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Fisheries Pêches and Environment Canada Canada

The Canada Water Act

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Fisheries and Environment Canada

Pêches et Environnement Canada The Canada Water Act

Annual Report

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Ministre Pêches et Environnement Canada

His Excellency, The Right Honourable Jules Léger, Governor General and Commander-in-Chief of Canada.

May it Please Your Excellency:

I have the honour herewith, for the information of Your Excellency and the Parliament of Canada, to present the Annual Report on the Canada Water Act for the fiscal year ended March 31, 1978.

Respectfully submitted,

Len Marchand Minister of State (Environment)



Deputy Minister Fisheries and Environment Canada

Sous-ministre Pêches et Environnement Canada

The Honourable Len Marchand, Minister of State (Environment), Ottawa, Canada.

Sir:

I have the honour to submit the Annual Report on the Canada Water Act for the fiscal year ended March 31, 1978.

Respectfully submitted,

J.B. Seaborn

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INTRODUCTION

The Canada Water Act, proclaimed on September 30, 1970, provides the framework for joint federal-provincial management of Canada's Water resources. Section 36 of the Act requires that a report on operations under the Act be laid before Parliament as soon as possible after the end of each fiscal year. This, the sixth annual report, covers operations to March 31, 1978.

The report first highlights the provisions of the Canada Water Act and then briefly discusses the individual programs which have been or are expected to be undertaken to meet those provisions.

A "special events" section contains brief descriptions of the drought experienced since September 1976 in western Canada and the outlook for relief from this drought in the spring of 1978. Table 2 is again included to indicate the current and projected release dates of final reports arising from Canada Water Act studies. Table 3, which is new, lists the brochure and maps released to date under the Flood Damage Reduction Program.

PROVISIONS OF THE CANADA WATER ACT

Part I of the Act provides for the establishment of formal federalprovincial consultative arrangements for water resource matters (Section 3); and for cooperative agreements with the provinces for the development and implementation of comprehensive plans for the management of water resources (Sections 4 - 7). This part also enables the Minister, directly, or in cooperation with any provincial government, institution, or person, to conduct research, collect data, and establish inventories associated with the water resources.

Part II envisages federal-provincial agreements where water quality has become a matter of urgent national concern. This part permits the establishment of joint federal-provincial incorporated agencies (although existing federal and provincial corporations might alternatively be used) to plan and implement approved water quality management programs.

Part III of the Act provides for the passing of regulations banning the manufacture or import for use or sale in Canada of any cleaning agent or water conditioner that contains a prescribed nutrient in a greater concentration than that prescribed by regulations. By providing for regulations to control phosphates in detergents, the Act provides one of the principal means of reducing the rate of eutrophication of water bodies.

Under Part IV are provisions for the general administration of the Act. In addition, it provides for inspection and enforcement, and permits the Minister, either directly or in cooperation with any government, institution, or person, to undertake public information programs.

ACTIVITIES UNDER THE CANADA WATER ACT

PART I: Comprehensive Water Resource Management Federal-Provincial Consultative Committees

To overcome the difficulties created by shared jurisdictional responsibilities for water resource planning and management in Canada, the Canada Water Act provides for the establishment of formal federal-provincial consultative arrangements on water resource matters. Specifically, these arrangements are met through federal-provincial consultative committees which are to maintain continuing consultation on water resource matters and to provide advice on priorities for research, planning, conservation, development, and utilization; and to both advise on the formulation of, and facilitate the coordination and implementation of, water policies and programs. All provinces have entered into consultative arrangements with the federal government.

During the year ending March 31, 1978, three Federal-Provincial Consultative Committees met: Canada-Manitoba (May 17), Canada-Alberta (September 28) and Canada-Saskatchewan (October 13). Matters discussed included federal-provincial water monitoring, flood damage reduction, flood risk mapping, international water studies of concern to the provinces, and a number of related federal-provincial agreements that were then either under way or under negotiation.

Interdepartmental Committee on Water

The Interdepartmental Committee on Water (ICW) was established before the Canada Water Act was passed to allow for the consideration and approval of all federal water programs. At that time, it was agreed that a permanent mechanism for reviewing programs and resolving interdepartmental conflicts on water programs would be set up. In 1973, Cabinet established the Interdepartmental Committee on the Environment (ICE), its mandate being to review the existing structures for interdepartmental consultation and coordination of all phases of environmental questions and related resource issues. This provided the mechanism for the formal adoption of ICW as a subcommittee of ICE, with a mandate to consider and make recommendations on any policies and programs dealing with water. Since then, ICW has actively pursued its mandate, having considered many of the more important water programs of recent years.

A total of 18 departments and agencies with an interest in water matters, are represented on this 25-man committee. Subcommittees and Working Groups are set up as required. During the year under review, there

were five such groups:

- 1) Subcommittee on the Great Lakes Water Quality Agreement
- 2) Subcommittee on Water Quality
- 3) Subcommittee on Flooding
- 4) Working Group on the U.N. Water Conference
- 5) Task Force on Droughts

Topics considered over the past year included: the long-term federal strategy in response to drought in western Canada; a Canada-Ontario Agreement on mercury pollution in the Wabigoon-English River system; a Mackenzie River Basin Study Agreement; and amendments to the Northern Inland Waters Act.

Federal-Provincial Agreements

In practice, when agreement has been reached on the need for a specific water resource program, the participating governments contribute funding, information, and expertise in agreed ratios. It is usual for the federal government to meet half the costs for planning agreements and the provincial government(s) the other half. Cost sharing for implementation is in proportion to federal and provincial responsibilities.

Progress in Water Planning and Management Programs

Table 1 shows a breakdown of current cost-shared agreements and other cooperative arrangements under the Canada Water Act and indicates the stage each has reached. Each of the programs is described briefly below and in greater detail later in this report.

<u>Implementation Programs</u>: Ten implementation programs are being reported on for 1977-1978, only one of which was new.

Based on a previous study of the flooding problem in the Marsh Creek Watershed (near Saint John, N.B.), a federal-provincial-municipal implementation agreement was signed on September 15, 1977. The total cost of this flood control agreement, \$2.01 million, is to be shared equally by the three levels of government.

Canada and Quebec entered into an Agreement Respecting Dykes and Flow Regulation Works in the Montreal Region, on October 4, 1976. In October 1977, both parties agreed to increase the funding required from \$5 million to \$10 million, and to extend the expiry date by two years to March 1980. By the year end, dykes had been constructed at Roxboro and Pierrefonds, were nearing completion at Pointe-Calumet and were being planned for Ste-Marthe-sur-le-lac. Studies were under way to add to the

Table 1 Status of Principal Implementation Agreements, Planning Studies, Flood Damage Reduction Programs and Other Cooperative Arrangements Under the Canada Water Act

IMPLEMENTATION AGREEMENTS

Under Negotiation

Saint John basin Lake Winnipeg, Churchill and Nelson Rivers

New during 1977-78 Flood Management - Marsh Creek, N.B.

Ongoing during 1977-78

Dykes and Flow Regulation Works, Montreal Region Lower Fraser Valley Flood Control Program Southwestern Ontario Dyking Upper Thames Agreement (CWCAA)* Okanagan basin Qu'Appelle basin Canada-Ontario Agreement on Lower Great Lakes Water Quality

Completed

Peace-Athabasca delta(1976) Metropolitan Toronto(CWCAA)*(1976)

PLANNING STUDIES

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Under Negotiation

Mackenzie River basin Waterford River basin(Nfld)

New during 1977-78

Lake Winnipeg Water Ouality

Ongoing during 1977-78

Souris basin St.Lawrence River Water Quality Northern Ontario Water Resources Shubenacadie-Stewiacke basin

Completed

Peace-Athabasca delta(1972) Ou'Appelle basin(1972) Saskatchewan-Nelson basin(1973) Okanagan basin(1974) Saint John basin(1975) Lake Winnipeg, Churchill, and Nelson Rivers(1975) Fraser River Upstream Storage(1976) Flow Regulation-Montreal Region(1976) Churchill River (Saskatchewan-Manitoba) (1976)

Under Negotiation

Programs with Nova Scotia. Alberta, British Columbia. and Yukon and NWT (DINA)

FLOOD DAMAGE REDUCTION PROGRAMS

New during 1977-78

Programs with Saskatchewan and Ontario New Brunswick Flood Forecasting

OTHER COOPERATIVE ARRANGEMENTS

Under Negotiation

Yukon River basin (pre-planning)

New during 1977-78

Winter River basin (PEI) Water Quality Monitoring. Garrison Diversion Project

Ongoing during 1977-78

Programs with New Brunswick, Ouebec and Manitoba Memorandum of Understanding on Flood Risk Mapping, NWT

Ongoing during 1977-78

Prairie Provinces Master Agreement on Apportionment Mackenzie River basin Lower Saskatchewan Basin Task Force (pre-planning) Water Quantity Survey Agreements Follow-Up Programs, Canada-Ontario Great Lakes Shore Damage Survey

Completed

Completed

Canada-Ontario Great Lakes Shore Damage Survey(1975)

*negotiated under the Canada Water Conservation Assistance Act

storage at Quinze reservoir and to provide a control structure on the Rivière des Mille Iles.

Construction programs were continued to reduce damages due to floods in the lower Fraser Valley of British Columbia and in southwestern Ontario. In the Fraser Valley, \$55 million of a total joint commitment of \$120 million has been spent by Canada and British Columbia up to the end of March 1978. The Southwestern Ontario Dyking Program, which was scheduled to expire in March 1977, and which received an extension in terms of both funds and time to March 1978, was granted a further one year extension to March 31, 1979.

In Ontario, two agreements that were entered into under the Canada Water Conservation Assistance Act have been continued under the Canada Water Act, to the extent possible within authorized funding. The Upper Thames Flood Control Agreement has been extended to January 24, 1979 and a request has been made by the province to extend the Metropolitan Toronto Flood Control Agreement also.

The Qu'Appelle and Okanagan Implementation Programs were ongoing during the year to implement recommendations arising from comprehensive basin studies. For the Canada-Saskatchewan Qu'Appelle Implementation Program, scheduled to run from 1975 until 1985, significant progress was made in flood control and sewage treatment. For the Canada-British Columbia Okanagan Implementation Program, the water quality monitoring program, initiated in 1976-1977, was continued, engineering and construction of flood control measures were started and a basin-wide sewage treatment plan was prepared.

The Canada-Ontario Agreement on Great Lakes Water Quality, as revised in January 1976, was continued in support of the Canada-United States Agreement on Great Lakes Water Quality. Provision for completion of research efforts initiated under the prior agreement were continued under this latest agreement, cost-sharing of surveillance activities was augmented and the scope of surveillance was extended to include the upper Great Lakes. This agreement provides for commitments by Ontario and the federal government to carry out the programs needed to meet the terms of the international agreement.

Manitoba Hydro and various provincial agencies continued to implement some of the recommendations contained in the final report arising from the study of environmental and social effects of the regulation of Lake Winnipeg and of the Churchill River diversion to the Nelson River.

Federal agencies are continuing water quality and water quantity monitoring, and a major fisheries research project on South Indian Lake, where diversion from the Churchill River begins. Discussions continued with Manitoba with a view to implementing recommendations requiring joint action. In addition, Canada, Manitoba, Manitoba Hydro and the Northern Subcommittee have signed an agreement that commits Canada and Manitoba to joint action and calls for annual reporting to northern communities on progress made.

An implementation agreement for the Saint John River basin has been under consideration for some time. A federal-provincial task force has reviewed the recommendations of the Saint John River Basin Board and has reported to the two governments.

The construction program to remedy the low water problems of the Peace-Athabasca delta was brought to completion in 1976 and monitoring studies on bison, waterfowl, furbearers, fish, and vegetation were initiated to determine the effectiveness of the mitigating works. These studies are being conducted and financed under regular programs by various federal and provincial agencies. Financing of an accelerated program, including water quality monitoring and improved fish passage facilities, is being considered.

<u>Planning Studies</u>: One new study agreement was signed and another came under negotiation in fiscal year 1977-1978, raising the number of studies either under way or under negotiation to seven. There were no planning studies completed during the year.

An agreement between Canada and Manitoba to carry out a water quality study of the Lake Winnipeg basin was signed on September 15, 1977. Before the year's end, the Study Board met and approved the hiring of a study director.

During the year, a new Canada-Newfoundland study was being negotiated to conduct a five-year hydrology study of the Waterford River basin (near St. John's) to examine the effects of urbanization on the water resources of the basin, and to develop criteria for urban development which minimize impacts.

A Memorandum of Understanding, which formalizes intergovernmental cooperation in the MacKenzie River basin was signed in September 1977 by seven ministers representing Canada, Alberta, British Columbia and Saskatchewan. A three-year Study Agreement, for studies scheduled to start early in 1978-1979, has been submitted to the respective Treasury Boards for approval and funding. (See also, Other Cooperative Arrangements)

Two planning studies that continued throughout fiscal year

1977-1978 are designed to develop framework plans for the management of the water and related resources in the Souris River basin and in the Shubenacadie-Stewiacke River basin. The Canada-Saskatchewan-Manitoba Souris Agreement was extended six months to June 30, 1978, to permit completion of the study and the final report. The Canada-Nova Scotia Shubenacadie-Stewiacke Agreement completed its first full year of operation. Several background studies were completed and others are in preparation. The Study Board issued an interim report and recommendations during the year. The study is expected to be completed by January 1979.

An Interim Report was released in 1976 on the Canada-Quebec St.Lawrence River Water Quality study which has as its goal a comprehensive water quality plan of the St.Lawrence River from the end of the international section near Cornwall, to the Gulf of St.Lawrence. The study was completed in March 1978, but the final report will not be available until June 1978.

Canada's share of the Northern Ontario Water Resources Studies was completed and reported on in the early 1970s. Field work for the Ontario share was largely finished in 1972 and several reports giving the findings of the study will be finalized late in 1978. Ontario Hydro has begun to assess the power potential of the lower Albany River based on the data in the federal reports as well as recent cost and hydrological data which have become available.

The Churchill River Study by Canada, Saskatchewan and Manitoba reported on the possible effects of the proposed Wintego dam on the natural environment of the area and on its inhabitants in May 1976. Public hearings by the Province of Saskatchewan relating to the report's findings were held in 1977.

Flood Damage Reduction Programs (1977-1978): During the year under review, this program was actively supported throughout most of Canada.

OBJECTIVE: The Flood Damage Reduction Program follows the cooperative federal-provincial approach of the Canada Water Act. It is aimed at reducing future flood damages by identifying risk areas and discouraging further flood vulnerable developments in those areas. A General Agreement with each province outlines the basic approach to reducing potential flood damage and a Flood Risk Mapping Agreement identifies areas to be mapped and permits joint funding of the mapping program. These are the first agreements that a province signs when joining the program.

Under the General Agreements, the respective governments commit themselves to (1) an agreement to carry out a flood risk mapping program

whereby lands subject to flooding would be clearly defined and (2) a number of policies to restrict government undertakings and programs on lands subject to flooding. The governments agree not to engage in or provide financial assistance to undertakings in areas designated as flood risk areas. Application of the disaster assistance program will also be restricted in designated flood risk areas. Only existing structures and, under certain circumstances, new structures which are flood-proofed, would be eligible for disaster assistance. Information linked with designated flood risk areas will be made available to governments, agencies, zoning authorities and the public. Zoning on the basis of flood risk will be encouraged.

Existing developments in designated areas will still require protection against flood damages and, for this reason, further agreements to study such problems can also be negotiated with the provinces. Where benefits exceed costs and where there is a national interest, federalprovincial agreements may subsequently be reached on implementation action. This action could include flood forecasting and warning, flood proofing, works to control flows and levels, acquisition of property, easements or land use planning. It should be noted that in examining alternatives, the best choice will be made on the basis of effectiveness, cost, associated benefits and environmental impact. This could mean allowing some flooding to occur.

DURATION: 10 years (starting dates vary from province to province; earliest date is 1976).

ENTITIES AND FUNDING:

CANADA

THE PROVINCES

The mapping and studies portion of the program, as originally approved, is to cost \$20 million, to be divided between the federal and provincial governments. Most of the \$20 million is to be spent on flood risk mapping.

Flood Proofing: Flood proofing techniques are being investigated with a view to suggesting standards. In due course, these techniques will be discussed with the Central Mortgage and Housing Corporation and the National Research Council for eventual adoption as national standards or guidelines for refitting old structures or building new ones.

RELATED AGREEMENTS: Several studies and implementation agreements dealing with separate flood prone areas in Canada were in force when the Flood Damage Reduction Program was launched. These include six flood risk mapping pilot projects and several agreements described elsewhere in this

report under the titles: Lower Fraser Valley Flood Control Program; Southwestern Ontario Dyking; Canada Water Conservation Assistance Act; Qu'Appelle Storage Study; Canada-Ontario Great Lakes Shore Damage Survey; Flood Management - Marsh Creek; and Dykes and Flow Regulation Works -Montreal Region.

STATUS: Progress by provinces and territory is as follows:

New Brunswick: On August 30, 1977, a Flood Forecasting Agreement was signed with the objective of developing a flood forecasting capability for the New Brunswick portion of the Saint John River basin. The total cost of \$600,000 will be shared equally by Canada and New Brunswick during the five-year life of the agreement. A Technical Subcommittee has been established under a Steering Committee to administer the agreement. Flood forecasts are now available and a flood forecasting center has been developed.

Flood risk mapping is being actively carried out in Fredericton, and in the Maugerville-Sheffield-Lincoln, Sussex and Walker Brook areas. *Nova Scotia*: Flood risk mapping of Truro was initially proposed as a pilot project under a work-shared agreement. However, anticipated increased funding necessitated a more formal agreement. It has been proposed that Nova Scotia sign both a general and a mapping agreement, with Truro as the first area to be mapped. Drafts of these agreements were being reviewed by the province.

Quebec: Mapping activities in Quebec were well under way with work being completed on 22 flood risk maps of the Montreal area and an accompanying public information brochure. The flood risk maps of the Gatineau and Chaudière basins were well advanced.

Ontario: An Agreement Respecting Flood Risk Mapping and Other Flood Damage Reduction Measures in the Province of Ontario was signed on March 31st, 1978. The Agreement is retroactive to April 1, 1977 and terminates on March 31st 1983. This agreement is different from others under the program in that it combines all aspects, (principles, mapping and other measures) in one agreement. An interim Steering Committee has been announced which will establish ground rules for the studies. Another feature of the agreement is the concept of one zone approach in delineation of flood prone areas.

The agreement calls for a total of \$9.2 million to be shared equally, with \$8.0 million allocated for flood risk mapping and \$1.2

million for other measures.

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Four flood risk map sheets have been produced for the Oshawa pilot project and a general brochure on flood damage in Oshawa is complete and will be released shortly.

Manitoba: Under the present Manitoba agreements, the Steering Committee has begun flood risk mapping in the communities of Elie, Starbuck, Sanford and LaSalle and Schedule A of the mapping agreement has been modified to include the St.Vital area of Winnipeg. A public information brochure for Manitoba has been printed as part of an overall public information program.

Manitoba is also considering two other agreements. One is an implementation agreement for the Ritchot area which makes provision for land acquisition, flood proofing and dyking. It is thought that this agreement will be a model for implementation agreements at other specific locations in the province. The second agreement being considered pertains to flood forecasting.

- Saskatchewan: Saskatchewan entered into a General Agreement Respecting Flood Damage Reduction Through Flood Area Management and an Agreement Respecting Flood Hazard Mapping and Studies on April 13, 1977. These agreements provide \$1.3 million for the mapping of 30 areas, 14 of which will involve studies costing an additional \$480,000. Costs will be shared equally between Canada and Saskatchewan. Steering and Technical Committees appointed to administer these agreements have been active in carrying out their duties. Mapping of Prince Albert, Moose Jaw and Regina has begun. Related public information activities are under way and a brochure for province-wide distribution has been printed.
- Alberta: Alberta has already completed much of the required flood risk mapping under its own program. Thus, the proposed agreement being negotiated with Alberta utilizes these maps and is expected to bind both parties to the basic approach of the overall program.

British Columbia: Negotiations with British Columbia are continuing. Yukon and Northwest Territories: Negotiations with DINA have resulted in

draft agreements for the Northwest Territories being prepared. They consist of 1) a Memo of Understanding between DFE and DINA consolidating the federal position and 2) General and Flood Risk Mapping Agreements between Canada and the Territory represented by the Commissioner for the Northwest Territories. Territorial towns to be mapped include Fort Simpson, Fort McPherson, Fort Good Hope, Aklavik and Hay River. Similar

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documents for the Yukon have been drafted.

The mapping at Hay River, being done under a two-year Memo of Understanding between DFE and DINA, was completed by the end of the fiscal year.

Indian Lands: Negotiations are continuing between officials from DINA and DFE regarding application of the Flood Damage Reduction Program on Indian Lands.

<u>Other Cooperative Arrangements</u>: This category includes programs which cannot be characterized entirely as implementation programs or planning studies. These programs are often of a continuous or long-term nature.

Water quality monitoring related to the Garrison Diversion Project was begun during the year to establish baseline water quality conditions on the Souris River where it crosses the International Boundary in both Saskatchewan and Manitoba. A work-shared agreement between Canada and Prince Edward Island to carry out an aquifer hydraulics and watershed management study in the Winter River Basin, near Charlottetown, was also begun. Phase I of this study is expected to be completed by June 1978, at which time the feasibility of a Canada Water Act agreement for subsequent phases will be assessed.

On the Great Lakes a Canada-Ontario Task Force completed the second year of a joint program to implement the recommendations of the Canada-Ontario Great Lakes Shore Damage Survey. Major programs in progress are shoreline monitoring, hazard land mapping, public awareness and a shoreland management study.

The shared-cost Water Quantity Survey Agreements, implemented with all provinces and the Department of Indian and Northern Affairs for the territories, effective April 1, 1975, is an ongoing program subject to 18 months written notice of termination by either party. Federal-Provincial Coordinating Committees established in each province and territory plan the hydrometric survey networks and determine the cost-sharing. A national meeting of all Coordinating Committees is convened each year to review annual progress reports and discuss problems arising under the agreement.

The Prairie Provinces Water Board, which administers the Prairie Provinces Master Agreement on Apportionment, continued to provide recommendations to Canada, Alberta, Saskatchewan, and Manitoba concerning the equitable apportionment of interprovincial prairie rivers flowing eastward. During the year, the Board's Committee on Hydrology recommended methods and networks for the determination of natural flow for five major basins on the prairies, and these are now being implemented. That Committee was also investigating the

mechanisms required to administer the apportionment agreement, and was studying apportionment possibilities of westward flowing streams. A review of existing water quality objectives was begun.

The Mackenzie Basin Intergovernmental Liaison Committee was formed in 1973 to gather information on the Mackenzie River basin, with the intent of determining what further studies should be undertaken. During 1977-1978, a Memorandum of Understanding was signed by seven federal and provincial ministers reaffirming cooperation of the entities involved (Canada, Alberta, British Columbia and Saskatchewan) and strengthening the role of the Committee. Also, the Committee's name was changed to the Mackenzie River Basin Committee and its membership enlarged to include representation from the Yukon and Northwest Territories. The Committee's endeavor to initiate a basin study is discussed in the section headed Planning Studies.

A pre-planning study to identify water management concerns needing further study in the lower Saskatchewan River basin was largely completed by Canada, Saskatchewan and the Lower Saskatchewan Basin Association and will be reported on in September 1978.

Pre-planning activities for the Yukon River basin have been initiated by the governments of Canada, British Columbia and Yukon Territory with a view to preparing a rationale and plan, if appropriate, for a subsequent cost-shared intergovernmental study agreement.

Activities Related to the Canada Water Act

Not to be overlooked in the review of operations under the Canada Water Act are various activities which are seldom objectives in themselves but indispensable tools in effective water planning and management. Socio-Economic Studies: Within the philosophy of the Canada Water Act, there lies the responsibility to develop the socio-economic techniques necessary to carry out studies and to provide technical advice in support of water management in Canada. During the year, efforts were continued to define planning and research techniques and to collect essential background data on water uses in Canada. Ongoing river basin planning studies and implementation programs, and the development of a national flood damage reduction program, provided a number of opportunities to apply these techniques during the year. Water Research: Some of the research undertaken by the department has included studies of non-point sources of water pollution including the atmosphere, land drainage, and drainage from urban centres; movement of pollutants through the aquatic environment; movement and action of water in lakes and reservoirs; physical characteristics and effects of moving ice; effect of gasoline leaks, sanitary landfill operation, radionuclide disposal,

irrigation practices, and open-pit mining on the quality of subsurface water; relationships between ground water quantity and related permafrost phenomena in the Canadian Arctic; and prediction of surface runoff from precipitation data. Priority areas of research supported in 22 Canadian universities through DFE's \$1,000,000 Water Resources Research Support Program included studies of economic, social and institutional aspects of water management, water quality problems, hydrologic modelling, subsurface contamination, and the hydraulics of water systems.

<u>Water Data</u>: Programs for the systematic collection and compilation of data on streamflow, water levels, sediment transport, ground water, water quality, and related information on glaciers, snow and ice predated the Canada Water Act but have continued to operate in support of water management basin studies and implementation programs. A relatively new innovation is the collection of background data on water use in Canada.

Data Management Systems: Numerous data and reference systems have been developed in support of water resource activities. WATDOC, the water resource document reference centre, gives direct access nationwide to a variety of water related data bases through a publicly available on-line interactive storage and retrieval system. GOWN, the ground water data storage, processing, and retrieval system, was developed to enlarge the scope and flexibility of the retrieval functions and to develop capability to deal with interconnected ground water and surface water systems. NAQUADAT, the national water quality data bank, was designed to accept chemical, physical, bacteriological, biological and hydrometric data relevant to water quality for surface waters, ground waters, wastewaters and sediments. STAR, a data storage and retrieval system, was developed to handle limnological data from Great Lakes monitoring cruises. WATENIS, the water effluent national information system, provides an inventory of industrial and municipal water pollution sources including data on physical, chemical, and toxicological characteristics of effluents and information on water effluent regulations and guidelines. MUNDAT, a data base covering municipal waterworks and wastewater systems from coast to coast, including data on federal facilities, was developed in close cooperation with the provincial governments and the Federation of Associations on the Canadian Environment (FACE). A Surface Water Data System has been developed to contain streamflow, water levels, and sediment transport information, and a Glacier Data and Information System has been designed to. contain a compilation of physical dimensions of Canadian glaciers and a bibliography of Canadian glacier documents.

PART II: Water Quality Management

No water quality management areas, as defined under Part II of the Canada Water Act, have been set up. However, there are a number of implementation programs by federal-provincial agreements under the Act, where water quality management programs are being implemented. These include programs in the Great Lakes basin and in the Okanagan and Qu'Appelle basins. While these agreements do not provide for the establishment of water quality management agencies under Part II of the Act, they nevertheless have the same objectives of maintaining and improving water quality and are managed by joint federal-provincial Boards. The federal government, in concert with provincial governments, is in the process of completing the development of comprehensive water resources management plans, including water quality management strategies, for several major Canadian river systems including the St. Lawrence (Quebec), the Souris (Manitoba-Saskatchewan) and the Shubenacadie-Stewiacke (Nova Scotia).

PART III: Regulating Nutrient Inputs

In the late 1960's, when phosphates from laundry detergents were identified as significant contributors to the degradation of some Canadian water resources, the federal government launched its phosphorus concentration control program for these products.

By 1970, regulations to control the amount of phosphorus in laundry detergents were written under the nutrient control provisions of the Canada Water Act. The initial regulations limited the maximum phosphorus content of laundry detergents to 8.7% elemental phosphorus by weight, expressed as 20% phosphorus pentoxide (P₂O₅) and an inspection program began under which product samples were collected from manufacturers and importers for government analysis. It is estimated that these first regulations resulted in a 22% reduction in the amount of phosphate discharged from all detergent sources (from 57,200,000 pounds to 44,000,000 pounds) per annum.

On January 1, 1973, a further reduction in the maximum permissible phosphorus content of laundry detergents came into effect. The revised regulations permitted a maximum of only 2.2% elemental phosphorus by weight, expressed as 5% P205. This further limitation is estimated to have reduced the pre-regulation levels of detergent phosphates discharged by 80% (from 57,200,000 pounds to 11,000,000 pounds) per annum.

In 1973 the inventory of detergent manufacturers and importers was updated and the inspection and sample collection program was reorganized

through the formation of a network of regionally-based Canada Water Act Inspectors. The new network was designed not only to improve the national collection of samples and update the inventory of manufacturers and importers but also to provide more direct day-to-day contact with regional manufacturers, importers and the public. Under the new regional system, a complete national sampling round has been carried out annually since 1973.

When the revised regulations and the new sampling system were first introduced, a number of violations were detected. These initial violations were committed by small manufacturers who were unaware of, or had misinterpreted, some aspects of the revised regulations. In some instances Canada Water Act Inspectors formally seized quantities of suspected products. In all instances, whether seizures were made or not, the companies concerned quickly rectified their errors and remained in compliance thereafter. Consequently, no formal prosecutions were recommended or undertaken as a result of these initial violations.

Since that time the few indicated violations which have occurred have generally been classified as "technical" violations where improper mixing, clean-up or analytical procedures have resulted in small batches of product exceeding the 2.2% limit by fractional amounts. Once discovered, all such occurrences have been quickly corrected. It should be noted that none of the larger Canadian manufacturers of nationally advertized laundry detergent brands, which make up the bulk of Canadian retail sales, have been involved in these incidents.

During 1975, the decentralization of laboratory analysis was begun with a view to significantly improving the speed with which the official analysis is performed and the results become available to inspectors, manufacturers and importers. In 1976 all analyses were conducted by newly designated regional analysts in regional laboratories and a significant time improvement resulted.

In addition to the required sampling and analysis of laundry detergents, other cleaning agents which are not regulated at present are analysed for informational purposes from time to time, improved methods of analysis are developed and the development of acceptable new low and non phosphate products by industry is monitored. In 1975, a dishwasher detergent survey was carried out and, in 1976, an improved automated method of analysis was published.

Reformulation of laundry detergents to comply with the phosphorus limit has resulted in the use of large quantities of alternative builders.

By far the most common substitute is nitrilotriacetic acid (NTA). The resulting presence of this synthetic substance in the Canadian environment, and more specifically in drinking water, is the subject of a continuing nationwide monitoring program to ensure that NTA concentrations in the environment stay as low as predicted.

Rapid biodegradation of NTA in the environment has been demonstrated by the many samples taken from drinking water supplies and from lake, river, marine and ground waters. To date 2,200 samples have been analysed. In most samples, NTA concentrations were below the normal detection level of 10 parts per billion (ppb), though a few ground water samples, also highly contaminated by other substances, produced readings up to 50 ppb. The latter level is still several orders of magnitude less than concentrations which had earlier raised concerns for public health though the evident contamination of these ground water wells with untreated sewage raises other public health concerns.

The search for acceptable substitutes for phosphates is continuing with the object of finding clean and effective materials which are readily biodegradable. Several promising substances are undergoing appraisal.

PART IV: Public Information Programs

The flood damage reduction program continued to be the main focus of information activities during 1977-1978 to increase public awareness of the potential hazards of flood plain development and of the ways in which governments are dealing with flood problems.

A press release was issued on April 18, 1977, announcing the signing of flood damage reduction agreements by Saskatchewan and the federal government. On March 31, 1978, Ontario became the fifth province (along with New Brunswick, Quebec, Manitoba and Saskatchewan, in that order) to join.

Public service announcements were produced to be televised across the country. They tell the animated story of a man who builds a house on the flood plain only to discover through flood damage that he shouldn't be there in the first place. The announcements end by explaining how to obtain more information on the program.

A booklet, entitled Cutting Our Flood Losses, was produced for viewers requesting more information, and to serve as an introduction to the program for the general public. The brochure contains histories of floods in Canada, questions and answers on the program, and a mail-in card for further information. Another brochure, Keeping The Fraser From The Door, was produced to answer specific public information needs on flood damage reduction in

the Fraser Valley of British Columbia.

Work has begun on a display unit and slide show for the flood damage reduction program. The display unit will be available at headquarters and in the regions for use at conferences and meetings. The slide show is expected to be used by speakers to help them explain the program when they are in specific flood areas.

Printing of the first Montreal Region flood plain map was announced on May 4 and a report on ways to reduce flood damage in the Montreal Region was announced on September 2.

On September 27, a press release announced an agreement between Canada and Manitoba to study the water quality of the Lake Winnipeg basin within Manitoba.

On the Great Lakes, a joint federal-provincial program continued to make the public more aware of shoreline flooding and erosion problems. During 1977 and 1978 a second brochure in the "Coping with the Great Lakes" series was prepared and mailed to Great Lakes shoreline property owners. Several displays and presentations on shoreline management were made at conferences attended by planners and municipal officials. In addition, discussions continued with shoreline conservation authorities on the development of local public awareness programs.

SPECIAL EVENTS

Drought in Western Canada 1976-1977

Beginning in September 1976, the southern limits of Canada's western provinces entered a very dry period. An area of about 200,000 square miles extending into northwestern Ontario reported precipitation for the 8-month period from September 1976 to April 1977 which was 50% or less of the long-term average precipitation for that area. At many points in this area, the period had become the driest 8 months ever recorded. The winter snowpack accumulation in the mountainous areas in the headwaters of the South Saskatchewan River was also much less than average, with the result that the accumulated runoff for the period April to July 1977 for these headwaters streams varied from 30% to 65% of normal.

The atmospheric circulation which generated these conditions featured a high pressure ridge anchored over the Mackenzie Valley which redirected rain-carrying storms to the north and east. The pattern itself is not unusual; it often occurs for short periods, but its persistence for 8 months was unprecedented.

The effects of this period of dryness on agriculture can best be considered separately from its effects on other needs of society. An agricultural drought can come and go quickly; it might materialize after a few days or weeks of hot rainless weather, and it may be relieved by one good rain. Before a drought that affects all of society sets in, however, precipitation must be deficient for a period of months or even years. Once such a drought is established, it takes a much longer period to return to normal.

The atmospheric circulation changed abruptly in May 1977. The storms from the Pacific broke through and brought rain to most of the plains and northwestern Ontario. With the exception of parts of southern Alberta and southwestern Saskatchewan, the agricultural drought was broken. The May rains were copious, near record in many places, and presented a remarkable turnaround. Climatological statistics indicate the odds are 1 in 1,000 for this type of recovery in May.

However, while the agricultural drought was broken in most areas by the summer rains, the problem of water supply shortages remained. The long, dry spell drove streams, lakes, reservoirs, and wells to dangerously low levels, and even in areas where summer rains were above average, the recovery was limited. Although the dryness that began in September of 1976 has been of relatively short duration, runoff has been as low as during the

worst years in the 1930s. Record low flows were established on many streams.

Water storage reservoirs, which have been constructed over the years to increase the available water supply for irrigation, hydroelectric generation and municipal use, and to provide reserves for dry periods, were not recharged to their full capacity during the 1977 runoff period and were drawn upon heavily over the dry summer. As a consequence, by August, most reservoirs were well below their normal level for that time of year.

<u>Outlook</u>: At the end of March 1978, dugouts and small reservoirs fed by prairie snowmelt runoff were generally replenished. However, in southwestern Saskatchewan and southern Alberta, water in storage was sufficient for only one irrigation compared to the normal two or three. There has yet to be significant recovery of groundwater supplies as represented by wells, and continued water shortages can be expected in many areas which experienced problems in 1977. The forecasts of mountain runoff would indicate that the large storage reservoirs on the interprovincial streams should reach full supply level if normal precipitation conditions prevail over the next few months.

Although climatic conditions could again alter the current outlook, great improvement has been noted over 1977 in terms of surface water supply.

The Drought Problem: Drought affects water users as well as renewable aquatic resources. Major effects lie in water supply for energy generation and agricultural, municipal and domestic use; in degraded water quality; in international and interprovincial water apportionment and water transfer; in increased forest fire damage and in reduced economic and social benefits from inland fisheries.

A more reliable assessment of the implications of long-term drought conditions is now under consideration. This will require a much improved knowledge of many factors - the likelihood, severity and persistence of future droughts; the extent of water quality degradation and possible remedial actions; the extent to which water conservation practices can be improved and understanding of their potential effects on water demand gained; the potential for further development of the existing supply; and the impact of drought and drought alleviation measures on fisheries.

Table 2 CURRENT AND PROJECTED RELEASE DATES OF FINAL REPORTS ARISING FROM CANADA WATER ACT STUDIES

| Name of Study | <u>1977-78</u> | <u> 1978–79</u> | <u>After 1978-79</u> |
|-------------------------------------|----------------|-----------------|----------------------|
| Lower Saskatchewan Basin Task Force | | Sept.1978 | |
| Souris Basin | | July 1978 | |
| St.Lawrence River Water Quality | | June 1978 | |
| Shubenacadie-Stewiacke Basin | | Jan. 1979 | |

Available upon request from:

Director Water Planning and Management Branch Inland Waters Directorate Department of Fisheries and the Environment Ottawa, KIA 0E7

TABLE 3 FLOOD RISK MAPS AND RELATED INFORMATION

Fredericton, N.B. Pilot Flood Risk Mapping Project

- Flood Hazard Map, Northwest Sheet
- Flood Hazard Map, Southeast Sheet
- Flood Damage in Fredericton (brochure)

Carman, Manitoba Pilot Flood Risk Mapping Project

- Flood Risk Map
- Flood Damage in Carman, Manitoba (brochure)

Moose Jaw Pilot Flood Risk Mapping Project

- Flooding in Moose Jaw, Sask. (map and text)

Cutting Our Flood Losses (National Brochure)

Canada - Manitoba Flood Damage Reduction Program (Brochure)

Available upon request from: Publication Division

Publication Division Inland Waters Directorate Department of Fisheries and Environment Ottawa, KIA 0E7 PRINCIPAL FEDERAL-PROVINCIAL COOPERATIVE ARRANGEMENTS UNDER THE CANADA WATER ACT

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PRINCIPAL FEDERAL-PROVINCIAL COOPERATIVE ARRANGEMENTS UNDER THE CANADA WATER ACT

IMPLEMENTATION AGREEMENTS

1. SAINT JOHN BASIN (proposed)

<u>Objective</u>: To implement recommendations arising from the 1970-74 Saint John River Basin Study.

Entities:

CANADA NEW BRUNSWICK

- Status: A Federal-Provincial Task Force reviewed the recommendations of the Saint John River Basin Board with a view towards (1) assessing those recommendations which have already been implemented and (2) recommending an implementation program to the governments of Canada and New Brunswick. The Task Force has submitted its report to the two governments.
- 2. FLOOD MANAGEMENT MARSH CREEK, N.B.

<u>Objective</u>: To reduce the damage from floods in the Marsh Creek Watershed through acquisition of lands, construction of flood control reservoirs, channel improvements, excavations and changes in structures.

Entities and Funding: CANADA.....\$670,000 NEW BRUNSWICK.....\$670,000 CITY OF SAINT JOHN.....\$670,000

PriorStudies conducted under the Canada-New Brünswick GeneralAction:Agreement Respecting Flood Damage Reduction contained
recommendations for appropriate measures to reduce flood
damages in the watershed.

Status: Work is proceeding as scheduled under the agreement. Preparation for the calling of construction contracts is well under way.

3. DYKES AND FLOW REGULATION WORKS - MONTREAL REGION

<u>Objective</u>: To plan and construct dykes to prevent flood damage in the municipalities of Pointe-Calumet, Ste-Marthe-sur-le-lac, Roxboro and Pierrefonds; and to determine the feasibility of enlarging the storage capacity of the Quinze Reservoir, and of reducing the maximum flow of Rivière des Mille Iles to approximately 25,000 cfs by means of a control structure.

<u>Duration of Agreement</u>: October 1976 to March 1980 (extended) Entities and Funding: CANADA.....45%

QUEBEC......45%

MUNICIPALITIES 10%

(Total funding was doubled from \$5 million to \$10 million in October 1977)

Prior Action: Between June 1974 and October 1976, a study was conducted to determine the means of reducing the frequency of both flooding and extreme low water levels in the Montreal Region water bodies. The Committee on Flow Regulation which conducted the study, submitted an interim report in 1975 and its final report in October 1976. This new implementation agreement was signed in October 1976 on the basis of the recommendations in the interim report, because the extensive damage caused by floods in 1974 and 1976 in the Montreal Region made it important that these recommendations be implemented immediately. A Flood Risk Mapping Agreement signed at the same time as this Flow Regulation Agreement is discussed in the section headed Flood Damage Reduction Programs.

<u>Status:</u>

Dykes have been constructed at Roxboro and Pierrefonds, are nearing completion at Pointe-Calumet and are being planned for Ste-Marthe-sur-le-lac. Studies are under way to add to the storage at Quinze Reservoir and to provide a control structure on the Rivière des Mille Iles.

4. CANADA WATER CONSERVATION ASSISTANCE ACT - CWCAA (Repealed)

Pursuant to the CWCAA agreements, Canada has contributed financially towards the construction of major flood control and water conservation projects. In Ontario two agreements were extended to allow Canada to recover federal funds overpaid during land purchases. In this regard, a further extension of the Upper Thames Agreement to January 24, 1979, has been granted; in the case of the Metropolitan Toronto Agreement, which was to have expired on June 14, 1976, Ontario has requested a three-month extension (to September 14, 1976) to cover claims received past the expiry date.

5. CANADA-ONTARIO AGREEMENT ON GREAT LAKES WATER QUALITY

<u>Objective</u>: To provide a basis for implementing the Canada-U.S. Agreement on Great Lakes Water Quality in the Great Lakes basin by reaching agreement on water quality objectives, by accelerating investment in sewage treatment and by conducting research into treatment technology.

Duration of Agreement: January 1976 to March 31, 1980

Entities and Funding:

CANADA ONTARIO

The entities will each pay half the costs associated with the research and surveillance programs; the federal share of research over the two fiscal years 1976-77 and 1977-78 is not to exceed \$500,000; the federal share of surveillance was \$762,500 for fiscal year 1976-77. For each fiscal year, the total amount payable by Canada shall not exceed an amount to be agreed upon between Canada and Ontario, taking into account:

 (a) the recommendations made by the International Joint Commission respecting surveillance of the whole of the boundary waters;

- (b) the decisions taken, as a result of such recommendations, by the parties to the Canada-U.S. Agreement with respect to such surveillance;
- (c) the recommendations of the Board of Review.

An initial agreement from August 1971 to December 1975 authorized \$3 million for feasibility studies and joint sewage treatment technology research. Loans totalling \$250 million for sewage treatment facilities from CMHC and the Ontario Government were also called for in the initial agreement. (Funding for municipal sewage treatment is now the subject of a separate agreement with CMHC under the National Housing Act.)

Status:

Prior

Action:

Increased attention has been focused on the importance of water quality trend information in warning of developing problems and assessing the effectiveness of ongoing abatement programs. To this end, surveillance design and data analysis under the Agreement have been strengthened.

Because, as already noted, the Canada-Ontario Agreement is being undertaken to provide a basis for implementing the Canada-U.S. Agreement on Great Lakes Water Quality, a brief outline of activities under the latter agreement is also provided.

CANADA-U.S. AGREEMENT ON GREAT LAKES WATER QUALITY

Objective: To improve the quality of the water in the areas of the Great Lakes now suffering from pollution and to ensure that Great Lakes water quality will be protected in the future.

Duration of Agreement: continuous since April 1972

Entities:

CANADA UNITED STATES

<u>Commitment</u>: Approximately 99 per cent of the sewered population on the Canadian side of the basin is now served by adequate municipal wastewater treatment facilities. Thunder Bay is the only major municipality in which construction of municipal wastewater treatment facilities is still under way and it is expected to be completed in the near future.

Arrangement: The International Joint Commission was given primary responsibility for overseeing implementation of this international water quality agreement. The Commission has established a number of Boards, Committees and Reference Groups to carry out the various provisions of the agreement. Activities are carried out under four programs: Pollution From Land Use Activities Study, Water Quality Objectives, Regulatory Activities, and Surveillance.

Status:

Under the Surveillance program, 9 surveillance cruises of Lake Ontario and 6 water quality surveys of the international section of the St. Lawrence River were conducted. Reports on uses and sources of Lead and Phthalate Esters were completed. Progress was made in developing new and revising existing water quality objectives to ensure protection of the most sensitive and beneficial uses in the boundary waters of the Great Lakes.

A survey of the public's perception of the Great Lakes and their water quality was carried out at the request of the Water Quality Board of the International Joint Commission. The results of the survey will be reported by the summer of 1978.

All Pollution From Land Use Activities field studies have been completed and many individual study reports have been prepared. Drafting of the final report continued for presentation to the International Joint Commission in July 1978.

6. SOUTHWESTERN ONTARIO DYKING

<u>Objective</u>: To provide for the construction and reconstruction of dykes and associated control works for protection of agricultural lands in the southwestern Ontario Counties of Essex and Kent, and the Regional Municipality of Niagara.

| Duration of Agreement: | March 1974 to March 1979 (extended) | |
|------------------------|---|-----|
| Entities and Funding: | CANADA Department of the Environment Department of Agriculture | 45% |
| | ONTARIO Municipalities and/or | 45% |

Conservation Authorities...... 10%

(Federal expenditures to March 1978 totalled \$6 million. In 1976-77, Treasury Board approved a one-year extension and expenditure of a further \$2 million in federal funds to make effective any major construction under way. A further one year extension to March 1979 has been approved.)

Prior Commitment: For purposes of this agreement, the program shall include the cost of completing the work in excess of \$2,700,000 undertaken pursuant to the Agreement made on 30 May 1973 between Canada (Minister of Regional Economic Expansion) and Ontario for the repair and construction of dykes protecting agricultural land in the Townships of Harwick, Pelee and Mersea.

<u>Status</u>: Work was completed in Pelee, Mersea and Harwick Townships and in the Regional Municipality of Niagara. Work was completed in East Tilbury Township and was partially completed in Delta Township.

7. LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS (proposed)

<u>Objective</u>: To implement recommendations arising from the Lake Winnipeg, Churchill and Nelson Rivers Study.

Entities:

CANADA MANITOBA Prior Action: The Lake Winnipeg, Churchill and Nelson Rivers Study Board concluded the three-year, \$2,000,000 joint study with the release of the Summary Report (and eight Technical Appendices) on June 2, 1975. Thirteen of the 47 recommendations are of direct federal interest, ranging from water, fisheries, and wildlife to Indian affairs and navigable waters.

Status:

Manitoba Hydro and various Manitoba Departments are implementing some of the Study Board's recommendations which are a provincial responsibility. Fisheries and Environment (Canada) is continuing its water quality and water quantity monitoring, and has undertaken a major research project on the fisheries of South Indian Lake.

Discussions continued with Manitoba to promote joint implementation of recommendations, including establishment of an implementation board. A long-term ecological monitoring program was prepared for possible joint implementation under such an agreement.

8. QU'APPELLE BASIN

<u>Objective</u>: To implement recommendations from the 1970-72 Qu'Appelle Basin Study.

Duration of Agreement: October 1975 to 1985

 Entities and Funding:
 CANADA
 \$18,000,000

 SASKATCHEWAN
 \$15,700,000

(An additional \$10,400,000 will be available on a loan basis \$8,400,000 through CMHC and \$2,000,000 from Saskatchewan)

Status:

S: The Department of Regional Economic Expansion is acting as this project's coordinator. The Management Board established by the agreement ratified a number of implementation programs (which had been undertaken on an interim basis) for retroactive cost sharing.

Projects are proceeding under all sectors of the agreement. Projects essentially completed include flood control works for Regina, Lumsden and Tantallon, and Phase I of the Regina tertiary sewage treatment plant. Implementation plans to increase channel capacity in the Qu'Appelle River, and to provide a livestock pollution control program and a Moose Jaw flood protection program, are nearing completion.

Plans for developing the recreation and tourism potential in the Qu'Appelle Valley are under preparation.

9. OKANAGAN BASIN

Objective: To implement recommendations arising from the 1969-74 Okanagan Basin Study.

Duration of Agreement: February 1976 to 1981

Entities and Funding:

CANADA.....\$2,500,000 BRITISH COLUMBIA.....\$2,500,000

(Central Mortgage and Housing Corporation loans and grants of \$17 million, and funding under the provincial Sewerage Facilities Assistance Act will also be made available for construction of waste treatment facilities)

Status: Work is proceeding on all aspects of the agreement. Although implementation of some flood control improvements has been delayed by the need to obtain cost estimates, substantial construction is scheduled for 1978-79. Programs under the Implementation Agreement include improvement to three Okanagan River dams, improvement to the Okanagan River flood control channel, lowering of some Okanagan Lake and River water supply intakes, adjustment to the Kelowna Floating Bridge, studies of tributary watershed management, identification of erosion areas, monitoring to assess water quality improvements resulting from waste treatment programs, and a review of the framework plan.

> The Agreement also provides for construction of waste treatment facilities to achieve a minimum of 80% phosphorus removal from major urban and municipal outfalls. A plan has been prepared for orderly development of waste treatment facilities. However recent policy announcements by the province may require the complete removal of all waste bearing out falls from waters in the basin.

10. LOWER FRASER VALLEY FLOOD CONTROL PROGRAM

<u>Objective</u>: To provide protection from flooding of land in the lower reaches of the Fraser River Valley and other areas upstream by rehabilitating existing dykes, constructing new dykes, increasing river bank protection, and improving internal drainage facilities.

Duration of Agreement: 1968 to 1984 (extended)

Entities and Funding:

BRITISH COLUMBIA......50%

(Local authorities are responsible for providing construction and access right-of-way.)

In 1974, the federal government increased its contribution to the Flood Control Program and Storage Studies from \$18,000,000 to \$30,500,000 and British Columbia agreed to increase its share by the same amount. In fiscal year 1976-77, both parties agreed to a further increase in funding and to extend the expiry date. The new funding level is \$60,000,000 for each party, and the agreement has been extended to March 31, 1984.

Status:

Construction of dykes and floodboxes continued in Delta, Richmond, Chilliwhack, New Westminster and Pitt Meadows. Dyke construction commenced in Coquitlam and Abbotsford. Preparation of design for the construction of dykes in Surrey continued. The conceptual design for set-back dykes on the Vedder River was completed for consideration by the Advisory Board.

PLANNING STUDIES

2.

1. SHUBENACADIE-STEWIACKE BASIN

| <u>Objective</u> : | To examine crit and the interre proposals for and to maintain comprehensive quantity object resource-use st | tical problems affecting the water resources elationships of these problems; to develop interim measures to control critical problems n options for future action; and to develop a framework plan focusing on water quality and tives and complementary development and trategies. |
|---------------------|---|---|
| <u>Duration of</u> | Agreement: | August 1977 to January 1979 |
| <u>Entities and</u> | l Funding: | CANADA\$365,000 NOVA SCOTIA\$365,000 |
| <u>Status</u> : | Several backgro are in preparat the year, as re | ound studies have been completed and others tion. An interim report was issued during equired by the agreement. |
| ST. LAWRENCE | RIVER WATER QUA | na service de la construcción de la ALITY de la construcción de la const Internación de la construcción de la |
| <u>Objective</u> : | To prepare a co Lawrence River near Cornwall, | omprehensive water quality plan of the St. from the end of the international section down to the Gulf of St. Lawrence. |
| Duration of | <u>Agreement</u> : | May 1972 to September 1978(extended) |
| Entities and | Funding: | CANADA |

(The Statement of Intent called for a total expenditure of \$400,000 in 1972-73, while a further \$3,500,000 was originally authorized under the formal agreement. In October 1977, a further \$550,000 was authorized under the formal agreement)

- <u>Arrangement</u>: The program was initiated in 1972 on the basis of a Statement of Intent, pending a formal agreement. In subsequent years, it has been authorized under the formal agreement.
- Status: The study program undertaken in the Cornwall-Varennes reach in 1972-73 was extended to cover the Varennes-Montmagny reach in 1973-74, with some overlapping in the Cornwall-Varennes reach; in 1974-75, the program was extended to cover the Montmagny-Saguenay River reach, with overlapping in the Cornwall-Montmagny reach; since 1975-76, a major change in study emphasis was brought about - biological data were collected including content of toxic material in fish; fish spawning grounds and bird nesting sites were identified; and vegetative studies were advanced, including studies of algae and aquatic weeds.

The study was completed in March 1978 but the main report will not be ready until June 1978. It is expected that implementation programs and a continuing water quality monitoring program will be needed.

3. LAKE WINNIPEG WATER QUALITY

<u>Objective</u>: A study of the Lake Winnipeg basin for the purpose of identifying beneficial uses of Lake Winnipeg, water quality criteria needed for such uses, and the need for more data on tributary inflows; identifying present and future contaminants and methods of controlling contaminant inflows; developing a predictive model; and determining alternative approaches to managing the water's quality.

Duration of Agreement: 1977-1982

Entities and Funding: CANADA.....\$1,450,000 MANITOBA.....\$1,450,000

<u>Status</u>: A Study Board has been appointed and it has approved the hiring of a Study Director. Staffing was awaiting provincial action.

4. SOURIS BASIN

<u>Objective</u>: To formulate a framework plan for the management of the water and related resources of the basin.

Duration of Agreement: 1974 to June 1978 (extended)

The agreement was extended by six months to June 30, 1978.

| Entities and Funding: | CANADA | \$465,000 |
|-----------------------|--------------|-----------|
| | SASKATCHEWAN | \$269,700 |
| | MANITOBA | \$195,300 |

The federal government has committed another \$220,000 for studies on international aspects, raising the total funding to \$1,150,000.

<u>Status</u>: The Souris River Basin Study Agreement and the reporting deadline were extended to June 30, 1978.

The work assignments were grouped into nine study sectors and contractual arrangements have been made for each assignment. The nine sectors are: Public Involvement, Flood Damage Reduction, Water Supply, Water Quality, Agriculture, Water-Related Resources, Economic Studies, Evaluation, and Program Management and Coordination.

All work was essentially complete at Year's end and printing of the report was begun. Expenditures to March 31 totalled \$1,035,000.

5. WATERFORD RIVER BASIN

<u>Objective</u>: To examine the effects of urbanization on the water resources of the basin, and to develop criteria for urban development which minimize impacts.

Duration of Agreement: 5 years

Entities and Funding:

(Funding proposed: \$410,000)

Status: A proposal has been received from the Province of Newfoundland and is currently under review.

OTHER COOPERATIVE ARRANGEMENTS

1. CANADA-ONTARIO GREAT LAKES SHORE DAMAGE SURVEY FOLLOW-UP PROGRAMS

<u>Objective</u>: To implement recommendations arising from the Canada-Ontario Great Lakes Shore Damage Survey.

Duration of Agreement: 1976-1981

Entities and Funding: CANADA......50% ONTARIO......50%

Programs are carried out by the province and DFE or both on work-shared and cost-shared bases.

Federal and provincial expenditures in 1977-78 totalled \$260,000. Of this amount, \$100,000 was funded under the Canada-Ontario Great Lakes Shore Monitoring Agreement and the remainder was met from regular programs.

Status:

Implementation began in 1976 with the establishment of a Canada-Ontario Task Force. The major programs now being implemented are:

- flood and erosion area mapping
- shoreline monitoring
- public awareness
- shoreline management

Maps delineating flood and erosion prone areas on the Great Lakes have been completed. These maps and a guide describing their intended application are being distributed to all shoreline municipalities and conservation authorities for use in developing official plans and regulations governing fill and flood-lines. Copies of the maps and guides are also available to the general public.

Programs for shoreline monitoring and public awareness over a five-year period were continued for the second year.

In 1977, a shoreline management study was initiated to provide guidelines and methodologies for evaluating the feasibility, costs, and benefits of various shoreline management strategies for reducing future flooding and erosion damage. These methodologies are being developed and tested on an 18-mile study site at the western end of Lake Erie. At the conclusion of the study, in the fall of 1978, two reports will be published: a general guide for developing and evaluating shoreline management alternatives anywhere on the Great Lakes; and a report with specific recommendations for the study site.

2. PRAIRIE PROVINCES MASTER AGREEMENT ON APPORTIONMENT

<u>Objective</u>: The equitable apportionment of interprovincial prairie waters flowing eastward. The agreement and subsidiary agreements ensure one half the natural eastward flow of waters arising in or flowing through Alberta for Saskatchewan, and one half the eastward flow arising in or flowing through Saskatchewan for Manitoba.

Duration of Agreement: Continuous since October 30, 1969.

Entities and Funding:

CANADA ALBERTA MANITOBA SASKATCHEWAN

(Funding to be borne one half by Canada and one sixth by each of the provinces)

<u>Arrangement</u>: Schedule C provides for the reconstitution of the Prairie Provinces Water Board, whose responsibility is to oversee and report on apportionment of waters flowing from one province into another province; to take under consideration comprehensive planning, water quality management and other management problems referred to it by the entities concerned; to recommend appropriate action to investigate such matters; and to submit recommendations for resolution of the problems.

Status: The Board's Committee on Hydrology recommended methods and networks for the determination of natural flow for five major basins in the area. These were approved by the Board and are now in the process of implementation. The companion study on streamflow forecasting for the same five basins is being finalized for consideration by the Board. In addition, the Committee on Hydrology is investigating the mechanisms required to administer the Apportionment Agreement, and is studying apportionment possibilities of westward flowing streams. The Board has initiated action through its standing Committee on Water Quality on a thorough review and update of the existing PPWB Water Quality Objectives. The Board has embarked on a water demand study of the area as a necessary companion to a completed water supply study to aid in the planning of the water resources of the prairies. A Committee of the Board is studying the effect of apportionment on water rights issued on the southern prairies.

3. MACKENZIE RIVER BASIN COMMITTEE

Objective: To exchange information on potential water-related developments in the basin and to formulate a program of studies to gather data on the basin's water and related resources.

Duration of Agreement:

Continuous since 1973

Entities:

CANADA.....Dept.of Fisheries and the Environment, Ministry of Transport, Dept. of Indian and Northern Affairs, including representatives of the governments of the Yukon and Northwest Territories. ALBERTA BRITISH COLUMBIA SASKATCHEWAN

Prior Action: Following detailed examination of interjurisdictional water resource issues, the Committee, then known as the Mackenzie Basin Intergovernmental Liaison Committee, submitted a formal agreement to the Ministers of the participating governments, in May 1977, and received endorsation of a study program.

Status: A Memorandum of Understanding was signed in May 1977 reaffirming cooperation and strengthening the role of the Mackenzie River Basin Committee. The Committee was empowered to proceed with negotiations of a study program for the period 1978-81.

> A study agreement costing \$1,600,000 was before the respective Treasury Boards at year's end. A report on the study program will be published as soon as the study agreement has been signed and the 1978-1979 work plan approved.

4. WATER QUANTITY SURVEY AGREEMENTS

- <u>Objective</u>: To maintain a viable and efficient national water quantity survey network and to give recognition to joint federal and provincial responsibilities in this activity.
- <u>Duration of Agreements</u>: Agreements between Canada and each province were signed in 1975 and letters were exchanged between the Department of Fisheries and Environment (DFE) and the Department of Indian and Northern Affairs (DINA) agreeing to joint survey operations in the territories. The programs are continuous but there is a provision in each agreement that provides for termination on 18 months written notice.

Entities:

CANADA.....Department of Fisheries and the the Environment, and the Department of Indian and Northern Affairs representing the Yukon and Northwest Territories. ALL PROVINCES

Arrangements: This is a shared-cost program, with the federal government carrying out field and office procedures and invoicing the provinces quarterly. An exception is Quebec which operates its own program and invoices the federal government quarterly except for international and navigable waters, and waters crossing federal land in Quebec, which are surveyed by the federal government. DINA transfers funds annually to DFE for the territories' share of costs. Funding: 1977-78

Canada's Share \$10,527,000 Provinces' Share 2,158,000

Total Program Cost \$12,685,000

The Total Program Cost reflects the survey and overhead costs to the federal government (including the National Capital Region Component) and to all provinces except Quebec. Incorporated in the Total Program Cost is a federal payment of \$681,000 to Quebec, but not Quebec's own costs.

<u>Status:</u> Coordinating Committees, established for each province, convene annually to review the water quantity survey networks and determine annual cost sharing.

5. LOWER SASKATCHEWAN BASIN TASK FORCE (pre-planning)

<u>Objective</u>: To prepare an overview report on the Lower Saskatchewan River basin which would identify water management concerns needing further study.

Duration of Agreement: September 1974 to 1978 (extended)

Entities:

CANADA Saskatchewan

LOWER SASKATCHEWAN BASIN ASSOCIATION

- Status: The target date for completion of this Task Force assignment for presentation to the Canada-Saskatchewan Consultative Committee has been extended to 1978. Publication of a report is scheduled for September 1978.
- 6. WINTER RIVER BASIN (pre-planning)
 - <u>Objective</u>: To carry out preliminary data acquisition and assessment on the aquifer hydraulics of the basin. This work will form the basis of subsequent studies to determine the reliability of the existing water supply system for Charlottetown.

Duration of Agreement: March 1977 to July 1978

Entities:

CANADA PRINCE EDWARD ISLAND

- <u>Status</u>: This study is being carried out under a work-shared arrangement. Phase I of the program will be completed by July 1978, at which time the feasibility of funding further work under the Canada Water Act will be assessed.
- 7. YUKON RIVER BASIN (pre-planning)

<u>Objective</u>: To prepare a rationale and plan, if appropriate, for a subsequent cost-shared intergovernmental study agreement.

Duration of Agreement: 1978-1979

Entities:

Status:

CANADA....Dept. of Fisheries and Forestry Dept. of Indian and Northern Affairs BRITISH COLUMBIA YUKON TERRITORY

Water officials in the basin have become concerned with conflicts which are developing among mining, hydro, parks, energy and transportation. The Departments of Fisheries and Forestry, and Indian and Northern Affairs have set up an informal preplanning task force to deal with water and related resources in the basin. British Columbia officials have been invited and have accepted a role on the task force.

8. WATER QUALITY MONITORING RELATED TO THE GARRISON DIVERSION PROJECT

Objective: To establish baseline water quality conditions on the Souris River at the International Boundary in both Saskatchewan and Manitoba by means of continuous and automatic monitoring equipment.

Duration of Agreement: Continuous since 1977.

Entities:

CANADA

<u>Status:</u>

Two monitors have been installed and are operating. Preliminary studies undertaken to determine natural variability in selected parameters to permit assessment of the effects of the Garrison Diversion Project on the quality of the Red River.