

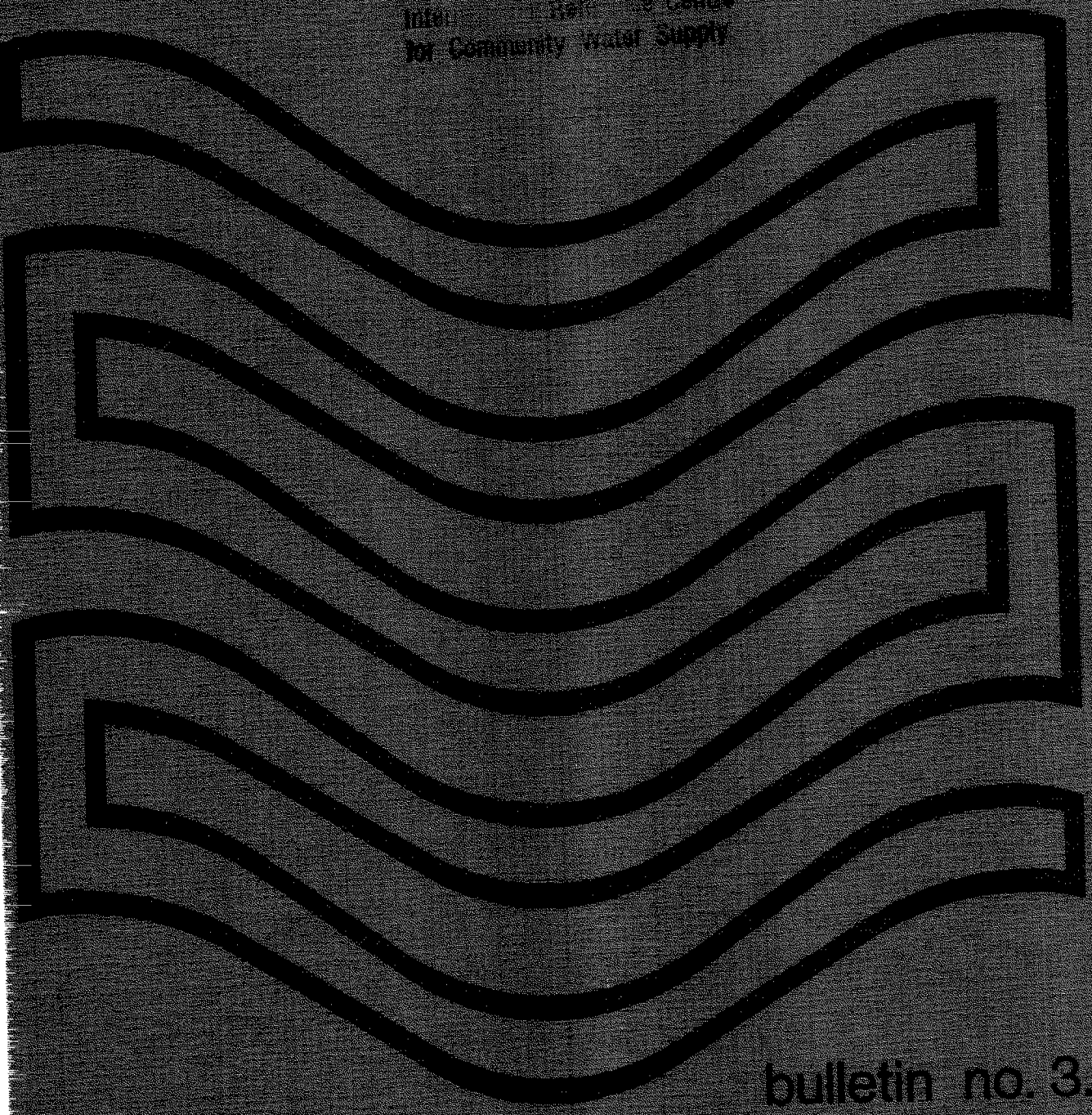
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WORLD HEALTH ORGANIZATION
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BULLETIN NO. 3
COMMUNITY WATER SUPPLY RESEARCH 1972

Inventory of research projects in the
community water supply field

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MARCH 1972
THE HAGUE - THE NETHERLANDS

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1. INTRODUCTION

The inventory of research projects carried out by research institutions has been started as an initial step, in order to arrive at systematic research coordination in the field of community water supply.

The first survey of research projects carried out by the institutions officially collaborating with the W.H.O. International Reference Centre for Community Water Supply has been issued in June 1971 in Bulletin no. 1 entitled "Community Water Supply Research 1971". Till now 28 institutions have been designated by the W.H.O. as Collaborating Institutions.

In the present bulletin the inventory includes research projects carried out by 29 research institutions also engaged in community water supply research.

All research projects have been classified according to the general classification of community water supply topics which has been elaborated for the purpose of the inventory.

One of the objectives of the I.R.C. is to promote closer relations between research workers in the field of community water supply. It is hoped that this bulletin will contribute to the realization of this intention.

2. RESEARCH INSTITUTIONS

The research projects of the following institutions are given in this bulletin:

1. The Netherlands Government Institute for Drinking Water Supply
(The Institute designated as the W.H.O. International Reference
Centre for Community Water Supply)
Parkweg 13
The Hague
The Netherlands

2. International Bank for Reconstruction and Development
1818 H Street, N.W.
Washington, D.C. 20433
U.S.A.

3. Economic Commission for Latin America
Natural Resources and Energy Programme
Hydraulic Resources Group ECLA/OCT/WMO/WHO
Avenida Dag Hammarskjold
Casilla 179 D
Santiago
Chile

4. Institute of Civil Engineering and Architecture
Bul. Hristo Smirnenski 1
Sofia
Bulgaria

5. Department of Sanitary Engineering
Technical University of Denmark
Building 115
2800 Lyngby
Denmark

6. Institute for Community Water Management
Technical University of Berlin
Strasse des 17. Juni 135
1 Berlin 12

7. Institute for Community Water Management
Technical University of Aachen
Templergraben 55
51 Aachen
Federal Republic of Germany

8. Leichtweiss Institute for Water Research
Technical University of Braunschweig
Pockelstr. 4
33 Braunschweig
Federal Republic of Germany

9. Institute for Community Water Management
Technical University of Hannover
Welfengarten 1
3 Hannover
Federal Republic of Germany

10. Chair for Water Management, Hydrology and Rural Water Engineering
Technical University of Hannover
Welfengarten 1
3 Hannover
Federal Republic of Germany

11. Chair for Water Chemistry
Technical University of Karlsruhe
Richard-Willstätter-Allee 5
75 Karlsruhe
Federal Republic of Germany

12. Institute for Water Chemistry and Chemical Balneology
Chair for Hydrogeology and Hydrochemistry
Technical University of Munich
Marchionistrasse 17
Munich 55
Federal Republic of Germany

13. SOGREAH
Consulting Engineers Research and Computing Centre
84-86, Avenue Léon-Blum
38 Grenoble
France

14. Wye College
University of London
Ashford, Kent
Great Britain

15. Faculty of Natural Science
University of London King's College
Strand
London W.C.2
Great Britain

16. Tokyo Metropolitan Waterworks Bureau
No. 8-1, Marunouchi 3-chome
Chiyoda-ku
Tokyo
Japan

17. Laboratory of Sanitary Engineering
Department of Civil Engineering
Technological University of Delft
Stevinweg 4
Delft
The Netherlands

18. Research Institute for Public Health Engineering - TNO
Schoemakerstraat 97
Delft
The Netherlands

19. Study and Information Centre TNO on Environmental Research
P.O. Box 186
Delft
The Netherlands

20. National Institute of Public Health
Geitmyrsveien 75
Oslo 1
Norway

21. State Institute of Hygiene
24 Chocimska Street
Warsaw
Poland

22. National Institute for Water Research of the South African
Council for Scientific and Industrial Research
P.O. Box 395
Pretoria
Republic of South Africa

23. Alaska Water Laboratory
Environmental Protection Agency
College, Alaska 99701
U.S.A.

24. Institute of Water Resources
The University of Connecticut
Storrs, Connecticut 06268
U.S.A.

25. Georgia Institute of Technology
Atlanta, Georgia 30332
U.S.A.

26. Water Resources Research Center
University of New Hampshire
James Hall
Durham, New Hampshire 03824
U.S.A.

27. Department of Civil Engineering
University of Notre Dame
Notre Dame, Indiana 46556
U.S.A.

28. Water Resources Research Institute
Mississippi State University
State College, Mississippi 39762
U.S.A.

29. Clemson University
Clemson, South Carolina 29631
U.S.A.

3. GENERAL CLASSIFICATION OF COMMUNITY WATER SUPPLY TOPICS

1. Water Supply - General

- 1.1 Historical survey
- 1.2 Water and environmental hygiene
- 1.3 Water supply categories and schemes
- 1.4 Demand for water and water consumption
- 1.5 Water for fire purposes
- 1.6 Sociology of community water supply
- 1.7 Planning
- 1.8 Financing
- 1.9 Economics
- 1.10 Legislation
- 1.11 Manpower
- 1.12 Research
- 1.13 Standardization
- 1.14 Statistics
- 1.15 Water utilities
- 1.16 Local authorities
- 1.17 National agencies and policy
- 1.18 International cooperation
- 1.19 Quality of water supplies
- 1.20 Re-use of waste water
- 1.21 Water losses in water supplies
- 1.22 Geographical survey
- 1.23 Other problems

2. Water quality

- 2.1 Water quality general
- 2.2 Quality of natural waters and contaminants
- 2.3 Physical characteristics of water
- 2.4 Chemical characteristics of water and chemical substances in water
- 2.5 Micro-organisms in water (Microbiology)
- 2.6 Organic life in water (Hydrobiology)
- 2.7 Radioactivity and radioactive substances in water
- 2.8 Technique of examination of water
- 2.9 Standards on water quality in water sources
- 2.10 Drinking water quality standards

- 2.11 Industrial water quality standards
- 2.12 Self-purification of water
- 2.13 Water quality control
- 2.14 Water quality deterioration in distribution systems
- 2.15 Economic evaluation of water quality
- 2.16 Other problems

3. Water catchment

- 3.1 Water catchment general
- 3.2 Water supply sources
- 3.3 Subsurface-water intake works
- 3.4 Surface-water intake works
- 3.5 Special problems of water catchment

4. Water transmission

- 4.1 Water transmission general
- 4.2 Transmission mains
- 4.3 Pumping stations
- 4.4 Special works
- 4.5 Special problems of water transmission

5. Water treatment

- 5.1 Water treatment general
- 5.2 Initial preparation of water
- 5.3 Screening and straining
- 5.4 Coagulation, flocculation, sedimentation and clarification
- 5.5 Filtration
- 5.6 Iron-manganese-colour removal
- 5.7 Softening and demineralization
- 5.8 Antiscale and anticorrosion treatment
- 5.9 Desalination
- 5.10 Removal of radionuclides
- 5.11 Fluoridation and defluoridation
- 5.12 Disinfection
- 5.13 Other methods of water treatment
- 5.14 Economics of water treatment
- 5.15 Special problems of water treatment

6. Water distribution

- 6.1 Water distribution general
- 6.2 Water distribution systems and schemes
- 6.3 Planning, design and hydraulics of distribution systems
- 6.4 Distribution system storage facilities
- 6.5 Pipe materials, coatings, linings, and joints for water distribution systems
- 6.6 Valves and hydrants
- 6.7 Water meters and water metering
- 6.8 Water main laying
- 6.9 Tapping, cleaning, disinfection, inspection and maintenance of water mains
- 6.10 Metallic corrosion and protection of mains against corrosion
- 6.11 Special problems of water distribution

4. CLASSIFIED RESEARCH PROJECTS

1. WATER SUPPLY - GENERAL

Research topic	Research Institution
<p>1.1 <u>Historical survey</u></p> <p>1. The hydraulic resources of Latin America (its development and plannification).</p>	<p>Economic Commission for Latin America (ECLA), Natural Resources and Energy Programme, Hydraulic Resources Group, Santiago, Chile.</p>
<p>1.2 <u>Water and environmental hygiene</u></p> <p>1. Potable water and sewage services in Latin America.</p> <p>2. Quality criteria for water and soil environment.</p> <p>3. Quality protection of water and soil environment.</p> <p>4. Waste water of the Dutch potato starch industry: - biological aspects of the Eems-Dollard estuary; - technological aspects of the industrial process; - waste water treatment.</p> <p>5. Influence of hardness of water on lead cummulation in organisms of warmblooded animals.</p> <p>6. Investigation methods of influence of new material on water.</p> <p>7. Pollution survey of rivers in the Western Cape.</p> <p>8. Pollution survey of the Upper Breë River.</p>	<p>Economic Commission for Latin America (ECLA), Natural Resources and Energy Programme, Hydraulic Resources Group, Santiago, Chile.</p> <p>Research Institute for Public Health Engineering T.N.O., Delft, The Netherlands.</p> <p>idem</p> <p>Study and Information Centre T.N.O. on Environmental Research, Delft, The Netherlands.</p> <p>State Institute of Hygiene, Warsaw, Poland.</p> <p>idem</p> <p>National Institute for Water Research, Pretoria, Republic of South Africa.</p> <p>idem</p>

Research topic	Research Institution
9. Reclamation of purified sewage and industrial effluents.	National Institute for Water Research, Pretoria, Republic of South Africa.
10. Evaluation of human and animal pathogenic bacteria in hospital waste water, raw sewage, purified and reclaimed effluents and other water environments with special reference to <i>Mycobacterium tuberculosis</i> .	idem
11. The evaluation of human and animal pathogenic viruses in hospital waste water, raw sewage, purified and reclaimed effluents and other water environments.	idem
12. The study of infectious hepatitis virus in water.	idem
13. A study of the main functional bacterial groups in waste water purification.	idem
14. Determination of conditions necessary for achieving optimum rates of bacterial denitrification.	idem
15. The incidence and occurrence of <i>Salmonellae</i> in polluted waters, particularly the sea.	idem
16. The systematics, larval correlations and instar characters of the <i>Trichoptera</i> .	idem
17. Energy, nitrogen and phosphorus turnover by selected aquatic invertebrates in relation to eutrophication.	idem

Research topic	Research Institution
18. Dissolved oxygen requirements of selected aquatic invertebrates in relation to eutrophication.	National Institute for Water Research, Pretoria, Republic of South Africa.
19. The evaluation of human and animal parasites in hospital waste water, raw sewage purified and reclaimed effluents and other water environments.	idem
20. Development of methods to measure the toxicity of polluted water to fish.	idem
21. An evaluation of the long- and short-term effects of toxic pollutants in sub-lethal concentrations on fish.	idem
22. Biological accumulation of toxic compounds in the food chain from polluted waters.	idem
23. Survey of selected estuaries to define the environment with a view to the development of pollution criteria for estuaries.	idem
24. Relative pollution strengths of undiluted waste material discharged in households and the dilution waters used for each.	Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.
25. Some of the effects of sub-lethal levels of DDT in the fresh water environment	Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.
26. Nitrogen content of drainage litter and soils in the vicinity of alder and white pines sites.	idem

Research topic	Research Institution
27. Changing environment of a water based recreational resource.	Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.
28. Effect of domestic pollution abatement on eutrophic lake.	Department of Civil Engineering, University of Notre Dame, Notre Dame, Indiana, U.S.A.
1.3 <u>Water supply categories and schemes</u>	
1. Optimal operation of ground water installations.	Leichtweiss Institute for Water Research, Technical University of Braunschweig, Braunschweig, Federal Republic of Germany.
2. Regional distribution systems for drinking water.	idem
3. The storage and purification of water in the natural sand beds of the Cape Flats.	National Institute for Water Research, Pretoria, Republic of South Africa
4. A program for metropolitan water management.	Georgia Institute of Technology, Atlanta, Georgia, U.S.A.
5. Water management in livestock waste handling systems.	Clemson University, Clemson, South Carolina, U.S.A.
6. An economic study of alternative systems of distributing water supplies in a decentralized urban - industrial area.	idem
1.4 <u>Demand for water and water consumption</u>	
1. Precast of water demand.	Leichtweiss Institute for Water Research, Technical University of Braunschweig, Braunschweig, Federal Republic of Germany.
2. Estimation of household consumption of water.	Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.

Research topic	Research Institution
1.5 <u>Water for fire purposes</u>	
1.6 <u>Sociology of community water supply</u> 1. Social and economic impact of water supply and waste treatment facilities in Alaska native villages. 2. Private sector reaction to normal political institutional procedures and outcomes when water is an issue.	Alaska Water Laboratory, Environmental Protection Agency, College, Alaska, U.S.A. Clemson University, Clemson, South Carolina, U.S.A.
1.7 <u>Planning</u> 1. The hydraulic resources of Latin America (its development and plannification) 2. Use of interactive computer graphics in water resources planning and management. 3. An appraisal of plans to meet the fresh water requirements of the Mississippi gulf coast area.	Economic Commission for Latin America (ECLA), Natural Resources and Energy Programme, Hydraulic Resources Group, Santiago, Chile. Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A. Water Resources Research Institute, Mississippi State University, State College, Mississippi, U.S.A.
1.8 <u>Financing</u> 1. The hydraulic resources of Latin America (its development and plannification).	Economic Commission for Latin America (ECLA), Natural Resources and Energy Programme, Hydraulic Resources Group, Santiago, Chile.
1.9 <u>Economics</u> 1. The hydraulic resources of Latin America (its development and plannification).	Economic Commission for Latin America (ECLA), Natural Resources and Energy Programme, Hydraulic Resources Group, Santiago, Chile.

Research topic	Research Institution
<p>1.14 <u>Statistics</u></p>	
<p>1.15 <u>Water utilities</u></p> <p>1. Legal and institutional aspects of water development in Latin America.</p>	<p>Economic Commission for Latin America (ECLA), Natural Resources and Energy Programme, Hydraulic Resources Group, Santiago, Chile.</p>
<p>1.16 <u>Local authorities</u></p> <p>1. Legal and institutional aspects of water development in Latin America.</p> <p>2. Investigation and advisory services to the Natal Provincial Administration.</p>	<p>Economic Commission for Latin America (ECLA), Natural Resources and Energy Programme, Hydraulic Resources Group, Santiago, Chile.</p> <p>National Institute for Water Research, Pretoria, Republic of South Africa.</p>
<p>1.17 <u>National agencies and policy</u></p> <p>1. Legal and institutional aspects of water development in Latin America.</p>	<p>Economic Commission for Latin America (ECLA), Natural Resources and Energy Programme, Hydraulic Resources Group, Santiago, Chile.</p>
<p>1.18 <u>International Cooperation</u></p>	
<p>1.19 <u>Quality of water supplies</u></p> <p>1. Restoring the quality of urban receiving waters: Interfacing upgraded treatment facilities with the stream.</p>	<p>Clemson University, Clemson, South Carolina, U.S.A.</p>
<p>1.20 <u>Reuse of waste water</u></p> <p>1. Waste water recycling.</p> <p>2. Use of treated waste waters for groundwater recharge.</p>	<p>The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.</p> <p>Institute for Community Water Management, Technical University of Hannover, Hannover, Federal Republic of Germany.</p>

Research topic	Research Institution
3. Inland water pollution: industrial processes, advanced waste water treatment, recycling and reuse, economical aspects.	Study and Information Centre T.N.O. on Environmental Research, Delft, The Netherlands.
4. Reclamation of purified sewage and industrial effluents.	National Institute for Water Research, Pretoria, Republic of South Africa.
5. Refinement of unit processes and design aspects in the reclamation of sewage effluents for reuse.	idem
6. Studies on full-scale reclamation of sewage effluents for reuse on the Stander Water Reclamation Plant.	idem
7. The efficiency of the unit processes in a multiple unit reclamation scheme to cope with shock loads and toxic substances.	idem
8. Reclamation of sewage effluents by physical/chemical means.	idem
9. Reclamation of sewage effluent for industrial reuse at Bellville.	idem
10. Disposal of mineralized effluents by irrigation.	idem
11. Use of ozone and ultrasonics for the treatment of waste water.	Department of Civil Engineering, University of Notre Dame, Notre Dame, Indiana, U.S.A.
1.21 <u>Water losses in water supplies</u>	

Research topic	Research Institution
1.22 <u>Geographical survey</u>	
1. Potable water and sewage services in Latin America.	Economic Commission for Latin America (ECLA), Natural Resources and Energy Programme, Hydraulic Resources Group, Santiago, Chile.
2. Pollution survey of rivers in the Western Cape.	National Institute for Water Research, Pretoria, Republic of South Africa.
3. Pollution survey of the Upper Breë River.	idem
4. Hydrochemistry of the Caledon, Orange, Fish and Sundays River, with special reference to mineralisation.	idem
5. Synopsis of the diatoms of Africa.	idem
6. The ecology of the diatoms of the Caledon-Orange River system.	idem
7. River surveys in Southern Natal.	idem
8. Georgia's water problems and related research needs.	Georgia Institute of Technology, Atlanta, Georgia, U.S.A.
9. Managing municipal watersheds for water supply in Georgia.	idem
10. Accumulation of suspended flocculated sediment by oyster reefs in Mississippi coastal waters.	Water Resources Research Institute, Mississippi State University, State College, Mississippi, U.S.A.
11. An appraisal of plans to meet the fresh water requirements of the Mississippi gulf coast area.	idem
12. Dilution capacity of small streams in South Carolina.	Clemson University, Clemson, South Carolina, U.S.A.

Research topic	Research Institution
<p>1.23 <u>Other problems</u></p> <ol style="list-style-type: none">1. Managing municipal watersheds for water supply in Georgia.	<p>Georgia Institute of Technology, Atlanta, Georgia, U.S.A.</p>

2. WATER QUALITY

Research topic	Research Institution
<p>2.1 <u>Water quality - general</u></p> <p>1. Relation river water quality - drinking water supply.</p> <p>2. Hydrochemistry of groundwater.</p>	<p>The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.</p> <p>idem</p>
<p>2.2 <u>Quality of natural waters and contaminants</u></p> <p>1. Suspended solids in surface waters and their removal by means of gravel filters. Contribution to groundwater recharge.</p> <p>2. Protection of groundwater against contamination caused by agriculture.</p> <p>3. Protection of groundwater against percolation of organic and anorganic matters.</p> <p>4. Protection of groundwater against percolation from garbage deposits.</p> <p>5. Organic substances in rivers and lakes and drinking water treatment.</p> <p>6. Trace metals in surface waters.</p> <p>7. Biological survey of the pollution of the Thames estuary.</p>	<p>Institute for Community Water Management, Technical University of Aachen, Aachen, Federal Republic of Germany.</p> <p>Leichtweiss Institute for Water Research, Technical University of Braunschweig, Braunschweig, Federal Republic of Germany.</p> <p>idem</p> <p>idem</p> <p>Chair for Water Chemistry, Technical University of Karlsruhe, Karlsruhe, Federal Republic of Germany.</p> <p>Institute for Water Chemistry and Chemical Balneology, Technical University of Munich, Munich, Federal Republic of Germany.</p> <p>Faculty of Natural Science, University of London King's College, London, England.</p>

Research topic	Research Institution
8. Nitrogen hydrology of the basin of the River Rother, West Sussex, England.	Faculty of Natural Science, University of London King's College, London, England.
9. The transport of solutes in the Rother catchment.	idem
10. Pollution and self-purification of surface waters.	Research Institute for public health engineering T.N.O., Delft, The Netherlands.
11. Quality, protection of water and soil environment.	idem
12. Water pollution - registration of the actual situation; - development of technical and economical models.	Study and Information Centre T.N.O. on Environmental Research, Delft, The Netherlands
13. North Sea and Estuary - inventory of pollution caused by the rivers Rhine, Meuse and Scheldt; - physical, chemical and biochemical distribution of the pollution; - effect of the pollution on the ecosystem.	idem
14. Inland water pollution - industrial processes; - advanced waste water treatment; - recycling and reuse; - economical aspects.	idem
15. Trace elements in water resources - especially B, Cd, Cr, Cu, Hg, Pb and Zn.	National Institute of Public Health, Department of Sanitary Engineering and Environmental Pollution, Oslo, Norway.
16. Ground water quality (major and minor constituents and trace elements) in relation to types of rocks and formations present.	idem

Research topic	Research Institution
17. Water quality of Lake Farris in relation to the natural conditions (geology, hydrology etc.) and the activities in the catchment area (especially agriculture).	National Institute of Public Health, Department of Sanitary Engineering and Environmental Pollution, Oslo, Norway.
18. Refinement of recognized pollution parameters for beaches and nearshore waters.	National Institute for Water Research, Pretoria, Republic of South Africa.
19. Pollution survey of rivers in the Western Cape.	idem
20. Pollution survey of the Upper Breë River.	idem
21. Hydrochemistry of the Caledon, Orange, Fish and Sundays River, with special reference to mineralisation.	idem
22. Ecological evaluation of multiuse waters receiving primary treatment effluent prior to a major flow increase.	Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.
23. Investigation of turbidity in estuarine waters.	idem
24. The quantity and movement of nitrates in soil water in two Connecticut soils treated with high and low levels of inorganic - nitrogen - fertilizer.	idem
25. Determination of the stages of eutrophication of some of New Hampshire's large lakes.	Water Resource Research Center, University of New Hampshire, Durham Durham, New Hampshire, U.S.A.
26. Some of the effects of sub-lethal levels of DDT in the fresh-water environment.	idem

Research topic	Research Institution
27. Chemical character of ground and surface waters in relation to soil weathering processes.	Water Resource Research Center, University of New Hampshire, Durham New Hampshire, U.S.A.
28. Ultraviolet absorption and its possible relation to eutrophication in large New Hampshire lakes.	idem
29. The influence of wetlands on quantity and quality of streamflow.	idem
30. Preliminary investigation of water quality of New Hampshire with emphasis on chloride and selected minor constituents.	idem
31. Surface water pollution control studies: adsorption of complex organic molecules by suspended clay.	idem
32. Hydrogeologic factors involved in predicting the effect of sanitary landfill operations on ground water quality.	Department of Civil Engineering, University of Notre Dame, Notre Dame, Indiana, U.S.A
33. Iron-organic interactions in natural waters.	idem
34. Accumulation of suspended and flocculated sediment by oyster reefs in Mississippi coastal waters.	Water Resources Research Institute, Mississippi State University, State College, Mississippi, U.S.A.
35. Effect of nitrogen fertilizers and organic pesticides on the quality of groundwater.	Clemson University, Clemson, South Carolina, U.S.A.
36. Effects of Santee-Cooper rediversion project and State Ports Authority's	idem

Research topic	Research Institution
<p>expansion on water quality in the Cooper River.</p>	
<p>2.3 <u>Physical characteristics of water</u></p> <ol style="list-style-type: none"> 1. Pollution and self-purification of ground water and soil. 2. Investigations of organic matter causing bad taste and odour of water. 3. Investigation of turbidity in estuarine waters. 4. The velocity dependence of the total cross section for alkali-water scattering. 5. Biologic detection and control of water pollution. 	<p>Research Institute for Public Health Engineering T.N.O., Delft, The Netherlands.</p> <p>State Institute of Hygiene, Warsaw, Poland.</p> <p>Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.</p> <p>idem</p> <p>Clemson University, Clemson, South Carolina, U.S.A.</p>
<p>2.4 <u>Chemical characteristics of water and chemical substances in water</u></p> <ol style="list-style-type: none"> 1. Fundamental heavy metal research. 2. Trace metals in surface waters. 3. Determination and reactions of pesticides in waters. 4. Genesis of jodine water. 5. Nitrogen hydrology of the basin of the River Rother, West Sussex, England. 	<p>The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.</p> <p>Institute for Water Chemistry and Chemical Balneology, Technical University of Munich, Munich, Federal Republic of Germany.</p> <p>idem</p> <p>idem</p> <p>Faculty of Natural Science, University of London King's College, London, England.</p>

Research topic	Research Institution
6. Trace elements in water resources - especially B, Cd, Cr, Cu, Hg, Pb and Zn.	National Institute of Public Health, Department of Sanitary Engineering and Environmental Pollution, Oslo, Norway.
7. The content of mercury and other trace elements in water in relation to water treatment.	idem
8. Comparison of gross nitrogen and phosphorus budgets in short sections of two streams, one high and one low in nutrients.	National Institute for Water Research, Pretoria, Republic of South Africa.
9. The quantity and movement of nitrates in soil water in two Connecticut soils treated with high and low levels of inorganic nitrogen fertilizer.	Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.
10. Metal complexes of components of yellow organic acids in water.	Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.
2.5 <u>Microorganisms in water (Microbiology)</u>	
1. Fundamental odour research.	The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.
2. Fundamental virus research.	idem
3. Application of immunofluorescence for detection of certain pathogens in water.	State Institute of Hygiene, Warsaw, Poland.
4. The study of infectious hepatitis virus in water.	National Institute for Water Research, Pretoria, Republic of South Africa.
5. A study of the main functional bacterial groups in waste water	idem

Research topic	Research Institution
<p>purification.</p>	
<p>6. Determination of conditions necessary for achieving optimum rates of bacterial denitrification.</p>	<p>National Institute for Water Research, Pretoria, Republic of South Africa.</p>
<p>7. Low temperature microbiological activity and dissolved oxygen; depletion.</p>	<p>Alaska Water Laboratory, Environmental Protection Agency, College, Alaska, U.S.A.</p>
<p>8. Winter survival of fecal indicator bacteria in a subarctic Alaska river.</p>	<p>idem</p>
<p>9. Determination of the stages of eutrophication of some New Hampshire's large lakes.</p>	<p>Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.</p>
<p>10. Numbers and types of microorganisms in stabilization pond effluents.</p>	<p>idem</p>
<p>11. Detection and enumeration of viruses in natural waters.</p>	<p>idem</p>
<p>12. Transport of animal viruses by clays and soil particles over ground and water surfaces.</p>	<p>idem</p>
<p>2.6 <u>Organic life in water</u> <u>(Hydrobiology)</u></p>	
<p>1. Biological survey of the pollution of the Thames estuary.</p>	<p>Faculty of Natural Science, University of London King's College, London, England.</p>
<p>2. Critical evaluation of existing methods to use algae to measure pollution.</p>	<p>National Institute for Water Research, Pretoria, Republic of South Africa.</p>
<p>3. Synopsis of the diatoms of Africa.</p>	<p>idem</p>
<p>4. The ecology of the diatoms of the Caledon-Orange River system.</p>	<p>idem</p>

Research topic	Research Institution
5. Growth potential of selected algae in relation to eutrophication.	National Institute for Water Research, Pretoria, Republic of South Africa.
6. The incidence and occurrence of Salmonellae in polluted waters, particularly the sea.	idem
7. The systematics, larval correlations and instar characters of the Trichoptera.	idem
8. Energy, nitrogen and phosphorus turnover by selected aquatic invertebrates in relation to eutrophication.	idem
9. Dissolved oxygen requirements of selected aquatic invertebrates in relation to eutrophication.	idem
10. The evaluation of human and animal parasites in hospital waste water, raw sewage, purified and reclaimed effluents and other water environments.	idem
11. Development of methods to measure the toxicity of polluted water to fish.	idem
12. An evaluation of the long- and short-term effects of toxic pollutants in sublethal concentrations on fish.	idem
13. Variation in diatom morphology and water pollution.	Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.
14. Indicator species in the Desmid <i>Staurastrum</i> .	idem

Research topic	Research Institution
15. An investigation of Aphanizomenon Flos-Aquae - a toxic by-product of eutrophication.	Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.
16. A study of algal populations associated with different levels of water quality in New Hampshire.	idem
17. Ultraviolet absorption and its possible relation to eutrophication in large New Hampshire lakes.	idem
18. Impact of toxic clones of blue green algae on water quality as related to aquatic animals.	idem
19. The ecological effects of thermal stress on certain neuroendocrine-physiological systems of selected aquatic animals.	Clemson University, Clemson, South Carolina, U.S.A.
20. Effects of cage culture of catfish upon water quality in reservoirs.	idem
21. The analysis of tritium oxide from selected areas on the Connecticut River.	Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.
2.7 <u>Radioactivity and radioactive substances in water</u>	
2.8 <u>Technique of examination of water</u>	
1. Application of immunofluorescence for detection of certain pathogens in water.	State Institute of Hygiene, Warsaw, Poland.
2. Identification of certain organic compounds in water by freezing.	idem

Research project	Research Institution
3. The recovery and measurement of chemical residues from reclaimed water.	National Institute for Water Research, Pretoria, Republic of South Africa.
4. Development of specialized analytical techniques.	idem
5. Chemical services to the National Physical Research Laboratory on chemistry of the deep sea.	idem
6. Development of methods for effluent toxicity determination in estuarine and marine environments.	idem
7. A chemical analysis of the Earthy-Musty odour in water.	Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.
8. Atomic fluorescence spectroscopy: a potential tool for trace analysis.	Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.
9. The analysis of aromatic compounds in water using fluorescence and phosphorescence.	idem
10. Detection and enumeration of viruses in natural waters.	idem
2.9 <u>Standards on water quality in water sources</u>	
1. Survey of selected estuaries to define the environment with a view to the development of pollution criteria for estuaries.	National Institute for Water Research, Pretoria, Republic of South Africa.
2.10 <u>Drinking water quality standards</u>	

Research project	Research Institution
<p>2.11 <u>Industrial water quality standards</u></p>	
<p>2.12 <u>Self-purification of waters</u></p> <ol style="list-style-type: none"> 1. Influence of nitrification on self-purification. 2. Determination of influence parameter of reaction rate k in the Streeter and Phelps equation. 3. Pollution and self-purification of groundwater and soil. 4. Pollution and self-purification of surface waters. 5. Physics, chemistry and biology of decomposition. 	<p>Institute for Community Water Management, Technical University of Berlin, Berlin.</p> <p>Institute for Community Water Management, Technical University of Aachen, Aachen, Federal Republic of Germany.</p> <p>Research Institute for Public Health Engineering T.N.O., Delft, The Netherlands.</p> <p>idem</p> <p>idem</p>
<p>2.13 <u>Water quality control</u></p> <ol style="list-style-type: none"> 1. Quality control national water resources. 2. Effects of pH control for red water. 3. Monitoring of the Durban effluent outfalls. 4. Monitoring the disposal of effluents from Alusaf. 5. Surface water pollution control studies: adsorption of complex organic molecules by suspended clay. 6. Biologic detection and control of water pollution. 	<p>The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.</p> <p>Tokyo Metropolitan Water Works Bureau, Tokyo, Japan.</p> <p>National Institute for Water Research, Pretoria, Republic of South Africa.</p> <p>idem</p> <p>Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.</p> <p>Clemson University, Clemson, South Carolina, U.S.A.</p>

Research topic	Research Institution
<p>2.14 <u>Water quality deterioration in distribution systems.</u></p> <hr style="width: 10%; margin-left: 0;"/>	
<p>2.15 <u>Economic evaluation of water quality</u></p> <ol style="list-style-type: none"> 1. Inland water pollution <ul style="list-style-type: none"> - industrial processes; - advanced waste water treatment; - recycling and reuse; - economical aspects. 	<p>Study and Information Centre T.N.O. on Environmental Research, Delft, The Netherlands</p>
<p>2.16 <u>Other problems</u></p> <ol style="list-style-type: none"> 1. The politics of water pollution. 2. Combined buoyancy and boundary effects and aeration effects on jet spreading. 3. Industrial water and effluent management. 4. Dilution capacity of small streams in South Carolina. 	<p>Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.</p> <p>idem</p> <p>National Institute for Water Research, Pretoria, Republic of South Africa.</p> <p>Clemson University, Clemson, South Carolina, U.S.A.</p>

3. WATER CATCHMENT

Research topic	Research Institution
<p>3.1 <u>Water catchment general</u></p> <ol style="list-style-type: none"> 1. The hydrometeorology in Latin American countries. 2. Studies on improvement of drinking water treatment and catchment. 	<p>Economic Commission for Latin America (ECLA), Natural Resources & Energy Programme, Hydraulic Resources Group, Santiago, Chile.</p> <p>Institute for Community Water Management, Technical University of Aachen, Aachen, Federal Republic of Germany.</p>
<p>3.2 <u>Water supply sources</u></p> <ol style="list-style-type: none"> 1. Limnology pilot plant. 2. "De Grote Rug" Reservoir 3. Ground water flow - development of new methods of calculation. 4. Tracer investigations with radio isotopes. 5. Hydrochemistry of ground water. 6. Artificial ground water recharge. 7. Induced recharge near low-land rivers. 8. Electric analogue investigations. 9. Systems analysis, applied to regional hydrogeological investigations. 10. Ground water resource evaluations. 11. The hydrometeorology in Latin American countries. 	<p>The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.</p> <p>idem</p> <p>idem</p> <p>idem</p> <p>idem</p> <p>idem</p> <p>idem</p> <p>idem</p> <p>idem</p> <p>idem</p> <p>Economic Commission for Latin America (ECLA), Natural Resources &</p>

Research topic	Research Institution
12. The operative investigation applied to the hydraulic resources development.	Energy Programme, Hydraulic Resources Group, Santiago, Chile. idem
13. Analog simulation of ground water movement with electrical resistance - capacitance networks.	Institute for Community Water Management, Technical University of Berlin, Berlin.
14. Ground water balance investigations in the area of Lüneburger Heide and Leinetal in relation to water supply of Hamburg and Hannover (digital and analog models).	Chair for Water Management, Hydrology and Rural Water Engineering, Technical University of Hannover, Hannover, Federal Republic of Germany.
15. Ground water balance investigations for the city of Hamburg (digital model).	idem
16. Ground water balance investigations for the city of Hannover (analog model).	idem
17. Hydrological and hydrochemical maps and data of Bavaria/Germany.	Institute for Water Chemistry and Chemical Balneology, Technical University of Munich, Munich, Federal Republic of Germany.
18. Nitrogen hydrology of the basin of the River Rother, West Sussex, England.	Faculty of Natural Science, University of London King's College, London, England.
19. Hydrological research in water source forest.	Tokyo Metropolitan Waterworks Bureau, Tokyo, Japan.
20. Experimentation of artificial rainfall.	idem
21. Special investigation of currents at Richards Bay.	National Institute for Water Research, Pretoria, Republic of South Africa.

Research topic	Research Institution
22. River surveys in Southern Natal.	National Institute for Water Research, Pretoria, Republic of South Africa.
23. Water map of the underground water resources in South West Africa with special reference to the utilization value of the water.	idem
24. The influence of wetlands on quantity and quality of streamflow.	Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.
25. Tree water stress in relation to water yield in a hardwood forest.	idem
26. Geophysical mapping of the water table in eocene sediments: feasibility and reliability evaluation.	Water Resources Research Institute, Mississippi State University, State College, Mississippi, U.S.A.
27. A case study of the hydrogeologic conditions in the outcrop area of an aquifer.	idem
28. Organizational goals and relationships in watershed development.	idem
29. Water distribution and movement in an unsaturated soil profile.	Clemson University, Clemson, South Carolina, U.S.A.
30. Determination of the hydrologic effects of developmental changes in watersheds using aerial photographs.	idem
31. Legal aspects of water use and control in South Carolina.	idem
32. Use of advanced water resources planning techniques	idem

Research topic	Research Institution
<p>in the development of regional water management programs.</p> <p>33. Administrative law, problems and potentials, in water resources planning for South Carolina.</p>	<p>Clemson University, Clemson, South Carolina, U.S.A.</p>
<p>3.3 <u>Subsurface-water intake works</u></p> <ol style="list-style-type: none"> 1. Automation of pumping test recordings. 2. Clogging of pumping wells. 3. Relationships of yield of ground water from drilled wells and types of bedrock in New Hampshire. 4. Occurrence and characteristics of fractures in the crystalline rocks of Southeastern New Hampshire and their relationship to the yield of drilled water wells. 5. Hydraulic fracturing of shallow water wells in crystalline rock. 	<p>The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.</p> <p>idem</p> <p>Water Resource Research Center, University of New Hampshire, Durham, New Hampshire, U.S.A.</p> <p>idem</p> <p>idem</p>
<p>3.4 <u>Surface-water intake works</u></p> <ol style="list-style-type: none"> 1. The design of bottom intakes for diverting stream flows. 	<p>Faculty of Natural Science, University of London King's College, London, England.</p>
<p>3.5 <u>Special problems of water catchment</u></p> <ol style="list-style-type: none"> 1. Movement of salt/fresh water interface caused by ground water abstraction. 2. Hydrodynamical problems. 3. Recharge wells. 	<p>The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.</p> <p>idem</p> <p>idem</p>

Research topic	Research Institution
4. Relationship between ground water abstraction and crop yield.	The Netherlands Government Institute for Drinking Water Supply. The Hague, The Netherlands.
5. Drainage problems in road building (efficiency of drain pipes).	Institute for Community Water Management, Technical University of Berlin, Berlin.
6. Replenishment of ground water by infiltration through river banks and from flood retention reservoirs.	Leichtweiss Institute for Water Research, Technical University of Braunschweig, Braunschweig, Federal Republic of Germany.
7. The transport of solutes in the Rother catchment.	Faculty of Natural Science, University of London King's College, London, England.
8. Artificial run-off and storage of water supplies.	National Institute for Water Research, Pretoria, Republic of South Africa.
9. Flow characteristics within a channel boundary of coarse materials.	Water Resources Research Institute, Mississippi State University, State College, Mississippi, U.S.A.

4. WATER TRANSMISSION

Research topic	Research Institution
4.1 <u>Water transmission - general</u> _____	
4.2 <u>Transmission mains</u> _____	
4.3 <u>Pumping stations</u> _____	
4.4 <u>Special works</u> _____	
4.5 <u>Special problems of water transmission</u> 1. Water transport costs.	Faculty of Natural Science, University of London King's College, London, England.

5. WATER TREATMENT

Research topic	Research Institution
<p>5.1 <u>Water treatment - general</u></p> <ol style="list-style-type: none"> 1. Studies on improvement of drinking water treatment and catchment. 2. Organic substances in rivers and lakes and drinking water treatment. 3. Kinetics of adsorption. 	<p>Institute for Community Water Management, Technical University of Aachen, Aachen, Federal Republic of Germany.</p> <p>Chair for Water Chemistry, University of Karlsruhe, Karlsruhe, Federal Republic of Germany.</p> <p>idem</p>
<p>5.2 <u>Initial preparation of water</u></p>	
<p>5.3 <u>Screening and straining</u></p>	
<p>5.4 <u>Coagulation, flocculation, sedimentation and clarification</u></p> <ol style="list-style-type: none"> 1. Artificial recharge pilot plant. 2. Limnology pilot plant. 3. Treatment of moor water by flocculation. 4. Combination of oxidation and flocculation. 5. Use and efficiency of polyelectrolyts. 6. Experimentation and research of sludge disposal. 7. Coagulation in water treatment. 	<p>The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.</p> <p>idem</p> <p>Institute for Community Water Management, Technical University of Hannover, Hannover, Federal Republic of Germany.</p> <p>Chair for Water Chemistry, University of Karlsruhe, Karlsruhe, Federal Republic of Germany.</p> <p>idem</p> <p>Tokyo Metropolitan Waterworks Bureau, Tokyo, Japan.</p> <p>Laboratory of Sanitary Engineering, Department of Civil Engineering, Technological University of Delft, Delft, The Netherlands.</p>

Research topic	Research Institution
8. Water quality control with synthetic polymeric flocculants: effect of metal ions on flocculation of biocolloids.	Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.
9. Coagulation control using electrical conductivity.	Department of Civil Engineering, University of Notre Dame, Notre Dame, Indiana, U.S.A.
10. Algal extraction by flocculative techniques.	idem
5.5 <u>Filtration</u>	
1. Artificial recharge pilot plant.	The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands.
2. Filtration.	idem
3. Suspended solids in surface waters and their removal by means of gravel filters. Contribution to artificial ground water recharge.	Institute for Community Water Management, Technical University of Aachen, Aachen, Federal Republic of Germany.
4. Experiments with various filter media - especially with plastic filter media - for filtration of pre-treated waste waters.	Institute for Community Water Management, Technical University of Hannover, Hannover, Federal Republic of Germany.
5. Active carbon filters in drinking water treatment.	Chair for Water Chemistry, University of Karlsruhe, Karlsruhe, Federal Republic of Germany.
6. Dry-filtration.	idem
7. Filter theory and practice.	idem
8. Apparatus for dosing activated carbon powder.	Tokyo Metropolitan Waterworks Bureau, Tokyo, Japan.
9. Upward flow filtration.	Laboratory of Sanitary Engineering, Department of Civil Engineering, Technological University of Delft, Delft, The Netherlands.

Research topic	Research Institution
10. Multi-layer filteration.	Laboratory of Sanitary Engineering, Department of Civil Engineering, Technological University of Delft, Delft, The Netherlands.
5.6 <u>Iron-manganese-colour removal</u> 1. Treatment of ground waters with high concentration of iron by multilayer filtration.	Institute for Community Water Management, Technical University of Hannover, Hannover, Federal Republic of Germany.
5.7 <u>Softening and demineralization</u>	
5.8 <u>Antiscale and anticorrosion treatment</u>	
5.9 <u>Desalination</u> 1. Odour removal during desalination. 2. Desalination. 3. Multistage flash distillation (desalination). 4. Desalination of sea-water. 5. Solar distillation of brackish water.	The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands. idem. SOGREAH (Industrial Division), Grenoble-Gare, France. National Institute for Water Research, Pretoria, Republic of South Africa. idem
5.10 <u>Removal of radionuclides</u>	
5.11 <u>Fluoridation and defluoridation</u>	
5.12 <u>Disinfection</u> 1. Iodine well water disinfection.	The Netherlands Government Institute for Drinking Water Supply, The Hague, The Netherlands,

Research topic	Research Institution
2. Use of UV-treatment together with oxidation.	Chair for Water Chemistry, University of Karlsruhe, Karlsruhe, Federal Republic of Germany.
3. Low temperature disinfection.	Alaska Water Laboratory, Environmental Protection Agency, College, Alaska, U.S.A.
4. Disinfection of algal laden waters.	Department of Civil Engineering, University of Notre Dame, Notre Dame, Indiana, U.S.A.
5.13 <u>Other methods of water treatment</u>	
1. Denitrification of water for community water supply.	Department of Sanitary Engineering, Technical University of Denmark, Lyngby, Denmark.
2. High-rate treatment of waste waters by sand filters, AK-filters and soil filters.	Institute for Community Water Management, Technical University of Hannover, Hannover, Federal Republic of Germany.
3. Waste-water treatment by contact oxidation by micro-organism.	Tokyo Metropolitan Waterworks Bureau, Tokyo, Japan.
4. Activated carbon filters in water treatment.	Laboratory of Sanitary Engineering, Department of Civil Engineering, Technological University of Delft, Delft, The Netherlands.
5. Application of algal systems for the treatment of organically polluted water.	National Institute for Water Research, Pretoria, Republic of South Africa.
6. Removal of organic and eutrophying pollutants by combined chemical and biological treatment.	Department of Civil Engineering, University of Notre Dame, Notre Dame, Indiana, U.S.A.
5.14 <u>Economics of water treatment</u>	
1. Economics of cooling water treatment for air conditioning plants.	Faculty of Natural Science, University of London King's College, London, England.
2. Efficient pricing for	Institute of Water Resources,

Research topic	Research Institution
urban waste water renovation - Phase I.	The University of Connecticut, Storrs, Connecticut, U.S.A.
5.15 <u>Special problems of water treatment</u>	
1. Investigations on better utilization of oxygen by aeration processes.	Institute for Community Water Management, Technical University of Aachen, Aachen, Federal Republic of Germany.
2. Humic acids removal by macroporous ion-exchangers.	Institute for Community Water Management, Technical University of Hannover, Hannover, Federal Republic of Germany.
3. Influence of ozone on various substances occurring in water.	Institute for Water Chemistry and Chemical Balneology, Technical University of Munich, Munich, Federal Republic of Germany.
4. Bacteriological investigations of activated carbon filters.	Laboratory of Sanitary Engineering, Department of Civil Engineering, Technological University of Delft, Delft, The Netherlands.
5. Study of adsorption for the removal of residual COD from effluents purified by biological, chemical and physical methods.	National Institute for Water Research, Pretoria, Republic of South Africa.
6. Study of flow patterns in clarigester plants.	idem
7. The content of mercury and other trace elements in water in relation to water treatment.	National Institute of Public Health, Department of Sanitary Engineering and Environmental Pollution, Oslo, Norway.
8. Drinking water additives: physical growth and behavioral development of mice receiving chlorine and fluorine.	Institute of Water Resources, The University of Connecticut, Storrs, Connecticut, U.S.A.
9. Chemical analysis and process classification of con-	idem

Research topic	Research Institution
<p>stituents of effluents (organic nitrogen in activated carbon effluents).</p> <p>10. Restoring the quality of urban receiving waters: interfacing upgraded treatment facilities with the stream.</p>	<p>Clemson University, Clemson, South Carolina, U.S.A.</p>

6. WATER DISTRIBUTION

Research topic	Research Institution
6.1 <u>Water distribution - general</u>	
6.2 <u>Water distribution systems and schemes</u>	
6.3 <u>Planning, design and hydraulics of distribution systems</u> 1. Experiments with free level flow in circular pipe and their evaluation by means of the statistical methods taking into consideration the flow in pressure pipe.	Institute for Community Water Management, Technical University of Aachen, Aachen, Federal Republic of Germany.
6.4 <u>Distribution system storage facilities</u> 1. Optimal operation of drinking water reservoirs.	Leichtweiss Institute for Water Research, Technical University of Braunschweig, Federal Republic of Germany.
6.5 <u>Pipe materials, coatings, linings, and joints for water distribution systems</u>	
6.6 <u>Valves and hydrants</u>	
6.7 <u>Water meters and water metering</u> 1. Experimentation for practical use of automatical meter reading.	Tokyo Metropolitan Waterworks Bureau, Tokyo, Japan.
6.8 <u>Water main laying</u>	

Research topic	Research Institution
<p>6.9 <u>Tapping, cleaning, disinfection, inspection and maintenance of water mains</u></p> <p>1. Studies on leakage detection in water mains by nitrous suboxide.</p>	<p>Tokyo Metropolitan Waterworks Bureau, Tokyo, Japan.</p>
<p>6.10 <u>Metallic corrosion and protection of mains against corrosion</u></p> <hr/>	
<p>6.11 <u>Special problems of water distribution</u></p> <p>1. Air chamber tank without compressors.</p> <p>2. The relation of the height to the diameter of air chamber tanks.</p>	<p>Institute of Civil Engineering and Architecture, Sofia, Bulgaria.</p> <p>idem</p>

1. The Netherlands Government Institute for
 Drinking Water Supply
 Parkweg 13
THE HAGUE
 The Netherlands

Research topic	Name of project leader	Papers/reports available for dissemination.
- Artificial recharge pilot plant	Ir. J.Hrubec	No
- Filtration	Ir. J.Hrubec	No
- Waste water recycling	Ir. B.C.J.Zoeteman	No
- Odour removal during desalination	Ir. B.C.J.Zoeteman	No
- Limnology pilot plant	Drs. J.C.v.d.Vlugt	No
- "De Grote Rug" reservoir	Drs. J.C.v.d.Vlugt	No
- Quality control national water resources	Ir. B.C.J.Zoeteman	Yes
- Fundamental odour research	Ir. B.C.J.Zoeteman	Yes
- Fundamental heavy metal research	Dr. F.J.Brinkman	
- Fundamental virus research	Drs. H.J.Kool	No
- Iodine well water disinfection	Ir. B.C.J.Zoeteman	Yes
- Relation river water quality - drinking water supply	Ir. B.C.J.Zoeteman	No
- Ground water flow - development of new methods of calculation	Ir. G.A.Bruggeman	Yes
- Tracer investigations with radio isotopes	Drs. E.Romijn	Yes
- Movement of salt/fresh water interface caused by ground water abstraction	Ir. G.A.Bruggeman	No

The Netherlands Government Institute for
Drinking Water Supply

THE HAGUE

The Netherlands

continued.

Research topic	Name of project leader	Papers/reports available for dissemination.
- Hydrochemistry of ground water	Ir. C.R.Meinardi	No
- Artificial ground water recharge	Drs. E.Romijn	No
- Hydrodynamical problems	Drs. E.Romijn	Yes
- Recharge wells	Ir. M.C.Brandes	No
- Induced recharge near low-land rivers	Ir. M.C.Brandes	No
- Automation of pumping test recordings	Ir. D.v.Rijsbergen	No
- Electric analogue investigations	Ir. J.A.Los	Yes
- Clogging of pumping wells	Ir. M.C.Brandes	No
- Systems analysis, applied to regional hydrogeological investigations	Drs. E.Romijn	No
- Relationship between ground water abstraction and crop yield	Ir. J.A.Los	No
- Groundwater resource evaluations	Ir. J.C.Booy	No
- Desalination	Ir. J.C.Booy	Yes

2. International Bank for Reconstruction and Development

1818 H Street, N.W.

WASHINGTON, D.C. 20433

U.S.A.

Project title	Name of project leader	Papers/reports available for dissemination.
- Property enhancement as an estimate of water supply/sewerage benefits	J.J. Warford	Not yet available

3. Economic Commission for Latin America (ECLA)

Natural Resources and Energy Programme

Hydraulic Resources Group ECLA/OCT/WMO/WHO

Casilla 179 D

SANTIAGO

Chile

Project title	Name of project leader	Papers/reports available for dissemination.
- Serie: The hydraulic resources of Latin America (its development and plannification)	Natural Resources & Energy Programme (N.R. & E.P.)	Yes (partially)
- Serie: Potable water and sewage services in Latin America	ECLA/WHO Expert Adscript to the N.R. & E.P.	No
- Serie: Legal and institutional aspects of water development in Latin America	ECLA/OCT Expert Adscript to the N.R. & E.P.	No
- Serie: The hydrometeorology in Latin American countries	ECLA/OMM Expert Adscript to the N.R. & E.P.	No
- Serie: The operative investigation applied to the hydraulic resources development	Natural Resources & Energy Programme	Under preparation

4. Institute of Civil Engineering and Architecture

Bul. Hristo Smirnenski 1

SOFIA

Bulgaria

Project title	Name of project leader	Papers/reports available for dissemination.
- Air chamber tank without compressors:	Prof. H.Hadjiev	Yes in Bulgarian
- The relation of the height to the diameter of air chamber tanks	Prof. D.Varbanov	Yes in Bulgarian

5. Department of Sanitary Engineering
Technical University of Denmark
Building 115
2800 LYNGBY
Denmark

Project title	Name of project leader	Papers/reports available for dissemination.
- Denitrification of water for community water supply	Mr. M. Henze Christensen	Rap. 1-70 in Danish with English summary

6. Institute for Community Water Management
Technical University of Berlin
Strasse des 17. Juni 135
1 BERLIN 12

Project title	Name for project leader	Papers/reports available for dissemination.
- Influence of nitrification on self-purification	Mr. D. Liebich	No
- Analog simulation of groundwater movement with electrical resistance - capacitance networks	Mr. H. Trostel	No
- Drainage problems in road building (efficiency of drain pipes)	Mr. K. Terzioglu	No

7. Institute for Community Water Management
 Technical University of Aachen
 Templergraben 55
51 AACHEN
 Federal Republic of Germany

Project title	Name of project leader	Papers/reports available for dissemination.
- Experiments with free level flow in circular pipe and their evaluation by means of the statistical methods taking into consideration the flow in pressure pipe	Dipl.-Ing. Diers	Yes
- Investigations on better utilization of oxygen by aeration processes	Dipl.-Ing. Gegenmantel	Yes
- Studies on improvement of drinking water treatment and cathment	Dipl.-Ing. Gatz	Yes
- Suspended solids in surface waters and their removal by means of gravel filters. Contribution to artificial ground water recharge	Dr-Ing. Kuntschik	Yes
- Determination of influence parameter of reaction rate k in the Streeter and Phelps equation	Dipl.-Ing. Pöppinghaus	Yes

8. Leichtweiss Institute for Water Research
 Technical University of Braunschweig
 Pockelstrasse 4
33 BRAUNSCHWEIG
 Federal Republic of Germany

Project title	Name of project leader	Papers/reports available for dissemination.
- Precast of water demand	Prof.Dr.-Ing. U. Maniak	Internal reports - not published
- Regional distribution systems for drinking water	Dr.-Ing. W. Mertens	
- Optimal operation of drinking water reservoirs	Prof. U. Maniak Dipl.-Ing. W. Trau	
- Optimal operation of groundwater installations	Dr.-Ing. J. Schmidt	
- Replenishment of groundwater by infiltration through river banks and from flood retention reservoirs	Prof. U. Maniak	
- Protection of groundwater against contamination caused by agriculture	Dipl.-Chem. H.J. Gieger Dipl.-Landwirt. E. Seifert	
- Protection of groundwater against against percolation of organic and anorganic matters	Dipl-Chem. Gieger	
- Protection of groundwater against percolation from garbage deposits	Dr.-Ing. H. Vahl	

9. Institute for Community Water Management
 Technical University of Hannover
 Welfengarten 1
3-HANNOVER
 Federal Republic of Germany

Project title	Name of project leader	Papers/reports available for dissemination.
- Treatment of moor water by flocculation	Prof.Dr.-Ing. Rüffer Prof.Dr.-Ing. Möhle	
- Treatment of groundwaters with high concentration of iron by multi-layer filtration	Prof.Dr.-Ing. Rüffer Prof.Dr.-Ing. Möhle	
- Humic acids removal by macro-porous iron-exchangers	Prof.Dr.-Ing. Rüffer	
- Use of treated waste waters for groundwater recharge	Prof.Dr.rev.nat. Mudrack Dr.-Ing. Doedens	
- High-rate treatment of waste waters by sand filters, AK-filters and soil filters	Prof.Dr.rev.nat. Mudrack Dr.-Ing. Doedens	
- Experiments with various filter media- especially with plastic filter media for filtration of pretreated waste waters	Prof.Dr.-Ing. Seyfried Dipl.-Ing. Dohman	

10. Chair for Water Management, Hydrology and Rural Water Engineering
Technical University of Hannover
Welfengarten 1
3-HANNOVER
Federal Republic of Germany

Project title	Name of project leader	Papers/reports available for dissemination
<ul style="list-style-type: none">- Groundwater balance investigations in the area of Lüneburger Heide and Leinetal in relation to water supply of Hamburg and Hannover (digital and analog models) - Groundwater balance investigations for the city of Hamburg (digital model) - Groundwater balance investigations for the city of Hannover (analog model)	Prof.Dr.-Ing. H. Billib	Yes

11. Chair for Water Chemistry
University of Karlsruhe
Richard-Willstätter-Allee 5
75 KARLSRUHE
Federal Republic of Germany

Project title	Name of project leader	Papers/reports available for dissemination.
- Organic substances in rivers and lakes and drinking water treatment	Mr. Sontheimer	
- Kinetics of adsorption	Mr. Heil	
- Active carbon filters in drinking water treatment	Mr. Maier	
- Use of UV-treatment together with oxidation	Mr. Sontheimer	
- Combination of oxidation and flocculation	Mr. Sontheimer	
- Dry-filtration	Mr. Sontheimer	
- Use and efficiency of poly-electrolyts	Mr. Fuchs	
- Filter theory and practice	Mr. Spindler	

12. Institute for Water Chemistry and Chemical Balneology
Chair for Hydrogeology and Hydrochemistry
Technical University of Munich
MUNICH 55
Federal Republic of Germany

Project title	Name of project leader	Papers/reports available for dissemination.
- Trace metals in surface waters	Prof.Dr. K.E. Quentin H. Winkler G. Schretzemayr	
- Determination and reactions of pesticides in waters	Prof.Dr. K.E. Quentin Dr. L. Weil	Yes
- Genesis of iodine water	Prof.Dr. K.E. Quentin Dr. N. Torkzadeh	
- Hydrological and hydrochemical maps and data of Bavaria/Germany	Prof.Dr. K.E. Quentin Dr. P. Udluft	Yes
- Influence of ozone on various substances occurring in water	Dr. D. Eichelsdörfer	Yes

13. SOGREAH

Consulting Engineers Research and Computing Centre

84-86, Avenue Léon Blum

38 GRENOBLE

France

Project title	Name of project leader	Papers/reports available for dissemination.
- Multistage flash distillation (desalination)		Yes

14. Wye College
University of London
ASHFORD, KENT
Great Britain

Project title	Name of project leader	Papers/reports available for dissemination.
- Economics of rural water supply investment in developing countries (Field work in Kenya 1969 - 1972)	Mr. I.D.Carrithers	Yes

15. Faculty of Natural Science,
 University of London King's College
 Strand
LONDON W.C.2
 Great Britain

Project title	Name of project leader	Papers/reports available for dissemination.
<u>Dept. of Zoology</u> - Biological survey of the pollution of the Thames estuary	Prof. D.A. Arthur	Yes
<u>Dept. of Engineering</u> - Economics of cooling water treatment for air conditioning plants - Water transport costs - The design of bottom intakes for diverting stream flows	Mr. W.B. Gosney Mr. J.K. White Mr. J.K. White	No Yes Yes
<u>Dept. of Geography</u> - Nitrogen hydrology of the basin of the River Rother, West Sussex, England - The transport of solutes in the Rother catchment	Mr. J.R. Petch Mr. A.M.C. Edwards	No No

16. Tokyo Metropolitan Waterworks Bureau
No. 8-1, Marunouchi 3-chome
Chiyoda-ku
TOKYO
Japan

Project title	Name of project leader	Papers/reports available for dissemination.
- Studies on leakage detection in water mains by nitrous suboxide		No
- Effects of pH control for Red Water		No
- Hydrological research in water source forest		Yes
- Experimentation of artificial rainfall		Yes
- Experimentation and research of sludge disposal		No
- Apparatus for dosing activated carbon powder		Yes
- Waste-water treatment by contact oxidation by micro-organisms		No
- Experimentation for practical use of automatical meter reading		Yes

17. Laboratory of Sanitary Engineering
Department of Civil Engineering
Technological University of Delft
Stevinweg 4
DELFT
The Netherlands

Project title	Name of project leader	Papers/rr
- Coagulation in water treatment	Ir. A.N.v.Breemen	No
- Upward flow filtration	Ir. A.N.v.Breemen	No
- Multi-layer filtration	Ir. P.P.C.M. Laurijssens	No
- Activated carbon filters in water treatment	Ir.J.G.den Blanken	No
- Bacteriological investigations of activated carbon filters	Ir.J.G.den Blanken	No

18. Research Institute for Public Health Engineering - TNO
Schoemakerstraat 97
DELFT
The Netherlands

Project title	Name of project leader	Papers/reports available for dissemination.
- Quality criteria for water and soil environment		Yes
- Pollution and self-purification of surface waters		Yes
- Pollution and self-purification of ground water and soil		Yes
- Quality protection of water and soil environment		Yes
- Physics, chemistry and biology of decomposition		Yes

19. Study and Information Centre TNO on Environmental Research

P.O. Box 186

DELFT

The Netherlands

Project title	Name of project leader	Papers/reports available for dissemination.
<ul style="list-style-type: none"> - Inventory of the environmental research carried out in the Netherlands 	Mr. L. de Lavieter	Yes
<ul style="list-style-type: none"> - Water pollution <ul style="list-style-type: none"> - registration of the actual situation; - development of technical and economical models. 	Mr. L. de Lavieter	No
<ul style="list-style-type: none"> - Waste water of the Dutch potato starch industry <ul style="list-style-type: none"> - biological aspects of the Eems-Dollard estuary; - technological aspects of the industrial process; - waste water treatment. 		To be published shortly
<ul style="list-style-type: none"> - North Sea and estuary <ul style="list-style-type: none"> - inventory of pollution caused by the rivers Rhine, Meuse and Scheldt; - physical, chemical and biochemical distribution of the pollution; - effect of the pollution on the ecosystem. 		No
<ul style="list-style-type: none"> - Inland water pollution <ul style="list-style-type: none"> - industrial processes; - advanced waste water treatment; - recycling and reuse; - economical aspects. 		No

20. National Institute of Public Health

Department of Sanitary Engineering and Environmental Pollution

Geitmyrsveien 75

OSLO 1

Norway

Project title	Name of project leader	Papers/reports available for dissemination.
- Trace elements in water resources especially B, Cd, Cr, Cu, Hg, Pb and Zn.	Mr. Ingvar Dahl	No
- The content of mercury and other trace elements in water in relation to water treatment	Mr. Jan Aug. Myhrstad	No
- Groundwater quality (major and minor constituents and trace elements) in relation to types of rocks and formations present	Mr. Jan Aug. Myhrstad	No
- Water quality of Lake Farris in relation to the natural conditions (geology, hydrology etc.) and the activities in the catchment area (especially agriculture)	Mr. Jan Aug. Myhrstad	No

21. State Institute of Hygiene
24 Chocimska Street
WARSAW
Poland

Project title	Name of project leader	Papers/reports available for dissemination.
<ul style="list-style-type: none">- Identification of certain organic compounds in water by freezing - Influence of hardness of water on lead cumulation in organism of warmblooded animals - Investigations of organic matter causing bad taste and odour of water - Decomposition of organic compounds in water by means of ozone - Investigation methods of influence of new material on water - Application of immunofluorescence for detection of certain pathogens in water		

22. National Institute for Water Research of the South African
 Council for Scientific and Industrial Research
 P.O. Box 395
PRETORIA
 Republic of South Africa

Project title	Name of project leader	Papers/reports available for dissemination.
- The storage and purification of water in the natural sand beds of the Cape Flats	Mr. M.R. Henzen	No
- Refinement of recognised pollution parameters for beaches and nearshore waters	Mr. W.D. Oliff	Yes
- Monitoring of the Durban effluent outfalls	Mr. D.J. Livingstone	Yes
- Pollution survey of rivers in the Western Cape	Mr. J.M. Fourie	Yes
- Industrial water and effluent management	Regional Officer, Bellville, C.P.,	No
- Investigation and advisory services to the Natal Provincial Administration	Dr. J. Hemens	Yes
- Pollution survey of the Upper Breë River	Mr. J.M. Fourie	No
- Reclamation of purified sewage and industrial effluents	Dr. L.R.J. van Vuren	Yes
- Refinement of unit processes and design aspects in the reclamation of sewage effluents for re-use	Dr. L.R.J. van Vuren	Yes
- Studies on full-scale reclamation of sewage effluents for re-use on the Stander Water Reclamation Plant	Dr. L.R.J. van Vuren	No

National Institute for Water Research of the South African
Council for Scientific and Industrial Research

PRETORIA

Republic of South Africa

continued

Project title	Name of project leader	Papers/reports available for dissemination.
- The efficiency of the unit processes in a multiple unit reclamation scheme to cope with shock loads and toxic substances	Mr. J.W. Funke	No
- Reclamation of sewage effluents by physical/chemical means	Dr. G.G. Cillie	Yes
- Reclamation of sewage effluent for industrial re-use at Bellville	Dr. G.G. Cillie	Yes
- Hydrochemistry of the Caledon, Orange, Fish and Sundays River, with special reference to mineralisation	Mr. P.T. Viljoen	Yes
- Special investigation of currents at Richards Bay	Mr. W.D. Oliff	No
- Synopsis of the diatoms of Africa	Dr. B.J. Cholnoky	No
- The ecology of the diatoms of the Caledon-Orange River system	Dr. F.R. Schoeman	Yes
- Growth potential of selected algae in relation to eutrophication		No
- Evaluation of human and animal pathogenic bacteria in hospital waste water, raw sewage, purified and reclaimed effluents and other water environments with special reference to <u>Mycobacterium tuberculosis</u>	Dr. W.O.K. Grabow	Yes

National Institute for Water Research of the South African Council for Scientific and Industrial Research

PRETORIA

Republic of South Africa

continued

Project title	Name of project leader	Papers/reports available for dissemination.
- The evaluation of human and animal pathogenic viruses in hospital waste water, raw sewage, purified and reclaimed effluents and other water environments	Mrs. E.M. Nupen	Yes
- Critical evaluation of existing methods to use algae to measure pollution	Mrs. K.H.C. Cholnoky	No
- The study of infectious hepatitis virus in water	Dr. W.O.K. Grabow	No
- A study of the main functional bacterial groups in waste water purification	Dr. D.F. Toerien	No
- Determination of conditions necessary for achieving optimum rates of bacterial denitrification	Mr. T.R. Davies	Yes
- The incidence and occurrence of Salmonellae in polluted waters, particularly the sea	Mr. D.J.Livingstone	Yes
- The systematics, larval correlations and instar characters of the Trichoptera	Dr. K.M.F. Scott	Yes
- Energy, nitrogen and phosphorous turnover by selected aquatic invertebrates in relation to eutrophication	Dr. A. Connell	No

National Institute for Water Research of the South African
Council for Scientific and Industrial Research

PRETORIA

Republic of South Africa

continued

Project title	Name of project leader	Papers/reports available for dissemination.
- Dissolved oxygen requirements of selected aquatic invertebrates in relation to eutrophication	Dr. R.G. Noble	No
- Comparison of gross nitrogen and phosphorous budgets in short sections of two streams, one high and one low in nutrients		No
- The evaluation of human and animal parasites in hospital waste water, raw sewage, purified and reclaimed effluents and other water environments	Dr. W.O.K. Grabow	No
- Development of methods to measure the toxicity of polluted water to fish	Mr. W.S.G. Morgan	No
- An evaluation of the long and short term effects of toxic pollutants in sublethal concentrations on fish	Mr. W.S.G. Morgan	No
- Biological accumulation of toxic compounds in the food chain from polluted waters	Mr. H.P. Hofmeyr	No
- The recovery and measurement of chemical residues from reclaimed water	Mr. J.J. van Huyssteen	No
- Development of specialized analytical techniques	Dr. W.H.J. Hattingh	Yes
- Chemical services to the National Physical Research Laboratory on	Mr. R.C. Stanton	No

National Institute for Water Research of the South African
 Council for Scientific and Industrial Research
PRETORIA
 Republic of South Africa

continued

Project title	Name of project leader	Papers/reports available for dissemination.
chemistry of the deep sea		
- Development of methods for effluent toxicity determination in estuarine and marine environments	Dr. J. Hemens	No
- Survey of selected estuaries to define the environment with a view to the development of pollution criteria for estuaries	Dr. J. Hemens	No
- Study of adsorption for the removal of residual COD from effluents purified by biological, chemical and physical methods	Mr. O.O. Hart	Yes
- Monitoring the disposal of effluents from Alusaf	Dr. J. Hemens	No
- River surveys in Southern Natal	Dr. P.H. Kemp	Yes
- Water map of the underground water resources in South West Africa with special reference to the utilization value of the water	Mr. G. Tredoux	No
- Disposal of mineralized effluents by irrigation	Mr. G. Murray	No
- Artificial run-off and storage of water supplies	Dr. D.H.R. Hellwig	No
- Desalination of sea water	Dr. S.G. Wiechers	Yes
- Solar distillation of brackish water	Mr. G. Tredoux	Yes

National Institute for Water Research of the South African
Council for Scientific and Industrial Research

PRETORIA

Republic of South Africa

continued

Project title	Name of project leader	Papers/reports available for dissemination.
- Application of algal systems for the treatment of organically polluted water	Dr. J. Hemens	Yes

23. Alaska Water Laboratory
Environmental Protection Agency
COLLEGE, ALASKA 99701
U.S.A.

Project title	Name of project leader	Papers/reports available for dissemination.
- Low temperature microbiological activity and dissolved oxygen; depletion	Mr. R.C. Gordon	Yes
- Winter survival of fecal indicator bacteria in a Subarctic Alaska River	Mr. R.C. Gordon	in preparation
- Low temperature disinfection	Mr. R.C. Gordon	No
- Social and economic impact of water supply and waste treatment facilities in Alaska Native villages	Mr. B. Puchtler	No

24. Institute of Water Resources
 The University of Connecticut
STORRS, CONNECTICUT 06268
 U.S.A.

Project title	Name of project leader	Papers/reports available for dissemination.
- Relative pollution strengths of undiluted waste material discharged in households and the dilution waters used for each	Dr. R. Laak	
- Use of interactive computer graphics in water resources planning and management	Dr. Y.T. Chien	
- A study of legal and administrative practices relating to lake pollution in the Northeast	Dr. W.C. Kennard Dr. R.I. Reis Dr. P. Goldstein	Yes
- The politics of water pollution	Dr. D.M. Fox	
- Ecological evaluation of multiuse waters receiving primary treatment effluent prior to a major flow increase	Dr. J.D. Buck	Yes
- Investigation of turbidity in estuarine waters	Dr. W.F. Bohlen	
- The quantity and movement of nitrates in soil water in two Connecticut soils treated with high and low levels of inorganic nitrogen fertilizer	Dr. G.F. Griffin Dr. R.W. Wengel	
- The velocity dependence of the total cross section for alkali-water scattering	Dr. T. Moran Dr. E. Pollack	Yes
- A chemical analysis of the earthy-musty odor in water	Dr. R.P. Collins	

Institute of Water Resources
 The University of Connecticut
STORRS, CONNECTICUT 06268
 U.S.A.

continued

Project title	Name of project leader	Papers/reports available for dissemination.
- Variation in diatom morphology and water pollution	Dr. F.R. Trainor	Yes
- Indicator species in the Desmid <i>Staurastrum</i>	Dr. F.R. Trainor	
- The analysis of tritium oxide from selected areas on the Connecticut River	Dr. D.M. Skauen	
- Combined buoyancy and boundary effects and aeration effects on jet spreading	Dr. E.K. Dabora Dr. R.L. Stoy	
- Water quality control with synthetic polymeric flocculants: effect of metal ions on flocculation of bio-colloids	Dr. J.K. Dixon Dr. R.C. Tilton	
- Efficient pricing for urban waste water renovation - Phase I	Dr. R.L. Leonard Dr. R. Laak Dr. H. Kardestuncer	
- Drinking water additives: physical growth and behavioral development of mice receiving chlorine and fluorine	Dr. J. Werboff	
- Chemical analysis and process classification of constituents of effluents (organic nitrogen in activated carbon effluents)	Dr. T. Helfgott	Yes

26. Water Resources Research Center
 University of New Hampshire
 James Hall
DURHAM, NEW HAMPSHIRE 03824
 U.S.A.

Project title	Name of project leader	Papers/reports available for dissemination.
<u>Inactive projects (terminated projects)</u>		
- An economic analysis of water supply and demand in the Piscataqua River watershed	Mr. R.H. Forste	Yes
- Estimation of household consumption of water	Mr. R. Andrews	Yes
- A compendium of water law and economics in New Hampshire	Mr. R.H. Forste and Mr. A.J. Kalinska	Yes
- An investigation of the stages of eutrophication of some of New Hampshire's large lakes	Mr. P.J. Sawyer	Yes
- Some of the effects of sublethal levels of DDT in the freshwater environment	Mr. P.J. Sawyer	Yes
- Chemical character of ground and surface waters in relation to soil weathering processes	Mr. F.R. Hall	Yes
- Numbers and types of microorganisms in stabilization pond effluents	Mr. L. Slanetz	No
- A study of algal populations associated with different levels of water quality in New Hampshire	Mr. A. Mathieson	Yes
- Detection and enumeration of viruses in natural waters	Mr. T.G. Metcalf	No
- Ultraviolet absorption and its possible relation to eutrophication in	Mr. D. Normandeau	No

25. Georgia Institute of Technology

ATLANTA, GEORGIA 30332

U.S.A.

Project title	Name of project leader	Papers/reports available for dissemination.
- A program for metropolitan water management	Mr.G.E.Willeke	No
- Georgia's water problems and related research needs	Mr.E.A. Laurent	No
- Managing municipal watersheds for water supply in Georgia	Mr. W.L. Nutter*	No
*Located at University of Georgia, Athens, Georgia		

Water Resources Research Center
 University of New Hampshire
DURHAM, NEW HAMPSHIRE 03824
 U.S.A.

continued

Project title	Name of project leader	Papers/reports available for dissemination.
in large New Hampshire lakes		
- Nitrogen content of drainage litter and soils in the vicinity of alder and white pine sites	Mr. N. Peterson	No
- The influence of wetlands on quantity and quality of streamflow	Mr. G. Byers and Mr. F.R. Hall	No
- Atomic fluorescence spectroscopy: a potential tool for trace analysis	Mr. D.W. Ellis	No
- The analysis of aromatic compounds in water using fluorescence and phosphorescence	Mr. D.W. Ellis	Yes
- Relationships of yield of ground water from dilled wells and types of bedrock in New Hampshire	Mr. G.W. Stewart	Yes
- Occurrence and characteristis of fractures in the crystalline rocks of Southeastern New Hampshire and their relationship to the yield of drilled water wells	Mr. G.W. Stewart	No
<u>Active projects</u>		
- Legal and economic evaluation of groundwater use in New Hampshire	Mr. G. Byers and Mr. R. Forste	No
- Changing environment of a water based recreational resource	Mr. C.T.K. Ching and Mr. G.E. Frick	No
- A study of algal populations associated with different levels of water quality in New Hampshire	Mr. A.C. Mathieson	No

Water Resources Research Center
 University of New Hampshire
DURHAM, NEW HAMPSHIRE 03824
 U.S.A.

continued

Project title	Name of project leader	Papers/reports available for dissemination.
- Impact of toxic clones of blue green algae on water quality as related to aquatic animals	Mr. P.J. Sawyer Mr. J.J. Sasner	No
- Metal complexes of components of yellow organic acids in water	Mr. J. Weber	No
- Transport of animal viruses by clays and soil particles over ground and water surfaces	Mr. T.G. Metcalf	No
- Preliminary investigation of water quality of New Hampshire with emphasis on chloride and selected minor constituents	Mr. F.R. Hall	No
- Surface water pollution control studies: adsorption of complex organic molecules by suspended clay	Mr. R.D. Harter	No
- Tree water stress in relation to water yield in a Hardwood Forest	Mr. G.W. Gee and Mr. C.A. Federer	No
- Hydraulic fracturing of shallow water wells in crystalline rock	Mr. G.W. Stewart	No

27. Department of Civil Engineering
 University of Notre Dame
NOTRE DAME, INDIANA 46556
 U.S.A.

Project title	Name of project leader	Papers/reports available for dissemination.
- Hydrogeologic factors involved in predicting the effect of sanitary landfill operations on ground water quality	Dr. P.C. Singer	No
- Use of ozone and ultrasonics for the treatment of waste water	Dr. P.C. Singer	No
- Effect of domestic pollution abatement on eutrophic lake	Dr. M.W. Tenney	Yes
- Disinfection of algal laden waters	Dr. W.F. Echelberger Jr.	Yes
- Coagulation control using electrical conductivity	Dr. W.F. Echelberger Jr.	Yes
- Iron-organic interactions in natural waters	Dr. P.C. Singer	Yes
- Algal extraction by flocculative techniques	Dr. M.W. Tenney	Yes
- Removal of organic and eutrophying pollutants by combined chemical and biological treatment	Dr. M.W. Tenney	Yes

28. Water Resources Research Institute
 Mississippi State University
STATE COLLEGE, MISSISSIPPI 39762
 U.S.A.

Project title	Name of project leader	Papers/reports available for dissemination.
- Accumulation of suspended and flocculated sediment by oyster reefs in Mississippi coastal waters	Mr. Ch.M. Hoskin	No
- An appraisal of plans to meet the fresh water requirements of the Mississippi gulf coast area	Mr. D.C. Williams Jr.	No
- Geophysical mapping of the water table in eocene sediments: feasibility and reliability evaluation	Mr. F. Followill	No
- Flow characteristics within a channel boundary of coarse materials	Mr. J.C. MacWhorter and Mr. J.B. Allen	No
- A case study of the hydrogeologic conditions in the outcrop area of an aquifer	Mr. D.M. Keady	No
- Organizational goals and relationships in watershed development	Mr. J.H. Peterson	No

29. Clemson University
CLEMSON, SOUTH CAROLINA 29631
 U.S.A.

Project title	Name of project leader	Papers/reports available for dissemination.
- An economic study of alternative systems of distributing water supplies in a decentralized urban - industrial area	Dr. J.M. Stepp	No
- Biologic detection and control of water pollution	Dr. R.K. Guthrie	No
- Water distribution and movement in an unsaturated soil profile	Mr. J.T. Ligon	No
- Determination of the hydrologic effects of developmental changes in watersheds using aerial photographs	Mr. D.B. Stafford	No
- Water management in livestock waste handling systems	Mr. C.L. Barth	No
- Dilution capacity of small streams in South Carolina	Mr. W.E. Sharp	No
- The ecological effects of thermal stress on certain neuroendocrine-physiological systems of selected aquatic animals	Mr. A.S. Tombes	No
- Legal aspects of water use and control in South Carolina	Mr. C.H. Randall Jr.	
- Use of advanced water resources planning techniques in the development of regional water management programs	Dr. B.C. Dysart	

29. Clemson University

CLEMSON, SOUTH CAROLINA 29631

U.S.A.

continued

Project title	Name of project leader	Papers/reports available for dissemination.
- Administrative law, problems and potentials, in water resources planning for South Carolina (Phase 2)	Mr. C.H.Randall Jr.	No
- Effects of price level and price change upon the domestic use of water over time	Mr. J.M. Stepp	No
- Effects of cage culture of catfish upon water quality in reservoirs	Mr. H.A. Loyacano	No
- Private sector reaction to normal political institutional procedures and outcomes when water is an issue	Mr. H.E. Albert	No
- Effects of Santee-Cooper Rediversion Project and State Ports Authority's expansion on water quality in the Cooper River	Mr. B.L. Edge	No
- Restoring the quality of urban receiving waters: interfacing upgraded treatment facilities with the stream	Mr. T.M. Keinath	No
- Effect of nitrogen fertilizers and organic pesticides on the quality of ground water	Mr. T.C. Peele	No