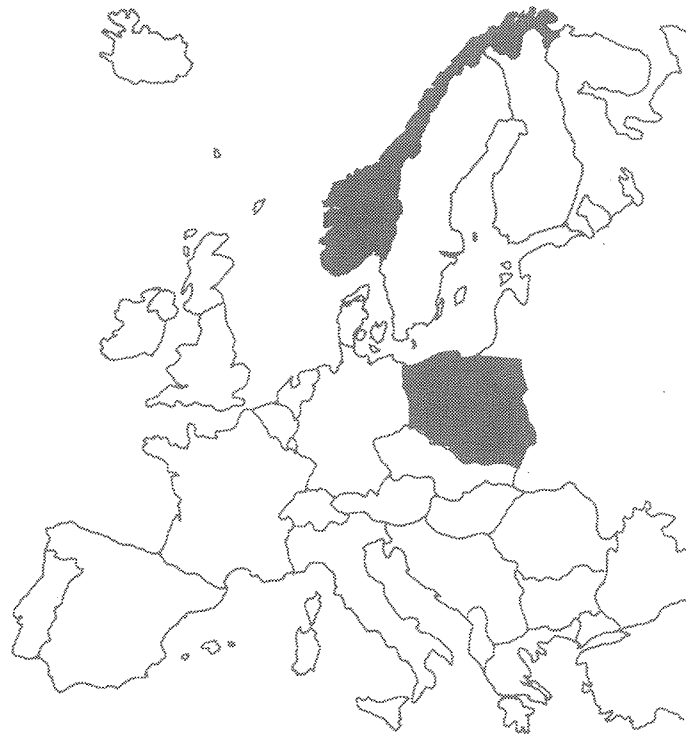



REPORT SNO 3346-95

Seminar on
"Strategy for Water
Pollution Abatement in
View of the Norwegian
Experience"



NIVA - REPORT

Norwegian Institute for Water Research  NIVA

Report No.:	Sub-No.:
O - 94131	
Serial No.:	Limited distrib.:
3346-95.	

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Report Title: Seminar on Strategy for Water Pollution Abatement in View of the Norwegian Experience.	Date: 26.07.95	Printed: NIVA 1995
	Topic group: International activities	
Author(s): Grazyna Englund	Geographical area: Poland/ Norway	
	Pages: 63	Edition: 1

Client(s): State Pollution Control Authority (SFT), Ministry of Environment (MD), Norway and Ministry of Environmental Protection, Natural Resources and Forestry (MOSZNiL), Poland	Client ref.: SFT, 94/3968-1 SNR 7369
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Abstract:

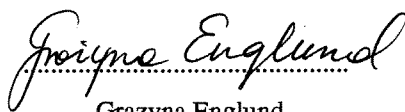
As a part of the Program of Bilateral Co-operation between the Norwegian Ministry of Environment and the Ministry of Environmental Protection, Natural Resources and Forestry in Poland, this project has been executed by the Norwegian Institute for Water Research (NIVA) while sponsored by the State Pollution Control Authority (SFT). As Polish co-ordinator, the Department of Water Management of the Ministry of Environmental Protection, Natural Resources and Forestry was appointed.

The seminar was held from the 13th to the 18th of March 1995 in Oslo and Lillehammer. The seminar aimed in providing a forum in which the Polish environmental decision-makers, officials and scientists could exchange views on and learn about the Norwegian environmental management, particularly related to the water pollution abatement.

4 keywords, Norwegian

1. Bilateralt samarbeid
2. Forvaltning av vannressurser
3. Begrensning av vannforurensning
4. Miljøløsninger

Project manager

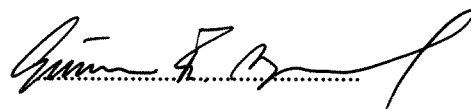


Grazyna Englund

4 keywords, English

1. Bilateral co-operation
2. Water Resources Management
3. Water Pollution Abatement
4. Environmental solutions

For the Administration



Gunnar Fr. Aasgaard

ISBN 82-577-2876-4

Preface

This report presents a project organized as a part of the Program of Bilateral Co-operation between the Norwegian Ministry of Environment and the Ministry of Environmental Protection, Natural Resources and Forestry in Poland.

The project has been executed by the Norwegian Institute for Water Research (NIVA) while sponsored by the State Pollution Control Authority (SFT) (§ 4.8 in the workplan for the co-operation between Norway and Poland in 1994 classified within Water Protection, Water and Wastewater Treatment). As the Polish co-operation partner, the Department of Water Management of the Ministry of Environmental Protection, Natural Resources and Forestry was appointed.

NIVA was responsible for the organization of the Seminar "Strategy for water pollution abatement in view of the Norwegian experience" in order to provide a forum in which the Polish environmental decision-makers, officials and scientists could exchange views on and learn about the Norwegian environmental management, particularly related to the water pollution abatement.

The Polish partner was responsible for the proposal of modifications to the program of the seminar according to their needs and expectations, to present the Polish environmental protection strategy shortly, water management, monitoring and control, as well as for the selection of the Polish participants.

The following team participated in the organization and the performance of the seminar from NIVA:

Research Scientist Grazyna Englund - project manager

Head of Research Department, Environmental Technology Gunnar Fr. Aasgaard - quality assurance

Research Manager (Water Resources Management) Jon Lasse Bratli - professional assistance

Secretary Anne-Lise Hvistendahl - practical arrangements.

NIVA wishes to thank all the lecturers and their institutions for contributing to a successful seminar.

Oslo, 11.07.95

Grazyna Englund

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Summary

This report presents a project organized as a part of the Program of Bilateral Co-operation between the Norwegian Ministry of Environment and the Ministry of Environmental Protection, Natural Resources and Forestry in Poland.

The project has been executed by the Norwegian Institute for Water Research (NIVA) while sponsored by the State Pollution Control Authority (SFT) (§ 4.8 in the workplan for the co-operation between Norway and Poland in 1994 classified within Water Protection, Water and Wastewater Treatment). As Polish co-operation partner, the Department of Water Management of the Ministry of Environmental Protection, Natural Resources and Forestry was appointed.

NIVA was responsible for the organization of the Seminar "*Strategy for water pollution abatement in view of the Norwegian experience*" in order to provide a forum in which the Polish environmental decision-makers, officials and scientists could exchange views on and learn about the Norwegian environmental management, particularly related to the water pollution abatement.

The Polish partner was responsible for the proposal of modifications to the program of the seminar according to their needs and expectations, to shortly present the Polish environmental protection strategy, water management, monitoring and control, as well as for the selection of the Polish participants.

One week of exchanges of the experience was regarded as interesting and useful by both sides. Fruitful discussions, both professional and social, brought the participants closer to each other and established, hopefully, a basis for further co-operation. A list of proposals for further co-operation has been prepared.

1. Introduction

The project proposal for the organization of the seminar "**Strategy for Water Pollution Abatement in View of the Norwegian Experience**" was proposed by the Norwegian Institute for Water Research (NIVA) to the Norwegian Ministry of Environment (MD) (ref. 2657/93, d.16th of August 1993, Appendix 1), as a result of the preliminary visit to Poland (3-5th of August 1993) by Hans Olav Ibrekk, NIVA. Proposed program of the seminar was revised after discussions with the Polish partner; the Polish Ministry of Environment, Natural Resources and Forestry.

The State Pollution Control Authority (SFT) in Norway approved financial support (ref. 94/3968-1, d. 12th of April 1994, Appendix 2) to finalise the program (§ 4.8 in the workplan for the co-operation between Norway and Poland in 1994 classified within Water Protection, Water and Wastewater Treatment). Since Hans Olav Ibrekk was delegated to another mission, Grazyna Englund was appointed as project manager.

Jon Lasse Bratli was responsible for contacting the institutions and finding the adequate lecturers for the performance of the sessions 1- 4 (all connected to water resource planning, policies and management), while Grazyna Englund - for the remaining sessions (water/wastewater pollution control technologies). Gunnar Fr. Aasgaard functioned for quality assurance.

15 representatives from the authorities and local decision-makers, as well as scientists were representing the Polish side. The Norwegian group of participants represented a wide spectrum of expertise within water resources management, environmental legislation and other different aspects of the Water Pollution Abatement in view of Norwegian experiences.

According to the wishes of the Polish partners the seminar was performed early spring 1995 (from the 13th to the 18th of March) in Oslo and Lillehammer.

2. Program of the Seminar

In general the seminar was divided in following sessions:

- Water management
- Legal and economic instruments
- Water resources planning / policies
- Sources of water pollution
- Norwegian water pollution control technology, inclusive case studies
- New environmental solutions, inclusive excursion
- Identifying of further activities/project ideas.

The Polish water management system and pollution control was also shortly presented.

Detailed program of the seminar is attached (Appendix 3).

3. Further co-operation

The last session at the seminar gave a lot of ideas to be considered within the framework of the bilateral co-operation.

Future co-operation ought to be based on the following:

1. The co-operation must be attractive and useful for the both sides
2. One subject will be scientific co-operation between NIVA and the Polish institutes
3. An other subject will be direct co-operation between regional/local representatives/institutions in Poland and Norway
4. Commercial co-operation for developing and implementing environmental products may be included
5. Co-operation between the governmental departments will be important, not only for exchange of experience but also for the implementation of solutions (administration, management, monitoring and regulations).

Based on these criteriaes the following project ideas were presented:

- Environmental Impact Assessments
 - methodology
 - case study
 - implementation
- Strategy for water resource management, based on the Norwegian concept generated from the new "Law for water resources and ground water"
- Environmental objects for water resources:
 - master plan
 - methods for cost/effective analysis
 - strategy for nutrient removal (N and P)
- Establishing of criteriaes for water quality
- Waste water treatment and transportation
 - biological phosphorus and nitrogen removal
 - combined biological and chemical treatment of waste water
 - SBR-processes
 - on line process control
 - upgrading of existing waste water treatment plants
 - optimization of sewer systems.

From the long list of project ideas we also include:

- water management
- testing and improvement of biofilm reactors
- management of the rural areas
- organization of new seminars
- health related analyses
- environmental protection of the road areas
- treatment of hazardous/toxic waste; life cycle analysis (LCA) of chemical products
- hydrological balancing of surface and underground water resources.

The first reactions of interest for further co-operation in form of letters are attached in Appendix 7.

Based on the letters and personal contacts a few research proposals are already sent (Appendix 8), and some are in preparation (table 1):

Table 1. Project proposals based on respons from Institute of Environmental Protection, Poland.

No	Project title	Applied from:	Budget, NOK
1	Master plan principles for selected catchment area	Will be sent to SFT	
2	Detailed action plan for technical solutions	Will be sent to SFT	
3	Implementation of the most economically attractive alternative at the case study area	Will be sent to SFT	
4	Educational part and Follow up	NFR/Collaboration with Eastern Europe, June '95	1996: 133.000,- 1997: 100.000,- 1998: 110.000,-
5	Improvement of the professional competence and network	NFR/Collaboration with Eastern Europe, June '95	1995: 100.000,- 1996: 96.000,-

4. Conclusions and Acknowledgements

The seminar was performed according to the program and represented a high professional level with a lot of possibilities for exchange of experience both from Poland and Norway. All presentations were evaluated as very interesting and gave the participants some new insight on solving environmental protection problems. NIVA has obtained several positive comments both verbally and in writing (Appendix 6) about the professional content and the way the seminar was conducted.

The seminar had a broad and a general nature, it was therefore proposed to hold a follow-up seminar, with detailed practical examples of implementing procedures and strategies based on the Norwegian regulations.

Organization of the Seminar was fully supported by the Norwegian State Pollution Control Authority (SFT). NIVA is thankful to SFT for all the support, both financial and professional, by assuring the needed lecturers. All the participating lecturers are greatly appreciated, and many thanks to the institutions they represented.

Appendixes

Appendix 1.

The Project Proposal.

Norwegian Institute for Water Research (NIVA)

O-93036

**Seminar on Strategy for Water Pollution Abatement in View of the
Norwegian Experience
and
Feasibility Study of the Orzechowo Sewage Treatment Plant.
Project Identification Mission to Poland**

Oslo, 6. August 1993

Hans Olav Ibrekk

1. Introduction

In 1991 the Norwegian Institute for Water Research (NIVA) applied for funding from the Norwegian Ministry of Environment to execute the project "Strategy for water pollution abatement in Poland". Due to delays in the decision making process and other priorities in Poland, Polish environmental authorities indicated their interest in receiving more information on the Norwegian environmental management system. A seminar could serve as a useful forum for this exchange of information. NIVA was requested by the Polish Ministry of Environment, Natural Resources and Forestry to prepare a seminar program.

The draft program was submitted to the Ministry of Environmental Protection, Natural Resources and Forestry in July 1992. The draft program was accepted in August 1992 (letter dated August 31., 1992). The proposal was considered by the Polish-Norwegian working group for the protection of the environment at its meeting in September 1992. It was agreed that the Norwegian Ministry of Environment should fund the seminar, however, the scope of the seminar should be revised. The seminar should be related to deal with specific environmental and management problems in the Orzechowo area. To facilitate the process of elaborating a seminar program designed to meet the needs of the Polish participants, the Norwegian Ministry of Environment decided to fund a fact-finding mission to Poland in early 1993. Due to other assignments the mission was delayed until August 1993.

In addition, the Polish delegation requested assistance from Norway in assessing the technical plans for the Orzechowo sewage treatment plant. This biological plant is under construction and it is proposed to upgrade the plant to comply with new standards. As part of the project a new sewer network is under construction. There is a need to undertake an independent assessment of the proposed technical solutions.

Objective of the mission

The objective with the study is to assess the local environmental and management problems in Poland to facilitate the preparation of the seminar. The seminar will focus on addressing issues of particular interest to local decision-makers and authorities. In addition the mission will collect and assess information related to the sewage treatment plant in Orzechowo to facilitate the process of preparing detailed terms of reference and work plan for the main project.

Execution of the mission

During the visit to Warsaw 3-5 August 1993 meetings were held with representatives from the Polish Ministry of Environmental Protection, Natural Resources and Forestry, Department of Water Management and Department of International Co-operation. In addition the Zegrze reservoir area was visited to study the environmental management problems around this reservoir and the construction of the Orzechowo treatment plant.

The Polish representatives presented a draft seminar program which was discussed and amended. This draft formed the basis for the program which is presented in this proposal. A revised program was prepared during the visit and discussed with Polish representatives before departure.

2. Justification

Poland as well as the other central and eastern European (CEE) countries in transition, is facing enormous challenges within the water sector. Nearly all major surface water resources are heavily polluted and some areas are facing water scarcity. This situation especially regarding water pollution,

is similar to the situation most Western European countries faced twenty to thirty years ago. The present water management administrative system in Poland lacks capacity and resources to solve the problems effectively. The system as well as the policies are now under revision. To facilitate this revision Polish authorities are keen to gain experience with the water management system in other countries. As such the water management system in Norway is of great interest.

Poland is receiving assistance from several countries within the environmental sector. However, the total international assistance amounts only to 5 percent of the total environmental investments. At the moment the donors finance approximately 200 projects of which about 70 are within the water sector. As such the water sector is considered extremely important from both parties, i.e. the donor and the Polish government. The most active donors in the water sector are the European Community (EC) and Sweden. The water sector in Poland has been able to prepare plans and strategies effectively enabling donors to select the most cost effective projects for funding.

In 1992 approximately 340 new sewage treatment plants were put into construction. Presently most major urban centers lack sewage treatment. The problems associated with municipal waste water treatment are therefore of great importance since considerable resources are spent each year. These resources should be utilized in the most cost effective way.

The legacy of the policy of the former government is evident in Poland, as well as in most other CEE countries. The water sector is currently under-going changes to meet the new challenges the sector is facing in the market economy. The water law is being amended, new water pollution abatement strategies are being formulated, the national monitoring program is under revision, and so forth. To use the scarce resources most effectively the Polish government wants to base its new policy on experience from other countries. By basing the new system and policies on experience from other countries, the Polish government hopes to avoid doing the same mistakes as other countries have done and as such use the resources more effectively.

The proposed seminar will provide a forum in which Polish water professionals can gain experience with the Norwegian water management system. This information can be compared with information from other countries, and if appropriate, used later in the formulation of new policies and strategies.

3. Proposed Program for the Seminar

Title:

"Strategy for Water Pollution Abatement in View of the Norwegian Experience"

Objective:

The seminar is convened to transfer Norwegian experiences on environmental management with specific emphasis on water pollution control to facilitate the process of improving the Polish policies for water protection from pollution.

Participants:

The Polish Ministry of Environmental Protection, Natural Resources and Forestry will select the participants. Representatives from the following institutions are expected to attend:

- Ministry of Environmental Protection, Natural Resources and Forestry
- Ministry of Building and Physical Planning
- Departments of Environmental Protection of Voivodship Offices
- Regional Water Management Authorities

Experts

The total number of participants will be limited to 15 persons. For budgetary reasons the number of participants can be limited further, however, the presented budget is based on 15 participants.

Speakers:

At the seminar each topic will be addressed by representatives from the Norwegian Ministry of Environment, the State Pollution Control Authority (SFT), Directorate for Nature Management, County Environmental Protection Departments, municipalities, Norwegian Institute for Water Research (NIVA), the Center for Environmental and Soil Research (Jordforsk), consulting firms, industries, and other institutions as appropriate. Speakers are expected to cover several of the topics presented in the program to reduce the number of speakers involved.

Language:

The presentations will be given in English with translation to Polish. Written material will be presented in English. The Norwegian organizers will prepare the written documentation. The documentation will be based on existing material to the extent possible.

Date and venue:

The seminar is tentatively scheduled for late November/early December 1993 or during winter of 1994 (depending on available funding). The seminar will last for 5 days. The participants have to stay one weekend in Norway (APEX tickets).

The venue for the seminar has not been selected, however, the seminar will be held in Oslo, Norway. Most likely the conference center at the headquarters of the State Pollution Control Authority (SFT) will be used.

Proposed Program:

Day 1:

Session 1. Water management system in Norway with emphasis on pollution control

- Water management system in Norway. Main structure.
Overview of the structure (central, regional (county), and local level), ministries/institutions involved, division of responsibility, role, co-operation, policies, etc..
Representative from the Norwegian Ministry of Environment (MD).
- The State Pollution Control Authority's (SFT) role in water management.
Representative from SFT.
- The Directorate for Nature Management's (DN) role in water management.
Representative from DN.
- The role of County Environmental Protection Department (MVA) in water management.
Representative from MVA.
- The role of municipalities.
Representative(s) from municipalities.
- Discussion and exchange of views.

Session 2. Legal and Economic Instruments

- Legal instruments used in water management (focus on pollution control).
The pollution act, the act on water-courses, Environmental Impact Assessment of water projects, etc.. Aim, scope, key paragraphs, amendments and regulations, enforcement, permits, licenses, procedures.
Representatives from MD and SFT.
- Economic instruments
Fees, charges, incentives, disincentives, grants, soft loans, etc..
Representatives from MD, municipalities, etc.
- Water resources planning in Norway.
Nation-wide master plans, river basin plans, planning and building act, municipal planning, integration of land use and water use planning, etc..
Representative from NIVA.
- Discussion and exchange of views.

Day 2:

Session 3. Water Quality Criteria and Monitoring

- Norwegian Water Quality Criteria - Freshwater and Marine Waters
Overview of the system, classification of level of pollution, suitability for use, parameters, chemical and biological criteria, comparison with EC criteria/standards.
Representatives from NIVA.
- Assessment of water quality - methodology
Brief overview of the most common methods used.
Representative from NIVA.
- Monitoring of rivers and lakes.
Scope of the program, objectives, methods, parameters, number of samples, international monitoring programs (acidification, North Sea (PARCOM), etc..).
Representatives from SFT and NIVA.
- Presentation and use of results.
How are the results used in policy and decision making? How are the results presented to the public and decision makers (politicians) ?
Representative from SFT.
- Examples of monitoring programs.
1000 Lakes Study, National Study of Eutrophication, PARCOM, etc.. Presentation of key results and methods.
Representatives from SFT and NIVA.
- Presentation of the Polish monitoring program.
Representative from Poland.
Discussion, exchange of views, recommendations, etc.

Session 4. Sources of Water Pollution; Industry and Agriculture

- Industrial pollution.
Key polluting industries, processes, typical loading, treatment technology, discharge standards, introduction of new clean technology, control of compliance, instruments used to reduce industrial pollution, etc.
Representative from SFT and industry.
- Agricultural pollution.
Sources, point and non-point, typical loading, control measures, effects of measures, agricultural policy, instruments used to reduce agricultural pollution, future development, etc.
Representatives from Jordforsk and the Agricultural University of Norway.

Day 3:

Session 5. Sources of Water Pollution; Municipal

- Master plan for sewage systems.
Presentation of methods and experiences from the Norwegian project "Master plan for sewage systems".
Representative from the project.
- Municipal sources.
Overview as introduction, typical loading figures, point and non-point sources, type of sewage system, level of treatment, treatment technology, critical factors, discharge standards and permits, enforcement, industrial sources discharging into the municipal sewer network, etc.
Representative from SFT
- Design of sewage treatment plants.
Mechanical, biological, chemical, nitrogen removal, key processes, basic design parameters, sewer network, etc.
Representative from NIVA or Aquateam.
- Sludge.
Use of sludge (agriculture), standards, technology,
Representative from Aquateam.
- Operation and maintenance (O & M) of treatment plants
Representative from municipality.
- Financing of construction and operation of sewage treatment plants.
Representative from SFT and municipality.
- Setting user fees.
Representative from MD or municipality.
- Discussion and exchange of views.

Day 4:

If the length of the seminar should be reduced to four days, the program elements (session 6 and 7)

proposed on this day can be excluded.

Session 6. Presentation of Norwegian Water Pollution Control Technology

Representatives from Norwegian environmental technology enterprises will be invited to present their products. Focus will be on waste water treatment and monitoring.

Session 7. Polish Case Study (optional item)

Presentation of the environmental problems in Zegrze reservoir area. Presentation of the current Polish approach. Discussion in working groups to identify possible strategies to solve the environmental problems based on the Norwegian approach. Norwegian experts will be present to contribute in the discussions.

Polish participants have to bring relevant information related to water quality, use of the water resources, sources to water pollution, loading figures (approximate), use of the catchment area, and so forth.

Day 5:

Session 8. Visit to Sites

Visits to selected waste water treatment facilities are planned (VEAS, Bekkelaget, or other plants as appropriate etc.).

Session 9. Evaluation and Closure

After the field visits the seminar participants are expected to evaluate the seminar and sum up some of their impressions before returning to Poland.

Organization of the seminar:

The Polish-Norwegian working group for the protection of the environment will consider the seminar program at its meeting in September 1993. If the program is approved the Polish Ministry of Environmental Protection, Natural Resources and Forestry will nominate the participants. The Norwegian Ministry of Environment has the overall responsibility for the organization and execution of the seminar.

An appropriate institution (NIVA?) will be contracted by the Norwegian Ministry of Environment to organize and to execute the seminar.

Finalization of the seminar program:

The seminar program will be finalized after a decision has been made. The presented program is subject to changes according to the availability of speakers and available resources.

Budget

The budget is based on the following cost-sharing principle: The Polish side will cover all expenses of the seminar participants' travel to the airport in Warsaw, translation of seminar documents, and the costs of printing. The other costs will be covered by the Norwegian side. This include airfare, subsistence for Polish participants during the stay in Norway, local transportation, preparation of seminar material (will be limited to existing, available material in English), fees of speakers and

interpreters. Other cost-sharing arrangements can be discussed.

Further the budget is based on 15 Polish participants.

Polish participants:

Air travel	15 á 3000	45000
Per diem	15 persons, 7 days á 1200	126000
Local transportation		10000
Total for Polish participants		181000

Other costs:

Planning and execution of the seminar		30000
Seminar co-ordinator		30000
Secretary		15000
Remuneration to speakers (preparation, etc.)		100000
Seminar dinner		10000
Interpreter (from Poland if available)		38000
Contingency		26000
Total budget for the seminar		NOK 430000

4. Study of the Orzechowo Sewage Treatment Plant

4.1 Introduction

An important recreational area for the city of Warsaw is Lake Zegrzynski, a man-made reservoir constructed at the confluence between the two rivers Narew and Bug. The dam forming the reservoir is 8 m high and a small hydro-electric plant with an output of 20 MW is a part of the dam. The reservoir provides one-third of the drinking water to Warsaw. About 40,000 people live in the vicinity of the lake, however, on a nice summer weekend half a million people visit the lake. There are many recreational homes around the lake, as well as hotels. There are no major water pollution industries draining directly to the lake.

The water quality satisfies except for a few parameters (tot-P), Class I water quality. The lake is swimmable. Estimates show that 65% of the pollution in the lake is caused by inputs from the Rivers Narew and Bug, while the rest is coming from a canal draining parts of the city of Warsaw. To maintain acceptable water quality and to allow further expansion of settlement areas, a new sewer system was planned.

Construction of the Orzechowo sewage treatment plant started in 1975 and the plant is still under construction. The plant was designed as a mechanical plant. The design capacity was 17,000 m³/day, however, the present loading is approximately 2,500 m³/day. Due to the low loading the plant functions as a biological treatment plant. The treatment efficiency is reported to be 95% for BOD₅ and SS.

A new sewer network is under construction around Lake Zegrzynski. A new collector and pumping station will be put into operation later this year and the loading to the treatment plant will increase to approximately 5,000 m³/d. The total loading to the sewage treatment plant is unclear. A study has been commissioned by the organization responsible for the construction of the sewer network and the treatment plant to determine the loading. Results will be available later this year. However, it is clear that the original design loading is overestimated (most likely the design loading will be between 10,000 - 12,000 m³/day).

The treatment plant has a permit/licences to discharge until the end of 1995. According to existing discharge standards the plant has to be upgraded to a biological plant with nutrient removal (phosphorous and nitrogen) before the end of 1995. Due to relatively long operation time most of the equipment is outdated and inefficient. The energy consumption is high and currently the operating costs is three times higher than the sewage fees/charges.

The decisive question facing the plant operators is how to upgrade the plant in a cost-effective way to meet the new discharge requirements.

4.2 Norwegian Assistance to Poland in the Field of Sewage Treatment

As part of the bilateral environmental program between Poland and Norway a project entitled "Upgrading of existing treatment plants in Poland" is being funded. The study is executed by the Norwegian Institute for Water Research (NIVA) with Aquateam A/S as partner. The Polish counterpart is Centrum Techniki Budownictwa Komunalnego (CTBK).

The objectives of this study are:

- To increase waste water treatment efficiency in existing mechanical and biological treatment plants in a cost-effective way.

- Through evaluation of existing treatment plants facilities, pilot plants and full scale experiments, obtain results which will give inputs to the development of a strategic plan and policy regarding waste water treatment in Poland.
- To exchange knowledge between the two countries.

Phase I of this study is completed and reported in 1992 and the phase II is funded and will be executed in 1993.

Through this project Norwegian experts have gained practical experience with the Polish conditions and established close working relationship with a Polish institution.

4.3 Project Proposal

To assess the state of the treatment plant and propose measures for upgrading the treatment plant to meet new discharge requirements, a feasibility study is proposed. The study should be executed jointly by Norwegian and Polish experts. It is foreseen that Polish experts/consultants will be responsible for the design phase of the project, i.e. Norwegian experts will take part in the feasibility study only.

Title:

"Feasibility Study of the Orzechowo Sewage Treatment Plant"

Objective:

Assess the possibility of upgrading the Orzechowo sewage treatment plant to a biological plant with nutrient removal (phosphorus and nitrogen) to comply with new discharge standards. The present facilities should be utilized to the extent possible. Further the feasibility study should focus on designing a new sludge management system.

Scope of work:

1. Assessment of the existing facilities at the treatment plant.
The status of the existing technical facilities; strainer, grit trap, aeration tanks, sedimentation tanks, sludge digester tanks, sludge dewatering station, chlorination station, etc. should be assessed to determine if these facilities can be utilized in a upgraded plant.
2. Assessment of appropriate treatment process.
Based on the existing facilities and equipment a new modern treatment process complying with the new discharge standards will be proposed. Full scale experiments will most likely be carried out for a limited period of time. Based on the results, the team will come up with recommendations for upgrading/rehabilitation and other improvements.
3. Sludge management system.
The existing sludge management system has to be improved. A new system will be proposed.
4. Financing.
Estimates for capital investments, operation and maintenance costs will be made. Based on these estimates a plan for financing of the project will be proposed.
5. Reporting.
A report outlining the proposed treatment process, key design figures, and costs will be

prepared.

Organization

To facilitate an efficient project implementation the experts/consultants should have experience with Polish conditions. It is therefore proposed to include the assessment of the Orzechowo sewage treatment plant in the on-going project "Upgrading of Wastewater Treatment Plants in Poland". However, the scope of this project has to be expanded to facilitate the inclusion of the assessment of the Orzechowo sewage treatment plant.

The study will be executed by the Norwegian Institute for Water Research (NIVA) with Aquateam A/S as partner. The Polish counterpart will be Centrum Techniki Budownictwa Komunalnego (CTBK).

Time Schedule

The Orzechowo sewage treatment plant has a permit to operate the existing plant until the end of 1995. The upgraded/rehabilitated plant should be operational by the end of 1995.

The feasibility study should be undertaken in 1993 and reported by January 31., 1994.

Budget

The budget includes only remuneration, international travel, and per diem to Norwegian experts. Interpreter is not included in the budget. The treatment plant's laboratory is expected to undertake the necessary water analysis. Costs are expected to be covered by the treatment plant. Remuneration to Polish experts is expected to be covered by Poland.

<u>Remuneration:</u>	<u>Hours:</u>	<u>Costs:</u>
Task 1: Assessment of facilities	40	23200
Task 2: Assessment of process	160	90800
Task 3: Sludge	40	21200
Task 4: Financing	80	47400
Task 5: Reporting	80	45400
Total	400	228000
International travel and per diem		113400
Contingency		8600
Total budget for the study		NOK 350000

Miljøverndepartementet
Postboks 8013 Dep.
0030 Oslo

Besøksadresse:
Brekkeveien 19
Postadresse:
Postboks 69 Korsvoll
0808 Oslo
Telefon 22 18 51 00
Telefax 22 18 52 00
Telex 74190 niva n
Postgiro 0813 5196712
Bankgiro 6094 05 11421
Foretaksnr. 855869942

Deres referanse
92/ IL/IdL

Deres brev av
7. jan 1993

Vår referanse
IBR
J.nr. 2657
S.nr. 93036

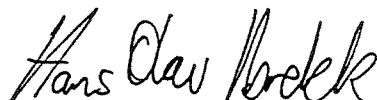
Dato
18. august 1993

Miljøvernssamarbeidet Polen - Norge. Revidert søknad om støtte til gjennomføring av prosjekter.

Viser til vårt brev av 16. august 1993. Etter oversendelse av søknaden fikk vi nye kommentarer fra Polen (se vedlegg til søknaden). Disse er nå inkludert i søknaden. Vi vil derfor be om at vår søknad datert 16. august 1993 erstattes av denne, datert 18. august 1993.

Vi bistår gjerne med ytterligere opplysninger.

Med vennlig hilsen
NORSK INSTITUTT FOR VANNFORSKNING



Hans Olav Ibrenk
Forskningsleder
Direkte linje 22 185109

Vedlegg: Revidert rapport med prosjektbeskrivelser.



**Ministry of Environmental Protection
Natural Resources and Forestry**
Department of Water Management

PL-00-922 Warszawa, POLAND, ul. Wawelska 52/54,
tel. (+4822) 25 11 38, fax (+4822) 25 27 04,

Date: 17 August 1993

For: Mr. Hans Olav Ibrekk, Research Manger, Norwegian Institute
for Water Research

Fax: +47 22 18 52 00

From: Ms. Eugenia Koblak Kalińska, Deputy Director, Departament
of Water Management

Page(s): 1

Dear Mr. H.O. Ibrekk

Thank you very much for sending the documents resulting from your visit to Poland. I would like to congratulate you for true presenting our intentions in the draft seminar programme you have elaborated as well as in the project of upgrading/modernization of sewage treatment plant in Orzechowo.

I would like to propose, because of very wide scope of the seminar, to replace in session 2 the topic "Water Resources Planning in Norway" with a topic "Procedures of giving licenses for waste water disposal to waters and sewage installations - practical example".

After introducing the above correction, the project you have elaborated can be presented to the Ministry of Environmental Protection of Norway as approved by the Polish party.

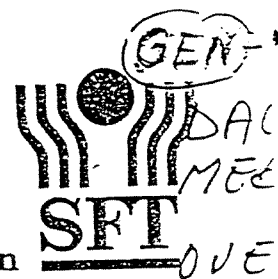
I share your opinion, that in case of shortening the duration of the seminar up to 4 days we can leave out some topics from session 6 and 7.

Yours sincerely,

Eugenia Koblak-Kalińska

Appendix 2.

The Project Approval.



Statens
forurensningstilsyn

Postadresse: Pb. 8100 Dep, 0032 Oslo

Kontoradresse: Strømsveien 96

Telefon: 22 57 34 00 Telefax: 22 67 67 06

Norsk institutt for vannforskning
Postboks 69 Korsvoll
0808 Oslo

NORSK INSTITUTT FOR VANNFORURENSNING
1430/94
93036
13.14

JLB
↑
Jan Lasse
Bræth

Deres ref.
IBR J.nr 2657 S.nr.93036

Vår ref. (Bes oppgitt ved svar)
94/3968-1

Dato
12 APR. 1994

Statsbudsjettet 1994, Kap. 0118 Post 75

TILSAGN OM MIDLER TIL SEMINAR OM STRATEGI FOR BEGRENSNING AV VANNFORURENSNING, SNR 7369

Svar på Deres søknad om støtte til å gjennomføre et seminar under det polsk-norske samarbeidet: 94/169

På bakgrunn av fullmakt fra Miljøverndepartementet av 17.03.94, gir Statens Forurensningstilsyn med dette NIVA tilsagn om inntil kroner 430.000 til et seminar, for representanter fra polske miljø- og planmyndigheter, om strategi for begrensning av vannforurensning. Beløpet skal benyttes i overensstemmelse med de planer og budsjett som er gitt i NIVAs søknad av 18.08.93 og de generelle kravene satt i dette brevet.

Vi viser til Deres søknad av 18.08.93 om støtte til seminar om strategi for begrensning av vannforurensning.

SFT har i brev av 17.03.94 fra Miljøverndepartementet fått fullmakt til å gi støtte med inntil kroner 430.000 til dette seminaret.

Beløpet er innvilget i henhold til de planer og budsjett som er gitt i søknaden av 18.08.93, og de spesielle vilkår som er gitt i dette brevet. NIVAs forslag til seminarprogram innebærer bred deltakelse fra den norske miljøforvaltning. SFT forutsetter at NIVA selv avklarer slik deltakelse. Når det gjelder deltakelse fra polsk side, bør det vurderes om det kan være aktuelt å invitere personer involvert i andre polsk-norske prosjekter vedr vannforurensning.

Hvis det skulle oppstå vesentlige avvik fra planen må dette meddeles SFT. Tilsagnet kan endres (tilsagnsbeløpet evt. reduseres) eller trekkes tilbake dersom prosjektet blir avbrutt, eller det forøvrig er gitt uriktige eller utilfredstillende opplysninger i forbindelse med søknadsbehandlingen.

Innen 3 måneder etter tilsagn om støtte må mottakeren skriftlig bekrefte at tilsagnet vil bli benyttet og at vilkårene for tilskuddet vil bli oppfylt. Etter denne tid bortfaller tilsagnet, med mindre fristforlengelse er gitt.

Utbetaling skjer mot revisorbekreftet regnskap, hvor det fremgår at kostnadene tilhører prosjektet. Eventuelle a konto utbetalinger skal skje mot fremleggelse av regnskap over påløpte utgifter. For utbetalinger i 1994 bør faktura være SFT i hende før 05.12.94.

Godkjente reiser dekkes etter statens regulativ.

Endelig regnskap og sluttrapport sendes inn senest en måned etter at prosjektet er avsluttet. Sluttrapporten skal foreligge på engelsk og i 5 eksemplarer.

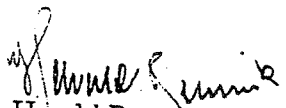
Riksrevisjonen har adgang til å kontrollere om tilskuddsmidlene er nyttet etter forutsetningene.

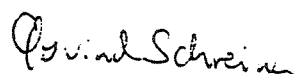
Opplysninger og informasjon som måtte være nødvendig for å evaluere tiltaket må fremskaffes på anmodning.

Prosjektets virksomhet i Øst-Europa forutsettes gjennomført i henhold til regler i angjeldende land.

Miljøvernmyndighetene vil informere om de prosjektene som støttes. Prosjektene vil derfor bli offentlig kjent, med mindre avtale om fortrolighet foreligger.

Med hilsen


Harald Rensvik (e.f.)


Øyvind Schreiner

Kopi til: Miljøverndepartementet, ILP-avdelingen v/ Irene Bauer (vedlagt G-24 skjema)
Utenriksdepartementet, Øst-Europasekretariatet (vedlagt G-24 skjema)
Den norske ambassade i Warszawa

Appendix 3.

Final Program.

Program for the Seminar

"Strategy for Water Pollution Abatement in View of the Norwegian Experience"

"Strategi for begrenning av vannforurensning - norske erfaringer"

Date: 13th -18th of March 1995
 Language: Norwegian with translation to Polish
 Place: The conference centre at the headquarters of the Norwegian Pollution Control Authority (SFT), Oslo and Municipal House, Lillehammer
 Co-ordinator: Grazyna Englund
 Project team: Jon Lasse Bratli, Gunnar F. Aasgaard & Anne-Lise Hvistendahl

Time	Subject	Presented by
Monday 13 March	Session 1: Water Management System in Norway with Emphasis on Pollution Control <i>Vannforvaltningen i Norge med vekt på forurensningskontroll.</i>	
900-910	Opening of the seminar	NIVA, Haakon Thaulow
910-940	• Water management system in Norway <i>Forvaltningen av vannressursene i Norge</i>	MD, Dag Petter Sødal
940-1010	• The role of the State Pollution Control Authority (SFT) in water management in Norway <i>SFT's rolle i vannforvaltningen i Norge</i>	SFT, Gunnar Jordfald
1010-1040	• The role of the Norw. Water Resources and Energy Administration (NVE) in water management in Norway <i>NVE's rolle i vannforvaltningen i Norge</i>	NVE, Are Tvede
1040-1110	Coffee, tea, refreshments	
1110-1130	• The role of the County Environmental Protection Department (MVA) in water management in Norway <i>MVA's rolle i vannforvaltningen i Norge</i>	MVA, Leif Nilsen
1130-1150	• The role of municipalities in Norway <i>Kommunenes rolle i Norge</i>	Municip., Tormod Schei
1150-1210	• Wat. Res. Management, views on organization <i>Vannforvaltning, synspunkter på organiseringen</i>	NIVA, Haakon Thaulow
1210-1310	Lunch	
1310-1340	• Water management system in Poland <i>Vannforvaltningen i Polen</i> • State Inspectorate for Environmental Protection in Poland <i>Den Polske stats inspektorat for miljøvern</i>	MD/Poland/ Eugenia Koblak-Kalinska PIOS/Poland/ Andrzej Miloszewski
1340-1410	• Discussion and exchange of views <i>Diskusjon og utveksling av synspunkter</i>	

Session 2:
Legal and Economic Instruments
Juridiske og økonomiske virkemidler

1410-1430	• Regulatory framework in water management <i>Lovverk for vannforvaltningen</i>	MD, Julie Danbolt Ajer
1430-1500	• Economic instruments (charging systems, pricing policies, grants, soft loans etc.) <i>Økonomiske virkemidler (avgiftssystemer, tilskudd, "myke" lån etc.)</i>	MD, Dag Petter Sødal
1500-1530	Coffee, tea, refreshments	
1530-1600	• Regulatory framework in water management <i>Lovverk for vannforvaltningen i Polen</i>	MD/Poland/ Eugenia Koblak-Kalinska
1600-1700	• Discussion and exchange of views <i>Diskusjon og utveksling av synspunkter</i>	
Evening: Informal Discussions at the Seminar Dinner		
Aften: Uformell diskusjon på seminarmiddagen		

Tuesday 14 March	Session 3: Water Resources Planning / Policies <i>Planlegging av vannressurser/policy</i>	
0900-0930	• Case study North Sea Plan and environmental goals for Norway <i>"Case study" Norsjøplanen og miljømål for vannforekomstene</i>	NIVA, Jon Lasse Bratli
0930-1000	• Monitoring of rivers and lakes, programs, results, presentation <i>Overvåking i elver og sjøer - metodikk</i>	NIVA, Dag Berge
1000-1030	• Monitoring, methodology, parameters, assesment <i>Vurdering av vannkvalitet - metodikk</i>	NIVA, Dag Berge
1030-1100	Coffee, tea, refreshments	
1100-1130	• Norwegian / EU Water Quality Criteria <i>Kriterier for vannkvalitet Norge/EU</i>	SFT, Isabelle Thélin
1130-1200	• Presentation of the Polish monitoring program <i>Presentasjon av det Polske overvåkingsprogram</i>	PIOS/Poland/ Adam Mierzwinski
1200-1230	• Discussion and exchange of views <i>Diskusjon og utveksling av synspunkter</i>	
1230-1330	Lunch	

Session 4:
Sources of Water Pollution: Industry and Agriculture
Kilder til vannforurensning: Industri og jordbruk

1330-1400	• Agricultural pollution, management, measures <i>Jordbruksforurensning, forvaltning, tiltak</i>	SFT, Janne Sollie
1400-1430	• Agricultural pollution, sources, processes, effects of measures <i>Jordbruksforurensning, årsaker/kilder, prosesser, effekter av tiltak</i>	Jordforsk, Nils Vagstad

1430-1500	<ul style="list-style-type: none"> Industrial pollution, management, sources <i>Industriforurensning, forvaltning, kilder</i> 	SFT, Anne-Grethe Kolstad
1500-1530	<ul style="list-style-type: none"> Causal pollution (calamity) <i>Akutt forurensning</i> 	OVA, Bente Myhre Haast
1530-1600	Coffee, tea, refreshments	
1600-1630	<ul style="list-style-type: none"> Discussion <i>Diskusjon</i> 	

Wednesday 15 March	Session 5: Sources of Water Pollution: Municipal <i>Kilder til vannforurensning: Bebyggelse (kommunene)</i>	
0900-0930	<ul style="list-style-type: none"> Municipal sources <i>Kommunale kilder</i> 	SFT, Oddvar Lindholm
0930-1030	<ul style="list-style-type: none"> General master plan for sewage systems <i>Hovedplan avløp</i> 	SFT, Oddvar Lindholm
1030-1100	<ul style="list-style-type: none"> Sludge management <i>Slambehandling</i> 	Aquateam, Bjarne Paulsrud
1100-1200	Lunch	
1200-1230	<ul style="list-style-type: none"> Wastewater treatment systems - chemical processes <i>Avløpsvannsystemer - kjemiske prosesser</i> 	NIVA, Harsha Ratnaweera
1230-1300	<ul style="list-style-type: none"> Wastewater treatment systems - biological processes <i>Avløpsvannsystemer - biologiske prosesser</i> 	NIVA, Bjørnar Nordeidet
1300-1330	<ul style="list-style-type: none"> Discussion and exchange of views <i>Diskusjon og utveksling av synspunkter</i> 	
1330-1400	Coffee, tea, refreshments	
	Session 6: Presentation of Norwegian Water Pollution Control Technology <i>Presentasjon av norsk teknologi for kontroll av vannforurensning</i>	
1400-1500	<ul style="list-style-type: none"> Representatives from Norwegian companies will present products and services relevant for the items of the seminar <i>Representanter fra norsk næringsliv vil presentere produkter og tjenester relevant for seminarets tema</i> 	Kaldnes Miljø Teknologi, Torbjørn Westrum MABO/BIOVAC
1500-1530	<ul style="list-style-type: none"> Financing possibilities of Norwegian/Polish projects <i>Finansieringsmuligheter for norske/polske prosjekter</i> 	Eksporthfinans A/S, Tor Østbø
1530-1600	<ul style="list-style-type: none"> SFT's representative -about Polish Norwegian cooperation <i>Polsk-Norsk bilateral- avtale og samarbeid</i> 	SFT, Björg Storesund
1600-1630	<ul style="list-style-type: none"> Discussion <i>Diskusjon</i> 	

Thursday 16 March	Session 7: Case Study	
0900-1000	<ul style="list-style-type: none"> Case study Upgrading of existing treatment plants <i>Oppgradering av eksisterende renseanlegg</i> 	NIVA, Svein Stene Johansen
1000-1100	<ul style="list-style-type: none"> Case study Kielce area <i>Case studie av Kielce området</i> Seasonal (tourism) <i>Sesongartet turisme</i> 	Biovac, Helge Eliassen, Zbigniew Dyk
1100-1130	Coffee, tea, refreshments	
1130-1230	<ul style="list-style-type: none"> Case study Bytom <i>Case studie av Bytom</i> 	Berdal Strømme, Tore Laugerud
1230-1330	Lunch	
1330-	<p>Bus departure for Lillehammer / We will have a stop at Sørumsand, to have a demonstration of Biovac WWTP <i>Bussavgang til Lillehammer. Vi vil stoppe på Sørumsand for å få en demonstrasjon av Biovac renseanlegg</i></p> <p>Evening: Dinner Aften: Middag</p>	

Friday 17 March	Session 8: Presentation of new environmental solutions <i>Presentasjon av nye miljøløsninger</i>	
0900-0930	<ul style="list-style-type: none"> Strategy for water pollution abatement in Lillehammer <i>Strategi for å forhindre vannforurensning i Lillehammer</i> 	Lillehammer municipality, Ellen Birgitte Strømø
0930-1000	<ul style="list-style-type: none"> On-line process control in treatment plants <i>On-line prosesskontroll i renseanlegg</i> 	NIVA, G.Fr. Aasgaard
1000-1030	<ul style="list-style-type: none"> Environmental surveillance and information system <i>Miljøovervåkning og informasjonssystem</i> 	NIT-Envirotec, Vidar Sannerhaugen
1030-1100	Coffee, tea, refreshments	
1100-1300	<ul style="list-style-type: none"> Visit to R2; Lillehammer waste water treatment plant and Korgen; Lillehammer water works (ground water) <i>Besøk til R2; Lillehammers avløpsrenseanlegg og besøk til Korgen; Lillehammer vannverk (grunnvann)</i> 	Lillehammer municipality, Steinar Bungum
1300-1400	Lunch	
1400-1430	<ul style="list-style-type: none"> Financing of construction and operation of the plants, operation and maintenance, payment and collection procedures <i>Finansiering av bygging, drift og vedlikehold av anlegg. Tilskuddsordninger av vann/kloakk avgifter</i> 	Fylkesmann i Oppland, Tor Brustugun
1430-1500	<ul style="list-style-type: none"> Discussion and exchange of views <i>Diskusjon og utveksling av synspunkter</i> 	
1500-1530	Coffee, tea, refreshments	

1530-1700	Session 9: Identifying of further activities/project ideas, and Evaluation and Closure <i>Identifisering av fremtidige aktiviteter/prosjektideer,</i> <i>evaluering og avslutning</i>
Saturday 18 March 1000-1300 1300-1400 1400-	Guided tour to the Olympic Arenas in Lillehammer <i>Guidet tur til Lillehammers OL-arenaer</i> Lunch Retur to Oslo <i>Retur til Oslo</i>
Sunday 19 March	Departure to Poland <i>Avreise til Polen</i>

Appendix 4.

List of the Polish Participants.

List of the Polish participants of the Seminar:
"Strategy for Water Pollution Abatement in View of the Norwegian Experience"
"Strategi for begrensnng av vannforurensning - norske erfaringer"
(13.-18.03.1995; Oslo og Lillehammer)

No	Name	Institution	Address	Telephon	Telefax
			Poland	095- 48.+	095-48.+
1.	Eugenia Koblak-Kalinska vice-director (contact person)	Min. of Environmental Protection, Natural Resources and Forestry Dept. of Water Management	00-922 Warszawa ul. Wawelska 52/54	22. 25-63-09	22. 25-27-04
2.	Andrzej Miloszewski vice-director, pollution control	State Inspectorate for Environmental Protection (PIOS)	00-922 Warszawa ul. Wawelska 52/54	22. 25-15-09	22. 25-15-09
3.	Adam Mierzwinski, director, monitoring	State Inspectorate for Environmental Protection (PIOS)	00-922 Warszawa ul. Wawelska 52/54	22. 25-41-29	22. 25-41-29
4.	Janusz Ostapiuk vice-president	National Fund for Environmental Protection and Water Management	02-673 Warszawa ul. Konstruktorska 3A	22. 49-38-88	22. 49-72-72
5.	Jerzy Kurbiel professor, expert-environmental protection	Cracow University of Technology, Inst. for Water Supply and Environm. Protection	31-155 Kraków ul. Warszawska 24	12. 34-12-79	12. 48-12-05
6.	Barbara Osmulska-Mrðz expert-environmental engineering	Institute of Environmental Protection (IOS)	00-548 Warszawa ul. Krucza 5/11	26. 25-10-05 int. 59 26. 21-36-70	26. 29-52-63
7.	Andrzej Badowski director	Regional Board of Water Management (RZGW) in Warsaw	02-237 Warszawa P.B. 11 ul. Instalatorów 9	22. 46-67-75	22. 46-61-97

No	Name	Institution	Address	Telephon	Telefax
			Poland	095- 48.+	095-48.+
8.	Tomasz Malinowski director	Voivodeship Office, Dept. of Environmental Protection	90-926 Łódź ul. Piotrowska 104	42. 36-05-31	42. 32-02-49
9.	Alina Rynkiewicz expert- water resources management	Min. of Environmental Protection, Natural Resources and ForestryDept. of Water Management	00-922 Warszawa ul. Wawelska 52/54	22. 25-90-37	22. 25-27-04
10.	Hanna Baradziej expert- water resources management	Min. of Environmental Protection, Natural Resources and ForestryDept. of Water Management	00-922 Warszawa ul. Wawelska 52/54	22. 25-00-00 int. 427	22. 25-27-04
11.	Maria Apolinarska expert- environmental engineering	National Fund for Environmental Protection and Water Management	02-673 Warszawa ul. Konstruktorska 3A	22. 49-00-80 int. 421	22. 49-72-72
12.	Lech Pieczynski director	Voivodeship Office of the National Fund for Environmental Protection and Water Management	70-502 Szczecin ul. Waly Chrobrego 4	91. 303-705	91. 303-504
13.	Jacek Rolbiecki vice-director	Voivodeship Office for Environmental Protection	80-819Gdansk ul. Okopowa 21/27	58. 31-18-71 58. 31-19-00	58. 31-92-14 58. 31-78-33
14.	Zbigniew Dyk director	Sveko-Dyk/Biovac	25-819 Kielce ul. Kolonia 41	41. 534-06	41. 68-33-03
15.	Maciej Dzikiewicz expert- wastewater treatment	Water Supply Foundation	01-015 Warszawa Skwer Kard. S. Wyszynskiego 6	22. 38-67-13 22. 38-46-83	22. 38-95-05

Appendix 5.

List of the Norwegian Institutions.

List of the Norwegian Institutions:

- NIVA : Norwegian Institute for Water Research, P.O.Box 173 Kjelsås, 0411 Oslo
Phone: 22 18 51 00, fax: 22 18 52 00
Contact persons: Grazyna Englund, Gunnar Fr. Aasgaard, Jon Lasse Bratli, Dag Berge,
Harsha Ratnaweera, Bjørnar Nordeidet, Svein Stene-Johansen
- MD : Ministry of Environment, P.Box 8013 Dep., 0030 Oslo
Phone: 22 34 90 90, fax: 22 34 95 63
Contact persons: Irene Bauer, Julie Danboet Ajer, Dag Petter Sødal
- SFT : State Pollution Control Authority, P.O.Box 8100 Dep., 0032 Oslo
Phone: 22 57 34 00, fax: 22 67 67 06
Contact persons: Nina Hedlund Markussen, Bjørg Storesund, Gunnar Jordfald, Isabelle
Thèlin, Janne Sollie, Anne-Grete Kolstad, Øddvar Lindholm
- DN : Directorate for Nature Management, 7005 Trondheim
Phone: 73 58 05 00, fax: 73 91 54 33
- MVA : County Governor in Oslo and Akershus/Voivodeship Office for Environmental Protection
for Oslo and Akershus, P.O.Box 8111 Dep., 0032 Oslo
Phone: 22 00 35 00/ 22 00 36 50, fax: 22 00 36 58
Contact person: Leif Nilsen
- NVE : Norwegian Water Resources and Energy Administration, Dept. of Hydrology, P.O.Box
5091 Majorstua, 0301 Oslo
Phone: 22 95 95 95, fax: 22 95 92 01
Contact person: Are Tvede
- MVA` : County Governor in Sarsborg/Sarpsborg Voivodeship Office for Environmental
Protection, P.O.Box 237, 1701 Sarpsborg
Phone: 69 11 60 00/69 11 61 14, fax: 69 16 17 08
Contact person: Tormod Schei
- MVA`` : County Governor in Oppland, Storegaten 170, 2600 Lillehammer
Phone: 61 26 60 00/61 26 60 70, fax: 61 26 61 67
Contact person: Tor Brustugun
- OVA : Oslo Water and Sewage Works, P.O.Box 4704 Sofienberg, 0506 Oslo
Phone: 22 66 40 37, fax: 22 66 40 83
Contact person: Bente Myhre Haast
- KMT : Kaldnes Miljøteknology AS (Environmental Technology), P.O.Box 2011, 3103 Tønsberg
Phone: 33 37 67 00, fax: 33 31 55 18
Contact person: Torbjørn Westrum
- Aquateam: Norwegian Water Technology Centre AS, P.O.Box 6326 Etterstad, 0604 Oslo
Phone: 22 67 93 10, fax 22 67 20 12
Contact person: Bjarne Paulsrud

Biovac : AS, P.O.Box 148, 1920 Sørumsand
Phone: 63 82 61 22, fax: 63 82 64 27
Contact person: Helge Eliassen

Eksportfinans: P.O.Box 1601 Vika, 0119 Oslo
Phone: 22 83 01 00, fax: 22 83 22 37
Contact person: Tor Østbø

Envirotec: Norwegian Information Technology (NIT)/Envirotec, P.O.Box 77, 0611 Oslo
Phone: 22 63 58 00, fax: 22 64 88 00
Contact person: Vidar Sannerhaugen

Jordforsk: Centre for Soil and Environmental Research, P.O.Box 1432 Ås
Phone: 64 94 81 00, fax: 64 94 81 10
Contact person: Nils Vagstad

Lillehammer Municipality, P.O.Box 98, 2601 Lillehammer
Phone: 61 26 65 00, fax: 61 26 64 74
Contact persons: Ellen Birgitte Strømø, Steinar Bungum

Norconsult International (Partner: Berdal Strømme S.S.), P.O.Box 626, 1301 Sandvika
Phone: 67 57 10 00, fax: 67 54 95 90
Contact person: Tore Laugerud

Appendix 6.

Letter of Appreciation.

GEN

Warsaw, April , 1995.

GAH

HTH

Honourable Thorbjørn Berntsen
Minister of Environment
NORWAY

MER

JLB

NORSK INSTITUTT FOR VANNFORSKNING	
Jahr:	1238/95
Sak nr.:	74131
Sted:	2.5

Dear Colleague,

With reference to the Polish - Norwegian seminar on "Strategy for Water Pollution Abatement in view of the Norwegian Experience", which was held in Oslo and Lillehammer on March 13 - 18, 1995, as a result of the implementation of the programme of cooperation between the Polish and Norwegian Ministries for the Environmental Protection, I would like, with a great pleasure to inform you, Mr. Minister that the Polish experts, taking part at this seminar have a high opinion of the merits of the seminar and of the logistical arrangements.

We appreciate very much the received knowledge concerning the implementation by the Norwegian side for many years the policy of water protection against the pollution. This knowledge was given to us by the learned Norwegian specialists. The implementation of the received knowledge can approach us to the positive state of the water cleanness.

Now, our economy system, including environmental protection matter is reconstructed. We learn the rules of taking democratic decisions in a very important national matters. Based on the experiences other countries, like Norway we have a chance to avoid some mistakes, which could be done.

I would like, Mr. Minister to express my thanks all staff of the Norwegian Institute for Water Research for the arrangements and realization of the seminar. Particularly, we are very grateful to Mr. Hakon Thawlow, Director of the Institute, Mr. Gunnar Fr. Aasgaard, Main Technologist and to Ms. Grażyna Englund - Borowiec. She was conversant with the subject of water protection against pollution, and her very good knowledge of the Polish and Norwegian languages was contributed to the success of the seminar. Also, I would like to express my thanks all lecturers from other Norwegian institutions.



FUNDACJA WSPOMAGAJĄCA ZAOPATRZENIE
WSI W WODĘ

WATER SUPPLY FOUNDATION

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Warsaw, March 23, 1995

Dear Mr. Aasgaard,

Having returned home from seminar in Oslo and Lillehammer I would like to thank you and your colleagues for your hospitality and kindness shown me during my stay there.

As I promise I am sending you official letter of our President hoping that our cooperation will go on.

It will be nice to visit all these basins together.

I look forward to hearing from you

Your sincerely

Maciej Dzikiewicz



FUNDACJA WSPOMAGAJĄCA ZAOPATRZENIE
WSI W WODĘ

WATER SUPPLY FOUNDATION

Warsaw, March 23, 1995

Mr. Gunnar Fr. Aasgaard
Research Manager
Norwegian Institute
for Water Research
P.O. Box 69 Korsvoll
N-0808 Oslo,
Norway

Dear Mr. Aasgaard,

Water Supply Foundation would like to establish a demonstration program for one or more small river basins in Poland to demonstrate to rural communities in those areas the need and the feasibility for improving water pollution control by installing waste water treatment systems to protect the groundwater and surface water quality.

Water Supply Foundation (WSF) was established by the Primate of Poland Józef Cardinal Glemp in 1987. According to its statutes, main goal of the WSF is assistance in constructing water supply installation and sewage treatment plants for villages where most farms are in private hands.

Up to date WSF supported the supply of running drinking water in 2611 villages and 148 064 houses of Polish farmers and 83 wastewater treatment systems.

Participating in the development of water supplies for the rural areas, the Water Supply Foundation also recognizes the need for control of pollution of ground and surface waters from the areas being served with their assistance and with assistance from other sources. Because of the high priorities to fulfill other needs, the local governments and residents have not always recognized the need for pollution control facilities as being of high priority. Competing demands for resources include: water supply systems and their expansion; road improvement including paving; telephone services; community structures including buildings for government services and recreation (i.e., community centers); and school facilities and improvements. Therefore, the WSF has tried to attract attention to

the need for water pollution control consisting of demonstration project funded by grants.

One such demonstration program was conducted by the Water Supply Foundation in the Rawka River Basin near Warsaw where eight wastewater treatment systems were completed.

It will be a good opportunity to establish a demonstration program for one or more river basins in other parts of Poland using Norwegian good experience.

This time we will concentrate on not only on construction of demonstration plants using different treatment process but also on possibility of central management and maintenance system which could be implement in these basins.

Our Foundation is able to find the localization of these basins where communities are willing to participate in demonstration programme. We already have two basins where communities were interested in demonstration programme: Swędrnia river basin and Zielawa river basin.

Swędrnia river basin has an area of 544 km² and falls within jurisdiction of nine communities and have total population of 70000 inhabitants.

Zielawa river basin has an area of 1226 km² and it falls within the jurisdiction of nine communities and have total population of 40 000 inhabitants.

So together with your experts we can select the best basin and prepare the programme of realization of this project. Our Foundation is able to finance some of construction cost by low interest loans. But we are not able to support planing and preparation works. It will be the best to cover these cost and same construction cost by Norwegian founds because the communities can not afford such high your prices in comparison to ours.

Thank you in advance for any assistance you can offer.

Your sincerely

Piotr Szczepański

Vice President

Mts Głazyna Engleing Botanice
Fax 4722185200



INSTYTUT OCHRONY ŚRODOWISKA

INSTITUTE OF ENVIRONMENTAL PROTECTION

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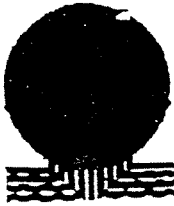
dr hab.inż Barbara Osmulska-Mróz

1037/95
94131
5-4

Proposal for Norwegian-Polish cooperation project: WASTEWATER TREATMENT & DISPOSAL SYSTEMS FOR SMALL COMMUNITIES

1. Principles of system selection:
 - * law regulation (comparison Polish & Norwegian approach),
 - * methods of preliminary evaluation of local conditions (soil and natural water survey, topography, land development),
 - * methods of preliminary evaluation of wastewater quantity & quality,
 - * cost-effective methods for preliminary selection of wastewater treatment and disposal.
 2. Cost-effective analysis for Polish & Norwegian conditions of various options of wastewater:
 - * collection,
 - * treatment (including sludge),
 - * disposal (including sludge).
 3. Maintenance methods of the wastewater systems for small communities.
 4. Options for financing of the wastewater systems (comparison Polish & Norwegian approach).
 5. Testing of the result of the proposed work in selected Polish & Norwegian communities located at small river basin (for example: pointed out by Water Supply Foundation in Poland)
- Proposed project participants:
- INSTITUTE for WATER RESEARCH - NIVA. NORWAY
INSTITUTE of ENVIRONMENTAL PROTECTION - IOS. POLAND
WATER SUPPLY FUNDATION . POLAND

adres/address:	telefon/phone:	telex:	telec:	e-mail:	konto bankowe/bank account:	NIP:
ul. Krucze 8/11	centrala (48 2) 626 10 05	(48 22) 23 52 63	816419 IOS PL	EARN/BIUNE1	PKS 5A III/Warszawa	525-000-73-07
00-648 Warszawa	syroka (48 2) 621 33 70			IOS@PLEARN.BITNET	Nr 3/0015-3/11	
				INTERNET		
				IOS@PLEARN.EDU.PL		



NARODOWY FUNDUSZ OCHRONY ŚRODOWISKA I GOSPODARKI WODNEJ

02-673 Warszawa, ul. Konstruktorska 3A
Konto: PBK IX O/Warszawa 370031-34438-132

Identyfikator 001381056
NIP 522-00-16-559

Prezes: 49-72-82
Z-ca Prezesa: 49-38-88
Centrala: 49-00-80: 49-00-79
49-22-80: 48-21-11
Fax: 49-72-72

NF/MA/9092 /95

Warszawa, dnia 15.05.1995

GEN
GAF
SLB

NORWEGIAN INSTITUTE
FOR WATER RESEARCH
Innr: 1404/95
Sak nr: 94131
Nettall: 16.5

NORWEGIAN INSTITUTE
FOR WATER RESEARCH
Grażyna ENGLUND
Brekkeveien 19
P.O.Box 173 Kjelsas
N-0411 OSLO
NORWAY
Fax 4722185200

Dziękujemy bardzo za fax i list zawierające wnioski z Seminarium pt. "Strategia obniżenia zanieczyszczeń w aspekcie doświadczeń norweskich" oraz wstępne propozycje możliwych form dalszej współpracy. Jednocześnie przepraszamy za tak długie milczenie spowodowane czynnikami od nas niezależnymi.

Z dużym opóźnieniem przekazujemy też podziękowania za interesujący pod względem zawodowym i przyjemny pobyt w Norwegii.

W pełni zgadzamy się z zawartą we wnioskach oceną Seminarium norweskiego, zaś przedstawione propozycje przyszłej dwustronnej współpracy polsko-norweskiej wydają się interesujące, chociaż należy traktować je jako wstępne /obejmują praktycznie całość zagadnień w dziedzinie ochrony wód i gospodarki wodnej/, wymagające bardziej szczegółowego sprecyzowania.

W nawiązaniu do wcześniejszych deklaracji, Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej podtrzymuje swoją gotowość dalszej współpracy w dwóch płaszczyznach:

- Przygotowanie master planów dla zlewni rzek, lub ich odcinków, np. zlewnia rzeki Pilicy, Zatoka Pucka, Ziemia Lubuska lub inne. *(zlewnia wód)*
- Modernizacja istniejących oczyszczalni ścieków, pod kątem zwiększenia ich przepustowości oraz efektywności. Mogą to być oczyszczalnie stosunkowo niedawno oddane do eksploatacji /np. w Lublinie lub Białymstoku/, ale charakteryzujące się procesami konwencjonalnymi, w których w niedalekiej przyszłości niezbędne będzie zapewnienie usuwania związków biogenych.

Szczegółowe sprecyzowanie tematów wymaga jednak ich uzgodnienia z Departamentem Gospodarki Wodnej w Ministerstwie Ochrony Środowiska, Zasobów Naturalnych i Leśnictwa oraz zgody poszczególnych inwestorów, którzy będą odbiorcami projektów. W przypadku master planów konieczna będzie koordynacja propozycji w ramach Porozumień wojewodów kilku województw, które obecnie znajdują się na etapie powstawania.

Jednocześnie pragniemy poinformować, że w Narodowym Funduszu przygotowywane jest spotkanie z delegacją norweską na szczeblu rządowym, którego tematem będzie ustalenie listy projektów przewidywanych do dwustronnej współpracy polsko-norweskiej. Mamy nadzieję, że w/w płaszczyzny współpracy w zakresie ochrony wód i gospodarki wodnej znajdą się również na tej liście. Pozwoli to wtedy na przystąpienie do szczegółowego sprecyzowania projektów.

Dziękując za gotowość współpracy, przesyłamy serdeczne pozdrowienia.

Z poważaniem

Z-ca Prezesa Zarządu
mgr inż. Józef Ostapuk

Fax fra Nasjonalt Fond for miljøvern og vannressursforvaltning

Dato: 15.05.95

NF/MA/ 9092 /95

Oversettelse

- Takk for brev og fax med konklusjoner fra seminaret " Strategi for begrensning av vannforurensning i Polen i lys av norske erfaringer" samt for innledende forslag til videre samarbeid.
- Beklager sen tilbakemelding.
- Tusen takk for faglig og sosialt interessant tid i Norge.

- De er helt enige i konklusjonene fra seminaret og nisjer for det videre bilaterale samarbeid. De sist nevnte er veldig interessante, men de har for videre detaljering av hver problemstilling.
- Nasjonal Fond deklarerer fortsatt sin beredskap til videre samarbeid, spesielt i to temaer som de prioriterer:
 - Utarbeide master-planer for flere nedbørsfelt el. deler av dem, for eks. nedbørsfelt for elva Pilica, Zatoka Pucka, Ziemia Lubuska m.m.
 - Oppgradering av eksisterende renseanlegg, med vinkling mot både økning av hydraulisk kapasitet og effektivitet. Oppgraderingen kan også gjelde relativt nye renseanlegg (f.eks. i Lublin og Bialystok), som benytter seg av en konvensjonell prosess nå, men som skal tilpasses fjerning av næringssalter i nær fremtid.
- Detaljert program for hvert tema krever imidlertid videre diskusjoner med det polske MD og investorer.
I tilfelle utarbeidelse av master-planer, må forslaget koordineres gjennom avtaler mellom de fylkene dette gjelder.
- Vi vil også informere at Fondet forbereder et møte med norske representanter på regjeringsnivå for å drøfte og konkretisere listen av prosjekter som egner seg til bilateralt samarbeid.
Vi håper at ovenfor nevnte teamer innenfor vern av vann og vannressursforvaltning vil bli inkludert på denne listen. Det blir da gitt klarsignal for start av detaljeringsfase av prosjekter.

Vi takker for deres samarbeidsvilje og sender hjertlige hilsener,

deputy direktør

Janusz Ostapiuk

oversatt av Grazyna Englund

16.05.95

Appendix 8.

Project Proposals sent NFR in June 1995.

Master and Action Plan for Chosen Area in Poland:

- Improvement of the Professional Competance and Network...52**
- Educational Part and Follow Up.....58**

Master and Action Plan for chosen Catchment Area in Poland:

5. Improvement of the Professional Competence and Network

List of contents:

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2. Project description.....	2
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2.2. Project organisation.....	2
2.3. Objectives.....	3
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2.5. Budget of the sub-project 5.....	4
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3.7. Biovac, Poland.....	6
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1. Project title

Master and action plan for chosen catchment area in Poland:

5. Improvement of the professional competence and network.

2. Project description

2.1. Background

The environmental issues related to water resource management and wastewater treatment in Poland have been focused in several projects financed by the Norwegian State Pollution Control Authority (SFT), the Norwegian Ministry of Environment (MD) and the Norwegian Foreign Ministry (UD). The Norwegian Institute for Water Research (NIVA) has been engaged in a number of these projects (a list attached).

The idea of the proposed project was initiated during the seminar "Strategy for water pollution abatement in view of the Norwegian experience" held in Norway 13th-18th of March 1995 in Oslo and Lillehammer. Representatives of the Polish participants and NIVA discussed the need for a joint project in order to develop strategy and methods for integrated water supply and wastewater treatment and disposal. There exist in Poland expertise on this subject at different institutions, but it is need for co-operation in order to build up a well structured and integrated master planning, methods for cost-effective analysis and routines for maintenance and process control.

2.2. Project concept

Further contacts between the representatives of the different institutes in Poland led to make a priority on the integrated approach, namely *master plan for a chosen catchment area* (letters included). This project will be performed as six sub-projects, which are interconnected with each other, though can function separately. Figure 1 illustrates the concept and the scope of each sub-project.

NIVA will apply for financial support for sub-projects 1, 2 and 3 from the State Pollution Control Authority (SFT), while we need a financial support from the *Programme for Eastern Europe* for sub-projects 4, 5 and 6. This proposal consider sub-project 5; *improvement of the professional competence and network*.

A project for improvement of the professional competence and network (5) will involve many R&D institutes, as well as suppliers, constructors, commissioners of finance, control bodies and environmental authorities. They will all have an interest in implementation and testing out the optimal alternative at the demonstration area (case-study). In order to specify in details the content and the dimension of the project and to get know the project participants, as well as the area where the project will be executed, we need some research and educational visits to Poland. A visit of the Polish researchers to Norway will also be considered.

In this way the network will be extended and the bilateral co-operation between Poland and Norway will be professionally strengthened.

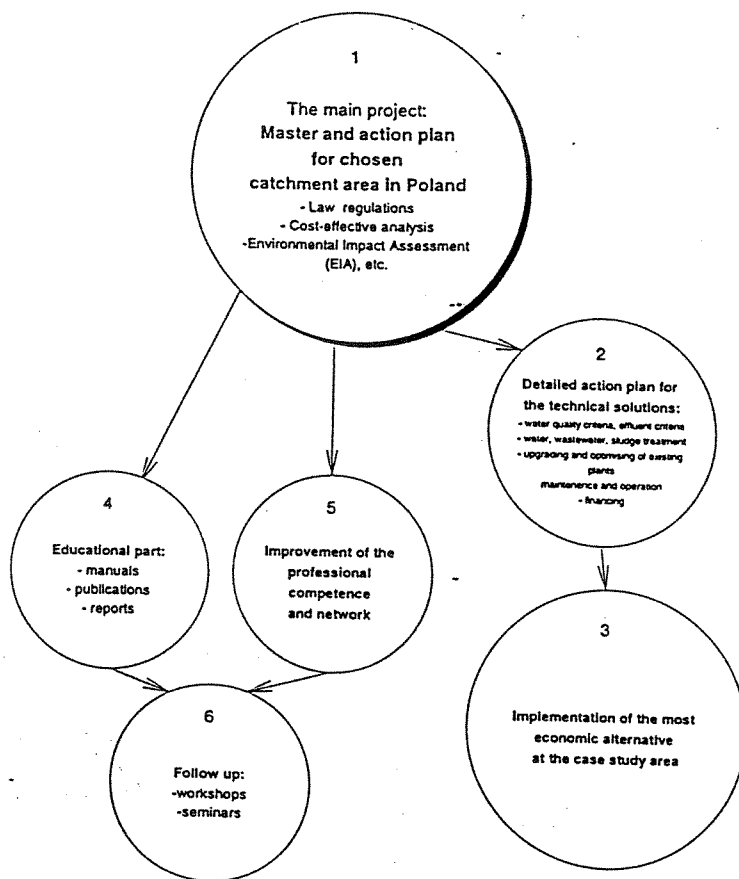


Figure 1. Project concept and scope of the sub-projects.

2.3. Objectives

The general objective is:

Network building and technology transfer to local users for planning tools for water management and water/wastewater treatment and disposal.

The specific objectives are:

- To meet the project participants and evaluate the area where the project will be executed.
- To specify in details the content and the dimension of the project.
- To establish the durable contacts between the R&D institutes and the sector for water and wastewater treatment.
- To strengthen the Norwegian-Polish co-operation between the R&D institutes and the users.

2.4. Main activities and time schedule

The main activities and time schedule are listed in table 1.

Table 1. Main activities and time schedule.

Sub-project / Main activities	1995				1996				1997				1998			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Master and action plan for chosen catchment area in Poland			x	x	x	x	x	x	x	x	x					
2. Detailed action plan for the technical solutions							x	x	x	x						
3. Implementation of the most economic alternative at the case study area										x	x	x	x			
4. Educational part											x	x		x	x	
5. Improvement of the professional competence and network																
- Visiting Poland for discussions with the project participants and evaluation of the project area			x	x	x											
- Project specification					x											
- Establishment of durable contacts between the R&D inst. and w&wwtp sector				x	x	x	x									
6. Follow up								x	x						x	x

2.5. Budget of the sub-project 5

Project will be performed according to the following budget:

Main activities	Time-expenses	Direct expenses	1995	1996	Total
- Visiting Poland for discussions with the project participants and evaluation of the project area	70.000	43.000	90.000	23.000	113.000
- Project specification	20.000			20.000	20.000
- Establishment of durable contacts between the R&D inst. and w&wwtp sector	30.000	23.000	10.000	43.000	53.000
- Reporting	8.500	1.500		10.000	10.000
Total			100.000	96.000	196.000

3. Participants in the project

3.1. Norwegian Institute for Water Research (NIVA)

NIVA has been Norway's leading research centre of water related expertise since 1958. NIVA is a non-profit research foundation which carries out research, surveys and development work on contracts or public authorities and private clients in Norway and abroad. NIVA has a staff of 190, of whom 90 are research scientists. NIVA does research on environmental technology connected to treatment of water and wastewater, aiming to find practical solutions to environmental problems in water. NIVA takes actively part in the environment related projects in Eastern Europe, where a number of projects are related to Poland. For the titles of the projects, please refer to the attached NIVA-information sheet.

The project manager for the main project (the project concept), Gunnar Fr. Aasgaard is the head of the research department for environmental technology consisting of 17 research scientists. Mr. Aasgaard is graduated from the Norwegian Institute of Technology, University of Trondheim (1977) in environmental engineering. He has specialised in system planning and treatment of water and wastewater. Mr. Aasgaard is a well experienced project manager from national and international projects.

Grazyna Englund is a research scientist at NIVA working in the same department. She is graduated as M.Sc. in environmental engineering both from the Technical University of Warsaw, Poland (1976) and the University of Delft, the Netherlands (1986). Mrs. Englund has specialised in wastewater treatment and especially on pilot testing and developing of new treatment processes. She is currently involved in various projects in Poland, and was the co-ordinator of the above mentioned seminar *Strategy for water pollution abatement in view of the Norwegian experience (march '95)*. Mrs. Englund will be the project manager for the applied sub-project.

Jon Lasse Bratli is a research manager at NIVA, responsible for the working area *Water Resource Management*. Mr. Bratli is graduated as M.Sc. in limnology from the University of Oslo (1989).

Enclosed you will find CVs for Aasgaard, Englund and Bratli.

3.2. National Foundation for Environmental Protection, Poland

Organisation which participate in the partial financing of the prioritised projects, chosen together with the governmental authorities, within environmental protection.

Contact persons:

Janusz Ostapiuk, M.Sc.

the National Foundation for Environmental Protection

ul Konduktorska 3a

02-673 Warszawa

Poland

3.3. Institute of Environmental Protection (IOS), Poland

Contact person:

Barbara Osmulska-Mròz, Dr. Eng. and Pawel Blaszczyk, Dr. Eng.

the Institute of Environmental Protection (IOS)

ul. Krucza 5/11

00-548 Warszawa

Poland

3.4. Ministry of Environmental Protection, Natural Resources and Forestry, Poland

Contact person:

Eugenia Koblak-Kalinska, M.Sc.

the Ministry of Environmental Protection, Natural Resources and Forestry

ul.Wawelska 52/54

00-922 Warszawa

Poland

3.5. State Inspectorate for Environmental Protection (PIOS), Poland

Contact person:

Adam Mierzwinski, Dr. Eng.

ul.Wawelska 52/54

00-922 Warszawa

Poland

3.6. Water Supply Foundation, Poland

Contact person:

Maciej Dzikiewicz, M.Sc.

the Water Supply Foundation

Skwer Kard. S. Wyszyńskiego 6

01-015 Warszawa

Poland

3.7. Biovac, Poland

Contact person:

Zbigniew Dyk, M.Sc.

Biovac

ul. Kolonia 41

25-819 Kielce

Poland

3.8. Technical University of Kraków, Poland

Contact person:

Jerzy Kurbiel, Prof. Dr.Eng.

ul. Warszawska 24

31-155 Kraków

Poland

All these institutions, together with representatives from the municipalities in the case-study-area, represent the combined competence needed to get a successful project performance.

4. Follow-up

After performance of the main sub-projects all gained experience will be presented on different seminars and workshops.



Master and Action Plan for chosen Catchment Area in Poland:

4 & 6. Educational Part and Follow Up

List of contents:

1. Project title	2
2. Project description	2
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2.2. Project organisation	2
2.3. Objectives	3
2.4. Main activities and time schedule	4
2.5. Budget of the sub-projects 4 & 6	4
3. Participants in the project	5
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3.2. National Foundation for Environmental Protection, Poland	5
3.3. Institute of Environmental Protection (IOS), Poland	5
3.4. Ministry of Environmental Protection, Natural Resources and Forestry, Poland	6
3.5. State Inspectorate for Environmental Protection (PIOS), Poland	6
3.6. Water Supply Foundation, Poland	6
3.7. Biovac, Poland	6
3.8. Technical University of Kraków, Poland	6
4. Follow-up	6

1. Project title

Master and action plan for chosen catchment area in Poland:
4 & 6. Educational part and follow up.

2. Project description

2.1. Background

The environmental issues related to water resource management and wastewater treatment in Poland have been focused in several projects financed by the Norwegian State Pollution Control Authority (SFT), the Norwegian Ministry of Environment (MD) and the Norwegian Foreign Ministry (UD). The Norwegian Institute for Water Research (NIVA) has been engaged in a number of these projects (a list attached).

The idea of the proposed project was initiated during the seminar "Strategy for water pollution abatement in view of the Norwegian experience" held in Norway 13th-18th of March 1995 in Oslo and Lillehammer. Representatives of the Polish participants and NIVA discussed the need for a joint project in order to develop strategy and methods for integrated water supply and wastewater treatment and disposal. There exist in Poland expertise on this subject at different institutions, but it is need for co-operation in order to build up a well structured and integrated master planning, methods for cost-effective analysis and routines for maintenance and process control.

2.2. Project concept

Further contacts between the representatives of the different institutes in Poland led to make a priority on the integrated approach, namely *master plan for a chosen catchment area* (letters included). This project will be performed as six sub-projects, which are interconnected with each other, though can function separately. Figure 1 illustrates the concept and the scope of each sub-project.

NIVA will apply for financial support for sub-projects 1, 2 and 3 from by the State Pollution Control Authority (SFT), while we need a financial support from the *Programme for Eastern Europe* for sub-projects 4, 5 and 6. This proposal consider sub-project 4 and 6; educational part and follow up.

A project for the educational part (4) and follow up (6) will involve many R&D institutes, as well as suppliers, constructors, commissioners of finance, control bodies and environmental authorities. They will all have an interest in implementation and testing out the optimal alternative at the demonstration area (case-study). Improvement of the skills for integrated environmental approach for master planning will be ensured by *the exchange of experiences* by the transfer and propagation of master plan principles for chosen catchment area in Poland (in form of meetings, manuals, reports, seminars, workshops, etc.). In this way the bilateral co-operation between Poland and Norway will be strengthened.

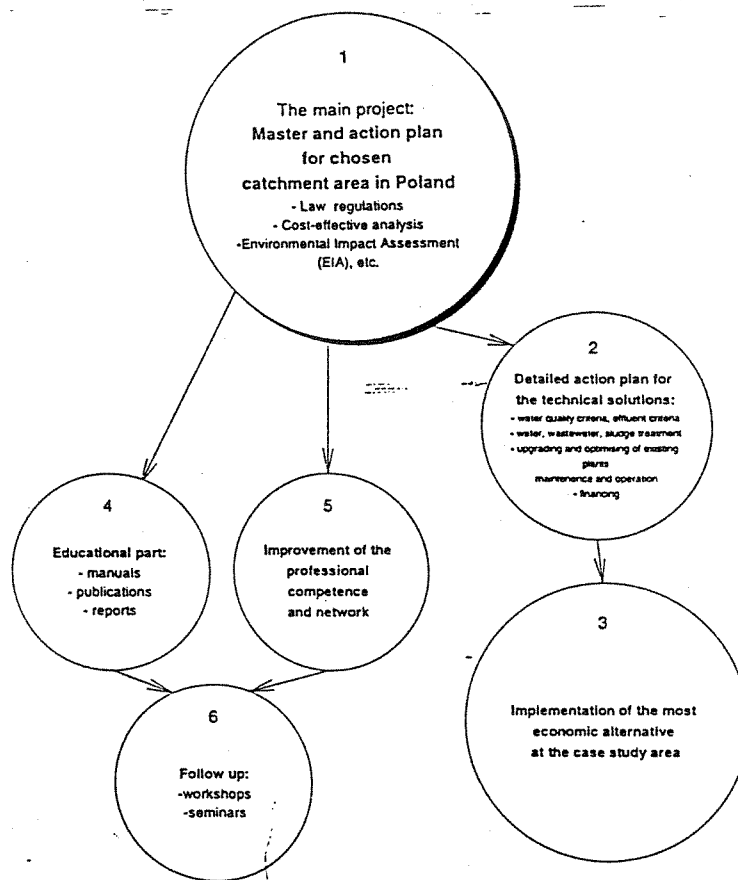


Figure 1. Project concept and scope of the sub-projects.

2.3. Objectives

The general objective is:

To transfer the gained experience, during the project performance, to the users at different levels (decision makers, local authorities, users, suppliers, consultants, plant operators, etc.) by different educational means (manuals, publications, reports, seminars, workshops, etc.)

The specific objectives are:

- In order to give a tool for the users at the different levels, describing of the developed methods and the ways of optimisation of the water resource management in form of:
 - publications of the results
 - manual with the principles for EIA and cost-effective analysis of the alternative environmental solutions in the procedures followed for master planning
 - manuals for maintenance and operation of the plants
 - manuals for simulation models and on-line process control
- Propagation/transfer of the results during the project performance as well as experiences from the case-study by organising seminars for different users
- Strengthening of Norwegian-Polish co-operation between the R&D and the users.

2.4. Main activities and time schedule

The main activities and time schedule are listed in table 1.

Table 1. Main activities and time schedule.

Sub-project	1995				1996				1997				1998			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Master and action plan for chosen catchment area in Poland				x	x	x	x	x	x	x	x					
2. Detailed action plan for the technical solutions							x	x	x	x						
3. Implementation of the most economic alternative at the case study area										x	x	x	x			
4. Educational part							x	x			x	x		x	x	
- publications of the results																
- manuals with the principles for EIA and cost-effective analysis																
- manuals for maintenance and operation of the plants																
- manuals for simulation models and on-line control																
5. Improvement of the professional competence and network			x	x	x	x	x									
6. Follow up							x	x							x	x
- organising seminars and workshops for decision makers, users of the methods in practice																

2.5. Budget of the sub-projects 4 & 6

Project will be performed according to the following budget:

Main activities	Time-expenses	Direct expenses	1996	1997	1998	Total
- Visiting Poland to discuss the content of educational presentations	50.000	33.000	83.000			83.000
- Preparation publications and manuals based on sub-project 1	170.000	10.000	20.000	100.000	60.000	180.000
- Organising of seminars and workshops	50.000	20.000	30.000		40.000	70.000
- Reporting	8.500	1.500			10.000	10.000
Total			133.000	100.000	110.000	343.000

3. Participants in the project

3.1. Norwegian Institute for Water Research (NIVA)

NIVA has been Norway's leading research centre of water related expertise since 1958. NIVA is a non-profit research foundation which carries out research, surveys and development work on contracts or public authorities and private clients in Norway and abroad. NIVA has a staff of 190, of whom 90 are research scientists. NIVA does research on environmental technology connected to treatment of water and wastewater, aiming to find practical solutions to environmental problems in water. NIVA takes actively part in the environment related projects in Eastern Europe, where a number of projects are related to Poland. For the titles of the projects, please refer to the attached NIVA-information sheet.

The project manager for the main project (the project concept), Gunnar Fr. Aasgaard is the head of the research department for environmental technology consisting of 17 research scientists. Mr. Aasgaard is graduated from the Norwegian Institute of Technology, University of Trondheim (1977) in environmental engineering. He has specialised in system planning and treatment of water and wastewater. Mr. Aasgaard is a well experienced project manager from national and international projects.

Grazyna Englund is a research scientist at NIVA working in the same department. She is graduated as M.Sc. in environmental engineering both from the Technical University of Warsaw, Poland (1976) and the University of Delft, the Netherlands (1986). Mrs. Englund has specialised in wastewater treatment and especially on pilot testing and developing of new treatment processes. She is currently involved in various projects in Poland, and was the co-ordinator of the above mentioned seminar *Strategy for water pollution abatement in view of the Norwegian experience (march '95)*. Mrs. Englund will be the project manager for the applied sub-project.

Jon Lasse Bratli is a research manager at NIVA, responsible for the working area *Water Resource Management*. Mr. Bratli is graduated as M.Sc. in limnology from the University of Oslo (1989).

Enclosed you will find CVs for Aasgaard, Englund and Bratli.

3.2. National Foundation for Environmental Protection, Poland

Organisation which participate in the partial financing of the prioritised projects, chosen together with the governmental authorities, within environmental protection.

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3.6. Water Supply Foundation, Poland

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3.8. Technical University of Kraków, Poland

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All these institutions, together with representatives from the municipalities in the case-study-area, represent the combined competence needed to get a successful project performance.

4. Follow-up

After performance of the main sub-projects all gained experience will be presented on different seminars and workshops.

Norwegian Institute for Water Research

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By ordering the report, please use
serial number 3346-95.

ISBN 82-577-2876-4