance, CCEG-Romania <u>http://www.cceq.ro/publicatii/recsdr%20enq.pdf</u>

How to Save the Black Sea-UNDP-GEF http://www.undp.org/gef/new/blacksea.htm

Water Pollution Control - A Guide to the Use of Water Quality Management Principles.1997 WHO/UNEP

http://www.who.int/docstore/water sanitation health/wpcontrol/ch07.htm

EU Environment News

http://www.unep.cz/dokumenty/bulletin43.pdf

Ideas for local actions in water management

http://www.gwpforum.org/gwp/library/Ideasbook%20Local%20action%20in%20water%20man agement.pdf

HELCOM-Research and information on the contribution of phosphate based detergents to eutrophication in the Baltic Sea area as well as information on the environmental impacts of zeolites or other possible substitutes

http://sea.helcom.fi/dps/docs/documents/Monitoring%20and%20Assessment%20Group%20(M ONAS)/MONAS%205,%202003/doc7-1.pdf

EUROPA-Phosphates and alternative detergent builders http://europa.eu.int/comm/environment/water/phosphates.html

Detergent phosphates and detergent ecotaxes: a policy assessment. http://www.ceep-phosphates.org/Files/Document/50/kohler_ecotax.pdf

The Dutch National Environmental Policy Plans (NEPP) and Industry Covenants http://www.epe.be/workbooks/sourcebook/2.2.html

The Role of Pollution Prevention in Reducing Nutrient Enrichment of Chesapeake Bay

http://www.umich.edu/~nppcpub/resources/compendia/CSTLpdfs/CSTLchesapeake.pdf

Voluntary Approaches for Environmental Policy in OEDC Countries: An Assessment <u>http://www.cerna.ensmp.fr/Documents/PBMGFL-OECDVAs.pdf</u>

Large scale ecosystem restoration initiatives-Protecting and Restoring the Chesapeake Bay http://www.nemw.org/chesapeake.htm

Farmers Journals-Phasing out P-based detergents http://www.farmersjournal.ie/2000/0129/environment/

Zeolites for Detergents As Nature Intended http://www.zeodet.org/downloads/Zeolites.pdf

Development of voluntary agreements to reduce phosphates in detergents <u>http://www.undp-drp.org/jart/projects/unodp/main.jart?rel=de&content-id=1100750554620</u>

Sustainable use of phosphates <u>http://www.kemira-growhow.com/UK/EventsAndNews/News/SustainablePhosphates.htm</u>