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1978/79

**Prairie
Farm
Rehabilitation
Administration**

ANNUAL REPORT 1978-79



**Government
of Canada**

**Gouvernement
du Canada**

**Regional
Economic
Expansion**

**Expansion
Économique
Régionale**

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FARM
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ADMINISTRATION**



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Cat. No. RE 21-1/1979
ISBN 0-662-50603-0

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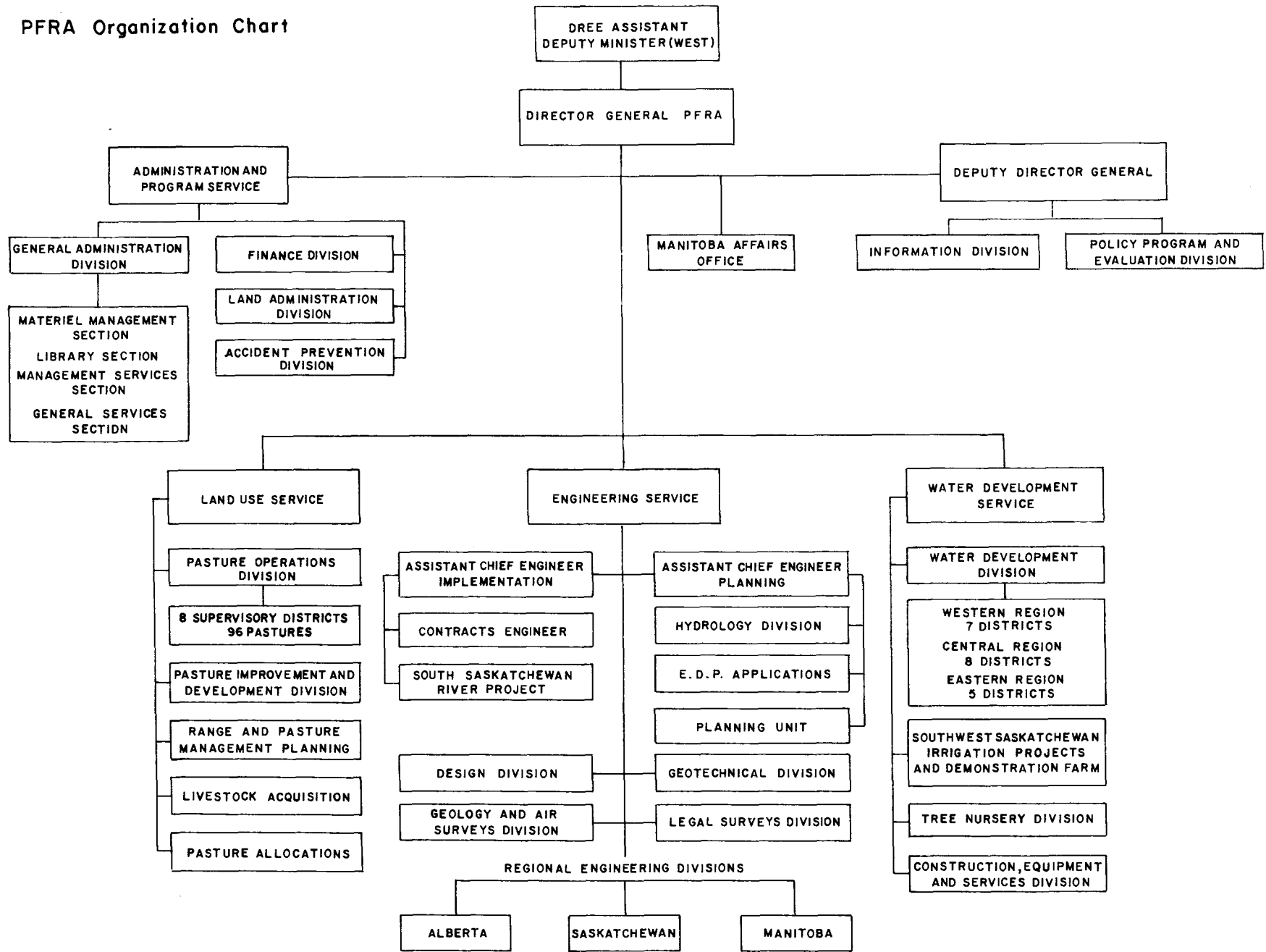
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HIGHLIGHTS OF THE YEAR

- Fears of a prolonged drought, brought about by a serious shortage of precipitation and lack of runoff in the spring of 1977, were laid to rest, at least temporarily, by adequate moisture during 1978-79. Emergency drought activities were phased out, allowing operations to return to normal.
- A Manitoba Affairs office was opened in Winnipeg. The Director will provide federal-provincial liaison and be responsible to PFRA's Director General.
- The \$8.1 million Brooks, Alberta, Aqueduct was ready for hydrostatic testing this spring.
- Drawings and specifications for repairs to the Bassano Dam, the final and probably the most expensive portion of the Alberta Irrigation Rehabilitation Program, were essentially completed.
- The \$2.2 million Vermilion Dam in Riding Mountain National Park, Manitoba, was completed. The reservoir it creates will be operational in 1979.
- Operation and maintenance of the Gardiner and Qu'Appelle River Dams, key structures in the South Saskatchewan River Project, were to have been taken over by the Government of Saskatchewan, March 31, 1979. By agreement, PFRA will continue to manage the operation for five more years at provincial expense.
- Three community pastures developed and operated by PFRA on Indian reserve lands were handed over to Indian Band Councils.
- The Agricultural Service Centres Agreement Program continued at a total cost of \$6.3 million. Of this money, half grant and half loan, \$1.5 million was spent in Manitoba, \$4 million in Saskatchewan and \$0.8 million in Alberta.
- A mission to Pakistan was headed by PFRA at the request of the Canadian International Development Agency (CIDA). The purpose of the mission was to investigate the feasibility of establishing a research station in Sind Province to carry out practical research and demonstrations related to on-farm water management, land reclamation and increased agricultural production. A draft report recommending such a facility was submitted to CIDA.
- Performance measurement and program evaluation of many PFRA activities began. This undertaking is intended to yield recommendations to improve PFRA services.
- A Canada-Saskatchewan Interim Subsidiary Agreement on Water Development for Regional Economic Expansion and Drought Proofing was negotiated. The Agreement provides for the identification of economic development opportunities consistent with water supply constraints. Sensitivity of the prairie economy to drought will be determined. The economic development and drought sensitivity studies will be utilized for the formulation of a long-term development strategy. Also included in the Agreement is a provision for the con-

struction of several community water storage and delivery schemes and projects aimed at reducing damages due to flooding in the Souris River Basin. The Agreement is expected to be signed early in the fiscal year 1979-80.

PFRA Organization Chart



THE ORGANIZATION OF PFRA

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The Deputy Director General is responsible for the Information and Policy, Program and Evaluation Divisions. The latter Division undertakes studies and makes recommendations on program and policy matters affecting PFRA and is responsible for undertaking and co-ordinating performance measurement and program evaluation of PFRA's long-standing programs as required by Treasury Board.

The Land Use Service is responsible for the management of the PFRA Land Use Program. The Operations Division manages the pastures. The Pasture Improvement Division is responsible for all construction and maintenance on the pastures. The Range and Pasture Management Planning Division advises the Service Chief on range management issues. The Livestock Acquisition Division acquires and maintains the PFRA bull inventory and the Pasture Allocations Division advises on the allocation of pasture privileges to applicants.

The Water Development Service administers the On-Farm Water Supply Program and a Community Projects Program through the Water Development Division. It also encompasses the Construction, Equipment and Services Division, Southwest Saskatchewan Irrigation Projects Division, the Demonstration Farm at Outlook, Saskatchewan, and the Tree Nursery at Indian Head, Saskatchewan. Service staff also prepare reports for the Federal Task Force on Drought on prairie moisture conditions.

The Administration and Program Service provides support to all elements within PFRA. Included are Accident Prevention, Library, Finance, Materiel, Records Management, Data Services and Land Administration sections and divisions.

The PFRA Engineering Service investigates, plans, designs, and is responsible for construction and maintenance of various works pertaining to water development, irrigation and community infrastructure programs. It provides technical assistance to the various PFRA offices including those responsible for the operation and maintenance of projects in which the federal government retains an interest. The Engineering Service also assists several outside agencies, such as the International Joint Commission and the Prairie Provinces Water Board which are engaged in studies of major river basins of interprovincial or international scope.

The offices of the regional divisions of the Engineering Service, located in Winnipeg, Regina and Calgary, are responsible for the delivery of engineering programs in their provinces. Specialized engineering divisions supplied extensive services in investigation, planning, hydrology, design, geology, air surveys, geotechnical evaluation and construction for all of these projects.

The Geotechnical Division is at the University of Saskatchewan, Saskatoon. The headquarters of all other specialized divisions are in Regina. The Saskatchewan Regional Division maintains a district office at Swift Current. A special project office is at Cutbank, Saskatchewan, to operate and maintain the South Saskatchewan River Project.

PFRA is a highly integrated agency. Although each operational unit has a specific function, each serves other units within PFRA. Service units of particular importance for internal support are the Engineering Service, the Construction, Equipment and Services Division and the Administration Service. See Figure 1.

Performance Measurement

In 1978-79, a draft report was completed on performance measurement of all Services of PFRA. This first attempt at performance measurement emphasized the need for additional data in various program areas to improve management decision making.

Program Evaluation

Government policy requires that programs be evaluated on a three-to five-year basis to determine their effectiveness in meeting their objectives and the efficiency with which they are being administered. Most of PFRA's programs, which have been in effect since the late 1930's and early 1940's, have not been subjected to a formal evaluation.

During the year, study designs were initiated for the evaluation of several of PFRA's programs including:

1. PFRA Tree Nursery Program
2. Community Pasture Program
3. Southwest Irrigation Project
4. Water Development Program
5. Outlook Demonstration Farm

Special Studies

Directives from Treasury Board required that studies be undertaken with respect to cost recovery of the Community Pasture Program and the Tree Nursery Program.

The Community Pasture Study resulted in the recognition by Treasury Board that community pastures serve two objectives:

- (1) conservation of lands unsuitable for cultivation,
and
- (2) provision of grazing facilities.

As a result of the study, pasture patrons will, in future, be assessed the full costs of grazing as well as any capital expenditures associated with improvements to the grazing resource.

The study of the Tree Nursery Program showed that recovery of costs of tree seedlings was impractical and that planting and maintenance costs experienced by recipients of seedlings, primarily farmers, exceed Canada's costs of production. Also, the benefits derived from soil and water conservation through the establishment of plantings are regional and national in nature and profit successive generations.

SOIL AND WATER CONSERVATION PROGRAMS

The major soil and water conservation programs administered by PFRA include the Land Use Program, On-Farm Water Program, Tree Nursery, Southwest Saskatchewan Irrigation projects and the Demonstration Farm at Outlook. Programs under this heading involving significant engineering content are discussed under Major Engineering Programs.

LAND USE PROGRAM

PFRA managed 96 pastures on 952 767 ha in the Provinces of Manitoba, Saskatchewan and Alberta. Seven pastures in Saskatchewan and two in Alberta were on Indian reserves. At the conclusion of the 1978 grazing season, two pastures in Alberta and one in Saskatchewan were transferred to the respective band councils for future management.

After the low-precipitation years of 1976 and 1977, grazing conditions generally returned to normal in 1978. Grazing was provided for 147 985 adult cattle compared to an estimated carrying capacity of 156 315. These cattle were owned by 1 257 patrons in Manitoba, 3 677 in Saskatchewan, and 281 in Alberta. Grazing privileges in PFRA pastures are determined on a point system which takes into account individual need and is related to each applicant's owned, leased or rented land resources.

PFRA continued to provide pasture breeding service. In 1978, 101 167 cows were put in the breeding fields and service was provided by 2 979 PFRA-owned bulls and 652 bulls rented from pasture patrons. During the year, PFRA purchased 704 bulls for total of \$1 334 445. The breeds were: 587 Hereford, 89 Charolais, and 28 Angus. Hay harvested to provide winter feed for PFRA bulls amounted to 10 535 tonnes.

Pasture fees are computed on a per diem basis to cover annual operating costs. There was no change in fees in 1978-79 from the previous year:

Cattle	head/day	\$0.12 (includes 1c municipal levy)
Calves	head/season	\$5.50
Horses	head/day	\$0.15 (includes 1c municipal levy)
Colts	head/season	\$6.50 (of current year, born before August 1, with dam)
Ewes	head/day	\$0.02 (includes 0.3c municipal levy)
Lambs	no charge	
Breeding Fee		\$13.00 for each cow placed in breeding field

Construction was completed in the Suffield Military Reserve, Alberta, on the Queenston Pasture and the Falcon Area, an extension of the #1 pasture.

Investigations and planning were conducted on the Sirko Project at Vita, Manitoba.

A summary of resource development work completed during the fiscal year is provided in Table 1.

TABLE 1

LAND	
Repiling windrows	444 ha
Knocking down and piling	425 ha
Breaking or preparation	809 ha
Forage seeding	8 238 ha
Weed and brush control	14 075 ha
Fertilizing	202 ha
Irrigation structures	6
STOCKWATERING	
Wells	19
Springs — new	2
Dugouts	41
Dugout cleanings	42
Dugouts lined (Bentonite)	4
Dugouts — pumping	5
Windmill relocation	4
Electric power	2
Steel troughs installed	153
CONSTRUCTION	
Fence construction	172 km
Fence rebuilding	198 km
Texas gates — new	8
Corral repairs and extensions	5
House renovations (Manager)	5
Rider dwellings	8
Rider dwellings renovations	3
Barn repairs	1
Barns — new	2
Garages	5
Garages renovations	2
Other buildings	5

WATER DEVELOPMENT PROGRAM

The On-Farm Water Supply Program provides technical and financial assistance in developing water supply and irrigation projects for individual farmers and ranchers.

This program covers wells, dugouts, small dams and individual irrigation schemes through a system of grants. Technical services include planning, field supervision, project design, plan preparation and construction supervision provided to individuals and small communities.

The Community Projects Program assists small urban communities and municipalities technically and financially in developing water supplies.

These programs are delivered through 20 district offices in the prairie provinces. Three districts are located in Manitoba, 10 in Saskatchewan and seven in Alberta.

On-Farm Water Supply Program

Very dry conditions during the fall and winter of 1976-77 resulted in increased federal assistance during the 1977-78 fiscal year. The limit on the number of grants individuals could receive was removed and the maximum grant for wells was increased from \$550 to \$1 500.

Above-normal precipitation during May and June, 1977, alleviated much concern, and by fall water tables throughout the prairies showed signs of recovery. On April 1, 1978, the on-farm policy reverted back to pre-drought levels. This resulted in a substantial decrease in the number of paid projects.

There was approximately a 40 per cent decrease in the number of financially assisted projects over 1977. The number of dugouts assisted decreased by 50 per cent, wells by 35 per cent and irrigation schemes by 17 per cent. The number of stockwatering dams assisted remained the same. A total of \$2.2 million was paid out under the program during the fiscal year (Table 2).

Small Community Water Projects

Financial and technical assistance is provided primarily to small urban centres and rural municipalities to create assured water supplies for domestic and agricultural use.

During the year preliminary investigations were carried out on 34 projects and 10 were constructed at a cost of \$125 000.

Feasibility studies involve detailed investigations of water use, consideration of alternate sources, soils evaluations and hydrology studies.

During 1978, PFRA established special agreements with nine rural municipalities in Manitoba. Under the agreements water supplies and pipelines are being developed and constructed at a maximum cost to Canada of \$15 000 each with the Province sharing the cost. Four of the nine projects approved for development were completed at an approximate cost of \$50 000.

The Deep Community Well Program of 1977-78 carried over into the 1978-79 fiscal year for projects previously approved. Payments totalling \$664 000 were made, covering 50 per cent of the cost of deep wells and pipelines, to a maximum of \$15 000 per project, as Canada's share. An amendment under the Deep Well Agreement provided assistance in transporting water overland and transporting or diverting water in emergencies.

TABLE 2

PFRA On-Farm Grant Program
Fiscal 1977-78 and 1978-79

	1977-78		1978-79	
	No. of Projects	Amount Paid	No. of Projects	Amount Paid
Dugouts	1899	618 889	958	327 725
Stockwatering Dams	113	41 895	115	40 023
Irrigation	180	101 111	150	85 680
Wells	6796	3 142 752	4425	1 748 014
TOTAL	8988	\$3 904 647	5648	\$2 201 442

Drought Monitoring

With the continuation of the Federal Task Force on Drought since the low precipitation period of 1976-77, PFRA has accepted the responsibility for monitoring and reporting to the Task Force on water supply conditions on the Prairies. Reports are prepared periodically on water supplies on farms and in communities with less than 2 000 population and on soil moisture and pasture conditions. Information provided by various federal and provincial agencies is included.

This program identifies general existing water supply conditions and forecasts areas where problems may develop. News releases are prepared on behalf of the Task Force.

SOUTHWEST SASKATCHEWAN IRRIGATION PROJECTS

PFRA has constructed 27 water storage and six irrigation projects in southwest Saskatchewan. Four reservoirs have been turned over to the Province. The remainder continue to be maintained and operated by PFRA.

Irrigation was provided for 15 739 ha of land, of which 9 403 ha were located in six federal irrigation projects; 3 971 ha on seven provincial projects, and 2 365 ha were irrigated under private water licenses. The City of Swift Current and the Towns of Gravelbourg, LaFleche and Eastend depend on PFRA reservoirs for water supplies.

Consul had only enough water for one irrigation. All other projects received their normal two irrigations.

Revenue derived by PFRA from the irrigation projects is primarily from water service charges, sale agreements and leases.

Rates for water service charges were increased in 1973 and 1976, with the 1976 rate of \$11.14 per ha still in effect. This was an increase from a rate for full irrigation service (storage, conveyance and distribution of water) of \$7.43 per ha.

With a few exceptions involving private holdings, PFRA's irrigation projects in southwest Saskatchewan were constructed on Crown land. For the most part, these were divided into 16 ha lots and provided with water from appropriate distribution systems.

Initially these lands were leased to farmers on an annual basis with an option to purchase the assigned lot at the end of the lease year. Under the purchase agreement, lands were held "in trust" for 99 years by Canada, however this policy has been amended and land titles are now being transferred to agreement holders on request following full payment of the sale price. The process takes from six to 12 months, depending on legal survey requirements. Irrigated and adjacent dry lands not sold remain leased to farmers in the project area. Table 3 shows the situation to March 31, 1979.

General upgrading, underway since 1970, was replaced by a reconstruction program following a 1974 study group report. Recommendations are being closely followed to increase efficiency of all systems, to maximize the delivery and application rates of water to irrigable land and to reduce the time required for irrigation. At the end of the fiscal year an estimated 85 per cent of the physical work was completed at a cost of \$1 757 463. Annual expenditures for the period 1970-71 to 1978-79 for work completed on the six irrigation projects average \$197 500.

TABLE 3
Number of Agreements Requested for Title
and Titles Issued to March 31, 1979

	Consul	Eastend	Maple Creek	Rush Lake	Val Marie	W. Val Marie	Total
Request for Title	15	6	16	20	55	17	129
Titles Issued	8	5	8	16	46	10	93

DEMONSTRATION FARM

The farm encompasses 63 ha adjacent to the Town of Outlook, Saskatchewan. It is a focal point within the South Saskatchewan River Irrigation Project where management techniques can be evaluated for a wide range of new and established crops. Different irrigation systems, canal linings and specialized agricultural equipment can be compared, and new trends in the beef cattle industry can be observed.

Agronomic demonstrations of horticultural and special crops were continued in a six-hectare plot in co-operation with Saskatchewan Department of Agriculture staff. Crops under test were: Jerusalem artichokes, kale, soybeans, asparagus, potatoes, carrots, rutabagas, onions, coriander, caraway, sweet corn and raspberries.

Corn silage was fed as the bulk of a finishing ration to 30 Hereford steers for 144 days. An overall average daily weight gain of 1.3 kg per head was recorded. The demonstration produced a profit of \$1 120 for the herd.

Table 4 details statistics on demonstration crops grown during the year.

TREE NURSERY

In the spring of 1978, 6.3 million tree and shrub seedlings were distributed to 8 566 applicants. Farm plantings accounted for 88 per cent while 10 per cent went to provincial and municipal agencies for watershed and wildlife plantings and other uses, and two per cent were supplied to federal agencies.

The highest demand, 3 681 000, continued to come from Saskatchewan, compared to 2 226 000 required by Manitoba, Alberta, British Columbia, and Ontario accounted for the remaining 420 000 seedlings.

Packing operations began April 18 and ended May 8, with 46 392 bales packed. Wet weather hampered activities but stock quality was excellent.

Deciduous trees planted in a 17 ha area included 900 000 willow cuttings and 776 000 poplar. In addition, 1 200 000 conifers were transplanted.

The grounds greenhouse has been converted to seedling container production of hard-to-grow species. A new cold storage building, capable of holding four to five million seedlings, is under construction and should be ready for use by fall, 1979.

Test plantings have demonstrated superior selections of Ponderosa pine and hybrid poplar. Shrub species test plantings were evaluated after 10 years. Chokecherry and hedge rose exhibited excellent growth. Storage studies of production species indicate that the best temperature for storage is between -2°C and 1°C. Evaluation for chemical defoliation of seedlings, to reduce storage mold, is nearing completion with several chemicals proving satisfactory.

Weed control studies have shown that a number of herbicides are safe for use on nursery crops. More than 80 per cent of nursery fields are treated with herbicides.

Detailed studies were started to attempt modification of soil texture, using additives, to improve soil drainage, and to evaluate nutrient needs to maximize seedling growth.

TABLE 4
DEMONSTRATION CROPS

Field	Crop	Field Size (Hectares)	Yield	Irrigation Water (m ³)
1	Confection Sunflowers	3.60	1 938.5 kg /ha	15 418.5
2	Bonanza Barley	2.00	7 723.0 dm ³ /ha	5 057.3
	Oilseed Sunflowers	0.81	1 640.8 kg /ha	5 057.3
3	Grain Corn	4.45	6 465.8 dm ³ /ha	13 074.9
4	Pinto Field Beans	4.45	1 944.3 kg /ha	6 167.4
5	Forage, Grass-Legume Mix	4.69	7.6 t /ha	8 511.0
6	Irrigated Pasture, beef	4.13	561.1 kg/ha	25 656.4
7	Mancan Buckwheat	4.94	1 903.8 dm ³ /ha	15 418.5
8	Triticale, rye-durum cross.	4.94	6 205.4 dm ³ /ha	12 581.5
9	Pinto Field Beans	1.21	1 944.3 kg /ha	14 431.7
	Navy Field Beans	0.40	1 097.6 kg /ha	14 431.7
	Great Northern Beans	3.24	1 007.9 kg /ha	14 431.7
10	Trapper Field Peas	4.94	2 406.7 dm ³ /ha	8 757.7
11	Grass-Legume, saline field	9.31	3.0 t /ha	22 449.3

Visits by staff were made to 1 057 farms and detailed planting plans were drawn up and sent to 504 of these. Demonstration plantings of three new species were established to illustrate their benefits to farmers.

Slide presentations were made to 49 organized meetings of farmers to show the benefits of shelterbelt planning and site maintenance. Staff prepared 13 radio tapes and participated in four television programs. New brochures on herbicide weed control, shelterbelt planning and shelterbelt species, and 16 news releases were prepared and distributed. A slide-tape program for use at large agricultural exhibitions was produced, and a detailed technical report on nursery activities was written, printed and distributed.

MAJOR ENGINEERING PROGRAMS

Major engineering programs include the Agricultural Service Centres Agreement (ASCA) Program, the Alberta Irrigation Rehabilitation Agreement Program, the Community Water Program, the maintenance of the Assiniboine dikes and other activities. The location of the major engineering projects carried out in 1978-79, with the exception of ASCA contracts, are shown in Figure 3. ASCA projects are shown in Figure 2.

Agricultural Service Centres Agreements (ASCA) Program

This Program provides financial and technical assistance for the construction of municipal water and sewer facilities. It was introduced in Saskatchewan and Manitoba in 1972 and will expire in 1982. In Alberta, it started in 1973 and expired March 31, 1979. The agreements providing for this Program designated 54 communities in the prairie provinces as being eligible for assistance.

The total financial commitment authorized by the federal government is \$54 million. Half of this sum is provided as grants and half as loans to the provinces. Approximately \$38.6 million has been spent to date.

Although most of the design work is performed by consulting engineering firms, PFRA makes substantial contributions in the form of engineering investigations, contract administration and construction supervision.

In Manitoba, ASCA construction valued at \$2.3 million was completed during the year. Of this, \$1.5 million was funded under the Program with the balance financed by the Province or the Central Mortgage and Housing Corporation. Of the \$20 million in program funds allotted to Manitoba, \$13.6 million has been spent to date. During the year, work was carried out at 11 of the centres eligible under the Program.

In Saskatchewan, \$4.0 million was spent on ASCA construction, of which \$3.9 million was funded under the Program. By the end of the fiscal year, \$19.2 million of the total \$28 million allocated to the Province had been spent. Supply and construction activities continued at 19 of the 26 designated centres.

In Alberta, ASCA construction was valued at \$0.8 million of which all but \$23 000 was funded under the Program. By the end of the fiscal year \$5.8 million of the \$6 million allocation had been spent. Construction activities continued at three centres in the Province, with two being completed during the fiscal year, bringing the total number of centres completed in Alberta to six.

PFRA was given responsibility for the design, contract administration and construction supervision work for raising the Crescent Creek Dam to increase the water supply for the City of Melville, Saskatchewan. Construction is expected to be completed next year. Also, under the ASCA Program, contracts for 1979 summer construction are being prepared for pumps and control equipment at the Vermilion Reservoir pumphouse and for pipeline installation from this pumphouse to serve the Town of Dauphin, Manitoba.

Community Water Projects Program

In March, 1973, the federal government made provision for the financing and construction of community water storage projects in the prairie provinces. Such projects are to meet municipal, domestic, agricultural and other water needs in rural areas.

Construction costs are shared equally between the initiating province and the federal government, with PFRA providing all engineering services for design and construction and the province providing the required lands. On completion of the projects, the province accepts full responsibility for operation and maintenance.

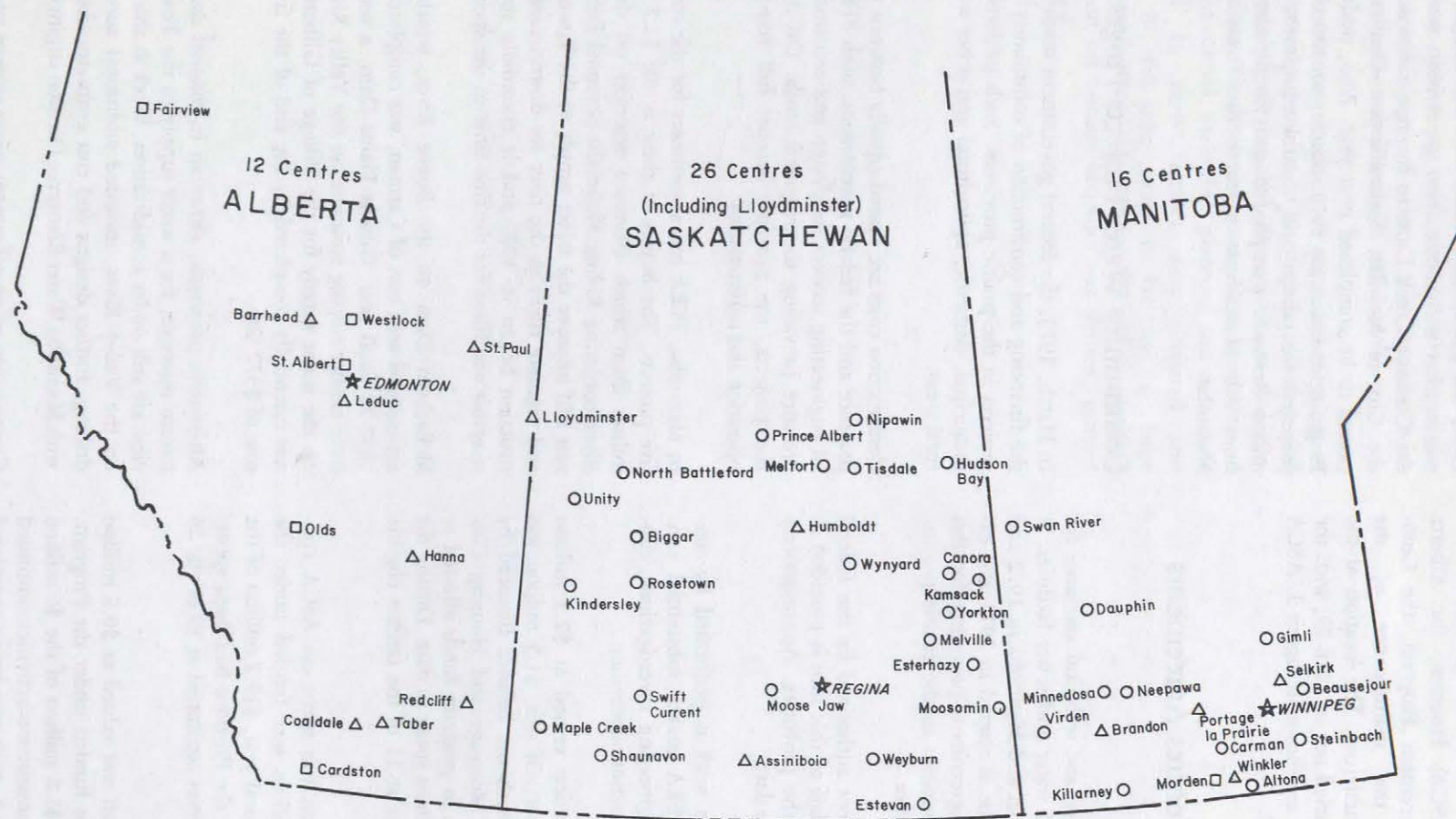
In Manitoba, PFRA has agreements for the construction of five projects. The largest of these is the \$2.2 million Vermilion Dam which creates a reservoir on the Vermilion River bordering Riding Mountain National Park. The reservoir will improve the water supply to the Town of Dauphin and regulate flows in the river for downstream users. Construction began in 1977 and is essentially complete. The reservoir was filled for the first time in the spring of 1979.

McEachern Dam on the Boyne River, which services an agricultural area east of Carman, was completed during the 1977-78 fiscal year. Gilbert Plains Dam, a reinforced concrete timber stoplog structure on the Valley River, will firm up the water supply for the Village of Gilbert Plains, and was essentially completed by the end of the fiscal year at a cost of \$372 500.

Alternative proposals, either an in-channel dam or an off-stream reservoir, for a water supply to the Town of Grandview are still under consideration. Work at this project, also on the Valley River, included additional surveys and test drilling, further designs and cost estimates, and discussions with Manitoba Water Resources Division engineers.

Construction of an off-stream water storage project to serve the Village of Plum Coulee has been completed at a cost of \$125 400 with only minor cleanup remaining. All costs

FIGURE 2 DESIGNATED AGRICULTURAL SERVICE CENTRES

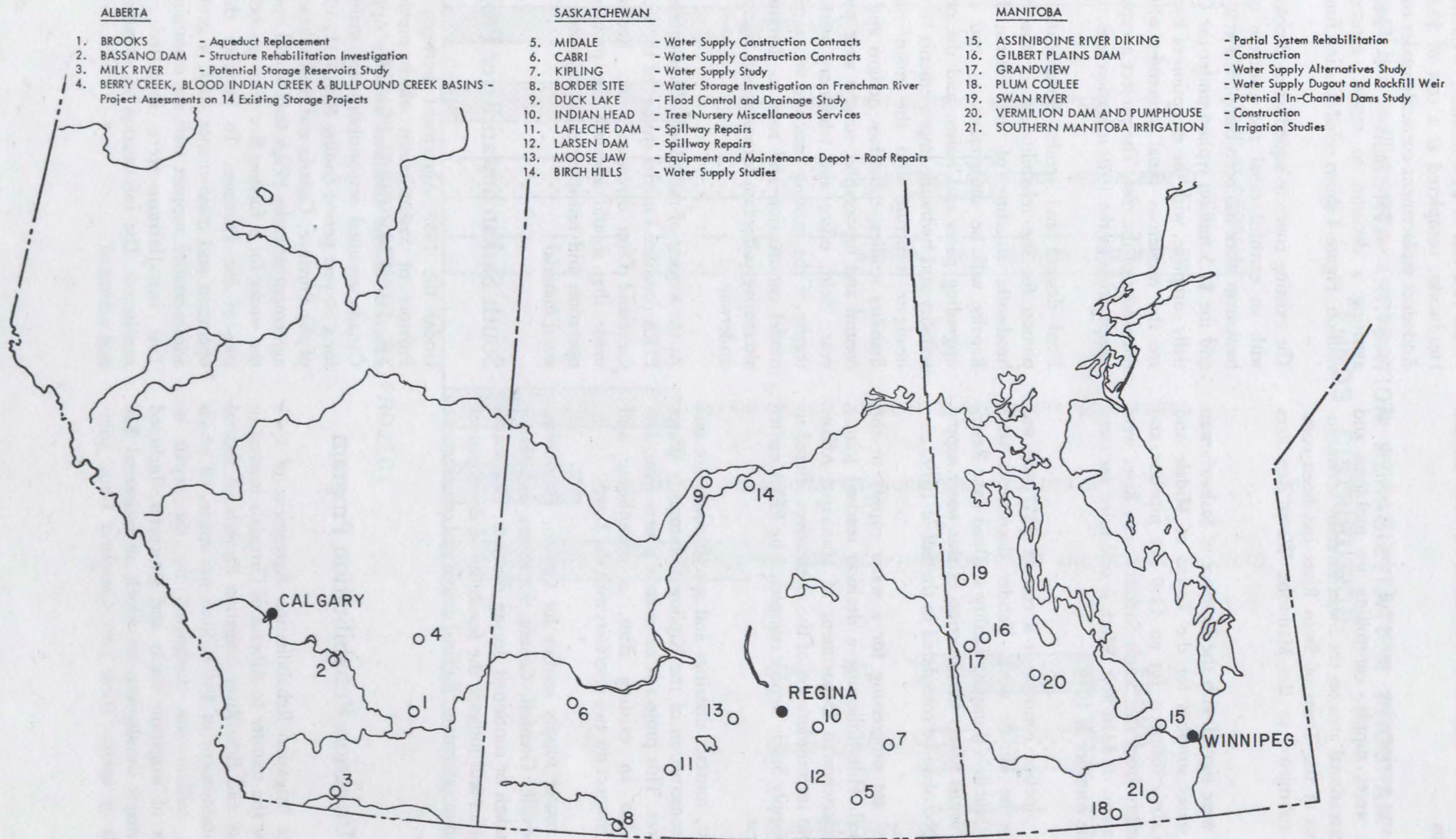


Legend

- — In progress
- △ — Completed
- — No work under program.

FIGURE 3

MAJOR ENGINEERING PROJECTS 1978-79



quoted represent the amount to be shared between Canada and Manitoba.

A preliminary engineering study of the feasibility of providing a water supply, controlling ice problems and creating a recreational area on the Swan River by several in-channel dams at the Town of Swan River has been completed and submitted to the Manitoba Water Resources Division.

Agreements were signed with the Province of Saskatchewan to provide water supplies for the Towns of Midale and Cabri. At Cabri, contracts for an 11.6 km pipeline and pumping facility from the South Saskatchewan River were awarded at a cost of \$316 800. Work is scheduled for completion in the summer of 1979.

An 8.3 km pipeline contract at a cost of \$257 400 was awarded for the Midale work. Tender documents were prepared for Midale's pumping facility at Dead Lake Reservoir on the Souris River. Construction of this water supply system is expected to be completed in the fall of 1979.

Final designs are progressing for a water supply to the Town of Birch Hills following a decision reached jointly with the Saskatchewan Department of Municipal Affairs and the Town in consideration of the alternatives offered in the Water Supply Study Report completed by PFRA earlier this fiscal year.

Final designs, contract drawings and specifications are underway for construction of the Kipling Community Water Supply Project. This project is to include a new dam, improvements to an existing dam, a pumphouse and pipelines to connect the two reservoirs with the Town.

Preliminary water supply studies for Ceylon, Humboldt, Melfort, Radville, Grenfell, Canora, Kerrobert and Manor were undertaken or continued during the year. The results of these studies will indicate the feasibility of development and may lead to agreements for final design and construction.

Alberta Irrigation Rehabilitation Program

The Alberta Irrigation Rehabilitation Agreement of 1973 provided for the transfer to Alberta of Canada's interest in the St. Mary and Bow River Irrigation Projects. A federal financial commitment of \$36 million was made, of which about \$32 million was designated for the repair or replacement of irrigation works and structures. Included were four major installations on which an estimated \$26 million will be spent. These are: Carseland Dam, com-

pleted at a cost of \$4.2 million; Western Irrigation District Headworks, completed at a cost of \$3.6 million; Brooks Aqueduct replacement currently under construction and expected to cost \$8.1 million; and Bassano Dam repairs, awaiting a decision to tender, estimated to cost \$10 million. Figure 4 shows rehabilitation funds distribution.

The existing concrete aqueduct at Brooks is being replaced with an earthfill canal and concrete syphon. Earth embankment work has been completed at a cost of \$5 million, and the \$1.5 million syphon under the CP railway is essentially complete, with the exception of hydrostatic testing, as are the numerous canal structures which make up the remainder of the cost. The project is expected to be put into operation in the 1979 irrigation season.

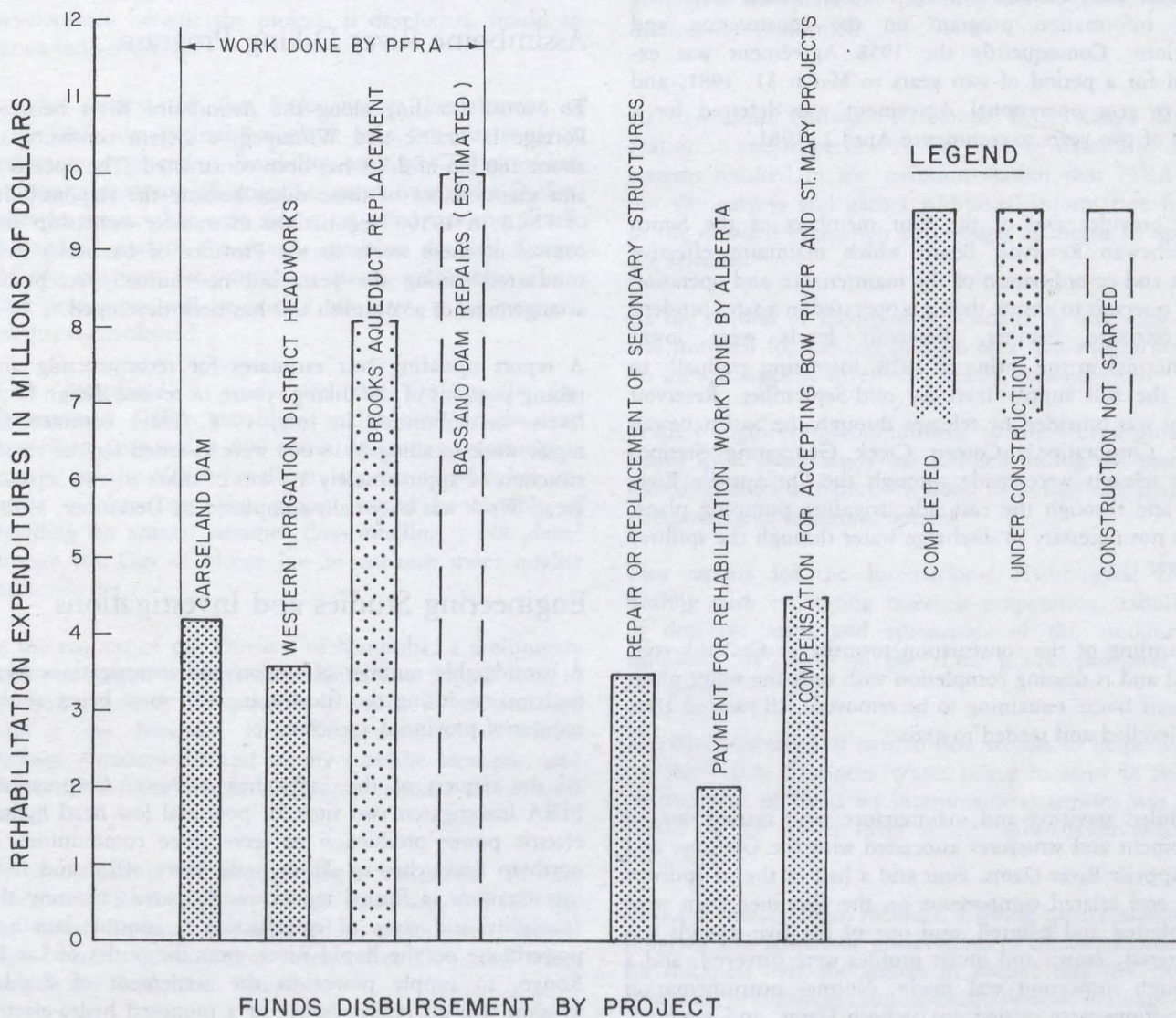
Final designs and tender documents are nearing completion for the rehabilitation of the Bassano Dam, the headworks structure of the Eastern Irrigation District. Repairs will be undertaken in two contracts, one for upgrading gates and hoists, and the other for structural, stability and hydraulic improvements to the spillway, canal headgate structure and the main earth embankment. Stability studies, cofferdam designs and specifications and control and topographic surveys were provided during the year. Field, office and laboratory work to assess the integrity of the existing structure was carried out. Hydraulic model construction and tests to determine the effects of alternative cofferdam arrangements during construction are underway.

At the request of the Alberta Department of Environment, PFRA conducted model studies of the weed problem at the Carseland Dam diversion works. Recommendations were made that should alleviate the problems with headgate operation and restricted canal flow due to the suspended weed material.

South Saskatchewan River Project

Under the 1958 Agreement between Canada and the Province of Saskatchewan which provided for the construction of the Gardiner and Qu'Appelle River Dams, Canada assumed responsibility for maintaining the works for a 10-year period ending March 31, 1979. At the request of the Province, Canada and Saskatchewan entered into an agreement whereby PFRA staff would operate and maintain the works for a further five years on behalf of and at the cost of the Province. To perform these functions, an operation and maintenance staff, a geotechnical staff and administrative support staff are maintained at the project. Test installations were installed, maintained and monitored. The information so obtained was interpreted and evaluated.

FIGURE 4 ALBERTA IRRIGATION REHABILITATION PROGRAM FUNDS DISTRIBUTION



However, before the termination date of the 1958 Agreement, March 31, 1979, the Province requested extension to the Agreement on the basis that sufficient time was not available for a full evaluation of the operational characteristics of the Dam. Canada agreed to a further two-year period during which Canada and the Province would complete joint evaluation of the operation of the Dam and both Canada and the Province would share in a public information program on the construction and operations. Consequently the 1958 Agreement was extended for a period of two years to March 31, 1981, and the five year operational Agreement was deferred for a period of two years to commence April 1, 1981.

PFRA provides two of the four members of the South Saskatchewan Reservoir Board which maintains effective liaison and co-ordination of the maintenance and operation of the reservoir to ensure that it is operated in a safe, prudent and effective manner. Reservoir levels were lower than normal in the spring of 1978, increasing gradually to reach the full supply level by mid-September. Reservoir control was provided by releases through the Saskatchewan Power Corporation's Coteau Creek Generating Station. Minor releases were made through the Qu'Appelle River Dam and through the east side irrigation pumping plant. It was not necessary to discharge water through the spillway this year.

Dismantling of the construction townsite at Cutbank continued and is nearing completion with only the water tower and staff house remaining to be removed. All vacated areas were levelled and seeded to grass.

Scheduled servicing and maintenance were carried out on equipment and structures associated with the Gardiner and Qu'Appelle River Dams. Four and a half of the 11 spillway gates and related components on the Gardiner Dam were sandblasted and painted, and one of the five tunnels was dewatered; crown and invert profiles were surveyed, and a thorough inspection was made. Normal instrumentation observations were carried out at both Dams, and some additional test apparatus was installed during the year.

Hydraulic model testing and detailed design work on the proposed Coteau Creek control conduit was begun. The conduit and related works could provide a means of regulating water levels in the Coteau Creek arm of the reservoir independent of the main body of Lake Diefenbaker. Lowering water levels behind the Coteau Creek portion of the embankment is one method of improving its long-term performance.

Work was tendered for installing drainage test wells in the foundation beneath the main embankment of Gardiner Dam. Stability investigations and tests are continuing dealing with electro-osmosis drainage and composite on the downstream slope of the Coteau Creek portion of the Dam as another means of improving its performance.

Assiniboine River Diking Program

To control flooding along the Assiniboine River between Portage la Prairie and Winnipeg, a system consisting of about 160 km of dikes has been constructed. The operation and maintenance of these dikes became the responsibility of PFRA in 1950. Negotiations to transfer ownership and control of these works to the Province of Manitoba were conducted during the year, but no mutually acceptable arrangement to accomplish this has been developed.

A report updating cost estimates for reconstructing and raising portions of the diking system to revised design flood levels was submitted in July, 1978. Three contracts for repair work totalling \$116 000 were awarded for the reconstruction of approximately 1.1 km of dikes in two separate areas. Work was essentially completed by December, 1978.

Engineering Studies and Investigations

A considerable number of studies and investigations were undertaken during the fiscal year, with most being at the request of provincial agencies.

At the request of the Saskatchewan Power Corporation, PFRA investigated two sites for potential low head hydro-electric power production to serve three communities in northern Saskatchewan. From preliminary office and field investigations, a formal report was prepared, assessing the feasibility and costs of constructing a control dam and powerhouse on the Rapid River, near the outlet of Lac La Ronge, to supply power to the settlement of Stanley Mission. An air reconnaissance of a proposed hydro-electric site on the Fond du Lac River to supply power to the communities of Stony Rapids and Black Lake was made for a possible future feasibility study of this project.

A report involving investigations and costing of reservoirs near the International Boundary on the Frenchman River flowing from southwest Saskatchewan into Montana, was completed for Environment Saskatchewan during the year. This was an extension to an earlier larger study. Also in response to a request by Environment Saskatchewan, stage-discharge relationships for the 1:100 and 1:500 floods were

investigated for the modified Albert Street Weir on Wascana Creek in Regina.

An assessment of a proposed flood control and drainage scheme for Duck Lake, midway between Saskatoon and Prince Albert was completed. The study was made at the request of the Department of Indian Affairs and Northern Development because the project, if developed, would affect an Indian reserve.

At the request of the Saskatchewan Department of Agriculture, the preliminary phase of a two-part study to determine engineering feasibility and cost of providing temporary pumping of irrigation water from Lake Diefenbaker to the existing west side main canal was completed. The second part of the study, involving detailed designs and cost estimates for pumping systems, canal seepage and slope protection, will be carried out later, if the project's viability is established.

PFRA completed a study for the Qu'Appelle Implementation Office providing preliminary designs and costs for a proposed 3 000 cubic decametre water-supply reservoir on the Moose Jaw River, approximately 8 km upstream of the City. This project would be capable of providing an annual summer flow totalling 1 000 dam³ through the City of Moose Jaw to enhance water quality and aesthetics.

At the request of the Province of Manitoba, a preliminary study was begun to determine capital and annual costs of developing systems for sprinkler irrigation in the southern part of the Province. Field inspections to determine drainage requirements and supply pipeline locations, and preparation of the engineering report remain to be completed.

An investigation of geohydrologic conditions in the Assiniboine River Valley at the upstream end of the Shellmouth Reservoir was initiated to explore the relationships between groundwater levels, river flow and water levels in the Shellmouth Reservoir.

A study of potential storage reservoirs on the Milk River and its major tributaries in Alberta, requested by Alberta Environment in 1977, was completed. Five storage sites were selected, based on field inspections, geologic and hydrologic appraisals to optimize storage and more fully utilize Canada's share of water on this international drainage basin. Preliminary designs and cost estimates of potential reservoir development were incorporated into a report submitted in July, 1978. Also at Alberta Environment's request, in support of a larger provincial study, a report was submitted on the condition and use of 14

community water storage projects in the Berry Creek, Blood Indian Creek and Bullpond Creek basins.

It was determined for Agriculture Canada that local geologic conditions can at least partially account for the soil salinity at three sites in the Swift Current-Gull Lake area of Saskatchewan. Investigations including test drilling, mapping and geological interpretation for the Swift Current Research Station were performed.

At Agriculture Canada's Kamloops, B.C., Range Research Station, a site inspection of the existing water and sewage systems resulted in the recommendation that PFRA carry out site surveys and gather additional information for use in the detailed evaluation and design of means to upgrade the systems.

At the request of Environment Canada, a feasibility study was initiated for the construction of a flow-measuring weir on the Qu'Appelle River near Welby, Saskatchewan.

PFRA's engineering commitment to the federal-provincial Souris River Basin Study was fulfilled during the year with the completion of reports on flood hydrology and hydraulic effectiveness of structural options.

Two reports for the International Hydrological Decade dealing with estimating reservoir evaporation, tabulations of drainage areas and summaries of the amount and variability of runoff in the three prairie provinces were completed.

The first in a series of natural flow studies to be performed for the Prairie Provinces Water Board to assist in the apportionment of flows on interprovincial streams was completed on the Antler River at the Saskatchewan-Manitoba boundary.

In-house investigations included a spring runoff monitoring program and systematic observations of the development of ice thickness over the winter in storage dugouts. Studies continued of corrosion control, electro-osmosis drainage, concrete durability, hydraulic fracturing in embankments, soil erodibility, reinforced earth and testing procedures for construction materials.

ADMINISTRATION

During the year under review, particular attention was paid to developing and introducing systems and procedures designed to promote economy and efficiency with increased emphasis on financial management and asset control.

The introduction and refinement of the departmental computerized Financial Management Information System (FMIS) received high priority. Numerous management reports not formerly available, or prepared on a manual basis, are now being produced by electronic data processing, and the provision of additional reporting to meet other identified needs is in the advanced developmental stage. Accounting control of assets, control and reporting of expenditures, collection of program revenue and development of performance measurement indicators have all received added attention by this Division.

Because widely dispersed operational activities are a significant aspect of PFRA programs, importance was placed on expanding the number and role of local Accident Prevention Committees. Regrettably, the PFRA injury statistics did not improve over the year, and the 103 accidents reported are an increase of 11 over 1977. More positively, the PFRA vehicle fleet safety record for 1978-79 is one of the best in government service, with one employee-related accident for every 550 000 kilometres of driving. An advanced Fleet Safety Program was recommended during the year to further improve this record.

With close to 1 000 000 ha under its jurisdiction, PFRA is one of the largest land holders in western Canada. A significant increase in land sales and acquisitions, and in the number of permits and leases issued, particularly with respect to petroleum exploration activities, was reported. In addition, more than 200 ha of community pasture land were returned to provincial governments for special purposes, and three community pastures on Indian lands in Alberta were returned to the Department of Indian Affairs and Northern Development on the expiry of management agreements. Considerable attention continued to be devoted to Indian treaty land entitlements in Saskatchewan, as related to the community pasture program. A summary of the PFRA land inventory as of March 31, 1979, is shown in Appendix 6.

Significant developments include the production of internal policy and procedure statements in areas such as asset control, manpower reporting, commitment control, and property administration. An administrative trainee program was initiated, and position papers were prepared on subjects which included motor vehicle operations, performance measurement and property administration. Reviews were carried out in critical areas within the Service to assess manpower utilization, need for and level of service, and cost of operations.

Considerable attention was given to improving productivity in word processing, increasing the capability of data services through new equipment, and improving Records Management service and security.

A new furniture inventory system and updated policies and procedures governing various aspects of its operations were introduced. Value of both procurement and Crown assets disposal decreased.

The Library operated with a smaller professional staff but noted an increase in direct loans, interlibrary loans, periodical routings and computerized literature searches. Some of this increase related to the relatively large number of technical reports and position papers which PFRA prepared. Special briefing sessions were held to familiarize staff with library services, and this, coupled with a new service manual, was intended to highlight the role of the Library in supporting PFRA programs.

CONSTRUCTION, EQUIPMENT AND SERVICES

General construction, tradeshop and equipment repair services and related technical and administrative functions are delivered through the Construction, Equipment and Services Division to other divisions of PFRA. A service depot and an equipment storage and marshalling yard is located in Moose Jaw, Saskatchewan, where equipment maintenance, transportation and tradeshop services are provided. Services for the construction and maintenance of buildings and engineering works associated with water development and land-use projects are also provided.

A total of 2 631 work assignments was completed at a cost/value of \$2 085 575 (Tables 5 and 6). In addition, related technical and administrative activities involving the establishment of equipment rental rates, equipment availability research, preparation of purchase specifications, appraisal and evaluation of new and used equipment, work site investigation and construction cost estimates were provided.

A contract for replacement of the roofing and upgrading of the roof insulation at the Moose Jaw Equipment and Maintenance Depot was completed.

TABLE 6

Service Depot Service Activities Provided

<i>Service or Division</i>	<i>Number of Assignments</i>	<i>Value of Services Provided</i>
Land Use Service	1 138	552 508
Engineering Service	38	40 920
Irrigation Projects Division	147	108 600
Tree Nursery Division	3	3 332
Water Development Division	46	7 803
C.E. & S. Division	1 069	445 475
Other	54	46 013
TOTAL	2 495	\$1 204 651

TABLE 5

Field Service Activities Provided

<i>Service or Division</i>	<i>Number of Assignments</i>	<i>Value of Services Provided</i>
Land Use Service	68	174 848
Engineering Service	7	3 586
Irrigation Projects Division	25	425 782
Tree Nursery Division	20	68 032
Water Development Division	6	24 692
C.E. & S. Division	4	130 909
Other	6	53 075
TOTAL	136	\$ 880 924

Some of the major assignments included building and installing a stoplog handling system on the LaFleche Dam; constructing and lining a portion of the Swift Current main supply canal; reconstructing two sections of the main supply canals and structures on the Rush Lake Irrigation Project; reconstructing a portion of the irrigation system on the Val Marie Irrigation Project and replacing the spillway pipe and repairing the drop inlet structure of the spillway system on the Larsen Dam.

Main activities carried out by the Service Depot included repairs to 1 153 equipment units at a cost/value of \$550 367; constructing or modifying 140 equipment units valued at \$229 456; completing 147 plumbing, heating and electrical installations and repair assignments valued at \$115 426; 877 trucking assignments involving 266 378 travelled miles at a cost/value of \$187 542.

INFORMATION

A wide range of photographic and writing services for internal and public information continued to be provided.

Ongoing programs such as the Agricultural Service Centres Agreements (ASCA) received considerable attention with 25 news releases distributed. Three official openings of completed ASCA projects were covered in depth. Several photographs with cutlines were sent to appropriate news media and 13 other releases on retirements, appointments and promotions were prepared.

Six brochures were developed as new publications or were revised and reprinted. Reports, fact sheets, press kits and other materials were prepared as required and ribbons were designed and handed out at exhibitions.

A two-and-a-half-day flying tour covering 3 000 km was arranged to update senior departmental staff on PFRA activities. The tour, originating in Winnipeg, covered all major activities of PFRA west to the Rocky Mountains.

Two short TV films were produced and six sound-slide presentations were developed for a variety of purposes. The first Video Tape Recording (VTR) was produced. It included motion pictures, slides, musical background and narration, dealing with the construction and performance of the Gardiner Dam.

The photographic section handled 1 500 requests for service from PFRA and other federal agencies, and made 15 000 prints including oversized enlargements and copies of line and continuous-tone originals. More than 6 800 color and black and white negatives and 2 000 color slides were added to the files which now house 107 000 negatives and 62 000 color transparencies for use in news items, audio visual programs and brochures.

OTHER ACTIVITIES

Throughout the year, PFRA staff were involved in a range of activities which cannot be readily categorized under specific programs or investigations.

These include preparation and presentation of papers at scientific conferences, and service on a number of steering and technical committees in support of the work of the Prairie Provinces Water Board, the International Joint Commission's Souris-Red River Engineering Board (Burlington Task Force), the federal/provincial Souris River Study Board, and the International Commission on Irrigation and Drainage.

An in-service committee worked during the year on a comprehensive consideration of the requirements for a dam safety program within PFRA. It is anticipated that the report to be submitted by this group will recommend the establishment of formal procedures for the assessment and regular inspection of PFRA built dams.

The Metric Implementation Co-ordinator established a conversion schedule for metrication which will be monitored throughout 1979. Divisional Metrication Officers are continuously accumulating related technical information from manufacturers and suppliers. Metric directives are being issued to establish standards.

APPENDIX I
EXPENDITURES BY ACTIVITIES
Includes Operation, Maintenance, Capital Funds and Contributions
1935 - March 31, 1979

	1978-1979	1935-1979
ADMINISTRATION		
Regina, Administration	\$ 2 119 124	\$20 269 386
LAND USE SERVICE		
Cultural Work - Soil Drifting, etc. (Experimental Farm Service)	—	4 966 394
Community Pastures - Construction, Operation and Maintenance	8 518 284	99 474 267
Movement of Settlers	—	227 841
WATER DEVELOPMENT SERVICE		
Supervision, Individual Dugouts, Wells, Community Large Water Storage and Irrigation Projects	5 813 396	103 559 338
Equipment - Purchase and Repairs, Service Depot	1 896 645	29 351 751
Tree Nursery	1 758 450	12 764 973
Bow River Irrigation Project	—	47 353 798
ENGINEERING SERVICE		
Surveys, Design, Geotechnics, Drainage Studies, Legal Surveys, Supervision of Construction	5 995 980	74 385 162
St. Mary Irrigation Project	—	33 928 864
South Saskatchewan Project	268 236	138 927 845
Assiniboine River Diking	128 686	1 872 459
Shellmouth Dam and Portage Diversion	10 208	14 796 868
B.C. Reclamation and Development, including Lillooet Project	—	3 310 182
Land Protection and Reclamation, Manitoba and Eastern Canada	—	4 136 021
Alberta Irrigation Rehabilitation	2 163 822	24 636 245
Agricultural Service Centres	3 154 110	19 481 362
Vermilion Dam and Reservoir	579 498	1 098 923
Miscellaneous Projects - Construction	181 821	5 768 455
	<u>\$32 588 260</u>	<u>\$640 310 134</u>

REVENUES BY ACTIVITIES

Community Pastures Operations	\$ 4 931 381	\$47 635 026
Irrigation Project Operation and General Revenue	2 306 162	27 783 043
	<u>\$ 7 237 543</u>	<u>\$75 418 069</u>

APPENDIX II
DEVELOPMENT AND OPERATION OF COMMUNITY PASTURES
1938—1979

<i>Fiscal Year</i>	<i>Operating Pastures</i>	<i>Acreage in Pastures</i>	<i>Construction Costs</i> \$	<i>Livestock Units Pastured</i>	<i>Acres Per Livestock Unit</i>	<i>Revenue</i> \$	<i>Operating Costs*</i> \$	<i>Stock Unit Operating Cost</i> \$	<i>Unit Cost to Patron</i> \$	<i>Municipal Levy Paid**</i> \$
1938-39	14	189 800	165 995	3 231	58.7	6 340	10 186	3.15	1.96	—
1948-49	54	1 436 480	277 358	71 393	20.1	204 012	175 666	2.46	2.86	—
1958-59	62	1 815 265	390 641	117 032	15.5	542 607	686 449	5.87	4.64	—
1968-69	88	2 382 456	696 754	172 629	13.8	1 570 652	1 554 688	9.01	9.10	170 000
1969-70	88	2 386 799	921 610	172 624	13.8	1 652 165	1 666 223	9.65	9.57	160 959
1970-71	90	2 431 784	1 004 514	182 689	13.3	1 754 194	1 900 158	10.40	9.60	162 974
1971-72	93	2 430 940	757 659	205 611	11.8	1 954 604	2 002 379	9.74	9.51	176 435
1972-73	94	2 431 420	650 889	216 708	11.2	1 912 347	2 368 818	10.93	8.82	182 373
1973-74	95	2 419 100	920 504	234 488	10.3	3 217 128	3 014 999	12.86	13.72	182 680
1974-75	95	2 409 220	3 311 642	242 176	9.9	3 116 880	3 549 388	14.66	12.87	188 854
1975-76	96	2 405 392	2 438 966	250 532	9.6	3 712 383	4 238 348	16.92	14.82	191 755
1976-77	96	2 240 447	2 259 723	241 135	9.3	3 584 175	4 337 671	17.99	14.86	200 662
1977-78	97	2 405 381	1 859 358	251 338	9.6	4 714 641	4 600 536	18.30	18.76	193 488
1978-79	96	2 352 510	1 400 741	242 443	9.7	4 931 381	5 294 673	21.83	20.34	197 384
Totals 1938-79			27 069 222			47 635 026	48 884 363			

*Includes direct operating costs only. Does not include supervision, capital and overhead.

**1963-64 was the first year tax levied.

N.B. Detailed annual figures for years 1938 through 1968 are available in the 1975-76 PFRA Annual Report.

APPENDIX III
SERVICES PROVIDED BY WATER DEVELOPMENT DIVISION
Three Regions Fiscal Year 1978-1979 March 31, 1979

Agency	Dugouts		Stockwatering Dams			Irrigation				Drainage			Community Projects				Wells		Other Services	Total		
	Technical Investigation	Final Inspection	Technical Investigation	Survey	Plan	Final Inspection	Technical Investigation	Survey	Plan	Final Inspection	Technical Investigation	Survey	Plan	Technical Investigation	Survey	Plan	Report	Final Inspection			Technical Investigation	Final Investigation
PFRA Program	589	1101	479	178	180	98	1009	354	309	143	58	14	2	375	13	15	3	11	420	4603	526	10 480
Federal Request	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	16	18
Provincial Request	15	—	95	41	42	4	70	19	13	1	3	1	—	12	2	3	1	—	14	—	101	437
Municipal Rural-Urban	1	—	—	—	—	—	1	—	—	—	1	—	—	13	5	3	1	—	—	—	20	45
Other Groups or Individuals	118	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	8	128
TOTAL	723	1101	575	219	222	102	1080	373	322	144	62	15	2	401	22	21	5	11	434	4603	671	11 108

Total Capital Expenditure on Individual Projects - \$2 321 423 (DO-327 725 SWD-39 023 IRR-80 988 WELLS-1 748 014)

Total Capital Expenditure on Small Community Projects - 119 981

Total Capital Expenditure on Neighbour IRR - 4 691

Total Capital Expenditure on Neighbour SWD - 1 000

APPENDIX IV
WATER DEVELOPMENT DIVISION
Number of Projects and Financial Assistance Paid from Inauguration of Program to March 31, 1978

Province and Classification	Dugouts		Stockwatering Dams		Irrigation Schemes		Wells		Total	
	Number of Projects Paid	Financial Assistance Paid \$	Number of Projects Paid	Financial Assistance Paid \$	Number of Projects Paid	Financial Assistance Paid \$	Number of Projects Paid	Financial Assistance Paid \$	Number of Projects Paid	Financial Assistance Paid \$
MANITOBA										
Individual	129	42 593.11	—	—	14	8 035.03	831	284 362.67	974	334 990.81
Neighbour	—	—	—	—	—	—	—	—	—	—
Small Community	1	15 000.00	—	—	—	—	—	—	1	15 000.00
TOTAL	130	57 593.11	—	—	14	8 035.03	831	284 362.67	975	349 990.81
SASKATCHEWAN										
Individual	410	136 749.51	51	15 197.47	67	36 676.57	1580	542 497.67	2108	731 121.22
Neighbour	—	—	1	1 000.00	8	4 691.50	—	—	9	5 691.50
Small Community	9	104 981.00	—	—	—	—	—	—	9	104 981.00
TOTAL	419	241 730.51	52	16 197.47	75	41 368.07	1580	542 497.67	2126	841 793.72
ALBERTA										
Individual	419	148 382.55	63	23 825.66	61	36 276.53	2014	921 153.88	2557	1 129 638.62
Neighbour	—	—	—	—	—	—	—	—	—	—
Small Community	—	—	—	—	—	—	—	—	—	—
TOTAL	419	148 382.55	63	23 825.66	61	36 276.53	2014	921 153.88	2557	1 129 638.62
GRAND TOTAL	968	447 706.17	115	40 023.13	150	85 679.63	4425	1 748 014.22	5658	2 321 423.15

APPENDIX V
 MAJOR PROJECTS - IRRIGATION RECLAMATION WATER STORAGE AND MUNICIPAL WORKS ¹
 1935 to March 31, 1979

<i>Name of Project</i>	<i>Location</i>	<i>Type of Project</i>	<i>Date Completed</i>	<i>Irrigated Acres</i>	<i>Storage Capacity Acre-Feet</i>	<i>Costs² \$</i>
MANITOBA						
Assiniboine River Diking and Cut-offs	Brandon and Portage la Prairie to Baie St. Paul	Flood Control	Not Yet Complete	—	—	1 872 459
Northwest Escarpment Reclamation Project - Riding Mt. Area	Dauphin Area	Flood Control	1966	—	—	1 313 103
Fairford River Project	Lake Manitoba	Flood Control	1960	—	—	287 751
Saskatchewan River Reclamation - Pasquia Area	The Pas	Reclamation	1960	—	—	2 256 388
Shellmouth Dam and Portage Diversion	Shellmouth and Portage la Prairie	River Control	1970	—	390 000	14 796 868 ³
Agricultural Service Centres	16 Communities	Water and Sewer	Not Yet Complete	—	—	6 835 116 ⁴
The Pas Indian Reserve	The Pas	Water, Sewer and Roads	1975	—	—	1 099 744
Vermilion Dam and Reservoir	Dauphin	Water Supply	Not Yet Complete	—	—	1 098 923 ³
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-Purpose	1969	350 000 (potential)	7 600 000	120 134 936 ⁵
Buffalo Pound Project	Qu'Appelle Valley	Water Supply	1960	—	42 000	2 293 145
Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	—	—	98 376
Agricultural Service Centres	26 Communities	Water and Sewer	Not Yet Complete	—	—	9 599 436 ⁴

<i>Name of Project</i>	<i>Location</i>	<i>Type of Project</i>	<i>Date Completed</i>	<i>Irrigated Acres</i>	<i>Storage Capacity Acre-Feet</i>	<i>Costs² \$</i>
ALBERTA						
Bow River	Vauxhall	Irrigation	--	235 000	408 862	--
(a) Purchase of Canada Land & Irrigation Company	--	--	--	--	--	2 353 517
(b) Development and Construction	--	--	1974	--	--	24 941 316
St. Mary	Lethbridge	Irrigation	--	300 000	460 000	25 160 993
Sawridge Creek	Slave Lake	Flood Control	1973	--	--	248 377
Alberta Irrigation Rehabilitation	3 Projects	Irrigation	Not Yet Complete	--	--	24 609 942 ⁶
Agricultural Service Centres	13 Communities	Water	Not Yet Complete	--	--	2 885 870 ⁴
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation	1951	629	2 000	185 491
Chase & Johnston — Western Canada Ranching	Kamloops	Irrigation	1951	755	--	98 243
Lillooet - Pemberton	Pemberton	River Control	1953	--	--	1 056 539
Westbank Project	Kelowna	Irrigation	1950	1 200	2 500	537 450
Penticton West Bench	Penticton	Irrigation	1953	800	--	66 362
B.C. Fruitlands	Kamloops	Irrigation	1966	2 000	--	200 000

1. Funds for certain of these projects were provided by special votes of Parliament.

2. Figures do not include operation and maintenance expenditures.

3. Canada's share only.

4. Grants only - does not include loans of equal amounts.

5. Includes \$25 000 000 contributed by Province of Saskatchewan.

6. Includes grants to Province of Alberta of \$3 500 000 for secondary works and \$6 200 000 associated with the turnover of Canada's interest in the Bow and St. Mary Rivers.

APPENDIX VI
SUMMARY OF LAND INVENTORY TO MARCH 31, 1979

	<i>Title</i>	<i>Reservation, Order-in-Council, Lease, Easement, (Hectares)</i>	<i>Total</i>
I. WATER DEVELOPMENT SERVICE			
A. <i>Water Conservation</i>			
Manitoba	0.53	—	0.53
Saskatchewan	4 104.55	342.31	4 446.86
Alberta	43.58	228.18	271.76
B. <i>Irrigation Projects</i>			
Southwest Saskatchewan	17 619.81	175.28	17 795.09
C. <i>Tree Nursery</i>			
	64.80	194.40	259.20
D. <i>Demonstration Farm</i>			
	68.69	—	68.69
	<u>21 901.96</u>	<u>940.17</u>	<u>22 842.13</u>
II. LAND USE SERVICE			
A. <i>Community Pastures</i>			
Manitoba	1 921.48	165 192.05	167 113.53
Saskatchewan	500 092.67	230 633.73	730 726.39
Alberta	—	54 871.43	54 871.43
	<u>502 014.15</u>	<u>450 679.21</u>	<u>952 711.35</u>
III. ENGINEERING SERVICE			
A. <i>Assiniboine River Diking</i>			
	454.25	22.35	476.60
	<u>454.25</u>	<u>22.35</u>	<u>476.60</u>
IV. MISCELLANEOUS			
A. <i>Hydrometric Site</i>			
	4.05	—	4.05
B. <i>Service Depots</i>			
	9.52	0.20	9.72
C. <i>Bow River Exchange Lands</i>			
	292.81	—	292.81
	<u>306.38</u>	<u>0.20</u>	<u>306.58</u>
SUMMARY			
I. Water Development Service	21 901.96	940.17	22 842.13
II. Land Use Service	502 014.15	450 697.21	952 711.35
III. Engineering Service	454.25	22.35	476.60
IV. Miscellaneous	306.38	0.20	306.58
	<u>524 676.74</u>	<u>451 659.93</u>	<u>976 336.66</u>

