

PRAIRIE PROVINCES WATER BOARD

TWENTIETH

ANNUAL REPORT

FOR THE CALENDAR YEAR 1967

October, 1968
Regina, Saskatchewan

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F. L. GRINDLEY

Frank Grindley died on the 14th July, 1966. He had served as a Member of the Board from 1954 to 1965. At the meeting of 18th May, 1967, the Members of the Board recorded their sincere appreciation for the many valued contributions to the work of the Board and for the esteemed personal association of Mr. Frank Grindley during the eleven years he represented the Province of Alberta on the Board.

J. A. GRIFFITHS

Jack Griffiths died on 14th January, 1967. He had served as a Member of the Board from 1959 to 1967. At the meeting of 18th May, 1967, the Members of the Board recorded their sincere appreciation for the many valued contributions to the work of the Board and for the esteemed personal association of Mr. Jack Griffiths during the eight years he represented the Province of Manitoba on the Board.

MEMBERSHIP OF THE BOARD

The Prairie Provinces Water Board is composed of five members. The three provincial members represent the Provinces of Alberta, Saskatchewan and Manitoba, and the two federal members represent the Department of Agriculture, and the Department of Energy, Mines and Resources. The Engineering Secretary to the Board is employed by the Prairie Farm Rehabilitation Administration (Canada Department of Agriculture).

During 1967 the following persons served on the Board:

M. J. Fitzgerald (Chairman)	Director, PFRA Canada Department of Agriculture Regina, Saskatchewan
R. H. Clark	Chief, Engineering Division Inland Waters Branch Department of Energy, Mines and Resources Ottawa, Ontario
R. E. Bailey	Director, Department of Water Resources Province of Alberta Edmonton, Alberta
B. W. Boyson	Director, Water Rights Branch Saskatchewan Water Resources Commission Province of Saskatchewan Regina, Saskatchewan
J. M. Crook (replacing B. W. Boyson with effect from Nov. 1967)	Chief Engineer Saskatchewan Water Resources Commission Province of Saskatchewan Regina, Saskatchewan
T. E. Weber	Director, Water Control and Conservation Branch Department of Agriculture and Conservation Province of Manitoba Winnipeg, Manitoba
J.G.S. McMorine	Acting Engineering Secretary to the Board Acting Chief, Hydrology Division, PFRA Canada Department of Agriculture Regina, Saskatchewan

WARRANT AND FUNCTION OF THE BOARD

The Prairie Provinces Water Board was established on 28 July 1948 by agreement between the Governments of Canada, Manitoba, Saskatchewan and Alberta. A copy of that agreement is attached to the Sixteenth Annual Report as Appendix I.

The Board's function, as expressed in that agreement, is "to recommend the best use to be made of interprovincial waters in relation to associated resources in Manitoba, Saskatchewan and Alberta and to recommend the allocation of water as between each such province of streams flowing from one province into another province."

The duties of the Board are set out in detail in the agreement. Briefly they are:

- (a) to collate and analyze existing data;
- (b) to determine what other data are required from time to time;
- (c) to recommend the allocation of water of any interprovincial stream; and
- (d) to report on any questions relating to projects for the utilization or control of common river or lake systems.

REVIEW OF ACTIVITIES IN 1967MEETINGS IN 1967

The Board held two meetings in 1967; one in Regina on May 18, and one in Edmonton on September 15.

ALBERTA REQUEST FOR ALLOCATION REVISIONS - APPORTIONMENT

Discussions continued during 1967 between officials of Alberta and Saskatchewan concerning the Alberta request for allocation revisions and the associated question of apportionment of inter-provincial waters. At the September meeting of the Board a progress report submitted on behalf of both governments was brought up for discussion.

The report reviewed events leading to the initiation of discussions early in 1966 and the decision to seek agreement between Alberta and Saskatchewan on the basis of apportionment between Provinces rather than allocation by projects. Eventually, an apportionment proposal was developed in the form of an agreement which would be subject to approval by the governments of Manitoba and Canada and to similar or other arrangements between Manitoba and Saskatchewan which would be subject to approval by the governments of Alberta and Canada.

The proposed agreement would apply to those waters which, under natural conditions, flow from Alberta to Saskatchewan. Among the various provisions, Alberta would be allowed to make a net depletion of one-half of the natural flow of these waters and the remaining one-half, flowing to Saskatchewan, would be subject to certain prior rights set out in the agreement. The determinations of the natural flows would be made by a method to be established by the parties to the agreement. Provision is also made for the referral of disputes to the Exchequer Court.

It is anticipated that the proposal will be approved in principle by the Province of Alberta next year and that discussions will continue with the other interested parties.

DATA NETWORK PLANNING

The initial work of the Committee assigned the task of studying the question of data network planning, was largely confined during the year, to the first items of its terms of reference concerned with forecasting. Two tables were prepared which list the current and planned forecasting activities of the three Prairie Provinces. The contributions made by the Federal Meteorological and Water Resources Branches with regard to weather and flood warning, were also outlined.

From their initial investigations, conclusions reached by the Committee were that more time would be needed to fully plan an integrated data network and that such a network would require continuing revision. To establish and maintain this network, it was also the opinion of the Committee that requests from provincial to federal agencies for assistance in developing efficient forecasting procedures should be made and coordinated through the Committee.

COLLATING OF PRAIRIE SURFACE WATER DATA

Progress was made during the year in developing an extension to the hydrometric network. In addition, agreement was reached with regard to the setting up of further hydrometric stations on a number of interprovincial streams. Plans were also formulated to initiate a study aimed at selecting appropriate "index area" stations for flood forecasting and water supply purposes.

It was noted that three new basins were established during the year under the Alberta International Hydrological Decade Projects with a view, among others, to study the effects of timber harvesting, re-afforestation and agricultural development on questions such as runoff, erosion and water quality.

POLLUTION COMMITTEE

In May an interim report entitled "Problems Associated with the Determination of Dilution Water Requirements on Interprovincial Streams" was submitted to the Board by the Committee on Pollution. In concluding that the Prairie Provinces Water Board had a necessary and legitimate responsibility to include water requirements for dilution purposes in its studies and that no other agency adequately fulfilled this requirement, the Committee recommended the establishment of a new committee, the terms of reference of which would be to report to the Board on:

- (a) Recommendations as to the development of common criteria to be used in determining interprovincial dilution water requirements;
- (b) The general magnitude of the present pollution problem in interprovincial streams and the approximate quantities of dilution water required;
- (c) Observations as to future problems;
- (d) Recommendations as to further action the Board might take.

The Board accepted the recommendation of the Committee and decided to establish a standing committee to be known as the "Committee on Dilution Water Requirements" with the above terms of reference.

During further discussions concerning pollution, in September the Member for Alberta informed the Board that an Alberta Pollution Committee had been established, with a membership of about 50 people representing such widespread interests as industry, towns and cities, and consultants. Also, in regard to Federal participation in pollution studies, the Board noted that a policy paper of the Department of Energy, Mines and Resources proposed the establishment of a National Committee on Pollution. This National Committee would, as required, establish task forces for various studies, to be financed under the Canada Water Act where appropriate. The conclusion of the Board was that this need not inhibit the Board from studying pollution from the point of view of water demand.

REGIONAL PLANNING AND DEVELOPMENT

In September, the Board discussed its future role in view of impending changes in federal policies and programmes with respect to water planning and development. It was noted that the proposed Canada Water Act envisaged a regional planning body and that ARDA programmes and possible changes in PFRA water programmes may also affect the "planning" function of the Board.

It was concluded that while the proposed Act would provide for agreements with individual provinces, the matter of regional problems must also be considered and that the Prairie Provinces Water Board should be strengthened in anticipation of the possibility of its assuming the duties of any regional board which might be envisaged.

RED DEER RIVER PROJECT

In May, the Member for Alberta gave a short summary of the status of the Red Deer River Project investigations. He noted that dam sites in the headwaters were under investigation, comparisons of layouts were being made and that socio-economic and land classification studies were in progress. The Board requested that a written report be prepared on the matter, to be presented to the Board when completed.

It was also agreed that the reservation for the project would be renewed for two years from December, 1966, or until apportionment of the stream be accomplished.

SMALL PROJECTS, RESERVATIONS

The reservation of 1,000,000 acre-feet for small projects in the South Saskatchewan River Basin expired in December, 1966. In May the Board renewed the reservation for two years or "until apportionment of the stream is accomplished."

QU'APPELLE-ASSINIBOINE REPORT

Further to the report submitted to the Board in 1966, additional studies and data were provided by the Engineering Secretariat at the

request of the Member for Manitoba. This information was needed in the preparation of the request by Manitoba for a reservation from Diefenbaker Lake.

DISTRIBUTION OF REPORTS

The widespread demand for copies of the report by Dr. Laycock on "Water Deficiency and Surplus Patterns in the Prairie Provinces" gave rise to some discussion concerning the distribution of Board reports in general. It was decided that the Secretariat should review all Board reports and recommend the ones which should be placed on a list for general distribution.

With regard to the report by Dr. Laycock, the Chairman suggested that 15 copies be sent to each member and that the possibility be explored of approaching the Queen's Printer with a view to publication of the report as a saleable item.

SASKATCHEWAN RIVER AT THE PAS

In September the Member for Manitoba raised the matter of the influence of Diefenbaker Lake on flood frequencies at The Pas with relation to proposed developments in the Pasquia area and asked if the Secretariat could work out new frequency curves. The Board agreed that the Secretariat should review the effect of Diefenbaker Lake on river flows at The Pas.

BOARD MEMBERSHIP

It was reported at the September meeting that Mr. B. W. Boyson had accepted a position with the Province of Alberta and that this would be his last appearance in the capacity of Member for Saskatchewan. The Board expressed its gratitude to Mr. Boyson for his valuable contributions to the work of the Board during his long term of office as Member for Saskatchewan and asked the Chairman to write him a letter of appreciation to that effect.

Mr. J. M. Crook, Chief Engineer of the Saskatchewan Water Resources Commission, replaced Mr. Boyson as Member for Saskatchewan, with effect from November, 1967.

OTHER REPORTS AND STUDIES

1. The report by Dr. A. H. Laycock was completed in March, 1967, and presented to the Board as Prairie Provinces Water Board Report No. 13 entitled "Water Deficiency and Surplus Patterns in the Prairie Provinces".
2. An estimate of streamflow depletions for the Saskatchewan River system is kept current by the Engineering Secretariat. A chart on

the following page provides a graphical comparison between these depletions and the recorded flows at Saskatoon and The Pas.

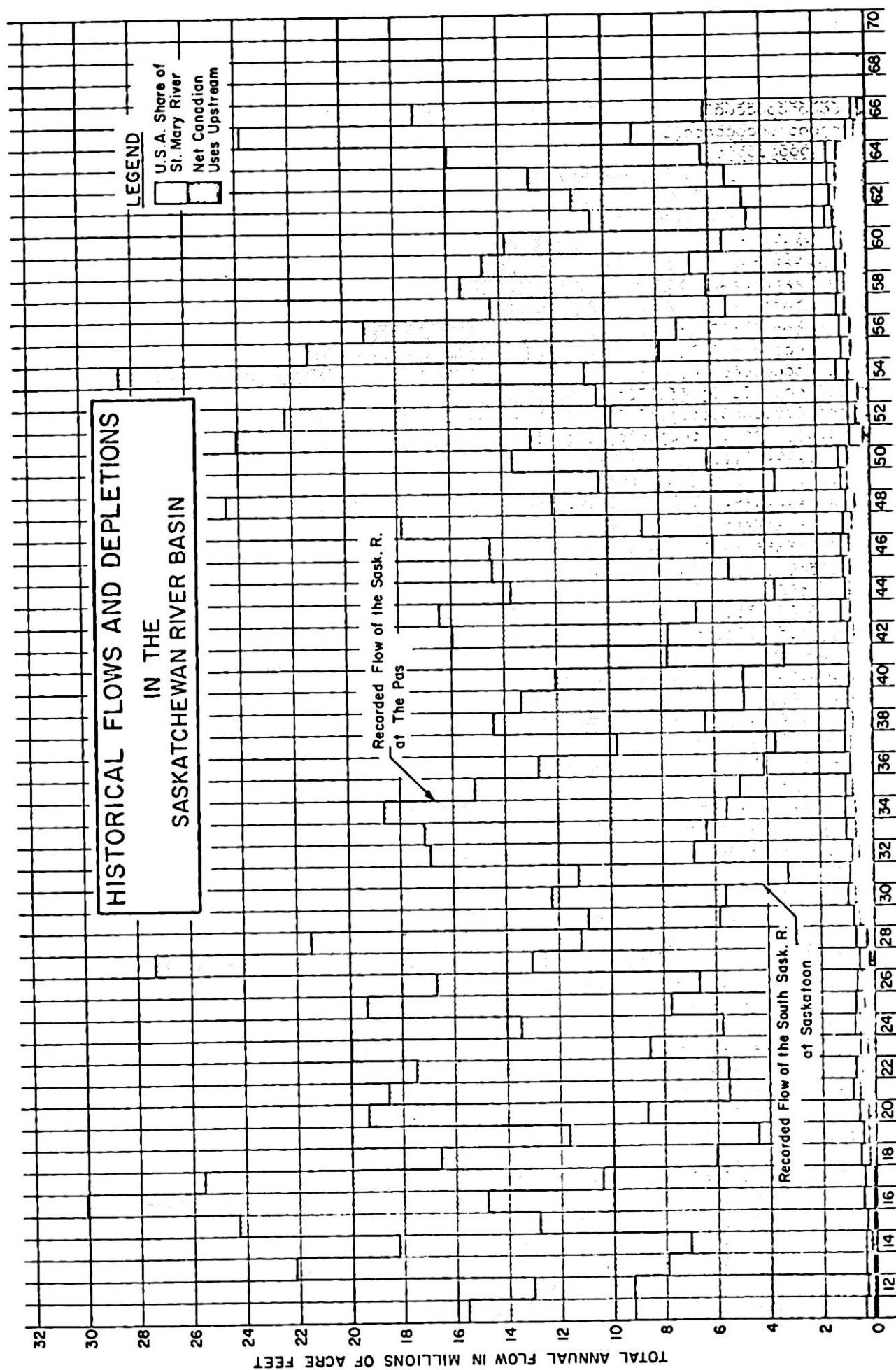
3. A tabulation of "Acreage Actually Irrigated in the Alberta portion of the South Saskatchewan Basin" has been prepared and may be found immediately following the flows and depletions graphs. The tabulation is based primarily on material supplied by the Alberta Water Resources Branch.



M. J. Fitzgerald
Chairman



L. K. Szojka
Acting Engineering Secretary



ACREAGE ACTUALLY IRRIGATED IN ALBERTA 1911 - 1972

YEAR	ST. MARY	WESTERN I.D.	EASTERN I.D.	BOW RIV. DEVELOP.	L. N. I.D.	U.I.D.	M. V. I.D.	L.I.D.	A.I.D.	MACLEOD I.D.	ROSS CR. I.D.	TOTAL
1911	47,000	500										47,500
12	76,200	500										76,700
13	76,200	2,600										78,800
14	76,200	8,448	7,806									92,454
15	76,200	512	7,800									84,512
16	71,281	859	1,497									73,637
17	91,780	3,657	9,005									104,442
18	102,900	25,191	24,440									152,531
19	112,569	31,908	43,660									187,937
1920	62,893	4,083	60,762	4,240								131,978
21	85,902	33,819	88,293	9,400								217,220
22	88,680	49,752	93,375	9,509								241,316
23	75,968	3,074	42,920	11,249	6,963							140,182
24	84,751	24,297	84,200	9,720	29,991	5,264						238,223
25	94,582	5,384	72,994	13,252	43,628	10,000						239,840
26	92,782	19,561	74,401	13,467	56,395	10,026						266,632
27	22,176	1,273	7,921	810	10,012	41						42,233
28	31,924	3,892	45,677	19,361	33,436	2,576						136,866
29	46,441	37,395	78,610	29,260	61,231	3,102						256,039
1930	98,483	41,570	89,913	27,102	70,007	5,847						332,922
31	100,403	47,593	90,724	29,803	70,408	12,983	300					352,214
32	99,788	8,680	90,651	26,379	41,842	11,500	800					279,640
33	104,854	40,812	96,019	21,917	62,416	10,500	1,168					337,686
34	105,490	31,131	101,566	22,208	54,200	10,000	1,950					326,545
35	93,471	19,109	143,997	22,694	73,022	12,000	3,000					367,293
36	111,397	44,614	111,781	26,660	62,790	18,000	2,900					378,142
37	113,546	50,866	124,645	30,107	70,020	17,500	3,500					410,184
38	112,629	35,755	133,928	33,326	73,297	10,000	3,500					402,435
39	110,677	11,647	141,688	34,984	56,712	10,000	3,200					368,908
1940	115,030	20,134	138,462	37,906	76,492	10,500	3,000					401,524
41	109,148	21,144	156,501	35,312	63,575	11,000	3,300					399,980
42	103,183	9,194	166,453	32,946	31,102	12,000	3,400					358,278
43	112,142	7,666	168,496	35,143	67,777	14,000	3,254					408,478
44	112,550	20,000	167,094	37,266	75,927	13,000	3,400	526				429,763
45	112,484	20,000	167,100	38,838	57,126	13,000	3,300	1,000				412,848
46	112,734	19,000	166,326	42,457	64,894	7,453	3,300	1,300				417,464
47	110,848	20,000	168,580	43,594	57,434	7,453	3,300	1,300				412,509
48	109,571	12,000	172,200	44,160	55,374	2,970	3,700	1,500				401,475
49	107,150	26,197	180,000	44,050	72,807	21,000	3,300	1,500				456,004
1950	111,513	23,079	180,000	36,508	78,721	9,758	3,500	2,500				445,579
51	104,571	1,000	153,804	24,283	21,979	1,859	(100)	200		0	0	307,806
52	117,261	700	149,289	40,416	35,314	6,072	3,350	940		1,600	850	355,792
53	112,779	500	114,776	(40,000)	37,409	8,894	3,380	980		1,800	1,100	321,618
54	152,489	1,900	156,884	(40,000)	58,745	10,033	3,392	254		2,600	2,100	428,397
55	123,679	2,500	148,892	(40,000)	31,753	10,115	3,132	423			1,500	361,994
56	142,155	6,000	190,976	109,400	31,588	11,082	2,773	852			1,800	496,627
57	161,292	4,500	189,928	65,000	51,803	15,888	2,773	2,779	0	0	0	495,652
58	168,793	9,870	189,845	60,185	51,916	11,032	2,759	1,542	0	0	0	497,443
59	241,030	9,330	163,993	54,514	46,453	17,761	2,789	1,542	360	0	0	539,238
1960	179,477	12,000	167,597	71,392	71,006	16,536	2,789	1,542	440	0	0	523,184
61	208,547	23,200	170,413	78,260	73,637	23,035	2,760	1,542	1,800	0	200	583,454
62	217,029	30,000	176,695	83,910	73,317	28,465	2,760	4,187	2,178	0	200	618,741
63	229,657	25,000	170,776	78,695	64,510	27,017	2,789	4,511	2,315	0	200	605,660
64	235,015	24,000	166,723	86,197	70,573	19,378	2,789	4,511	2,523	0	200	611,907
65	209,005	2,750	143,512	44,526	22,778	9,805	2,789	4,511	2,523	0	1,050	443,699
66	210,904	3,100	144,186	41,536	19,196	12,725	2,789	4,523	2,523	0	0	442,532
67												
68												
69												
1970												
71												
72												

NOTE Acreage figures from early Irrigation Company annual reports, except as noted below

- (1) From "Report on Return Flows from Irrigation Districts in Alberta, 1951 to 1965." by Water Resources Branch, Department of Northern Affairs and National Resources, Calgary.
- (2) Information by letter from Alberta Water Resources Office, Edmonton.

E No records - estimated -

HYD-A-477

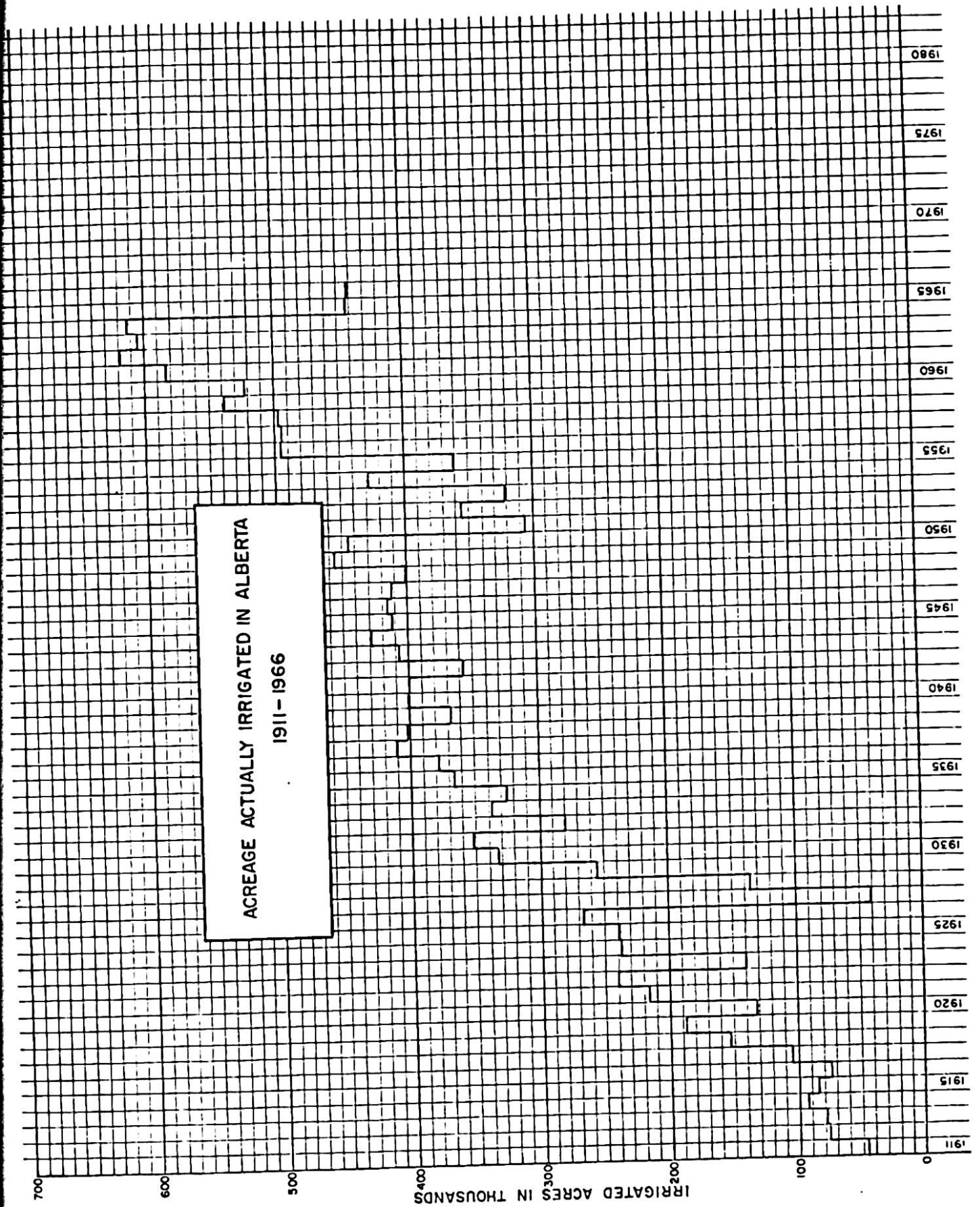


TABLE 1

<u>SUMMARY OF FINAL ALLOCATIONS</u> <u>IN THE SASKATCHEWAN RIVER BASIN</u>						
Project	Province	Irrigable Acreage Acres	Allocation Ac. Ft.	Recommended by Water Board	Recommendation approved by O.I.C. from all Governments	
St. Mary-Milk River Proj.	Alta.	465,000	796,000	6-5-49	4-7-51	
Western Irrig. District	"	50,000	85,700	"	"	
Eastern Irrig. District	"	281,000	562,000	"	"	
Bow River Irrig. District	"	240,000	478,534	"	"	
United Irrig. District	"	34,000	51,000	"	"	
Leth. Northern Irr. Dist.	"	96,135	150,000	"	"	
Mountain View Irrig. Dist.	"	3,600	6,000	"	"	
Leavitt Irrig. District	"	4,400	7,000	"	"	
Aetna Irrig. District	"	7,300	13,000	"	"	
MacLeod Irrig. District	"	5,000	8,000	"	"	
Private Projects	"	70,000	80,000	"	"	
Saskatoon - Municipal	Sask.		11,426	18-12-50	8-8-51	
- Steam Plant	"		31,260	"	"	
Caron - Moose Jaw Div.	"		12,600	"	"	
Swift Current Irr. Proj.	"	21,000	55,000	"	"	
<u>Small Projects</u>						
- Main Stem			1,500	"	"	
- Swift Current Basin			5,600	"	"	
- Other Tributaries			4,500	"	"	
<u>SUMMARY OF TENTATIVE ALLOCATIONS</u> <u>IN THE SASKATCHEWAN RIVER BASIN</u>						
Regina - Moose Jaw Div.	Sask.		29,000	18-12-50	8-8-51	
French Flats - Valley Park	"	6,502	11,140	"	"	
South Sask. River Project	"	470,000	960,000	15-5-53	-53	

TABLE 1 (Cont'd)

SUMMARY OF RESERVATIONS IN GOOD STANDING IN THE SASKATCHEWAN RIVER BASIN						
Project	Province	Irrigable Acreage Acres	Allocation Ac. Ft.	Recommended by Water Board	Recommendation approved by O.I.C. from all Governments	
Red Deer (Wm. Pearce)	Alta.	250,000	700,000	18-12-58	(Original Reservation)	EXPIRED Dec. 1960
				1-12-60	(Renewed)	EXPIRED Dec. 1962
				16-1-63	(Renewed)	EXPIRED Dec. 1964
				10-11-64	(Renewed)	EXPIRED Dec. 1966
				18-5-67	(Renewed)	EXPIRES* Dec. 1968
Small Projects	Alta. & Sask.		1,000,000	2-12-59	(Original Reservation)	EXPIRED Dec. 1960
				1-12-60	(Renewed)	EXPIRED Dec. 1961
				6-12-61	(Renewed)	EXPIRED Dec. 1962
				16-1-63	(Renewed)	EXPIRED Dec. 1963
				6-11-63	(Renewed)	EXPIRED Dec. 1964
				21-9-65	(Renewed)	EXPIRED Dec. 1966
				18-5-67	(Renewed)	EXPIRES* Dec. 1968

* "or until apportionment of the stream is accomplished" - See PPWB Minute 36-05.

TABLE 1 (Cont'd)

BATTLE CREEK BASIN

Project	Province	Irrigable Acres	Allocation Ac. Ft.	Recommended by Water Board	Recommendation Approved
<u>Final Allocations</u>					
Small Projects	Sask.	-	10,946	18-12-50	8-8-51
Richardson-MacKinnon Project	Sask.	-	3,054	18-12-50	8-8-51
<u>Tentative Allocations</u>					
Small Projects	Sask.	-	2,000	18-12-50	8-8-51
Vidora Project	Sask.	2,136	3,360	18-12-50	8-8-51
Consul Project	Sask.	1,500	2,400	18-12-50	8-8-51

MIDDLE CREEK BASIN

Project	Province	Irrigable Acres	Allocation Ac. Ft.	Recommended by Water Board	Recommendation Approved
<u>Final Allocations</u>					
Small Projects	Sask.	-	1,027	18-12-50	8-8-51
Middle Cr. Reservoir Losses	Sask.	-	2,335	18-12-50	8-8-51

LODGE CREEK BASIN

Project	Province	Irrigable Acres	Allocation Ac. Ft.	Recommended by Water Board	Recommendation Approved
<u>Final Allocations</u>					
Small Projects	Sask.	-	600	18-12-50	8-8-51
Spangler Project	Sask.	1,322	2,970	18-12-50	8-8-51

QU'APPELLE RIVER BASIN

Project	Province	Irrigable Acres	Allocation Ac. Ft.	Recommended by Water Board	Recommendation Approved
<u>Final Allocations</u>					
Small Projects	Sask.	-	20,000	18-12-50	8-8-51