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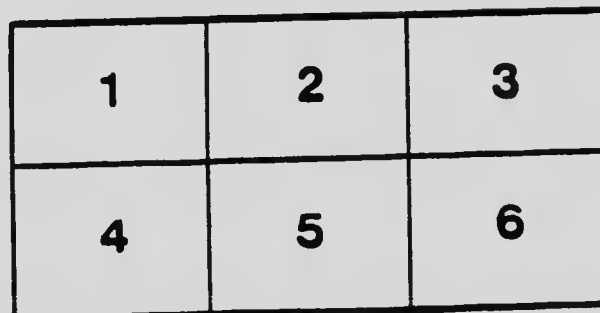
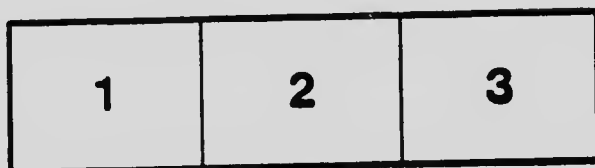
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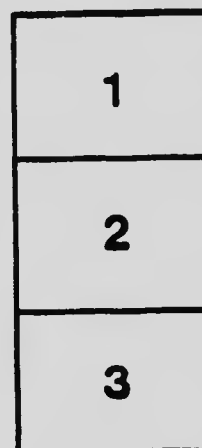
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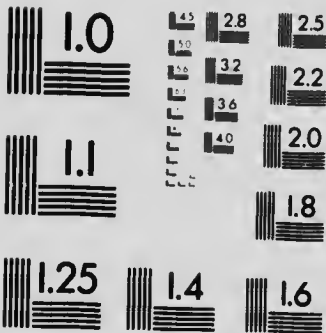
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from waste and to draw
from them energy, labour
without brains, and so to
save mankind from toil
that it can be spared,
is to supply what, next
to intellect, is the very
foundation of all our
achievements and all
our welfare.

Justice Holmes



DEPARTMENT OF THE INTERIOR—CANADA

Hon. W. J. ROCHE, Minister. W. W. CORY, Deputy Minister.

DOMINION WATER POWER BRANCH,

J. B. CHALLIES, C.E., Superintendent.

WATER RESOURCES PAPER No. 22

PROGRESS REPORT
OF THE
MANITOBA HYDROMETRIC
SURVEY

FOR
THE CALENDAR YEAR 1916

BY
M. C. HENDRY, A.M. Can. Soc. C.E.
Chief Engineer

Prepared under the Direction of the Superintendent of Water Power.

PRINTED BY ORDER OF PARLIAMENT



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*To His Excellency the Duke of Devonshire, K.G., P.C., G.C.M.G., G.C.V.O., etc., etc.,
Governor General and Commander in Chief of the Dominion of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the
Manitoba Hydrometric Survey Report for 1916.

Respectfully submitted

W. J. ROCHE,
Minister of the Interior.

OTTAWA, May 31, 1917.

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PROGRESS REPORT
OF THE
MANITOBA HYDROMETRIC SURVEY
FOR
THE CALENDAR YEAR 1916

PART I.



PART I.

PROGRESS REPORT OF THE MANITOBA HYDROMETRIC SURVEY FOR THE CALENDAR YEAR 1916

INTRODUCTION.

The report presented herewith contains the results of hydrological observations made throughout the province of Manitoba during the calendar year 1916.

Throughout the winter season of 1915-16, very heavy precipitation was observed over the entire provincial area covered by meteorological observations. Taking the station in Winnipeg as an example, a heavier precipitation was recorded there than for any previous winter season since the meteorological station was established. Following the season of heavy precipitation, the spring run-off reached large proportions, and many of the rivers recorded a much higher discharge than had been previously observed. In some cases this high discharge continued throughout the summer and early Fall, giving a total run-off for the year in excess of that for previous years.

Of those rivers where conditions of high discharge obtained, the following might be noted:—

Red River.
Assiniboine River.
Souris River.
Saskatchewan River.
Nelson River.
Winnipeg River.

In each of the foregoing cases all previous records of discharge were equalled or exceeded.

The following table gives the maximum discharge of the principal rivers in Manitoba during 1916:—

River.	Station.	Maximum Recorded Discharge, C.F.S.	Date.
Red.	Emerson	46,180	April 24.
Red.	Winnipeg (below mouth of Assiniboine)	73,000 (Est.)	April 27.
Assiniboine	Headingley	21,670	April 27.
Assiniboine	Brandon	9,140	April 19.
Assiniboine	Millwood	2,933	April 23.
Souris	Melita	3,785	April 23.
Souris	Wawanesa	6,400	April 19.
Saskatchewan	Pas.	102,000	July 19.
Nelson	Manitou Rapids	114,000	Aug. 8.
Winnipeg	Whiteford Falls	40,550	July 20.
Winnipeg	Slave Falls	69,400	July 21.

It was also noted that the maximum stage for the year of a number of lakes that are under observation by this Survey exceeded that previously recorded. The following is a table giving the stage of the more important of these lakes:—

Lake.	Station.	Max. Stage. (Sea Level Datum).	Date.	Mean Elev. for Month.
Winnipeg	Winnipeg Beach	717.98	Sept. 1	715.41
Lake of the Woods	Kenora	1,063.93	July 19.	1,063.72
Lac Seul	Hudson's Bay Post	1,164.37	July 20.	1,164.10
Manitoba	Delta	813.38	Aug. 3.	812.72
Winnipegosis	Winnipegosis	829.12	July 23.	828.22

ORGANIZATION AND SCOPE.

(1) Following the inception of the work undertaken by the Winnipeg River Power Survey, the Manitoba Hydrometric Survey (formerly Manitoba Hydrographic Survey) was organized in 1912, superceding the former organization. It is a subsidiary organization of the Dominion Water Power Branch, Department of the Interior, Ottawa. The Survey is, therefore, not a provincial but a federal government organization.

(2) The energies of the Survey are directed toward the gathering of stream flow data, the making of power and storage investigations, and the furnishing of hydrological, meteorological and power data to the interested public by correspondence and interviews at the Winnipeg office.

(3) The field covered by the investigations of the Survey comprises the whole of Manitoba. In addition, certain investigations have been carried on outside of the Province. These relate to storage questions, having a bearing on stream regulation and power development within the Province. The greater part of the data so gathered has been made use of by the International Joint Commission in its study of the question of the regulation of the Lake of the Woods. These outside investigations have been confined almost entirely to the upper part of the Winnipeg River drainage basin.

DISTRICTS.

For purposes of organization and for convenience of description, the whole territory covered by the Survey has been separated into several main divisions. These conform generally to the several drainage systems covering the Province. They may be enumerated as follows:—

- 1—Lake of the Woods Outlets.
- 2—Winnipeg River and Tributaries.
- 3—Red River and Tributaries (excepting the Assiniboine River).
- 4—Assiniboine River and Tributaries.
- 5—Saskatchewan River and District West of Lake Winnipegosis.
- 6—The East Shore of Lake Winnipeg.
- 7—Nelson River and Tributaries.

MANITOBA HYDROMETRIC SURVEY

5

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Below are listed the stations maintained by the Survey (see Plate 7). In the first list appear the names of those stations for which continuous records of discharge are available. In the second are listed stations at which meterings have been secured, but for which continuous records are not available. It should be pointed out that while continuous records of gauge height have in some cases been secured, for various reasons estimates of daily discharge have not been made; the stations are therefore classed as miscellaneous. The third list contains the names of stations at which gauge height records only have been obtained:—

REGULAR METERING STATIONS.

File No.	Name.	Location.	Station No.
A.1.a	Assiniboine river.....	Brandon.....	5 M.H.1
A.1.c	Assiniboine river.....	Headingley.....	5 M.J.1
A.1.d	Assiniboine river.....	Millwood.....	5 M.E.1
B.3.a	Brokenhead river.....	Sinnert.....	5 S.A.1
B.4.a	Birdtail creek.....	Birtle.....	5 M.E.2
L.1.a	Lake of the Woods.....	Kenora Power House (headrace).....	5 P.E.1
L.1.b	Lake of the Woods.....	North Tunnel Island.....	5 P.E.4
L.1.c	Lake of the Woods.....	Keewatin River Bridge.....	
L.1.e	Lake of the Woods.....	Norman Traffic Bridge.....	5 P.E.2
L.1.f	Lake of the Woods.....	Norman Dam headrace.....	
L.1.g	Lake of the Woods.....	Old K.L. & M. Co.....	5 P.E.3
L.3.f	Minnedosa river.....	Mill "A".....	5 P.E.4
L.3.b	Minnedosa river.....	Mill "C".....	5 P.E.4
L.3.m	Minnedosa river.....	Beilby's Bridge.....	5 M.F.1
M.1.a	Manitogagan river.....	Indian Bridge.....	5 M.F.3
M.4.d	Mossy river.....	Middleton Bridge.....	5 M.F.4
N.1.e	Nelson river.....	Above Wood falls.....	5 R.A.1
O.1.a	Ochre river.....	Below Fork river.....	5 L.J.2
R.1.a	Rat river.....	4 miles above Shell rapids.....	5 U.E.1
R.4.a	Red river.....	Ochre river.....	5 L.J.3
R.5.b	Roseau river.....	Otterburne.....	5 O.E.1
R.5.e	Roseau river.....	Emerson.....	5 O.C.1
R.6.a	Red Deer river.....	Baskerville's farm.....	5 O.D.1
R.7.b	Rolling river.....	Stuartburn.....	5 O.D.2
S.1.a	Saskatchewan river.....	Hudson Bay Junction.....	5 L.C.2
S.1.d	Saskatchewan river.....	C. N. R. Crossing.....	5 M.F.3
S.3.a	Shell river.....	Head of Grand Rapids.....	5 K.L.1
S.4.a	Souris river.....	Pas.....	5 K.J.1
S.4.b	Souris river.....	Assessippi.....	5 M.D.1
S.6.a	Swan river.....	Wawanesa.....	5 N.G.1
V.1.a	Valley river.....	Melita.....	5 N.F.1
W.1.a	Whitemouth river.....	Swan River.....	5 L.E.1
W.6.d	Winnipeg river.....	Valley River.....	5 L.J.4
W.6.w	Winnipeg river.....	Whitemouth.....	5 P.H.1
W.10.a	Whirlpool river.....	Slave Falls.....	5 P.F.1
W.11.a	Woody river.....	Whitedog Falls.....	5 P.E.10
		Danvers.....	5 M.F.2
		Bowman.....	5 L.E.2

MISCELLANEOUS METERING STATIONS.

File No.	Name.	Location.
B.1.a	Berens river.....	8½ miles from mouth.
B.1.b	Berens river.....	Little Grand Rapids.
B.5.a	Bloodvein river.....	8 miles above mouth
B.6.a	Boyer river.....	Carman.
C.3.b	Clear creek.....	Outlet Clear lake.
L.1.j	Lake of the Woods.....	C. P. R. Culvert.
L.2.b	La Salle river.....	Sanford.
L.3.c	Minnedosa river.....	Minnedosa Power House (headrace).
M.3.b	Morris river.....	Rosenort.
P.1.c	Pembina river.....	Near Manitou.
P.2.b	Pinawa channel.....	Below Control Dam.
P.2.j	Winnipeg river.....	Below Sharkes's Dam.
P.4.a	Pigeon river.....	Above First rapids.
R.5.d	Roseau river.....	Below Dominion City.
W.6.ab	Winnipeg river.....	Throat Rapids.
W.6.bc	Winnipeg river.....	Intake, Point du Bois.
W.8.a	Whitemud river.....	Hoanfield.

GAUGING STATIONS OPERATED IN 1916.

File No.	Name.	Location.
B.8.a	Boggy lake.....	At Outlet Walrpool river.
F.1.a	Fairford river.....	Fairford.
F.3.a	Family lake.....	Little Grand Rapids.
L.1.a	Lake of the Woods.....	Kenora Power House (Tailrace).
L.1.d	Lake of the Woods.....	Norman Dam (Tailrace).
L.1.m	Lake of the Woods.....	Ontario D.P.W. Lake gauge (M.H.S.).
L.1.n	Lake of the Woods.....	Keewatin River Gauge. Mill "A."
L.1.p	Lake of the Woods.....	Kenora Automatic Gauge.
L.3.c	Minnedosa river.....	Minnedosa Power House (Tailrace).
L.4.a	Lac Seul.....	Hudson's Bay Co. Post.
M.1.a	Manigotagan river.....	Below Wood Falls.
M.2.c	Lake Manitoba.....	Delta.
N.1.a	Nelson river.....	Norway House.
N.1.f	Nelson river.....	McMillan's Landing.
N.1.H	Nelson river.....	Manitou Bridge Crossing.
N.1.j	Nelson river.....	Kettle rapids
N.1.k	Nelson river.....	Kettle Bridge Crossing.
O.3.a	Otter creek.....	Scandinavia.
P.1.b	Pembina river.....	Killarney.
P.2.a	Pinawa channel.....	Above Control Dam.
P.2.b	Pinawa channel.....	Automatic Gauge below Control Dam.
P.2.c	Pinawa channel.....	W.E.S. Ry. Forebay and Tailrace.
P.2.h	Pinawa channel.....	Intake.
P.2.j	Pinawa channel.....	Above Sharkey's Dam.
P.2.k	Pinawa channel.....	Above Diversion Dam (M.H.S.).
P.2.l	Pinawa channel.....	Above Diversion Dam (W.E.S. Ry.).
P.2.m	Pinawa channel.....	Below Diversion Dam (W.E.S. Ry.).
R.4.c	Red river.....	St. Agathe.
R.4.d	Red river.....	Redwood Bridge (Winnipeg).
R.4.e	Red river.....	Morris.
R.4.f	Red river.....	Elm Park Bridge (Winnipeg).
S.2.a	Seine river.....	St. Anne de Chenes.
W.4.a	Lake Winnipegosis.....	Winnipegosis.
W.5.a	Lake Winnipeg.....	Winnipeg Beach.
W.6.a	Winnipeg river.....	Minaki.
W.6.bc	Winnipeg river.....	Above Intake, Point du Bois.
W.6.bb	Winnipeg river.....	Above Screens, Point du Bois.
W.6.b	Winnipeg river.....	Tailrace, Point du Bois.
W.6.z	Winnipeg river.....	Above 8 Foot falls.
W.6.z	Winnipeg river.....	Below 8 Foot falls.
W.6.d	Winnipeg river.....	Above Slave falls.
W.6.d	Winnipeg river.....	Below Slave falls.
W.6.r	Winnipeg river.....	Above Seven Sisters.
W.6.s	Winnipeg river.....	Between 1st and 2nd falls, Seven Sisters.
W.6.t	Winnipeg river.....	Between 2nd and 3rd falls, Seven Sisters.
W.6.u	Winnipeg river.....	Foot of 3rd falls, Seven Sisters.
W.6.v	Winnipeg river.....	Foot of 4th falls, Seven Sisters.
W.6.f	Winnipeg river.....	Foot of Seven Sisters.
W.6.g	Winnipeg river.....	Winnipeg City Tramway Bridge.
W.6.h	Winnipeg river.....	Foot 1st McArthur falls.
W.6.ae	Winnipeg river.....	Foot 2nd McArthur falls.
W.6.j	Winnipeg river.....	Head Grand du Bonnet.
W.6.k	Winnipeg river.....	Head Little du Bonnet.
W.6.af	Winnipeg river.....	Foot of Little du Bonnet.
W.6.l	Winnipeg river.....	Head Whitemud falls.
W.6.m	Winnipeg river.....	Head of Silver falls.
W.6.r	Winnipeg river.....	Foot of Silver falls.
W.6.o	Winnipeg river.....	Head of Pine falls.
W.6.P	Winnipeg river.....	Foot of Pine falls.
W.6.q	Winnipeg river.....	Fort Alexander.
W.12.a	Wolf lake.....	Elphinstone.

The following is a list of stations at which gauge readings have been obtained for various periods since the organization of the Survey, but which were not in operation during 1916.

The gauge readings for all gauging stations operated at various times have been tabulated and appear in the third part of the report. As far as possible these records have been grouped so that gauge readings relating to particular drainage areas, rivers or stretches of the same river, appear in proper order, and wherever possible they have been reduced to the same datum:—

File No.	Name.	Location.
A.1.b	Assiniboine river.....	Currie's Landing, Brandon.
A.5.a	Audy lake.....	Forest Rangers' Quarters, Riding Mountain.
C.1.a	Cypress river.....	Cypress river.
L.3.a	Minnedosa river.....	Kirkham Bridge.
L.3.b	Minnedosa river.....	McKellar Bridge.
L.3.k	Minnedosa river.....	Minnedosa Traffic Bridge.
M.2.a	Manitoba lake.....	Meadow Portage.
M.2.b	Manitoba lake.....	Oak Point.
M.4.a	Mossy river.....	Clendenning Bridge, lake Dauphin.
M.4.b	Mossy river.....	Cameron's Bridge.
N.1.d	Nelson river.....	Warren's Landing.
O.4.a	Otter lake.....	Erickson.
P.1.a	Pembina river.....	La Riviere.
P.2.d	Pinawa channel.....	Gauge A below First Rock Cut.
P.2.e	Pinawa channel.....	Gauge B above First Rock Cut.
P.2.f	Pinawa channel.....	Gauge C above Second Rock Cut.
P.2.g	Pinawa channel.....	Gauge D above Third Rock Cut.
P.2.n	Pinawa channel.....	Below Diversion Dam, M.H.S.
P.3.a	Pipestone creek.....	Cromer.
Q.1.a	Qu'Appelle river.....	Welby, Sask.
Q.1.b	Qu'Appelle river.....	De Corby's Farm, St. Lazare.
R.4.b	Red river.....	2 miles below Emerson.
R.4.g	Red river.....	Agricultural College, Winnipeg.
R.6.b	Red Deer lake.....	Near Barrows, Man.
R.8.a	Round lake.....	Erickson.
S.1.b	Saskatchewan river.....	Near Lake Winnipeg.
S.1.c	Saskatchewan river.....	Foot of Grand Rapids.
S.1.e	Saskatchewan river.....	Morrison's Dock.
S.5.a	Squirrel creek.....	Austin.
W.1.b	Whitemouth river.....	First Falls at Mouth.
W.2.a	Whitemud river.....	Westbourne.
W.6.c	Winnipeg river.....	Hunt Club.
W.6.ad	Winnipeg river.....	At Rapids below Twin falls.
W.6.e	Winnipeg river.....	Mouth of Whitemouth river.
W.6.ea	Winnipeg river.....	Above mouth of Whitemouth river.
W.6.x	Winnipeg river.....	Gustafson's Farm, Lac du Bonnet.
W.6.y	Winnipeg river.....	Rapids, B.M. No. 161.

DEFINITION OF TERMS.

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups: (1) Those which represent a rate of flow, as "second-feet," "miner's inches", and "discharge in second-feet per square mile"; and (2) those which represent the actual quantity of water, as "run-off depth in inches", "acre-feet", "mile-feet", and "millions of cubic feet".

The units used in this series of reports are "second-feet", "second-feet per square mile", "run-off depth in inches", "acre-feet", "mile-feet" and "millions of cubic feet". They may be defined as follows:—

"Second-feet" is an abbreviation for cubic feet per second (c. f. s.). A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section, 1 foot wide and 1 foot deep at an average velocity of 1 foot a second. It is generally used as a fundamental unit from which others are computed by the use of factors given in the following tables of equivalents.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off depth in inches" is the depth to which a drainage area would be covered if all the water flowing from it in a given period were conserved and

uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

"Acre-foot" is equivalent to 43,560 cubic feet and is the quantity of water required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation or power.

"Mile-foot" is equivalent to 27,878,400 cubic feet, and is the quantity of water required to cover one square mile to a depth of 1 foot, and is equal to 640 acre-feet.

"Millions of cubic feet" is a term frequently used to express quantity of storage. When the quantities are of sufficient magnitude the unit is increased to that of "billions of cubic feet."

Certain terms not in common use may be defined as follows:—

"Control", "controlling section", and "point of control" are used to designate the cross section of the stream below the gauge, which controls or regulates the height of the water surface at the gauge. The control may not be the same cross section at all stages.

"Discharge relation" is the relation of gauge height to discharge.

CONVENIENT EQUIVALENTS

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting velocity in feet per second into velocity in miles per hour.

[1 foot per second = 0.681818 mile per hour, or very nearly $\frac{1}{2}$ mile per hour. 1 mile per hour = 1.4667 foot per second, or very nearly $1\frac{1}{2}$ foot per second. In computing the table the values 0.68182 and 1.4667 were used.]

Units.	Tenths.									
	0	1	2	3	4	5	6	7	8	9
0.....	0.000	0.068	0.136	0.205	0.273	0.341	0.409	0.477	0.545	0.614
1.....	0.682	0.750	0.818	0.886	0.955	1.020	1.090	1.160	1.230	1.300
2.....	1.360	1.430	1.500	1.570	1.640	1.700	1.770	1.840	1.910	1.980
3.....	2.050	2.110	2.180	2.250	2.320	2.390	2.450	2.520	2.590	2.660
4.....	2.730	2.800	2.860	2.930	3.000	3.070	3.140	3.200	3.270	3.340
5.....	3.410	3.480	3.550	3.610	3.680	3.750	3.820	3.890	3.950	4.020
6.....	4.090	4.160	4.230	4.300	4.360	4.430	4.500	4.570	4.640	4.700
7.....	4.770	4.840	4.910	4.980	5.050	5.110	5.180	5.250	5.320	5.390
8.....	5.450	5.520	5.590	5.660	5.730	5.800	5.860	5.930	6.000	6.070
9.....	6.140	6.200	6.270	6.340	6.410	6.480	6.550	6.610	6.680	6.750

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area.

Discharge in second-feet per square mile.	Run-off in inches.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	0.03719	1.041	1.079	1.116	1.153
2.....	0.07438	2.083	2.157	2.231	2.306
3.....	0.11157	3.124	3.236	3.347	3.459
4.....	0.14876	4.165	4.314	4.463	4.612
5.....	0.18595	5.207	5.393	5.578	5.764
6.....	0.22314	6.248	6.471	6.694	6.917
7.....	0.26033	7.289	7.550	7.810	8.070
8.....	0.29752	8.331	8.628	8.926	9.223
9.....	0.33471	9.372	9.707	10.041	10.376

NOTE.—For part of a month multiply the values for one day by the number of days.

Table for converting discharge in second-feet into run-off in acre-feet.

Discharge in second-feet	Run-off in acre-feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	1.981	55.54	57.52	59.50	61.49
2	3.967	111.10	115.00	119.00	123.00
3	5.950	166.60	172.60	178.50	184.50
4	7.934	222.10	230.10	238.00	246.00
5	9.917	277.70	287.60	297.50	307.40
6	11.900	333.20	345.10	357.00	368.90
7	13.880	388.80	402.60	416.50	430.40
8	15.870	444.30	460.20	470.00	491.00
9	17.850	499.80	517.70	535.50	553.40

NOTE.—For part of a month multiply values for one day by the number of days.

Table for converting discharge in second-feet into run-off in millions of gallons.

Discharge in second-feet.	Run-off in millions of gallons.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	0.6463	18.10	18.74	19.39	20.04
2	1.2930	36.20	37.48	38.78	40.08
3	1.9390	54.30	56.22	58.17	60.12
4	2.5850	72.40	74.96	77.56	80.16
5	3.2320	90.50	93.70	96.95	100.20
6	3.8780	108.60	112.40	116.80	120.20
7	4.5240	126.70	131.20	135.70	140.30
8	5.1710	144.80	149.90	155.10	160.30
9	5.8170	162.90	168.70	174.50	180.40

NOTE.—For part of a month multiply the value for one day by the number of days.

Table for converting discharge in second-feet into run-off in millions of cubic feet.

Discharge in second-feet.	Run-off in millions of cubic feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	0.0864	2.419	2.506	2.592	2.678
2	0.1728	4.838	5.012	5.184	5.356
3	0.2592	7.257	7.518	7.776	8.034
4	0.3456	9.676	10.024	10.368	10.712
5	0.4320	12.095	12.530	12.960	13.390
6	0.5184	14.514	15.036	15.552	16.068
7	0.6048	16.933	17.542	18.144	18.746
8	0.6912	19.352	20.048	20.736	21.424
9	0.7776	21.771	22.554	23.328	24.102

NOTE.—For part of a month multiply values for one day by the number of days.

1 second-foot equals 35.71 British Columbia miner's inches, or one British Columbia miner's inch equals 1.68 cubic feet per minute.

1 second-foot equals 6.23 British imperial gallons per second; equals 538,453 gallons for one day.

1 second-foot equals 7.48 United States gallons per second; equals 646,317 gallons for one day.

1 second-foot for one year covers 1 square mile 1.131 feet or 13.572 inches deep.

1 second-foot for one year equals 31,536,000 cubic feet; equals 724 acre-feet.

1 second-foot for one hour equals about 1 acre-inch.

- 100 British Imperial gallons per minute equals 0.268 second-foot.
 100 United States gallons per minute equals 0.223 second-foot.
 1,000,000 British imperial gallons per day equals 1.86 second-foot.
 1,000,000 United States gallons per day equals 1.55 second-foot.
 1,000,000 British Imperial gallons equals 3.68 acre-feet.
 1,000,000 United States gallons equals 3.07 acre-feet.
 1,000,000 cubic feet equals 22.95 acre-feet.
 1,000,000,000 (1 billion) cubic feet equals 11,570 second-feet for one day.
 1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.
 1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.
 1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.
 1,000,000,000 cubic feet equals 373 second feet for one 31-day month.
 1 acre-foot equals 43,560 cubic feet.
 1 acre-foot equals 271,472 British imperial gallons.
 1 acre-foot equals 325,850 United States gallons.
 1 inch deep on 1 square mile equals 2,323,200 cubic feet.
 1 inch deep on 1 square mile equals 0.0737 second-foot per year.
 1 foot deep on 100 square miles equals 2.79 billions of cubic feet, equals
 3,227 second-feet for 10 days, 1,076 second-feet for 30 days, or 88 second-feet
 for one year.
 1 foot equals 0.3048 metre.
 1 mile equals 1.60935 kilometre.
 1 mile equals 5,280 feet.
 1 acre equals 0.4047 hectare.
 1 acre equals 43,560 square feet.
 1 acre equals 209 feet square, nearly.
 1 square mile equals 2.59 square kilometres.
 1 cubic foot equals 0.0283 cubic metre.
 1 cubic foot of water weighs 62.43 pounds.
 1 cubic meter per minute equals 0.5886 second-foot.
 1 horse power equals 550 foot-pounds per second.
 1 horse power equals 76.0 kilogram-metres per second.
 1 horse power equals 746 watts, or 0.746 kilowatt.
 1 horse power equals 1 second-foot of water falling 8.80 feet.
 $1\frac{1}{2}$ horse power equals about 1 kilowatt.
 To calculate water-power quickly:
 Second-feet x fall in feet $\div$ 11 = net horse-power on water wheel, realizing
 80 per cent of theoretical power.

EXPLANATION OF DATA.

For each regular gauging station the following data, so far as available, are given:—

1. Description of the station.
2. Table of Discharge Measurements.
3. Table of Daily Gauge Heights and Discharges.
4. Table of Monthly Discharge and Run-off.

Under the description of the station, the following information is given: - location and installation of the station, method of determining discharge, characteristics of channel, extent of drainage area and control factors, if any, which might affect the discharge relation. A statement is also made as to the accuracy and reliability of the data.

The table of discharge measurements gives particulars of each individual measurement including the date of the measurement, by whom made, the number of meter in use, gauge height, width and area of cross section, mean velocity and discharge in second feet.

The table of daily gauge heights and discharges gives the observed daily elevation of water surface at the station together with the corresponding discharge. Where observations are made more frequently than once a day, the mean of the day's readings is given in the table.

Attention is called to the fact that the zero of the gauge bears no relation to zero flow or the bottom of the river.

The discharge measurements and gauge heights are the base data from which discharge rating tables, daily discharges and monthly discharges are computed.

The discharge rating table, which is not published in this report, gives the discharge in second-feet corresponding to every stage of the river recorded during the period for which the table is applicable. At such times as the gauge height is temporarily affected by ice cover, backwater, etc., the discharge relation is not applicable unless proper corrections to the gauge heights are known and applied.

In the table of monthly discharge, the column headed "Maximum" gives the mean flow for the day of highest discharge. As this discharge is based on the mean daily gauge reading, it is evident that there may have been short periods when the discharge was higher than that given in the column. Likewise in the column of "Minimum" the quantity given is the mean flow for the day of the lowest discharge. The column headed "Mean" is the average flow for the month in cubic feet per second based upon the mean daily discharge. On this mean are based the computations of run-off which have previously been defined.

The drainage areas as given for each station have been obtained by planimeter determination from the latest available departmental maps.

The base data presented in this report, unless otherwise stated in the description of station, has been collected by methods commonly in practice and described in previous annual reports.

METHODS OF DETERMINING DISCHARGE.

There are a number of methods employed in determining the discharge for streams, each of which has its own particular advantage when employed under certain conditions.

These various methods have been discussed at length in a previous publication so are not included in the present report. Those desiring information along these lines will find the subject well covered in Water Resources Paper No. 4 of the Dominion Water Power Branch.

PUBLICATIONS.

The data gathered by the Survey is published by the Dominion Water Power Branch in the form of Water Resources Papers. The data are prepared and appear as promptly as possible in printed form. These publications may be had either on application to the Superintendent of the Dominion Water Power Branch, Ottawa, or to the Chief Engineer, Manitoba Hydrometric Survey, Winnipeg, where a limited supply of the publications is held for local distribution.

These publications dealing particularly with hydrometric data in Manitoba are listed below:—

Water Resources Paper No. 3—Report on Power and Storage Investigations, Winnipeg River, by J. T. Johnston, C.E.

Water Resources Paper No. 4—Report of the Manitoba Hydrometric Survey to the end of 1914, by M. C. Hendry, B.A.Sc.

Water Resources Paper No. 7—Report on the Manitoba Water Powers, by S. S. Scovil, B.Sc.

Water Resources Paper No. 19—Report of the Manitoba Hydrometric Survey for 1915, by M. C. Hendry, B.A.Sc.

Water Resources Paper No. 22—Report of the Manitoba Hydrometric Survey for 1916, by M. C. Hendry, B.A.Sc.

ACKNOWLEDGEMENTS.

The Survey is indebted to the officials of a number of corporations for co-operation in obtaining records and for placing the results of various observations made by members of their own staff, at the disposal of the Survey. The officials to whom acknowledgement is due are those of the Winnipeg Electric Railway Company, of the Winnipeg Municipal Power Plant, Point du Bois, of the Lake of the Woods Milling Company, of the Kenora Municipal Plant, of the Minnedosa Power Company, and the City Engineer, Brandon.

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PROGRESS REPORT

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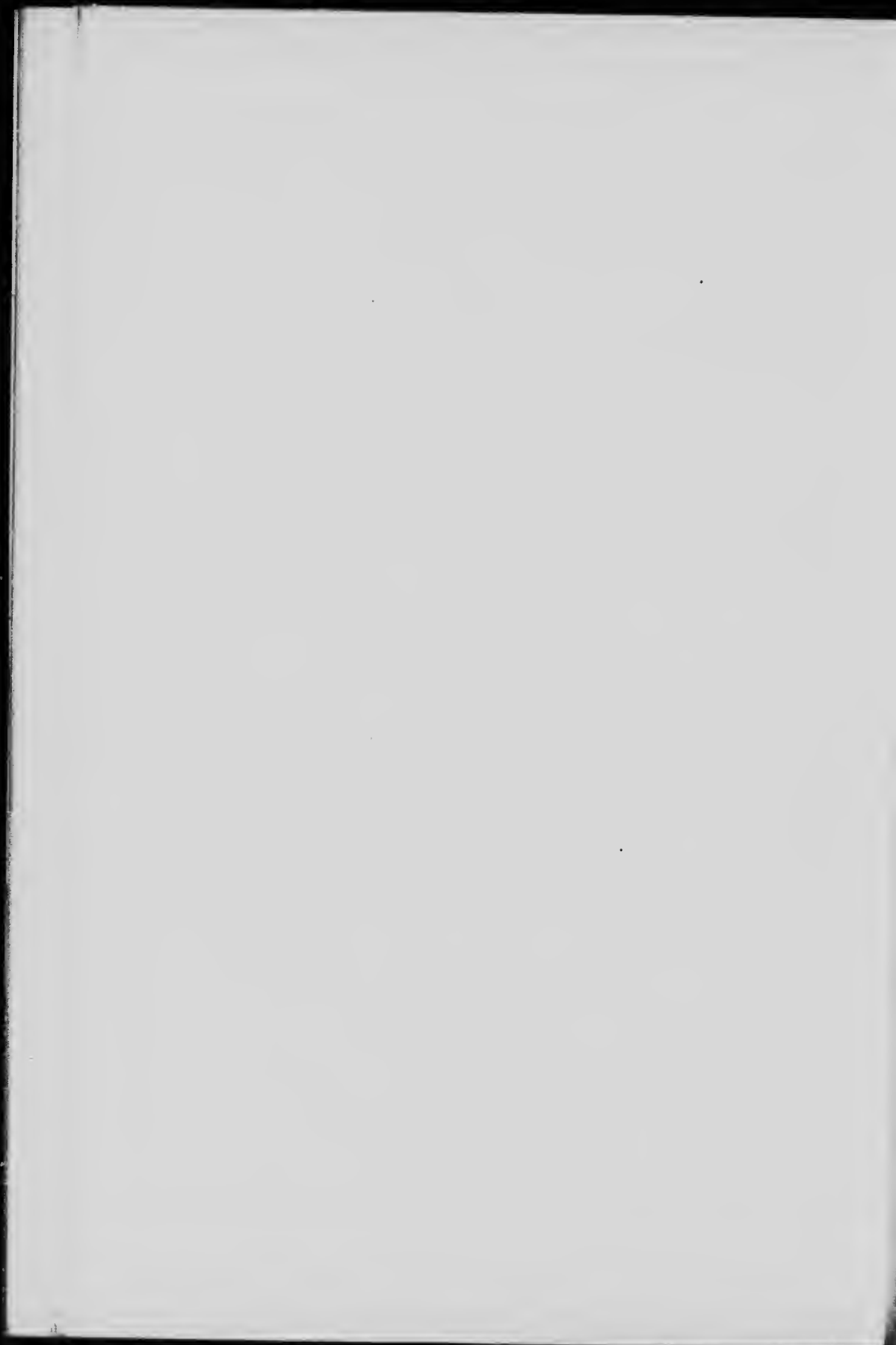
MANITOBA HYDROMETRIC SURVEY

FOR

THE CALENDAR YEAR 1916

PART II.

HYDROMETRIC DATA



PART II.

HYDROMETRIC DATA

LAKE OF THE WOODS OUTLETS.

The outflow from Lake of the Woods into the Winnipeg river takes place through several natural and artificial channels. The flow through all these outlets is controlled by the operation of hydraulic plants or the manipulation of dams. The outlets from the lake in order from the east are,—Eastern Outlet, completely controlled by the Municipal Power Plant of Kenora; the Western Outlet, upon which has been built the Norman Dam; the head race of Mill "C" Lake of the Woods Milling Co., an artificial outlet; the head race of Mill "A" belonging to the same company and also an artificial channel, and lastly, the head race of the Keewatin Lumber and Manufacturing Co's. plant which was formed by the enlargement of an old high water channel that discharged into Mink bay which in turn drains into Darlington bay, an arm of the Winnipeg river.

Below the outlets the Winnipeg river is split up into a number of branches, the tailraces of Mills "A" and "C", the outlet of Darlington bay and the Western Outlet forming the West Branch, and the river below the Eastern Outlet forming the East Branch. These unite below Old Fort Island to form the main river.

The manipulation and operation of the dams and plants at the various outlets renders it difficult to ascertain the discharge from Lake of the Woods. In order that correct estimates may be made it has been necessary to establish and operate a number of metering stations and to maintain gauges at various points in the district. The location of the metering stations are as follows:

1. Eastern Outlet, above the Kenora Power House.
2. Western Outlet, Norman Traffic Bridge.
3. Head Race Mill "C".
4. Head Race, Mill "A".
5. Head Race, Keewatin Lumber & Manufacturing Co.
6. C.P.R. Culvert, Outlet of Mink Bay.
7. North Tunnel Island station.

In addition to the records obtained at these regular stations, observations of the discharge at different controlling sections below the outlets have been made from time to time.

EAST BRANCH WINNIPEG RIVER, KENORA POWER HOUSE.
(LAKE OF THE WOODS OUTLETS.)

STATION NO. 5. P.E₁

History.—The discharge of the East Branch, or Eastern Outlet, Lake of the Woods, depends upon the operation of the Kenora Municipal Power Plant. To determine the discharge under these circumstances it was necessary to rate the power plant. At first an attempt was made to determine the discharge directly, and to this end a station was established by Mr. S. S. Scovil, June 27, 1912, about one-half mile below the power house near Old Fort Island; this proved unsatisfactory so a station was established by A. Pirie, October 8, 1913, about one hundred and fifty feet above the power house on the Eastern Outlet. This section was used to rate the power station.

Location of Section.—The metering section is located about one hundred and fifty feet above the Kenora Power House on the Eastern Outlet of the Lake of the Woods. The station is operated as a boat station and is used throughout the year.

Drainage Area.—The drainage area above the section is 26,400 square miles, but as there are several other outlets from the Lake of the Woods, this drainage area cannot be used as applying only to the Eastern Outlet.

Channel.—The channel is permanent, being in solid rock and boulders, is fairly uniform and free from cross eddies. It is straight for fifty feet above the section and one hundred feet below and fairly uniform. All the water passes through the power house excepting a small portion escaping in the log chute.

Gauge.—Headrace and tailrace gauges were established at the power plant in 1907, and are those used in the records up to June of 1912. On June 24 and 27, 1912 respectively, head and tailrace gauges were established by S. S. Scovil, the former being on the upstream side of the timber platform in the headrace and the latter sixty feet below the power house. Both were referred to W.P.S. datum.

Discharge Measurements. Since this station was established, discharge measurements have been made covering practically the entire range in head and load to be met with in the operation of the plant, and from this information rating curves of load discharge for various heads have been constructed.

Records Available.—Daily gauge height readings are available for the head and tailrace of the plant from August 21, 1907 to December 31, 1916. Based on these gauge heights and the accompanying loads on the plant, estimates of daily discharge are available for the above period.

Accuracy.—Except for conditions due to very small loads, the rating may be considered good.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26a

Discharge Measurements of East Branch Winnipeg River at Kenora Power House, for 1916.

Date	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 27	C. C. Galloway	2,018	79	1,354	0.52	1,060.15	704.1
June 2	C. C. Galloway	2,018	79	1,477	1.14	1,061.74	1,684.3
June 2	C. C. Galloway	2,018	79	1,478	1.22	1,061.74	1,802.7
June 15	C. C. Galloway	1,939	79	1,504	0.93	1,062.08	1,399.1
June 17	C. C. Galloway	1,939	79	1,501	1.46	1,062.00	2,192.2
June 19	C. C. Galloway	1,939	79	1,500	1.79	1,062.02	2,684.6
June 19	C. C. Galloway	1,939	79	1,500	1.82	1,062.02	2,729.6
June 21	M. S. Madden	1,919	79	1,506	1.89	1,062.05	2,847.3
June 21	M. S. Madden	1,919	79	1,506	1.85	1,062.05	2,787.0
June 24	M. S. Madden	1,919	80	1,519	1.82	1,062.14	2,765.1
June 24	M. S. Madden	1,919	80	1,519	1.84	1,062.14	2,795.5
June 27	C. C. Galloway	1,919	79	1,520	1.82	1,062.28	2,766.4
July 4	C. C. Galloway	1,919	79	1,520	1.78	1,062.28	2,705.6
July 8	C. C. Galloway	1,919	79	1,543	1.02	1,062.52	1,574.3
July 8	C. C. Galloway	1,919	79	1,542	1.10	1,062.50	1,696.1
July 8	C. C. Galloway	1,919	79	1,542	1.10	1,062.50	1,696.1
July 8	C. C. Galloway	1,919	79	1,545	1.17	1,062.54	1,807.6
July 12	C. C. Galloway	1,919	79	1,545	1.13	1,062.54	1,745.8
July 12	C. C. Galloway	1,919	79	1,544	1.53	1,062.47	2,362.8
July 14	C. C. Galloway	1,919	79	1,544	1.54	1,062.47	2,378.2
July 14	C. C. Galloway	1,919	79	1,535	1.68	1,062.42	2,579.3
July 17	C. C. Galloway	1,919	79	1,535	2	1,062.42	2,640.7
July 17	C. C. Galloway	1,919	79	1,527	1	1,062.32	2,428.6
July 22	C. C. Galloway	1,919	79	1,527	1	1,062.32	2,489.7
July 25	C. C. Galloway	1,919	79	1,532	1.73	1,062.38	2,650.5
July 25	C. C. Galloway	1,919	79	1,516	1.67	1,062.17	2,531.1
July 27	C. C. Galloway	1,919	79	1,516	1.69	1,062.17	2,561.4
July 27	C. C. Galloway	1,919	79	1,512	1.59	1,062.12	2,404.1
July 31	C. C. Galloway	1,919	79	1,512	1.54	1,062.12	2,328.5
Aug. 2	C. C. Galloway	1,919	79	1,509	1.12	1,062.08	1,689.9
Aug. 2	C. C. Galloway	1,919	79	1,502	1.68	1,061.99	2,523.0
Aug. 4	C. C. Galloway	1,919	79	1,502	1.66	1,061.99	2,493.0
Aug. 4	C. C. Galloway	1,919	79	1,491	1.60	1,061.85	2,474.7
Aug. 8	C. C. Galloway	1,919	79	1,491	1.65	1,061.85	2,159.8
Aug. 8	C. C. Galloway	1,919	79	1,488	1.60	1,061.81	2,380.2
Aug. 18	C. C. Galloway	1,919	79	1,488	1.63	1,061.81	2,424.8
Aug. 23	C. C. Galloway	1,919	79	1,453	1.49	1,061.36	2,164.7
Aug. 28	C. C. Galloway	1,919	79	1,441	1.34	1,061.20	1,930.3
Aug. 31	M. S. Madden	1,939	79	1,430	1.41	1,061.07	2,016.3
Sept. 1	M. S. Madden	1,939	79	1,388	1.47	1,060.59	2,049.8
Sept. 1	M. S. Madden	1,939	79	1,388	1.43	1,060.59	1,985.3
Sept. 6	M. S. Madden	1,939	79	1,399	0.81	1,060.73	1,133.5
Sept. 6	M. S. Madden	1,939	79	1,399	0.78	1,060.73	1,091.5
Sept. 7	M. S. Madden	1,939	79	1,390	1.37	1,060.61	1,904.2
Sept. 7	M. S. Madden	1,939	79	1,390	1.33	1,060.61	1,848.6
Sept. 11	C. C. Galloway	1,919	79	1,388	1.37	1,060.58	1,901.3
Sept. 11	C. C. Galloway	1,919	79	1,402	1.38	1,060.58	1,915.2
Sept. 11	C. C. Galloway	1,919	79	1,402	1.20	1,060.77	1,682.6
Sept. 22	C. A. Hansen	1,939	79	1,402	1.19	1,060.77	1,668.6
Sept. 22	C. A. Hansen	1,939	79	1,343	1.18	1,060.00	1,584.5
Sept. 23	C. A. Hansen	1,939	79	1,343	1.18	1,060.01	1,584.9
Sept. 23	M. S. Madden (Haskell)	1,939	79	1,356	1.17	1,060.7	1,586.2
Sept. 23	M. S. Madden (Haskell)	1,939	79				
Sept. 24	M. S. Madden (Haskell)	1,939	79				
Sept. 24	M. S. Madden (Haskell)	1,939	79				
Sept. 29	C. C. Galloway	1,919	79				
Sept. 30	M. S. Madden	1,919	79		0.60	1,060.80	1,809.5
Sept. 30	M. S. Madden	1,919	79	1,348	1.16	1,060.07	1,563.3
Oct. 3	C. C. Galloway	1,919	79	1,348	1.24	1,060.07	1,671.3
Oct. 4	M. S. Madden	1,919	79	1,315	1.32	1,059.65	1,736.1
Oct. 4	M. S. Madden	1,919	79	1,331	1.28	1,059.85	1,703.4
Oct. 12	M. S. Madden	1,919	79	1,331	1.29	1,059.85	1,716.6
Oct. 12	M. S. Madden	1,919	79	1,300	1.23	1,059.45	1,598.8
Nov. 1	M. S. Madden	1,196	79	1,296	1.27	1,059.41	1,646.3
Nov. 1	M. S. Madden	1,196	79	1,287	1.15	1,059.30	1,480.4
Nov. 24	M. S. Madden	1,196	79	1,280	1.13	1,059.32	1,456.5
Nov. 29	C. C. Galloway	1,919	79	1,305	1.26	1,058.80	1,644.4
Nov. 29	C. C. Galloway	1,919	79	1,249	1.31	1,058.80	1,635.5

*Daily Gauge Height and Discharge of East Branch Winnipeg River at Kenora
Power House for 1916.*

(Drainage area, 26,400 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	58-87	1,553	59-16	917	58-92	976	58-82	742	60-38	830	61-72	1,326
2	58-94	928	59-13	930	58-92	985	58-80	713	60-54	974	61-71	1,596
3	58-92	1,320	59-17	944	58-97	972	58-70	760	60-48	968	61-80	1,354
4	58-87	1,550	59-17	926	58-86	1,020	58-75	1,269	60-53	943	61-70	1,006
5	58-98	879	59-16	933	58-90	890	58-74	1,063	60-52	1,232	61-80	1,325
6	58-89	1,150	59-16	853	58-78	1,212	58-73	1,079	60-47	1,212	61-90	1,325
7	58-84	1,583	59-16	932	58-85	1,163	58-72	1,260	60-67	929	61-90	1,186
8	58-94	1,013	59-10	932	58-93	879	58-72	991	60-70	958	61-90	1,090
9	58-94	827	59-17	941	58-93	872	58-83	670	60-77	955	61-97	1,322
10	58-98	1,175	59-13	942	58-93	825	58-74	1,007	60-89	976	62-00	1,324
11	58-95	1,529	59-08	948	58-89	869	58-74	1,012	60-60	990	62-00	1,041
12	58-94	1,519	59-08	951	58-97	815	58-68	787	60-83	969	62-05	1,073
13	59-03	1,331	59-06	893	58-86	883	58-83	724	60-83	955	62-20	1,100
14	59-03	1,265	59-08	939	58-87	899	58-85	1,010	60-77	920	62-30	1,087
15	59-03	951	59-06	950	58-82	1,106	58-98	708	60-35	976	62-10	1,359
16	59-06	865	59-03	903	58-78	1,233	59-03	670	60-70	1,003	61-97	1,635
17	59-03	912	59-06	896	58-83	908	59-18	706	60-92	966	62-07	1,663
18	59-07	1,125	59-02	905	58-87	898	59-23	714	61-09	998	62-02	1,527
19	59-07	896	59-01	885	58-87	829	59-29	714	61-12	1,579	62-03	2,322
20	59-02	693	59-00	830	58-83	810	59-38	729	61-16	1,297	62-02	2,325
21	59-07	681	59-03	898	58-85	791	59-50	726	61-32	960	62-17	2,228
22	59-12	682	58-98	900	58-78	828	59-65	762	61-25	1,472	62-07	2,348
23	59-02	670	59-01	881	58-80	835	59-80	714	61-31	1,280	62-16	2,378
24	59-07	854	58-97	879	58-74	1,092	59-89	755	61-37	1,487	62-11	2,362
25	59-01	962	58-97	878	58-79	968	59-91	778	61-35	1,284	62-26	2,087
26	58-94	957	58-92	899	58-88	688	60-00	780	61-45	1,540	62-19	2,360
27	59-00	935	58-92	848	58-83	746	60-10	775	61-75	1,403	62-27	2,307
28	59-06	911	58-90	906	58-84	752	60-25	802	61-70	970	62-35	2,217
29	59-10	891	58-91	945	58-82	745	60-25	819	61-52	1,533	62-28	2,596
30	59-17	824	.....	.....	58-75	741	60-35	770	61-69	1,334	62-38	2,234
31	59-17	889	.....	.....	58-80	724	.....	.....	61-78	1,564	.....	.....
	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	62-53	1,588	62-16	1,685	60-75	1,026	59-98	810	59-34	1,007	58-80	1,250
2	62-48	1,552	62-16	1,949	60-66	1,305	59-50	1,229	59-30	1,256	58-75	1,260
3	62-53	1,587	62-00	1,926	60-80	999	59-65	1,411	59-34	1,028	58-83	831
4	62-58	1,605	61-95	1,916	60-64	1,060	59-84	1,191	59-23	1,039	58-78	993
5	62-56	1,596	61-83	1,846	60-74	1,305	59-73	1,409	59-45	717	58-74	1,218
6	62-48	1,601	62-00	1,616	60-60	1,327	59-90	1,189	59-50	1,019	58-65	1,251
7	62-45	1,591	61-78	1,847	60-56	1,290	59-68	1,225	59-53	1,283	58-60	1,282
8	62-50	1,629	61-78	1,858	60-60	1,259	59-65	815	59-30	1,060	58-75	1,284
9	62-57	1,579	61-82	1,764	60-58	1,295	59-42	1,166	59-38	1,062	58-66	1,286
10	62-59	1,656	61-82	1,876	61-05	998	59-67	1,192	59-05	1,316	58-80	893
11	62-43	1,857	61-55	1,809	61-08	1,173	59-62	1,164	59-14	1,101	58-68	1,299
12	62-41	1,846	61-52	1,776	60-54	1,342	59-48	1,168	59-25	800	58-68	1,285
13	62-35	1,830	61-56	1,466	60-57	1,109	59-48	893	59-20	1,232	58-74	1,285
14	62-46	1,916	61-66	1,959	60-30	1,139	59-64	850	59-10	1,272	58-73	1,305
15	62-43	2,010	61-45	1,700	60-25	1,122	59-37	801	59-15	1,269	58-75	955
16	62-30	1,691	61-39	1,681	60-30	1,147	59-25	860	59-05	1,297	58-75	1,167
17	62-36	1,979	61-35	1,652	60-32	782	59-14	1,195	59-00	1,308	58-78	884
18	62-55	1,786	61-31	1,642	60-30	1,138	59-20	1,493	59-05	1,173	58-70	1,283
19	62-55	2,071	61-40	1,668	60-22	1,299	59-02	1,255	59-07	829	58-73	961
20	62-46	2,035	61-35	1,358	60-24	1,105	59-13	1,244	58-95	1,253	58-75	952
21	62-48	2,093	61-33	1,603	59-90	1,349	59-25	1,292	59-03	1,290	58-80	1,062
22	62-36	2,119	61-20	1,602	59-89	1,159	59-16	854	59-16	1,232	58-65	1,255
23	62-54	1,757	61-20	1,336	60-16	1,133	59-13	1,282	58-80	1,247	58-75	964
24	62-25	2,042	61-03	1,385	60-13	786	59-43	1,108	58-85	1,319	58-77	878
25	62-18	2,014	61-03	1,327	60-17	1,330	59-10	1,188	58-80	1,302	58-73	895
26	62-20	2,002	60-97	1,339	60-24	1,071	59-25	876	58-95	858	58-60	939
27	62-18	1,946	61-02	1,016	59-94	1,140	59-20	929	58-90	1,285	58-66	1,225
28	62-23	1,898	61-05	1,326	59-64	1,102	59-35	1,101	58-78	1,280	58-64	1,175
29	62-20	1,898	60-75	1,346	60-05	566	59-27	737	58-70	1,253	58-72	907
30	62-16	1,646	60-86	1,330	60-10	1,177	59-40	1,016	58-78	1,278	58-68	1,248
31	62-07	1,637	60-75	1,307	.....	.....	59-20	1,055	.....	.....	58-75	873

NOTE.—Gauge heights are those read at the Forebay and are to W.P.S. Datum.

MANITOBA HYDROMETRIC SURVEY

19

SESSIONAL PAPER No. 26e

Monthly Discharge of East Branch Winnipeg River at Kenora Power House for 1916.

[Drainage area 26,400 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet
January.....	1,533	670	1,043			64,132
February.....	951	830	910			32,344
March.....	1,233	688	905			35,646
April.....	1,269	670	834			49,628
May.....	1,579	830	1,144			70,342
June.....	2,596	1,006	1,698			101,038
July.....	2,119	1,552	1,808			111,170
August.....	1,949	1,016	1,601			98,442
September.....	1,349	782	1,144			68,073
October.....	1,493	737	1,096			67,390
November.....	1,319	717	1,156			68,787
December.....	1,305	831	1,108			68,129
The year.....	2,596	670	1,205			875,110

NOTE.—Discharge per square mile and runoff-depth in inches omitted, as the outlet is one of several from Lake of the Woods.

WESTERN OUTLET AT NORMAN TRAFFIC BRIDGE.

(LAKE OF THE WOODS OUTLETS.)

STATION NO. 5. P.E₂

History.—The station was established by S. S. Scovil on June 5, 1912 and since that date has been in continuous operation.

Location of Section.—The section is located at the downstream side of the Norman traffic bridge which spans the Western Outlet of Lake of the Woods about two miles west of Kenora on the highway leading to Keewatin. All discharge measurements throughout the year are taken from this bridge.

Drainage Area.—The drainage area above this section is 26,400 square miles, but owing to the fact that there are several other outlets of Lake of the Woods, this drainage area can only be used in conjunction with the total outflow from all outlets.

Channel.—The bed of the channel is composed of loose rock and boulders and not liable to shift. The entire discharge of the channel is confined within the limits of the station at all stages.

The velocities on the section are high and under certain conditions, eddies are encountered.

Gauge.—When the station was first established, a reference point was marked on the northeast corner of the west pier of the bridge, to which water levels at the time of metering were referred. This was later replaced by a vertical staff gauge which was referred to W.P.S. datum.

Owing to the fact that the discharge past this section normally depends on the operation of the Norman Dam, the discharge measurements and estimates of daily discharge have been referred to the gauge height at the dam. The Ontario D.P.W. gauge which was located on the upper side of the dam was used for obtaining these gauge readings up to August 25, 1913. On August 26, 1913 a vertical staff gauge referred to W.P.S. datum was installed at this point by the Manitoba Hydrometric Survey from which readings have since been obtained.

Discharge Measurements.—A large number of discharge measurements have been obtained at this section ranging in discharge from 2,700 to 37,700 c.f.s.

Records Available.—From May 1, 1913 to December 31, 1916, a continuous record of daily gauge height has been obtained at the Headrace gauge of the Norman Dam.

Estimates of daily discharge over the above period are available. These estimates are based upon these gauge heights and discharge measurements which have been taken at regular intervals throughout the period.

Accuracy.—Within certain limits, the Norman Dam which is located about 4000 feet below the section, forms the control, and the discharge within such limits is dependent upon the manipulation of the dam. Considerable range in discharge may occur for the same gauge height recorded at the station.

Discharge Measurements of Western Outlet, Lake of the Woods, at Norman Traffic Bridge for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Logs in Dam.
Jan. 14	C. C. Galloway.....	2,019	205	5,022	1.41	1,058.98	7,080.6	
Jan. 14	C. C. Galloway.....	2,019	205	5,022	1.46	1,058.98	7,331.7	272
Jan. 17	C. C. Galloway.....	2,019	205	5,022	1.44	1,058.98	7,231.2	272
Jan. 21	C. C. Galloway.....	2,019	205	5,022	1.39	1,058.98	6,980.2	272
Jan. 21	C. C. Galloway.....	2,019	205	5,022	1.40	1,058.98	7,030.4	272
Jan. 24	C. C. Galloway.....	2,019	205	5,022	1.37	1,058.98	6,879.7	272
Jan. 24	C. C. Galloway.....	2,019	205	5,022	1.42	1,058.98	7,130.8	272
Jan. 31	C. C. Galloway.....	2,019	205	5,042	1.41	1,058.98	7,080.5	272
Feb. 4	C. C. Galloway.....	2,019	205	5,042	1.42	1,059.08	7,159.6	272
Feb. 4	C. C. Galloway.....	2,019	205	5,040	1.43	1,059.08	7,210.1	272
Feb. 11	C. C. Galloway.....	2,019	205	5,040	1.41	1,059.07	7,108.4	272
Feb. 11	C. C. Galloway.....	2,019	205	4,909	1.40	1,059.07	7,056.0	272
Feb. 11	C. C. Galloway.....	2,019	205	4,909	2.33	1,058.87	11,430.2	247
Feb. 14	C. C. Galloway.....	2,019	205	4,977	2.38	1,058.87	11,684.4	247
Feb. 14	C. C. Galloway.....	2,019	205	4,977	2.71	1,058.76	13,487.7	227
Feb. 18	C. C. Galloway.....	2,019	205	4,965	2.69	1,058.76	13,388.1	227
Feb. 18	C. C. Galloway.....	2,019	205	4,965	2.74	1,058.70	13,611.8	227
Feb. 28	C. C. Galloway.....	2,019	205	4,938	2.73	1,058.70	13,544.9	227
Feb. 28	C. C. Galloway.....	2,019	205	4,938	2.74	1,058.58	13,200.4	227
Mar. 8	C. C. Galloway.....	2,019	205	4,912	2.67	1,058.59	13,515.3	227
Mar. 8	C. C. Galloway.....	2,019	205	4,942	2.69	1,058.59	13,182.0	227
Mar. 15	C. C. Galloway.....	2,019	205	4,936	2.67	1,058.56	13,265.1	227
Mar. 20	C. C. Galloway.....	2,019	205	4,936	2.60	1,058.56	13,156.3	227
Mar. 20	C. C. Galloway.....	2,019	205	4,924	2.62	1,058.50	13,278.6	227
Mar. 30	C. C. Galloway.....	2,019	205	4,924	2.70	1,058.50	12,901.1	227
Mar. 30	C. C. Galloway.....	2,019	205	4,916	2.70	1,058.46	13,295.0	227
April 7	C. C. Galloway.....	2,019	205	4,916	2.65	1,058.46	13,273.2	227
April 7	C. C. Galloway.....	2,019	205	4,914	2.55	1,058.45	13,024.7	227
April 10	C. C. Galloway.....	2,019	205	4,914	2.67	1,058.45	12,511.7	227
April 10	C. C. Galloway.....	2,019	205	4,916	2.50	1,058.45	13,127.7	227
April 14	C. C. Galloway.....	2,019	205	4,916	2.50	1,058.46	12,732.4	227
April 14	C. C. Galloway.....	2,019	205	4,938	2.64	1,058.46	12,732.4	227
May 1	C. C. Galloway.....	2,019	205	4,938	2.69	1,058.58	13,066.7	227
May 1	C. C. Galloway.....	2,019	212	5,130	4.96	1,058.58	13,284.0	227
May 9	C. C. Galloway.....	2,019	212	5,130	5.06	1,059.45	25,445.8	123
May 9	C. C. Galloway.....	2,019	212	5,176	5.44	1,059.67	25,958.8	123
May 12	C. C. Galloway.....	2,019	212	5,176	5.46	1,059.67	28,155.8	106
May 12	C. C. Galloway.....	2,019	212	5,186	5.48	1,059.77	28,259.3	106
May 17	C. C. Galloway.....	2,019	212	5,186	5.58	1,059.77	28,995.4	106
May 17	C. C. Galloway.....	2,019	212	5,198	5.50	1,059.77	28,579.7	106
May 19	C. C. Galloway.....	2,019	212	5,198	5.51	1,059.78	28,642.6	106
May 19	C. C. Galloway.....	2,019	212	5,260	5.80	1,059.78	28,642.6	106
May 29	C. C. Galloway.....	2,019	212	5,260	5.72	1,060.12	30,558.5	106
May 29	C. C. Galloway.....	2,019	212	5,316	6.04	1,060.12	30,137.0	106
June 1	C. C. Galloway.....	2,019	212	5,316	6.07	1,060.34	32,109.2	65
June 20	C. C. Galloway.....	1,939	212	5,340	6.33	1,060.34	32,268.7	65
June 20	C. C. Galloway.....	1,939	212	5,302	6.73	1,059.41	33,803.5	41
June 21	C. C. Galloway.....	1,939	212	5,302	6.75	1,060.71	36,288.2	
June 24	C. C. Galloway.....	1,939	212	5,442	6.71	1,060.90	36,396.0	
June 26	M. S. Madden.....	1,939	212	5,452	6.71	1,060.90	36,513.8	
June 27	M. S. Madden.....	1,939	212	5,442	6.64	1,060.89	36,554.9	
July 4	M. S. Madden.....	1,939	212	5,474	6.61	1,060.89	36,132.2	
July 4	M. S. Madden.....	1,939	212	5,474	6.61	1,061.04	36,190.8	
July 5	M. S. Madden.....	1,939	212	5,224	6.78	1,061.04	36,344.0	
July 5	M. S. Madden.....	1,939	212	5,224	6.78	1,061.28	37,343.6	
July 6	M. S. Madden.....	1,919	212	5,509	6.85	1,061.28	37,454.1	
July 7	M. S. Madden.....	1,939	212	5,497	6.71	1,061.21	36,637.5	
July 8	M. S. Madden.....	1,939	212	5,474	6.74	1,061.15	36,882.9	
July 10	M. S. Madden.....	1,939	212	5,495	6.78	1,061.04	36,891.4	
July 10	M. S. Madden.....	1,939	212	5,518	6.67	1,061.14	37,253.4	
July 11	M. S. Madden.....	1,939	212	5,518	6.72	1,061.25	36,804.4	
July 12	M. S. Madden.....	1,939	212	5,497	6.70	1,061.25	37,080.3	
July 13	M. S. Madden.....	1,939	212	5,494	6.68	1,061.13	36,827.9	
July 13	M. S. Madden.....	1,939	212	5,478	6.74	1,061.03	36,099.9	
July 14	M. S. Madden.....	1,939	212	5,478	6.72	1,061.06	36,919.7	
July 15	M. S. Madden.....	1,939	212	5,518	6.64	1,061.06	36,810.1	
July 17	M. S. Madden.....	1,939	212	5,501	6.70	1,061.16	36,970.2	
July 19	M. S. Madden.....	1,939	212	5,538	6.67	1,061.17	36,856.7	
July 21	M. S. Madden.....	1,939	212	5,524	6.82	1,061.07	36,935.1	
July 22	M. S. Madden.....	1,939	212	5,514	6.73	1,061.28	37,675.7	
July 24	M. S. Madden.....	1,939	212	5,493	6.82	1,061.23	37,106.5	
July 24	M. S. Madden.....	1,939	212	5,471	6.77	1,061.13	37,458.9	
July 25	M. S. Madden.....	1,939	212	5,429	6.72	1,061.03	37,041.4	
July 26	M. S. Madden.....	1,939	212	5,450	6.76	1,060.83	36,482.9	
						1,060.97	36,900.8	

Discharge Measurements of Western Outlet, Lake of the Woods, at Norman Traffic Bridge for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Logs in Dam.
July 27	M. S. Madden	1,030	212	5,433	6.64	1,060.85	36,077.1	
July 27	M. S. Madden	1,030	212	5,433	6.77	1,060.85	36,783.4	
July 29	M. S. Madden	1,030	212	5,412	6.73	1,060.75	36,423.4	
July 31	M. S. Madden	1,030	212	5,404	6.65	1,060.71	35,933.9	
Aug. 1	M. S. Madden	1,030	212	5,425	6.69	1,060.85	36,200.9	
Aug. 2	M. S. Madden	1,030	212	5,416	6.63	1,060.77	35,910.1	
Aug. 2	M. S. Madden	1,030	212	5,416	6.52	1,060.77	35,314.3	
Aug. 3	M. S. Madden	1,030	212	5,399	6.59	1,060.69	35,582.0	
Aug. 4	M. S. Madden	1,030	212	5,380	6.58	1,060.60	35,403.0	
Aug. 5	M. S. Madden	1,030	212	5,363	6.58	1,060.52	35,290.5	
Aug. 8	M. S. Madden	1,030	212	5,353	6.47	1,060.47	34,633.3	
Aug. 8	M. S. Madden	1,030	212	5,353	6.54	1,060.47	35,008.0	
Aug. 9	M. S. Madden	1,030	212	5,374	6.49	1,060.57	34,877.3	
Aug. 17	M. S. Madden	1,030	212	5,202	6.19	1,060.18	32,764.4	
Aug. 18	M. S. Madden	1,030	212	5,264	6.19	1,060.05	32,584.2	
Aug. 23	M. S. Madden	1,030	212	5,230	6.64	1,059.93	32,688.0	
Aug. 24	M. S. Madden	1,030	212	5,207	6.08	1,059.78	31,658.0	
Aug. 25	M. S. Madden	1,030	212	5,192	6.05	1,059.71	31,411.6	2
Aug. 28	M. S. Madden	1,030	212	5,203	6.02	1,059.76	31,319.7	2
Aug. 28	M. S. Madden	1,030	212	5,203	6.14	1,059.76	31,944.0	15
Aug. 29	M. S. Madden	1,030	212	5,156	6.04	1,059.54	31,142.8	151
Sept. 8	M. S. Madden	1,030	212	5,205	5.02	1,059.77	26,127.6	151
Sept. 8	M. S. Madden	1,030	212	5,205	5.06	1,059.77	26,235.8	151
Sept. 9	C. C. Galloway	1,030	212	5,203	4.93	1,059.76	25,648.8	151
Sept. 9	C. C. Galloway	1,030	212	5,203	4.98	1,059.76	25,908.9	151
Sept. 11	M. S. Madden	1,030	212	5,258	4.93	1,060.02	25,920.0	151
Sept. 12	C. C. Galloway	1,030	212	5,186	5.00	1,059.68	25,928.5	151
Sept. 16	C. C. Galloway	1,030	212	5,128	4.73	1,059.44	24,255.9	151
Sept. 19	M. S. Madden	1,030	212	5,123	4.98	1,059.38	25,511.0	151
Sept. 20	C. C. Galloway	1,030	212	5,097	4.77	1,059.27	24,311.3	151
Sept. 27	M. S. Madden	1,030	212	4,986	5.45	1,058.74	27,171.5	88
Sept. 29	M. S. Madden	1,030	212	5,017	5.50	1,058.88	27,590.7	80
Sept. 30	C. C. Galloway	1,030	212	5,029	5.53	1,058.96	27,812.0	80
Oct. 3	M. S. Madden	1,030	212	4,953	5.53	1,058.58	27,389.4	80
Oct. 4	C. C. Galloway	1,030	212	4,976	5.40	1,058.70	26,871.5	80
Oct. 5	M. S. Madden	1,030	212	4,968	5.39	1,058.66	26,775.9	80
Oct. 7	C. C. Galloway	1,030	205	4,920	5.28	1,058.48	25,978.1	80
Oct. 10	C. C. Galloway	1,030	212	4,951	5.21	1,058.58	25,793.1	80
Oct. 11	M. S. Madden	1,030	212	4,942	5.20	1,058.54	25,996.5	80
Oct. 13	M. S. Madden	1,030	205	4,894	5.20	1,058.35	25,446.2	80
Oct. 16	C. C. Galloway	1,030	205	4,792	4.84	1,057.85	23,192.8	80
Oct. 19	M. S. Madden	1,030	205	4,796	4.91	1,057.87	23,548.4	82
Oct. 20	C. C. Galloway	1,030	205	4,851	4.88	1,058.14	23,672.4	80
Oct. 21	M. S. Madden	1,030	205	4,892	4.73	1,058.34	23,136.8	121
Oct. 23	C. C. Galloway	1,030	205	4,908	4.43	1,058.42	21,742.0	147
Oct. 24	M. S. Madden	1,030	212	5,014	3.96	1,058.88	19,856.2	180
Oct. 25	C. C. Galloway	1,030	212	4,944	3.15	1,058.55	15,574.5	190
Oct. 26	M. S. Madden	1,030	212	5,033	2.86	1,058.98	14,394.7	202
Oct. 27	C. C. Galloway	1,030	212	5,006	2.91	1,058.85	14,568.0	202
Oct. 28	M. S. Madden	1,030	212	5,045	2.93	1,059.04	14,783.0	202
Oct. 30	C. C. Galloway	1,030	212	5,043	2.97	1,059.03	14,978.9	202
Oct. 31	M. S. Madden	1,030	212	5,027	2.89	1,058.95	14,527.7	202
Nov. 2	C. C. Galloway	1,030	212	5,023	2.84	1,058.93	14,767.0	202
Nov. 3	M. S. Madden	1,030	212	5,041	2.93	1,059.02	14,771.0	202
Nov. 4	C. C. Galloway	1,030	212	5,015	2.91	1,058.80	14,592.2	202
Nov. 6	C. C. Galloway	1,030	212	5,066	2.89	1,059.14	15,147.6	202
Nov. 8	C. C. Galloway	1,030	212	5,031	2.80	1,058.97	14,066.8	202
Nov. 10	C. C. Galloway	1,030	205	4,953	3.08	1,058.64	15,253.7	187
Nov. 11	M. S. Madden	1,030	205	4,953	3.55	1,058.64	17,581.4	177
Nov. 13	M. S. Madden	1,030	205	4,938	3.90	1,058.57	19,259.4	167
Nov. 14	C. C. Galloway	1,030	205	4,918	3.97	1,058.47	19,524.5	167
Nov. 15	C. C. Galloway	1,030	205	4,934	3.90	1,058.55	19,243.8	167
Nov. 16	M. S. Madden	1,030	205	4,898	3.93	1,058.37	19,248.0	167
Nov. 17	C. C. Galloway	1,030	205	4,912	3.89	1,058.44	19,106.5	167
Nov. 21	C. C. Galloway	1,030	205	4,902	3.90	1,058.39	19,116.6	167
Nov. 23	C. C. Galloway	1,030	205	4,855	3.83	1,058.16	18,594.3	167
Nov. 23	C. C. Galloway	1,030	205	4,851	3.85	1,058.14	18,676.0	167
Nov. 28	M. S. Madden	1,030	205	4,857	3.87	1,058.17	18,796.6	167
Nov. 30	M. S. Madden	1,030	205	4,855	3.91	1,058.15	18,974.8	167
Nov. 30	M. S. Madden	1,030	205	4,855	3.93	1,058.16	19,079.8	167
Dec. 5	C. C. Galloway	1,030	205	4,837	3.86	1,058.07	18,660.7	167
Dec. 5	C. C. Galloway	1,030	205	4,837	3.84	1,058.07	18,572.9	167
Dec. 8	M. S. Madden	1,030	205	4,859	3.68	1,058.19	17,891.1	177
Dec. 9	C. C. Galloway	1,030	205	4,877	3.69	1,058.27	18,534.0	181
Dec. 9	C. C. Galloway	1,030	205	4,881	3.20	1,058.29	15,913.4	186
Dec. 11	M. S. Madden	1,030	205	4,894	2.98	1,058.35	14,582.0	195

Discharge Measurements of Western Outlet, Lake of the Woods, at Norman Traffic Bridge for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Logs in Dam.
Dec. 12	C. C. Galloway....	1,919	205	4,908	2.85	1,058.37	13,958.4	195
Dec. 12	C. C. Galloway....	1,919	205	4,908	2.88	1,058.37	14,105.4	195
Dec. 13	M. S. Madden....	1,919	205	4,904	2.81	1,058.40	13,779.4	201
Dec. 14	C. C. Galloway....	1,919	205	4,918	2.66	1,058.47	13,081.9	201
Dec. 15	M. S. Madden....	1,919	205	4,920	2.62	1,058.48	12,890.7	210
Dec. 16	C. C. Galloway....	1,919	205	4,914	2.57	1,058.45	12,628.7	212
Dec. 16	C. C. Galloway....	1,919	205	4,914	2.53	1,058.45	12,432.2	212
Dec. 19	M. S. Madden....	1,919	205	4,908	2.58	1,058.42	12,662.1	212
Dec. 20	C. C. Galloway....	1,919	205	4,910	2.50	1,058.43	12,716.6	212
Dec. 22	C. C. Galloway....	1,919	205	4,912	2.61	1,058.44	12,820.1	212
Dec. 28	C. C. Galloway....	1,919	205	4,908	2.51	1,058.42	12,318.6	212
Dec. 28	C. C. Galloway....	1,919	205	4,908	2.52	1,058.42	12,307.7	212

*Daily Gauge Height and Discharge of Western Outlet, Lake of the Woods, at Norman
Traffic Bridge for 1916.
(Drainage area 26,400 square miles.)*

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	58 06	6,850	58 83	7,238	57 71	12,832	57 61	12,531	58 48	25,014	51 83	33,261
2	58 06	6,950	58 83	7,301	57 71	12,911	57 60	12,547	58 18	25,161	51 73	33,548
3	58 06	6,941	58 85	7,297	57 71	12,820	57 61	12,902	56 13	25,588	51 53	33,756
4	58 06	6,888	58 82	7,307	57 70	12,791	57 61	12,755	54 73	25,925	51 14	33,035
5	58 08	6,798	58 83	7,146	57 62	12,835	57 60	12,721	54 38	26,058	51 21	34,051
6	58 62	6,734	58 84	7,282	57 63	12,724	57 61	12,856	54 18	26,210	51 13	34,521
7	58 62	6,725	58 84	7,175	57 62	12,936	57 58	12,818	54 16	27,265	51 08	34,290
8	58 64	6,904	58 82	7,125	57 63	13,155	57 62	12,660	54 18	27,250	51 03	34,222
9	58 63	6,887	58 58	8,358	57 64	13,033	57 63	12,864	54 43	27,838	50 98	34,863
10	58 69	7,131	58 23	10,338	57 71	13,064	57 61	12,803	54 58	28,101	50 93	34,597
11	58 70	7,000	58 15	11,523	57 68	13,063	57 61	12,387	54 38	27,167	.....	34,488
12	58 70	6,780	57 88	12,282	57 69	12,942	57 60	12,757	54 38	28,018	.....	34,535
13	58 73	6,908	57 72	12,985	57 66	12,938	57 63	12,903	54 53	27,930	.....	36,032
14	58 73	7,165	57 73	13,074	57 66	12,821	57 61	12,834	54 38	27,816	.....	35,388
15	58 74	6,984	57 75	13,154	57 68	12,645	57 73	13,046	54 08	25,540	.....	35,043
16	58 74	6,725	57 78	13,030	57 66	12,707	57 80	13,336	54 33	27,236	50 58	34,576
17	58 74	7,047	57 73	13,024	57 66	12,796	57 88	13,573	54 48	28,392	50 57	35,701
18	58 75	6,839	57 78	13,084	57 64	12,945	57 96	13,762	54 68	29,620	50 78	34,495
19	58 73	7,205	57 68	13,239	57 66	12,832	57 43	15,191	54 68	29,788	50 59	35,247
20	58 73	7,117	57 77	13,031	57 63	12,714	56 98	17,116	54 68	29,662	50 70	35,244
21	58 75	6,621	57 79	13,071	57 61	12,501	57 03	17,780	54 81	31,004	50 53	35,523
22	58 76	7,175	57 78	13,009	57 66	12,510	57 13	18,681	54 75	30,964	50 70	35,619
23	58 73	7,077	57 76	12,921	57 64	12,523	57 22	18,981	54 48	31,155	50 58	36,196
24	58 73	7,080	57 75	12,887	57 63	12,802	56 73	20,571	53 98	31,279	50 72	35,614
25	58 72	6,985	57 73	12,914	57 66	12,914	56 43	21,456	53 18	31,253	50 75	35,794
26	58 66	7,038	57 73	12,870	57 64	12,915	56 18	22,368	.....	31,803	50 78	35,954
27	58 68	7,093	57 76	12,933	57 66	12,802	56 03	23,345	.....	33,324	50 69	35,870
28	58 73	7,183	57 74	13,121	57 63	12,645	55 83	24,048	.....	32,947	50 70	36,249
29	58 81	7,234	57 73	12,984	57 61	12,724	55 68	24,299	.....	32,144	50 65	36,787
30	58 83	7,186	.....	.....	57 60	12,650	55 69	24,892	52 53	32,348	50 67	37,880
31	58 85	7,106	.....	.....	57 63	12,810	.....	.....	52 23	33,600	.....	.....
	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	50 95	36,677	50 73	35,343	52 60	29,781	52 10	26,150	57 70	14,422	56 15	18,270
2	50 93	36,759	50 75	34,946	52 80	29,656	51 90	25,479	57 75	14,693	56 10	18,329
3	50 97	37,260	50 55	34,801	53 00	31,012	52 00	25,693	57 90	14,999	56 10	18,400
4	50 77	37,618	50 60	35,239	52 90	28,799	52 00	25,833	57 80	14,585	56 10	18,260
5	50 82	37,522	50 58	34,451	54 20	28,009	51 95	26,330	57 95	14,515	56 05	18,145
6	50 80	37,278	50 65	34,017	54 95	27,980	52 05	26,103	57 70	14,574	56 05	18,020
7	50 80	36,823	50 60	33,762	56 10	25,664	52 00	24,983	57 90	14,321	56 15	17,879
8	50 82	37,166	50 48	33,794	56 30	25,400	52 00	25,767	57 85	14,594	56 75	17,656
9	50 82	37,207	50 55	34,299	56 30	25,402	51 90	24,679	57 80	14,334	57 10	15,937
10	50 90	37,635	50 40	33,275	56 65	25,634	51 90	25,059	57 20	15,070	57 10	15,979
11	50 92	37,040	50 40	32,275	56 45	25,648	51 95	25,107	56 95	17,493	57 30	14,180
12	50 80	37,173	50 32	32,001	56 30	25,302	51 80	23,986	57 00	14,684	57 35	13,712
13	50 92	36,815	50 45	32,346	56 25	25,282	51 80	25,056	56 80	19,043	57 55	13,386
14	50 80	37,141	50 37	32,803	56 15	24,282	51 90	24,851	56 30	19,298	57 25	12,960
15	50 90	36,919	50 29	32,492	56 15	24,219	51 80	25,073	56 40	19,073	57 65	12,599
16	50 82	35,973	50 18	32,652	56 15	24,312	51 65	22,709	56 25	19,012	57 65	12,242
17	50 82	36,598	50 32	32,549	56 15	24,216	52 00	23,176	56 30	18,894	57 67	12,245
18	51 05	37,511	50 20	32,432	56 15	24,436	51 80	23,145	56 30	19,033	57 65	12,282
19	51 10	37,832	50 20	32,253	56 15	24,302	51 70	23,067	56 30	19,043	57 65	12,425
20	51 02	37,493	50 20	32,307	56 15	24,247	52 00	23,429	56 20	18,743	57 65	12,428
21	50 95	37,009	50 30	31,760	55 95	24,058	54 70	23,271	56 30	18,604	57 65	12,420
22	50 90	36,932	50 20	31,575	55 95	24,111	54 60	23,085	56 30	18,383	57 65	12,492
23	50 88	36,931	50 20	31,963	54 70	25,444	55 20	21,284	56 15	18,111	57 65	12,402
24	50 87	37,404	50 10	30,879	54 55	25,730	57 20	19,512	56 20	18,271	57 65	12,675
25	50 83	36,080	49 90	30,620	54 65	25,638	57 70	15,114	56 15	18,405	57 65	12,234
26	50 72	35,976	49 90	30,618	53 70	26,609	57 80	15,083	56 15	18,403	57 65	11,990
27	50 80	35,742	49 90	30,618	52 30	26,274	57 70	14,238	56 10	18,269	57 65	12,029
28	.....	36,001	50 10	30,839	52 20	25,754	57 75	14,326	56 15	18,234	57 60	12,000
29	50 70	35,386	50 00	30,368	52 20	26,713	57 75	15,020	56 15	18,446	57 60	12,061
30	50 76	35,061	50 00	30,685	52 30	27,172	57 80	14,366	56 10	18,440	57 60	11,999
31	50 60	35,021	51 10	29,981	.....	.....	57 70	14,228	.....	.....	57 60	11,968

NOTE.—Gauge heights are those read on the D.P.W. gauge at the Forebay, Norman Dam, and are to W.P.S Datum.

MANITOBA HYDROMETRIC SURVEY

25

SESSIONAL PAPER No. 26a

Monthly Discharge of Western Outlet, Lake of the Woods, at Norman Traffic Bridge for 1916.

[Drainage area, 26,400 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	7,234	6,621	6,978			429,061
February	11,230	7,125	11,003			638,077
March	13,155	12,501	12,812			787,779
April	24,832	12,387	16,021			951,116
May	33,000	25,014	28,945			1,779,739
June	37,809	33,035	35,070			2,086,810
July	37,832	35,021	36,741			2,256,116
August	33,343	29,981	32,515			1,909,269
September	31,012	24,068	26,035			1,549,190
October	26,330	14,228	22,103			1,359,000
November	19,298	14,321	17,123			1,018,880
December	18,400	11,990	14,182			872,017
The year	37,880	6,621	21,670			15,732,343

NOTE.—Discharge per square mile and runoff-depth in inches omitted, as the outlet is one of several from Lake of the Woods.

MILL "A" HEADRACE, KEEWATIN.
(LAKE OF THE WOODS OUTLETS.)

STATION No. 5. P.E3

History. The station was established by S. S. Scovil on December 23, 1912 and has been in continuous operation since that date. This channel has formed one of the outlets of the Lake of the Woods since the erection of Mill "A" in 1887.

Location of Section. The section is located in the headrace of Mill "A", Lake of the Woods Milling Company, Keewatin. At first it was on the downstream side of the bridge across the channel midway between the head gates and the intake racks. On December 10, 1913 the station was changed to a position just above the intake racks of the power house of Mill "A."

Drainage Area.—The drainage area above Lake of the Woods Outlets is 26,400 square miles.

Channel.—The entrance to the racks is uniform and the section is well situated to avoid eddies of entrance, the stream line being perpendicular to the section.

Gauge.—During the operation of the station as first established, all measurements were referred to a vertical staff gauge on the Keewatin Traffic Bridge, at which lake level was recorded. When the station was relocated at the intake racks, a gauging point, referred to W.P.S. datum was established on the section near the right bank of the channel, and from this point, minus readings were made at the time of discharge measurement.

On October 1, 1914 a vertical staff gauge was established on the metering section and since that time all discharge measurements have been referred to this gauge.

Discharge Measurements.—Since the station was established, discharge measurements have been obtained over a sufficient range in head and load to give a rating of the plant. From this rating together with the daily records of head and load the daily discharges are computed. Discharge measurements are obtained periodically at the station as a check on the rating.

Records Available.—Intermittent records of gauge readings in the forebay and tailrace of the mill during the years 1896 — 1912 are available.

Records of daily discharge through the plant based on forebay and tailrace gauge readings and loads on the mill are available from February 14, 1913 to December 31, 1916.

Accuracy.—The records are quite reliable owing to conditions controlling the discharge, i.e., gate opening, head, etc., being easily observed.

SESSIONAL PAPER No. 26a

*Discharge Measurements of Mill "A" Flume No. 1 at Headrace, Lake of the
Woods Milling Co. for 1916.*

Date.	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 26	C. C. Galloway	2,019	15	175	1.68	1,058.61	203
Jan. 26	C. C. Galloway	2,019	15	175	1.70	1,058.61	207
Feb. 23	C. C. Galloway	2,019	15	175	1.42	1,058.68	240
Feb. 23	C. C. Galloway	2,019	15	175	1.38	1,058.68	242
April 17	C. C. Galloway	2,019	15	175	1.52	1,058.87	271
April 17	C. C. Galloway	2,019	15	178	1.43	1,058.87	255
June 3	C. C. Galloway	2,019	15	218	1.54	1,061.53	346
July 10	C. C. Galloway	1,919	15	225	1.68	1,061.98	378
July 10	C. C. Galloway	1,919	15	225	1.60	1,061.98	360
July 21	C. C. Galloway	1,919	15	225	1.68	1,061.95	377
July 21	C. C. Galloway	1,919	15	222	1.64	1,061.95	368
July 25	C. C. Galloway	1,919	15	222	1.63	1,061.76	361
July 25	C. C. Galloway	1,919	15	222	1.56	1,061.76	332
Aug. 5	C. C. Galloway	1,919	15	218	1.46	1,061.54	319
Aug. 5	C. C. Galloway	1,919	15	218	1.40	1,061.54	306
Aug. 19	C. C. Galloway	1,919	15	212	1.35	1,061.10	286
Aug. 25	C. C. Galloway	1,919	15	205	1.30	1,060.64	279
Aug. 25	C. C. Galloway	1,919	15	205	1.40	1,060.64	287
Sept. 13	A. Hansen	1,919	15	198	1.57	1,060.19	311
Sept. 13	A. Hansen	1,919	15	198	1.45	1,060.19	287
Sept. 19	C. C. Galloway	1,919	15	192	1.61	1,059.79	309
Sept. 19	C. C. Galloway	1,919	15	192	1.63	1,059.79	313
Sept. 20	C. C. Galloway	1,919	15	189	1.40	1,059.58	265
Sept. 20	C. C. Galloway	1,919	15	189	1.38	1,059.58	261
Nov. 18	M. S. Madden	1,196	15	173	1.53	1,058.57	265
Dec. 7	C. C. Galloway	1,919	15	167	1.82	1,058.12	304

*Discharge Measurements of Mill "A" Flume No. 2 at Headrace, Lake of the Woods
Milling Co. for 1916.*

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 26	C. C. Galloway	2,019	37	571	1.21	1,058.61	689
Jan. 26	C. C. Galloway	2,019	37	571	1.20	1,058.61	685
Feb. 23	C. C. Galloway	2,019	37	573	1.13	1,058.66	648
Feb. 23	C. C. Galloway	2,019	37	573	1.09	1,058.66	621
April 17	C. C. Galloway	2,019	37	580	1.00	1,058.85	632
April 17	C. C. Galloway	2,019	37	580	1.08	1,058.85	626
June 3	C. C. Galloway	2,019	37	678	1.49	1,061.53	1,010
June 23	C. C. Galloway	1,919	37	689	1.56	1,061.83	1,074
June 23	C. C. Galloway	1,919	37	689	1.55	1,061.83	1,068
July 8	C. C. Galloway	1,919	37	692	1.68	1,061.93	1,163
July 8	C. C. Galloway	1,919	37	692	1.60	1,061.93	1,108
July 15	C. C. Galloway	1,919	37	690	1.59	1,061.88	1,098
July 19	C. C. Galloway	1,919	37	694	1.61	1,061.97	1,117
July 19	C. C. Galloway	1,919	37	694	1.65	1,061.97	1,145
July 26	C. A. Hansen	1,919	37	687	1.57	1,061.78	1,078
Aug. 3	C. A. Hansen	1,919	37	682	1.61	1,061.65	1,098
Aug. 3	C. A. Hansen	1,919	37	682	1.53	1,061.65	1,044
Aug. 7	C. A. Hansen	1,919	37	676	1.63	1,061.48	1,102
Aug. 7	C. A. Hansen	1,919	37	676	1.69	1,061.48	1,142
Aug. 18	C. A. Hansen	1,919	37	660	1.61	1,061.04	1,062
Aug. 18	C. A. Hansen	1,919	37	660	1.58	1,061.04	1,042
Aug. 23	C. A. Hansen	1,919	37	655	1.56	1,060.91	1,022
Aug. 23	C. A. Hansen	1,919	37	655	1.55	1,060.91	1,015
Sept. 1	C. A. Hansen	1,919	37	634	1.58	1,060.33	1,002
Sept. 1	C. A. Hansen	1,919	37	634	1.56	1,060.33	989
Sept. 15	C. A. Hansen	1,919	37	618	1.72	1,059.00	1,063
Sept. 15	C. A. Hansen	1,919	37	618	1.58	1,059.00	76
Sept. 28	C. A. Hansen	1,919	37	599	1.61	1,059.38	104
Sept. 28	C. A. Hansen	1,919	37	599	1.67	1,059.38	100
Oct. 6	C. C. Galloway	1,919	37	597	1.80	1,059.31	1074
Oct. 6	C. C. Galloway	1,919	37	597	1.80	1,059.31	1074
Oct. 13	M. S. Madden	1,196	37	581	1.68	1,058.89	976
Oct. 18	M. S. Madden	1,196	37	570	1.66	1,058.58	940
Nov. 4	M. S. Madden	1,196	37	581	1.25	1,058.88	726
Nov. 25	C. C. Galloway	1,919	37	562	1.63	1,058.36	915
Nov. 25	C. C. Galloway	1,919	37	562	1.62	1,058.36	910
Dec. 2	M. S. Madden	1,919	37	556	1.55	1,058.22	862

Discharge Measurements of Mill "A" at Headrace 2nd Bridge for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Gauge at Section.
June 3	C. C. Galloway	2,019	54	562	2.41	1,059.73	1,355	-1.15
June 26	C. C. Galloway	1,919	54	574	2.95	1,059.73	1,694	-0.90
June 26	C. C. Galloway	1,919	54	574	2.84	1,059.73	1,631	-0.90
June 29	C. C. Galloway	1,919	55	590	2.94	1,059.86	1,706	-0.80
July 5	C. C. Galloway	1,939	55	585	3.28	1,059.96	1,919	-0.70
July 5	C. C. Galloway	1,939	55	584	3.30	1,059.95	1,926	-0.75
July 13	C. C. Galloway	1,919	55	580	3.06	1,059.87	1,775	-0.80
July 13	C. C. Galloway	1,919	55	580	3.02	1,059.87	1,751	-0.80
July 19	C. C. Galloway	1,919	55	585	3.31	1,059.96	1,936	-0.70
July 19	C. C. Galloway	1,919	55	585	3.26	1,059.96	1,907	-0.70
July 26	C. C. Galloway	1,919	55	578	2.84	1,059.70	1,640	-0.88
July 26	C. C. Galloway	1,919	55	578	2.96	1,059.70	1,710	-0.88
Aug. 1	M. S. Madden	1,919	55	578	2.41	1,059.70	1,392	-0.88
Aug. 1	M. S. Madden	1,919	55	578	2.54	1,059.70	1,467	-0.88

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26e

Estimated Daily Discharge, Keewatin Mills, for January and February, 1916.

Day.	Mill "A"						Mill "A"						Mill "C"
	Mill.	Generators			Pump.	Mill "C"	Mill.	Generators			Pump.		
		Gate.		Dis-charge.				Gate.		Dis-charge.			
		c. f. s.	hrs.					c. f. s.	hrs.				
1	682	10	56	104	19	822	682	10	62	127	18	768	
2	660	24	42	122	17	780	660	14	40	68	17	718	
3	682	10	52	108	17	774	660	14	40	68	17	743	
4	660	14	40	68	18	810	660	14	59	121	20	338	
5	682	14	50	146	15	841	660	14	40	68	17	128	
6	682	10	40	49	18	883	90	14	58	119	20	338	
7	682	14	57	164	15	841	660	14	40	68	17	128	
8	682	10	40	49	18	883	90	14	61	125	17	237	
9	704	14	57	164	16	896	660	14	40	70	11	237	
10	704	10	40	49	16	896	660	14	56	161	20	67	
11	704	10	58	119	15	780	660	10	40	68	20	539	
12	91	3	45	17	7	198	660	10	59	121	20	718	
13	716	10	55	114	7	198	660	14	40	68	17	711	
14	682	14	40	68	20	780	660	10	62	127	16	711	
15	682	10	58	119	18	731	644	14	56	115	16	711	
16	293	14	40	68	8	816	644	14	43	72	16	840	
17	40	10	48	100	0	780	98	10	65	130	18	740	
18	40	14	38	65	0	835	687	14	40	68	7	302	
19	40	10	59	121	0	835	687	14	50	80	15	635	
20	40	14	38	65	0	786	690	10	59	121	16	732	
21	42	3	42	19	0	198	690	14	44	77	16	732	
22	667	10	57	117	0	835	687	10	56	110	16	732	
23	682	14	40	68	0	786	690	14	44	71	16	732	
24	660	10	62	127	0	835	687	10	50	99	13	695	
25	660	14	40	68	20	847	690	14	43	69	17	676	
26	660	11	40	53	20	761	690	10	62	121	17	676	
27	660	10	60	123	17	749	690	14	42	68	15	732	
28	660	14	40	68	17	749	88	10	59	116	15	732	
29	660	10	56	115	17	705	711	14	43	69	20	689	
30	660	14	40	68	17	705	731	10	62	121	7	251	
31	90	2	30	8	7	198	775	14	42	69	7	251	
32	660	10	59	121	17	835	755	10	50	99	13	695	
33	682	14	40	68	20	847	690	14	43	69	17	676	
34	682	13	36	150	20	761	690	10	62	121	17	676	
35	660	11	40	53	17	749	690	14	42	68	15	732	
36	660	10	62	127	17	749	690	10	59	116	15	732	
37	660	14	40	68	17	749	88	14	43	69	20	689	
38	660	10	60	123	17	749	88	10	62	121	7	251	
39	660	14	40	68	17	749	88	14	42	69	7	251	
40	660	10	56	115	17	705	711	10	62	121	17	677	
41	660	14	40	68	17	705	731	14	43	69	18	768	
42	90	10	58	119	7	198	775	10	66	128	18	768	
43	90	14	40	68	7	198	775	14	43	69	18	750	
44	660	10	30	8	17	835	755	10	61	117	18	750	
45	660	14	59	121	17	835	755	14	43	67	18	780	
46	682	10	40	68	17	871	755	10	71	133	18	780	
47	682	14	56	115	17	871	755	14	43	67	18	780	
48	682	10	40	68	17	871	755	10	63	120	18	768	
49	682	14	40	68	18	847	755	14	45	70	15	772	
50	704	10	66	134	18	847	755	10	63	120	15	772	
51	704	14	40	68	16	810	90	14	43	68	7	268	
52	682	10	67	136	16	810	90	10	64	125	15	641	
53	682	14	40	68	18	835	638	14	44	71	15	744	
54	682	10	48	100	18	835	638	10	66	125	15	744	
55	682	14	40	68	18	743	755	14	44	69	15	744	
56	90	2	35	9	7	198	798	14	44	69	15	744	
57	682	14	27	104	20	798	798	14	44	69	15	744	
58	682	10	40	49	20	798	798	14	44	69	15	744	

Estimated Daily Discharge, Keewatin Mills for March and April 1916.

Day.	Mill "A"					Mill "C"	Mill "A"					Mill "C"
	Mill.	Generators.		Pump.	Mill.		Generators.		Pump.			
		Gate.	Dis-charge.				Gate.	Dis-charge.				
c. f. s.	hrs.	%	c. f. s.	c. f. s.	c. f. s.	hrs.	%	c. f. s.	c. f. s.	c. f. s.		
1	775	10	69	129	15	774	629	10	59	116	15	701
2	715	14	43	67	15	702	53	14	41	66		187
3	715	10	52	101	15	760	628	10	60	118	17	656
4	715	14	44	69	15	772	629	14	41	66		744
5	55	10	64	121	15	772	629	10	55	109	15	750
		14	45	70				14	34	56		
		24	37	105	7	750	634	10	65	123	15	750
								14	37	59		
6	655	10	61	120	15	772	70	10	50	97	15	714
7	715	14	43	69	15	719	69	14	36	57		720
8	628	10	83	120	15	708	22	10	47	93	10	720
		14	44	69				14	36	59		
9	52	10	55	106	15	708	22	9	44	79	10	173
		14	45	70	7	676	40	15	46	78		
10	50	10	46	73	7	726	41	10	50	99	10	617
		14	53	105				14	35	58		
11	50	10	41	66	7	701	269	10	48	95	10	701
12	52	14	64	125	7	250	275	14	34	56	10	663
13	642	10	34	56	15	726	275	10	55	109	10	676
14	670	14	64	125	15	720	57	14	34	56	10	695
15	670	10	43	69	15	720	57	10	54	107	7	720
		14	58	111	17	732	24	14	33	55		
		10	43	67				6	34	56		
		14	65	123				18	59	70		
			42	66	15	725	30		38	80		
16	634	10	68	128	15	725	30				7	223
17	715	14	43	67	15	772	670	10	55	109	15	619
18	715	10	68	128	15	719	650	14	34	56	15	720
19	65	14	44	69	15	719	650	10	57	112	15	714
20	306	10	66	125	10	246	650	14	37	61	15	731
		14	42	66	8	252	685	10	53	105		
21	77	5	58	114	8	252	685	14	37	61	15	772
22	50	10	38	62	8	287	804	10	60	115	15	772
23	50	18	47	47	9	186	787	14	38	60	7	208
24	50	5	46	94	7	180	55	10	64	118	15	697
25	50	14	31	52	7	180	587	14	38	58	14	367
		151	39	40	6	180	787	10	68	125		
		71	42	42	6	180	787	14	57	112	15	772
		41	35	35	6	180	787	10	37	59	7	208
		43	41	35	6	180	787	14	67	123	15	697
		61	43	41	6	180	787	10	37	59	14	367
		61	47	33	6	180	787	14	67	123	14	367
								10	38	58		
26	64	10			6	229	787	14	52	98	14	208
27	459	14	55	109	19	511	787	10	36	55	14	193
28	629	14	40	65	15	701	802	14	34	54	14	193
29	629	81	54	91	15	701	802	10	54	101	14	193
30	614	151	42	75	17	689	874	10	35	54	14	193
		10	58	114	17	689	874	14	50	94	14	193
		14	40	65	17	682	55	6	35	54	14	193
		10	59	113	17	682	55	18	53	58	9	188
31	629	14	40	63	15	701		14	41	61		
		10	50	99								
		14	40	65								

Estimated Daily Discharge, Keewatin Mills for May and June 1916.

Mill "C"

c. f. s.

701

187

656

744

756

714

720

720

173

617

701

663

676

695

720

223

619

720

714

731

772

772

208

997

367

208

193

193

88

88

Day.	Mill "A"										Mill "C"	Mill "C" Gener- ators	Mill "A"										Generators No load				Mill "C"
	Mill.	Generators.			Pump.	Mill "C"	Mill "C" Gener- ators	Mill.	Generators.				Pump.	Mill "C"	Mill "C" Gener- ators	Mill.	Generators.			Pump.	Mill "C"	Mill "C" Gener- ators					
		Gate	Dis- charge	c. f. s.					Gate	Dis- charge							c. f. s.	Gate	Dis- charge				c. f. s.	Gate	Dis- charge	c. f. s.	
1	787	10	68	125	9	183	.....	1,095	10	65	112	14	14	30	39	781											
2	874	14	36	55				1,077	14	52	71																
		10	69	123	14	188	61		14	69	118	14	14	30	39	760											
3	893	14	36	54				1,077	14	51	70																
		10	48	85	14	188	.....		14	69	118	14	14	30	39	760											
4	893	14	37	56				51	24	53	73																
		10	53	97	14	188	.....		30	64		6															
5	855	14	36	54				1,036	10	73	125	14	14	30	39	787											
		10	55	100	14	188	.....		14	47	66																
6	905	10	56	100	14	188	.....	1,041	10	73	125	14	14	30	39	736											
		14	35	52					14	47	66																
7	55	11	37	55	9	188	.....	1,023	10	66	113	14	14	30	39	771											
									14	50	69																
8	772	10	53	95	9	188	91	1,059	10	72	124	14	14	30	39	771											
		14	38	56					14	50	69																
9	905	10	53	95	14	188	99	1,077	10	72	124	14	14	30	39	771											
		14	39	58					14	50	69																
10	868	10	65	114	14	239	53	1,041	10	69	118	14	14	30	39	771											
		14	44	64					14	53	73																
11	923	10	71	124	14	529	.....	60	10	48	86	6	24	30	64	719											
		14	40	59					14	50	71	6	14	30	37	516											
12	942	10	70	123	14	725	72	60	10	65	115	6	14	30	37	777											
		14	41	60					14	50	71	6	14	30	37	777											
13	942	10	62	113	14	703	72	75	10	68	120	6	14	30	37	777											
		14	40	59					14	52	73																
14	55	11	36	53	6	176	.....	796	10	71	122	14	14	30	39	771											
									14	47	66																
15	598	10	71	124	17	721	67	1,059	10	79	136	14	14	30	39	771											
		14	42	61					14	51	70																
16	961	10	60	106	16	753	130	1,059	10	73	125	14	14	30	39	777											
		14	42	61					14	51	70																
17	998	10	62	109	14	764	111	1,059	10	79	136	14	24	30	66	777											
		14	42	61					14	51	70																
18	942	10	55	98	14	781	111	50	10	37	65	6	24	30	66	172											
		14	41	60					14	55	75																
19	942	10	55	98	16	781	111	1,005	10	82	142	14	14	30	39	766											
		14	44	64					14	51	70																
20	961	10	53	95	14	781	111	1,023	10	53	92	14	14	30	39	771											
		14	43	63																							
21	44	Shut	Down		6	106	.....	1,041	10	81	140	14	14	30	39	771											
									14	53	72																
22	827	Shut	Down		14	781	133	1,059	10	77	133	14	14	30	39	771											
									14	55	75																
23	942	Shut	Down		14	781	126	1,041	10	79	136	14	14	30	39	771											
									14	55	75																
24	998	10	51	93				1,150	10	82	142	14	24	30	66	771											
		14	42	61					14	53	73																
25	998	10	60	106	14	781	.....	50	10	48	80	6				123											
		14	43	63																							
26	961	10	62	109	14	781	122	1,095	10	80	138	14	14	25	39	766											
		14	44	64					14	53	73																
27	1,035	10	57	101	14	781	115	1,095	10	81	140	14	14	25	39	771											
		14	44	64					14	55	75																
28	1,091	10	51	92	14	781	.....	1,095	10	80	138	14	14	25	39	771											
		14	46	66					14	53	73																
29	1,072	10	59	104	14	781	118	1,095	10	70	120	14	14	30	39	771											
		14	46	66					14	56	76																
30	1,054	10	65	114	14	781	118	1,095	10	80	138	14	14	30	39	771											
		14	47	67					14	58	79																
31	1,091	10	67	118	14	781	122	.....	10	80	138	14	14	30	39	771											
		14	48	69																							

Estimated Daily Discharge, Keewatin Mills for July and August 1916.

Day	Mill "A"										Mill "A"										Mill "A" generators "No Load"	Mill "A" Leakage over Wing Wall	Mill "C" Generators
	Mill.	Generators.				Pump	Mill "A" generators "No Load"				Mill "C" Generators	Mill "C" Generators	Generators.				Mill "A" generators "No Load"	Mill "C" Generators					
		Gate.	Dis-charge				hrs.	c. f.	s.	c. f.			s.	hrs.	c. f.	s.			c. f.	s.			
1	50	10	42	60	5					1,212	167			1,005	14	66	158	14	10	28	440	858	111
2	50				5					1,135	102			1,034	10	47	157	16	10	28	425	858	100
3	1,132	10	77	13	14	14	55	747	824	115	1,010	14	48	165	16	10	28	335	885	100			
4	1,041	14	49	88	14	14	38	515	810	118	843	14	46	165	16	10	28	305	833	111			
5	1,059	14	51	70	14	14	55	794	887	14	1,053	10	46	165	14	14	38	170	823	115			
6	1,077	14	73	97																			
7	1,150	14	32	71	14	14	55	636	816	107	1,072	14	62	148	14	10	28	148	833	111			
8	1,150	14	54	74	14	14	55	670	824	115	1,053	10	54	110	14	14	38	170	820	117			
9	50				6	24	66	1,200	167		1,043	14	63	151	14	10	28	193	841	108			
10	1,186	10	80	138	14	14	38	748	859	100	1,053	14	65	157	14	10	28	170	808	107			
11	1,222	10	76	131	14	14	38	608	832	122	1,081	14	62	148	14	10	28	75	799	115			
12	1,095	10	65	112	15	14	38	593	866	108	1,119	10	56	106	14	14	38	60	808	107			
13	1,095	14	54	74	14	14	38	593	874	111	50	11	37	42	4								
14	1,077	10	76	134	14	14	38	748	875	104	1,071	14	63	151	16								
15	1,095	14	44	82	14	14	38	670	866	108	1,071	14	69	165	16								
16	50	10	39	43	6	24	66	1,011	162		1,081	14	67	161	16								
17	1,095	10	74	127	14	14	38	824	884	100	1,071	14	48	48	14								
18	1,059	14	56	76	14	14	37	748	841	118	1,071	10	48	117	16								
19	1,129	10	80	135	14	14	37	670	866	108	1,071	14	47	66	16								
20	1,129	14	55	75	14	14	37	701	849	115	50	10	39	37	6								
21	1,129	10	75	126	14	14	37	701	866	108	1,053	14	65	157	16								
22	1,039	10	74	124	14	14	37	593	866	108	1,053	14	48	48	16								
23	50	14	56	76	6	24	66	1,259	127		1,043	14	60	144	16								
24	1,147	10	78	131	15	14	37	515	850	101	1,053	14	62	148	16								
25	1,147	14	54	72	16	10	27	365	841	104	1,053	14	48	48	16								
26	1,094	10	53	89	16	10	27	410	841	104	1,053	10	59	101	16								
27	1,129	14	74	96	16	10	27	395	834	111	1,053	14	51	50	16								
28	1,129	10	52	88	16	10	27	440	841	104	1,071	14	49	49	16								
29	1,129	14	74	96	16	14	27	395	850	101	1,091	14	69	165	16								
30	50	14	54	72	6	24	66	902	127		1,091	14	52	51	16								
31	1,058	14	70	123	16	10	28	290	816	122	1,100	14	66	158	16								
		10	48	49								14	74	127	16								
												14	53	73									

MANITOBA HYDROMETRIC SURVEY

SESSIONAL PAPER No 25e

Estimated Daily Discharge, Keewatin Mills for September and October 1916.

Mill "C" Generators.	Day.	Mill "A"								Mill "A"								Mill "C" Generators.
		Generators.				Mill "C"				Generators.				Mill "C"				
		Mill.	Gate.		Pump.	Discharge	Mill.	Gate.		Pump.	Discharge	Mill.	Gate.		Pump.	Discharge		
			c. f. s.	hrs.				%	c. f. s.				c. f. s.	c. f. s.			c. f. s.	
111	1	1,091	14	64	110	16	833	111	50	12½	43	56	6	141	...	...	...	
100	2	1,081	10	62	106	16	816	118	1,190	14	81	196	14	1,023	58	...	...	
100	3	60	11	49	68	6	162	...	1,052	10	52	51	16	1,023	55	...	...	
111	4	1,043	10	50	101	14	833	111	1,052	14	71	171	16	1,023	55	...	...	
115	5	1,045	14	49	68	14	807	122	1,052	14	66	158	16	1,023	59	...	...	
111	6	1,051	10	52	52	11	860	100	1,052	10	58	56	16	1,023	60	...	...	
117	7	1,016	14	58	144	11	860	100	1,091	14	67	161	16	1,023	60	...	...	
108	8	1,122	10	51	51	11	812	108	1,091	14	66	158	16	1,023	55	...	...	
107	9	961	14	57	141	11	812	108	1,091	10	52	51	16	1,023	55	...	...	
115	10	50	10	54	96	14	860	100	50	14	64	110	16	1,023	63	...	...	
107	11	1,075	14	53	75	14	860	100	1,052	14	65	153	16	1,023	63	...	...	
108	12	1,054	10	65	115	17	833	56	1,052	14	62	148	14	1,023	57	...	...	
104	13	1,054	14	43	63	6	167	...	1,061	10	47	47	16	1,023	63	...	...	
108	14	1,054	10	77	136	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
104	15	1,084	14	45	65	17	997	...	1,052	10	50	49	16	1,023	63	...	...	
108	16	1,074	14	86	132	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
108	17	50	12½	39	52	6	123	...	1,033	10	50	49	16	1,023	59	...	...	
107	18	1,084	14	43	63	17	997	...	50	12½	43	56	7	134	...	...	...	
115	19	1,054	14	73	128	17	1,025	27	1,052	14	66	158	16	1,023	55	...	...	
100	20	1,054	14	45	65	17	997	...	1,072	14	46	46	16	1,023	55	...	...	
165	21	1,084	14	86	132	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
146	22	1,132	14	45	65	17	997	...	1,033	10	50	49	16	1,023	63	...	...	
146	23	1,103	14	73	128	17	1,025	27	1,033	14	65	155	16	1,023	65	...	...	
156	24	50	12½	39	52	6	123	...	1,033	10	50	49	16	1,023	65	...	...	
104	25	1,132	14	86	132	17	997	...	50	12½	43	56	7	134	...	...	...	
100	26	1,084	14	45	65	17	997	...	1,052	14	67	161	16	1,023	60	...	...	
104	27	1,045	14	43	63	17	997	...	1,061	14	65	153	16	1,023	63	...	...	
100	28	1,053	14	77	136	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
111	29	1,051	14	43	63	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
117	30	1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
	31	1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,033	14	66	158	16	1,023	55	...	...	
		1,051	14	77	136	17	997	...	1,052	14	71	171	16	1,023	63	...	...	
		1,051	14	45	65	17	997	...	1,033	14	65	155	16	1,023	65	...	...	
		1,051	14	86	132	17	997	...	1,033	10	50	49	16	1,023	59	...	...	
		1,051	14	45	65	17	997	...	50	12½	43	56	7	134	...	...	...	
		1,051	14	43	63	17	997	...	1,0									

Estimated Daily Discharge, Keewatin Mills for November and December 1916

Day.	Mill "A"						Mill "C"	Gener- ator.	Mill "A"							
	Mill.	Generators.			Pump.	c. f. s.			Mill.	Generators.			Pump.	Mill "C"		
		Gate.		Dis- charge						Gate.		Dis- charge.				
		c. f. s.	hrs.							%	c. f. s.				%	c. f. s.
1	900	14	63	168	21	827			1,027	14	72	179	12	1,025		
2	938	14	64	169	18	846			950	10	53	155	12	1,025		
3	777	14	62	165	18	788			70	15	42	70	6	204		
4	818	13	57	143	15	827			931	14	77	190	12	1,040		
5	70	11	31	39	7	192			970	10	45	48	12	1,040		
6		14	33	55						10	78	186	12	1,040		
6	838	14	60	161	18	897			970	14	78	192	12	1,012		
7	838	10	29	34						10	45	48				
7	838	14	67	176	18	827			931	14	78	192	12	1,012		
8	838	10	41	46						10	45	48				
8	838	14	69	181	18	856			970	14	74	183	12	1,012		
9	859	10	41	46						10	46	48				
9	859	14	68	179	12	907			970	10	80	140	10	1,040		
10	859	10	43	48						15	44	73				
10	859	13	74	177	12	907			80	15	41	68	7	215		
11		11	51	61												
11	839	10	78	140	12	876			997	14	71	181	12	1,054		
12		15	43	72	7					10	55	58				
12	70	14	35	58		220			879	14	73	185	12	907		
13		10	54	57						10	54	57				
13	938	14	73	186	11	970			879	14	76	192	12	827		
14		10	49	52						10	51	55				
14	958	14	73	186	14	970			719	14	76	192	18	807		
15		10	54	57						10	51	55				
15	931	14	73	182	14	998			799	14	68	175	15	837		
16		10	49	51						10	51	55				
16	931	14	75	186	14	998			818	10	76	140	15	788		
17		10	53	55						14	44	69				
17	970	14	72	179	14	985			60	19	40	85	0	210		
18		10	49	51												
18	970	14	77	136	17	815			838	13	67	164	12	827		
19		10	46	73						11	49	59				
19	70	15	46	68	0	215			817	14	70	183	12	788		
20		10	42	68						10	49	54				
20	970	14	71	177	12	1,040			284	14	71	185	12	719		
21		10	44	49						10	48	53				
21	931	14	73	181	12	985			128	14	64	175	0	709		
22		10	49	51						10	53	59				
22	893	14	80	196	12	985			80	14	52	144	0	695		
23		10	50	52						10	53	50				
23	970	14	74	183	12	985	45	80		10	59	116	0	716		
24		10	49	51						15	45	77				
24	931	14	62	157	12	985	30	80		15	40	60	0	226		
25		10	54	56												
25	950	10	79	139	12	985			80	0	0	0	0	226		
26		14	48	70												
26	80	13	45	65	6	215			756	14	63	168	15	767		
27		10	49	51						10	44	49				
27	1,084	14	85	207	9	1,025			797	14	59	159	15	716		
28		10	49	51						14	69	54				
28	989	14	79	194	10	1,025			77	10	49	181	14	756		
29		10	53	55						14	69	181				
29	970	14	75	186	12	1,025			655	10	49	54				
30		10	55	56						10	74	136	18	746		
30	970	14	72	179	12	1,025			695	14	74	136				
31		10	48	50						10	73	135	17	728		
		10	48	50					80	14	49	78				
		15	44	75						15	44	75	0	198		

MILL "C" HEADRACE, KEEWATIN.

(LAKE OF THE WOODS OUTLETS.)

STATION No. 5. P.E₄

History.—The station was established by S. S. Scovil on July 17 1912, and since that time has been in continuous operation.

Location of Section.—The metering section is located five feet upstream from the racks in the head-race of Mill "C" of the Lake of the Woods Milling Company at Keewatin, Ont.

Drainage Area.—The drainage area of the combined Lake of the Woods Outlets is 26,400 square miles.

Channel.—The channel is a rectangular rock cut having a normal depth of twelve feet.

Gauge.—A vertical staff gauge is located on the east side of the channel ten feet upstream from the racks. This gauge is referred to W.P.S. datum.

Discharge Measurements.—Since this station was established, discharge measurements have been obtained over a sufficient range of head and load to give a rating of the plant, and from this rating and the records of daily head and load, daily discharges are deduced.

Discharge measurements are obtained periodically at the station as a check on the rating.

Records Available.—Records of daily discharge through the plant based on forebay and tailrace gauge readings and loads on the mill are available from July 17, 1912 to December 31, 1916.

Accuracy.—The records are quite reliable owing to conditions controlling the discharge, i.e., gate opening, head, etc., being easily observed.

*Discharge Measurements of Headrace, Mill "C" at Lake of the Woods Milling Co.,
Kewatin, for 1916.*

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 12	C. C. Galloway.	2,019	40	507	1.79	1,038 04	907.0
Jan. 12	C. C. Galloway.	2,019	40	507	1.73	1,058 04	876.6
Feb. 9	C. C. Galloway.	2,019	40	513	1.58	1,059 10	819.9
Feb. 9	C. C. Galloway.	2,019	40	513	1.60	1,059 10	821.1
Mar. 4	C. C. Galloway.	2,019	40	500	2.04	1,058 78	1,020.4
Mar. 4	C. C. Galloway.	2,019	40	500	2.17	1,058 78	1,085.4
Mar. 6	C. C. Galloway.	2,019	40	499	1.93	1,058 75	963.0
Mar. 6	C. C. Galloway.	2,019	40	499	1.91	1,058 75	953.1
Mar. 13	C. C. Galloway.	2,019	40	498	1.96	1,058 73	974.4
Mar. 13	C. C. Galloway.	2,019	40	498	2.05	1,058 73	1,021.7
April 5	C. C. Galloway.	2,019	40	498	1.49	1,058 71	741.3
April 5	C. C. Galloway.	2,019	40	498	1.55	1,058 71	771.1
May 18	C. C. Galloway.	2,019	40	502	1.92	1,061 00	1,117.4
May 18	C. C. Galloway.	2,019	40	502	1.93	1,061 00	1,143.3
May 20	C. C. Galloway.	2,019	40	508	1.88	1,061 19	1,123.9
May 20	C. C. Galloway.	2,019	40	508	1.85	1,061 19	1,105.9
June 6	C. C. Galloway.	2,019	40	634	1.80	1,062 08	1,140.3
June 15	C. C. Galloway.	1,939	40	634	1.64	1,062 08	973.8
June 15	C. C. Galloway.	1,939	40	634	1.70	1,062 08	1,081.3
June 15	C. C. Galloway.	1,939	40	634	1.70	1,062 08	1,037.0
June 23	M. S. Madden.	1,939	40	642	1.04	1,062 28	1,088.8
June 23	M. S. Madden.	1,939	40	642	1.77	1,062 28	1,136.2
July 5	C. C. Galloway.	1,939	40	654	1.61	1,062 58	1,055.4
July 11	C. C. Galloway.	1,919	40	650	1.78	1,062 48	1,156.5
July 11	C. C. Galloway.	1,919	40	650	1.82	1,062 48	1,182.4
July 13	C. C. Galloway.	1,919	40	647	1.84	1,062 42	1,191.0
July 13	C. C. Galloway.	1,919	40	647	1.86	1,062 42	1,204.0
July 15	C. C. Galloway.	1,919	40	650	1.84	1,062 49	1,195.8
July 15	C. C. Galloway.	1,919	40	650	1.79	1,062 49	1,163.3
July 17	C. C. Galloway.	1,919	40	647	1.69	1,062 42	1,093.9
July 17	C. C. Galloway.	1,919	40	647	1.75	1,062 42	1,132.8
July 19	C. C. Galloway.	1,919	40	655	1.79	1,062 60	1,171.6
July 19	C. C. Galloway.	1,919	40	655	1.78	1,062 60	1,165.0
July 22	C. C. Galloway.	1,919	40	648	1.78	1,062 43	1,152.7
July 22	C. C. Galloway.	1,919	40	648	1.74	1,062 43	1,126.8
July 24	C. C. Galloway.	1,919	40	644	1.88	1,062 35	1,211.5
July 24	C. C. Galloway.	1,919	40	644	1.79	1,062 35	1,153.5
July 27	C. C. Galloway.	1,919	40	641	1.86	1,062 26	1,192.1
July 27	C. C. Galloway.	1,919	40	641	1.85	1,062 26	1,185.7
July 29	C. C. Galloway.	1,919	40	637	1.76	1,062 16	1,120.8
July 29	C. C. Galloway.	1,919	40	637	1.78	1,062 16	1,133.5
July 31	C. C. Galloway.	1,919	40	634	1.85	1,062 10	1,173.6
July 31	C. C. Galloway.	1,919	40	634	1.89	1,062 10	1,199.0
Aug. 2	C. C. Galloway.	1,919	40	638	1.84	1,062 18	1,173.0
Aug. 4	C. C. Galloway.	1,919	40	630	1.83	1,061 98	1,152.0
Aug. 4	C. C. Galloway.	1,919	40	630	1.84	1,061 98	1,158.3
Aug. 8	C. C. Galloway.	1,919	40	625	1.79	1,061 86	1,118.0
Aug. 8	C. C. Galloway.	1,919	40	625	1.81	1,061 86	1,130.5
Aug. 10	C. A. Hansen.	1,919	40	625	1.81	1,061 87	1,131.2
Aug. 10	C. A. Hansen.	1,919	40	625	1.81	1,061 87	1,131.2
Aug. 17	C. C. Galloway.	1,919	40	605	1.85	1,061 38	1,119.4
Aug. 17	C. C. Galloway.	1,919	40	605	1.87	1,061 38	1,131.5
Aug. 22	C. C. Galloway.	1,919	40	598	1.90	1,061 21	1,136.8
Aug. 22	C. C. Galloway.	1,919	40	598	1.99	1,061 21	1,190.6
Aug. 24	C. C. Galloway.	1,919	40	589	1.88	1,060 98	1,107.7
Aug. 24	C. C. Galloway.	1,919	40	589	1.84	1,060 98	1,084.1
Aug. 27	C. C. Galloway.	1,919	40	588	1.74	1,060 94	1,022.2
Aug. 27	C. C. Galloway.	1,919	40	588	1.68	1,060 94	987.0
Aug. 29	C. C. Galloway.	1,919	40	579	1.98	1,060 73	1,146.6
Aug. 29	C. C. Galloway.	1,919	40	579	1.99	1,060 73	1,136.6
Aug. 30	C. A. Hansen.	1,919	40	589	1.93	1,060 97	1,130.7
Aug. 30	C. A. Hansen.	1,919	40	589	1.92	1,060 97	1,083.0
Aug. 31	C. A. Hansen.	1,919	40	573	1.89	1,060 58	1,094.4
Aug. 31	C. A. Hansen.	1,919	40	573	1.91	1,060 58	1,121.2
Sept. 2	C. C. Galloway.	1,919	40	575	1.95	1,060 63	1,151.7
Sept. 6	C. C. Galloway.	1,919	40	573	2.01	1,060 58	1,146.0
Sept. 6	C. C. Galloway.	1,919	40	572	1.99	1,060 56	1,138.7
Sept. 8	C. C. Galloway.	1,919	40	572	1.98	1,060 56	1,133.0
Sept. 11	C. C. Galloway.	1,919	40	590	1.68	1,061 01	991.0
Sept. 12	C. A. Hansen.	1,919	40	570	1.74	1,060 50	991.6
Sept. 13	C. C. Galloway.	1,919	40	571	1.80	1,060 52	1,026.9
Sept. 13	C. C. Galloway.	1,919	40	571	1.77	1,060 52	1,000.8
Sept. 15	C. C. Galloway.	1,919	40	560	1.84	1,060 26	1,030.6
Sept. 15	C. C. Galloway.	1,919	40	560	1.85	1,060 26	1,036.2
Sept. 18	C. C. Galloway.	1,919	40	564	1.68	1,060 36	947.7
Sept. 18	C. C. Galloway.	1,919	40	564	1.73	1,060 36	975.9

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*Discharge Measurements of Headrace, Mill "C" at Lake of the Woods Milling Co.,
Keewatin, for 1916.*

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Sept. 21	M. S. Madden	1,919	40	544	2.33	1,059.87	1,207.5
Sept. 25	C. C. Galloway	1,919	40	558	1.88	1,060.21	1,037.9
Sept. 25	C. C. Galloway	1,919	40	558	2.07	1,060.21	1,155.1
Sept. 25	C. A. Hansen	1,910	40	558	1.77	1,060.22	988.0
Sept. 28	C. C. Galloway	1,919	40	538	2.00	1,059.71	1,124.2
Sept. 28	C. C. Galloway	1,919	40	538	2.07	1,059.71	1,113.5
Oct. 3	C. C. Galloway	1,919	40	533	2.14	1,059.58	1,139.5
Oct. 5	C. C. Galloway	1,919	40	535	2.18	1,059.64	1,166.3
Oct. 5	C. C. Galloway	1,919	40	535	2.18	1,059.64	1,166.3
Oct. 17	C. C. Galloway	1,919	40	517	2.23	1,059.20	1,153.4
Oct. 17	C. C. Galloway	1,919	40	517	2.23	1,059.20	1,153.4
Oct. 28	C. C. Galloway	1,196	40	515	1.87	1,059.13	962.3
Oct. 28	C. C. Galloway	1,196	40	515	1.83	1,059.11	941.7
Nov. 18	M. S. Madden	1,196	40	508	1.96	1,058.97	995.7
Nov. 18	M. S. Madden	1,196	40	508	2.01	1,058.97	1,021.3
Dec. 7	C. C. Galloway	1,919	40	495	1.97	1,058.05	975.5
Dec. 7	C. C. Galloway	1,919	40	495	2.00	1,058.06	1,035.0
Dec. 18	M. S. Madden	1,919	40	498	1.84	1,058.73	917.1
Dec. 18	M. S. Madden	1,919	40	498	1.74	1,058.72	866.3

KEEWATIN LUMBER & MANUFACTURING CO'S. HEADRACE, KEEWATIN.
(LAKE OF THE WOODS OUTLETS.)

STATION NO. 5. P.E5

History.—The station was established by S. C. O'Grady on December 13, 1913, and has been in continuous operation since that date.

The channel forms one of the outlets of the Lake of the Woods. It was constructed in connection with the above company's mill, the discharge being controlled by the headgates. This mill was burned in 1903, and after this date the gates fell into disrepair and leakage occurred. It was to ascertain the amount of this leakage that the station was established.

Location of Section.—The metering section is on the upstream side of the bridge crossing the channel, 300 feet above the old power house and east of the head gates of the Keewatin Lumber & Milling Company's plant.

Drainage Area.—The drainage area above the section is 26,400 square miles, but as there are several other outlets from the Lake of the Woods, this drainage area should not be used in the computation of run-off.

Channel.—The bed of the channel is fairly permanent, being composed of clay and rock.

Gauge.—When this station was established a point was located on the floor of the bridge from which minus readings were taken coincident with the discharge measurements. On October 5, 1916 a vertical staff gauge was installed on the upstream side of the centre pile of the bridge.

All daily discharges at this station are referred to the lake gauge located on the Keewatin Traffic Bridge.

Discharge Measurements.—Since the station was established, discharge measurements have been made at frequent intervals. As the control formed by the old headworks is fairly permanent the discharge depends largely on the lake stage.

Records Available.—Records of daily discharge based on lake gauge records and discharge measurements are available from May 1, 1913 to December 31, 1916.

Accuracy.—No discharge curve has been plotted for the station and the daily discharges are based on discharge measurements and may be considered of high accuracy.

*Discharge Measurements of Western Outlet, Lake of the Woods, at Headrace,
K.L. & M.Co. for 1916.*

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Lake Gauge.
Jan. 19	C. C. Galloway.....	2,019	29	157	1.01	1,034.21	158.4	1,059.07
Jan. 19	C. C. Galloway.....	2,019	29	157	0.91	1,034.21	142.7	1,059.07
Feb. 16	C. C. Galloway.....	2,019	29	156	1.06	1,034.16	164.8	1,059.06
Feb. 16	C. C. Galloway.....	2,019	29	156	1.01	1,034.16	157.1	1,059.06
Mar. 18	C. C. Galloway.....	2,019	29	144	0.99	1,033.76	142.8	1,058.86
Mar. 18	C. C. Galloway.....	2,019	29	144	1.00	1,033.76	144.2	1,058.86
April 12	C. C. Galloway.....	2,019	29	142	1.01	1,033.68	143.4	1,058.76
April 12	C. C. Galloway.....	2,019	29	142	0.99	1,033.68	140.6	1,058.76
May 16	C. C. Galloway.....	2,019	29	181	1.11	1,055.06	200.8	1,060.73
May 16	C. C. Galloway.....	2,019	29	181	1.14	1,055.06	206.2	1,060.73
June 3	C. C. Galloway.....	2,019	30	212	1.61	1,056.11	341.2	1,061.88
June 12	M. S. Madden.....	1,939	32	210	1.60	1,056.16	351.0	1,062.15
June 10	M. S. Madden.....	1,919	30	216	1.63	1,056.12	351.8	
June 28	M. S. Madden.....	1,919	30	216	1.56	1,056.10	336.6	
June 28	C. C. Galloway.....	1,919	30	228	1.70	1,056.61	387.1	1,062.41
July 7	C. C. Galloway.....	1,919	30	228	1.68	1,056.61	382.5	1,062.41
July 7	C. C. Galloway.....	1,919	30	238	1.65	1,056.95	392.0	1,062.47
July 11	C. C. Galloway.....	1,919	30	238	1.62	1,056.95	384.9	1,062.47
July 11	C. C. Galloway.....	1,919	30	239	1.69	1,056.99	403.2	1,062.46
July 18	C. C. Galloway.....	1,919	30	246	1.64	1,056.99	391.3	1,062.46
July 18	C. C. Galloway.....	1,919	30	246	1.74	1,057.26	428.7	1,062.59
July 24	C. C. Galloway.....	1,919	30	243	1.84	1,057.26	433.4	1,062.59
July 24	C. C. Galloway.....	1,919	30	243	1.57	1,057.00	382.1	1,062.34
July 29	C. C. Galloway.....	1,919	30	225	1.56	1,057.09	370.7	1,062.34
July 29	C. C. Galloway.....	1,919	30	225	1.50	1,056.86	338.0	1,062.27
July 29	C. C. Galloway.....	1,919	30	225	1.46	1,056.86	328.9	1,062.27
Aug. 3	C. C. Galloway.....	1,919	30	218	1.42	1,056.61	310.0	1,062.06
Aug. 3	C. C. Galloway.....	1,919	30	218	1.39	1,056.61	303.4	1,062.06
Aug. 9	C. C. Galloway.....	1,919	30	224	1.45	1,056.41	324.7	1,061.98
Aug. 9	C. C. Galloway.....	1,919	30	224	1.44	1,056.41	322.4	1,061.98
Aug. 21	C. C. Galloway.....	1,919	29	185	1.37	1,055.40	253.3	1,061.24
Aug. 21	C. C. Galloway.....	1,919	29	185	1.44	1,055.49	266.3	1,061.24
Aug. 31	C. C. Galloway.....	1,919	29	172	1.37	1,054.81	236.1	1,060.76
Aug. 31	C. C. Galloway.....	1,919	29	172	1.40	1,054.81	241.2	1,060.76
Sept. 8	C. C. Galloway.....	1,919	29	157	1.53	1,054.36	240.7	1,060.58
Sept. 8	C. C. Galloway.....	1,919	29	157	1.54	1,054.36	242.2	1,060.58
Sept. 13	C. C. Galloway.....	1,919	29	159	1.41	1,054.41	223.6	1,060.58
Sept. 13	C. C. Galloway.....	1,919	29	159	1.43	1,054.41	226.8	1,060.58
Sept. 26	M. S. Madden.....	1,919	29	152	1.41	1,054.53	217.9	1,060.16
Sept. 26	M. S. Madden.....	1,919	29	152	1.41	1,054.53	214.9	1,060.16
Oct. 14	C. C. Galloway.....	1,919	29	148	1.30	1,054.03	205.9	1,059.33
Oct. 14	C. C. Galloway.....	1,919	29	148	1.34	1,054.03	198.5	1,059.33
Nov. 4	M. S. Madden.....	1,196	28	150	1.22	1,054.10	183.1	1,059.29
Nov. 4	M. S. Madden.....	1,196	28	150	1.21	1,054.09	181.5	1,059.29
Dec. 2	M. S. Madden.....	1,919	30	149	1.30	1,054.05	193.7	
Dec. 2	M. S. Madden.....	1,919	30	149	1.30	1,054.05	193.7	

SESSIONAL PAPER No. 26e

Daily Gauge Height and Discharge of Headrace K.L. & M. Co. at 2nd Bridge for 1916

[Drainage area 26,400 square miles.]

Day.	January		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	58.92	148	59.18	159	58.02	149	58.80	142	60.41	222	61.76	316
2	58.97	151	59.16	158	58.04	149	58.81	143	60.46	225	61.76	316
3	58.96	150	59.18	159	58.96	150	58.81	143	60.48	226	61.88	327
4	58.93	149	59.20	160	58.88	146	58.80	142	60.54	229	61.70	316
5	58.98	151	59.20	160	58.91	148	58.79	142	60.59	232	61.94	333
6	58.96	150	59.20	160	58.96	145	58.78	141	60.56	231	62.09	348
7	58.93	149	59.20	160	58.87	146	58.78	141	60.68	238	62.01	330
8	58.96	150	59.14	158	58.92	148	58.78	141	60.71	240	61.93	332
9	58.96	150	59.17	159	58.91	148	58.82	143	60.76	243	61.99	337
10	58.97	151	59.15	158	58.91	148	58.79	142	60.83	247	62.04	342
11	59.02	153	59.13	157	58.91	148	58.79	142	60.61	244	62.13	352
12	59.02	153	59.10	156	58.94	149	58.76	140	60.81	246	62.15	355
13	59.06	154	59.14	158	58.89	147	58.83	141	60.83	247	62.23	364
14	59.06	154	59.11	156	58.87	146	58.80	140	60.78	244	62.19	350
15	59.07	155	59.11	156	58.89	147	58.93	150	60.41	222	62.09	348
16	59.09	156	59.06	154	58.84	144	59.04	154	60.66	237	62.01	350
17	59.04	154	59.06	151	58.86	145	59.11	158	60.90	251	62.08	347
18	59.07	155	59.04	154	58.86	145	59.21	160	61.09	264	62.06	347
19	59.06	154	59.01	152	58.80	147	59.29	164	61.17	270	62.13	352
20	59.10	156	59.02	153	58.84	144	59.38	168	61.22	273	62.13	352
21	59.06	154	59.06	154	58.80	145	59.40	174	61.31	280	62.19	359
22	59.11	156	58.99	152	58.84	144	59.65	182	61.33	281	62.20	360
23	59.07	155	59.01	152	58.82	143	59.70	189	61.34	282	62.31	373
24	59.06	151	58.90	150	58.85	145	59.91	195	61.39	286	62.20	360
25	59.01	152	58.96	150	58.87	146	59.91	195	61.38	285	62.33	376
26	58.97	151	58.96	150	58.88	146	60.01	200	61.51	296	62.25	364
27	59.02	153	58.99	152	58.86	145	60.14	206	61.76	316	62.37	380
28	59.06	151	58.94	149	58.83	144	60.26	213	61.68	309	62.39	383
29	59.10	156	58.92	148	58.79	142	60.24	211	61.57	301	62.42	387
30	59.20	160	58.77	141	60.36	216	61.61	304	62.62	345	62.62	415
31	59.18	159	58.78	141	60.36	216	61.86	325	62.62	345	62.62	415

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	62.51	398	61.16	356	60.68	238	59.16	197	59.34	166	58.83	142
2	62.51	399	61.09	348	60.70	239	59.59	179	59.30	164	58.78	139
3	62.53	402	61.05	341	60.70	243	59.68	183	59.39	169	58.84	142
4	62.53	405	61.05	331	60.56	231	59.87	193	59.28	163	58.77	139
5	62.57	408	61.87	326	60.74	241	59.79	189	59.48	173	58.78	139
6	62.52	400	61.96	331	60.65	236	59.87	193	59.58	178	58.71	136
7	62.44	389	61.84	324	60.61	231	59.65	182	59.54	176	58.71	136
8	62.50	397	61.85	325	60.60	233	59.60	184	59.36	167	58.76	139
9	62.61	414	61.94	333	60.63	235	59.41	170	59.22	161	58.70	140
10	62.59	411	61.76	316	61.14	268	59.69	184	59.06	154	58.81	141
11	62.47	393	61.57	301	60.92	252	59.66	182	59.16	158	58.76	138
12	62.49	396	61.52	297	60.56	231	59.42	170	59.23	161	58.76	138
13	62.43	388	61.58	301	60.54	229	59.47	173	59.19	160	58.78	139
14	62.50	397	61.66	308	60.29	214	59.46	172	59.13	157	58.78	139
15	62.46	392	61.48	293	60.26	213	59.41	170	59.23	161	58.79	140
16	62.36	379	61.48	293	60.25	212	59.09	156	59.06	154	58.76	138
17	62.40	384	61.42	289	60.26	213	59.38	168	59.12	157	58.79	140
18	62.57	408	61.35	283	60.40	221	59.21	160	59.10	156	58.76	138
19	62.61	414	61.37	285	60.26	213	59.07	155	59.05	154	58.74	138
20	62.56	406	61.36	284	60.16	207	59.21	160	58.99	152	58.77	139
21	62.48	394	61.27	277	59.96	197	59.35	167	59.09	156	58.79	140
22	62.45	391	61.27	277	60.00	199	59.16	158	59.17	159	58.76	140
23	62.56	406	61.19	271	60.21	210	59.28	163	58.81	143	58.77	139
24	62.35	378	61.03	260	60.11	205	59.57	178	58.91	148	58.76	140
25	62.27	368	60.96	255	60.23	211	58.97	151	58.91	149	58.76	140
26	62.26	367	61.00	258	60.22	210	59.43	171	58.98	151	58.68	135
27	62.22	362	60.99	257	59.90	194	59.26	162	58.85	145	58.76	140
28	62.27	368	61.08	264	59.80	189	59.29	164	58.82	143	58.74	138
29	62.16	356	60.77	243	60.02	200	59.33	166	58.85	147	58.76	140
30	62.19	359	60.95	255	60.12	205	59.37	168	58.84	144	58.74	138
31	62.08	347	60.71	240	59.29	164	59.29	164	58.78	139	58.78	139

NOTE.—Gauge heights are those read on D.P.W. Lake Gauge and are to W.P.S. Datum.

Monthly Discharge of Headrace Old K.L.&M. Co. at 2nd Bridge for 1918.

[Drainage area, 26,400 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on Drainage area.	Total in acre-feet.
January	160	148	153			9,408
February	160	148	153			8,016
March	150	141	146			8,077
April	216	140	164			9,760
May	325	222	261			16,048
June	415	316	353			21,005
July	414	347	380			23,980
August	350	240	295			18,130
September	268	180	221			13,150
October	197	151	172			10,576
November	178	143	157			9,342
December	142	135	130			8,547
The year	415	135	217			157,847

NOTE.—Discharge per square mile and run-off depth in inches omitted, as the outlet is one of several from the Lake of the Woods.

C.P.R. CULVERT AT MINK BAY.

(LAKE OF THE WOODS OUTLETS.)

STATION NO. 5. P.E.6

History.—The station was established by S. S. Scovil on July 29, 1912 and since that date has been in operation.

Location of Section.—The metering section is located about twenty-five feet above a rock-cut tunnel connecting Mink bay with Darlington bay. This tunnel which is under the Canadian Pacific Railway main line right-of-way, is about two thousand feet west of the old Keewatin Lumber and Manufacturing Company's mill on Mink Bay, Keewatin.

Drainage Area.—The drainage area is not significant as most of the water flowing past this station is leakage through K.L. & M. Co's. head gates from the Lake of the Woods.

Channel.—The channel is rock cut and is of fairly uniform section above and below the metering station.

Gauge.—The water levels at time of metering have been observed by measuring down from a point on the rock which has been referred to W.P.S. datum.

Discharge Measurements.—Since the establishment of the station, discharge measurements have been obtained at frequent intervals.

Records Available.—There have been no gauge heights obtained at this station, but records of discharge measurements taken from July 29, 1912 to December 31, 1916 are available.

Discharge Measurements of C.P.R. Culvert at First Tunnel West of Keewatin for 1916.

Date	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	'Sec.-ft.
Jan. 14	C. Galloway	2,019	17	51	2.84	1,040.81	111
Feb. 14	C. Galloway	2,019	17	51	3.05	1,040.81	153
Feb. 20	C. Galloway	2,019	17	50	2.97	1,040.79	149
Mar. 28	C. Galloway	2,019	17	50	3.00	1,040.79	150
Apr. 11	C. Galloway	2,019	17	49	2.90	1,040.72	142
Apr. 18	C. Galloway	2,019	17	49	2.90	1,040.72	142
May 1	C. Galloway	2,019	17	49	2.85	1,040.72	140
May 15	C. Galloway	2,019	17	49	2.90	1,040.72	142

NORTH TUNNEL ISLAND.
(LAKE OF THE WOODS OUTLETS.)
STATION NO. 5. P.E8

History.—The station was established by S. S. Scovil on June 28, 1912 and since that date has been in continuous operation.

Location of Section.—The metering section is located on the west branch of the Winnipeg river, on the north side of Tunnel Island and about one mile below the Keewatin River bridge. The station is operated as a boat station throughout the year.

Drainage Area.—The drainage area above this section is 26,400 square miles, though all of the water coming from this basin does not pass the section as part of it goes through the east branch of the Winnipeg. These two branches, the east and west, join a short distance below the section.

Channel.—The discharge is confined to the channel for all stages. The bed and banks of the river are of solid rock or large boulders and of a very permanent nature. The current is regular across the section and the velocities are high.

Gauge.—A vertical staff gauge is secured to a pile on the west side at the south end of the Keewatin River bridge. All discharge measurements are referred to this gauge.

A vertical staff gauge read during the meterings is located on the north shore about thirty feet above the meter section.

Both of these gauges are referred to W.P.S. datum.

Discharge Measurements.—A large number of discharge measurements have been made at this section over a range in stage of 14.12 feet, corresponding to a range in discharge of from 3,300 to 41,900 c.f.s.

Records Available.—A continuous record of daily gauge height has been obtained on the gauge at Keewatin river bridge from June 28, 1912 to December 31, 1916.

Based on these gauge readings and the frequent discharge measurements which have been obtained at the station, estimates of daily discharge for the above period are available.

Accuracy.—Part of the water flowing past this section enters the river through the Lake of the Woods Milling Co's. plants and part is discharged through the Norman Dam on the western outlet of the Lake of the Woods. On account of the conditions controlling the discharges at these outlets and also on account of the ponding effect of Darlington bay, considerable difficulty is experienced in arriving at the daily discharge by means of a discharge curve alone.

Owing to the close supervision exercised at this station and the short interval at which discharge measurements are taken, the records may be considered of high accuracy.

SESSIONAL PAPER No. 25a

Discharge Measurements of West Branch Winnipeg River at North Tunnel Island for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Gauge at Section.
Jan. 3	C. C. Galloway	2,019	163	4,558	1.91	1,035.60	8,706	1,035.52
Jan. 3	C. C. Galloway	2,019	163	4,558	1.94	1,035.60	8,846	1,035.52
Jan. 6	C. C. Galloway	2,010	163	4,566	1.90	1,035.65	8,675	1,035.57
Jan. 6	C. C. Galloway	2,010	163	4,566	1.91	1,035.65	8,721	1,035.57
Jan. 11	C. C. Galloway	2,019	163	4,560	1.91	1,035.67	8,721	1,035.57
Jan. 11	C. C. Galloway	2,019	163	4,560	1.94	1,035.67	8,858	1,035.57
Jan. 15	C. C. Galloway	2,019	163	4,539	1.82	1,035.50	8,261	1,035.40
Jan. 15	C. C. Galloway	2,019	163	4,530	1.80	1,035.50	8,170	1,035.40
Jan. 18	C. C. Galloway	2,019	163	4,544	1.91	1,035.54	8,679	1,035.43
Jan. 18	C. C. Galloway	2,010	163	4,544	1.91	1,035.54	8,679	1,035.43
Jan. 20	C. C. Galloway	2,019	163	4,542	1.94	1,035.52	8,812	1,035.42
Jan. 20	C. C. Galloway	2,019	163	4,542	1.96	1,035.52	8,916	1,035.42
Jan. 25	C. C. Galloway	2,019	163	4,544	1.96	1,035.52	8,897	1,035.43
Jan. 25	C. C. Galloway	2,019	163	4,544	1.95	1,035.52	8,860	1,035.43
Feb. 1	C. C. Galloway	2,019	163	4,566	1.95	1,035.65	8,904	1,035.57
Feb. 1	C. C. Galloway	2,019	163	4,566	2.02	1,035.65	9,223	1,035.57
Feb. 3	C. C. Galloway	2,019	163	4,571	1.99	1,035.70	9,096	1,035.60
Feb. 5	C. C. Galloway	2,019	163	4,544	1.88	1,035.53	8,542	1,035.43
Feb. 5	C. C. Galloway	2,010	163	4,544	1.85	1,035.53	8,406	1,035.43
Feb. 8	C. C. Galloway	2,010	163	4,552	1.95	1,035.57	8,876	1,035.48
Feb. 8	C. C. Galloway	2,019	163	4,552	1.96	1,035.57	8,921	1,035.48
Feb. 15	C. C. Galloway	2,019	171	4,916	3.02	1,037.86	14,837	1,037.64
Feb. 15	C. C. Galloway	2,019	171	4,916	3.05	1,037.86	15,020	1,037.64
Feb. 17	C. C. Galloway	2,019	171	4,943	2.95	1,038.00	14,586	1,037.64
Feb. 17	C. C. Galloway	2,019	171	4,943	3.02	1,038.00	14,929	1,037.80
Feb. 19	C. C. Galloway	2,019	171	4,951	3.03	1,038.06	15,001	1,037.85
Feb. 19	C. C. Galloway	2,019	171	4,951	3.03	1,038.06	14,981	1,037.85
Feb. 22	C. C. Galloway	2,010	171	4,954	3.01	1,038.10	14,897	1,037.87
Feb. 22	C. C. Galloway	2,019	171	4,954	3.00	1,038.10	14,869	1,037.87
Feb. 29	C. C. Galloway	2,019	171	4,970	3.01	1,038.17	14,947	1,037.97
Feb. 29	C. C. Galloway	2,019	171	4,970	2.97	1,038.17	14,745	1,037.97
Mar. 3	C. C. Galloway	2,019	171	4,983	2.96	1,038.23	14,770	1,038.05
Mar. 3	C. C. Galloway	2,019	171	4,983	2.92	1,038.23	14,551	1,038.05
Mar. 7	C. C. Galloway	2,019	171	4,990	3.00	1,038.27	15,009	1,038.09
Mar. 7	C. C. Galloway	2,019	171	4,990	2.89	1,038.27	14,444	1,038.09
Mar. 14	C. C. Galloway	2,010	171	4,959	2.92	1,038.10	14,180	1,037.90
Mar. 14	C. C. Galloway	2,019	171	4,959	2.96	1,038.10	14,698	1,037.90
Mar. 16	C. C. Galloway	2,019	171	4,975	2.93	1,038.21	14,577	1,038.00
Mar. 16	C. C. Galloway	2,019	171	4,975	2.92	1,038.21	14,527	1,038.00
Mar. 21	C. C. Galloway	2,019	171	4,910	2.70	1,037.76	13,257	1,037.60
Mar. 21	C. C. Galloway	2,019	171	4,910	2.69	1,037.76	13,208	1,037.60
Mar. 29	C. C. Galloway	2,019	171	4,926	2.90	1,037.90	14,308	1,037.70
Mar. 29	C. C. Galloway	2,019	171	4,926	2.94	1,037.90	14,483	1,037.70
Mar. 31	C. C. Galloway	2,019	171	4,931	2.92	1,037.93	14,399	1,037.73
Mar. 31	C. C. Galloway	2,019	171	4,931	2.87	1,037.93	14,160	1,037.73
April 4	C. C. Galloway	2,019	171	4,936	2.95	1,037.98	14,575	1,037.76
April 4	C. C. Galloway	2,019	171	4,936	2.90	1,037.98	14,324	1,037.76
April 6	C. C. Galloway	2,010	171	4,946	2.84	1,037.98	14,046	1,037.82
April 6	C. C. Galloway	2,019	171	4,946	2.82	1,037.98	13,947	1,037.82
April 8	C. C. Galloway	2,019	171	4,933	2.78	1,037.94	13,685	1,037.74
April 8	C. C. Galloway	2,019	171	4,933	2.78	1,037.94	13,704	1,037.74
April 11	C. C. Galloway	2,010	171	4,923	2.77	1,037.92	13,627	1,037.68
April 11	C. C. Galloway	2,019	171	4,923	2.78	1,037.92	13,691	1,037.68
April 13	C. C. Galloway	2,019	171	4,936	2.88	1,037.97	14,223	1,037.76
April 13	C. C. Galloway	2,019	171	4,936	2.86	1,037.97	14,129	1,037.76
April 15	C. C. Galloway	2,019	171	4,941	2.87	1,038.00	14,163	1,037.79
April 15	C. C. Galloway	2,019	171	4,041	2.84	1,038.00	14,056	1,037.79
April 18	C. C. Galloway	2,019	171	4,993	3.07	1,038.31	15,336	1,038.11
April 18	C. C. Galloway	2,019	171	4,993	3.11	1,038.31	15,528	1,038.11
May 3	C. C. Galloway	2,010	192	5,660	4.79	1,042.30	27,112	1,041.74
May 3	C. C. Galloway	2,019	192	5,660	4.74	1,042.30	26,829	1,041.74
May 11	C. C. Galloway	2,019	197	5,824	4.07	1,043.10	28,947	1,042.58
May 11	C. C. Galloway	2,019	197	5,824	4.97	1,043.10	28,947	1,042.58
May 13	C. C. Galloway	2,019	197	5,866	5.10	1,043.40	29,919	1,042.81
May 13	C. C. Galloway	2,019	197	5,866	5.12	1,043.40	30,036	1,042.81
May 18	C. C. Galloway	2,019	198	5,916	5.41	1,043.69	32,006	1,043.06
May 18	C. C. Galloway	2,019	198	5,916	5.33	1,043.69	31,533	1,043.06
May 20	C. C. Galloway	2,019	198	5,969	5.35	1,043.95	31,935	1,043.35
May 20	C. C. Galloway	2,019	198	5,969	5.32	1,043.95	31,756	1,043.35
May 31	C. C. Galloway	2,010	206	6,181	5.73	1,045.00	36,413	1,044.73
June 2	C. C. Galloway	2,019	206	6,206	5.78	1,045.22	36,601	1,044.73
June 5	C. C. Galloway	2,019	206	6,214	5.86	1,045.22	36,601	1,044.73
June 7	C. C. Galloway	2,019	206	6,251	5.87	1,045.48	37,238	1,044.80
June 8	C. C. Galloway	2,019	206	6,256	5.85	1,045.44	36,600	1,044.75
June 10	C. C. Galloway	1,939	206	6,270	5.94	1,045.55	37,238	1,044.80
June 13	C. C. Galloway	1,939	206	6,260	6.12	1,045.50	38,342	1,044.75
June 17	C. C. Galloway	1,939	206	6,310	6.20	1,045.77	39,121	1,045.00

*Discharge Measurements of West Branch Winnipeg River at North Tunnel Island
for 1916.*

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Gauge at Section.
June 19	C. C. Galloway	1,939	206	6,318	6.07	1,045.75	38,350	1,045.04
June 19	C. C. Galloway	1,939	206	6,318	6.10	1,045.75	38,539	1,045.04
June 20	C. C. Galloway	1,939	206	6,338	6.09	1,045.82	38,599	1,045.14
June 21	C. C. Galloway	1,939	207	6,345	6.09	1,045.82	38,640	1,045.17
June 21	C. C. Galloway	1,939	207	6,345	6.09	1,045.82	38,640	1,045.17
June 22	C. C. Galloway	1,939	207	6,347	6.14	1,045.95	38,970	1,045.18
June 24	C. C. Galloway	1,939	207	6,396	6.19	1,046.12	39,594	1,045.43
June 24	M. S. Madden	1,939	207	6,396	6.14	1,046.12	39,274	1,045.43
June 26	M. S. Madden	1,939	207	6,380	6.17	1,046.10	39,367	1,045.34
June 27	M. S. Madden	1,939	206	6,406	6.19	1,046.17	39,650	1,045.48
June 28	M. S. Madden	1,939	206	6,406	6.26	1,046.28	40,098	1,045.48
June 29	M. S. Madden	1,939	206	6,417	6.27	1,046.30	40,237	1,045.54
June 29	M. S. Madden	1,939	206	6,423	6.26	1,046.30	40,210	1,045.57
July 4	M. S. Madden	1,939	206	6,419	6.48	1,046.27	41,597	1,045.55
July 5	M. S. Madden	1,919	206	6,416	6.33	1,046.28	40,610	1,045.53
July 6	M. S. Madden	1,939	207	6,420	6.35	1,046.30	40,827	1,045.59
July 7	M. S. Madden	1,939	207	6,437	6.27	1,046.34	40,361	1,045.63
July 10	M. S. Madden	1,939	207	6,418	6.37	1,046.28	40,879	1,045.63
July 11	M. S. Madden	1,939	207	6,431	6.34	1,046.35	40,776	1,045.60
July 12	M. S. Madden	1,919	207	6,437	6.24	1,046.33	40,168	1,045.63
July 14	M. S. Madden	1,939	207	6,437	6.41	1,046.22	41,261	1,045.63
July 15	M. S. Madden	1,939	207	6,437	6.39	1,046.35	41,132	1,045.63
July 17	M. S. Madden	1,939	207	6,402	6.19	1,046.14	39,626	1,045.48
July 18	M. S. Madden	1,939	207	6,467	6.48	1,046.49	41,909	1,045.78
July 19	M. S. Madden	1,939	209	6,518	6.41	1,046.70	41,784	1,046.02
July 21	M. S. Madden	1,939	209	6,511	6.31	1,046.67	41,082	1,045.98
July 22	M. S. Madden	1,939	209	6,501	6.31	1,046.58	41,021	1,045.93
July 24	M. S. Madden	1,939	208	6,441	6.19	1,046.28	39,807	1,045.63
July 24	M. S. Madden	1,939	208	6,443	6.18	1,046.28	39,815	1,045.65
July 25	M. S. Madden	1,939	208	6,443	6.19	1,046.35	39,880	1,045.65
July 27	M. S. Madden	1,939	208	6,439	6.20	1,046.29	39,919	1,045.63
July 28	M. S. Madden	1,939	208	6,435	6.17	1,046.21	39,701	1,045.61
July 29	M. S. Madden	1,939	208	6,425	6.23	1,046.22	40,025	1,045.66
July 31	M. S. Madden	1,939	207	6,350	6.14	1,045.93	39,044	1,045.24
Aug. 1	M. S. Madden	1,939	207	6,367	6.23	1,045.97	39,665	1,045.28
Aug. 2	M. S. Madden	1,939	207	6,377	6.11	1,046.00	38,962	1,045.33
Aug. 3	M. S. Madden	1,939	207	6,357	6.04	1,045.93	38,395	1,045.23
Aug. 3	M. S. Madden	1,939	207	6,357	6.05	1,045.93	38,458	1,045.23
Aug. 4	M. S. Madden	1,939	207	6,357	6.08	1,045.93	38,640	1,045.23
Aug. 5	M. S. Madden	1,939	207	6,343	5.96	1,045.80	37,804	1,045.16
Aug. 7	M. S. Madden	1,939	207	6,296	5.92	1,045.60	37,260	1,044.92
Aug. 8	M. S. Madden	1,939	207	6,297	6.02	1,045.59	37,910	1,044.93
Aug. 9	M. S. Madden	1,939	207	6,303	5.98	1,045.66	37,693	1,044.96
Aug. 9	M. S. Madden	1,939	207	6,303	6.02	1,045.66	37,945	1,044.96
Aug. 15	M. S. Madden	1,939	206	6,196	5.74	1,045.11	35,566	1,044.43
Aug. 16	M. S. Madden	1,939	206	6,200	5.77	1,045.11	35,776	1,044.45
Aug. 17	M. S. Madden	1,939	206	6,191	5.84	1,044.99	36,153	1,044.40
Aug. 18	M. S. Madden	1,939	206	6,184	5.70	1,044.96	35,622	1,044.37
Aug. 18	M. S. Madden	1,939	206	6,184	5.71	1,044.96	35,314	1,044.37
Aug. 19	M. S. Madden	1,939	206	6,181	5.71	1,045.01	35,291	1,044.35
Aug. 21	M. S. Madden	1,939	205	6,127	5.68	1,044.76	34,802	1,044.09
Aug. 21	M. S. Madden	1,939	205	6,129	5.68	1,044.76	34,813	1,044.10
Aug. 22	M. S. Madden	1,939	205	6,131	5.66	1,044.76	34,793	1,044.11
Aug. 23	M. S. Madden	1,939	205	6,129	5.73	1,044.77	35,122	1,044.10
Aug. 24	M. S. Madden	1,939	205	6,120	5.51	1,044.68	33,718	1,044.05
Aug. 25	M. S. Madden	1,939	204	6,100	5.60	1,044.67	34,160	1,043.96
Aug. 28	M. S. Madden	1,939	204	6,073	5.59	1,044.48	33,945	1,043.82
Aug. 29	M. S. Madden	1,939	203	6,007	5.42	1,044.40	32,883	1,043.80
Aug. 30	M. S. Madden	1,939	202	6,048	5.00	1,044.35	33,868	1,043.71
Aug. 31	M. S. Madden	1,939	202	6,050	5.46	1,044.36	33,033	1,043.72
Sept. 1	M. S. Madden	1,939	200	6,021	5.49	1,044.13	33,055	1,043.58
Sept. 1	M. S. Madden	1,939	200	6,019	5.39	1,044.13	32,444	1,043.57
Sept. 5	M. S. Madden	1,939	200	5,957	5.18	1,043.85	30,857	1,043.25
Sept. 6	M. S. Madden	1,939	200	5,945	5.20	1,043.78	30,910	1,043.19
Sept. 7	M. S. Madden	1,939	200	5,902	4.82	1,043.42	28,448	1,042.97
Sept. 7	M. S. Madden	1,939	200	5,900	4.85	1,043.42	28,616	1,042.96
Sept. 8	M. S. Madden	1,939	200	5,852	4.82	1,043.23	28,205	1,042.71
Sept. 9	M. S. Madden	1,939	199	5,823	4.94	1,043.10	28,768	1,042.57
Sept. 11	M. S. Madden	1,939	196	5,805	5.04	1,042.98	29,259	1,042.48
Sept. 12	M. S. Madden	1,939	195	5,785	4.92	1,042.88	28,464	1,042.38
Sept. 13	M. S. Madden	1,939	195	5,770	4.92	1,042.85	28,388	1,042.30
Sept. 15	M. S. Madden	1,939	195	5,737	4.76	1,042.62	27,309	1,042.13
Sept. 15	M. S. Madden	1,939	195	5,739	4.73	1,042.62	27,146	1,042.14
Sept. 16	M. S. Madden	1,939	194	5,731	4.77	1,042.60	27,336	1,042.16
Sept. 18	M. S. Madden	1,939	191	5,672	4.85	1,042.33	27,511	1,041.82
Sept. 19	M. S. Madden	1,939	192	5,689	4.79	1,042.37	27,249	1,041.90

SESSIONAL PAPER No. 26a

*Discharge Measurements of West Branch Winnipeg River at North Tunnel Island
for 1916.*

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Gauge at Section.
Sept. 20	M. S. Madden	1,930	192	5,693	4.74	1,042.40	26,983	1,041.92
Sept. 22	M. S. Madden	1,930	191	5,679	4.69	1,042.33	26,634	1,041.85
Sept. 23	M. S. Madden	1,930	193	5,717	4.98	1,042.61	28,472	1,042.04
Sept. 25	M. S. Madden	1,930	193	5,712	5.01	1,042.60	28,615	1,042.01
Sept. 25	M. S. Madden	1,930	193	5,714	5.05	1,042.60	28,856	1,042.03
Sept. 26	C. C. Galloway	1,930	195	5,771	5.14	1,042.90	29,602	1,042.31
Sept. 26	C. C. Galloway	1,930	195	5,771	5.12	1,042.90	29,548	1,042.31
Sept. 27	M. S. Madden	1,930	195	5,700	5.00	1,042.93	28,948	1,042.40
Sept. 28	M. S. Madden	1,930	195	5,780	4.93	1,042.92	28,407	1,042.36
Sept. 28	M. S. Madden	1,930	195	5,780	5.00	1,042.92	28,902	1,042.37
Sept. 29	M. S. Madden	1,930	195	5,784	5.10	1,042.93	29,408	1,042.38
Sept. 30	M. S. Madden	1,930	195	5,802	5.20	1,043.02	30,172	1,042.48
Oct. 3	M. S. Madden	1,930	195	5,770	4.98	1,042.79	28,730	1,042.30
Oct. 4	M. S. Madden	1,930	195	5,788	4.99	1,042.93	28,880	1,042.40
Oct. 5	M. S. Madden	1,930	195	5,788	5.06	1,042.88	29,285	1,042.40
Oct. 6	M. S. Madden	1,930	195	5,797	5.03	1,043.00	29,160	1,042.45
Oct. 7	C. C. Galloway	1,919	195	5,791	4.87	1,042.88	28,203	1,042.42
Oct. 10	C. C. Galloway	1,919	195	5,747	4.91	1,042.65	28,216	1,042.18
Oct. 11	M. S. Madden	1,919	195	5,754	4.91	1,042.68	28,252	1,042.22
Oct. 12	M. S. Madden	1,919	195	5,750	4.73	1,042.68	27,197	1,042.20
Oct. 13	M. S. Madden	1,919	194	5,724	4.92	1,042.58	28,161	1,042.07
Oct. 14	M. S. Madden	1,919	194	5,729	4.88	1,042.60	27,959	1,042.10
Oct. 16	M. S. Madden	1,919	193	5,658	4.57	1,042.28	25,856	1,041.78
Oct. 19	M. S. Madden	1,196	193	5,697	4.51	1,042.35	25,692	1,041.93
Oct. 20	M. S. Madden	1,196	192	5,676	4.59	1,042.28	26,051	1,041.83
Oct. 21	M. S. Madden	1,196	192	5,667	4.56	1,042.24	25,839	1,041.78
Oct. 23	M. S. Madden	1,196	189	5,574	4.30	1,041.71	23,970	1,041.30
Oct. 24	M. S. Madden	1,196	189	5,592	4.29	1,041.62	23,859	1,041.23
Oct. 25	M. S. Madden	1,196	187	5,429	3.25	1,040.69	17,643	1,040.50
Oct. 26	M. S. Madden	1,196	184	5,314	3.28	1,040.10	17,428	1,039.88
Oct. 27	M. S. Madden	1,196	182	5,268	3.14	1,039.82	16,543	1,039.02
Oct. 30	M. S. Madden	1,196	179	5,157	3.20	1,039.20	16,502	1,039.65
Oct. 31	C. C. Galloway	1,196	177	5,150	3.19	1,039.29	16,456	1,039.97
Nov. 1	M. S. Madden	1,196	175	5,155	3.24	1,039.27	16,704	1,039.03
Nov. 2	C. C. Galloway	1,196	177	5,145	3.28	1,039.17	16,876	1,038.97
Nov. 3	M. S. Madden	1,196	177	5,145	3.25	1,039.20	16,722	1,038.97
Nov. 6	M. S. Madden	1,196	177	5,090	3.26	1,038.88	16,594	1,038.65
Nov. 7	M. S. Madden	1,196	175	5,131	3.29	1,039.10	16,880	1,038.89
Nov. 8	M. S. Madden	1,196	175	5,123	3.28	1,039.08	16,802	1,038.84
Nov. 9	M. S. Madden	1,196	177	5,116	3.18	1,039.00	16,269	1,038.80
Nov. 10	M. S. Madden	1,196	177	5,107	3.28	1,038.95	16,752	1,038.76
Nov. 13	C. C. Galloway	1,196	178	5,203	3.54	1,039.65	18,419	1,039.29
Nov. 15	C. C. Galloway	1,196	182	5,300	3.81	1,040.25	20,194	1,039.81
Nov. 16	M. S. Madden	1,196	183	5,328	3.87	1,040.33	20,620	1,039.97
Nov. 17	C. C. Galloway	1,196	182	5,327	3.74	1,040.35	19,921	1,039.98
Nov. 22	M. S. Madden	1,919	183	5,339	3.97	1,040.37	21,194	1,040.03
Nov. 22	M. S. Madden	1,919	183	5,342	3.90	1,040.37	21,315	1,040.05
Nov. 24	M. S. Madden	1,919	183	5,342	3.84	1,040.40	20,514	1,040.05
Nov. 20	C. C. Galloway	1,919	183	5,326	3.78	1,040.24	20,133	1,039.96
Dec. 1	C. C. Galloway	1,919	183	5,326	3.79	1,040.34	20,187	1,039.96
Dec. 6	M. S. Madden	1,919	183	5,304	3.77	1,040.34	20,080	1,039.96
Dec. 6	M. S. Madden	1,919	183	5,304	3.68	1,040.17	19,942	1,039.83
Dec. 8	M. S. Madden	1,919	183	5,321	3.73	1,040.23	19,848	1,039.93
Dec. 27	C. C. Galloway	1,919	169	4,930	2.92	1,037.65	14,305	1,037.75
Dec. 27	C. C. Galloway	1,919	169	4,930	2.83	1,037.95	14,444	1,037.75
Dec. 29	C. C. Galloway	1,919	169	4,938	2.89	1,037.98	14,270	1,037.80

*Daily Gauge Height and Discharge of West Branch Winnipeg River at North
Tunnel Island for 1916.*

[Drainage area 26,400 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	35-73	8,700	35-66	9,060	38-21	14,740	37-94	14,200	41-86	26,400	45-09	35,800
2	35-68	8,680	35-66	9,050	38-21	14,660	37-80	14,930	42-15	26,700	45-14	36,060
3	35-63	8,740	35-67	9,065	38-23	14,630	37-75	14,430	42-27	27,050	45-26	36,320
4	35-68	8,720	35-66	8,800	38-23	14,630	37-95	14,450	42-39	27,400	45-18	36,960
5	35-69	8,700	35-49	8,415	38-16	13,900	38-03	14,450	42-62	27,500	45-14	36,630
6	35-69	8,680	35-35	7,780	38-14	14,500	38-05	13,950	42-74	27,700	45-33	37,150
7	35-69	8,700	35-38	8,850	38-23	14,720	37-88	13,900	42-73	27,810	45-45	36,870
8	35-69	8,740	35-57	8,870	38-21	14,830	37-89	13,710	42-77	28,710	45-47	36,810
9	35-45	7,350	35-81	10,100	38-14	14,090	37-73	13,230	42-01	29,440	45-51	37,200
10	35-41	8,980	36-40	12,070	38-07	14,200	37-71	13,770	43-04	29,700	45-57	37,240
11	35-65	8,780	36-01	13,390	37-02	14,170	37-92	13,660	43-13	29,050	45-47	36,100
12	35-71	8,255	37-25	14,050	37-91	13,400	37-96	14,010	43-26	30,200	45-40	36,520
13	35-50	8,045	37-48	13,550	37-93	14,660	37-97	14,170	43-39	30,080	45-55	38,340
14	35-55	8,380	37-59	14,790	38-10	14,550	37-98	13,900	43-30	28,350	45-58	38,380
15	35-51	8,140	37-87	14,920	38-14	14,400	38-00	14,100	43-22	27,350	45-68	37,770
16	35-34	7,140	37-93	14,750	38-15	14,420	37-96	13,750	43-38	29,500	45-71	37,200
17	35-34	8,920	37-99	14,750	38-15	14,640	38-05	15,200	43-26	30,700	45-75	38,490
18	35-51	8,660	38-04	14,880	38-17	14,650	38-28	15,480	43-66	31,890	45-68	35,990
19	35-57	8,980	38-05	14,080	37-97	13,300	38-48	16,900	43-80	32,070	45-69	38,000
20	35-55	8,890	37-94	13,530	37-93	13,600	39-07	18,900	43-93	31,960	45-84	37,900
21	35-53	8,340	37-91	14,820	37-78	13,160	39-60	19,730	43-89	31,440	45-87	38,400
22	35-54	8,900	38-08	14,875	37-72	13,000	39-91	20,620	43-84	32,000	45-96	38,480
23	35-34	7,535	38-14	14,800	37-69	13,060	39-98	19,440	44-06	33,300	46-06	39,130
24	35-32	8,935	38-17	14,790	37-67	13,260	40-18	22,250	44-22	33,570	46-03	38,600
25	35-54	8,890	38-19	14,705	37-67	13,370	40-76	23,000	44-35	33,500	46-02	37,140
26	35-61	8,960	38-19	14,750	37-60	13,360	40-94	23,920	44-47	34,150	46-02	38,810
27	35-63	8,980	38-05	13,450	37-70	14,200	41-27	24,700	44-62	35,750	46-20	38,930
28	35-65	8,990	37-99	14,700	37-73	14,300	41-42	25,420	44-71	35,300	46-28	39,370
29	35-67	9,020	38-15	14,840	37-88	14,390	41-66	25,710	44-72	34,600	46-30	39,850
30	35-47	7,650	.....	.....	37-91	14,280	41-73	25,300	44-79	34,800	46-38	41,110
31	35-43	8,980	.....	.....	37-92	14,260	.....	.....	44-05	36,120	.....	.....
	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	46-25	38,570	45-92	38,360	44-18	32,250	42-76	26,600	39-25	16,540	40-28	20,710
2	46-10	38,510	45-96	37,960	44-06	32,100	42-66	28,190	39-19	16,760	40-27	20,650
3	46-10	40,750	45-92	37,730	43-54	31,500	42-80	28,250	39-17	16,550	40-05	18,990
4	46-24	40,700	45-82	37,980	43-70	31,200	42-59	28,890	39-13	16,500	39-96	20,620
5	46-30	40,970	45-80	37,180	43-82	30,430	42-93	28,880	38-92	15,060	40-14	20,540
6	46-32	40,640	45-68	35,260	43-74	30,440	42-94	28,690	38-87	16,450	40-19	20,390
7	46-34	40,200	45-54	36,490	43-47	28,070	42-02	27,560	39-06	16,800	40-20	20,210
8	46-34	40,600	45-60	36,516	43-22	27,900	42-65	26,180	39-06	16,700	41-17	20,020
9	46-24	39,200	45-63	37,060	43-08	27,690	42-47	27,190	39-03	16,500	39-88	18,310
10	46-23	41,200	45-65	35,980	42-95	26,170	42-67	27,610	39-06	17,240	39-41	16,490
11	46-33	40,460	45-55	34,800	42-92	28,110	42-69	27,620	39-38	19,590	39-18	16,620
12	46-35	40,470	45-43	34,620	42-89	27,800	42-70	26,530	39-50	15,200	39-10	15,890
13	46-34	40,120	45-20	32,870	42-87	27,780	42-60	27,570	39-60	21,360	38-87	15,490
14	46-34	40,590	45-00	35,320	42-84	26,780	42-57	27,340	40-05	21,640	38-76	14,890
15	46-35	40,300	45-14	35,010	42-62	26,750	42-33	25,490	40-10	21,410	38-61	14,620
16	46-18	37,690	45-08	35,210	42-58	26,860	42-21	25,250	40-30	21,350	38-43	14,210
17	46-08	39,940	45-06	35,060	42-33	24,660	42-38	25,640	40-37	21,250	38-20	12,740
18	46-51	40,030	45-01	34,900	42-25	27,010	42-45	25,600	40-38	21,200	38-11	14,320
19	46-69	41,290	44-99	34,720	42-35	26,790	42-36	25,490	40-23	10,550	38-19	14,420
20	46-69	40,930	44-86	32,800	42-37	26,550	42-34	25,810	40-17	21,140	38-14	13,820
21	46-65	40,460	44-77	34,270	42-38	26,670	42-26	25,640	40-29	20,920	38-02	13,640
22	46-57	40,200	44-80	34,070	42-37	26,700	41-84	23,450	40-38	20,680	37-96	13,610
23	46-44	38,880	44-78	34,460	42-55	28,030	41-62	23,730	40-38	20,500	37-90	13,530
24	46-27	39,650	44-69	33,410	42-52	26,180	41-50	21,900	40-38	20,590	37-73	13,190
25	46-32	39,130	44-63	33,140	42-55	28,270	40-79	17,480	40-39	20,710	37-62	12,680
26	46-31	39,020	44-56	33,050	42-88	29,170	40-15	17,260	40-15	18,920	37-70	13,880
27	46-29	38,800	44-49	33,000	42-92	28,750	39-86	16,410	40-10	20,790	37-93	13,910
28	46-23	39,110	44-47	33,360	42-90	28,230	39-70	16,500	40-25	20,650	37-93	13,920
29	46-22	38,460	44-49	32,900	42-92	29,250	39-36	15,500	40-30	20,840	37-99	13,830
30	46-03	36,610	44-41	33,200	42-99	29,700	39-22	16,660	40-30	20,820	37-98	13,790
31	45-93	37,870	44-34	32,470	.....	.....	39-27	16,300	.....	.....	37-92	12,490

NOTE.—Gauge heights are those read at the Keewatin River Bridge gauge and are to W.P.S. Datum.

SESSIONAL PAPER No. 25a

*Monthly Discharge of West Branch Winnipeg River at North Tunnel Island
for 1916.*

[Drainage area 26,400 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....	9,020	7,140	8,560			526,333
February.....	14,980	7,780	12,672			728,902
March.....	14,880	13,060	14,107			867,405
April.....	25,710	12,930	17,303			1,029,600
May.....	36,120	26,400	30,806			1,596,187
June.....	41,110	33,960	37,628			2,239,022
July.....	41,280	36,610	39,752			2,444,255
August.....	38,360	32,470	34,943			2,148,561
September.....	32,250	24,660	28,261			1,681,647
October.....	28,880	15,500	24,217			1,489,045
November.....	21,640	15,060	19,140			1,138,909
December.....	20,710	12,490	15,881			976,485
The year.....	41,280	7,140	23,652			17,166,351

NOTE.—Discharge per square mile and runoff-depth in inches omitted, as the outlet is one of several from the Lake of the Woods.

Combined Discharge of Winnipeg River Below Lake of the Woods Outlets for 1916.

[Drainage area 26,400 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1		10,253	.....	9,977	.....	15,716	.....	14,942	.....	27,230	.....	37,126
2		9,608	.....	9,980	.....	15,045	.....	13,048	.....	27,074	.....	37,036
3		10,060	.....	10,009	.....	15,602	.....	15,190	.....	28,018	.....	37,074
4		10,270	.....	9,726	.....	15,850	.....	15,719	.....	28,343	.....	34,966
5		9,579	.....	9,348	.....	14,790	.....	15,513	.....	28,732	.....	37,955
6		9,830	.....	8,633	.....	15,712	.....	15,029	.....	28,912	.....	38,503
7		10,283	.....	9,782	.....	15,883	.....	15,160	.....	28,739	.....	38,056
8		9,753	.....	9,802	.....	15,709	.....	14,701	.....	29,668	.....	37,900
9		8,177	.....	11,041	.....	14,982	.....	13,900	.....	30,395	.....	38,522
10		10,155	.....	13,012	.....	15,025	.....	14,777	.....	30,076	.....	38,504
11		10,309	.....	14,338	.....	15,039	.....	14,672	.....	30,040	.....	37,141
12		9,774	.....	15,001	.....	14,215	.....	14,797	.....	31,169	.....	37,593
13		9,301	.....	14,443	.....	15,343	.....	14,894	.....	31,035	.....	39,440
14		9,230	.....	15,609	.....	15,449	.....	14,910	.....	29,270	.....	39,467
15		9,091	.....	15,870	.....	15,390	.....	14,808	.....	28,326	.....	39,129
16		8,005	.....	15,653	.....	15,653	.....	14,420	.....	30,503	.....	38,835
17		9,832	.....	15,646	.....	15,548	.....	13,900	.....	31,666	.....	40,153
18		9,785	.....	15,705	.....	15,548	.....	16,194	.....	32,888	.....	37,307
19		9,876	.....	15,865	.....	14,129	.....	17,614	.....	33,649	.....	40,322
20		9,583	.....	14,360	.....	14,410	.....	19,629	.....	33,257	.....	40,225
21		9,021	.....	15,718	.....	13,951	.....	20,456	.....	32,400	.....	40,628
22		9,582	.....	15,775	.....	13,828	.....	21,382	.....	34,372	.....	40,828
23		8,205	.....	15,681	.....	13,895	.....	20,154	.....	34,580	.....	41,508
24		9,789	.....	15,669	.....	14,352	.....	23,005	.....	35,057	.....	40,962
25		9,852	.....	15,673	.....	14,338	.....	23,778	.....	34,784	.....	39,527
26		9,917	.....	15,649	.....	14,048	.....	24,600	.....	35,690	.....	41,170
27		9,915	.....	14,298	.....	14,946	.....	25,475	.....	37,153	.....	41,237
28		9,901	.....	15,666	.....	15,052	.....	26,222	.....	36,270	.....	41,587
29		9,911	.....	15,785	.....	15,125	.....	26,529	.....	36,133	.....	42,446
30		8,474	.....	.....	.....	15,021	.....	26,070	.....	36,134	.....	43,344
31		9,869	.....	.....	.....	14,984	.....	.....	.....	37,684	.....	.....

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1		40,158	.....	40,045	.....	33,276	.....	27,410	.....	17,847	.....	21,990
2		40,062	.....	39,909	.....	33,405	.....	29,419	.....	18,016	.....	21,910
3		42,337	.....	39,656	.....	32,499	.....	29,061	.....	17,578	.....	19,721
4		42,365	.....	39,896	.....	32,260	.....	29,581	.....	17,539	.....	21,613
5		42,566	.....	39,026	.....	31,735	.....	30,289	.....	15,777	.....	21,758
6		42,241	.....	39,876	.....	31,767	.....	29,879	.....	17,469	.....	21,641
7		41,791	.....	38,337	.....	29,360	.....	28,785	.....	18,083	.....	21,492
8		42,229	.....	38,368	.....	29,159	.....	26,995	.....	17,750	.....	21,304
9		40,779	.....	38,824	.....	28,985	.....	28,356	.....	17,562	.....	19,596
10		42,836	.....	37,956	.....	27,168	.....	28,802	.....	18,556	.....	17,383
11		42,317	.....	36,699	.....	29,283	.....	28,784	.....	20,691	.....	17,919
12		42,316	.....	36,396	.....	29,142	.....	27,698	.....	16,000	.....	17,175
13		41,950	.....	34,336	.....	28,880	.....	28,433	.....	22,592	.....	16,775
14		42,506	.....	36,970	.....	27,919	.....	28,190	.....	22,912	.....	16,195
15		42,310	.....	36,716	.....	27,872	.....	26,291	.....	22,679	.....	15,575
16		39,381	.....	36,891	.....	28,007	.....	26,110	.....	22,647	.....	15,377
17		41,919	.....	36,712	.....	25,442	.....	26,835	.....	22,558	.....	15,624
18		42,716	.....	36,542	.....	28,148	.....	27,093	.....	22,373	.....	15,603
19		43,351	.....	36,368	.....	28,089	.....	26,735	.....	20,379	.....	15,381
20		42,965	.....	34,158	.....	27,655	.....	27,054	.....	22,393	.....	14,772
21		42,553	.....	35,873	.....	28,019	.....	26,932	.....	22,210	.....	14,702
22		42,319	.....	35,672	.....	27,850	.....	24,334	.....	21,912	.....	14,865
23		40,637	.....	35,796	.....	29,163	.....	25,012	.....	21,747	.....	14,494
24		41,692	.....	34,795	.....	26,966	.....	23,008	.....	21,909	.....	14,068
25		41,141	.....	34,167	.....	29,600	.....	18,668	.....	22,012	.....	13,575
26		41,022	.....	31,380	.....	30,241	.....	18,136	.....	19,778	.....	14,819
27		40,746	.....	34,015	.....	29,920	.....	17,399	.....	22,075	.....	15,135
28		41,008	.....	34,684	.....	29,332	.....	17,601	.....	21,930	.....	15,095
29		40,358	.....	34,246	.....	30,116	.....	16,237	.....	22,123	.....	14,737
30		38,256	.....	34,530	.....	30,877	.....	17,676	.....	22,098	.....	15,038
31		39,507	.....	33,777	.....	.....	.....	17,355	.....	.....	.....	13,363

NOTE.—Total discharge from the Lake of the Woods.

Monthly Discharge of Winnipeg River Below Lake of the Woods Outlets for 1916.
[Drainage area 26,400 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....	10,309	8,005	9,587	0.363	0.419	589,481
February.....	15,870	8,633	13,582	0.514	0.554	781,246
March.....	15,883	13,828	15,012	0.569	0.656	923,052
April.....	26,529	13,648	18,136	0.687	0.767	1,079,167
May.....	37,684	27,230	31,950	1.210	1.395	1,864,529
June.....	43,344	3,966	39,326	1.490	1.662	2,340,059
July.....	43,351	3,956	41,560	1.574	1.815	2,535,425
August.....	40,045	33,777	36,544	1.384	1.506	2,247,003
September.....	33,405	25,442	29,405	1.114	1.243	1,749,710
October.....	30,289	16,237	25,313	0.959	1.106	1,556,436
November.....	22,912	15,777	20,297	0.769	0.858	1,207,756
December.....	21,960	13,363	16,989	0.644	0.742	1,044,612
The year.....	43,351	8,005	24,854	0.941	12.813	18,038,485

NOTE.—Total discharge from the Lake of the Woods.

WINNIPEG RIVER AND TRIBUTARIES

WINNIPEG RIVER.

The Winnipeg river is one of the most important in the province of Manitoba, forming the source of power supply for the city of Winnipeg. It joins Lake of the Woods to lake Winnipeg flowing in a westerly direction. The drainage area of the river is 53,500 square miles above the mouth. The basin has all the characteristics of the Laurentian formation, being dotted with lakes, ponds and muskegs. A considerable portion of the basin is composed of lake areas the sizes of which range from a few square miles up to the 1,500 square miles of Lake of the Woods. The country drained is rough and more or less timbered. The upper part of the area has been lumbered to a considerable extent and still affords a field for such industry.

The river itself is of considerable proportions, and its characteristics are lake-like expanses joined by short stretches of swift water or falls. On account of these features, splendid opportunity is offered for the development of water power. At the present time advantage has been taken of these possibilities in two cases, and developments are to be found at Point du Bois, where the city of Winnipeg has a municipally owned and operated plant, and on the Pinawa channel where the plant of the Winnipeg Electric Railway Company is in operation. A number of other sites are capable of economic development and it has been established as a result of detailed surveys and studies by the engineers of the Dominion Water Power Branch that a total output of approximately 420,000 continuous 24-hour horse-power is available from this river within the province of Manitoba.¹

In consequence of the importance of this river a number of stations at which records of discharge have been obtained have been established. They are as follows:—

1. The Dalles.
2. Throat Rapids.
3. Minaki.
4. Whitedog Rapids.
5. Slave Falls.
6. Otter Falls.
7. Pinawa Channel.
8. Grand du Bonnet Falls.

At some of these points continuous discharges are not available, the record being confined to a few isolated meterings.

¹ See Water Resources Paper No. 3.—Report on Power and Storage Investigations on the Winnipeg River by J. T. Johnston, Chief Hydraulic Engineer, Dominion Water Power Branch.

1918

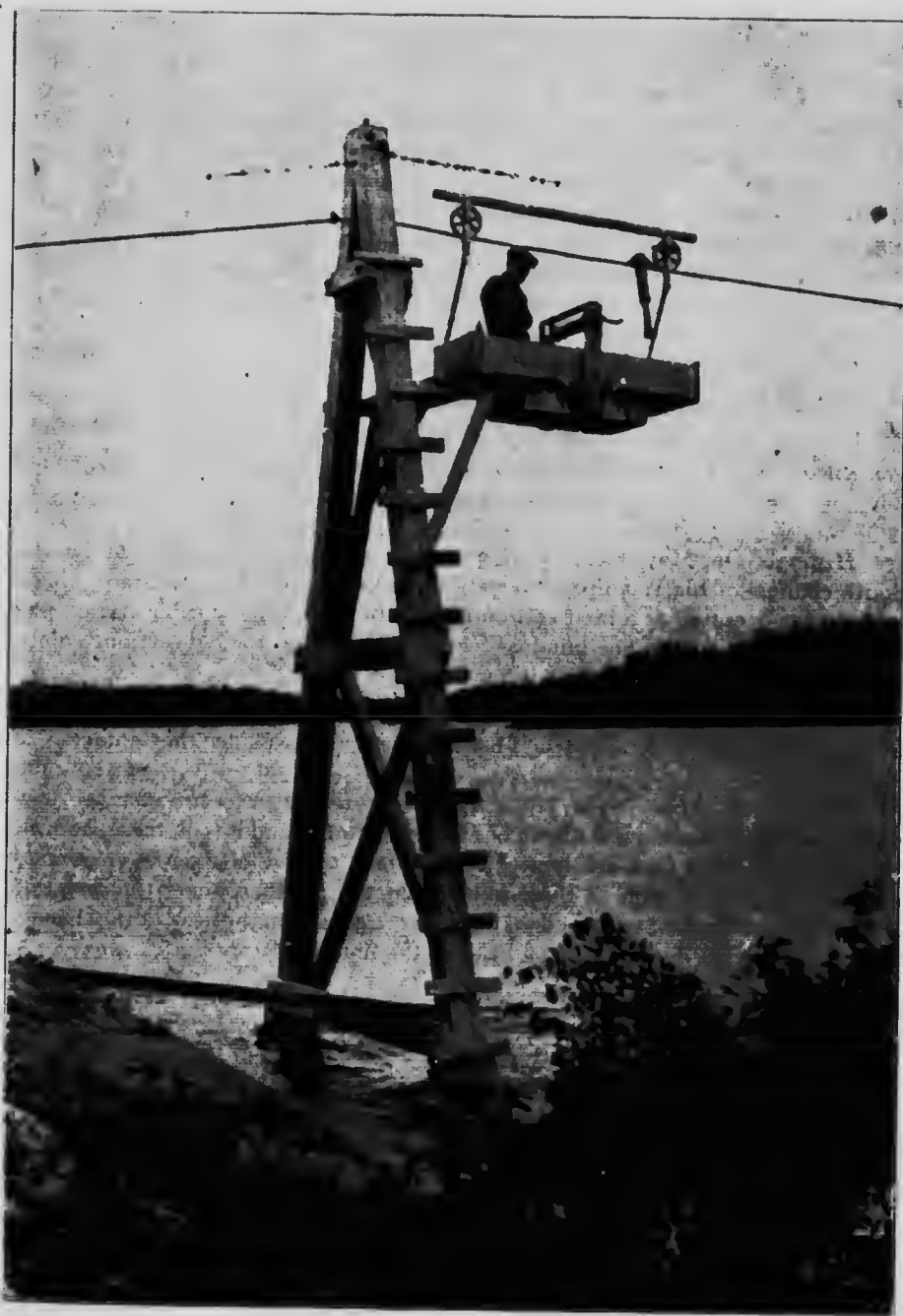
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Winnipeg River—Whitedog Falls—South Channel.
Cable Station—Right Bank.

TRIBUTARIES.

The tributaries of the Winnipeg river are, with one exception, of minor importance, having for the most part small drainage areas. The exception is the English river, which enters the Winnipeg from the north just within the province of Ontario and drains nearly one-half of the total drainage area above the junction. The other tributaries of the Winnipeg river are, the Whiteshell river which joins the main river in the lake-like expanse known as Jessie lake, the Whitemouth which enters just below the Seven Sisters rapids and the Bird river which flows into Lac du Bonnet.

Of these tributaries, the Whitemouth is the only one for which daily records of discharge are available.

WINNIPEG RIVER AT WHITEDOG FALLS, NORTH AND SOUTH CHANNELS.
STATION No. 5. P.E 10

History.—On May 18, 1914 a metering station was established on the South channel of the Winnipeg river at Whitedog falls by S. C. O'Grady. This station was operated as a boat station until July 1915, when a cable station was installed approximately one hundred feet upstream from the old section. Since that time this station has been in operation.

On May 24, 1914 a cable carrier station was established on the North channel at these falls by S. C. O'Grady and has been in operation since that date.

Location of Section.—The Winnipeg river is divided into two channels at a point thirteen miles below the town of Minaki, Ontario, and it is on these channels that the Whitedog falls are located. The falls consist of a series of pitches extending over a stretch of three miles. On the North channel the metering section is located about two hundred feet downstream from the head of the channel and within twenty-five feet of the head of the first pitch.

The metering section on the South channel is located about one mile below the head of the channel and nine hundred feet above the crest of the second pitch of the falls.

There is no ice interference at either of these stations during the winter months and discharge measurements may be made at all seasons of the year without any change in location of the station.

Drainage Area.—The drainage area above these sections is 27,200 square miles.

Channel.—The South channel is approximately four hundred feet wide. The bed of the channel is rock and not liable to shifting, the control for the section being the crest of the falls, nine hundred feet below. The banks are of rock and of sufficient height to confine the discharge to the channel at all stages. The channel is straight and free from eddies under nearly all conditions.

The North channel has a width of approximately forty-five feet. The head and banks of the channel are of rock and free from likelihood of shifting, the control being twenty feet below. The channel is straight above and below the section for a sufficient distance to insure freedom from eddies.

Gauge.—The gauge at the South channel section is a rock bolted vertical staff gauge, located on the left bank one hundred feet below the section, reading direct to W.P.S. datum. On June 17, 1916 on account of high water conditions, a temporary staff gauge referred to W.P.S. datum was placed two hundred feet below the section on the right bank.

On the North channel a rock bolted vertical staff gauge is located on the right bank, about one hundred feet above the section. This gauge is also referred to W.P.S. datum.

On account of impossibility of obtaining gauge readers for the above gauges, the daily records are obtained from gauge readings at Minaki. The gauge at this point is a vertical staff gauge secured to the crib work at the east end of the Grand Trunk Pacific Railway bridge at Minaki. The gauge is referred to W.P.S. datum.

In August of 1915 a Gurley Printed Record, Water Stage Register, was installed on an island opposite the head of the South channel and since that date daily records have been obtained from same.

Discharge Measurements.—Discharge measurements over a range in stage of 6.25 feet have been taken at frequent intervals since the installation of these stations.

Records Available.—From September 14, 1913 to December 5, 1914 and from May 18, 1915 to August 15, 1915, continuous records of daily gauge height have been obtained. From the latter date to December 31, 1916 records on the automatic gauge at Whitedog have been obtained.

Based on these gauge readings, estimates of daily discharge for the above periods are available. Estimates of monthly mean discharge based on gauge heights and actual measurements are also available.

Combined and separate records of discharge for the two channels are available covering the above periods.

Accuracy.—The discharge curves for each channel are well defined between gauge heights 1033.0 and 1039.25. Above and below these limits the curves are only fairly well defined.



Winnipeg River—Whitedog Falls—North Channel.
Below Meter Section.

*Discharge Measurements of Winnipeg River at South Channel, Whitedog Falls
for 1916.*

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 23	W. J. Ireland	1,039	355	7,296	1.31	1,027.81	9,557
May 17	R. C. Robinson	1,919	393	9,511	2.96	1,033.47	28,153
June 17	M. C. Hendry	1,615	399	10,074	3.43	1,034.90	34,552
July 1	M. C. Hendry	1,615	399	10,202	3.43	1,035.17	35,196
July 15	W. J. Ireland	1,615	399	10,227	3.61	1,035.20	36,921
July 30	W. J. Ireland	1,615	401	10,263	3.52	1,035.31	36,125
Aug. 22	W. J. Ireland	1,615	400	9,950	3.18	1,034.41	31,640
Aug. 26	W. J. Ireland	1,615	398	9,868	3.09	1,034.30	30,492
Sept. 9	W. J. Ireland	1,615	393	9,630	3.05	1,033.66	29,371
Oct. 21	R. C. Robinson	1,435	391	9,268	2.77	1,032.86	25,710

SEASONAL PAPER No. 25c

Daily Gauge Height and Discharge of Winnipeg River at South Channel, Whitdog
for 1916.

[Drainage area 27,300 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	33-15	9,890	33-14	9,890	34-44	14,090	34-21	13,630	36-47	23,360	36-41	21,440
2	33-15	9,890	33-15	9,890	34-46	14,100	34-20	13,600	36-59	23,510	36-45	22,060
3	33-15	9,890	33-15	9,890	34-48	14,230	34-28	13,530	36-73	23,460	36-50	23,300
4	33-15	9,890	33-16	9,890	34-49	14,270	34-26	13,460	36-54	23,980	36-48	23,450
5	33-15	9,890	33-14	9,890	34-50	14,300	34-25	13,430	36-56	24,000	36-57	23,680
6	33-15	9,890	33-13	9,830	34-51	14,340	34-28	13,530	37-06	24,980	36-59	23,800
7	33-14	9,890	33-12	9,800	34-51	14,340	34-29	13,570	37-15	25,480	36-51	23,900
8	33-14	9,890	33-10	9,740	34-51	14,340	34-31	13,630	37-21	25,760	36-63	23,000
9	33-14	9,890	33-15	9,890	34-50	14,300	34-23	13,330	37-30	26,200	36-66	23,150
10	33-14	9,890	33-19	10,010	34-49	14,270	34-32	13,670	37-34	26,400	36-70	23,350
11	33-14	9,890	33-27	10,260	34-49	14,270	34-30	13,600	37-38	26,600	36-72	23,480
12	33-14	9,890	33-30	10,630	34-47	14,190	34-31	13,630	37-43	26,860	36-73	23,800
13	33-14	9,890	33-29	11,260	34-44	14,090	34-35	13,780	37-48	27,100	36-78	23,900
14	33-14	9,890	33-26	11,480	34-40	13,950	34-39	13,910	37-52	27,300	36-74	23,650
15	33-13	9,830	33-28	11,870	34-41	13,980	34-46	14,160	37-54	27,400	36-75	23,600
16	33-13	9,830	33-28	12,190	34-43	14,060	34-50	14,300	37-55	27,450	36-77	23,700
17	33-13	9,830	33-24	12,390	34-44	14,090	34-55	14,490	37-58	27,600	36-79	23,850
18	33-13	9,830	34-08	12,690	34-43	14,060	34-59	14,620	37-61	27,760	36-81	23,950
19	33-13	9,830	34-17	13,160	34-41	13,980	34-63	14,770	37-65	27,960	36-83	24,050
20	33-13	9,830	34-22	13,330	34-40	13,950	34-70	15,020	37-71	28,250	36-84	24,100
21	33-14	9,890	34-25	13,430	34-36	13,810	34-87	15,630	37-77	28,530	36-87	24,250
22	33-10	9,740	34-28	13,530	34-35	13,780	34-97	16,030	37-81	28,760	36-91	24,450
23	33-09	9,710	34-32	13,670	34-31	13,630	35-20	16,910	37-85	28,960	36-96	24,850
24	33-08	9,680	34-35	13,780	34-26	13,460	35-45	17,900	37-91	29,260	36-91	25,000
25	33-07	9,650	34-38	13,890	34-22	13,330	35-53	18,220	37-99	29,700	36-97	25,300
26	33-06	9,620	34-40	13,950	34-30	13,600	35-67	18,800	38-07	30,100	36-98	25,350
27	33-09	9,710	34-42	14,020	34-16	13,120	35-85	19,550	38-13	30,400	36-11	25,500
28	33-12	9,800	34-42	14,020	34-20	13,260	36-02	20,280	38-20	30,760	36-13	25,650
29	33-14	9,890	34-43	14,090	34-22	13,330	36-13	20,750	38-24	30,960	36-15	25,750
30	33-16	9,920	.....	.....	34-26	13,460	36-39	21,900	38-29	31,200	36-21	26,050
31	33-14	9,890	.....	.....	34-28	13,530	.....	.....	38-38	31,700	.....	.....
	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	39-21	36,050	39-19	35,950	38-14	30,450	37-22	25,810	35-44	17,880	35-77	19,210
2	39-21	36,050	39-15	35,750	38-11	30,300	37-23	25,860	35-40	17,700	35-77	19,210
3	39-19	35,950	39-13	35,650	38-07	30,100	37-23	25,860	35-32	17,380	35-76	19,170
4	39-17	35,850	39-11	35,500	38-14	30,450	37-22	25,810	35-26	17,140	35-72	19,000
5	39-17	35,850	39-08	35,350	38-05	30,000	37-23	25,860	35-24	17,070	35-72	19,000
6	39-18	35,900	39-07	35,300	37-98	29,650	37-25	25,950	35-22	16,990	35-70	18,920
7	39-20	36,000	39-02	35,050	37-92	29,300	37-25	25,950	35-25	16,950	35-70	18,920
8	39-21	36,050	38-98	34,850	37-84	28,900	37-25	25,950	35-15	16,710	35-70	18,920
9	39-22	36,100	38-95	35,100	37-75	28,450	37-19	25,690	35-14	16,680	35-69	18,880
10	39-20	36,000	38-93	34,550	37-72	28,300	37-16	25,510	35-13	16,640	35-69	18,880
11	39-18	35,900	38-89	34,350	37-59	27,650	37-16	25,510	35-12	16,600	35-63	18,630
12	39-19	35,950	38-84	34,100	37-51	27,250	37-14	25,420	35-12	16,600	35-55	18,300
13	39-21	36,050	38-80	33,900	37-45	26,950	37-14	25,420	35-09	16,480	35-49	18,060
14	39-22	36,100	38-76	33,600	37-35	26,450	37-11	25,270	35-16	16,750	35-43	17,820
15	39-21	36,050	38-69	33,300	37-29	26,150	37-10	25,220	35-24	17,070	35-30	17,300
16	39-19	35,950	38-66	33,150	37-24	25,910	37-04	24,930	35-40	17,700	35-26	17,140
17	39-19	35,950	38-63	33,100	37-18	25,610	37-01	24,790	35-53	18,220	35-19	16,870
18	39-42	37,200	38-63	33,000	37-13	25,370	36-90	24,660	35-63	18,630	35-16	16,750
19	39-49	37,600	38-61	32,900	37-07	25,080	37-96	24,550	35-64	18,670	35-12	16,600
20	39-53	37,800	38-57	32,650	37-03	24,880	37-96	24,550	35-67	18,800	35-06	16,370
21	39-51	37,700	38-51	32,350	37-02	24,840	36-96	24,550	35-70	18,920	34-96	16,060
22	39-50	37,650	38-45	32,050	37-04	24,930	36-93	24,400	35-73	19,050	34-90	15,780
23	39-49	37,600	38-42	31,900	37-04	24,930	36-82	23,880	35-75	19,130	34-96	15,990
24	39-45	37,350	38-39	31,750	37-04	24,930	36-77	23,650	35-78	19,260	34-97	16,030
25	39-40	37,100	38-37	31,650	37-07	25,080	36-73	23,410	35-81	19,380	34-79	15,350
26	39-36	36,850	38-33	31,450	37-08	25,120	36-74	23,040	35-82	19,420	34-80	15,390
27	39-35	36,800	38-30	31,250	37-10	25,220	36-74	22,900	35-82	19,420	34-81	15,430
28	39-34	36,750	38-27	31,100	37-14	25,420	36-74	20,970	35-81	19,350	34-82	15,460
29	39-34	36,750	38-23	30,900	37-18	25,610	35-84	19,590	35-79	19,300	34-82	15,460
30	39-31	36,600	38-23	30,900	37-23	25,860	35-67	18,800	35-78	19,260	34-81	15,430
31	39-24	36,250	38-19	30,700	.....	.....	35-60	18,100	.....	.....	34-80	15,390

Notes.—From January 23 to April 12 and October 23 to December 31, inclusive, gauge heights are deduced from Minaki gauge heights.

1,000-00 should be added to gauge heights to reduce to station datum.



Winnipeg River—Whitedog Falls—South Channel.
Temporary Staff Gauge below Station—Right Bank.

Monthly Discharge of Winnipeg River at South Channel, Whitedog for 1916.
(Drainage area 27,200 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....	9,920	9,620	9,826			604,177
February.....	14,060	9,740	11,803			678,915
March.....	14,340	13,120	13,922			856,031
April.....	21,900	13,330	15,455			919,836
May.....	31,700	22,260	27,431			1,686,666
June.....	36,950	31,850	33,863			2,014,988
July.....	37,800	35,850	36,508			2,244,790
August.....	35,950	30,700	33,326			2,049,136
September.....	30,450	24,840	26,971			1,604,886
October.....	25,950	18,100	24,227			1,489,660
November.....	19,420	16,480	17,972			1,069,408
December.....	19,210	15,350	17,281			1,062,567
The year.....	37,800	9,620	22,382			16,290,861

NOTE.—Discharge per square mile and run off-depth in inches omitted, as the channel is one of two of the river at this point.

Discharge Measurements of Winnipeg River at North Channel, Whitedog Falls, for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 22	W. J. Ireland	1,939	37	198	1.68	1,032.84	333
May 16	R. C. Robinson	1,919	45	380	4.82	1,037.41	1,833
May 18	R. C. Robinson	1,919	45	382	4.49	1,037.50	1,714
June 17	M. C. Hendry	1,615	47	449	5.11	1,038.73	2,204
July 1	M. C. Hendry	1,615	48	480	4.98	1,039.14	2,392
July 5	M. C. Hendry	1,615	48	479	5.14	1,039.11	2,460
July 30	W. J. Ireland	1,615	48	486	5.43	1,039.21	2,637
Aug. 21	W. J. Ireland	1,615	47	444	4.81	1,038.41	2,137
Aug. 21	W. J. Ireland	1,615	46	437	4.73	1,038.30	2,060
Sept. 9	W. J. Ireland	1,615	45	408	4.39	1,037.62	1,792
Oct. 22	R. C. Robinson	1,435	45	361	3.89	1,036.85	1,405

MANITOBA HYDROMETRIC SURVEY

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Daily Gauge Height and Discharge of Winnipeg River at North Channel, Whitedog, for 1916.

[Drainage area 27,200 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	33-15	340	33-14	338	34-44	627	34-31	597	36-47	1,207	38-41	2,080
2	33-15	340	33-15	340	34-46	632	34-30	595	36-59	1,250	38-45	2,100
3	33-15	340	33-15	340	34-48	636	34-28	590	36-73	1,303	38-50	2,130
4	33-15	340	33-16	343	34-49	639	34-26	586	36-84	1,346	38-53	2,145
5	33-15	340	33-14	338	34-50	641	34-25	584	36-95	1,390	38-57	2,165
6	33-15	340	33-13	336	34-51	643	34-28	590	37-05	1,431	38-59	2,180
7	33-14	338	33-12	334	34-51	643	34-29	593	37-15	1,474	38-61	2,190
8	33-14	338	33-10	330	34-51	643	34-31	597	37-21	1,500	38-63	2,200
9	33-14	338	33-15	340	34-50	641	34-22	577	37-30	1,540	38-66	2,220
10	33-14	338	33-19	349	34-49	639	34-32	600	37-34	1,558	38-70	2,240
11	33-14	338	33-27	366	34-49	639	34-30	595	37-38	1,575	38-72	2,250
12	33-14	338	33-30	392	34-47	634	34-31	597	37-43	1,598	38-73	2,255
13	33-14	338	33-59	436	34-44	627	34-35	606	37-48	1,621	38-73	2,255
14	33-14	338	33-66	451	34-40	618	34-39	616	37-52	1,639	38-74	2,265
15	33-13	336	33-78	478	34-41	620	34-46	632	37-54	1,648	38-75	2,270
16	33-13	336	33-88	500	34-43	625	34-50	641	37-55	1,653	38-77	2,280
17	33-13	336	33-94	513	34-44	627	34-55	653	37-58	1,687	38-79	2,290
18	33-13	336	34-03	533	34-43	625	34-59	663	37-61	1,681	38-81	2,305
19	33-13	336	34-17	565	34-41	620	34-63	672	37-65	1,700	38-83	2,315
20	33-13	336	34-22	577	34-40	618	34-70	689	37-71	1,729	38-84	2,320
21	33-14	336	34-25	584	34-36	609	34-87	731	37-77	1,758	38-87	2,340
22	33-10	332	34-28	590	34-35	606	34-97	756	37-81	1,777	38-91	2,360
23	33-09	330	34-32	600	34-31	597	35-20	816	37-85	1,796	38-98	2,405
24	33-08	328	34-35	606	34-26	586	35-45	886	37-91	1,825	39-01	2,420
25	33-07	324	34-38	613	34-22	577	35-53	908	37-99	1,863	39-07	2,460
26	33-06	322	34-40	618	34-30	595	35-67	948	38-07	1,905	39-08	2,465
27	33-09	328	34-42	623	34-16	563	35-85	1,091	38-13	1,935	39-11	2,485
28	33-12	334	34-42	623	34-20	572	36-02	1,054	38-20	1,970	39-13	2,495
29	33-14	338	34-43	625	34-22	577	36-13	1,090	38-24	1,990	39-15	2,510
30	33-16	343	.....	.....	34-26	586	36-39	1,179	38-29	2,015	39-21	2,545
31	33-14	338	.....	.....	34-28	590	.....	.....	38-38	2,065	.....	.....
	July.		August.		September.		October.		November.		December.	
	30-21	2,545	39-19	2,535	38-14	1,940	37-22	1,505	35-44	883	35-77	977
1	30-21	2,545	39-15	2,510	38-11	1,925	37-23	1,509	35-40	872	35-77	977
2	30-19	2,535	39-13	2,495	38-07	1,905	37-23	1,509	35-32	850	35-76	974
3	30-17	2,520	39-11	2,485	38-14	1,940	37-22	1,505	35-26	833	35-72	962
4	30-17	2,520	39-08	2,465	38-05	1,895	37-23	1,509	35-24	827	35-72	962
5	30-18	2,530	39-07	2,460	37-98	1,858	37-25	1,518	35-22	822	35-70	956
6	30-20	2,540	39-02	2,430	37-92	1,830	37-25	1,518	35-21	819	35-70	956
7	30-21	2,545	38-98	2,405	37-84	1,791	37-25	1,518	35-15	803	35-70	956
8	30-22	2,550	38-95	2,385	37-75	1,748	37-19	1,492	35-14	800	35-69	953
9	30-20	2,540	38-93	2,375	37-72	1,734	37-16	1,478	35-13	798	35-69	953
10	30-18	2,530	38-80	2,350	37-50	1,671	37-16	1,478	35-12	795	35-63	936
11	30-19	2,535	38-84	2,320	37-51	1,635	37-14	1,470	35-12	795	35-55	914
12	30-21	2,545	38-80	2,300	37-45	1,607	37-14	1,470	35-09	787	35-49	897
13	30-22	2,550	38-75	2,270	37-35	1,562	37-11	1,456	35-16	806	35-43	880
14	30-21	2,545	38-69	2,235	37-29	1,536	37-10	1,452	35-24	827	35-30	844
15	30-19	2,535	38-66	2,220	37-24	1,514	37-04	1,427	35-40	872	35-26	833
16	30-19	2,535	38-65	2,210	37-18	1,487	37-01	1,414	35-53	908	35-19	813
17	30-42	2,680	38-63	2,200	37-13	1,465	36-99	1,406	35-63	936	35-16	806
18	30-49	2,725	38-61	2,190	37-07	1,439	36-96	1,394	35-64	939	35-12	795
19	30-53	2,750	38-75	2,165	37-03	1,423	36-96	1,394	35-67	948	35-06	780
20	30-51	2,735	38-51	2,135	37-02	1,418	36-96	1,394	35-70	950	34-98	759
21	30-50	2,730	38-45	2,100	37-04	1,427	36-93	1,382	35-73	965	34-90	739
22	30-49	2,725	38-42	2,085	37-04	1,427	36-82	1,338	35-75	971	34-96	754
23	30-45	2,700	38-39	2,070	37-04	1,427	36-77	1,319	35-78	980	34-97	756
24	30-40	2,665	38-37	2,090	37-07	1,439	36-72	1,300	35-81	989	34-79	711
25	30-36	2,640	38-33	2,035	37-08	1,444	36-64	1,269	35-82	992	34-80	714
26	30-35	2,635	38-30	2,020	37-10	1,452	36-43	1,193	35-82	992	34-81	716
27	30-34	2,630	38-27	2,005	37-14	1,470	36-19	1,107	35-81	989	34-82	719
28	30-34	2,630	38-23	1,985	37-18	1,487	35-86	1,004	35-79	983	34-82	719
29	30-31	2,610	38-23	1,985	37-23	1,509	35-67	948	35-78	980	34-81	716
30	30-24	2,565	38-19	1,965	.....	.....	35-50	900	.....	.....	34-80	714

Notes.—From January 23 to April 12 and August 23 to December 31 inclusive, gauge heights are deduced from Minak gauge heights.
1,000-0 should be added to gauge heights to reduce to station datum.

Monthly Discharge of Winnipeg River at North Channel, Whitedog, for 1916.

[Drainage area, 27,200 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....	343	322	336			20,660
February.....	625	330	472			27,150
March.....	643	563	616			37,876
April.....	1,179	577	721			42,902
May.....	2,065	1,207	1,658			101,947
June.....	2,545	2,080	2,298			136,740
July.....	2,750	2,520	2,599			159,906
August.....	2,535	1,965	2,240			137,732
September.....	1,940	1,416	1,614			96,040
October.....	1,513	900	1,373			84,423
November.....	992	787	891			53,018
December.....	977	711	843			51,834
The year.....	2,750	322	1,305			950,128

NOTE.—Discharge per square mile and run-off depth in inches omitted, as the channel is one of two of the river at this point.

SESSIONAL PAPER No. 26a

*Daily Gauge Height and Discharge of Winnipeg River at North and South Channel,
Whitedog, for 1916.*

[Drainage area 27,200 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	33.15	10,230	33.14	10,200	34.44	14,720	34.31	14,240	36.47	23,470	38.41	33,900
2	33.15	10,230	33.15	10,230	34.46	14,790	34.30	14,200	36.59	24,050	38.45	34,150
3	33.15	10,230	33.15	10,230	34.48	14,870	34.28	14,130	36.73	24,750	38.50	34,450
4	33.15	10,230	33.16	10,260	34.49	14,900	34.26	14,050	36.84	25,300	38.53	34,600
5	33.15	10,230	33.14	10,200	34.50	14,940	34.25	14,020	36.95	25,900	38.57	34,850
6	33.15	10,230	33.13	10,170	34.51	14,980	34.28	14,130	37.05	26,400	38.59	34,950
7	33.14	10,200	33.12	10,130	34.51	14,980	34.29	14,160	37.15	26,950	38.61	35,050
8	33.14	10,200	33.10	10,070	34.51	14,980	34.31	14,240	37.21	27,250	38.63	35,200
9	33.14	10,200	33.15	10,230	34.50	14,940	34.22	13,900	37.30	27,750	38.66	35,350
10	33.14	10,200	33.19	10,360	34.49	14,900	34.32	14,270	37.34	27,950	38.70	35,600
11	33.14	10,200	33.27	10,620	34.49	14,900	34.30	14,200	37.38	28,150	38.72	35,700
12	33.14	10,200	33.39	11,020	34.47	14,830	34.31	14,240	37.43	28,450	38.73	35,750
13	33.14	10,200	33.59	11,700	34.44	14,720	34.35	14,300	37.48	28,700	38.73	35,750
14	33.14	10,200	33.66	11,930	34.40	14,570	34.39	14,530	37.52	28,950	38.74	35,850
15	33.13	10,170	33.78	12,340	34.41	14,610	34.46	14,790	37.54	29,050	38.75	35,900
16	33.13	10,170	33.88	12,690	34.43	14,680	34.50	14,940	37.55	29,100	38.77	36,000
17	33.13	10,170	33.94	12,900	34.44	14,720	34.55	15,130	37.58	29,250	38.79	36,100
18	33.13	10,170	34.03	13,220	34.43	14,680	34.59	15,280	37.61	29,450	38.81	36,250
19	33.13	10,170	34.17	13,720	34.41	14,610	34.63	15,440	37.65	29,650	38.83	36,350
20	33.13	10,170	34.22	13,900	34.40	14,570	34.70	15,710	37.71	30,000	38.84	36,400
21	33.14	10,200	34.25	14,020	34.36	14,420	34.87	16,380	37.77	30,300	38.87	36,600
22	33.10	10,070	34.28	14,130	34.35	14,390	34.97	16,780	37.81	30,550	38.91	36,850
23	33.09	10,040	34.32	14,270	34.31	14,240	35.20	17,720	37.85	30,750	38.98	37,250
24	33.08	10,010	34.35	14,390	34.26	14,050	35.45	18,790	37.91	31,100	39.01	37,400
25	33.07	9,970	34.38	14,500	34.22	13,900	35.53	19,130	37.99	31,550	39.07	37,750
26	33.06	9,940	34.40	14,570	34.30	14,200	35.67	19,750	38.07	32,000	39.08	37,850
27	33.09	10,040	34.42	14,640	34.16	13,690	35.85	20,560	38.13	32,350	39.11	38,000
28	33.12	10,130	34.42	14,640	34.20	13,830	36.02	21,330	38.20	32,700	39.13	38,150
29	33.14	10,200	34.43	14,680	34.22	13,900	36.13	21,840	38.24	32,950	39.15	38,250
30	33.16	10,260	.....	.....	34.26	14,050	36.39	23,080	38.29	33,250	39.21	38,600
31	33.14	10,200	.....	.....	34.28	14,130	.....	.....	38.38	33,750	.....	.....

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	39.21	38,600	39.19	38,500	38.14	32,400	37.22	27,300	35.44	18,740	35.77	20,200
2	39.21	38,600	39.15	38,250	38.11	32,200	37.23	27,350	35.40	18,570	35.77	20,200
3	39.19	38,500	39.13	38,150	38.07	32,000	37.23	27,350	35.32	18,230	35.76	20,150
4	39.17	38,350	39.11	38,000	38.14	32,400	37.22	27,300	35.29	17,970	35.72	19,970
5	39.17	38,350	39.08	37,850	38.05	31,900	37.23	27,350	35.24	17,890	35.72	19,970
6	39.18	38,450	39.07	37,750	37.98	31,500	37.23	27,450	35.22	17,800	35.70	19,880
7	39.20	38,550	39.02	37,500	37.92	31,150	37.25	27,450	35.21	17,760	35.70	19,880
8	39.21	38,600	38.98	37,250	37.84	30,700	37.25	27,450	35.15	17,510	35.70	19,880
9	39.22	38,650	38.95	37,050	37.75	30,200	37.19	27,150	35.14	17,470	35.69	19,840
10	39.20	38,550	38.93	36,950	37.72	30,050	37.16	27,000	35.13	17,430	35.69	19,840
11	39.18	38,450	38.89	36,700	37.59	29,350	37.16	27,000	35.12	17,390	35.63	19,570
12	39.19	38,500	38.84	36,400	37.51	28,900	37.14	26,900	35.12	17,390	35.55	19,220
13	39.21	38,600	38.80	36,200	37.45	28,550	37.14	26,900	35.09	17,270	35.49	18,960
14	39.22	38,650	38.75	35,900	37.35	28,000	37.11	26,700	35.16	17,560	35.43	18,700
15	39.21	38,600	38.69	35,550	37.29	27,700	37.10	26,650	35.24	17,890	35.30	18,140
16	39.19	38,500	38.66	35,350	37.24	27,400	37.04	26,350	35.40	18,570	35.26	17,970
17	39.19	38,500	38.63	35,300	37.18	27,100	37.01	26,200	35.53	19,130	35.19	17,680
18	39.42	39,900	38.63	35,200	37.13	26,850	36.99	26,100	35.63	19,570	35.16	17,500
19	39.49	40,300	38.61	35,050	37.07	26,500	36.98	25,950	35.64	19,620	35.12	17,390
20	39.53	40,550	38.57	34,850	37.03	26,300	36.96	25,950	35.67	19,750	35.08	17,150
21	39.51	40,450	38.51	34,500	37.02	26,250	36.96	25,950	35.70	19,880	34.98	16,820
22	39.50	40,350	38.45	34,150	37.04	26,350	36.93	25,800	35.73	20,010	34.96	16,500
23	39.49	40,300	38.42	33,950	37.04	26,350	36.82	25,200	35.75	20,100	34.96	16,740
24	39.45	40,050	38.39	33,800	37.04	26,350	36.77	24,950	35.78	20,240	34.97	16,780
25	39.40	39,750	38.37	33,700	37.07	26,500	36.72	24,700	35.81	20,370	34.70	16,060
26	39.36	39,500	38.33	33,450	37.08	26,500	36.64	24,300	35.82	20,420	34.80	16,100
27	39.35	39,450	38.30	33,300	37.10	26,650	36.43	23,280	35.82	20,420	34.81	16,140
28	39.34	39,400	38.27	33,100	37.11	26,900	36.18	22,060	35.81	20,370	34.82	16,180
29	39.34	39,400	38.23	32,900	37.18	27,100	35.88	20,600	35.79	20,290	34.82	16,180
30	39.31	39,200	38.23	32,900	37.23	27,350	35.67	19,750	35.78	20,240	34.81	16,140
31	39.24	38,800	38.19	32,650	.....	.....	35.50	19,000	.....	.....	34.80	16,100

NOTES.—From January 23 to April 12 and October 23 to December 31, inclusive, gauge heights are deduced from Minaki gauge heights.
1,000.00 should be added to gauge heights to reduce to station datum.

Monthly Discharge of Winnipeg River at North and South Channels, Whitedog Falls for 1916.

[Drainage area 27,200 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....	10,260	9,940	10,163	0.374	0.431	624,898
February.....	14,680	10,070	12,274	0.451	0.486	706,009
March.....	14,980	13,690	14,538	0.534	0.616	893,906
April.....	23,090	13,900	16,178	0.595	0.664	962,558
May.....	33,750	23,470	29,089	1.069	1.232	1,788,613
June.....	38,600	33,900	36,162	1.329	1.482	2,151,789
July.....	40,650	38,350	39,110	1.438	1.654	2,404,780
August.....	38,500	32,650	35,553	1.307	1.507	2,186,069
September.....	32,400	26,250	28,683	1.051	1.173	1,700,807
October.....	27,450	19,000	25,695	0.941	1.085	1,573,775
November.....	20,420	17,270	18,861	0.693	0.773	1,122,807
December.....	20,200	16,060	18,125	0.666	0.768	1,114,463
The year.....	40,350	9,940	23,686	0.871	11.875	17,230,074

NOTE.—This table gives the total combined discharges, run-off, etc., for the Winnipeg river at the North and South channels, Whitedog Falls.

WINNIPEG RIVER AT SLAVE FALLS.

STATION No. 5. P.F.₁

History.—On October 1, 1911 a metering station was established above Slave falls by D. L. McLean, and from that date the station has been in constant operation.

Location of Section.—The metering section, on which is installed a cable station, is located about two hundred and fifty feet above the crest of Slave falls, four miles below the power plant of the city of Winnipeg at Point du Bois.

Drainage Area.—The drainage area above Slave falls is 49,700 square miles.

Channel.—The channel at this point is straight and free from eddies except at exceptionally high stage and even then the interference is slight. The bed of the channel is of rock and of a permanent character. The banks are of rock and sufficiently high to confine the discharge to the channel at all stages.

Gauge.—A vertical staff gauge is located on the right bank about seventy-five feet downstream from the section.

On account of the difficulty in obtaining daily readings of this gauge, the station records were originally referred to the tailrace gauge of the power plant at Point du Bois.

This gauge was a vertical staff gauge set in the tailrace about one hundred feet west of the power house.

In June of 1915 a Gurley Printed Record Water Stage Register was installed on the left bank of the river, three hundred feet above the metering section. A relation has been obtained between this gauge and the above mentioned tailrace gauge, and all records at this station from the first of the year of 1915 refer to the stage at Slave falls. All these gauges are referred to W.P.S. datum.

Discharge Measurements.—Since the establishment of the station, discharge measurements have been made at frequent intervals. Particular attention has been given this station at times when rapid or exceptional change in stage was anticipated so that the discharge measurements cover practically the entire range in stage as recorded by the gauge readings. These records cover a range of 13.09 feet and correspond to a range in discharge of from 12,000 to 70,000 c.f.s.

Records Available.—Records of daily gauge height from January 23, 1907 to June 16, 1915 on the tailrace gauge at Point du Bois have been obtained. From the latter date to the end of 1916, similar records based upon the daily means derived from the records of the automatic gauge have been obtained.

Based on these gauge readings, estimates of daily discharge throughout the above mentioned period are available.

Accuracy.—The discharge curve is well defined over the complete range in stage observed. As there is no backwater effect at this station caused by ice conditions in the winter, the curve applies with equal accuracy throughout the year.

Discharge Measurements of Winnipeg River at Slave Falls for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Automatic Gauge.
Jan. 7	W. J. Ireland	1,939	263	6,921	3.00	919.54	21,497.7	919.67
Jan. 9	W. J. Ireland	1,939	263	6,896	3.10	919.44	21,374.4	919.66
May 7	R. C. Robinson	1,919	298	8,197	4.87	924.06	28,919.9	924.36
May 17	E. B. Patterson	1,911	308	8,057	5.32	925.56	46,037.4	926.05
May 27	E. B. Patterson	1,911	312	8,945	5.51	926.50	49,284.2	927.06
May 29	E. B. Patterson	1,911	312	9,012	5.71	926.68	51,455.7	927.27
May 30	E. B. Patterson	1,911	313	9,036	5.73	926.80	51,776.9	927.40
May 31	E. B. Patterson	1,911	314	9,062	5.79	926.93	52,466.1	927.54
June 13	E. B. Patterson	1,911	332	9,308	6.14	927.83	57,520.7	928.56
June 15	E. B. Patterson	1,911	330	9,303	6.19	927.92	58,140.8	928.67
June 17	E. B. Patterson	1,911	331	9,412	6.30	927.98	59,298.1	928.74
June 20	E. B. Patterson	1,911	331	9,447	6.30	928.05	59,518.0	928.86
June 22	E. B. Patterson	1,911	333	9,453	6.34	928.10	59,930.1	928.87
June 23	E. B. Patterson	1,911	334	9,445	6.46	928.36	61,012.1	929.15
June 24	E. B. Patterson	1,911	334	9,508	6.35	928.25	60,372.6	929.04
June 26	E. B. Patterson	1,911	337	9,595	6.51	928.52	62,460.8	929.35
June 27	E. B. Patterson	1,911	339	9,649	6.62	928.70	63,877.0	929.66
June 29	E. B. Patterson	1,911	340	9,736	6.64	928.77	64,643.7	929.62
June 30	E. B. Patterson	1,911	340	9,698	6.67	928.84	64,688.3	929.74
July 4	E. B. Patterson	1,911	340	9,740	6.71	928.96	65,352.0	929.85
July 13	E. B. Patterson	1,911	341	9,772	6.75	929.05	65,959.0	929.95
July 18	E. B. Patterson	1,911	342	9,838	6.91	929.21	67,983.3	930.21
July 19	E. B. Patterson	1,911	342	9,836	6.79	929.24	66,785.8	930.22
July 24	E. B. Patterson	1,911	369	9,951	6.95	929.57	69,158.8	930.55
July 25	E. B. Patterson	1,911	369	9,954	6.95	929.58	69,182.4	930.48
July 26	E. B. Patterson	1,911	369	9,931	6.97	929.51	68,221.2	930.50
July 27	E. B. Patterson	1,911	369	9,948	7.02	929.56	69,832.2	930.44
July 31	E. B. Patterson	1,911	369	9,921	6.99	929.48	69,348.5	930.15
Aug. 8	E. B. Patterson	1,911	342	9,828	6.78	929.22	66,636.6	929.10
Aug. 23	C. O. Allen	1,911	337	9,530	6.29	928.35	59,941.2	929.12
Aug. 23	C. O. Allen	1,911	337	9,529	6.35	928.34	60,266.6	928.97
Aug. 24	C. O. Allen	1,911	338	9,461	6.42	928.22	60,971.4	929.01
Aug. 24	C. O. Allen	1,911	337	9,497	6.38	928.15	60,490.7	928.91
Aug. 25	C. O. Allen	1,911	338	9,481	6.25	927.91	58,675.0	928.67
Aug. 30	E. B. Patterson	1,911	331	9,388	6.18	927.80	57,787.8	928.56
Aug. 31	E. B. Patterson	1,911	331	9,352	6.16	927.75	57,450.0	928.50
Sept. 1	E. B. Patterson	1,911	331	9,326	6.20	927.81	58,048.9	928.54
Sept. 7	E. B. Patterson	14,819	329	9,309	6.16	927.66	57,364.0	928.36
Sept. 8	E. B. Patterson	14,819	327	9,310	6.11	927.54	56,912.1	928.24
Sept. 9	E. B. Patterson	14,819	315	9,150	5.80	927.17	53,061.4	927.81
Sept. 12	E. B. Patterson	14,819	314	9,117	5.77	927.07	52,651.1	927.69
Sept. 15	E. B. Patterson	14,819	313	9,023	5.83	926.77	51,732.0	927.82
Sept. 16	E. B. Patterson	14,819	313	8,989	5.78	926.69	51,965.8	927.22
Sept. 18	E. B. Patterson	14,819	311	8,922	5.66	926.48	50,597.6	927.005
Sept. 23	E. B. Patterson	14,819	310	8,805	5.42	926.07	47,712.0	926.53
Sept. 24	E. B. Patterson	14,819	309	8,787	5.35	925.95	46,938.0	926.38
Sept. 25	E. B. Patterson	14,819	310	8,811	5.48	926.09	49,254.9	926.53
Sept. 28	E. B. Patterson	14,819	309	8,748	5.41	925.88	47,286.8	926.32
Sept. 28	E. B. Patterson	14,819	309	8,748	5.37	925.89	46,906.5	926.315
Sept. 29	E. B. Patterson	14,819	308	8,723	5.43	925.80	47,223.2	926.22
Oct. 7	E. B. Patterson	14,819	308	8,740	5.37	925.83	46,971.9	926.24
Oct. 9	E. B. Patterson	14,819	308	8,709	5.34	925.73	46,527.4	926.13
Oct. 11	E. B. Patterson	14,819	308	8,721	5.28	925.77	46,093.1	926.18
Oct. 12	E. B. Patterson	14,819	308	8,721	5.30	925.69	46,066.7	926.13
Oct. 13	E. B. Patterson	14,819	308	8,687	5.30	925.58	45,824.8	925.98
Oct. 13	E. B. Patterson	14,819	307	8,553	5.22	925.26	44,698.5	925.70
Oct. 21	E. B. Patterson	14,819	305	8,552	5.19	925.25	44,385.4	925.62
Oct. 23	E. B. Patterson	14,819	305	8,495	5.13	925.06	43,606.0	925.395
Oct. 25	E. B. Patterson	14,819	304	8,483	5.16	925.02	43,751.6	925.40
Oct. 26	E. B. Patterson	14,819	304	8,453	5.15	924.92	43,617.1	925.28
Oct. 27	E. B. Patterson	14,819	304	8,428	5.09	924.84	42,635.4	925.16
Oct. 28	E. B. Patterson	14,819	301	8,331	4.91	924.52	40,924.3	924.87
Oct. 30	E. B. Patterson	14,819	299	8,249	4.84	924.25	39,954.4	924.54
Oct. 31	E. B. Patterson	14,819	298	8,220	4.79	924.12	39,289.9	924.39
Nov. 1	E. B. Patterson	14,819	298	8,132	4.68	923.86	38,087.6	924.08
Nov. 2	E. B. Patterson	14,819	297	8,150	4.70	923.92	38,266.5	924.16
Nov. 3	E. B. Patterson	14,819	296	8,090	4.60	923.72	37,206.9	924.005
Nov. 3	E. B. Patterson	14,819	296	8,105	4.63	923.77	37,523.3	924.04
Nov. 4	E. B. Patterson	14,819	295	8,026	4.53	923.50	36,326.6	923.73
Nov. 4	E. B. Patterson	14,819	295	8,026	4.52	923.50	36,312.6	923.77
Nov. 5	E. B. Patterson	14,819	293	7,970	4.43	923.31	35,339.8	923.57
Nov. 6	E. B. Patterson	14,819	295	8,009	4.51	923.48	36,091.2	923.74
Nov. 7	E. B. Patterson	14,819	293	7,926	4.37	923.16	34,625.0	923.41
Nov. 8	E. B. Patterson	14,819	293	7,910	4.34	923.11	34,311.3	923.35
Nov. 9	E. B. Patterson	14,819	292	7,878	4.28	923.16	33,706.4	923.41

SESSIONAL PAPER No. 26a

Daily Gauge Height and Discharge of Winnipeg River at Slave Falls for 1916.
 [Drainage area 40,700 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	19-60	20,940	20-58	24,270	21-20	26,500	20-70	24,700	23-03	33,460	27-59	53,030
2	19-60	20,940	20-61	24,380	21-42	27,200	20-58	24,270	23-22	34,120	27-68	53,460
3	20-03	22,360	20-84	25,200	21-54	27,730	20-95	25,600	23-53	35,360	27-79	53,990
4	19-91	21,960	20-87	25,310	21-37	27,110	20-81	25,200	23-86	36,720	27-82	54,140
5	19-98	22,190	20-78	24,090	21-18	26,430	20-70	24,700	23-07	37,170	28-06	55,300
6	20-06	22,460	20-53	24,090	21-68	28,250	20-58	24,270	24-29	38,480	28-14	55,700
7	20-15	22,770	20-92	25,490	21-51	27,620	20-61	24,380	24-44	39,090	28-19	55,950
8	20-11	22,630	20-92	25,490	21-37	27,110	20-53	24,090	24-67	40,050	28-21	56,550
9	19-77	21,500	21-01	25,820	21-51	27,620	20-36	23,400	21-96	41,270	28-31	56,600
10	19-98	22,190	20-87	25,310	21-45	27,400	20-61	24,380	25-16	42,130	28-39	57,000
11	20-11	22,630	20-92	25,490	21-34	27,000	20-58	24,270	25-23	42,430	28-47	57,400
12	20-25	23,110	20-84	25,200	21-18	26,430	20-53	24,090	25-47	43,460	28-55	57,850
13	20-61	24,380	20-41	23,670	21-45	27,400	20-67	24,590	25-63	44,150	28-64	58,300
14	20-78	24,990	20-92	25,490	21-42	27,290	20-58	24,270	25-74	44,620	28-62	58,620
15	20-61	24,380	20-87	25,310	21-42	27,290	20-61	24,380	25-92	45,400	28-66	58,400
16	20-44	23,770	20-75	24,880	21-34	27,000	20-70	24,700	25-93	45,440	28-71	58,700
17	20-78	24,990	20-67	24,590	21-42	27,290	20-87	25,310	26-02	45,840	28-74	58,850
18	20-95	25,600	20-84	25,200	21-28	26,790	21-04	25,920	26-16	46,430	28-72	58,750
19	20-78	24,990	20-75	24,880	21-09	26,100	21-20	26,500	26-24	46,810	28-83	59,350
20	20-70	24,700	20-58	24,270	21-28	26,790	21-34	27,000	26-37	47,400	28-85	59,450
21	20-44	23,770	20-92	25,490	21-34	27,000	21-18	26,430	26-44	47,710	28-88	59,600
22	20-44	23,770	20-84	25,200	21-28	26,790	21-34	27,000	26-63	48,570	28-93	59,900
23	20-25	23,110	20-95	25,600	21-20	26,500	21-25	26,680	26-65	48,660	29-09	60,750
24	20-36	23,490	20-95	25,600	21-20	26,500	21-71	28,360	26-71	48,940	29-06	60,600
25	20-41	23,670	21-04	25,920	21-18	26,430	21-71	28,360	26-91	49,860	29-19	61,300
26	20-53	24,090	21-09	26,100	20-95	25,600	21-88	28,990	26-96	50,090	29-34	62,200
27	20-82	25,130	20-84	25,200	21-09	26,100	22-04	29,580	27-03	50,400	29-49	63,050
28	20-70	24,700	21-18	26,430	21-09	26,100	22-33	30,660	27-06	50,550	29-57	63,500
29	20-41	23,670	21-34	27,000	21-12	26,210	22-38	30,850	27-24	51,380	29-63	63,850
30	20-08	22,530	.....	.....	21-04	25,920	22-52	31,390	27-35	51,900	29-73	64,450
31	20-53	24,090	.....	.....	20-84	25,200	.....	.....	27-52	52,700	.....	.....

	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	29-72	64,400	30-38	68,550	28-47	57,400	26-24	46,810	24-39	38,890	23-27	34,320
2	29-79	64,800	30-33	68,250	28-43	57,200	26-37	47,400	24-15	37,910	23-19	34,000
3	29-90	65,500	30-29	67,950	28-40	57,050	26-38	47,440	24-02	37,370	23-10	33,650
4	29-87	65,300	30-26	67,760	28-83	59,350	26-32	47,170	23-81	36,510	23-39	34,800
5	29-86	65,250	30-23	67,600	28-88	59,600	26-28	46,990	23-68	35,980	23-27	34,320
6	29-87	65,300	30-18	67,250	28-67	58,450	26-29	47,040	23-70	36,060	23-19	34,000
7	29-87	65,300	30-13	66,950	28-48	57,450	26-25	46,850	23-46	35,080	23-10	33,650
8	29-88	65,350	30-12	66,850	28-34	56,750	26-18	46,540	23-34	34,600	23-05	33,450
9	29-90	65,500	30-10	66,750	28-22	56,100	26-19	46,590	23-19	34,000	23-02	33,340
10	29-97	65,900	30-04	66,350	28-13	55,650	26-23	46,770	23-05	33,450	22-88	32,790
11	29-90	65,500	29-87	65,300	27-97	54,870	26-16	46,450	22-85	32,680	22-96	33,100
12	29-93	65,700	29-80	64,900	27-77	53,900	26-10	46,190	22-69	32,050	22-85	32,670
13	29-96	65,900	29-72	64,400	27-65	53,320	26-03	45,880	22-77	32,360	22-77	32,360
14	29-97	65,900	29-73	64,450	27-43	52,270	25-99	45,710	22-77	32,360	22-69	32,050
15	29-95	65,800	29-62	63,800	27-26	51,470	25-91	45,350	22-85	32,680	22-55	31,500
16	29-92	65,600	29-55	63,400	27-16	51,010	26-00	45,750	22-88	32,790	22-43	31,040
17	30-00	66,100	29-55	63,400	26-08	50,180	25-90	45,310	22-85	32,680	22-35	30,740
18	30-12	66,850	29-46	62,850	26-09	50,220	25-87	45,180	22-88	32,790	22-63	31,820
19	30-19	67,300	29-37	62,350	26-84	49,530	25-75	44,670	22-72	32,170	22-77	32,360
20	30-29	67,950	29-23	61,550	26-70	48,890	25-71	44,490	23-27	34,320	22-80	32,480
21	30-35	68,350	29-27	61,800	26-57	48,300	25-69	44,410	23-39	34,640	22-77	32,360
22	30-39	68,600	29-16	61,150	26-54	48,160	25-60	44,020	23-44	35,000	22-72	32,170
23	30-46	69,100	29-07	60,650	26-54	48,160	25-62	44,110	23-19	34,000	22-85	32,670
24	30-51	69,400	28-97	60,100	26-43	47,670	25-58	43,930	23-10	33,650	22-69	32,050
25	30-50	69,350	28-95	60,000	26-51	48,030	25-41	43,200	23-19	34,000	22-93	32,990
26	30-49	69,250	28-84	59,400	26-40	47,530	25-42	43,250	23-05	33,450	22-93	32,990
27	30-46	69,100	28-77	59,000	26-34	47,260	25-32	42,820	23-22	34,120	22-88	32,790
28	30-43	68,900	28-70	59,100	26-28	46,990	25-18	42,210	23-36	34,680	22-77	32,860
29	30-46	69,100	28-66	58,400	26-32	47,170	24-93	41,150	23-30	34,440	22-60	31,700
30	30-39	68,600	28-65	58,350	26-34	47,260	24-89	40,980	23-39	34,800	22-60	31,700
31	30-41	68,750	28-57	57,950	.....	.....	24-60	39,760	.....	.....	22-21	30,210

Notes.—From January 1 to May 5 and November 7 to December 31, inclusive, the gauge heights are deduced from readings of the tallage gauge, Point du Bois.
 900-00 should be added to gauge heights to reduce to station datum.
 Marked thus (i) interpolated.

Monthly Discharge of Winnipeg River at Slave Falls for 1916.

[Drainage area 49,700 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....	25,600	20,940	23,403	0.471	0.543	1,438,804
February.....	27,000	23,670	25,237	0.508	0.548	1,451,649
March.....	28,250	25,200	26,800	0.539	0.621	1,647,868
April.....	31,390	23,490	29,147	0.526	0.587	1,555,855
May.....	52,700	33,460	44,536	0.896	1.033	2,738,412
June.....	64,450	53,030	58,539	1.178	1.313	3,483,312
July.....	69,400	64,400	66,894	1.344	1.549	4,113,152
August.....	69,550	57,950	63,437	1.276	1.471	3,900,580
September.....	59,600	46,990	52,240	1.051	1.172	3,108,495
October.....	47,440	39,780	44,981	0.905	1.043	2,765,774
November.....	38,890	32,050	34,317	0.690	0.770	2,042,003
December.....	34,800	30,210	32,659	0.657	0.757	2,008,123
The year.....	69,400	20,940	41,685	0.839	11.407	30,254,226

WINNIPEG RIVER AT PINAWA CHANNEL, BELOW CONTROL DAM.
STATION NO. 5. P.F 3

History.—The Pinawa channel was a high water or back channel of the Winnipeg river, which was enlarged and utilized as a diverting channel for a power plant built about nine miles below the inlet by the Winnipeg Electric Street Railway Company. At first the plant depended upon the stage of the river for water down this channel, but the rapid growth of the load necessitated the building of diverting dams in the main river to ensure sufficient flow down the Pinawa channel. Meterings were made below the control dam on this channel by engineers of the Company from 1907 to 1911. In May 1912, a boat station was established on the Pinawa channel by A. M. Beale, for the purpose of collecting discharge data, and from that date records have been obtained at this station. In June of 1915 a cable station was installed to take the place of the boat station on practically the same section.

Location of Section.—The metering section is located approximately two hundred feet downstream from the control dam and eight miles above the power plant of the Winnipeg Electric Railway Company as on the Pinawa channel. This plant is seven miles southeast of the town of Lac du Bonnet.

Channel.—The channel at the meter section is straight and regular, being a rock-cut channel, to which the discharge is confined at all stages of the river.

Gauge.—A vertical staff gauge bolted to the upstream side of the control dam was set in place by the Winnipeg Electric Railway Company.

In May of 1915 a Gurley Printed Record Water Stage Register was installed on the upstream side of the control dam close to the right bank.

Both of these gauges are referred to W.P.S. datum.

Discharge Measurements.—Discharge measurements covering a range in stage of four feet have been taken at frequent intervals since the establishment of the station.

Records Available.—Intermittent records of daily gauge height were obtained by the Company from April 28, 1906 to the end of 1914, and these have been placed at the disposal of the Manitoba Hydrometric Survey.

From May 1915 to the end of 1916 the daily gauge record, being the mean of the daily records of the automatic gauge, are available.

Based on the records of gauge height for the open water seasons to 1914, estimates of daily discharge are available.

Accuracy.—During the earlier years of the operation of the plant, the discharge curve was fairly well defined for the open water periods of the year, but since the plant has become heavily loaded the effect of same is apparent on the discharge at the section. For this reason estimates of discharge based on gauge readings at the section are liable to error.

During the winter season the extreme and varying ice conditions on the channel below the station preclude the possibility of obtaining accurate estimates of discharge based on gauge readings at the section.

Discharge Measurements of Pinawa Channel Below Control Dam for 1918.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Disch. cu ft.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 18	M. S. Madden	1,460	129	1,799	4.33	896.34	7,780
Feb. 20	M. S. Madden	1,460	129	1,786	4.46	896.26	7,766
Feb. 22	M. S. Madden	1,460	129	1,786	4.58	896.22	8,180
Feb. 23	M. S. Madden	1,460	129	1,786	4.62	896.26	8,252
Feb. 24	M. S. Madden	1,460	129	1,786	4.62	896.26	8,252
Feb. 25	M. S. Madden	1,460	129	1,786	4.57	896.22	8,163
Feb. 26	M. S. Madden	1,460	129	1,786	4.66	896.23	8,323
Feb. 27	M. S. Madden	1,460	129	1,799	4.61	896.31	8,293
Feb. 27	M. S. Madden	1,460	129	1,799	4.50	896.32	8,096
Feb. 28	M. S. Madden	1,460	129	1,786	4.80	896.28	8,573
Feb. 29	M. S. Madden	1,460	129	1,799	4.72	896.33	8,491
Mar. 1	M. S. Madden	1,460	129	1,799	4.78	896.37	8,599
Mar. 2	M. S. Madden	1,460	129	1,825	4.73	896.52	8,632
Mar. 10	M. S. Madden	1,460	129	1,839	4.87	896.66	8,958
Mar. 21	M. S. Madden	1,460	129	1,802	4.89	896.35	8,813
May 10	R. C. Robinson	1,919	129	1,777	6.41	896.16	11,388
July 7	E. B. Patterson	1,911	129	1,463	5.36	893.64	7,840
July 7	E. B. Patterson	1,911	129	1,463	5.32	893.64	7,782
Sept. 26	E. B. Patterson	14,810	130	1,431	5.35	893.32	7,663
Oct. 5	E. B. Patterson	14,810	130	1,428	5.40	893.27	7,716
Nov. 11	E. B. Patterson	14,810	130	1,501	5.56	893.87	8,341

WHITEMOUTH RIVER.

The source of the Whitemouth river is in Whitemouth lake which lies in the southeastern part of the Province. The course of the river is generally north from the source to its junction with the Winnipeg river just below the Seven Sisters rapids on the latter stream.

The drainage area of the river is 1,566 square miles. The upper part of the river flows through that part of the country known as the Julius muskeg, and as the name would imply is low and wet. The lower part of the valley is narrow, the land is fertile, and a considerable portion has been cleared and is now under cultivation. The lower two miles of the river flows through a well timbered belt of country, spruce, oak, and poplar of merchantable size being plentiful.

The drainage system in connection with the construction of the conduit for the Greater Winnipeg Water Supply, cuts across the swamp land in the upper part of the drainage basin, and the Whitemouth is being used as a discharge channel, in consequence of which the flow has been noticeably affected.

The bed of the river is generally clay, but at the lower end rock ridges extend across the river bed, and at one point near the mouth form what is known as Whitemouth falls. The valley is generally from thirty to fifty feet in depth, and the valley proper varies from two hundred to five hundred or six hundred feet wide.

WHITEMOUTH RIVER AT WHITEMOUTH.

STATION NO. 5. P.H. 1

History.—The station was established on May 28, 1912 by G. H. Burnham and has been in practically constant operation since that date.

Location of Section.—The meter section is located on the downstream side of the traffic bridge across the Whitemouth river in the town of Whitemouth. All open water measurements are taken from this bridge, and in winter the measurements are made from the ice on the same cross section of the river.

Drainage Area.—The drainage area of the river above the station is 1,400 square miles.

Channel.—At the meter section there is slight interference to the flow by the piles of the bridge which are located at five points on the section.

The bed of the channel is clay, and the control of the section is located about three hundred feet downstream. There is a possibility of this control shifting during extreme conditions of flow.

The banks at the section are sufficiently high to confine the discharge within their limits even under extreme flood conditions.

Gauge.—A vertical staff gauge is secured to a pile at station 90 on the section. It is referred to an arbitrary datum.

Discharge Measurements.—Discharge measurements have been taken at frequent intervals since the installation of the station and are over a range in stage of 5.74 feet.

Records Available.—From May 29, 1912 to March 31, 1914 continuous records of daily gauge height for the open water season and intermittent records for the winter seasons have been obtained. From April 1, 1914 to the end of 1916 continuous daily gauge readings have been obtained.

Based on these gauge readings, estimates of daily discharge throughout the open water seasons, and where sufficient information was obtained, estimates of daily discharge under ice cover, are available. Estimates of monthly mean discharge based on gauge readings and actual measurements are also available.

Accuracy.—Between gauge heights 73.5 and 76.0 the discharge curve is well defined, beyond these limits the curve is not well defined.

The estimates of daily discharge under winter conditions are reliable.

Discharge Measurements of Whitemouth River at Whitemouth for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 18	C. O. Allen	1,374	132	271.0	0.11	73.41	29.8 ¹
Feb. 15	C. O. Allen	1,912	128	233.9	0.30	73.43	21.0 ¹
April 10	C. O. Allen	1,912	120	192.1	0.20	73.50	38.4 ¹
April 27	C. O. Allen	1,912	175	145.5	0.53	79.17	3,904.5
May 15	C. O. Allen	1,435	165	100.7	2.03	76.70	2,045.0
July 31	R. C. Robinson	1,196	155	716.0	1.08	75.11	773.3
Sept. 5	R. C. Robinson	1,196	149	582.0	0.38	74.18	221.2
Sept. 25	R. C. Robinson	1,614	149	583.8	0.39	74.20	227.7
Oct. 27	R. C. Robinson	1,496	150	610.0	0.48	74.39	295.7

Note.—Ice measurement.

Daily Gauge Height and Discharge of Whitemouth River at Whitemouth for 1916.

[Drainage area 1,400 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	73.59	55	73.42	26	73.42	18	73.45	17	77.00	2,850	76.00	1,330
2	73.59	54	73.43	25	73.42	18	73.45	17	77.87	2,740	75.86	1,240
3	73.57	51	73.44	25	73.42	17	73.45	17	77.75	2,640	75.81	1,205
4	73.55	49	73.44	25	73.42	17	73.45	17	77.60	2,515	75.50	1,010
5	73.51	46	73.44	25	73.42	17	73.45	18	77.53	2,460	75.30	940
6	73.57	45	73.45	24	73.42	17	73.45	20	77.44	2,385	75.31	890
7	73.51	44	73.45	24	73.42	17	73.45	25	77.39	2,345	75.27	865
8	73.51	43	73.46	23	73.42	16	73.45	27	77.33	2,300	75.19	815
9	73.49	41	73.46	23	73.43	16	73.45	30	77.29	2,265	75.12	775
10	73.49	40	73.46	23	73.41	16	73.51	38	77.26	2,245	75.06	740
11	73.47	38	73.47	23	73.41	16	73.56	45	77.21	2,205	75.08	750
12	73.47	37	73.47	22	73.40	16	73.61	75	77.10	2,120	75.10	765
13	73.47	36	73.47	22	73.40	16	74.03	.....	77.04	2,075	75.08	750
14	73.46	35	73.45	22	73.39	15	74.04	.....	76.85	1,930	75.06	740
15	73.44	33	73.43	21	73.38	15	76.64	1,780	76.83	1,915	75.05	735
16	73.44	32	73.43	21	73.37	15	76.49	1,670	76.83	1,915	75.02	720
17	73.44	31	73.44	21	73.37	15	77.54	2,465	76.78	1,880	74.98	695
18	73.42	30	73.44	21	73.37	15	78.74	3,510	76.78	1,880	74.96	685
19	73.41	29	73.45	21	73.37	15	79.18	3,915	76.43	1,630	74.76	570
20	73.41	29	73.44	20	73.40	15	79.47	4,190	76.35	1,575	74.69	530
21	73.40	28	73.44	20	73.38	15	80.40	5,170	76.48	1,665	74.64	505
22	73.40	28	73.44	20	73.38	14	80.40	5,170	76.65	1,785	74.58	470
23	73.40	27	73.44	20	73.38	14	80.34	5,025	76.74	1,850	74.53	445
24	73.40	27	73.44	20	73.41	14	79.99	4,685	76.74	1,850	74.50	480
25	73.40	27	73.44	19	73.41	14	79.52	4,235	76.50	1,745	74.76	570
26	73.41	27	73.44	19	73.41	14	79.34	4,065	76.45	1,645	74.91	655
27	73.41	27	73.43	19	73.42	15	79.16	3,895	76.40	1,610	75.20	825
28	73.41	26	73.43	18	73.44	15	79.04	3,785	76.35	1,575	75.39	940
29	73.42	26	73.43	18	73.42	16	78.78	3,545	76.35	1,575	75.43	965
30	73.42	26	.....	.....	73.42	16	78.41	3,210	76.29	1,530	75.54	1,030
31	73.42	26	.....	.....	73.44	16	.....	.....	76.28	1,505	.....	.....

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	75.37	1,050	74.98	695	74.14	247	74.28	315	74.56	460	73.74	.....
2	75.23	840	74.93	665	74.12	237	74.28	315	74.52	440	73.74	.....
3	75.17	805	74.66	515	74.12	237	74.30	325	74.50	430	73.74	.....
4	75.06	740	74.51	435	74.18	260	74.28	315	74.56	460	73.74	.....
5	74.77	575	74.47	415	74.18	266	74.20	305	74.68	525	73.74	.....
6	74.73	555	74.66	515	74.16	256	74.26	305	74.76	570	73.74	.....
7	74.87	630	74.78	580	74.22	285	74.26	305	74.88	640	73.72	.....
8	74.87	630	74.72	550	74.24	295	74.24	295	74.98	695	73.70	.....
9	74.91	655	74.43	395	74.18	260	74.24	295	74.95	675	73.70	.....
10	74.85	620	74.38	365	74.20	275	74.24	295	74.95	675	73.68	.....
11	74.70	535	74.99	700	74.22	285	74.26	305	74.90	650	73.68	.....
12	74.54	450	74.71	545	74.24	295	74.26	305	74.88	640	73.68	.....
13	74.49	425	74.56	460	74.19	270	74.28	315	74.82	605	73.66	.....
14	74.45	405	74.54	450	74.23	290	74.26	305	74.46	410	73.66	.....
15	74.32	335	74.50	430	74.25	300	74.24	295	74.28	315	73.60	.....
16	74.23	290	74.48	420	74.28	315	74.28	315	74.20	275	73.66	.....
17	74.27	310	74.48	420	74.26	305	74.28	315	74.18	266	73.66	.....
18	78.07	2,910	74.44	490	74.24	295	74.28	315	74.05	207	73.64	.....
19	78.24	3,055	74.39	370	74.22	285	74.26	305	73.98	.....	73.62	.....
20	77.68	2,580	74.33	340	74.20	275	74.26	305	73.92	.....	73.62	.....
21	77.24	2,230	74.30	325	74.18	266	74.24	295	73.90	.....	73.62	.....
22	77.02	2,060	74.26	305	74.16	256	74.26	305	73.88	.....	73.62	.....
23	76.70	1,820	74.24	295	74.22	285	74.24	295	73.88	.....	73.62	.....
24	76.35	1,575	74.13	242	74.18	266	74.26	305	73.86	.....	73.60	.....
25	75.82	1,210	74.18	266	74.26	305	74.26	305	73.84	.....	73.60	.....
26	75.75	1,165	74.16	256	74.25	300	74.38	365	73.82	.....	73.60	.....
27	75.54	1,030	74.14	247	74.22	285	74.39	370	73.82	.....	73.58	.....
28	75.48	995	74.12	237	74.25	300	74.50	430	73.78	.....	73.58	.....
29	75.41	950	74.14	247	74.28	315	74.58	470	73.78	.....	73.58	.....
30	75.31	890	74.16	256	74.28	315	74.60	485	73.76	.....	73.58	.....
31	75.11	770	74.18	266	.....	.....	74.58	470	.....	.....	73.56	.....

NOTE.—Ice conditions from November 10 to December 31.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26a

Monthly Discharge of Whitemouth River at Whitemouth for 1916.

[Drainage area 1,400 square miles.]

MONTH	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....	55	26	35	0.025	0.029	2,152
February.....	26	18	22	0.016	0.017	1,265
March.....	18	14	16	0.011	0.013	944
April.....	5,170	1	2,080 ⁽¹⁾	1.464	1.634	121,924
May.....	2,850		1,007	1.433	1.632	123,405
June.....	1,330		758	0.563	0.628	44,880
July.....	2,065		1,067	0.762	0.878	64,607
August.....	700		40 ⁽¹⁾	91	0.335	25,025
September.....	315		24	11	0.224	16,721
October.....	485		32	16	0.272	20,352
November.....	605		37		0.284	21,243
December.....			31		0.042	3,074
The year.....	5,170				6.008	448,641

NOTE.—Marked thus ⁽¹⁾ estimate

RED RIVER AND TRIBUTARIES.

RED RIVER.

The Red river, one of the most important in the province of Manitoba, has its source near the central part of the State of Minnesota. It flows south and west to the town of Breckenbridge, then north to the International Boundary forming, in that stretch, the boundary between the States of Minnesota and North Dakota.

The general direction of the river from Breckenbridge to lake Winnipeg, into which body of water the river empties, is north, though the river itself is very sinuous in its course, nearly doubling its length between the points mentioned.

The drainage basin of the river is 116,347 square miles, of which 42,547 are in Minnesota and Dakota, 50,500 in Saskatchewan and 23,300 in Manitoba.

The valley of the river is not defined by high banks as in most cases, but the whole country slopes gently towards the river which lies in a channel cut to a depth of from 25 to 50 feet below the plain.

The valley of the Red river is the oldest settled district in the Province, the land being practically all settled and farmed. Little standing timber is to be found, only clumps of elm and ash with poplar and cottonwood being found along the river.

The stream afforded the first means of access to the country, and was navigated for a number of years before the advent of the railways to the country between Grand Forks and lake Winnipeg. This traffic has however practically ceased to exist except upon the stretch of the river between Winnipeg and the lake. The Dominion Government has built a dam and lock near the mouth of the river and by operating it an eight foot depth for navigation purposes is insured between the lake and the city of Winnipeg.

A number of important centres are located along the river. Among those within the province of Manitoba are:—Emerson, which is just north of the International Boundary; Winnipeg, at the junction of the Assiniboine with the Red, and Selkirk about 22 miles below Winnipeg. In addition to these there are a small number of communities located along the banks of the river.

Metering stations have been located from time to time and maintained for certain periods at the following points along the river in the province of Manitoba:—

1. At the C.N.R. bridge at Emerson.
2. Three miles below Emerson.
3. At Elm Park in Winnipeg.
4. At Redwood bridge in Winnipeg.

TRIBUTARIES.

The tributaries of the Red which enter that river within the province of Manitoba or close to its boundaries are:—

Pembina river
Roseau river
Rat river
Morris river
Assiniboine river
Seine river

Of these, the Assiniboine is the most important and is given a separate section in this report. The others are considered along with the Red river; they enter it in the order given from source to mouth. Records of discharge for the Roseau and Rat are fairly continuous, but for the others only isolated meterings are available and are therefore listed under the head of Miscellaneous Meterings.

In the case of the Penibina, note should be made that this river flows partly through United States territory. Records of its discharge were kept by the United States Geological Survey at Neche, North Dakota, during the years 1903 to 1910 inclusive, and are included in Water Resources Paper No. 4.

RED RIVER AT EMERSON.

STATION No. 5. O.C1

History.—The station was established by S. S. Scovil on May 3, 1912 and has been in continuous operation since that date.

Location of Section.—The section when established was on the downstream side of the C.N.R. bridge at Emerson. In the spring of 1914 the old bridge was replaced by a new one. At this new bridge the section is located on the downstream side and approximately twelve feet below the old station.

All discharge measurements are made from this bridge during the open water season. In the winter the measurements are taken from the ice and downstream from the bridge to escape the effect of the piers.

Drainage Area.—The drainage area of the river above this station is 34,600 square miles.

Channel.—The bed of the channel at the station is composed of clay and gravel and not liable to shift. It is straight above and below the section and the current is fairly regular throughout its width.

The banks are high and only liable to overflow during exceptional flood periods such as were encountered during the years of 1879, 1882, 1897 and 1916.

Gauge.—A nine-foot vertical staff gauge is secured to the sheet piling around the west pier twenty feet upstream from the section and is used for the lower stages of the river. The records of the upper stage of the river are observed on a gauge placed on the east side of the ice breaker on the upstream side of the bridge.

On April 23, 1916 a chain gauge was established on the bridge, and the gauge records have been obtained from it during the past open water season. During the winter the readings are made at one of the staff gauges. On account of the extreme range in stage noted at this station, it is impossible to obtain satisfactory records at any one gauge. All the gauges are referred to M.H.S. datum.

Discharge Measurements.—Since the installation of the station, discharge measurements have been taken at frequent intervals and are over a range of 38.5 feet which represents a range in discharge from 400 to 46,000 c.f.s.

Records Available.—From May 3, 1912 to March 22, 1914 continuous records of daily gauge height for the open water season and intermittent records for the winter season have been obtained. From March 23, 1914 to December 31, 1916 continuous daily gauge readings have been obtained.

Based on these gauge readings, estimates of daily discharge throughout the open water season, and from January 1, 1914 practically continuous estimates of daily discharge during the winter season, are available.

Estimates of monthly mean discharge based on gauge readings and actual measurements are also available.

Accuracy.—Between gauge heights 749.0 and 788.5 the discharge curve is well defined. Outside these limits the curve is not well defined.

Discharge Measurements of Red River at Emerson for 1916.

	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 21	C. O. Allen	1,911	182	827	1.04	751.85	800 ¹
Feb. 11	C. O. Allen	1,911	191	791	0.95	751.74	752 ¹
Mar. 23	C. O. Allen	1,911	185	905	1.05	752.73	950 ¹
April 18	E. B. Patterson	1,940	628	13,425	2.80	785.96	37,591
April 19	E. B. Patterson	1,940	628	13,861	2.99	786.70	41,384
April 20	E. B. Patterson	1,940	628	14,189	3.01	787.22	42,739
April 22	E. B. Patterson	1,940	628	14,706	3.15	787.94	46,381
April 24	E. B. Patterson	1,940	628	15,064	3.02	788.31	45,498
April 27	E. B. Patterson	1,940	628	14,677	2.95	787.80	43,289
April 29	E. B. Patterson	1,940	628	14,260	2.91	787.25	41,496
May 1	E. B. Patterson	1,940	624	13,776	2.99	786.44	41,195
May 4	M. S. Madden	1,940	593	12,889	2.93	784.98	37,764
May 5	M. S. Madden	1,940	579	12,511	2.82	784.34	35,282
May 6	M. S. Madden	1,940	561	12,091	2.95	783.60	35,600
May 9	M. S. Madden	1,940	493	10,651	2.90	780.83	30,888
May 13	M. S. Madden	1,940	346	8,044	2.80	774.84	22,524
May 16	M. S. Madden	1,940	310	6,066	2.45	768.89	14,861
May 17	M. S. Madden	1,946	315	5,663	2.28	767.33	12,938
May 18	M. S. Madden	1,940	301	4,717	2.39	764.25	11,274
May 20	M. S. Madden	1,940	301	4,717	2.41	762.85	10,260
June 9	C. O. Allen	1,496	296	4,248	2.41	761.88	10,229
July 5	C. O. Allen	1,496	294	4,611	2.55	764.01	12,636
July 25	R. C. Robinson	1,196	303	4,080	2.70	756.95	4,982
Sept. 3	R. C. Robinson	1,196	227	2,529	1.97	753.90	2,967
Oct. 30	R. C. Robinson	1,435	267	1,686	1.76		

Note.—¹Ice measurement.

SESSIONAL PAPER No. 25a

Daily Gauge Height and Discharge of Red River at Emerson for 1916.

[Drainage area 34,600 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	52 10	993	51 70	810	51 85	797	54 05	3,061	86 50	10,370	63 41	10,220
2	52 20	1,024	51 70	810	51 90	804	55 34	3,880	86 06	30,450	63 21	10,040
3	52 25	1,003	51 70	810	51 90	804	57 84	5,620	85 58	38,400	63 11	9,950
4	52 30	1,010	51 75	826	51 95	810	62 05	9,015	85 00	37,380	62 01	9,770
5	52 30	1,010	51 70	810	52 00	817	64 33	11,055	84 41	36,320	62 71	9,595
6	52 20	988	51 68	791	52 05	823	65 31	11,980	83 62	35,000	62 61	9,510
7	52 10	965	51 68	791	52 15	845	67 40	14,250	82 87	33,800	62 71	9,305
8	52 07	962	51 72	804	52 25	872	69 00	15,805	81 76	32,110	62 01	9,770
9	52 05	948	51 74	785	52 35	888	70 23	17,035	80 80	30,070	63 01	9,860
10	52 15	958	51 75	785	52 35	888	71 57	18,530	79 14	28,250	62 80	9,075
11	52 15	958	51 75	785	52 35	888	72 01	20,090	78 20	26,920	62 60	9,500
12	52 15	935	51 70	770	52 35	888	73 00	21,290	76 43	24,510	62 45	9,365
13	52 15	935	51 65	755	52 45	904	75 39	23,160	74 56	22,110	62 15	9,100
14	52 12	924	51 65	755	52 55	924	77 08	26,200	72 60	19,720	61 75	8,755
15	52 05	908	51 65	755	52 65	945	81 30	31,420	70 56	17,400	61 35	8,415
16	52 05	908	51 65	755	52 66	935	83 30	34,480	68 78	15,480	60 90	8,035
17	51 95	868	51 75	804	52 80	972	84 80	37,020	67 47	14,120	60 50	7,700
18	51 95	868	51 70	788	52 85	989	85 91	39,150	65 73	12,385	60 00	7,290
19	51 90	852	51 70	788	52 80	972	86 66	40,780	64 72	11,415	59 70	7,050
20	51 85	845	51 70	788	52 80	962	87 20	42,380	64 21	10,945	59 30	6,735
21	51 85	836	51 75	785	52 75	938	87 62	43,540	64 10	10,840	58 95	6,460
22	51 80	829	51 75	785	52 75	935	87 97	44,880	64 13	10,870	58 70	6,270
23	52 80	829	51 80	791	52 75	924	88 19	45,800	64 09	10,835	58 40	6,045
24	51 75	826	51 85	797	52 75	924	88 28	46,180	64 01	10,760	58 14	5,845
25	51 75	826	51 85	797	52 75	924	88 67	45,290	63 90	10,660	57 94	5,695
26	51 65	804	51 80	791	52 80	941	87 92	44,690	63 81	10,580	57 74	5,550
27	51 65	804	51 80	791	52 85	958	87 82	44,310	63 71	10,490	57 64	5,470
28	51 65	794	51 80	791	52 95	993	87 68	43,770	63 61	10,400	57 60	5,305
29	51 65	794	51 85	797	53 15	1,063	87 20	42,200	63 51	10,310	57 74	5,550
30	51 65	794			53 15	1,063	86 88	41,330	63 40	10,265	58 19	5,885
31	51 65	794			53 45	1,173			63 41	10,220		

	July.		August.		September.		October.		November.		December.	
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	58 64	6,225	60 40	7,620	57 34	5,255	55 24	3,820	53 90	2,970	54 19	2,103
2	59 14	6,610	59 85	7,170	57 24	5,185	55 11	3,735	53 85	2,940	54 09	2,055
3	59 54	6,920	59 30	6,735	56 92	4,955	55 10	3,670	54 05	3,060	53 80	1,967
4	60 64	7,820	58 90	6,425	56 55	4,695	54 88	3,585	54 10	3,090	53 69	1,875
5	61 59	8,620	58 35	6,000	56 15	4,420	54 85	3,550	54 12	3,105	53 54	1,807
6	62 54	9,445	58 00	5,740	55 65	4,090	54 81	3,540	54 14	3,115	53 53	1,795
7	63 24	10,065	57 70	5,520	55 45	3,960	54 69	3,460	54 16	3,160	53 48	1,767
8	63 84	10,605	57 32	5,210	55 10	3,725	54 60	3,460	54 19	3,150	53 43	1,735
9	64 53	11,240	57 27	5,205	54 95	3,630	54 67	3,450	54 24	3,180	53 41	1,719
10	64 93	11,615	56 87	4,920	54 80	3,530	54 64	3,430	54 16	3,130	53 75	1,847
11	65 43	12,090	56 62	4,745	54 58	3,390	54 59	3,400	54 18	2,279	54 95	1,919
12	65 88	12,530	56 47	4,640	54 67	3,450	54 54	3,365	53 88	2,147	54 05	1,951
13	65 94	12,590	56 22	4,470	54 80	3,530	54 47	3,320	53 93	2,159	53 97	1,907
14	66 01	12,660	56 12	4,400	54 90	3,505	54 37	3,290	53 88	2,131	53 97	1,899
15	66 07	12,720	56 02	4,335	55 25	3,825	54 27	3,290	53 73	2,063	53 85	1,813
16	66 14	12,790	55 92	4,270	55 67	4,100	54 17	3,135	53 42	1,927	53 80	1,815
17	66 20	12,845	56 07	4,370	56 10	4,390	54 07	3,075	53 25	1,851	53 70	1,767
18	66 27	12,915	56 27	4,505	56 30	4,525	53 97	3,010	53 07	1,771	53 65	1,735
19	66 33	12,975	56 37	4,570	56 50	4,660	53 92	2,980	52 97	1,723	53 55	1,687
20	66 40	13,040	56 42	4,605	56 55	4,695	53 88	2,960	52 92	1,695	53 50	1,650
21	66 46	13,100	56 47	4,640	56 45	4,625	53 88	2,960	52 96	1,699	53 45	1,631
22	65 88	12,530	56 54	4,690	56 53	4,680	53 88	2,960	53 31	1,831	53 35	1,583
23	65 30	11,970	56 04	4,760	56 35	4,560	53 87	2,950	52 61	1,943	53 37	1,583
24	64 72	11,415	56 79	4,865	56 15	4,420	53 85	2,940	52 61	1,931	53 36	1,567
25	64 13	10,870	56 69	4,795	56 07	4,370	53 80	2,910	52 41	1,843	53 30	1,535
26	63 80	10,570	56 54	4,690	55 91	4,260	53 78	2,900	52 70	1,951	53 30	1,527
27	63 40	10,210	56 49	4,655	55 76	4,160	53 75	2,880	54 10	2,103	53 25	1,499
28	62 90	9,760	56 54	4,690	55 56	4,030	53 73	2,870	54 10	2,095	53 20	1,471
29	62 30	9,235	56 76	4,840	55 53	4,010	53 73	2,870	54 20	2,123	53 20	1,459
30	61 65	8,670	57 00	5,075	55 41	3,930	53 92	2,980	54 20	2,115	53 20	1,451
31	61 10	8,205	57 24	5,185			53 85	2,940			53 30	1,483

NOTES. -Marked thus (i) interpolated.

700 00 should be added to gauge heights to reduce to station datum.

Ice conditions from January 1 to March 31 and November 11 to December 31.

Monthly Discharge of Red River at Emerson for 1916.
 [Drainage area 24,600 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....	1,024	794	896	0.026	0.090	35,093
February.....	826	755	790	0.023	0.025	45,441
March.....	1,173	797	921	0.027	0.031	56,630
April.....	46,180	3,061	28,941	0.836	0.933	1,722,100
May.....	40,370	10,220	20,745	0.600	0.692	1,275,560
June.....	10,220	5,470	7,940	0.229	0.256	472,463
July.....	13,100	9,225	10,737	0.310	0.357	660,192
August.....	7,620	4,270	5,100	0.148	0.171	314,140
September.....	5,255	3,390	4,222	0.122	0.136	251,227
October.....	3,820	2,870	3,212	0.093	0.107	197,498
November.....	3,180	1,695	2,342	0.068	0.076	139,358
December.....	2,103	1,451	1,730	0.050	0.058	100,373
The year.....	46,180	755	7,297	0.211	2.872	5,296,084

ROSEAU RIVER.

The Roseau river is the largest tributary entering the Red river from the east within the province of Manitoba. The mouth of the Roseau is about twelve miles north of the International Boundary and it drains the territory lying to the west and south of the Lake of the Woods.

The general direction followed by the Roseau is northwest, but the actual course of the river is very sinuous, about half of its length lies in United States territory. The banks of the river vary from ten to twelve feet in height and are cut sharply down from the prairie level. The river bottom and banks are composed chiefly of heavy clay.

The drainage area is 1,987 square miles, 890 square miles being in Manitoba and 1,097 square miles in the state of Minnesota. A large part of the drainage area is under cultivation, there being little standing timber in that part within the Province. What there is consists mostly of elm, ash and oak, very little of which is of commercial size.

Considerable drainage work has been done in the basin, especially on the United States side of the line. There are no towns of any size to be found along the river, but three small villages are so located; these are Sprague, near the International Boundary on the Ridgeville branch of the C.N.R., Stuartburn on the same line and Dominion City located at the crossing of the Emerson branch of the C.P.R., Dominion City has a population of about two hundred.

Discharge measurements have been made at various sections on the river since the establishment of the Survey in 1912. The sections were used and then abandoned in favor of more suitable ones for various reasons and are as follows:—

1. At Dominion City
2. At Mayne's Farm.
3. Below Dominion City.
4. At Baskerville's Farm.
5. At Stuartburn.

Of these stations, those in operation at present are Baskerville's Farm and Stuartburn.

ROSEAU RIVER AT STUARTBURN.
STATION No. 5. O.D 4

History.—This station was established on May 7, 1915 by A. Pirie and since that time has been in practically constant operation.

Location of Section.—The station as originally established was located on the downstream side of the Canadian Northern Railway bridge, about five hundred yards east of Stuartburn station. On June 6, 1915 a station was chosen approximately three hundred feet downstream from the above mentioned bridge and a cable carrier station established. This station has been in operation since that time. Winter measurements are made from the ice on the same cross section of the river.

Drainage Area.—The drainage area of the river above this station is 1,520 square miles.

Channel.—The bed of the channel is composed of sandy silt and during extreme stages of the river is liable to change. This would also apply to the control points below the section.

The banks at the section are high and not subject to overflow.

Gauge.—A vertical staff gauge is driven into the bed of the stream and suitably braced. It is located close to the left bank of the river at the C.N.R. bridge and is referred to a permanent M.H.S. bench mark set to an arbitrary datum.

Discharge Measurements.—Since the establishment of the station, discharge measurements have been made at frequent intervals over a range in stage of 7.84 feet, representing a range in discharge from 20 to 3,000 c.f.s.

Records Available.—From May 7 to November 12, 1915 and from April 25 to December 31, 1916 continuous records of daily gauge height have been obtained. Based on these daily gauge heights, estimates of daily discharge are available. Estimates of mean monthly discharge based on the daily gauge heights together with actual measurements are also available.

Accuracy.—Throughout the range in stage covered by the discharge measurements, the discharge curve is fairly well defined.

Discharge Measurements of Roseau River at Stuartburn for 1916.

Date.	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 2	E. B. Patterson.....	1,940	97	978	2.73	100.13	2,671
May 3	E. B. Patterson.....	1,940	97	968	3.11	100.03	3,006
May 11	M. S. Madden.....	1,940	93	754	2.74	98.21	2,069
May 12	M. S. Madden.....	1,940	94	785	2.91	98.56	2,283
May 18	M. S. Madden.....	1,940	93	728	2.62	97.98	1,908
May 19	M. S. Madden.....	1,940	92	690	2.50	97.63	1,724
May 23	M. S. Madden.....	1,940	91	672	2.40	97.36	1,612
May 24	M. S. Madden.....	1,940	91	653	2.40	97.18	1,568
June 8	C. O. Allen.....	1,496	89	533	1.95	95.64	1,041
July 7	C. O. Allen.....	1,496	86	381	1.18	94.06	450
July 24	R. C. Robinson.....	1,197	77	197	0.10	92.40	20
Sept. 2	R. C. Robinson.....	1,197	83	244	0.35	92.75	85
Oct. 31	R. C. Robinson.....	1,496	85	284	0.59	93.12	167

Daily Gauge Height and Discharge of Roseau River at Stuartburn for 1916.
[Drainage area 1,520 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1									100-21	3,008	96-55	1,330
2									100-12	3,047	96-36	1,255
3									100-03	2,997	96-31	1,236
4									99-41	2,650	96-18	1,185
5									99-07	2,963	95-05	1,097
6									100-02	2,991	95-98	1,108
7									99-87	2,907	95-75	1,019
8									99-73	2,829	95-67	999
9									99-71	2,815	95-55	945
10									99-58	2,745	95-36	874
11									98-71	2,281	95-23	828
12									98-58	2,216	95-08	775
13									98-01	1,952	94-96	733
14									97-90	1,902	94-85	695
15									97-89	1,898	94-73	654
16									97-88	1,893	94-59	607
17									97-95	1,925	94-51	579
18									97-98	1,938	94-48	567
19									97-63	1,783	94-33	516
20									97-53	1,739	94-16	458
21									97-35	1,662	94-09	435
22									97-33	1,653	94-02	411
23									97-36	1,666	93-95	387
24									97-18	1,588	93-88	363
25							98-59	2,221	97-16	1,580	93-81	339
26							99-71	2,818	96-93	1,483	93-74	317
27							99-77	2,851	96-91	1,474	93-67	295
28							100-01	2,986	96-85	1,450	93-60	274
29							99-26	2,568	96-75	1,410	93-70	304
30							100-33	3,165	96-66	1,374	93-80	336
31									96-71	1,394		

	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	93-00	370	91-97	4	92-71	78	92-69	75	93-18	164	92-55	.....
2	94-00	404	91-84	2	92-76	85	92-74	82	93-14	155	92-54	.....
3	94-10	438	91-89	3	92-74	82	92-71	78	93-14	155	92-57	.....
4	94-47	564	93-19	167	92-72	79	92-79	90	93-14	155	92-61	.....
5	94-37	530	93-17	102	92-75	83	92-81	93	93-24	179	92-64	.....
6	94-27	196	93-09	144	92-69	75	92-74	82	93-39	216	92-67	.....
7	94-17	462	93-04	133	92-59	61	92-71	78	93-39	216	92-69	.....
8	94-04	286	92-90	122	92-69	75	92-69	75	93-41	222	92-67	.....
9	94-07	428	92-94	114	92-74	82	92-69	75	93-34	203	92-59	.....
10	94-09	301	92-91	109	92-79	90	92-71	78	93-27	186	92-54	.....
11	93-59	271	92-97	119	92-72	79	92-69	75	92-74	82	92-49	.....
12	93-49	243	92-99	122	92-69	75	92-67	72	93-44	.....	92-61	.....
13	92-79	90	93-11	148	92-64	68	92-64	68	93-49	.....	92-69	.....
14	93-69	301	92-99	122	92-59	61	92-67	72	93-54	.....	92-69	.....
15	93-59	271	92-94	114	92-67	72	92-69	75	93-27	.....	92-69	.....
16	93-79	333	92-79	90	92-74	82	92-71	78	93-24	.....	92-67	.....
17	93-39	216	92-80	91	92-89	105	92-71	78	93-09	.....	92-64	.....
18	92-80	105	92-81	93	92-91	109	92-69	75	92-98	.....	92-64	.....
19	92-69	75	92-79	90	92-87	102	92-74	82	93-49	.....	92-64	.....
20	92-29	25	92-77	87	92-84	97	92-77	87	92-99	.....	92-65	.....
21	92-09	10	92-73	81	92-79	90	92-84	97	92-89	.....	92-63	.....
22	92-13	12	92-69	75	92-79	90	92-87	102	92-79	.....	92-61	.....
23	92-17	14	92-79	90	92-84	97	92-89	105	92-69	.....	92-59	.....
24	92-49	48	92-84	97	92-79	90	92-91	109	92-59	.....	92-59	.....
25	92-29	25	92-81	93	92-71	78	92-89	105	92-64	.....	92-59	.....
26	92-24	20	92-77	87	92-74	82	92-91	109	92-69	.....	92-61	.....
27	92-09	10	92-74	82	92-77	87	92-91	109	92-59	.....	92-64	.....
28	91-99	5	92-89	105	92-79	90	92-97	119	92-54	.....	92-61	.....
29	92-11	11	92-84	97	92-77	87	93-01	126	92-54	.....	92-59	.....
30	92-04	7	92-87	102	.....	.....	93-04	133	92-54	.....	92-59	.....
31	91-99	5	92-77	87	.....	.....	93-14	155	.....	.....	.....	.....

NOTES.—Marked thus (i) interpolated.
Ice conditions from November 12 to December 31.
Data insufficient to compute daily discharge.

Monthly Discharge of Roseau River at Stuartburn for 1916.
 [Drainage area 1,520 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....			8 ¹	0.005	0.006	492
February.....			6 ¹	0.004	0.004	345
March.....			9 ¹	0.006	0.007	553
April.....			1,000 ¹	0.658	0.734	59,504
May.....	3,098	1,374	2,107	1.386	1.598	129,554
June.....	1,330	274	607	0.450	0.503	41,474
July.....	564	5	206	0.136	0.157	12,668
August.....	167	2	98	0.064	0.074	6,026
September.....	109	61	81	0.053	0.059	4,820
October.....	155	68	92	0.061	0.070	5,657
November.....	222		86 ¹	0.057	0.063	5,117
December.....			4 ¹	0.003	0.003	246
The year.....	3,098	2	367	0.241	3.278	266,454

NOTE.—Marked thus (1) estimated.

ROSEAU RIVER AT BASKERVILLE'S FARM.
STATION No. 5. O.D1

History.—This station was established on April 23, 1913 by A. Pirie. It was continued in use until August 12, 1914, when on account of cost of operation it was superseded by the station below Dominion City. In the spring of 1916 the latter station was found to be unsatisfactory on account of backwater during flood periods; it was therefore decided to again operate the Baskerville Farm station, and from July 6 of that year the station has been in continuous operation.

Location of Section.—The meter section is located on the downstream side of the steel traffic bridge at Baskerville's Farm, eight miles northeast of Dominion City. All open water measurements are taken from this bridge, while winter measurements are taken from the ice on the same cross section of the river.

Drainage Area.—The drainage area of the river above this station is 1,900 square miles.

Channel.—The bed of the channel at this point is a gravelly clay and is not liable to shift. The channel is straight above and below the section and the banks are high enough to prevent overflow.

Gauge.—When the station was established, a vertical staff gauge was secured to a pile on the bank of the river twenty-five feet above the section. Difficulty was encountered in obtaining readings on this gauge at all stages of the river, and on March 14, 1914 a chain gauge was placed on the upstream side of the bridge. All records subsequent to this latter date have been obtained at this chain gauge.

Discharge Measurements.—During the periods in which the station has been in operation, discharge measurements have been taken at frequent intervals over a range in stage of 11.11 feet, which represents a range in discharge from 20 to 2,000 c.f.s.

Records Available.—From April 12, 1913 to August 12, 1914 continuous records of daily gauge height for the open water season and intermittent records for the winter season have been obtained.

From July 5 to December 31, 1916 continuous daily gauge readings have been obtained.

Based on these gauge readings, estimates of daily discharge for the above open water seasons are available.

Estimates of monthly mean discharge based on gauge readings and actual measurements are also available.

Accuracy.—Between gauge heights 83.7 and 85.0 the discharge curve is well defined; between 85.0 and 94.8 it is fairly well defined. Beyond these limits the definition of the curve is imperfect.

Discharge Measurements of Roseau River at Baskerville's Farm for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
July 5	C. O. Allen	1,496	61	284	1.23	86.60	349
July 26	R. C. Robinson	1,197	48	108	0.17	83.55	18
Sept. 2	R. C. Robinson	1,197	51	153	0.63	84.42	96
Nov. 2	R. C. Robinson	1,496	55	191	0.98	85.19	170

Daily Gauge Height and Discharge of Roseau River at Baskerville's Farm for 1916.

[Drainage area 1,900 square miles]

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	83.43	28	83.37	25	84.33	104	84.53	105	85.10	156	84.75	.....
2	83.31	22	84.58	109	84.45	98	84.45	98	85.21	167	84.64	.....
3	83.30	21	84.82	131	84.45	98	84.45	98	85.27	173	84.63	.....
4	86.60	327	83.22	18	84.34	89	84.46	99	85.32	178	84.65	.....
6	86.52	317	85.44	190	84.28	84	84.46	99	85.61	176	84.64	.....
7	86.68	337	85.22	168	84.28	84	84.35	90	85.78	175	84.65	.....
8	87.06	392	84.99	146	84.16	75	84.35	90	85.70	174	84.58	.....
9	86.53	318	84.96	143	84.12	72	84.31	87	85.83	173	84.65	.....
10	86.56	322	85.02	149	84.57	108	84.32	88	86.03	172	84.49	.....
11	86.31	289	84.80	137	84.52	104	84.22	88	85.41	171	84.42	.....
12	86.09	263	84.82	131	84.34	89	84.31	87	85.23	.....	84.27	.....
13	85.99	251	84.80	129	84.22	80	84.29	85	85.04	.....	84.25	.....
14	85.42	188	84.84	133	84.22	80	84.19	77	86.81	.....	84.20	.....
15	85.56	203	85.02	149	84.21	79	84.20	78	86.65	.....	84.22	.....
16	85.78	227	84.93	141	84.12	72	84.14	73	85.99	.....	84.32	.....
17	84.92	140	84.75	125	84.27	84	84.20	78	85.72	.....	84.58	.....
18	85.30	176	84.62	113	84.58	109	84.19	77	85.49	.....	84.65	.....
19	85.22	168	84.62	104	84.62	113	84.23	80	85.40	.....	84.52	.....
20	84.60	111	84.56	100	84.72	122	84.21	79	85.25	.....	84.32	.....
21	84.20	78	84.44	97	84.72	122	83.95	60	85.30	.....	84.21	.....
22	83.72	44	84.36	91	84.72	122	84.29	85	85.14	.....	84.23	.....
23	83.71	44	84.14	73	84.61	112	84.49	101	85.12	.....	84.38	.....
24	83.63	39	84.24	81	84.59	110	84.42	96	84.85	.....	84.35	.....
25	83.62	38	84.50	102	84.58	109	84.44	97	84.75	.....	84.35	.....
26	83.52	32	84.47	100	84.49	101	84.79	128	84.64	.....	84.40	.....
27	83.42	50	84.52	104	84.51	103	84.68	118	84.71	.....	84.42	.....
28	83.61	38	84.62	104	84.38	92	84.66	116	84.69	.....	84.54	.....
29	83.68	42	84.52	104	84.42	96	84.62	113	84.54	.....	84.64	.....
30	83.62	38	84.58	109	84.59	110	84.67	144	84.59	.....	84.71	.....
31	83.52	32	84.61	112	.....	.....	85.10	156	.....	.....	84.74	.....

NOTES.—Marked thus (?) interpolated.
Ice conditions November 12 to December 31.
Data insufficient to compute daily discharge.

Monthly Discharge of Roseau River at Baskerville's Farm for 1916.
[Drainage area 1,900 square miles.]

MONTH.	DISCHARGE IN SECOND FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
July.....	392	.....	188 ¹	0.099	0.114	11,560
August.....	190	18	108	0.085	0.093	6,456
September.....	131	72	98	0.052	0.058	5,831
October.....	156	60	96	0.051	0.059	5,903
November.....	178	.....	82 ¹	0.043	0.048	4,879
December.....	.....	.....	14 ¹	0.007	0.008	861
The period.....	392	.....	97	0.051	0.330	33,490

NOTE.—Marked thus (1) estimated.

ROSEAU RIVER, BELOW DOMINION CITY.

STATION No. 5. O.D 3

History.—The station at Baskerville's Farm, about eight miles northeast of Dominion City on the Roseau river, while satisfactory in so far as accuracy of records was concerned, entailed a drive of eighteen miles on each visit to the station. On this account a station was established below Dominion City on April 14, 1914 by D. B. Gow, to supersede the above. During the spring of 1916 it was found that this station was interfered with by the back water effect from the Red river when the latter was in flood, and on that account it has been abandoned and the upper station again put in operation.

Location of Section.—The section, which is equipped as a cable carrier station, is located about two thousand feet below the bridge of the Canadian Pacific Railway just north of the station of Dominion City. Discharge measurements are taken on this section throughout the year.

Drainage Area.—The drainage area of the river above this station is 1,940 square miles.

Channel.—The bed of the channel is a gravelly clay and fairly permanent. The channel is straight above and below the section and the discharges at all stages would be confined within the limits of the banks.

Gauge.—A vertical staff gauge was placed at a point one thousand feet downstream from the section. It is fastened to a post driven into the bed of the river and securely braced.

Discharge Measurements.—During the period in which this station was operated discharge measurements were obtained over a range in stage of 9.04 feet.

Records Available.—From April 14 to December 5, 1914 and from April 15, 1915 to June 20, 1916 practically continuous records of daily gauge height have been obtained.

Based on these gauge heights, estimates of daily discharge throughout the open water season are available, except during the period of break up in the spring of 1916, when back water conditions on the river rendered accurate estimating of discharge based on the gauge readings unreliable.

Accuracy.—The discharge curve is well defined between gauge heights 86.5 and 90.0, and fairly well defined between gauge heights 90.0 and 95.5.

Mean Daily Gauge Height, in Feet, of Roseau River Below Dominion City for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	87.70	87.80	87.91	88.64	.....	96.77	.....	.....	.....	.....	.....	.....
2	87.60	87.80	87.94	88.50	.....	96.57	.....	.....	.....	.....	.....	.....
3	87.62	87.80	87.93	88.58	.....	96.32	.....	.....	.....	.....	.....	.....
4	87.60	87.80	87.91	88.58	.....	96.02	.....	.....	.....	.....	.....	.....
5	87.60	87.80	87.80	88.56	.....	95.62	.....	.....	.....	.....	.....	.....
6	87.60	87.91	88.01	88.59	112.92	95.17	.....	.....	.....	.....	.....	.....
7	87.71	87.94	87.90	88.90	112.32	94.77	.....	.....	.....	.....	.....	.....
8	87.60	87.95	88.04	89.80	111.92	94.67	.....	.....	.....	.....	.....	.....
9	87.60	87.96	88.04	90.82	110.37	94.58	.....	.....	.....	.....	.....	.....
10	87.89	87.96	88.04	92.50	.....	93.79	.....	.....	.....	.....	.....	.....
11	87.79	87.95	88.04	93.73	110.22	94.46	.....	.....	.....	.....	.....	.....
12	87.81	87.95	88.04	.....	108.62	94.01	.....	.....	.....	.....	.....	.....
13	87.81	87.93	88.05	.....	107.22	92.00	.....	.....	.....	.....	.....	.....
14	87.83	89.93	88.09	.....	106.22	92.48	.....	.....	.....	.....	.....	.....
15	87.83	87.93	88.09	.....	105.47	92.14	.....	.....	.....	.....	.....	.....
16	87.81	87.91	88.12	.....	104.77	91.84	.....	.....	.....	.....	.....	.....
17	87.93	87.91	88.14	.....	104.17	91.39	.....	.....	.....	.....	.....	.....
18	87.94	87.91	88.17	.....	103.72	91.12	.....	.....	.....	.....	.....	.....
19	87.94	87.91	88.18	.....	103.02	90.85	.....	.....	.....	.....	.....	.....
20	87.92	87.90	88.24	.....	102.27	90.58	.....	.....	.....	.....	.....	.....
21	87.89	87.91	88.34	.....	101.82	.....	.....	.....	.....	.....	.....	.....
22	87.88	87.91	88.38	.....	101.32	.....	.....	.....	.....	.....	.....	.....
23	87.86	87.89	88.79	.....	100.97	.....	.....	.....	.....	.....	.....	.....
24	87.79	87.89	88.94	.....	100.67	.....	.....	.....	.....	.....	.....	.....
25	87.79	87.91	88.79	.....	100.27	.....	.....	.....	.....	.....	.....	.....
26	87.79	87.93	88.74	.....	99.77	.....	.....	.....	.....	.....	.....	.....
27	87.84	87.91	88.69	.....	99.22	.....	.....	.....	.....	.....	.....	.....
28	87.84	87.91	88.69	.....	98.62	.....	.....	.....	.....	.....	.....	.....
29	87.84	87.91	88.69	.....	97.97	.....	.....	.....	.....	.....	.....	.....
30	87.85	.....	88.71	.....	97.47	.....	.....	.....	.....	.....	.....	.....
31	87.86	.....	88.69	.....	97.12	.....	.....	.....	.....	.....	.....	.....

Gauge heights reduced to M.H.S. station datum (assume 1).

RAT RIVER.

The drainage area of the Rat river from its source to its mouth comprises 997 square miles. The northern boundary of this area is formed by the watersheds of the Whitemouth and Seine rivers, while its southern limits consist of the northern slope or the watershed of the Roseau river.

The west branch of the river takes its rise in the country lying to the southeast of the town of Woodridge on the Ontario branch of the Canadian Northern Railway, and is confined chiefly to Tp. 3, R. 11, E.P.M. The first ten miles of its course the river has a southwesterly bearing; from this latter point it flows northwest for about four miles, then nearly due south for three miles, then north for about six miles. This latter point lies about two miles east of the town of Zhoda, from this point it flows through a swampy and marshy country due west for about eighteen miles and then in a northwesterly direction to its mouth at the Red river.

The territory drained is generally flat prairie country, except in the upper reaches where the land is inclined to be wet and swampy. Nearly all the drainage area is under cultivation, the settlement being about the oldest in the province.

RAT RIVER AT OTTERBURNE.

STATION NO. 5. O.E. 1

History.—This station was established by S. S. Scovil on May 23, 1912, and has been in continuous operation since that time.

Location of Section.—The metering section is on the downstream side of the traffic bridge which crosses the Rat at F.X. Joubert's farm, four miles southeast of the Canadian Pacific Railway station at Otterburne. Throughout the open water season the discharge measurements are made from the bridge. In the winter they are made from the ice on the same cross section of the river.

Drainage Area.—The drainage area of the river above the station is 650 square miles.

Channel.—The channel is straight for a considerable distance above and below the section. The banks are high and the bed of the channel, though of mud and clay, is not liable to shift.

Gauge.—A vertical staff gauge is secured to a pile of the bridge about fifteen feet from the left bank on the section. This gauge is referred to a permanent M.H.S. bench mark, located about thirty feet southwest from the gauge. This bench mark is set to an assumed datum.

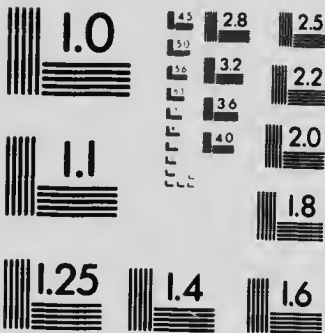
Discharge Measurements.—Since the establishment of this station, discharge measurements have been taken at frequent intervals and cover a range in stage approximately twelve feet, corresponding to a range in discharge of from zero to 1,100 c.f.s.

Records Available.—From May 23, 1912 to December 2, 1914 continuous records of daily gauge heights for the open water season, and intermittent gauge readings for the winter season have been obtained.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482-0300 - Phone
(716) 288-5989 - Fax

From April 4, 1915 to December 31, 1916 continuous records of daily gauge height have been obtained. From these records, estimates of daily discharge for the open water seasons are available. Estimates of mean monthly discharge based on gauge heights and actual measurements are available.

Accuracy.—From gauge height 88.3 to 92.4 the discharge curve is well defined; from 92.4 to 96.7 it is fairly well defined; beyond these limits it is not well defined.

Discharge Measurements of Rat River at Otterburne for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 14	C. O. Allen.....	1,374	35	24.00	0.12	89.47	2.90 ¹
Feb. 9	C. O. Allen.....	1,912	30	19.02	0.22	89.82	4.20 ¹
Mar. 21	C. O. Allen.....	1,912	19	8.24	0.46	89.95	4.04 ¹
May 25	M. S. Madden.....	1,339	32	200.10	1.11	92.03	222.10
June 6	C. O. Allen.....	1,496	44	110.80	0.92	90.08	101.90
June 8	C. O. Allen.....	1,496	30	77.70	1.23	90.08	95.50 ²
July 4	C. O. Allen.....	1,496	43	100.20	0.99	90.00	99.20
July 26	R. C. Robinson.....	1,197	34	39.10	0.29	88.43	11.30
Sept. 1	R. C. Robinson.....	1,197	31	32.90	0.21	88.26	6.90
Nov. 3	R. C. Robinson.....	1,496	37	57.70	0.59	89.02	34.00

NOTE.—¹ Ice measurement.

² At Bridge.

SESSIONAL PAPER No. 25e

Daily Gauge Height and Discharge of Rat River at Otterburne for 1916.

[Drainage area 650 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	89-07		89-71		89-76		90-24		97-66		91-05	
2	89-08		89-76		86-73		90-25		97-43		90-83	
3	89-17		89-80		89-70		90-27		96-90		90-54	
4	89-27		89-83		89-67		90-29		96-33		90-33	
5	89-27		89-87		89-68		90-88		95-79		90-25	
6	89-27		89-89		89-70		91-35		95-25		90-10	
7	89-27		89-85		89-72		91-28		94-78		90-03	
8	89-40		89-85		89-71		90-95		92-89		89-96	
9	89-34		89-82	4	89-76		90-70		92-43		89-87	
10	89-38		89-82		89-79		90-64		92-23		89-73	
11	89-41		89-81		89-82		90-52		92-03		89-67	
12	89-45		89-81		89-84		90-53		91-73		89-69	
13	89-47		89-81		89-86		90-73		91-57		89-67	
14	89-53	3	89-80		89-87		91-73	199	91-48		89-64	
15	89-60		89-80		89-87		97-62	722	91-35		89-61	
16	89-66		89-80		89-88		98-73	833	91-23		89-59	
17	89-57		89-81		89-89		99-73	933	91-34		89-58	
18	89-52		89-83		89-91		99-83	943	91-42		89-57	
19	89-51		89-84		89-92		100-89	1,029	91-54		89-51	
20	89-53		89-84		89-94		100-71	1,031	91-67		89-43	
21	89-54		89-85		89-96	4	100-46	1,006	91-78		89-38	
22	89-56		89-84		89-96		100-31	991	91-86		89-33	
23	89-57		89-84		89-97		100-34	994	91-90		89-36	
24	89-58		89-82		89-98		100-34	994	92-06		89-37	
25	89-57		89-82		90-00		100-14	974	92-01		89-38	
26	89-56		89-81		90-02		100-14	974	91-85		89-36	
27	89-56		89-81		90-04		99-85	945	91-73		89-58	
28	89-57		89-81		90-06		99-35	895	91-67		89-66	
29	89-60		89-81		90-11		99-01	861	91-43		89-79	
30	89-64				90-17		98-59	819	91-30		89-83	
31	89-67				90-21				91-15			

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	89-03	82	88-36	6	88-26	4	88-77	24	89-09	40	89-22	
2	90-03	88	88-44	10	88-25	4	88-77	24	89-11	41	89-20	
3	89-93	82	88-36	6	88-24	3	88-79	25	89-02	36	89-21	
4	89-99	85	88-40	8	88-21	3	88-83	27	89-11	41	89-24	
5	89-92	81	88-36	6	88-23	3	88-86	28	89-11	41	89-27	
6	89-85	77	88-63	17	88-25	4	88-82	26	89-10	40	89-47	
7	89-79	75	88-84	27	88-21	3	88-86	28	89-16	43	89-37	
8	89-73	72	88-95	33	88-23	3	88-86	28	89-17	44	89-35	
9	89-68	69	88-78	24	88-25	4	88-87	29	89-20	45	89-36	
10	89-57		88-89	30	88-36	6	88-88	29	89-26	48	89-37	
11	89-59	65	89-03	37	88-60	16	88-91	31	89-35	53	89-11	
12	89-52	61	88-25	48	88-60	16	88-92	31	89-26	48	89-06	
13	89-36	53	88-94	34	88-57	15	88-87	29	89-27		89-15	
14	89-17	44	88-93	32	88-46	10	88-85	28	89-25		89-16	
15	89-02	36	88-90	30	88-59	16	88-85	28	89-46		89-31	
16	88-91	31	88-89	30	88-50	12	88-84	27	89-49		89-32	
17	88-86	28	88-85	28	88-51	12	88-81	26	89-29		89-33	
18	88-81	26	88-74	22	88-54	14	88-85	28	89-19		89-34	
19	88-75	23	88-67	19	88-53	13	88-87	29	89-19		89-36	
20	88-69	20	88-65	18	88-51	12	88-92	31	89-14		89-26	
21	88-64	18	88-51	12	88-53	13	88-92	31	89-20		89-02	
22	88-60	16	88-44	10	88-54	14	88-94	32	89-18		88-97	
23	88-54	14	88-40	8	88-56	14	88-96	33	89-17		88-93	
24	88-49	12	88-36	6	88-59	16	88-97	34	89-10		88-93	
25	88-42	9	88-31	4	88-63	17	88-99	35	89-14		88-95	
26	88-44	10	88-26	4	88-66	18	88-99	35	89-11		88-96	
27	88-40	8	88-26	4	88-67	19	89-00	35	89-09		88-99	
28	88-34	6	88-26	4	88-69	20	89-03	37	89-16		89-06	
29	88-38	7	88-27	4	88-73	22	89-07	39	89-21		89-00	
30	88-41	8	88-26	4	88-76	23	89-10	40	89-24		89-12	
31	88-44	10	88-26	4			89-12	41			89-12	

Notes.—Ice conditions from January 1 to April 14 and November 13 to December 31.
Data insufficient to compute daily discharges.

Monthly Discharge of Rat River at Otterburne for 1916

(Drainage area, 650 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....			3 ¹	0.005	0.006	184
February.....			4 ¹	0.006	0.006	230
March.....			4 ¹	0.006	0.007	246
April.....	1,031		507 ¹	0.780	0.870	30,169
May.....	726	158	289	0.445	0.513	17,770
June.....	152	52	76	0.117	0.131	4,522
July.....	88	6	41	0.063	0.073	2,521
August.....	48	4	17	0.026	0.030	1,045
September.....	23	3	12	0.018	0.020	714
October.....	41	24	31	0.048	0.055	1,906
November.....	53		28 ¹	0.043	0.048	1,666
December.....			6 ¹	0.009	0.010	369
The year.....	1,031	3	85	0.131	1.769	61,342

NOTE.—Marked thus (1) estimated.

SEINE RIVER AT STE. ANNE DES CHENES.
STATION NO. 5. O.H.1

History.—The station was established on October 4, 1912 by A. Pirie, but was discontinued on November 11 of the same year. No further information was obtained at this point until May 1, 1915, when operations were again commenced. Since this latter date this station has been in operation.

Location of Section.—The metering section is located at the downstream side of the Canadian Northern Railway bridge, one mile east of the town of Ste. Anne des Chenes.

Drainage Area.—The drainage area of the river above this station is 310 square miles.

Channel.—The section is located on a slightly curved stretch of the river but is at right angles to the direction of flow. The bed of the channel is of a sandy nature and the control is located at a point a short distance downstream, formed by the remains of an old dam. There is liable to be interference to the flow at this point. The banks of the channel at the section are high and not liable to overflow.

Gauge.—A vertical staff gauge is secured to a pile of the bridge at the section and is referred to an arbitrary datum.

Discharge Measurements.—During the periods in which this station has been in operation, discharge measurements have been made over a range in stage corresponding to a range in discharge of from zero to 440 c.f.s.

Records Available.—From May 1 to November 12, 1915 and from April 11 to November 11, 1916, continuous records of daily gauge heights are available.

Based on these gauge heights, estimates of daily discharge are available except during times of extreme flood or under ice conditions, when the information at hand was not sufficiently full on which to allow of estimates of discharge being made.

Estimates of mean monthly discharge based on gauge readings and actual measurements are available.

Accuracy.—The discharge curve is fairly well defined over the range in stage covered by the recorded gauge heights.

Daily Gauge Height and Discharge of Seine River at Ste. Anne des Chenes for 1916.

(Drainage area 310 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
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NOTE.—From April 11 to 24 and October 28 to November 11, data insufficient to compute daily discharge.

Monthly Discharge of Seine River at Ste. Anne des Chenes for 1916.
(Drainage area, 310 square miles).

MONTH	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.....			300 ¹	0.968	1.080	17,851
May.....	278	121	183	0.590	0.680	11,252
June.....	118	36	77	0.248	0.277	4,552
July.....	161	3	55	0.177	0.204	3,252
August.....	96	0	30	0.097	0.112	1,846
September.....	22	0	10	0.032	0.036	596
October.....			31 ¹	0.100	0.115	1,906
The period.....	278	0	98	0.316	2.504	41,413

NOTE.—Marked thus (1) estimated.

ASSINIBOINE RIVER AND TRIBUTARIES.**ASSINIBOINE RIVER.**

The Assiniboine river, rising in the province of Saskatchewan on the south-eastern slope of the Nut mountains is one of the chief tributaries of the Red river, joining the latter within the city limits of Winnipeg. It flows in a south-easterly direction and crosses the Manitoba boundary in Tp. 26, R. 28, W.P.M., thence nearly due south until it reaches Tp. 10, R. 25, W.P.M., where it turns and flows south and east to the Red river.

The principal tributaries of the Assiniboine are the Shell, Qu'Appelle, Little Saskatchewan and Souris rivers. The total drainage area is 59,550 square miles, of which 8,800 square miles are in the state of North Dakota, 37,700 square miles in the province of Saskatchewan and 13,050 square miles in the province of Manitoba.

The area drained varies between the open prairie to be found in the south-western part of the province and the well timbered country lying on the slopes of the Duck and Riding mountains. In the prairie country the banks are sharp cut, rising abruptly from the water's edge for a height varying between three and twenty-five feet. In the wooded section or the upper part of the drainage area the valley is well defined and narrow, the rise from the river in some places reaching an elevation of two hundred and fifty feet above the water level.

In the lower part of the river basin the land is nearly all under cultivation, the soil is rich but in the valley bottom it is subject to overflow. It flows through the most densely populated part of the province, the three largest cities, Portage-la-Prairie, Brandon and Winnipeg being built upon its banks.

The importance of this river as a source of water supply, a means of drainage and sewage disposal is great in a district where the natural water supply is somewhat limited. In order that a study may properly be made of its regimen and data for various purposes be gathered, several gauging stations have been established. All have not been in continuous operation but discharge records have been obtained at the following places on the river:—

1. Millwood.
2. Brandon.
3. Headingly.
4. St. James.

TRIBUTARIES.

The tributaries of the Assiniboine river in order from source to mouth are:—

1. Shell river.
2. Qu'Appelle river.
3. Birdtail creek.
4. Little Saskatchewan river.
5. Souris river.
6. Cypress river.

On all of these, with the exception of the Qu'Appelle river, records of discharge are available.

ASSINIBOINE RIVER AT MILLWOOD.
STATION NO. 5. M.E.1

History.—This station was established by W. G. Worden on October 11, 1912, and since that date has been in practically continuous operation.

Location of Section.—The metering section is located at the downstream side of the traffic bridge, four hundred feet downstream from the old mill dam and one quarter of a mile south of the town of Millwood. All open water measurements are taken from the bridge. Winter measurements are taken from the ice on the same section of the river.

Drainage Area.—The drainage area of the river above this station is 7,590 square miles.

Channel.—The channel above and below the station is straight and the velocities across the section fairly regular. The bed of the channel is composed of clay and gravel and not liable to shift. During times of extreme flood conditions the river is liable to overflow its banks at this point.

Gauge.—A vertical staff gauge is secured to the central pier of the bridge, and is referred to a permanent M.H.S. bench mark, located seventy-five feet southeast from the down stream side of the bridge on the left bank. The bench mark is set to an assumed datum.

Discharge Measurements.—Since the establishment of the station, discharge measurements have been made over a range in stage of 8.51 feet corresponding to a range in discharge of from 30 to 5,200 c.f.s.

Records Available.—From January 27, 1913 to March 29, 1914 continuous records of daily gauge height for open water seasons and intermittent records of gauge height for the winter season have been obtained. From March 29, 1914 to December 31, 1916 continuous records of daily gauge height have been obtained.

Based on these daily gauge heights, estimates of daily discharge are available.

Estimates of mean monthly discharge based on gauge heights and actual discharge measurements are available.

Accuracy.—Under open water conditions the discharge curve is well defined between gauge heights 98.91 and 107.4; beyond these limits the curve is not well defined.

The discharge curve for ice conditions is fairly well defined throughout the range of gauge heights recorded.

Discharge Measurements of Assiniboine River at Millwood for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Ft.	Sec. Ft.
Jan. 24	M. S. Madden	1,462	111	114.5	0.47	99.61	53.8 ¹
Mar. 31	G. K. Gainsford	1,939	97	114.7	0.44	99.79	50.5 ¹
April 25	M. S. Madden	1,460	143	1,050.0	2.44	103.72	2,561.0
June 11	R. C. Robinson	1,196	152	879.6	1.98	102.31	1,741.6
July 4	R. C. Robinson	1,196	147	794.9	1.95	101.87	1,550.0
Aug. 27	R. C. Robinson	1,196	150	511.8	1.06	99.94	542.5
Oct. 1	R. C. Robinson	1,614	148	473.2	0.64	99.52	302.8
Nov. 16	R. C. Robinson	1,490	149	453.7	0.65	99.83	294.9 ¹

Note—Ice measurement.

Daily Gauge Height and Discharge of Assiniboine River at Millwood for 1916.

(Drainage area 7,500 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	101-39	1,764	99-99	496	99-09	167	99-52	308	99-90	460	99-51	194
2	102-24	1,674	99-89	456	99-04	152	99-49	296	99-90	460	99-51	194
3	102-04	1,562	99-89	465	98-99	137	99-49	296	99-90	460	99-44	180
4	101-89	1,479	99-89	456	99-09	167	99-49	296	99-90	460	99-44	180
5	101-74	1,397	99-89	456	99-09	167	99-49	296	99-90	460	99-44	180
6	101-69	1,369	99-94	478	99-04	152	99-49	296	99-90	460	99-44	180
7	101-64	1,342	99-94	478	98-99	137	99-49	296	99-95	480	99-51	174
8	101-59	1,208	99-94	478	98-99	137	99-49	296	99-98	492	99-51	174
9	101-54	1,122	99-94	478	98-99	137	99-49	296	99-78	412	99-51	174
10	101-04	1,015	99-99	496	98-99	137	99-53	312	99-70	388	99-51	174
11	100-94	965	100-19	590	98-99	137	99-53	312	99-70	370	99-51	123
12	100-84	915	100-09	540	98-94	122	99-49	296	99-70	321	99-51	123
13	100-74	864	99-99	496	99-39	261	99-46	289	99-70	321	99-51	108
14	100-69	840	99-89	456	99-79	416	99-53	312	99-80	321	99-61	103
15	100-64	815	99-84	436	99-69	376	99-54	316	99-90	321	99-56	103
16	100-59	799	99-89	456	99-59	336	99-53	312	99-86	309	99-56	103
17	100-59	799	99-89	456	99-49	296	99-64	356	99-83	299	99-56	103
18	100-64	815	99-84	436	99-49	296	99-64	356	99-81	293	99-56	99
19	100-69	840	99-79	416	99-59	336	99-69	376	99-71	266	99-51	74
20	100-59	799	99-69	376	99-69	376	99-64	356	99-71	266	99-61	74
21	100-49	740	99-59	336	99-79	416	99-64	356	99-61	266	99-81	74
22	100-39	690	99-54	316	99-69	376	99-69	376	99-57	256	99-61	60
23	100-29	640	99-49	296	99-69	376	99-69	376	99-57	231	99-71	74
24	100-19	590	99-44	279	99-69	376	99-69	376	99-57	231	99-61	60
25	100-19	590	99-39	261	99-64	356	99-76	404	99-61	241	99-56	57
26	100-09	540	99-34	244	99-59	336	99-79	416	99-61	241	99-66	57
27	100-04	515	99-29	227	99-59	336	99-79	416	99-66	228	99-71	55
28	100-04	515	99-29	227	99-59	336	99-87	448	99-50	228	99-66	52
29	100-29	640	99-29	227	99-59	336	99-85	456	99-51	194	100-01	55
30	100-09	540	99-14	182	99-54	316	99-93	472	99-51	194	99-66	49
31	99-99	496	99-09	167			99-89	456			99-81	55

NOTES.—Marked thus (i) interpolated.

Ice conditions from January 1 to March 31, data insufficient to compute daily discharge.

SESSIONAL PAPER No. 26a

Monthly Discharge of Assiniboine River at Millwood for 1916.

[Drainage area 7,500 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet
January.....			50 ¹	0.007	0.008	3,074
February.....			50 ¹	0.007	0.008	2,878
March.....			45 ¹	0.006	0.007	2,767
April.....	2,033	50 ¹	1,445	0.190	0.212	85,983
May.....	1,369	865	841	0.111	0.128	51,711
June.....	2,364	1,093	1,826	0.241	0.260	108,684
July.....	1,764	496	931	0.123	0.142	57,245
August.....	690	107	392	0.052	0.060	24,103
September.....	416	122	267	0.035	0.039	15,588
October.....	472	286	349	0.046	0.063	21,450
November.....	492	194	331	0.044	0.049	19,606
December.....	104	40	112	0.015	0.017	6,887
The year.....	2,033	40	552	0.073	0.092	400,343

NOTE.—Marked thus (¹) estimated.

ASSINIBOINE RIVER AT BRANDON.

STATION 5. M.H. 1

History.—This station was established by G. H. Burnham on July 4, 1912 and has been in practically continuous operation since that time.

Location of Section.—The metering section is located at the downstream side of the First Street traffic bridge in the easterly part of the city of Brandon. All discharge measurements during open water seasons are taken from this bridge. In winter the measurements are taken from the ice, and if conditions are favorable on the same cross section of the river. Frequently it is impossible to take an ice measurement at this point. A temporary section is then chosen some distance downstream from the bridge.

Drainage Area.—The drainage area of the river above the section is 34,500 square miles.

Channel.—The section is located in a straight stretch of the river, with high banks. The discharge at all times is confined to the limits of the section.

The bed of the river is clay and liable to shifting during extreme stages of the river.

Gauge.—The original gauge at this station was a vertical staff gauge secured to the downstream side of the ice breaker opposite the central pier of the bridge. This gauge was replaced in December of 1915 by a vertical staff gauge bolted to the downstream side of the central pier. On April 13, 1916, on account of the great range in stage during break up, a chain gauge was established on the upstream side of the bridge and adjacent to the central pier. All of these gauges are referred to a M.H.S. bench mark set to an assumed datum.

Discharge Measurement.—Since the establishment of the station, discharge measurements have been obtained over a range of 12.7 feet, corresponding to a range in discharge of from 60 to 13,000 c.f.s.

Records Available.—From July 4, 1912 to April 17, 1914 continuous records of daily gauge height for open water seasons, and intermittent records of gauge height for the winter seasons have been obtained. From April 17, 1914 to December 31, 1916 practically continuous records of daily discharge are available.

Based on these gauge heights, estimates of daily discharge are available.

Estimates of mean monthly discharge based on gauge heights and discharge measurements are available.

In addition to the above, a record of daily gauge height has been obtained at the Municipal pumping station of the city of Brandon, dating from April 8, 1906 to December 31, 1912. A correlation has been established between this gauge and the gauge at the metering section, and estimates of daily discharge from April 8, 1906 to October 31, 1912, based on deduced normal daily gauge heights are available.

Accuracy.—The discharge curve is very well defined between gauge heights 97.3 and 110.0.

The estimates of daily discharge under ice conditions are reliable.

Discharge Measurements of Assiniboine River at Brandon for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 27	M. S. Madden	1,462	132	119	0.84	98.36	100 ¹
April 14	C. O. Allen	1,912	238	1,576	1.92	104.20	3,025
April 14	C. O. Allen	1,912	238	1,490	1.79	103.91	2,667
April 15	C. O. Allen	1,912	265	2,083	2.11	106.10	4,394
April 15	C. O. Allen	1,912	265	2,113	2.21	106.05	4,671
April 17	C. O. Allen	1,912	265	2,150	3.57	106.36	7,676
April 17	C. O. Allen	1,912	265	2,150	3.58	106.39	7,697
April 18	C. O. Allen	1,912	265	2,443	3.78	107.51	9,236
April 19	C. O. Allen	1,912	265	2,443	3.70	107.46	9,038
April 22	C. O. Allen	1,912	265	2,363	3.69	107.16	8,729
May 3	C. O. Allen	1,912	230	1,277	3.03	102.90	3,869
May 4	C. O. Allen	1,912	230	1,233	2.99	102.69	3,686
May 6	C. O. Allen	1,912	219	1,046	2.69	101.91	2,812
May 10	C. O. Allen	1,912	219	1,035	2.74	101.73	2,835
May 11	C. O. Allen	1,912	219	968	2.74	101.42	2,652
June 5	R. C. Robinson	1,196	230	1,004	2.95	101.29	2,961
June 29	R. C. Robinson	1,196	236	1,338	3.02	103.61	4,042
Aug. 2	R. C. Robinson	1,196	205	570	2.16	99.31	1,231
Sept. 26	R. C. Robinson	1,615	174	300	1.63	98.41	586
Nov. 6	R. C. Robinson	1,496	179	427	1.82	98.81	778

Note.—¹Ice measurement.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26a

Daily Gauge Height and Discharge of Assiniboine River at Brandon for 1916. [Drainage area 34,500 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	98 17		98 31		98 41		98 46		103 51	4,445	100 80	2,135
2	98 22		98 32		98 47		98 43		103 12	4,078	100 80	2,223
3	98 22		98 33		98 53		98 30		102 02	3,880	101 91	2,313
4	98 22		98 34		98 57		98 40		102 74	3,736	101 04	2,335
5	98 24		98 35				98 41		102 45	3,488	101 12	2,305
6	98 26		98 35		98 50		98 40					
7	98 27		98 34		98 62		98 30		102 26	3,326	101 34	2,567
8	98 27		98 30		98 62		98 37		102 09	3,182	101 45	2,655
9	98 26		98 41		98 63		98 30		101 92	3,037	101 60	2,775
10	98 33		98 30		98 61		98 40		101 70	2,927	101 73	2,870
									101 66	2,823	101 81	2,944
11	98 32		98 40		98 50		98 44		101 42	2,631	101 91	3,020
12	98 35		98 40		98 61		98 40		101 34	2,567	101 99	3,067
13	98 35		98 41		98 67		98 29		101 08	2,365	102 11	3,100
14	98 37		98 41		98 54		104 24	2,845	101 03	2,328	102 33	3,386
15	98 39		98 43		98 51		105 06	4,533	100 93	2,253	105 41	3,454
16	98 41		98 44		98 53		106 24	7,500	100 83	2,178	105 47	3,505
17	98 39		98 37		98 54		100 43	7,740	100 75	2,118	105 54	3,564
18	98 35		98 30		98 50		107 47	9,110	100 67	2,058	105 53	3,536
19	98 33		98 34		98 54		107 40	9,140	100 50	1,998	105 58	3,598
20	98 32		98 35		98 55		107 39	9,005	100 55	1,968	105 50	3,607
21	98 32		98 32		98 51		107 34	8,935	100 57	1,983	105 59	3,607
22	98 31		98 30		98 51		107 18	8,725	100 60	2,005	105 68	3,683
23	98 32		98 20		98 52		106 94	8,400	100 58	1,990	105 78	3,772
24	98 32		98 31		98 50		106 67	8,050	100 48	1,916	105 87	3,853
25	98 35		98 33		98 49		106 24	7,455	100 47	1,900	103 01	3,970
26	98 33		98 34		98 51		105 66	7,155	100 46	1,902	103 09	4,051
27	98 33	100	98 34		98 52		105 37	6,430	100 60	2,005	103 14	4,096
28	98 34		98 35		98 53		104 92	5,910	100 51	1,938	103 17	4,123
29	98 36		98 37		98 51		104 25	5,180	100 56	1,975	103 62	4,540
30	98 35				98 49		103 87	4,795	100 59	1,908	104 20	5,130
31	98 34				98 47				100 46	1,902		

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	104 22	5,150	99 30	1,160	98 20	495	104 35	570	98 65	733	98 50	
2	104 25	5,180	99 32	1,123	98 18	485	98 32	535	98 66	738	98 57	
3	104 31	5,215	99 21	1,056	98 30	545	98 36	575	98 70	760	98 55	
4	104 45	5,400	99 22	1,062	98 41	600	98 39	590	98 73	777	98 54	
5	104 48	5,430	99 24	1,074	98 10	445	98 42	606	98 77	799	98 54	
6	104 62	5,580	99 24	1,074	98 15	470	98 45	623	98 81	820	98 49	
7	104 72	5,690	99 21	1,056	98 18	485	98 48	639	98 84	825	98 41	
8	104 50	5,450	99 26	1,066	98 07	432	98 39	590	98 84	825	98 45	
9	104 17	5,095	99 00	930	98 04	418	98 39	590	98 65	730	98 53	
10	103 87	4,795	99 10	990	98 14	465	98 36	575	98 87	855	98 51	
11	103 28	4,226	98 92	882	98 21	500	98 34	565	98 99		98 50	
12	102 99	3,961	98 90	906	98 16	475	98 32	555	99 17		98 49	
13	102 82	3,808	98 92	882	98 03	414	98 30	545	99 09		98 51	
14	102 26	3,326	98 86	848	97 00	385	98 29	540	98 84		98 54	
15	191 59	2,787	98 88	850	97 94	363	98 26	525	98 77		98 55	
16	101 29	2,527	98 87	854	97 86	329	98 24	515	98 69		98 58	
17	101 11	2,388	98 99	924	97 88	337	98 25	520	98 64		98 53	
18	100 95	2,268	99 03	948	97 86	329	98 27	530	98 72		98 52	
19	100 77	2,133	98 95	900	97 88	327	98 31	550	98 75		98 53	
20	100 58	1,990	98 92	882	98 07	432	98 36	575	98 76		98 49	
21	100 40	1,860	98 00	870	98 20	495	98 37	580	98 77		98 47	
22	100 26	1,762	98 58	694	98 34	565	98 38	585	98 79		98 47	
23	100 14	1,673	98 73	777	98 35	570	98 41	600	98 67		98 48	
24	100 01	1,577	98 68	740	98 39	590	98 46	628	98 66		98 49	
25	99 99	1,573	98 61	711	98 46	628	98 42	606	98 67		98 50	
26	99 88	1,496	98 44	617	98 41	600	98 44	617	98 71		98 51	
27	99 81	1,447	98 52	661	98 48	639	98 48	639	98 77		98 53	
28	99 48	1,227	98 68	749	98 54	672	98 51	655	98 69		98 54	
29	99 49	1,234	98 43	623	98 38	595	98 50	685	98 67		98 54	
30	99 60	1,305	98 23	510	98 36	575	98 46	605	98 63		98 51	
31	99 45	1,200	98 23	510			98 66	740			98 51	

Notes.—Marked thus (†) interpolated.

Discharges marked thus (‡) are from actual measurements, backwater obtaining at the time.

Ice conditions from January 1 to April 13 and from November 11 to December 31. Data insufficient to compute daily discharge.

Monthly Discharge of Assiniboine River at Brandon for 1916.

[Drainage area 34,500 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....			100 ¹	0.003	0.003	6,149
February.....			75 ¹	0.002	0.002	4,314
March.....			100 ¹	0.003	0.003	6,149
April.....	9,140		4,080 ¹	0.118	0.132	242,777
May.....	4,445	1,902	2,545	0.074	0.085	155,547
June.....	5,130	2,155	3,335	0.097	0.108	198,505
July.....	5,690	1,208	3,185	0.092	0.106	195,900
August.....	1,169	510	870	0.025	0.029	53,494
September.....	672	329	489	0.014	0.016	29,098
October.....	906	515	599	0.017	0.020	36,831
November.....			550 ¹	0.016	0.018	32,727
December.....			200 ¹	0.006	0.007	12,298
The year.....	9,140		1,343	0.039	0.529	974,789

NOTE.—Marked thus (1) estimated.

*Daily Gauge Height and Discharge of Assiniboine River at Pumping Station,
Brandon, for 1906.*

(Drainage area 34,600 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1								6.07				
2								6.07				681
3								6.00		352		686
4								6.04		368		690
5								6.07		380		700
6								6.12		400		710
7										6.14		719
8										6.17		729
9										6.19		734
10										6.23		734
11							7.35	986		6.25		738
12							7.22	902		6.27		748
13							7.10	844		6.31		753
14							7.00	796		6.33		758
15							6.85	724		6.36		762
16							6.70	652		6.39		767
17							6.55	586		6.41		772
18							6.40	520		6.43		772
19							6.24	450		6.47		777
20							6.05	372		6.49		777
21							5.86	302		6.51		782
22							5.68	238		6.53		782
23							5.48	177		6.56		782
24							5.25	117		6.58		786
25							5.50	182		6.60		786
26							5.75	262		6.62		786
27							5.87	305		6.64		786
28							6.00	352		6.67		782
29							6.12	400		6.68		782
30							6.24	450		6.70		782
31							6.17	420		6.72		777
										6.75		
										6.76		

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	6.96	777	6.06	376	5.55	198	7.97	1,300	6.38	511		
2	6.95	772	6.02	360	5.60	213	7.95	1,290	6.40	520		
3	6.94	767	5.97	341	5.62	219	7.95	1,290	6.44	538		
4	6.93	762	5.90	316	5.68	238	7.90	1,260	6.47	551		
5	6.92	758	5.85	298	5.75	262	7.85	1,230	6.50	564		
6	6.91	753	5.80	280	5.82	287	7.80	1,205	6.55	586		
7	6.90	748	5.73	255	5.90	316	7.73	1,165	6.60	608		
8	6.87	734	5.67	235	6.00	352	7.63	1,110	6.65	630		
9	6.86	729	5.60	213	6.10	392	7.47	1,030	6.71	657		
10	6.83	714	5.50	182	6.20	432	7.20	892				
11	6.82	710	5.46	171	6.30	476	6.90	748				
12	6.80	700	5.43	163	6.40	520	6.70	652				
13	6.77	686	5.40	155	6.55	586	6.56	590				
14	6.75	676	5.37	147	6.65	630	6.50	564				
15	6.73	666	5.36	144	7.15	868	6.46	546				
16	6.70	652	5.34	139	7.35	935	6.42	529				
17	6.66	634	5.33	136	7.50	1,045	6.38	511				
18	6.64	626	5.33	136	7.60	1,065	6.36	502				
19	6.60	608	5.32	132	7.66	1,125	6.34	491				
20	6.57	595	5.32	133	7.75	1,175	6.32	481				
21	6.53	577	5.32	133	7.80	1,205	6.31	480				
22	6.49	560	5.33	136	7.84	1,225	6.30	470				
23	6.45	542	5.34	139	7.87	1,245	6.30	476				
24	6.40	520	5.34	139	7.91	1,265	6.30	476				
25	6.37	507	5.35	142	7.94	1,280	6.30	476				
26	6.33	489	5.37	147	7.95	1,290	6.30	476				
27	6.27	463	5.40	155	7.97	1,300	6.31	480				
28	6.23	454	5.41	158	7.98	1,305	6.32	455				
29	6.20	432	5.43	163	8.00	1,315	6.33	489				
30	6.16	416	5.45	169	8.00	1,315	6.35	498				
31	6.12	400	5.50	182			6.36	502				

NOTE.—Daily discharge is deduced from gauge heights observed at the Brandon Pumping Station.

Monthly Discharge of Assiniboine River at Brandon Pumping Station for 1906.

[Drainage area 34,300 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April...	966	.....	500 ¹	0.014	0.016	29,752
May...	676	352	520	0.015	0.017	31,974
June...	786	681	754	0.022	0.025	44,866
July...	777	400	627	0.018	0.021	38,553
August...	376	133	193	0.006	0.007	11,867
September...	1,315	198	805	0.023	0.026	47,901
October...	1,300	476	732	0.021	0.024	45,006
November...	657	.....	500 ¹	0.014	0.016	29,752
The period....	1,315	.....	578	0.017	0.0152	279,674

NOTE.—Marked thus (¹) estimated.

SESSIONAL PAPER No. 26a

*Daily Gauge Height and Discharge of Assiniboine River at Pumping Station,
Brandon, for 1907.*

[Drainage area 34,500 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	15.50	7,230							15.50	7,230	13.30	5,085
2	15.75	7,500							15.75	7,500	13.37	5,145
3	13.75	5,500							13.75	5,500	13.45	5,220
4	13.00	4,825							13.00	4,825	13.47	5,235
5	12.06	4,545							12.06	4,545	13.47	5,235
6									12.45	4,380	13.46	5,230
7									12.25	4,220	13.45	5,220
8									12.06	4,070	13.37	5,145
9									11.95	3,985	13.32	5,100
10									11.85	3,910	13.27	5,060
11									11.75	3,830	13.20	4,995
12									11.65	3,755	13.15	4,955
13							10.07	2,615	11.57	3,695	13.10	4,910
14							10.15	2,670	11.50	3,640	13.04	4,860
15							10.25	2,740	11.45	3,605	12.95	4,785
16							10.30	2,770	11.40	3,570	12.90	4,740
17							10.40	2,840	11.35	3,530	12.85	4,700
18							10.50	2,910	11.32	3,510	12.85	4,700
19							10.60	2,980	11.32	3,510	12.83	4,685
20							10.70	3,055	11.35	3,530	12.83	4,685
21							10.85	3,160	11.40	3,570	12.85	4,700
22							10.98	3,255	11.50	3,640	12.85	4,700
23							11.13	3,370	11.90	3,945	12.87	4,715
24							11.31	3,500	12.15	4,140	12.90	4,740
25							11.50	3,640	11.30	4,260	12.93	4,765
26							11.75	3,830	11.50	4,420	12.96	4,790
27							12.00	4,025	11.65	4,540	13.00	4,825
28							12.30	4,260	11.80	4,660	13.05	4,870
29							12.75	4,620	11.95	4,785	13.10	4,910
30							13.25	5,040	13.05	4,870	13.15	4,955
31									13.20	4,995	13.17	4,970

	July.		August.		September.		October.		November.		December.	
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	13.25	5,040	10.80	3,125	10.33	2,795	10.73	3,075	9.83	2,455		
2	13.35	5,130	10.68	3,040	10.33	2,795	10.67	3,030	9.76	2,410		
3	13.50	5,265	10.68	3,040	10.34	2,800	10.61	2,990	9.70	2,370		
4	13.75	5,500	10.56	2,955	10.35	2,805	10.55	2,945	9.65	2,335		
5	14.00	5,735	10.43	2,865	10.38	2,830	10.50	2,910	9.60	2,300		
6	13.50	5,265	10.32	2,785	10.43	2,865	10.45	2,875	9.55	2,270		
7	13.30	5,085	10.16	2,675	10.55	2,945	10.40	2,840	9.50	2,235		
8	13.20	4,995	10.00	2,570	10.75	3,090	10.37	2,820	9.48	2,225		
9	13.05	4,870	9.87	2,480	10.90	3,200	10.32	2,785	9.46	2,210		
10	12.90	4,740	9.75	2,400	11.00	3,270	10.27	2,750				
11	12.80	4,660	10.00	2,570	11.07	3,325	10.24	2,730				
12	12.70	4,580	10.15	2,670	11.12	3,360	10.20	2,705				
13	12.60	4,500	10.25	2,740	11.15	3,385	10.15	2,670				
14	12.50	4,420	10.30	2,770	11.17	3,400	10.10	2,635				
15	12.45	4,380	10.35	2,805	11.18	3,405	10.05	2,600				
16	12.35	4,300	10.40	2,840	11.20	3,420	10.02	2,580				
17	12.27	4,235	10.45	2,875	11.20	3,420	9.97	2,550				
18	12.20	4,180	10.47	2,890	11.20	3,420	9.95	2,535				
19	12.12	4,120	10.50	2,910	11.19	3,415	9.90	2,500				
20	12.05	4,065	10.50	2,910	11.17	3,400	9.87	2,480			2	
21	11.97	4,000	10.52	2,925	11.16	3,390	9.87	2,480				
22	11.92	3,960	10.52	2,925	11.15	3,385	9.90	2,500				
23	11.85	3,910	10.52	2,925	11.12	3,360	9.93	2,520				
24	11.80	3,870	10.51	2,920	11.08	3,330	10.04	2,595				
25	11.50	3,640	10.48	2,900	11.06	3,315	10.07	2,615				
26	11.40	3,570	10.46	2,885	11.01	3,280	10.09	2,630				
27	11.35	3,530	10.43	2,865	10.96	3,240	10.09	2,630				
28	11.20	3,420	10.40	2,840	10.90	3,200	10.07	2,615				
29	11.10	3,345	10.37	2,820	10.85	3,160	10.00	2,570				
30	11.00	3,270	10.36	2,815	10.78	3,110	9.95	2,535				
31	10.90	3,200	10.35	2,805			9.90	2,500				

NOTE.—Daily discharge is deduced from gauge heights observed at the Brandon Pumping Station.

Monthly Discharge of Assiniboine River at Brandon Pumping Station for 1907.
 [Drainage area 34,500 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acrs. sq.
April	5,040	.....	3,000 ¹	0.087	0.097	178,512
May	7,500	3,510	4,328	0.125	0.144	266,118
June	5,235	4,585	5,068	0.147	0.164	302,757
July	5,735	3,200	4,348	0.126	0.145	267,348
August	3,125	2,400	2,824	0.082	0.095	173,641
September	3,420	2,795	3,204	0.093	0.104	190,651
October	3,075	2,490	2,684	0.078	0.090	168,083
November	2,455	.....	1,800 ¹	0.052	0.058	107,107
The period	7,500	.....	3,413	0.099	0.097	1,651,167

NOTE.—Marked thus (1) estimated.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1									11-00	3,720	9-10	1,975
2									11-06	3,765	8-90	1,850
3									11-75	3,830	8-70	1,720
4									11-83	3,895	8-50	1,600
5									11-93	3,970	8-25	1,455
6												
7									12-03	4,045	8-00	1,315
8									12-15	4,140	7-90	1,205
9									12-30	4,260	7-60	1,095
10									12-50	4,420	7-35	965
									12-65	4,540	7-10	844
11									13-00	4,825	6-85	724
12									13-00	4,825	6-50	584
13									12-80	4,860	6-25	454
14								11-22	3,435	12-65	6-00	352
15								11-24	3,450	12-45	5-65	229
16								11-26	3,465	12-25	5-35	142
17								11-26	3,465	12-07	5-00	59
18								11-27	3,470	11-90	5-00	59
19								11-27	3,470	11-70	5-25	117
20								11-28	3,480	11-50	5-75	262
21												
22								11-28	3,480	11-30	11-00	3,270
23								11-28	3,480	11-10	11-50	3,640
24								11-29	3,485	10-95	11-85	3,910
25								11-30	3,495	10-75	12-25	4,220
								11-33	3,515	10-55	12-50	4,420
26												
27								11-35	3,530	10-35	12-85	4,700
28								11-38	3,555	10-15	13-25	5,040
29								11-42	3,585	9-95	13-50	5,265
30								11-46	3,610	9-75	13-50	5,265
31								11-53	3,665	9-50	13-50	5,265
									9-28	2,090		

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	13-87	5,610	8-85	1,815	7-34	980	7-82	1,215	7-60	1,095		
2	13-75	5,500	8-77	1,765	7-33	955	7-83	1,220	7-62	1,105		
3	13-12	4,925	8-72	1,735	7-33	955	7-83	1,220	7-64	1,115		
4	13-00	4,825	8-67	1,700	7-32	950	7-83	1,220	7-66	1,125		
5	12-85	4,700	8-62	1,670	7-32	950	7-83	1,220	7-68	1,140		
6	12-75	4,620	8-57	1,640	7-32	950	7-82	1,215	7-70	1,150		
7	12-57	4,475	8-53	1,620	7-32	950	7-82	1,215	7-73	1,165		
8	12-42	4,355	8-47	1,580</								

NOTE.—Daily discharge is deduced from gauge heights observed at the Brandon Pumping Station.

Monthly Discharge of Assiniboine River at Brandon Pumping Station for 1908.
(Drainage area 34,500 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.....	3,665	.....	3,000 ¹	0.087	0.097	176,512
May.....	4,825	2,090	3,688	0.107	0.123	226,766
June.....	5,265	50	2,066	0.060	0.067	122,935
July.....	5,610	1,850	3,291	0.095	0.110	202,356
August.....	1,815	965	1,330	0.039	0.045	82,322
September.....	1,210	796	984	0.029	0.032	58,552
October.....	1,220	1,065	1,131	0.033	0.038	69,543
November.....	1,230	.....	1,000 ¹	0.029	0.032	50,504
The period.....	5,610	.....	2,068	0.060	0.544	1,000,500

NOTE.—Marked thus (¹) estimated.

*Daily Gauge Height and Discharge of Assiniboine River at Pumping Station,
Brandon, for 1909.*

(Drainage area 34,500 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1												
2									10.86	3.170	11.25	3.455
3									10.86	3.170	11.00	3.270
4									10.86	3.170	10.75	3.090
5									10.87	3.175	10.40	2.840
6									10.89	3.190	9.90	2.500
7												
8									10.91	3.205	9.40	2.170
9									10.95	3.235	9.05	1.945
10									11.00	3.270	8.85	1.815
11									11.10	3.345	8.70	1.720
12									11.50	3.640	8.58	1.650
13												
14									12.00	4.025	8.48	1.590
15									12.20	4.180	8.35	1.510
16									12.25	4.220	8.26	1.460
17									12.25	4.220	8.18	1.415
18									12.25	4.220	8.11	1.380
19												
20									11.40	3.570	8.05	1.345
21									11.35	3.580	8.00	1.315
22									11.30	3.485	7.95	1.290
23									11.25	3.455	7.93	1.275
24									11.20	3.420	7.90	1.260
25												
26									11.15	3.385	7.88	1.250
27									11.10	3.345	7.87	1.245
28									11.07	3.325	7.86	1.240
29									11.04	3.300	7.84	1.240
30									11.00	3.270	7.87	1.245
31												
32									10.97	3.250	7.90	1.260
33									10.93	3.220	7.94	1.280
34									10.91	3.205	8.00	1.315
35									10.90	3.200	8.10	1.370
36									10.88	3.185	8.75	1.750
37												
38									11.43	3.590		
39												
40												
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NOTE.—Daily discharge is deduced from gauge heights observed at the Brandon Pumping Station.

Monthly Discharge of Assiniboine River at Brandon Pumping Station for 1909.
(Drainage area 24,500 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.....	3,640	.....	3,000 ¹	0.087	0.097	178,512
May.....	4,220	3,170	3,790	0.110	0.127	233,088
June.....	3,458	1,240	1,718	0.060	0.066	102,109
July.....	2,010	1,595	1,745	0.061	0.069	107,296
August.....	3,370	1,710	2,660	0.077	0.089	164,110
September.....	1,780	970	1,209	0.038	0.039	71,940
October.....	1,128	945	1,018	0.030	0.035	62,595
November.....	1,115	.....	800 ¹	0.023	0.026	47,608
The period.....	4,220	.....	1,999	0.058	0.058	967,203

NOTE.—Marked thus (¹) estimated.

SESSIONAL PAPER No. 26a

**Daily Gauge Height and Discharge of Assiniboine River at Pumping Station,
Brandon, for 1910.**

(Drainage area 34,500 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1									9.80	2,105	7.65	1,120
2									9.86	2,070	7.80	1,205
3									9.16	2,010	7.95	1,200
4									9.06	1,945	8.26	1,435
5									8.90	1,850	8.76	1,750
6												
7									8.65	1,600	9.26	2,070
8									8.35	1,510	9.70	2,370
9									8.15	1,400	9.85	2,465
10									8.00	1,200	9.96	2,535
11									7.90	1,316	10.03	2,590
12												
13									7.80	1,205	10.06	2,620
14									7.70	1,150	10.11	2,645
15									7.60	1,096	10.13	2,655
16							9.75	2,400	7.52	1,055	10.12	2,650
17									7.47	1,080	10.11	2,646
18							9.65	2,335	7.40	990	10.05	2,600
19							9.60	2,300	7.37	976	10.00	2,570
20							9.55	2,270	7.35	965	9.90	2,500
21							9.50	2,235	7.32	950	9.80	2,435
22							9.45	2,225	7.30	940	9.70	2,370
23												
24							9.45	2,205	7.28	930	9.55	2,270
25							9.43	2,190	7.27	926	9.46	2,205
26							9.42	2,185	7.27	926	9.35	2,135
27							9.40	2,170	7.27	926	9.27	2,065
28							9.40	2,170	7.28	930	9.26	2,070
29												
30							9.40	2,170	7.30	940	9.25	2,070
31							9.39	2,165	7.33	955	9.27	2,065
							9.38	2,155	7.36	970	9.31	2,110
							9.37	2,150	7.41	995	9.60	2,300
							9.36	2,135	7.47	1,030	9.90	2,500
									7.55	1,070		

	July.		August.		September.		October.		November.		December.	
1	10.15	2,670	7.67	1,130	6.96	772	6.63	577	6.73	666		
2	10.50	2,910	7.63	1,110	6.90	745	6.50	564	6.77	686		
3	10.80	3,125	7.60	1,095	6.80	700	6.47	551	6.84	719		
4	11.45	3,605	7.67	1,080	6.75	676	6.46	546	6.90	745		
5	11.50	3,640	7.55	1,070	6.74	671	6.43	533	6.96	772		
6	11.50	3,640	7.53	1,055	6.74	671	6.42	529	7.00	796		
7	11.45	3,605	7.50	1,045	6.75	676	6.40	520	7.05	820		
8	11.30	3,496	7.45	1,020	6.80	700	6.39	516	7.08	834		
9	11.10	3,345	7.40	990	6.85	724	6.38	511	7.12	854		
10	10.90	3,200	7.37	976	6.92	758	6.38	511	7.16	868		
11	10.65	2,920	7.32	950	6.97	782	6.37	507	7.18	882		
12	10.45	2,876	7.26	916	6.70	652	6.37	507	7.20	892		
13	10.25	2,740	7.20	892	6.70	652	6.37	507				
14	10.06	2,600	7.15	868	6.70	652	6.37	507				
15	9.90	2,500	7.10	844	6.70	652	6.37	507				
16	9.65	2,335	7.03	810	6.70	652	6.37	507				
17	9.50	2,235	7.00	796	6.70	652	6.37	507				
18	9.25	2,070	7.00	796	6.70	652	6.38	511				
19	9.06	1,946	7.00	796	6.66	772	6.38	511				
20	8.85	1,816	7.05	820	6.90	748	6.40	520				
21	8.60	1,660	7.16	868	6.87	734	6.40	520				
22	8.45	1,570	7.35	955	6.83	714	6.42	529				
23	8.35	1,510	7.40	990	6.78	690	6.44	538				
24	8.20	1,430	7.40	990	6.75	676	6.45	542				
25	8.10	1,370	7.40	990	6.70	652	6.47	551				
26												
27	8.00	1,316	7.35	955	6.67	639	6.50	564				
28	7.93	1,275	7.31	940	6.64	626	6.52	572				
29	7.87	1,245	7.26	916	6.62	617	6.56	590				
30	7.80	1,206	7.15	868	6.58	599	6.60	608				
31	7.76	1,175	7.10	844	6.55	586	6.63	621				
	7.70	1,150	7.05	820			6.68	643				

NOTE.—Daily discharge is deduced from gauge heights observed at the Brandon Pumping Station.

Monthly Discharge of Assiniboine River at Brandon Pumping Station for 1910.
(Drainage area 34,500 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.....	2,400	.....	2,000 ¹	0.058	0.065	119,008
May.....	2,105	926	1,329	0.038	0.042	75,540
June.....	2,655	1,120	2,212	0.064	0.071	131,623
July.....	3,640	1,150	2,231	0.065	0.078	143,337
August.....	1,120	796	942	0.027	0.031	57,921
September.....	782	586	683	0.020	0.022	40,641
October.....	643	507	540	0.016	0.018	33,208
November.....	892	.....	300 ¹	0.014	0.016	29,752
The period.....	3,640	.....	1,304	0.038	0.043	631,044

NOTE.—Marked thus (¹) estimated.

**Daily Gauge Height and Discharge of Assiniboine River at Pumping Station,
Brandon, for 1911.**

(Drainage area 34,800 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	10.00	2,570	10.65	3,020					10.00	2,570	10.65	3,020
2	9.85	2,465	10.85	3,160					9.85	2,465	10.85	3,160
3	9.65	2,335	11.00	3,270					9.65	2,335	11.00	3,270
4	9.50	2,235	11.17	3,400					9.50	2,235	11.17	3,400
5	9.37	2,160	11.33	3,515					9.37	2,160	11.33	3,515
6									9.27	2,065	11.43	3,590
7									9.20	2,040	11.53	3,665
8									9.12	1,990	11.57	3,695
9									9.07	1,953	11.59	3,710
10									9.02	1,925	11.59	3,710
11									8.97	1,895	11.57	3,695
12									8.95	1,880	11.52	3,655
13									8.93	1,865	11.45	3,605
14									8.92	1,860	11.30	3,495
15									8.90	1,850	11.05	3,310
16												
17							8.47	1,580	8.90	1,840	10.85	3,160
18							8.58	1,650	8.99	1,840	10.55	3,020
19							8.75	1,750	8.90	1,840	10.40	2,940
20							9.00	1,910	8.89	1,840	10.25	2,740
21							9.30	2,105	8.90	1,850	10.10	2,635
22							10.00	2,570	8.92	1,860	10.00	2,570
23							10.40	2,840	8.94	1,875	9.90	2,470
24							10.45	2,875	8.96	1,885	9.77	2,410
25							10.47	2,890	9.00	1,910	9.67	2,350
26							10.47	2,890	9.06	1,950	9.58	2,290
27							10.45	2,875	9.15	2,010	9.50	2,235
28							10.40	2,840	9.25	2,070	9.40	2,170
29							10.35	2,805	9.40	2,170	9.35	2,135
30							10.25	2,740	9.75	2,400	9.25	2,070
31							10.15	2,670	10.15	2,670	9.20	2,040
									10.45	2,875		

	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	9.15	2,010	8.70	1,720	7.74	1,170	6.96	777	7.23	906		
2	9.10	1,975	8.55	1,630	7.70	1,150	7.00	796	7.23	906		
3	9.05	1,945	8.40	1,540	7.58	1,085	7.06	825	7.23	906		
4	9.00	1,910	8.25	1,445	7.45	1,020	7.14	863	7.23	906		
5	8.93	1,865	8.08	1,360	7.42	1,000	7.25	916	7.23	906		
6	8.88	1,835	7.95	1,290	7.43	1,010	7.45	1,020	7.23	906		
7	8.84	1,810	7.80	1,205	7.45	1,020	8.00	1,315	7.23	906		
8	8.80	1,785	7.70	1,150	7.65	1,120	8.45	1,570	7.23	906		
9	8.77	1,765	7.60	1,095	7.75	1,175	8.60	1,660	7.23	906		
10	8.75	1,750	7.60	1,045	7.87	1,245	8.70	1,720	7.23	906		
11	8.73	1,740	7.43	1,010	7.90	1,260	8.78	1,770				
12	8.72	1,735	7.35	965	7.90	1,260	8.82	1,795				
13	8.72	1,735	7.30	940	7.85	1,230	8.85	1,815				
14	8.72	1,735	7.24	911	7.75	1,175	8.87	1,830				
15	8.73	1,740	7.20	892	7.60	1,045	8.87	1,830				
16	8.75	1,750	7.15	868	7.35	965	8.85	1,815				
17	8.77	1,765	7.13	858	7.20	892	8.80	1,785				
18	8.81	1,790	7.10	844	7.13	858	8.70	1,720				
19	8.85	1,815	7.08	834	7.05	820	8.63	1,680				
20	8.93	1,865	7.07	830	7.00	796	8.53	1,620				
21	9.07	1,955	7.07	830	6.97	782	8.40	1,540				
22	9.20	2,040	7.08	834	6.93	762	8.30	1,485				
23	9.22	2,055	7.10	844	6.91	753	8.17	1,410				
24	9.25	2,070	7.15	868	6.90	748	8.00	1,315				
25	9.25	2,070	7.25	916	6.88	738	7.87	1,245				
26	9.25	2,070	7.50	1,045	6.88	738	7.75	1,175				
27	9.20	2,040	7.62	1,105	6.59	743	7.60	1,095				
28	9.15	2,010	7.70	1,150	6.90	748	7.47	1,030				
29	9.06	1,945	7.73	1,168	6.92	758	7.35	965				
30	8.95	1,880	7.75	1,175	6.94	767	7.30	940				
31	8.80	1,785	7.75	1,175			7.25	916				

NOTE.—Daily discharge is deduced from gauge heights observed at the Brandon Pumping Station.

Monthly Discharge of Assiniboine River at Brandon Pumping Station for 1911.

(Drainage area 34,500 square miles.)

MONTH.	DISCHARGE IN SECOND-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.....	2,890	.....	1,500 ¹	0.043	0.045	59,256
May.....	2,875	1,540	2,064	0.060	0.069	126,910
June.....	3,710	2,040	2,969	0.087	0.097	177,358
July.....	3,070	1,735	1,879	0.054	0.062	115,556
August.....	1,720	830	1,032	0.031	0.036	69,680
September.....	1,260	735	941	0.028	0.031	57,163
October.....	1,530	777	1,363	0.040	0.046	63,908
November.....	908	.....	700 ¹	0.020	0.022	41,653
The period.....	3,710		1,568	0.045	0.411	758,734

NOTE.—Marked thus ¹ estimated.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 28a

Daily Gauge Height and Discharge of Assiniboine River at Pumping Station, Brandon, for 1912.

(Drainage area 34,800 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1									14 00	5,735	15 06	6,770
2									13 50	5,640	14 06	6,665
3									13 50	5,545	14 05	6,560
4									13 55	5,405	14 12	6,430
5									13 55	5,319	14 58	6,295
6									13 50	5,265	14 43	6,145
7									13 50	5,265	14 25	5,970
8									13 50	5,265	14 05	5,780
9									13 52	5,285	13 52	5,565
10									13 55	5,405	13 55	5,310
11									14 15	5,875	13 25	5,040
12									14 50	6,215	12 25	4,620
13									14 70	6,410	11 00	3,945
14									14 55	6,590	10 57	3,030
15									15 02	6,720	10 50	2,980
16									15 15	6,860	10 00	2,980
17									15 25	6,950	19 52	2,995
18									15 33	7,050	11 00	3,270
19							2	4,220	15 35	7,070	12 00	4,025
20							1	5,970	15 35	7,100	12 30	4,260
21									15 45	7,120	12 34	4,290
22							14 45	6,165	15 42	7,140	12 34	4,290
23							14 48	6,195	15 42	7,140	12 32	4,275
24							14 50	6,215	15 42	7,140	12 25	4,220
25							14 47	6,185	15 42	7,140	12 05	4,065
26							14 45	6,165	15 41	7,120	11 55	3,910
27							14 37	6,090	15 40	7,120	11 55	3,755
28							14 30	6,020	15 35	7,070	11 45	3,605
29							14 20	5,920	15 32	7,040	11 20	3,420
30							14 12	5,845	15 25	6,960	11 00	3,270
31									15 15	6,870		

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	10 75	3,090	9 17	2,020	8 32	1,405	13 34	5,120				
2	10 45	2,875	9 17	2,020	8 35	1,500	13 34	5,120				
3	10 20	2,705	9 17	2,020	8 35	1,510	13 32	5,100				
4	9 54	2,525	9 16	2,015	8 37	1,525	13 27	5,060				
5	9 55	2,335	9 15	2,010	8 40	1,540	13 10	4,910				
6	9 40	2,170	9 14	2,000	8 45	1,570	12 50	4,660				
7	9 15	2,019	9 13	1,995	8 53	1,620	12 50	4,660				
8	9 10	1,975	9 12	1,990	8 50	1,785	12 25	4,420				
9	9 06	1,945	9 08	1,965	9 15	2,010	12 00	4,025				
10	9 02	1,925	9 06	1,960	9 50	2,235	11 50	3,870				
11	9 00	1,910	9 08	1,930	9 75	2,400	11 40	3,720				
12	8 58	1,900	9 00	1,919	10 02	2,580	11 40	3,570				
13	8 58	1,900	8 57	1,895	10 27	2,750	11 25	3,455				
14	8 59	1,905	8 53	1,865	10 50	2,919	11 07	3,325				
15	9 01	1,920	8 59	1,840	10 75	3,090	10 53	3,220				
16	9 08	1,930	8 55	1,815	10 95	3,235	10 50	3,125				
17	9 05	1,945	8 51	1,790	11 15	3,385	10 55	3,020				
18	9 07	1,955	8 76	1,760	11 35	3,530	10 52	2,925				
19	9 09	1,970	8 71	1,725	11 55	3,680	10 38	2,830				
20	9 11	1,980	8 66	1,695	11 75	3,830	10 27	2,750				
21	9 12	1,990	8 61	1,665	11 95	3,985	10 15	2,679				
22	9 13	1,995	8 54	1,625	12 15	4,140	10 05	2,600				
23	9 14	2,000	8 48	1,590	12 30	4,290	9 55	2,535				
24	9 15	2,019	8 43	1,579	12 48	4,400	9 55	2,465				
25	9 16	2,015	8 41	1,545	12 65	4,540	9 75	2,400				
26	9 17	2,020	8 37	1,525	12 80	4,660	9 79	2,370				
27	9 17	2,020	8 35	1,510	13 00	4,825	9 55	2,335				
28	9 17	2,020	8 32	1,500	13 15	4,955	9 50	2,300				
29	9 17	2,020	8 32	1,495	13 27	5,060	9 55	2,270				
30	9 17	2,020	8 31	1,490	13 32	5,100	9 50	2,235				
31	9 17	2,020	8 32	1,495			9 45	2,205				

NOTE.—Daily discharge is deduced from gauge heights observed at the Brandon Pumping Station.

Monthly Discharge of Assiniboine River at Brandon Pumping Station for 1912.
[Drainage area 34,500 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.....	6,215	.....	3,500 ¹	0.101	0.113	208,264
May.....	7,140	5,265	6,415	0.186	0.214	394,443
June.....	6,770	2,980	4,591	0.133	0.148	273,183
July.....	3,090	1,900	2,097	0.061	0.070	128,939
August.....	2,020	1,490	1,781	0.052	0.060	109,510
September.....	5,100	1,495	3,137	0.091	0.102	186,664
October.....	5,120	2,205	3,382	0.098	0.113	207,951
November.....	.....	.....	1,800 ¹	0.052	0.058	107,107
December.....	.....	.....	1,000 ¹	0.029	0.033	61,488
The period.....	7,140	.....	3,076	0.089	0.091	1,677,549

NOTE.—Marked thus (¹) estimated.

ASSINIBOINE RIVER AT HEADINGLY.
STATION No. 5. M.J1

History.—The station was established by S. S. Scovil on April 9, 1913 and has been in continuous operation since that date. It was established to supersede the station which had been in operation previously at a point eleven miles downstream and at the westerly limits of the city of Winnipeg. This latter station was found to be affected by back water caused by the operation of the St. Andrew's dam on the Red river. The station at Headingly is beyond the effect of this dam.

Location of Section.—The meter section is located at the downstream side of the Canadian Pacific Railway bridge, which crosses the Assiniboine river one-quarter of a mile south of the station of Headingly and fourteen miles upstream from the junction of the Assiniboine and Red rivers.

This bridge is used for all discharge measurements taken during the open water seasons. In the winter, measurements are taken from the ice at a point about four hundred feet upstream from the bridge.

Drainage Area.—The drainage area of the river above the station at this point is 59,420 square miles.

Channel.—The channel above and below the metering section is straight. The bed of the channel is of clay and not liable to shifting. The banks are of sufficient height to confine the discharge to the channel at all stages of the river.

Gauge.—A vertical staff gauge is secured to crib work at the north bank of the river and at the upstream side of the bridge. This gauge is used throughout the open water season. During the winter, a staff gauge secured to the crib work around the north pier of the bridge is used to obtain the daily readings. Both of these gauges are referred to an arbitrary datum.

Discharge Measurements.—Since this station was established, discharge measurements have been taken at frequent intervals over a range in stage of 11.93 feet, corresponding to a range in discharge of from 360 to 20,200 c.f.s.

Records Available.—From April 17, 1913 to April 2, 1914 continuous records of daily gauge height for the open water seasons, and intermittent records of gauge height for the winter seasons, have been obtained. From April 2, 1914 to December 31, 1916 practically continuous records of daily gauge height have been obtained.

Based on these gauge heights, estimates of daily discharge throughout the greater part of the above periods are available.

Estimates of mean monthly discharge based on gauge readings and actual measurements are available.

Accuracy.—Between gauge heights 75.3 and 87.3 the discharge curve is well defined for open water conditions. Under ice conditions the discharge curve is fairly well defined between gauge heights 73.8 and 76.1.

Discharge Measurements of Assiniboine River at Headingly for 1916.

Date	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 24	C. O. Allen	1,912	260	628	0.35	76.20	219.8 ¹
Feb. 17	C. O. Allen	1,912	270	643	0.33	76.47	212.1 ¹
April 8	C. O. Allen	1,912	263	694	0.39	76.89	270.5 ¹
April 25	C. O. Allen	1,912	357	4,537	4.45	87.27	20,190.1
April 26	C. O. Allen	1,912	357	4,394	4.34	86.82	19,071.2
May 1	C. O. Allen	1,912	333	3,438	3.54	84.15	12,171.5
May 13	C. O. Allen	1,435	322	2,382	2.97	81.19	7,074.5
June 20	C. O. Allen	1,496	314	2,050	2.73	80.39	5,620.2
Aug. 24	R. C. Robinson	1,196	237	1,025	1.31	76.75	1,342.9
Sept. 7	R. C. Robinson	1,196	225	906	1.07	76.33	969.2
Oct. 12	R. C. Robinson	1,614	215	847	0.98	76.17	830.2
Oct. 26	R. C. Robinson	1,435	221	863	1.03	76.15	889.1

Note—¹Ice measurement.

Daily Gauge Height and Discharge of Assiniboine River at Headingly for 1916.

[Drainage area 59,420 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	75.97	254	76.37	229	76.54	222	76.77	237	83.91	12,060	79.79	4,470
2	75.93	246	76.37	227	76.54	222	76.77	237	83.66	11,530	79.73	4,380
3	75.92	244	76.36	223	76.55	222	76.77	237	83.16	10,480	79.80	4,485
4	75.92	244	76.35	220	76.55	222	76.77	237	82.81	9,775	79.77	4,440
5	75.96	246	76.33	214	76.55	222	76.77	237	82.71	9,575	79.78	4,460
6	75.96	244	76.36	218	76.55	222	76.80	242	82.47	9,105	79.89	4,615
7	75.93	229	76.42	227	76.60	229	76.82	246	82.11	8,430	79.91	4,650
8	75.97	230	76.42	225	76.60	227	76.87	256	81.91	8,060	79.93	4,680
9	75.95	223	76.41	222	76.60	227	76.94	261	81.71	7,690	80.01	4,800
10	75.98	227	76.37	213	76.57	222	77.00	273	81.31	6,970	80.07	4,890
11	76.07	235	76.35	207	76.58	223	77.02	293	81.41	7,150	80.11	4,955
12	76.07	235	76.45	222	76.57	222	77.04	1,440	81.30	6,950	80.13	4,985
13	76.07	225	76.44	218	76.57	222	77.20	1,565	81.21	6,795	80.21	5,110
14	76.05	218	76.45	220	76.59	223	77.77	2,043	81.03	6,490	80.23	5,140
15	76.02	211	76.45	218	76.59	223	79.06	2,670	80.92	6,280	80.29	5,230
16	76.08	216	76.47	222	76.62	227	80.76	3,400	80.79	6,060	80.30	5,250
17	76.12	213	76.47	211	76.62	227	81.01	4,282	80.60	5,745	80.33	5,300
18	76.14	213	76.47	211	76.62	225	83.56	5,250	80.44	5,485	80.33	5,300
19	76.16	216	76.48	213	76.62	225	82.40	6,300	80.31	5,270	80.38	5,380
20	76.17	211	76.49	214	76.63	225	81.60	7,490	80.26	5,190	80.39	5,400
21	76.21	218	76.48	213	76.64	227	84.01	13,610	80.06	4,870	80.36	5,350
22	76.20	214	76.50	216	76.64	225	85.51	15,750	80.03	4,830	80.31	5,270
23	76.23	218	76.50	216	76.67	231	86.71	18,780	80.01	4,800	80.36	5,350
24	76.22	216	76.50	216	76.67	229	87.36	20,470	80.01	4,800	80.31	5,270
25	76.23	216	76.51	218	76.69	233	87.11	19,820	79.93	4,680	80.36	5,350
26	76.22	214	76.52	220	76.72	238	87.61	21,130	79.93	4,680	80.43	5,465
27	76.27	222	76.52	220	76.72	237	87.81	21,670	80.01	4,800	80.41	5,435
28	76.32	229	76.52	218	76.74	238	85.91	16,750	80.06	4,780	80.31	5,270
29	76.36	235	76.52	218	76.74	238	85.60	16,200	79.91	4,650	80.31	5,270
30	76.37	237	76.52	218	76.74	238	84.27	12,850	79.83	4,525	80.31	5,270
31	76.37	235	76.52	218	76.76	242	79.82	12,850	79.82	4,515	80.31	5,270
	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	80.31	5,270	77.77	2,040	76.41	990	76.13	810	76.30	920	76.46	591
2	80.39	5,400	77.64	1,925	76.41	990	76.15	825	76.25	890	76.46	578
3	80.39	5,400	77.54	1,845	76.41	990	76.10	790	76.27	900	76.51	591
4	80.31	5,270	77.53	1,835	76.31	925	76.26	895	76.29	915	76.53	587
5	80.26	5,190	77.47	1,785	76.21	860	76.20	855	76.30	920	76.57	596
6	80.30	5,290	77.47	1,785	76.20	855	76.21	860	76.33	940	76.54	566
7	80.31	5,270	77.42	1,740	76.31	925	76.23	875	76.37	965	76.52	548
8	80.35	5,330	77.33	1,670	76.21	860	76.32	935	76.39	980	76.52	540
9	80.43	5,410	77.26	1,615	76.25	890	76.24	880	76.35	955	76.52	524
10	80.31	5,270	77.23	1,590	76.29	915	76.19	850	76.37	965	76.54	524
11	80.40	5,410	77.32	1,660	76.29	855	76.13	810	76.33	840	76.52	507
12	80.42	5,450	77.33	1,670	76.10	830	76.15	825	76.34	825	76.37	448
13	80.21	5,110	77.31	1,655	76.13	810	76.23	875	76.18	795	76.28	418
14	79.90	4,630	77.25	1,605	76.09	785	76.19	850	76.19	695	76.23	377
15	79.61	4,210	77.09	1,480	76.00	730	76.10	790	75.75	486	76.23	392
16	79.43	3,950	77.06	1,455	75.92	680	76.10	790	75.81	496	76.23	385
17	79.23	3,670	76.96	1,380	75.92	680	76.03	750	75.82	489	76.23	378
18	79.09	3,490	76.85	1,300	76.00	730	76.04	755	75.83	486	76.33	391
19	78.91	3,260	76.91	1,345	75.92	680	76.12	805	75.73	445	76.33	390
20	78.91	3,260	76.81	1,270	75.94	695	76.10	790	75.83	470	76.24	350
21	78.74	3,060	76.73	1,210	75.95	700	76.10	760	76.66	875	76.24	351
22	78.61	2,910	76.73	1,210	75.82	625	76.03	750	76.72	895	76.23	342
23	78.51	2,790	76.75	1,225	75.80	615	76.12	805	76.56	775	76.23	338
24	78.41	2,680	76.80	1,260	75.80	615	76.12	805	76.53	735	76.26	338
25	78.30	2,570	76.71	1,195	75.82	625	76.14	815	76.53	720	76.26	331
26	78.21	2,470	76.80	1,260	75.80	615	76.13	810	76.57	725	76.26	321
27	78.12	2,380	76.69	1,185	76.10	790	76.15	815	76.59	720	76.28	321
28	78.03	2,290	76.56	1,090	76.15	825	76.20	855	76.62	725	76.28	318
29	77.94	2,235	76.59	1,115	76.10	790	76.23	875	76.62	705	76.25	312
30	77.81	2,175	76.52	1,065	76.09	785	76.27	900	76.53	640	76.28	307
31	77.81	2,080	76.51	1,055	76.09	785	76.28	905	76.53	640	76.28	307

Monthly Discharge of Assiniboine River at Headingly for 1916.

(Drainage area 59,420 square miles.)

MONTH;	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in Inches on Drainage area.	Total in acre-feet.
January.....	254	211	227	0.004	0.005	13,958
February.....	229	207	218	0.004	0.004	12,540
March.....	242	222	228	0.004	0.005	14,019
April.....	21,670	237	7,141	0.120	0.134	424,919
May.....	12,060	4,515	6,678	0.112	0.129	410,614
June.....	5,465	4,380	5,041	0.085	0.095	299,961
July.....	5,450	2,080	3,971	0.067	0.077	244,167
August.....	2,040	1,055	1,468	0.025	0.029	90,263
September.....	990	615	789	0.013	0.014	46,949
October.....	935	750	830	0.014	0.016	51,035
November.....	980	445	760	0.013	0.014	45,223
December.....	596	301	429	0.007	0.008	26,378
The year.....	21,670	207	2,315	0.039	0.530	1,680,026

SHELL RIVER.

The Shell river is one of the largest tributaries of the Assiniboine, emptying into that river in Tp. 23, R. 29, W.P. M. The source of the river is on the north western slope of the Duck mountains which it parallels for a considerable distance, the course being almost due south for the entire length of the river. About five miles from the junction with the Assiniboine it turns sharply to the west and flows in that direction to its mouth.

The watershed drained is narrow, lying between that of the valley and the Assiniboine, except at the upper part where it opens out to a width of about thirty-five miles, the total length of the basin being about sixty miles, though the river itself has a length of ninety miles.

In the upper part of the basin the river flows through the Duck Mountain forest reserve, a district in which valuable timber is to be found. The valley of the river is narrow and quite deep, varying between one hundred and three hundred and fifty feet. The valley itself is gravelly and boulder strewn, but the land forming the upper benches and table land is good for agriculture.

At Asessippi, the only town located on the stream, a small flour mill was operated by water power from 1884 to 1911 in which year the dam was washed out.

SHELL RIVER AT ASESSIPPI.

STATION No. 5. M.D.1

History.—The first measurement under direction of this Survey was taken on the Shell river at Asessippi by W. J. Ireland on September 15, 1913. This measurement was taken from the downstream side of the traffic bridge, a short distance below the dam.

As a permanent station this location was not satisfactory, and on June 9, 1914 a cable carrier station was established downstream from the bridge. This station has been in continuous operation since that date.

Location of Section.—This station is located on the Shell river, one and one-quarter mile downstream from the traffic bridge in the town of Asessippi and fourteen miles north of the town of Russell.

Drainage Area.—The drainage area of the river above this point is 930 square miles.

Channel.—The channel is straight above and below the section for a short distance, though the general course of the river is very sinuous. The bed of the channel is composed of gravel and boulders. The banks are high and not liable to overflow.

Gauge.—A vertical staff gauge is located about one mile above the meter section. This gauge is referred to an arbitrary datum.

Discharge Measurements.—Since the establishment of this station discharge measurements have been made over a range of 1.94 feet, corresponding to a range in discharge of from 40 to 600 c.f.s.

Records Available.—From June 9, 1914 to December 31, 1916 continuous records of daily gauge height have been obtained.

Based on these gauge heights, estimates of daily discharge throughout the open water season are available.

Estimates of mean monthly discharge based on daily gauge heights and actual discharge measurements are also available.

Accuracy.—Between gauge heights 91.02 and 92.96 the discharge curve is well defined. Beyond these limits the curve is not well defined.

Discharge Measurements of Shell River at Asessippi for 1916.

Date.	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 21	M. S. Madden.	1,462	30	35	1.09	90.66	38.7
Mar. 30	G. Gainsford.	1,939	39	?	0.88	93.28	32.5
April 24	M. S. Madden.	1,469	52	141	4.46	92.96	627.5
June 10	R. C. Robinson.	1,196	49	130	3.92	92.56	508.8
July 5	R. C. Robinson.	1,196	49	115	4.04	92.63	465.4
Aug. 7	R. C. Robinson.	1,196	39	54	1.86	91.43	97.6
Oct. 2	R. C. Robinson.	1,614	40	55	1.73	91.68	94.5
Nov. 17	R. C. Robinson	1,496	41	52	1.99	92.03	103.1

Note.—¹Ice measurement.

Daily Gauge Height and Discharge of Shell River at Asessippi for 1916.

(Drainage area 930 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	91.68		91.84		91.88		93.08		92.46	395	92.64	472
2	91.68		91.88		91.84		93.08		92.26	319	92.66	481
3	91.68		91.88		91.82		92.98		92.19	294	92.66	481
4	91.68		91.88		91.81		92.98		92.22	304	92.62	463
5	91.68		91.88		91.80		92.88		92.20	297	92.56	437
6	91.68		91.98		91.78		92.78		92.16	283	92.56	437
7	91.68		91.98		91.78		92.78		92.16	283	92.56	437
8	91.68		92.08		91.78		92.63		92.13	273	92.56	437
9	91.68		92.08		91.80		92.63		92.11	266	92.56	437
10	91.78		92.08		91.80		93.28		92.16	283	92.55	433
11	91.78		92.08		91.82		93.18		92.24	311	92.52	420
12	91.78		92.18		91.82		92.98		92.26	319	92.46	395
13	91.78		92.28		91.82		92.98		92.36	356	92.42	379
14	91.78		92.28		91.82		92.93		92.38	363	92.36	356
15	91.78		92.28		91.82		92.88		92.41	375	92.34	348
16	91.78		92.28		91.82		93.28		92.41	375	92.32	341
17	91.68		91.98		91.88		93.48		92.46	395	92.31	337
18	91.58		92.08		91.98		93.58		92.54	428	92.29	329
19	91.58		92.08		92.18		93.98	1,285	92.51	415	92.26	319
20	91.58		91.58		92.38		93.73	1,100	92.46	395	92.26	319
21	91.66	38	91.93		92.38		93.50		92.43	383	92.26	319
22	91.64		91.93		92.38		93.25	930	92.38	363	92.26	319
23	91.58		91.93		92.38		93.00	780	92.36	356	92.28	326
24	91.58		91.98		92.83		92.74	645	92.42	379	92.32	341
25	91.66		91.98		92.86		92.76	518	92.46	395	92.36	356
26	91.74		91.98		92.88		92.81	551	92.50	411	92.41	375
27	91.74		91.88		93.08		92.74	518	92.52	420	92.46	395
28	91.76		91.88		93.18		92.62	463	92.54	428	92.61	456
29	91.76		91.88		93.38		92.52	420	92.56	437	92.74	518
30	91.76				93.18	33	92.46	395	92.60	454	92.86	575
31	91.76				93.08				92.62	463		

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	92.87	580	91.59	127	91.08	55	91.69	149	91.82	181	92.02	
2	92.82	555	91.56	121	91.07	54	91.69	149	91.81	179	92.02	
3	92.77	532	91.53	116	91.06	53	91.71	153	91.81	179	92.02	
4	92.72	508	91.49	108	91.05	52	91.71	153	91.81	179	92.02	
5	92.64	472	91.47	105	91.05	52	91.71	153	91.80	176	92.02	
6	92.57	441	91.43	99	91.04	51	91.71	153	91.80	176	92.02	
7	92.47	399	91.41	96	91.04	51	91.70	151	91.80	176	92.02	
8	92.37	360	91.39	93	91.03	50	91.70	151	91.81	179	92.12	
9	92.27	322	91.37	90	91.02	49	91.69	149	91.81	179	92.17	
10	92.14	277	91.55	120	91.02	49	91.68	147	91.82	181	92.17	
11	92.12	270	91.59	127	91.20	68	91.68	147	91.82	181	92.19	
12	92.11	266	91.53	116	91.30	80	91.68	147	91.82		92.19	
13	92.09	260	91.51	112	91.55	119	91.68	147	91.82		92.19	
14	92.07	254	91.49	108	91.60	129	91.68	147	91.82		92.20	
15	91.96	220	91.45	102	91.60	120	91.70	151	91.82		92.22	
16	91.90	212	91.32	83	91.60	120	91.77	168	91.92		92.24	
17	91.80	203	91.33	84	91.60	120	91.81	179	92.02	102	92.24	
18	91.80	203	91.29	79	91.60	120	91.81	179	92.02		92.08	
19	91.86	192	91.25	74	91.60	120	91.81	179	92.02		91.96	
20	91.78	171	91.23	72	91.60	120	91.81	179	92.02		91.90	
21	91.73	159	91.22	70	91.62	133	91.79	174	92.02		91.92	
22	91.68	147	91.21	69	91.63	136	91.80	176	92.02		92.22	
23	91.68	147	91.19	67	91.60	129	91.80	176	92.02		92.22	
24	91.71	154	91.19	67	91.60	129	91.80	176	92.02		92.02	
25	91.76	166	91.18	66	91.62	133	91.80	176	92.02		91.92	
26	91.74	161	91.17	65	91.64	138	91.81	179	92.02		91.80	
27	91.74	161	91.15	63	91.65	140	91.81	179	92.02		91.80	
28	91.71	154	91.14	61	91.66	142	91.82	181	92.02		91.80	
29	91.79	173	91.13	60	91.67	144	91.82	181	92.02		91.80	
30	91.69	149	91.11	58	91.68	147	91.82	181	92.02		91.82	
31	91.63	136	91.09	56			91.82	181			91.82	

Notes.—Marked thus (i) interpolated.

Ice conditions from January 1 to April 18 and from November 12 to December 31, inclusive. Data insufficient to compute daily discharges.

Monthly Discharge of Shell River at Asessippi for 1916.

[Drainage area 930 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....			40 ¹	0.043	0.050	2,460
February.....			30 ¹	0.032	0.035	1,726
March.....			25 ¹	0.027	0.031	1,537
April.....	1,285		404 ¹	0.434	0.484	24,040
May.....	463	266	362	0.389	0.449	22,259
June.....	575	319	401	0.431	0.481	23,861
July.....	580	136	271	0.291	0.336	16,663
August.....	127	56	88	0.095	0.110	5,411
September.....	147	46	102	0.110	0.123	6,069
October.....	181	147	164	0.176	0.203	10,084
November.....	181		125 ¹	0.134	0.149	7,438
December.....			60 ¹	0.065	0.075	3,689
The year.....	1,285		173	0.186	2.526	125,237

NOTE.—Marked thus (¹) estimated.

BIRDTAIL CREEK.

Birdtail creek is one of the small tributaries of the Assiniboine river. It joins the latter in Indian Reserve No. 57. The source of the river is on the south slope of the Riding mountains and the course is generally south from the headwaters to the mouth.

The upper part of the drainage area, which is 400 square miles, is very well timbered and lumbering has been carried on in the district. Towards the mouth the land is given up to agriculture.

There was some question of a small power development on the river, so records of the discharge have been kept. These show that the power output would be very small and subject to interruption during the winter months.

BIRDTAIL CREEK AT BIRTLE.

STATION NO. 5. M.E.2

History.—This station was established by C. O. Allen on May 14, 1914 and since that date has been in operation during open water seasons.

Location of Section.—The metering section is located on the downstream side of the traffic bridge on the road between the Canadian Pacific Railway station and the town of Birtle.

Drainage Area.—The drainage area of the river above the station is 400 square miles.

Channel.—The station is located in a straight stretch of the river approximately 350 feet long. The full discharge of the river at all stages is confined within the limits of the banks. The bed of the channel is composed of clay and silt and not liable to shift.

Gauge.—A vertical staff gauge is secured to the bridge close to the right bank of the stream. It is referred to a permanent M.H.S. bench mark set to an arbitrary datum.

Discharge Measurements.—Since the establishment of the station, discharge measurements have been taken over a range of 3.01 feet, corresponding to a range in discharge of from zero to 540 c.f.s.

Records Available.—From May 14, 1914 to the end of 1916 continuous records of daily gauge height for open water seasons have been obtained. Based on these gauge heights, estimates of daily discharge for open water seasons are available. Estimates of mean monthly discharge based on gauge heights and actual discharge measurements are also available.

Accuracy.—The discharge curve is well defined between gauge heights of 88.5 and 91.5.

Discharge Measurements of Birdtail Creek at Birtle for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
April 26	M. S. Madden.....	1,409	71	172	1.40	90.21	240
June 12	R. C. Robinson.....	1,196	71	214	1.66	90.67	355
July 6	R. C. Robinson.....	1,196	71	244	1.77	90.99	432
Aug. 8	R. C. Robinson.....	1,196	62	84	0.40	88.87	38
Sept. 30	R. C. Robinson.....	1,614	66	126	0.24	89.30	30
Nov. 18	R. C. Robinson.....	1,496	56	77	0.18	89.09	14 ¹

¹Ice measurement.

Daily Gauge Height and Discharge of Birdtail Creek near Birtle for 1918.

(Drainage area 400 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1								0	89.70	152	89.84	176
2								0	89.65	144	89.84	176
3								0	89.65	144	89.79	167
4								0	89.60	136	89.79	167
5								0	89.50	120	89.84	176
6								0	89.40	105	89.84	195
7							89.28	50	89.20	78	89.99	204
8							89.28	100	89.20	78	90.09	223
9							89.08	150	89.20	78	90.19	243
10							90.23	200	89.20	78	90.39	285
11							90.78	250	89.15	72	90.54	319
12							90.43	294	89.15	72	90.78	376
13							90.88	400	89.15	72	90.93	412
14							91.58	566	89.15	66	91.03	436
15							91.89	640	89.10	66	91.03	436
16							91.79	617	89.10	66	90.88	400
17							91.94	652	89.10	66	90.68	352
18							91.89	640	89.10	66	90.18	241
19							91.74	605	89.10	66	90.13	231
20							91.49	545	89.05	60	89.93	202
21							91.39	522	89.04	59	89.98	202
22							91.19	474	89.09	65	89.93	202
23							90.94	415	89.24	83	90.04	221
24							90.74	367	89.24	83	90.18	241
25							90.49	307	89.39	103	90.73	365
26							90.18	241	89.54	126	90.93	412
27							89.90	187	89.59	134	91.18	471
28							89.85	178	89.06	150	91.28	495
29							89.75	160	89.79	167	91.88	637
30							89.70	152	89.79	167	91.93	640
31									89.79	167		

	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	91.88	637	88.98	53	88.82	35	89.27	87	89.52	123		
2	91.68	590	88.98	53	88.82	35	89.27	87	89.57	131		
3	91.58	56	88.98	53	88.77	30	89.27	87	89.62	139		
4	91.48	542	89.03	58	88.72	24	89.32	94	89.62	139		
5	91.28	495	89.03	58	88.72	24	89.32	94	89.57	131		
6	90.98	424	89.03	58	88.77	30	89.32	94	89.52	123		
7	90.78	376	88.98	53	88.77	30	89.32	94	89.52	123		
8	90.58	328	88.87	41	88.82	35	89.32	94	89.47	115		
9	90.48	305	88.82	35	88.87	41	89.37	100	89.42	108		
10	90.18	241	88.82	35	88.87	41	89.37	100	89.32	94		
11	90.08	221	88.77	30	88.82	35	89.37	100	89.32	94		
12	89.88	183	88.72	24	88.82	35	89.37	100	89.32	94		
13	89.78	166	88.72	24	88.87	41	89.37	100	89.27	87		
14	89.78	166	88.77	30	88.97	52	89.42	108	89.22	81		
15	89.83	174	88.77	30	88.97	52	89.42	108	89.17	74		
16	89.83	174	88.72	24	89.02	57	89.42	108	89.17	74		
17	89.68	149	88.72	24	89.07	63	89.42	108				
18	89.63	141	88.72	24	89.07	63	89.42	108				
19	89.53	125	88.67	19	89.07	63	89.42	108				
20	89.48	117	88.67	19	89.07	63	89.42	108				
21	89.48	117	88.62	13	89.07	63	89.42	108				
22	89.38	102	88.62	13	89.07	63	89.37	100				
23	89.38	102	88.62	13	89.07	63	89.37	100				
24	89.18	76	88.62	13	89.12	68	89.42	108				
25	89.18	76	88.62	13	89.17	74	89.42	108				
26	89.13	70	88.62	13	89.17	74	89.47	115				
27	89.08	64	89.62	13	89.22	81	89.47	115				
28	89.03	58	88.62	13	89.17	74	89.47	115				
29	88.98	53	88.72	24	89.27	87	89.52	123				
30	88.98	53	88.77	30	89.31	92	89.47	115				
31	88.98	53	88.82	35			89.50	120				

NOTE.—Marked thro (i) interpolated.

Monthly Discharge of Birdtail Creek at Birtle for 1916.

(Drainage area 400 square miles.)

MONTH.	DISCHARGE IN SECOND-FeET.				RUN-Off.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth. in inches on Drainage area.	Total in acre-feet.
January.....			0 ¹	0 ¹		
February.....			0 ¹	0 ¹		
March.....			0 ¹	0 ¹		
April.....			290 ¹	0.725	0.809	17,236
May.....	167	59	100	0.250	0.288	6,149
June.....	649	167	310	0.775	0.865	18,446
July.....	637	53	224	0.560	0.646	13,773
August.....	58	13	30	0.075	0.087	1,845
September.....	92	24	53	0.132	0.147	3,154
October.....	123	87	104	0.266	0.300	6,395
November.....			80 ¹	0.200	0.222	4,760
December.....			40 ¹	0.100	0.111	2,460
The year.....	649	0	103	0.256	3.480	74,238

NOTE.—Marked thus (1) estimated.

MINNEDOSA RIVER

FORMERLY LITTLE SASKATCHEWAN RIVER.

The source of the Minnedosa river is on the southern slope of the Riding mountains. It flows in a general southeasterly direction until it reaches the town of Minnedosa in Tp. 15, R. 18, W.P.M., at which point it turns and flows almost southwest to its junction with the Assiniboine river in Tp. 10, R. 20, W.P.M., about eight miles west of the city of Brandon.

The drainage area is 1,640 square miles. In the upper part of the basin there are numerous small lakes and in this section the greater part of the drainage is obtained. The largest tributary, the Rolling river, enters the Minnedosa about thirteen miles above Minnedosa.

In the upper waters the country is covered to a considerable extent by stands of good merchantable timber, a considerable portion of which is within the forest reserve. The rest of the country drained is very well settled, the land offering splendid opportunity for agriculture.

The river valley is well defined, lying between 100 and 300 feet below the general level of the surrounding country. It varies in width between one-quarter of a mile and one and one-quarter mile, the course of the river in the valley bottom being very sinuous, almost doubling its length over the total length of the drainage basin.

A number of small towns are to be found along the course of the river, as Rivers, Gautier, Rapid City, Riverdale and Minnedosa, the latter having a population of about 1,700. There are possible power sites on the river, three of which have been developed; these are at Minnedosa, Rapid City and the Brandon Power Company's plant about two miles from the mouth of the river.

MINNEDOSA RIVER AT MIDDLETON BRIDGE.

STATION NO. 5. M.F4

History.—This station was established by E. B. Patterson on May 17, 1915 and has been in practically continuous operation since that date.

Location of Section.—The metering section is located at the downstream side of what is locally known as Middleton's bridge, situated in Sec. 6, Tp. 20, R. 20, W.P.M., and approximately fifteen miles north of the town of Elphinstone.

Drainage Area.—The drainage area of the river above the station is 184 square miles.

Channel.—The bed of the channel at this point is gravel and boulders and not liable to shifting. The discharge is confined within the limits of the banks at the station at all stages.

Gauge.—A vertical staff gauge is secured to a pile on the downstream side of the bridge near the left bank. This gauge is referred to an arbitrary datum.

Discharge Measurements.—Discharge measurements have been obtained over a range in stage of 3.51 feet, corresponding to a range in discharge of from 4 to 560 c.f.s.

Records Available.—From May 17, 1915 to November 10, 1916 continuous records of daily gauge height have been obtained. Based on these gauge readings, estimates of daily gauge height for the open water seasons are also available.

Accuracy.—The discharge curve for this station is not well defined.

*Discharge Measurements of Minnedosa River at Middleton Bridge,
Elphinstone, for 1916.*

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Ft.	Sec. Ft.
June 30	G. K. Gainford	1.861	116	435	1.29	91.96	562

MANITOBA HYDROMETRIC SURVEY

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Daily Gauge Height and Discharge of Minnedosa River at Middleton Bridge for 1916.

(Drainage area 184 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	89.56	396	90.00	180	89.46	53	89.26	37	89.26	37	89.50	66
2	91.06	396	90.66	185	89.36	45	89.36	45	89.36	45	89.50	66
3	91.06	396	90.66	185	89.26	37	89.36	45	89.36	45	89.50	66
4	91.06	396	90.50	176	89.26	37	89.46	53	89.36	45	89.50	66
5	91.04	392	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
6	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
7	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
8	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
9	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
10	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
11	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
12	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
13	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
14	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
15	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
16	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
17	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
18	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
19	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
20	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
21	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
22	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
23	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
24	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
25	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
26	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
27	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
28	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
29	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
30	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66
31	91.06	396	90.56	172	89.26	37	89.46	53	89.26	37	89.50	66

Notes.—Ice conditions from April 2 to April 15 and from November 11 to November 25.
Data insufficient to compute daily discharge.

*Monthly Discharge of Minnedosa River at Middleton Bridge for Period
April to November, 1916.*

(Drainage area 184 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.....	220	.....	71 ^a	0.380	0.424	4,165
May.....	73	22	42	0.228	0.267	2,582
June.....	387	66	144	0.783	0.87	8,560
July.....	306	198	315	1.712	1.974	19,360
August.....	189	63	128	0.696	0.802	7,870
September.....	53	22	37	0.201	0.224	2,202
October.....	53	22	39	0.212	0.244	2,398
November.....	45	.....	25 ^a	0.136	0.152	1,488
The period.....	396	.....	101	0.549	4.957	48,643

Nore.—Marked thus (b) estimated.

**MINNEBOSA RIVER AT ELPHINSTONE (INDIAN BRIDGE).
STATION No. 3. M.F.**

History.—The station was established by E. B. Patterson on May 10, 1915 and has been in practically continuous operation since that date.

Location of Section.—The metering section is located at the downstream side of the traffic bridge, known as Indian bridge, one and one-half mile north of the town of Elphinstone.

Drainage Area.—The drainage area of the river above this station is 380 square miles.

Channel.—The bed of the channel at the section is composed of boulders and not liable to shift. The channel is curved above the section, but the direction of the current is at right angles to the section.

Gauge.—A vertical staff gauge is secured to a pile on the upstream side of the bridge near the left bank. This gauge is referred to an arbitrary datum.

Discharge Measurements.—Discharge measurements have been obtained at this station over a range of 1.95 feet, corresponding to a range in discharge of from 12 to 670 c.f.s.

Records Available.—From May 10, 1915 to December 30, 1916 a continuous record of daily gauge height has been obtained.

Based on these gauge heights, estimates of daily discharge for the open water seasons are available.

Estimates of mean monthly discharge based on gauge heights and actual discharge measurements are available for the whole period.

Accuracy.—The discharge curve is well defined between gauge heights 93.40 and 94.0. Beyond these limits the curve is not well defined.

Discharge Measurements of Minnedosa River at Indian Bridge for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 20	M. S. Madden	1,462	6	4	0 40	95 08	1 6 ¹
Mar. 29	G. K. Gainsford	1,939	11	6	0 67	93 65	4 1 ¹
April 22	M. S. Madden	1,469	73	74	2 36	94 80	173 7
June 30	G. K. Gainsford	1,861	74	146	4 61	95 35	677 2
Nov. 15	R. C. Robinson	1,496	65	43	1 19	94 20	50 9

¹Ice measurement.

*Daily Gauge Height and Discharge of Minnedosa River at Indian Bridge,
Elphinstone, for 1916.*

(Drainage area 380 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	94.83		96.00		96.75		93.85		94.50	189	94.48	184
2	94.83		96.05		96.55		91.05		94.47	182	91.48	184
3	94.80		96.15		96.55		93.95		94.41	168	94.46	180
4	94.76		97.15		96.55		93.75		94.37	159	94.45	178
5	94.68		96.15		96.55				94.38	162	94.51	192
6	94.65		96.15		96.55				94.42	171	94.57	207
7	94.59		96.15		96.55				94.47	166	94.60	214
8	94.54		96.05		96.55				94.52	162	94.62	219
9			95.95		96.55				94.71	159	94.60	214
10			95.90		96.55				94.72	157	94.60	214
11			95.65		96.35		96.55	82	94.60	153	94.61	217
12			95.55		95.85		96.38	87	94.53	148	94.63	222
13			95.55		95.85		96.27	91	94.30	144	94.63	222
14			95.55		95.75		95.65	96	94.30	144	94.64	224
15			95.65		95.35		95.68	101	94.26	136	94.64	224
16			95.65		95.35		95.23	107	94.25	134	94.64	224
17			95.65				95.15	113	94.19	122	94.64	224
18			95.70				95.06	118	94.30	144	94.64	224
19			95.80				94.98	126	94.21	126	94.63	222
20	95.08		95.95				94.83	132	94.17	118	94.59	212
21	95.13		95.95				94.80	138	91.16	116	94.55	202
22	95.25		95.95				94.88	144	94.22	128	94.59	212
23	95.30		95.87				94.61	151	94.27	138	94.73	248
24	95.28		95.97				94.55	157	94.27	138	94.85	281
25	95.15		96.14				94.57	164	94.26	136	94.96	312
26			96.30				94.63	171	94.30	144	95.08	348
27			96.50				94.60	178	94.35	155	95.15	369
28	95.55		96.65				94.55	184	94.35	155	95.13	363
29	95.70		96.75		93.65	4.1	94.55	192	94.36	157	95.21	387
30	95.75				93.81		94.55	202	94.39	164	95.30	415
31	95.83				93.85				94.44	175		

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	95.43	457	94.47	182			93.91	77	94.02	91	94.30	
2	95.34	494	94.42	171			93.94	77	94.01	80	94.12	
3	95.56	500	94.38	162			93.95	79	94.05	96	94.12	
4	95.55	497	94.39	164			94.20	124	94.02	91	94.42	
5	95.50	480	94.38	162			94.15	115	94.02	91	94.45	
6	95.49	477	94.38	162			94.05	96	94.03	92	94.48	
7	95.47	470	94.38	162			94.05	96	94.05	96	94.50	
8	95.42	454	94.36	157			94.03	92	94.05	96	94.56	
9	95.38	441	94.34	153			94.03	92	94.05	96	94.65	
10	95.35	425	94.32	148			94.00	87	94.70		94.64	
11	95.27	406	94.30	144			93.97	82	94.38		94.81	
12	95.20	384	94.28	140			93.95	79	94.33		94.88	
13	95.17	375	94.28	140			93.94	77	94.33		94.78	
14	95.11	357					93.93	75	94.26		94.78	
15	95.04	336					93.92	73	94.20		94.71	
16	94.99	321			93.93	75	93.94	77	94.13		95.05	
17	94.94	307			93.93	75	93.94	77	94.19		95.25	
18	94.89	292			93.93	75	93.95	79	94.18		95.48	
19	94.84	278			93.93	75	93.92	73	94.18		95.45	
20	94.77	259			93.92	73	93.89	68	94.15		95.05	
21	94.72	245			93.92	73	94.01	80	94.15		95.12	
22	94.67	232			93.92	73	93.95	79	94.15		95.25	
23	94.74	251			93.91	72	93.94	77	94.14		95.30	
24	94.67	232			93.89	68	93.91	72	94.18		95.45	
25	94.61	217			93.89	68	93.95	79	94.20		95.55	
26	94.60	214			93.95	79	94.00	87	94.25		95.65	
27	94.55	202			93.94	77	94.02	91	94.30		95.82	
28	94.54	199			93.95	79	94.05	96	94.35		95.91	
29	94.53	197			93.95	79	94.05	96	94.35		96.06	
30	94.53	197			93.94	77	94.05	96	94.39		96.11	
31	94.51	192					93.98	84			96.11	

NOTES.—Ice conditions from January 1 to April 10 and from November 10 to December 31.
Data insufficient to compute daily discharge.

*Monthly Discharge of Minnedosa River at Indian Bridge, Elphinstone,
for 1916.*

[Drainage area 380 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Average.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....			2 ¹	0.005	0.006	123
February.....			2 ¹	0.005	0.005	115
March.....			4 ¹	0.011	0.013	246
April.....	202		120 ¹	0.316	0.353	7,140
May.....	189	116	160	0.395	0.455	9,223
June.....	415	178	245	0.645	0.720	14,579
July.....	500	192	335	0.882	1.017	20,598
August.....			135 ¹	0.355	0.409	8,301
September.....			80 ¹	0.211	0.235	4,760
October.....	124	68	85	0.224	0.258	5,226
November.....	96		40 ¹	0.105	0.117	2,380
December.....			20 ¹	0.053	0.061	1,230
The year.....	500		102	0.268	3.649	73,921

NOTE.—Marked thus (1) estimated.

MINNEBOSA RIVER AT BEILBY'S BRIDGE.

STATION NO. 5. M.F₁

History.—The station was established by W. J. Ireland on March 18, 1914 to supersede the station which had been located at Riverdale, at which station it was found there was considerable fluctuation in stage due to the operation of the power plant at Minnedosa. Since the establishment of the Beilby Bridge station it has been in continuous operation.

Location of Section.—This station was originally located on the downstream side of the traffic bridge, one and one-half mile down stream from the junction of the Rolling and Minnedosa rivers, five miles west of Clan William and twelve miles northwest of Minnedosa. After the spring break-up of 1914 it was found that on account of eddies on the section the location was not satisfactory as a metering station and a cable carrier station was installed four hundred feet down stream from the bridge. Measurements are made at this cross section during all seasons of the year.

Drainage Area.—The drainage area of the river above the station is 1,120 square miles.

Channel.—The station is located in the centre of a straight stretch of the river eight hundred feet long. The bed and banks are of silt and gravel and fairly permanent, though there may be a shift at the control point a short distance down stream during extreme stages of the river. The banks are low and subject to overflow during high stages.

Gauge.—A vertical staff gauge is secured to a pile on the downstream side of the bridge above the section and is referred to a permanent M.H.S. bench mark, seventy-three feet north of the north end of the bridge. This bench mark is set to an arbitrary datum.

Discharge Measurements.—Since this station was established, discharge measurements have been taken over a range in stage of 3.53 feet, corresponding to a range in discharge of from practically zero to 830 c.f.s.

Records Available.—From April 25, 1914 to December 31, 1916 continuous records of daily gauge height during the open water seasons and intermittent gauge heights during the winter seasons have been obtained.

Based on these gauge readings, estimates of daily discharge are available for the open water seasons.

Estimates of mean monthly discharge based on gauge heights and actual discharge measurements are available over the above period.

Accuracy.—Throughout the range in stage covered by the discharge measurements, viz., between gauge heights 93.7 and 97.2 the discharge curve is fairly well defined.

Discharge Measurements of Minnedosa River at Beilby's Bridge for 1916.

Date.	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 19	M. S. Madden	1,462	64	69	0.21	94.54	14.4 ¹
Mar. 22	G. Gaimstord	1,939	7	21	0.32	94.28	6.8 ¹
Apr. 21	M. S. Madden	1,469	74	414	1.85	96.08	766.3
June 9	R. C. Robinson	1,196	77	233	1.69	95.29	393.9
July 3	R. C. Robinson	1,196	86	376	2.21	97.21	830.6
Aug. 6	R. C. Robinson	1,196	76	171	1.11	94.75	189.4
Sept. 29	R. C. Robinson	1,614	75	112	0.45	93.96	50.4
Nov. 11	R. C. Robinson	1,496	77	368	0.30	94.56	110.3

(¹) Ice measurement.

MANITOBA HYDROMETRIC SURVEY

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Daily Gauge Height and Discharge of Minnedosa River at Beilby's Bridge for 1916.

(Drainage area 1,120 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	94.39		94.40				94.50		95.57	418	95.19	319
2									95.57	418	95.21	319
3									95.58	421	95.21	325
4					91.29		94.79		95.54	410	95.21	325
5	94.44		94.47						95.47	392	95.23	330
6							94.79		95.41	377	95.25	335
7					94.29				95.39	371	95.26	338
8	94.40		94.14				94.79		95.34	358	95.27	340
9							94.99		95.31	351	95.29	345
10							95.04		95.29	345	95.20	345
11	94.49				94.29		95.34		95.19	319	95.29	345
12			94.39				95.39	309	95.14	306	95.27	340
13							95.56	325	95.09	293	95.23	330
14					94.29		95.34	340	95.07	288	95.19	319
15	94.49		94.34				95.51	351	94.94	254	95.17	314
16							95.39	371	94.91	247	95.15	309
17							95.09	527	94.89	242	95.14	306
18					91.29		96.39	631	94.87	237	95.14	306
19	94.49		94.31				96.21	585	94.84	229	95.09	293
20							96.01	533	94.81	222	95.19	319
21							95.97	522	94.80	219	95.29	345
22	94.46		94.31		94.28		95.94	514	94.79	217	95.44	384
23							95.87	496	94.79	217	95.54	410
24					94.28		95.83	486	94.89	242	95.69	449
25	94.44						95.71	455	94.94	254	96.09	553
26			94.29				95.69	449	94.99	267	96.29	605
27							95.67	444	95.04	280	96.49	657
28					94.29		95.64	436	95.09	293	96.69	709
29	94.47		94.29				95.59	423	95.11	299	96.94	774
30							95.49	397	95.14	306	97.11	819
31									95.17	314		

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	97.39	891	94.95 ¹	257	94.05 ¹	72	93.94 ¹	58	94.21	95	94.44	
2	97.30 ¹	868	94.93	252	94.05	72	93.94	58	94.22 ¹	96	94.45 ¹	
3	97.21	845	94.88 ¹	239	94.14 ¹	84	93.94 ¹	58	94.24	99	94.46 ¹	
4	97.08 ¹	811	94.83	227	94.24	99	93.94	58	94.26 ¹	95	94.47	
5	96.94	774	94.79 ¹	217	94.24 ¹	99	93.96 ¹	60	94.27	92	94.48 ¹	
6	96.89 ¹	761	94.75	207	94.24	99	93.97	61	94.28 ¹	89	94.48 ¹	
7	96.84 ¹	748	94.72 ¹	199	94.19 ¹	92	93.99 ¹	64	94.29	86	94.49	
8	96.79	735	94.69	192	94.14	84	94.01	66	94.30 ¹	83	94.51 ¹	
9	96.72 ¹	717	94.63 ¹	177	94.11 ¹	80	94.04 ¹	70	94.31	80	94.53 ¹	
10	96.64	696	94.57	162	94.09	77	94.07	74	94.39		94.54	
11	96.53 ¹	668	94.53 ¹	154	94.10 ¹	78	94.09 ¹	77	94.44		94.56 ¹	
12	96.41	637	94.49	145	94.01	66	94.10	78	94.43 ¹		94.57 ¹	
13	96.25 ¹	595	94.46 ¹	139	93.98 ¹	63	94.11 ¹	80	94.42 ¹		94.58 ¹	
14	96.09	553	94.43	133	93.94	58	94.11	80	94.41		94.59	
15	95.95 ¹	517	94.41 ¹	129	93.94 ¹	58	94.11 ¹	80	94.40 ¹		94.61 ¹	
16	95.81	481	94.39	125	93.94	58	94.10	78	94.38 ¹		94.62 ¹	
17	95.66 ¹	442	94.37 ¹	122	93.94 ¹	58	94.09 ¹	77	94.37		94.64	
18	95.51	403	94.34	116	93.94	58	94.09	77	94.35 ¹		94.66 ¹	
19	95.46 ¹	390	94.32 ¹	113	93.94 ¹	58	94.09 ¹	77	94.34		94.67 ¹	
20	95.41	377	94.29	107	93.94	58	94.09	77	94.35 ¹		94.69	
21	95.33 ¹	356	94.26 ¹	103	93.94 ¹	58	94.09 ¹	77	94.36 ¹		94.69 ¹	
22	95.24	332	94.23	98	93.94	58	94.10	78	94.37		94.70 ¹	
23	95.22 ¹	327	94.22 ¹	96	93.94 ¹	58	94.11 ¹	80	94.37 ¹		94.71	
24	95.19	319	94.21	95	93.94	58	94.12	81	94.38 ¹		94.72 ¹	
25	95.17 ¹	314	94.20 ¹	93	93.94 ¹	58	94.13 ¹	83	94.39		94.73 ¹	
26	95.14	306	94.19	92	93.94	58	94.15	86	94.40 ¹		94.74	
27	95.12 ¹	301	94.14 ¹	84	93.94 ¹	58	94.17 ¹	89	94.40 ¹		94.75 ¹	
28	95.09	293	94.09	77	93.94	58	94.19	92	94.41		94.76 ¹	
29	95.05 ¹	283	94.06 ¹	75	93.96 ¹	60	94.19 ¹	92	94.42 ¹		94.77	
30	95.01 ¹	273	94.07	74	93.94	58	94.19	92	94.43 ¹		94.77 ¹	
31	94.97	262	94.06 ¹	73			94.20 ¹	93			94.77 ¹	

NOTES.—Marked thus (1) interpolated.

Ice conditions from January 1 to April 11 and from November 10 to December 31.

Data insufficient to compute daily discharge.

Monthly Discharge of Minnedosa River at Beilby's Bridge for 19

[Drainage area 1,120 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....			15 ¹	0.013	0.015	922
February.....			12 ¹	0.011	0.012	690
March.....			8 ¹	0.007	0.008	492
April.....	631		350 ¹	0.313	0.349	20,826
May.....	421	217	303	0.271	0.312	18,631
June.....	819	293	407	0.363	0.405	24,218
July.....	891	262	525	0.469	0.541	32,281
August.....	257	73	141	0.126	0.145	8,670
September.....	99	58	68	0.061	0.068	4,046
October.....	93	58	76	0.068	0.078	4,673
November.....			60 ¹	0.054	0.060	3,570
December.....			30 ¹	0.027	0.031	1,845
The year.....	891		167	0.149	2.024	120,864

NOTE.—Marked thus (1) estimated.

MINNEDOSA RIVER AT MINNEDOSA POWER HOUSE.

STATION No. 5. M.F₂

History.—The station was established by C. O. Allen on July 13, 1914 and since that time has been in continuous operation. The object in placing a station at this point was to obtain a rating of the power plant of the Minnedosa Power Company. The total discharge of the river at this point is not recorded.

Location of Section.—The station is located at the upstream side of the traffic bridge across the intake of the plant of the Minnedosa Power Company. It is at the easterly limits of the town of Minnedosa.

Drainage Area.—The drainage area of the river above Minnedosa is 1,200 square miles, though this is not significant in connection with the operation of the station.

Channel.—The channel of the station is formed by the concrete walls and floor of the intake to the plant. It does not carry the full discharge of the river, as at high stages the spillway of the dam discharges the surplus at such times.

Gauges.—The headrace gauge is a vertical staff gauge secured to the wall on the left hand side of the intake.

The tailrace gauge is a vertical staff gauge secured to the retaining wall on the right hand side of the tailrace.

Both of these gauges are referred to M.H.S. datum.

Discharge Measurements.—Since the establishment of the station, discharge measurements with the accompanying loads on the plant and forebay and tailrace gauge readings have been obtained.

Records Available.—From June 2, 1914 to December 31, 1916 a continuous record of daily gauge height on the headrace and tailrace gauges of the plant have been obtained.

Discharge Measurements of Minnedosa River at Minnedosa Power House for 1916.

Date.	Engineer.	Meter No	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	Tailrace.
June 12	R. C. Robinson.....	1,197	19	246.1	0.26	1,651.98	63.9	1,626.83
June 12	R. C. Robinson.....	1,196	60	72.0	3.09	1,652.00	222.5 ¹	3.27
July 4	R. C. Robinson.....	1,197	19	262.3	0.19	1,653.16	49.8	1,628.66
Aug. 6	R. C. Robinson.....	1,197	19	257.1	0.16	1,652.60	41.1	1,626.22
Sept. 29	R. C. Robinson.....	1,614	19	250.3	0.32	1,652.14	80.1	1,626.30
Nov. 10	R. C. Robinson.....	1,496	19	282.0	0.19	1,653.79	53.6	1,626.35

¹Not at regular Spillway.

ROLLING RIVER (NEAR) C.N.R. CROSSING.

STATION NO. 5. M.Fg

History.—The station was established by E. B. Patterson on June 22, 1915 and has been in operation since that date.

Location of Section.—The metering section is located at the downstream side of Lee's bridge, one-half mile north of the Canadian Northern Railway and three and one-half miles from Erickson.

Drainage Area.—The drainage area of the river above this station is 235 square miles.

Channel.—The channel of the river above and below the section is slightly curved, though the direction of the current is at right angles to the section. The bed of the channel is silt and liable to shift in high stages. The banks at the section are sufficiently high to confine the discharge to the channel at all stages.

Gauge.—A vertical staff gauge is secured to the centre pile on the downstream side of the bridge and is referred to an arbitrary datum.

Discharge Measurements.—Since the station was established, discharge measurements have been obtained over a range in stage of 6.83 feet, corresponding to a range in discharge of from practically zero to 600 c.f.s.

Records Available.—From June 22 to November 12, 1915 and from January 1 to December 31, 1916 continuous records of daily gauge height have been obtained.

Based on these gauge heights, estimates of daily discharge for open water seasons are available.

Estimates of mean monthly discharge based on gauge heights and actual discharge measurements are available for the whole period.

Accuracy.—The discharge curve between gauge heights 88.6 and 95.4 is fairly well defined.

Discharge Measurements of Rolling River near C.N.R. Crossing for 1916.

Date	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 19	M. S. Madden.....	1,562	23	24	0.22	90.13	5.2 ¹
Mar. 24	G. Gainsford.....	1,939	23	21	0.18	90.13	3.7 ¹
April 21	M. S. Madden.....	1,469	48	254	1.56	93.83	395.5
June 30	G. Gainsford.....	1,861	66	369	1.64	95.43	607.6
Nov. 13	R. C. Robinson.....	1,496	39	67	0.40	89.62	26.8 ¹

¹Ice measurement.

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Daily Gauge Height and Discharge of Rolling River near C.N.R. Crossing for 1916.

(Drainage area 235 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	91.03		90.23		90.13		90.33		92.16		91.32	
2	91.03		90.18		90.13		90.36		92.28	210	91.32	180
3	90.93		90.13		90.13		90.43		92.40	231	91.33	180
4	90.53		90.23		90.23		90.53		92.38	242	91.32	180
5	90.33		90.23		90.23		90.57		91.98	240	91.26	145
6	90.28		90.23		90.18		90.58		91.81	204	91.17	138
7	90.13		90.23		90.22		90.58		91.68	189	91.17	138
8	90.08		90.21		90.38		90.63		91.53	178	91.22	142
9	90.03		90.22		90.38		90.71		91.35	166	91.28	146
10	89.63		90.15		90.18		90.83		91.35	154	91.30	148
11	89.58		90.13		90.13		90.93		91.21	141	91.23	142
12	89.63		90.13		90.21		90.98		91.03	128	91.20	140
13	89.63		90.13		90.21		90.98		90.99	125	91.08	132
14	89.63		90.13		90.21		91.13		90.91	120	90.91	120
15	89.78		90.13		90.18		91.33		90.86	116	90.81	113
16	89.92		90.13		90.21		92.33		90.78	111	90.62	99
17	90.03		90.08		90.13		93.13		90.70	105	90.56	95
18	90.06		90.03		90.13		93.78		90.61	99	90.50	91
19	90.13	5	89.93		90.13		94.43	465	90.48	90	90.45	88
20	90.13		89.93		90.11		95.28	585	90.30	79	90.43	87
21	90.23		89.93		90.08		94.68	498	90.22	74	90.36	83
22	90.41		89.98		90.06		94.10	424	90.18	72	90.23	75
23	90.33		90.03		90.12		93.43	347	90.15	70	90.24	75
24	90.43		90.03		90.13		93.03	305	90.28	78	90.71	106
25	90.33		90.07		90.11	4	92.68	270	90.46	89	91.63	174
26	90.28		90.08		90.09		92.33	236	90.61	99	92.18	222
27	90.23		90.38		90.12		92.05	211	90.81	113	93.08	310
28	90.33		90.13		90.18		91.95	202	91.01	127	94.28	446
29	90.38		90.13		90.21		91.92	199	91.18	139	95.03	548
30	90.33		90.13		90.21		91.91	198	91.26	145	95.23	578
31	90.28		90.23		90.21		92.07	212	91.30	148	95.46	614
					90.23			91.34	151			

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	95.08	555	90.36	83	89.32	26	88.80	12	89.30	25	89.68	
2	94.88	526	90.30	79	89.27	24	88.86	13	89.26	24	89.69	
3	94.48	471	90.26	77	89.23	23	88.92	14	89.36	27	89.70	
4	93.98	410	90.23	75	89.18	21	89.01	16	89.47	30	89.62	
5	93.68	375	90.23	75	89.21	22	89.28	24	89.56	32	89.60	
6	93.38	342	90.26	77	89.32	26	89.56	36	89.62	34	89.60	
7	93.18	320	90.25	76	89.28	24	89.51	34	89.71	35	89.60	
8	92.99	301	90.23	75	89.30	25	89.41	29	89.80	36	89.60	
9	92.78	280	90.20	73	89.24	23	89.46	31	89.98	37	89.59	
10	92.61	263	90.15	70	89.22	23	89.34	27	89.93	38	89.61	
11	92.45	247	90.06	65	89.16	21	89.27	24	89.88	38	89.62	
12	92.23	227	90.00	61	89.10	19	89.24	23	89.75		89.67	
13	92.12	217	89.97	59	89.02	17	89.22	23	89.62		89.64	
14	91.98	204	89.93	57	88.97	15	89.19	22	89.60		89.62	
15	91.43	158	89.87	53	88.93	15	89.14	20	89.60		89.62	
16	91.13	135	89.73	45	88.92	14	89.12	20	89.62		89.66	
17	91.07	131	89.70	43	88.91	14	89.11	19	89.66		89.67	
18	90.92	120	89.68	42	88.90	14	89.21	22	89.64		89.70	
19	90.87	117	89.64	40	88.91	14	89.33	26	89.62		89.71	
20	90.90	119	89.59	38	88.89	14	89.30	25	89.61		89.72	
21	90.69	104	89.57	37	88.88	14	89.24	23	89.61		89.72	
22	90.71	106	89.52	34	88.87	13	89.20	22	89.61		89.72	
23	90.60	98	89.51	34	88.86	13	89.16	21	89.59		89.72	
24	90.52	92	89.58	37	88.83	13	89.12	20	89.62		89.62	
25	90.51	92	89.54	35	88.82	12	89.10	19	89.64		89.52	
26	90.50	91	89.52	34	89.84	13	89.14	20	89.64		89.22	
27	90.47	89	89.48	32	88.87	13	89.21	22	89.65		89.27	
28	90.46	89	89.42	30	88.88	14	89.30	25	89.67		89.12	
29	90.44	87	89.36	27	88.85	13	89.36	27	89.67		89.62	
30	90.42	86	89.32	26	88.83	13	89.40	29	89.68		89.62	
31	90.44	87	89.35	27	88.86	13	89.36	27	89.68		89.67	

NOTES.—Marked thus (†) interpolated.

Ice conditions from January 1 to April 17 and from November 12 to December 31.

Data insufficient to compute daily discharge.

Monthly Discharge of Rolling River near C.N.R. Crossing for 1916.

(Drainage area 233 square miles.)

MONTH.	DISCHARGE IN SECOND-FOOT.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....			5 ¹	0.021	0.024	307
February.....			4 ¹	0.017	0.018	230
March.....			4 ¹	0.017	0.020	246
April.....			150 ¹	0.638	0.712	8,926
May.....	242	70	137	0.583	0.673	8,424
June.....	614	75	183	0.800	0.893	11,187
July.....	555	86	211	0.898	1.035	12,974
August.....	83	26	52	0.221	0.255	3,197
September.....	26	12	18	0.077	0.086	1,071
October.....	36	12	23	0.098	0.113	1,414
November.....			20 ¹	0.085	0.095	1,190
December.....			10 ¹	0.043	0.050	615
The year.....	614	3 ¹	69	0.294	3.973	49,781

NOTE.—Marked thus (1) estimated.

WHIRLPOOL RIVER AT DANVERS.

STATION No. 5. M.Fg

History.—The station was established by E. B. Patterson on May 6, 1915 and has been in practically continuous operation since that date.

Location of Section.—The metering section is located at the downstream side of what is locally known as Erickson's bridge, one-half mile from Danvers Post Office, on the north boundary of Sec. 21, Tp. 18, R. 18, W.P.M. During periods of low stage measurements are made by wading at a point five feet downstream from the bridge.

Drainage Area.—The drainage area of the river above this station is 79 square miles.

Channel.—The bed of the channel is of clay and liable to shift. The banks are low and during periods of high discharge would overflow above and below the station, but all discharge would be confined within the limits of the banks at the station.

Gauge.—A vertical staff gauge is secured to a pile on the downstream side of the bridge. This gauge is referred to an arbitrary datum.

Discharge Measurements.—Since the station was established, discharge measurements have been obtained over a range in stage of 1.42 feet, corresponding to a range in discharge of from practically zero to 20 c.f.s.

Records Available.—From May 6 to November 11, 1915 and from April 14 to November 9, 1916 continuous records of daily gauge height have been obtained.

Based on these gauge heights, estimates of daily discharge for the open water seasons are available.

Accuracy.—The discharge curve is not well defined, except between gauge heights 87.3 and 88.3, where discharge is very low.

Discharge Measurements of Whirlpool River at Danvers for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Nov. 13	R. C. Robinson.....	1,496	21	22.5	0.72	88.72	16.2 ¹

¹Ice measurement.

Daily Gauge Height and Discharge of Whirlpool River at Danvers for 1918.

(Drainage area 79 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	93.90	213	91.90	126								
2	93.40	190	91.40	106								
3	92.80	163	91.00	92								
4	92.40	146	90.80	85								
5	91.90	126	90.60	79								
6									91.50	110	90.70	82
7									91.20	99	90.49	75
8									90.80	85	90.49	75
9									90.50	75	90.49	75
10									90.40	72	90.70	82
11									90.20	66	90.40	72
12									90.43	73	90.20	66
13									90.10	63	90.00	60
14							92.10	134	90.00	60	89.80	54
15							93.90	213	90.40	72	89.50	46
16							93.70 ¹	204	90.50	75	89.50	46
17							93.70 ¹	204	89.80	64	89.40	43
18							93.50 ¹	194	89.47	45	89.44	44
19							93.30 ¹	185	89.60	49	89.43	44
20							93.10 ¹	176	89.50	46	89.10	35
21							92.90 ¹	167	89.30	40	89.00	33
22							92.80	163	89.40	43	88.90	30
23							92.30	142	89.46	45	90.30	60
24							91.90	126	89.80	54	91.90	126
25							91.20	99	90.30	69		132 ²
26							91.42	107	90.80	85		142 ²
27							91.10	96	91.45	108		146 ²
28							91.20	99	91.45	108		150 ²
29							92.50	150	91.50	110		150 ²
30							93.90 ¹	213	91.90	126		163 ²
31									92.40	146		

	July.		August.		September.		October.		November.		December.	
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	167 ³	88.80	27	87.60	7	87.80	9	88.70	25			
2	176 ³	88.80	27	87.60	7	87.70	8	89.20	37			
3	185 ³	88.70	25	87.60	7	87.80	9	89.20	37			
4	176 ³	88.47	20	87.70	8	87.90	11	89.20	37			
5	92.80	163	88.60	23	87.80	9	88.30	17	89.10	35		
6	92.20	138	88.50	21	87.80	9	88.50	21	89.00	33		
7	91.20	99	88.40	19	87.70	8	88.60	23	89.30	40		
8	90.90	89	88.30	17	87.70	8	88.60	23	89.40	43		
9	90.80	85	88.20	16	87.70	8	88.50	21	89.50	46		
10	90.60	79	88.10	14	87.60	7	88.40	19				
11	90.40	72	88.42	19	87.70	8	88.40	19				
12	90.20	66	88.00	13	87.70	8	88.30	17				
13	89.90	57	88.00	13	87.80	9	88.20	16				
14	89.70	51	88.00	13	87.70	8	88.20	16				
15	89.30	40	87.90	11	87.70	8	88.10	14				
16	89.10	35	87.90	11	87.70	8	88.20	16				
17	89.00	33	87.90	11	87.70	8	88.20	16				
18	89.00	33	87.80	9	87.70	8	88.20	16				
19	88.90	30	87.80	9	87.80	9	88.30	17				
20	88.80	27	87.70	8	87.90	11	88.30	17				
21	88.60	23	87.70	8	88.00	13	88.20	16				
22	88.60	23	87.70	8	87.90	11	88.20	16				
23	88.60	23	87.70	8	87.90	11	88.10	14				
24	89.10	35	87.70	8	87.70	8	88.20	16				
25	88.90	30	87.70	8	87.80	9	88.30	17				
26	88.50	27	87.70	8	87.80	9	88.40	19				
27	88.70	25	87.70	8	87.80	9	88.40	19				
28	88.70	25	87.70	8	87.70	8	88.50	21				
29	88.80	27	87.70	8	87.80	9	88.50	21				
30	89.40	43	87.60	7	87.70	8						
31	88.90	30	87.60	7			88.70	25				

NOTES.—Marked thus (1) interpolated.

Marked thus (2) estimated.

From January 1 to April 14 and November 10 to December 31, data insufficient to compute daily discharge.

Monthly Discharge of Whirlpool River at Danvers for 1916.
(Drainage area 79 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.....	213		125 ¹	1.582	1.765	7.438
May.....	213	40	91	1.152	1.325	5.595
June.....	163	30	84	1.063	1.186	4.996
July.....	185	23	68	0.861	0.998	4.181
August.....	27	7	13	0.164	0.189	799
September.....	13	7	9	0.114	0.127	530
October.....	25	8	17	0.216	0.248	1,045
November.....	46		20 ¹	0.253	0.282	1,190
December.....			10 ¹	0.127	0.146	615
The period.....	213		49	0.620	6.264	26,397

NOTE.—Marked thus (1) estimated.

SOURIS RIVER.

The source of the Souris river is in the province of Saskatchewan, northwest of the town of Weyburn. The course of the river from its source is generally southeast, crossing the International Boundary into the State of North Dakota in Tp. 1, R. 34, W.P.M. After crossing the boundary it bends northeast recrossing the International Boundary to the east of the boundary between Saskatchewan and Manitoba and flowing in a general northeastern direction to its junction with the Assiniboine river near the city of Brandon.

The drainage area of the Souris is 22,860 square miles, very large when compared with the discharge, as will be noted by reference to the following tables.

The area drained is largely settled and under cultivation, the soil being of a gravelly nature lightly overlaid by an alluvial deposit. The land is largely open prairie with very little timber to be found.

In the upper part the river valley is not deep, but as the mouth is approached the depth is increased until banks of from 150 to 200 feet are encountered.

The district drained is about the most closely settled in the province, and the question of water supply for various purposes renders the gathering of discharge data important.

SOURIS RIVER AT MELITA.

STATION No. 5. N.F1

History.—This station was established by M. S. Madden on April 23, 1915 and since that date has been in constant operation. Previous to the date mentioned above, a station was operated at this point by the Irrigation Branch, Department of the Interior.

Location of Section.—The meter section is located at the downstream side of the traffic bridge in River Park in the town of Melita.

Drainage Area.—The drainage area of the river above the station is 18,024 square miles. Of this area, 8,280 square miles lie south of the International Boundary.

Channel.—The station is located on a straight stretch of the river about four hundred feet long. The banks are fairly high and not liable to overflow except under extreme flood conditions. The bed of the channel is composed of sandy gravel and under ordinary conditions is not liable to shift.

Gauge.—A vertical staff gauge is secured to a pile at the east end of the bridge and is referred to a permanent M.H.S. B.M., located fifty-seven feet southeast from the southeast corner of the bridge. This B.M. is set to an assumed datum.

Discharge Measurements.—Since this station was established, discharge measurements have been obtained over a range of 13.64 feet, corresponding to a range in discharge of from zero to 4,000 c.f.s. During the flood period of 1916, when the station was under water, discharge measurements were taken from the C.P.R. bridge and Melita traffic bridge, but referred to station datum.

Records Available.—From April 23, 1915 to December 31, 1916 continuous records of daily gauge height have been obtained.

Based on these gauge heights, estimates of daily discharge for the open water seasons are available.

Estimates of mean monthly discharge based on gauge heights and actual discharge measurements are also available for the whole period.

Accuracy.—Between gauge heights 87.0 and 91.0 the discharge curve is well defined; between 91.0 and 100.0 the curve is fairly well defined. Beyond these limits it is not well defined.

Discharge Measurements of Souris River at Melita for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 20	C. O. Allen.....	1,912	218	3,258	1.24	100.73	4,040
May 6	C. O. Allen.....	1,912	135	1,933	1.42	100.31	2,803
June 6	R. C. Robinson.....	1,196	116	1,290	1.42	98.07	1,832
June 30	R. C. Robinson.....	1,196	100	482	1.01	91.08	487
Aug. 3	R. C. Robinson.....	1,196	90	311	0.68	89.24	196
Sept. 27	R. C. Robinson.....	1,614	81	193	0.26	87.99	50
Nov. 9	R. C. Robinson.....	1,496	80	175	0.19	87.82	33

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 206

Daily Gauge Height and Discharge of Souris River at Melita for 1916.

(Drainage area 18,024 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	88.41		88.13		88.08							
2	88.41		88.15		88.05				100.40	2,737	98.25	2,010
3	88.42		88.13		88.08				100.32	2,707	98.22	2,001
4	88.43		88.16		88.10				100.24	2,676	98.20	1,995
5	88.53		88.13		88.08				100.15	2,642	98.18	1,989
6									100.15	2,642	98.16	1,983
7	88.73		88.15		88.06				100.07	2,612	98.12	1,971
8	88.61		88.15		88.05				99.97	2,575	97.97	1,927
9	88.81		88.08		88.01				99.77	2,505	97.72	1,867
10	88.08		88.08		88.08				99.68	2,473	97.60	1,823
	88.53		88.08		88.03		90.17		99.41	2,387	97.38	1,763
11	88.42											
12	88.40		88.01		88.02		90.83		99.20	2,341	97.29	1,738
13	88.39		88.06		88.03		91.00		99.22	2,318	97.24	1,735
14	88.37		88.01		88.05		92.00	615	99.11	2,281	97.11	1,680
15	88.34		88.08		88.05		93.28	840	98.99	2,242	96.82	1,613
			88.05		88.02		94.52	1,079	98.87	2,203	96.34	1,492
16	88.33		88.13		88.02							
17	88.30		88.08		88.03		95.76	1,355	98.72	2,155	95.53	1,302
18	88.26		88.13		88.01		97.00	1,690	98.64	2,130	94.91	1,170
19	88.21		88.11		88.02		98.24	2,007	98.48	2,079	94.67	1,112
20	88.20		88.08		88.01		99.48	2,401	98.47	2,076	94.53	1,082
							100.73	2,809	98.42	2,061	94.40	1,055
21	88.10		88.13		88.01							
22	88.10		88.11		88.05		101.75	3,292	98.40	2,055	94.37	1,049
23	88.13		88.08		88.05		102.82	3,785	98.38	2,049	93.65	900
24	88.11		88.01		88.03		102.53	3,785	98.37	2,046	92.62	722
25	88.05		88.08		88.01		102.36	3,643	98.35	2,040	92.07	627
								3,565	98.34	2,037	91.82	586
26	88.02		88.00		88.02							
27	87.99		88.08		88.00		101.90	3,358	98.32	2,031	91.57	546
28	87.96		88.08				101.32	3,111	98.31	2,028	91.42	523
29	87.93		88.03				101.15	3,042	98.30	2,025	91.22	493
30	87.84		88.05				100.86	2,923	98.29	2,022	91.02	463
31	87.83						100.80	2,898	98.28	2,019	91.08	472
									98.26	2,013		

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	91.04	466	89.32	217	88.44	103	87.96	46	88.04	55	88.14	
2	90.96	454	89.28	211	88.47	106	87.92	41	88.05	56	88.15	
3	90.92	448	89.24	206	88.55	117	88.03	54	88.06	57	88.16	
4	90.76	424	89.22	204	88.35	92	88.05	56	88.04	55	88.18	
5	90.74	421	89.20	201	88.29	85	88.04	55	88.11	63	88.17	
6	90.72	418	89.19	200	88.26	81	88.03	54	88.16	69	88.16	
7	90.70	415	89.17	197	88.23	78	88.06	56	87.86	35	88.15	
8	90.55	393	89.15	195	88.20	74	87.89	38	87.85	34	88.14	
9	90.54	391	89.14	193	88.18	72	87.98	48	87.81	29	88.14	
10	90.44	376	89.17	197	88.15	68	88.06	57	87.79	27	88.15	
11	90.38	360	89.21	202	88.11	63	88.10	62	87.91		88.15	
12	90.27	351	89.23	202	88.03	54	88.05	56	87.85		88.14	
13	90.24	346	89.28	201	88.02	52	88.00	50	87.93		88.13	
14	90.22	345	89.28	201	87.96	46	88.08	60	87.92		88.11	
15	90.21	345	89.29	200	87.98	48	88.06	57	87.90		88.10	
16	90.22	345	89.17	197	88.00	50	88.05	56	87.87		88.09	
17	90.14	331	89.16	196	88.05	56	88.02	52	87.85		88.09	
18	90.09	326	89.12	191	88.05	56	88.15	68	87.36		88.08	
19	90.02	313	89.10	188	88.04	55	87.99	49	87.93		88.08	
20	89.96	308	89.07	184	87.99	49	87.87	36	87.97		88.08	
21	89.94	302	89.02	178	87.87	36	88.01	51	88.03		88.07	
22	89.86	296	89.00	175	87.70	17	88.04	55	88.05		88.06	
23	89.84	294	89.06	170	87.67	14	88.10	62	88.07		88.05	
24	89.82	285	89.08	162	87.78	26	88.18	72	88.10		88.05	
25	89.82	285	88.78	144	87.89	38	88.05	56	88.11		88.04	
26	89.81	283	88.72	139	88.02	52	88.03	54	88.12		88.04	
27	89.72	271	88.67	132	88.01	51	88.00	50	88.13		88.04	
28	89.64	260	88.65	122	87.83	31	88.04	55	88.13		88.04	
29	89.66	257	88.87	158	87.95	45	88.10	62	88.12		88.04	
30	89.51	245	88.72	143	87.98	48	88.07	58	88.14		88.01	
31	89.37	223	88.58	120			88.05	56			88.00	

Notes.—Numbers thus (i) interpolated.

For conditions from January 1 to April 18 and November 11 to December 31.
Data insufficient to compute daily discharge.

Monthly Discharge of Souris River at Melita for 1918.

[Drainage area 1⁸ 024 square miles.]

MONTH.	DISCHARGE IN SECOND-FOOT.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....			0 ¹			0
February.....			0 ¹			0
March.....			0 ¹			0
April.....	3,785		1,500 ¹	0.087	0.097	92,826
May.....	2,737	2,013	2,265	0.126	0.145	139,269
June.....	2,010	403	1,317	0.073	0.081	78,367
July.....	466	223	339	0.019	0.022	20,844
August.....	217	120	183	0.010	0.012	11,252
September.....	117	14	59	0.003	0.003	3,511
October.....	72	36	54	0.003	0.003	3,320
November.....	69	0	20 ¹	0.001	0.001	1,190
December.....			5 ¹	0.000		298
The year.....	3,785		483	0.027	0.364	350,877

NOTE.—Marked thus (1) estimated.

SOURIS RIVER AT WAWANESA.

STATION NO. 5. N.G₁

History.—This station was established on October 7, 1912 by W. G. Worden and has been in practically continuous operation since that date.

Location of Section.—The meter section is located on the downstream side of the traffic bridge across the Souris river approximately one quarter of a mile north of the town of Wawanesa. This bridge is used for all open water measurements. Winter measurements are made from the ice on the same cross section of the river.

Drainage Area.—The drainage area of the Souris above the station is 20,056 square miles. Of this area, 8,289 square miles lie south of the International Boundary.

Channel.—For two hundred feet above and six hundred feet below the section the channel is straight. The bed of the river is composed of mud and gravel and the control points are liable to shift during extreme conditions of flow. The banks at the section are sufficiently high to confine the river within their limits even under the most extreme flood conditions.

Gauge.—A vertical staff gauge is secured to the downstream side of the north pier of the bridge. This gauge is referred to a permanent M.H.S. bench mark set to an arbitrary datum and located about fifty feet southwest of the southerly end of the bridge.

Discharge Measurements.—Discharge measurements have been taken at frequent intervals since the time of installation of the station and are over a range in stage of 8.55 feet.

Records Available.—From October 7, 1912 to March 31, 1914 continuous records of daily gauge height for the open water season and intermittent records for the winter season have been obtained. From April 1, 1914 to December 31, 1916 continuous daily gauge readings have been obtained.

Based on these gauge readings, estimates of daily discharge throughout the open water seasons are available.

Estimates of monthly mean discharge based on gauge readings and actual measurements are also available.

Accuracy.—Between gauge heights 100.7 and 107 the discharge curve is well defined, and from 107 to 109 is fairly well defined.

Discharge Measurements of Souris River at Wawanesa for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. Ft.
April 21	C. O. Allen.....	1,912	99	1,078	4.60	108.98	4,948
May 5	C. O. Allen.....	1,912	99	831	4.04	107.22	3,356
May 9	C. O. Allen.....	1,912	99	828	3.64	106.79	3,013
June 6	R. C. Robinson.....	1,196	111	723	2.84	105.58	2,054
June 30	R. C. Robinson.....	1,196	91	432	1.91	103.25	825
Aug. 3	R. C. Robinson.....	1,196	87	276	0.92	101.76	254
Sept. 27	R. C. Robinson.....	1,614	75	185	0.34	100.81	63
Nov. 8	R. C. Robinson.....	1,496	75	194	0.42	100.94	81

Daily Gauge Height and Discharge of Souris River at Wawanesa for 1916.
(Drainage area 20,056 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	1-03		0-99		0-87		1-56		7-24	3,401	5-65	2,127
2	1-03		1-02		0-79		1-53		7-21	3,374	5-62	2,108
3	1-02		1-02		0-75		1-51		7-21	3,374	5-59	2,088
4	1-04		1-02		0-78		1-48		7-25	3,410	5-57	2,075
5	1-09		0-99		0-88		1-33		7-22	3,383	5-56	2,069
6	1-03		1-01		0-87		1-29		7-18	3,347	5-60	2,095
7	1-03		0-94		0-96		1-32		6-95	3,140	5-55	2,082
8	1-13		0-92		0-92		1-33		6-79	2,996	5-52	2,043
9	1-01		0-91		0-86		1-38		6-79	2,996	5-50	2,030
10	1-07		0-87		0-85		1-35		6-78	2,988	5-44	1,991
11	1-02		0-92		0-84		1-51		6-61	2,843	5-41	1,971
12	1-05		0-92		0-88		1-77		6-55	2,792	5-35	1,935
13	1-08		0-91		0-91		2-08		6-42	2,686	5-30	1,906
14	1-11		0-97		0-95		3-15		6-28	2,575	5-26	1,881
15	1-12		1-03		0-99		4-62		6-10	2,440	5-21	1,851
16	1-24		1-04		1-00		9-17		6-03	2,387	5-12	1,797
17	1-12		1-10		1-02		13-31		5-93	2,316	5-03	1,743
18	1-12		1-11		1-06		13-39		5-88	2,281	4-87	1,653
19	1-05		1-14		1-12		10-24	6,101	5-85	2,260	4-75	1,587
20	0-99		1-14		1-14		9-59	5,766	5-83	2,246	4-57	1,488
21	1-00		1-18		1-12		9-21	5,174	5-80	2,225	4-39	1,395
22	0-96		1-13		1-13		8-42	4,463	5-84	2,253	4-25	1,326
23	0-97		1-13		1-14		8-16	4,229	5-87	2,274	4-19	1,295
24	0-95		1-12		1-17		7-84	3,911	5-78	2,212	4-03	1,215
25	0-93		1-06		1-21		7-75	3,860	5-78	2,212	3-82	1,110
26	0-89		1-04		1-20 ¹		7-54	3,671	5-80	2,225	3-68	1,040
27	0-89		1-03		1-20		7-46	3,599	5-76	2,199	3-50	950
28	0-90		1-04		1-40 ¹		7-35	3,500	5-73	2,179	3-37	891
29	0-90		0-95		1-48 ¹		7-31	3,464	5-73	2,179	3-18	806
30	0-94				1-58		7-26	3,419	5-70	2,160	3-25	837
31	0-98				1-58				5-71	2,166		

	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
1	3-08	761	1-88	295	1-22	130	0-88	71	0-89	73	0-89	.....
2	2-97	713	1-82	280	1-20	126	0-91	75	0-89	73	0-89	.....
3	2-89	680	1-77	265	1-15	116	0-96	83	0-92	77	1-12	.....
4	2-84	659	1-75	259	1-17	120	0-95	81	0-86	68	1-14	.....
5	2-72	610	1-71	247	1-13	112	0-94	80	0-98	86	1-14	.....
6	2-77	631	1-74	256	1-14	114	0-99	88	0-93	78	1-13	.....
7	2-89	680	1-73	253	1-10	106	0-94	80	0-97	84	1-15	.....
8	2-70	602	1-68	239	1-10	106	0-89	73	0-95	81	1-15	.....
9	2-57	549	1-97	327	1-09	104	0-90 ¹	74	0-97	84	1-14	.....
10	2-59	557	1-77	265	1-03	94	0-92	77	1-21	.....	1-16	.....
11	2-54	536	1-67	236	0-98	86	0-92	77	1-28	.....	1-12	.....
12	2-49	516	1-60	218	0-98	86	0-91	75	1-13	.....	1-13	.....
13	2-44	497	1-63	226	0-97	85	0-90	74	0-97	.....	1-16	.....
14	2-37	469	1-63	226	0-98	86	0-85	67	1-05	.....	1-07	.....
15	2-33	454	1-62	223	1-01	91	0-88	71	0-98	.....	1-12	.....
16	2-29	438	1-61	221	0-95	81	0-93	78	0-92	.....	1-06	.....
17	2-30	442	1-61	221	0-90	74	1-02	92	0-90	.....	0-99	.....
18	2-36	465	1-63	226	0-86	68	0-99	88	0-88	.....	1-06	.....
19	2-29	438	1-58	213	0-84	66	0-97	84	0-89	.....	1-05	.....
20	2-23	417	1-53	200	0-82	63	0-97	84	0-91	.....	1-18	.....
21	2-19	402	1-52	197	0-80	60	0-97	84	0-93	.....	1-10	.....
22	2-20	406	1-50	192	0-82	63	0-92	77	0-93	.....	1-03	.....
23	2-09	367	1-49	190	0-83	64	0-89	73	0-94	.....	0-99	.....
24	2-08	363	1-45	180	0-83	64	0-92	77	0-87	.....	1-14	.....
25	2-08	363	1-43	176	0-86	68	0-89	73	0-84	.....	1-22	.....
26	2-04	350	1-40	169	0-84	66	0-87	70	0-88	.....	1-24	.....
27	2-03	347	1-37	162	0-81	61	0-92	77	0-87	.....	1-01	.....
28	2-03	347	1-35	157	0-78	58	0-95	81	0-88	.....	0-84	.....
29	2-01	340	1-31	148	0-73	52	1-02	92	0-88	.....	0-66	.....
30	1-96	324	1-26	138	0-77	56	1-01	91	0-89	.....	1-89	.....
31	1-94	317	1-24	134			0-96	83				

NOTES.—Marked thus (1) interpolated.
Ice conditions January 1 to April 18 and November 11 to December 31.
Not sufficient information to compute daily discharge.
100-00 should be added to gauge heights to reduce to station datum.

Monthly Discharge of Souris River at Wawanesa for 1916.
(Drainage area 20,056 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....			1 ¹	0.000	0.000	61
February.....			0 ¹	0.000	0.000	0
March.....			2 ¹	0.000	0.000	123
April.....	6,101		1,978 ¹	0.099	0.110	117,699
May.....	3,410	2,160	2,630	0.131	0.151	161,712
June.....	2,127	806	1,645	0.082	0.091	97,885
July.....	761	317	485	0.024	0.028	29,821
August.....	327	134	217	0.011	0.013	13,343
September.....	130	52	84	0.004	0.004	4,998
October.....	92	67	79	0.004	0.005	4,858
November.....			60 ¹	0.003	0.003	3,570
December.....			20 ¹	0.001	0.001	1,230
The year.....	6,101		600	0.030	0.406	435,300

NOTE.—Marked thus ⁽¹⁾ estimated.

TRIBUTARIES OF LAKE WINNIPEGOSIS.

General—Practically all of the drainage west of Lake Manitoba and between the Riding mountains and the Saskatchewan river drains directly or indirectly into lake Winnipegosis.

Three small lakes act as intermediate basins and to these the greater part of the drainage first finds its way, being drained from them into lake Winnipegosis. These lakes are,—

Red Deer lake, into which Red Deer river drains and is then drained by the same river into Dawson bay, an arm of lake Winnipegosis.

Swan lake, drained by the Shoal river into Dawson bay, which is the collecting basin for the Swan and Woody rivers.

Lake Dauphin, drained by the Mossy river and having as tributaries among others, the Valley and Ochre rivers. The Fork river is a tributary of the Mossy.

RED DEER RIVER.

The source of the Red Deer river is in Tp. 44, R. 19, W.2.M., south of Melfort, Saskatchewan. It flows in a general easterly direction into Red Deer lake, an expanse of the river, and also drains the lake into lake Winnipegosis.

The total drainage area of the Red Deer is 5,478 square miles, including Red Deer lake which has an area of 100 square miles. The valley through which the river flows is deep and wide. In the upper portion the tributaries which head in small lakes and swamps are:—Fir, Etoimami, Pipestone and Barrier rivers, nearly all of which enter from the south.

The upper portion of the drainage area is well timbered, growths of spruce and poplar of merchantable size being found. The Red Deer Lumber Company carry on lumbering operations on the river and operate a saw mill on Red Deer lake, the logs being floated downstream to the mill.

The Canadian Northern Railway crosses the river at Erwood, thirty miles west of the lake, and a spur line has been built in from Powell to touch the west end of the lake at Barrows.

RED DEER RIVER AT HUDSON BAY JUNCTION.

STATION No. 5. L.C2

History.—The station was established by G. Ebner on August 12, 1913 and has been in continuous operation during the open water seasons since that date.

This station supersedes the one established by E. Bankson on June 4 of the same year, which was discontinued on account of difficulty of operation.

Location of Section.—The metering section is located at the ferry crossing, five hundred feet downstream from the confluence of the Etomami and Red Deer rivers, and three and one-half miles south of the town of Hudson Bay Junction. The previous station was located about four hundred feet further down stream. All measurements in open water season are taken from the ferry or a boat. In winter the measurements are taken from the ice at the same cross section of the river.

Drainage Area.—The drainage area of the river above the station is 4,900 square miles.

Channel.—The station is located on a straight section of the river about one thousand feet long. The bed of the channel is composed of gravel and boulders and is not liable to shift. The banks of the channel are liable to overflow at high stages.

Gauge.—A vertical staff gauge is driven into the bed of the stream about forty feet below the section on the right bank. It is referred to a permanent M.H.S. bench mark set to an arbitrary datum.

Discharge Measurements.—Since the establishment of the station, discharge measurements have been secured over a range in stage of 3.96 feet, corresponding to a range in discharge of from 90 to 4,400 c.f.s. for open water seasons.

Records Available.—From July 9, 1913 to December 31, 1916 continuous records of daily gauge height during the open water seasons, and intermittent gauge readings for the winter seasons have been obtained.

Based on these gauge heights, estimates of daily discharge for the open water seasons are available.

Estimates of mean monthly discharge based on gauge readings and actual discharge measurements are also available for the whole period.

Accuracy.—Between gauge heights 100.0 and 102.5, the discharge curve is well defined; from 102.5 to 104.0 it is fairly well defined; beyond these limits it is not well defined.

Discharge Measurements of Red Deer River at Hudson Bay Junction for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
June 21	P. C. Robinson.....	1,196	150	1,053	4.21	103.97	4,432
July 13	R. C. Robinson.....	1,196	171	821	3.04	102.80	2,496
Aug. 15	R. C. Robinson.....	1,196	162	622	1.64	101.78	1,019
Sept. 14	R. C. Robinson.....	1,815	187	487	0.99	101.02	482
Oct. 26	C. O. Allen.....	1,550	154	519	1.27	101.21	660

MANITOBA HYDROMETRIC SURVEY

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Daily Gauge Height and Discharge of Red Deer River at Hudson Bay Junction for 1916.

(Drainage area 4,900 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	99.92										106.62	8,880
2	99.92										106.47	8,630
3	99.92										106.18	8,140
4	99.92										105.83	7,540
5	99.92										105.48	6,960
6	99.87										106.34	8,410
7	99.87										107.92	11,090
8	99.87										108.34	11,810
9	99.87										107.95	11,150
10	99.82										107.35	10,130
11	99.82										106.80	9,190
12	99.82										106.16	8,100
13	99.77										105.61	7,170
14	99.77										105.26	6,570
15	99.77										104.97	6,080
16	99.72										104.82	5,820
17	99.72										104.72	5,650
18	99.67										104.63	5,500
19	99.67										104.43	5,180
20	99.62										104.22	4,800
21	99.62										103.94	4,330
22	99.52										103.74	3,990
23	99.52										103.64	3,820
24	99.52								104.09	4,580	103.50	3,580
25	99.47								104.05	4,520	103.45	3,500
26	99.47								105.25	6,560	103.35	3,330
27	99								106.60	8,850	103.31	3,260
28	99								106.91	9,380	103.21	3,090
29	99								106.56	8,780	103.11	2,920
30	99								106.06	7,930	103.02	2,760
31	99								106.12	8,030		

	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	102.92	2,500	102.56	1,990	100.78	340	100.75	325	101.36	710		
2	102.82	2,420	102.41	1,760	100.77	335	100.77	335	101.37	720		
3	102.73	2,270	102.30	1,620	100.75	325	100.81	355	101.30	670		
4	102.78	2,360	102.17	1,460	100.73	315	100.81	355	101.30	670		
5	102.96	2,660	102.08	1,360	100.72	310	100.84	375	101.27	650		
6	102.97	2,680	101.93	1,200	100.72	310	100.86	385	101.26	640		
7	102.99	2,710	101.79	1,060	100.71	305	100.91	415	101.24	630		
8	102.99	2,710	101.69	970	100.71	305	100.94	435	101.22	615		
9	103.00	2,730	101.63	940	100.72	310	101.07	510	101.22	615		
10	103.00	2,730	101.90	1,170	100.77	335	101.02	480	101.31	675		
11	102.95	2,650	102.10	1,380	100.87	390	101.07	510	101.22	615		
12	102.86	2,490	102.09	1,370	100.92	420	101.12	545				
13	102.81	2,410	101.97	1,240	100.99	465	101.14	560				
14	102.62	2,080	101.91	1,180	101.01	475	101.16	570				
15	102.50	1,890	101.72	1,000	101.01	475	101.20	600				
16	102.33	1,660	101.62	915	101.00	470	101.27	650				
17	102.12	1,400	101.52	835	100.98	460	101.27	650				
18	101.99	1,260	101.42	755	100.98	460	101.26	640				
19	102.04	1,310	101.37	720	100.94	435	101.26	640				
20	102.13	1,420	101.32	685	100.90	410	101.24	630				
21	102.05	1,330	101.27	650	100.87	390	101.23	620				
22	101.96	1,230	101.14	560	100.87	390	101.22	615				
23	102.01	1,280	101.12	545	100.81	355	101.07	510				
24	102.26	1,570	101.10	530	100.81	355	101.07	510				
25	102.31	1,630	101.04	495	100.80	350	101.17	580				
26	102.33	1,660	100.98	460	100.79	345	101.19	595				
27	102.38	1,720	100.95	440	100.78	340	101.22	615				
28	102.59	2,030	100.92	420	100.77	335	101.22	615				
29	102.72	2,250	100.89	405	100.77	335	101.32	685				
30	102.70	2,220	100.86	385	100.75	325	101.34	700				
31	102.68	2,190	100.80	350			101.36	710				

NOTE.—Data insufficient to compute daily discharge from January 1 to May 24, 1916.

Monthly Discharge of Red Deer River at Hudson Bay Junction for 1916.
[Drainage area 4,900 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May.....			6,000 ¹	1.224	1.412	368,926
June.....	11,810	2,760	6,378	1.302	1.452	379,516
July.....	2,730	1,230	2,050	0.418	0.482	126,050
August.....	1,990	350	931	0.190	0.219	57,245
Septem.	475	305	372	0.076	0.085	22,136
October.....	710	325	539	0.110	0.127	33,142
November.....			450 ¹	0.092	0.103	26,777
The period.....	11,810	305	2,380	0.488	3.880	1,013,801

NOTE.—Marked thus (¹) estimated.

WOODY RIVER AT BOWSMAN.

STATION No. 5. L.E2

History.—The station was established by F. S. Smith on May 31, 1915 and since that date has been in continuous operation during open water periods.

Location of Section.—The metering section is located at the downstream side of a traffic bridge which spans the river one mile south of the town of Bowsman.

Drainage Area.—The drainage area of the river above this point is 731 square miles.

Channel.—The station is located in a straight stretch of the river about eight hundred feet long. The bed of the channel is of gravel and boulders and of a permanent character. The entire discharge of the river at all stages will be confined within the limits of the metering section.

Gauge.—A chain gauge is located on the downstream side of the bridge and is referred to a permanent M.H.S. bench mark set to an arbitrary datum.

Discharge Measurements.—Since the establishment of the station, discharge measurements have been obtained over a range in stage of 1.75, corresponding to a range in discharge of from 10 to 520 c.f.s.

Records Available.—From May 31 to November 9, 1915 and from April 10 to November 10, 1916 continuous records of daily gauge heights have been obtained.

Based on these gauge heights, estimates of daily discharge for the open water seasons are available.

Estimates of mean monthly flow, based on gauge readings and discharge measurements for the months included in the above periods are also available.

Accuracy.—Between gauge heights 88.51 and 90.26 the discharge curve is well defined.

Discharge Measurements of Woody River at Bowsman for 1916.

Date	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 23	C. O. Allen	1,435	103	209.1	2.49	90.26	521.2
June 22	R. C. Robinson	1,196	109	181.4	2.33	90.19	422.7
July 13	R. C. Robinson	1,196	106	176.8	2.00	90.07	353.6
Aug. 17	R. C. Robinson	1,196	72	71.4	0.56	88.90	40.0
Sept. 19	R. C. Robinson	1,614	70	60.3	0.39	88.76	23.5
Oct. 31	C. O. Allen	1,551	71	78.7	0.81	89.02	63.4

Daily Gauge Height and Discharge of Woody River at Bowsman for 1916.

(Drainage area 731 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1									89-36	152	91-53	996
2									89-36	152	91-50	983
3									89-28	127	91-35	920
4									89-29	130	91-19	853
5									89-22	109	91-14	832
6									89-23	112	92-00	1,193
7									89-25	118	92-10 ¹	1,235
8									89-21	106	92-20 ¹	1,277
9									89-18	98	92-30 ¹	1,319
10							90-99		89-30	133	92-35 ¹	1,340
11							90-65		89-24	115	92-39	1,357
12							90-65		89-26	121	91-95	1,172
13							90-54		89-27	124	91-59	1,021
14							90-42		89-27	124	91-37	928
15							90-75		89-29	130	91-18	849
16												
17							91-04	790	89-31	136	90-99	760
18							90-78	683	89-33	142	90-90	732
19							90-39	523	89-36	152	90-78	683
20							90-14	424	89-41	167	90-68	642
21							89-90	333	89-46	184	90-47	556
22							89-73	273	89-47	187	90-27	475
23							89-68	256	89-61	233	90-17	435
24							89-70	263	89-93	344	90-33	499
25							89-67	253	90-14	424	90-49	564
26							89-60	230	90-26	471	90-74	666
27							89-56	217	90-43	539	90-79	687
28							89-47	187	91-10	815	90-78	675
29							89-58	223	91-55	1,004	90-66	634
30							89-47	187	91-48	975	90-49	564
31							89-35	140	91-31	903	90-3 ¹	503
									91-36	924		
	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	90-10	443	89-16	93	88-54	12	88-85	38	89-26	121		
2	90-05	389	89-12	84	88-52	10	88-84	37	89-12	84		
3	89-92	340	89-09	77	88-52	10	88-85	38	89-05	52		
4	89-84	311	89-08	75	88-61	17	88-93	49	89-02	63		
5	89-79	294	89-10	70	88-56	13	88-94	50	88-87	40		
6	89-74	277	89-01	61	88-53	11	88-93	49	89-09	77		
7	89-72	270	89-03	65	88-49	9	88-92	47	89-06	71		
8	89-69	260	89-01	61	88-48	8	88-95	52	89-13	86		
9	89-87	322	89-00	59	88-54	12	88-97	55	89-25	118		
10	90-02	378	89-00	59	88-67	22	88-97	55	89-38	158		
11	90-25	467	89-04	67	88-68	22	88-98	56				
12	90-27	475	89-04	67	88-58	15	88-98	56				
13	90-11	412	89-03	65	88-50	15	88-99	58				
14	90-02	378	89-00	59	88-55	13	88-99	58				
15	89-81	301	88-95	52	88-56	13	88-98	56				
16	89-68	256	88-93	49	88-56	13	88-99 ¹	58				
17	89-58	223	88-89	43	88-65	20	89-00	59				
18	89-56	217	88-86	39	88-73	26	88-99	58				
19	89-50	197	88-74	27	88-74	27	89-07	73				
20	89-43	174	88-64	19	88-74	27	89-06	71				
21	89-36	152	88-66	21	88-73	26	89-10	79				
22	89-30	133	88-73	26	88-73	26	89-19	101				
23	89-27	124	88-71	25	88-72	26	89-18	98				
24	89-28	127	88-69	23	88-71	25	89-10	79				
25	89-34	145	88-67	22	88-78	30	89-19	101				
26	89-29	130	88-64	19	88-82	34	89-14	89				
27	89-27	124	88-62	18	88-81	33	89-18	98				
28	89-28	127	88-60	16	88-80	32	89-13	86				
29	89-24	115	88-58	15	88-82	34	89-97	55				
30	89-24	115	88-55	13	88-85	38	88-99	58				
31	89-20	103	88-55	13			88-97	55				

Notes.—Marked thus (°) interpolated.
Ice conditions from January 1 to April 16.
Data insufficient to estimate daily discharge.

Monthly Discharge of Woody River at Bowsman for 1916.

(Drainage area 731 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.....	790	...	180 ⁴	0 246	0 274	10,711
May.....	1,004	98	305	0 417	0 481	18,754
June.....	1,357	435	845	1 136	1 290	50,281
July.....	475	103	251	0 343	0 395	15,433
August.....	93	13	46	0 063	0 073	2,828
September...	38	8	20	0 027	0 030	1,190
October.....	101	37	64	0 088	1 015	3,935
November...	158	...	45 ¹	0 062	0 069	2,678
The period	1,357	8	219	0 300	3 627	105,810

NOTE.—Marked thus ⁽¹⁾ estimated.

SWAN RIVER.

The Swan river rises on the extreme northwestern slope of the Porcupine mountains. Its course is generally south and east until it reaches a point in Tp. 34, R. 31, W.P.M., when it turns and flows almost due northeast through the valley between Porcupine and Duck mountains into Swan lake.

The valley between the two mountains is broad and deep, but nearly all the drainage entering this section of the river is from the south, most of the tributaries heading in the Duck mountains. To the north the basin is confined by the drainage area of the Woody river which follows a parallel course to the Swan.

The banks of the valley are an alluvial deposit of clay and gravel. The river has an average width of one hundred and fifty feet, the banks ranging from ten to fifty feet in height. The upper parts of the valley are largely covered with a timber growth, but in the lower bottom lands mixed farming is extensively followed. The valley is well settled, the town of Swan River being the principal community.

In 1909 an investigation of the power possibilities of the river was made and a site located in the vicinity of Swan River with a view to supplying that town with power.

SWAN RIVER AT SWAN RIVER.

STATION No. 5. L.E1

History.—The station was established by W. G. Worden on October 12, 1912 and since that time has been in practically continuous operation.

Location of Section.—The metering section is located at the downstream side of the traffic bridge which spans the Swan river at the northerly end of the town of Swan River.

All open water discharge measurements are taken from this bridge. In winter the measurements are taken from the ice on the same cross section of the river.

Drainage Area.—The drainage area of the river above this point is 1,215 square miles.

Channel.—The station is located in a straight section of the river about five hundred feet long. The bed of the channel is clay and boulders and is not liable to shifting. The banks at the section are of sufficient height to confine the discharge to the river bed for all stages of the river.

Gauge.—A chain gauge is secured to the lower chord of the truss on the upstream side of the bridge. It is referred to a permanent M.H.S. bench mark, located forty-five feet northeast of the north abutment of the bridge. This bench mark is set to an arbitrary datum.

Discharge Measurements.—Since this station was established, discharge measurements have been obtained over a range in stage of 4.75 feet, corresponding to a range in discharge of from 10 to 4,200 c.f.s.

Records Available.—From October 24, 1912 to March 31, 1914 continuous records of daily gauge height for the open water seasons and intermittent gauge readings for the winter periods have been obtained. From April 1, 1914 to December 31, 1916 continuous records of daily gauge height have been obtained.

Based on these gauge heights, estimates of daily discharge throughout the open water seasons are available.

Estimates of mean monthly discharge based on gauge heights and actual discharge measurements are also available for the whole period.

Accuracy.—Between gauge heights 90.40 and 101.8, the discharge curve is well defined; between 101.8 and 104.20 it is fairly well defined.

Discharge Measurements of Swan River at Swan River for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 1	C. O. Allen.....	1,912	50	35.5	0.43	99.63	15.0
May 25	R. C. Robinson.....	1,435	150	420.6	1.65	101.28	694.0
June 22	R. C. Robinson.....	1,196	150	468.8	2.28	101.77	1,068.0
July 14	R. C. Robinson.....	1,196	150	445.7	2.04	101.40	900.0
Aug. 17	R. C. Robinson.....	1,196	134	254.3	0.35	100.16	139.0
Sept. 19	R. C. Robinson.....	1,614	124	228.4	0.45	100.01	102.0
Oct. 31	C. O. Allen.....	1,551	128	261.5	0.60	100.20	156.0

¹Ice Measurement.

NOTES.—Marked (1) interpolated. Ice conditions from January 1 to April 14 and November 10 to December 31.
Data insufficient to compute daily discharge from March 28 to April 14 and November 10 to December 31.

Monthly Discharge of Swan River at Swan River for 1916.
(Drainage area 1,215 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	21	14	17	0.014	0.016	1,045
February	15	11	13	0.011	0.012	748
March			14 ¹	0.012	0.014	861
April			520 ¹	0.428	0.478	30,042
May	1,280	205	510	0.427	0.492	31,012
June	2,730	1,050	1,700	1.407	1.870	101,002
July	1,050	254	564	0.464	0.535	34,079
August	238	52	130	0.107	0.123	7,903
September	147	39	87	0.072	0.080	5,177
October	165	87	130	0.107	0.123	7,903
November			75 ¹	0.062	0.060	4,463
December			18 ¹	0.015	0.017	1,107
The year			315	0.250	3.520	224,612

NOTE.—Marked thus ¹ estimated.

MOSSY RIVER.

The Mossy river is the connecting link between lake Dauphin and lake Winnipegosis, draining the former into the latter. It heads in the extreme northern end of lake Dauphin and flows generally north for a distance of about twenty-one miles.

The Fork and Fishing rivers are tributaries that have their sources on the eastern slope of the Duck mountains. All the basin of the Mossy river, with the exception of that supplied by these rivers, is gathered by the rivers tributary to lake Dauphin. These are the Valley, Turtle, Ochre, Wilson and Vermilion rivers. The upper part of the basin is well timbered while the lower part is prairie country and used extensively for mixed farming.

The banks of the Mossy vary between five and fifteen feet in height and are of clay overlying a bed of gravel. The river varies in width from 120 to 200 feet and has been considerably improved by dredging.

The country adjacent to the river is very well settled, especially on the west side. The town of Winnipegosis with a population of 600 people is situated at the mouth of the river and the town of Dauphin is the chief centre in the district.

In 1908 the Department of Public Works made a survey of the river with a view to lowering lake Dauphin. In connection with this project, dredging operations were carried on in the river basin between 1908 and 1912. A water power project has been looked into on the river near Winnipegosis and a reconnaissance survey for this purpose was made by a field party of the Manitoba Hydrometric Survey, in the summer of 1913.

MOSSY RIVER AT WILSON'S FARM (BELOW FORK RIVER).

STATION NO. 5. L.J2

History.—The station was established by W. J. Ireland on July 28, 1914 and superseded a station which had previously been operated at Lacey's Farm, just below lake Dauphin. This latter station was discontinued on account of its inaccessibility and the difficulty of obtaining gauge records.

Location of Section.—The metering section is located one-quarter of a mile upstream from the house on the farm of D. F. Wilson, two and one-half miles northeast of the town of Fork River.

The section is equipped as a cable carrier station, and from this cable all measurements during the open water season are taken. During the winter months the measurements are taken from the ice at the same cross section of the river.

Drainage Area.—The drainage area of the river above the station is 3,950 square miles.

Channel.—The bed of the channel is of gravel and boulders and is of a permanent character. The banks are sufficiently high to confine the discharge at all stages of the river.

Gauge.—A vertical staff gauge is secured to a post driven into the bed of the stream near the left bank near Mr. Wilson's house and about one-quarter of a mile down stream from the metering section.

Discharge Measurements.—Since this station was established, discharge measurements have been obtained over a range in stage of 4.22 feet, corresponding to a range in discharge of from 60 to 1,300 c.f.s.

Records Available.—From July 14, 1913 to August 10, 1914 a continuous record of daily gauge height during the open water seasons, and intermittent gauge readings during the winter seasons were obtained at the original station on the river at Lacey's Farm. From July 3, 1914 to December 31, 1916 a continuous record of daily gauge height has been obtained at the Wilson Farm station.

Based on the above gauge readings, estimates of daily discharge are available for the whole of the period covered by gauge readings obtained at Lacey's farm and on those obtained during the open water periods at the Wilson Farm station.

Estimates of mean monthly discharge based on gauge readings and actual discharge measurements are available for the above periods.

It will be noted that the discharge at the Wilson's Farm station includes the discharge of the Fork river which enters the Mossy below the original station at Lacey's.

Accuracy.—The curve is fairly well defined over a range in gauge height of from 90.0 to 94.2.

Discharge Measurements of Mossy River near Fork River for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 3	C. O. Allen	1,912	70	12	0.16	90.17	24.31
April 5	C. O. Allen	1,912	59	11	0.16	90.22	19.11
May 28	C. O. Allen	1,912	100	437	1.61	92.61	671.0
June 24	R. C. Robinson	1,196	119	619	2.11	94.26	1,306.9
July 17	R. C. Robinson	1,196	99	410	1.40	92.42	574.6
Aug. 19	R. C. Robinson	1,196	95	340	1.28	91.81	434.9
Sept. 21	R. C. Robinson	1,614	87	273	0.64	90.90	174.6
Nov. 3	C. O. Allen	1,581	90	324	0.97	91.60	313.9

¹Ice measurement.

Daily Gauge Height and Discharge of Mossy River below Fork River for 1916.

(Drainage area 3,950 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	90-34	26	90-22	15	90-08	14	90-10	15	90-19	88	92-74	601
2	90-32	26	90-20	14	90-09	14	90-10	15	90-26	96	92-64	657
3	90-30	23	90-17	14	90-09	14	90-16	17	90-29	99	92-36	563
4	90-26	22	90-18	14	90-08	14	90-17	17	90-23	92	92-16	503
5	90-25	22	90-17	17	90-08	14	90-24	15	90-27	97	92-64	657
6	90-29	23	90-17	17	90-08	14	90-20	19	90-27	97	92-46	505
7	90-28	23	90-15	17	90-08	14	90-18	19	90-34	104	93-48	965
8	90-27	20	90-15	17	90-09	14	90-18	20	90-66	51	93-98	1,175
9	90-19	19	90-15	15	90-10	14	90-24	22	90-30	100	94-01	1,187
10	90-17	17	90-14	15	90-09	14	90-50	34	90-26	96	94-46	1,357
11	90-17	17	90-14	15	90-09	14	90-77	165	89-85	62	94-04	1,200
12	90-17	17	90-15	15	90-10	14	90-90	189	91-50	321	93-64	1,032
13	90-19	15	90-17	15	90-10	14	91-02	214	90-81	140	93-40	958
14	90-16	16	90-15	15	90-10	14	91-24	261	90-62	141	93-07	810
15	90-15	15	90-15	15	90-11	14	91-11	233	90-57	134	92-65	660
16	90-14	15	90-17	15	90-10	14	90-34	104	90-45	118	92-50	640
17	90-10	14	90-17	15	90-10	14	90-20	89	90-33	103	92-56	629
18	90-21	15	90-15	15	90-10	14	90-57	134	90-40	111	92-35	560
19	90-16	15	90-18	14	90-08	14	90-70	153	90-71	155	92-24	527
20	90-09	14	90-17	14	90-07	14	90-60	138	90-78	157	92-10	485
21	90-18	15	90-18	14	90-07	14	90-51	125	90-75	162	92-05	470
22	90-17	15	90-17	14	90-07	14	90-42	114	90-84	178	91-99	452
23	90-17	15	90-18	14	90-05	14	90-34	104	90-98	206	92-25	530
24	90-14	14	90-13	13	90-07	14	90-30	100	90-82	174	93-94	1,158
25	90-15	15	90-11	13	90-07	14	90-24	93	91-16	244	94-44	1,378
26	90-18	15	90-15	14	90-09	14	90-22	91	91-07	446	95-14	1,695
27	90-18	15	90-13	13	90-09	14	90-19	88	92-34	557	95-70	1,945
28	90-19	15	90-12	13	90-13	14	90-20	89	92-53	619	95-49	1,850
29	90-11	14	90-09	14	90-14	14	89-57	46	92-74	691	95-18	1,711
30	90-12	14	.....	.....	90-15	15	90-15	85	92-95	784	94-99	1,625
31	90-14	14	.....	.....	90-11	14	.....	.....	93-06	806	.....	.....
	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	94-68	1,486	92-40	575	91-53	329	90-85	180	91-69	370	90-89	.....
2	94-22	1,279	92-16	508	91-67	365	91-40	298	91-62	352	90-90	.....
3	94-00	1,183	92-23	524	91-79	398	91-42	303	91-65	360	90-89	.....
4	93-82	1,107	92-06	473	91-69	370	91-40	298	91-70	373	90-81	.....
5	93-45	954	92-03	464	91-96	443	91-45	310	91-98	449	90-63	.....
6	93-05	802	92-08	479	91-61	350	91-50	321	92-01	458	91-21	.....
7	93-03	794	92-07	476	91-66	363	91-55	334	91-51	324	91-40	.....
8	93-02	791	92-08	479	91-67	365	91-58	342	91-64	357	91-24	.....
9	93-02	791	92-19	512	91-84	409	91-58	342	91-60	347	91-30	.....
10	92-65	660	91-52	326	91-60	370	91-58	342	.....	.....	91-31	.....
11	92-72	684	91-85	400	91-20	252	91-59	344	.....	.....	91-29	.....
12	92-65	660	91-99	453	91-58	342	91-68	368	90-99	.....	91-25	.....
13	92-57	633	91-94	437	91-47	314	91-51	324	91-00	.....	91-20	.....
14	92-81	714	91-99	453	90-74	160	91-61	350	90-98	.....	91-33	.....
15	92-45	592	91-98	449	91-04	218	91-58	342	90-97	.....	91-20	.....
16	92-34	557	92-21	518	91-49	319	91-70	373	90-96	.....	91-29	.....
17	92-43	585	91-96	443	91-59	344	91-59	344	90-94	.....	91-29	.....
18	92-57	633	91-90	453	91-87	417	91-60	347	90-92	.....	91-27	.....
19	92-34	557	91-91	428	91-67	365	91-35	327	90-91	.....	91-22	.....
20	92-16	503	91-82	404	91-68	368	91-57	330	90-90	.....	91-24	.....
21	92-25	530	91-81	402	91-19	250	91-62	352	90-80	.....	91-29	.....
22	92-20	515	91-80	399	91-20	252	91-40	298	90-88	.....	91-31	.....
23	92-17	506	91-80	399	91-62	352	91-75	386	90-84	.....	91-34	.....
24	92-04	467	91-58	342	91-50	321	91-64	357	90-81	.....	91-35	.....
25	92-15	500	91-59	344	91-78	394	91-12	235	90-92	.....	91-33	.....
26	92-19	512	91-67	365	91-54	331	91-70	373	90-95	.....	91-36	.....
27	92-12	491	91-69	370	91-09	229	91-51	324	90-93	.....	90-75	.....
28	92-20	515	91-72	378	91-51	324	91-78	394	90-90	.....	91-01	.....
29	92-11	485	91-38	293	91-58	342	91-70	373	90-90	.....	91-20	.....
30	92-08	479	91-79	396	91-54	331	92-22	521	90-92	.....	91-39	.....
31	92-15	500	91-49	310	.....	.....	91-68	368	.....	.....	91-40	.....

NOTES.—Ice conditions from January 1 to April 10 and November 10 to December 31.
Data insufficient to compute daily discharge for the latter period.

Monthly Discharge of Mossy River below Fork River for 1916.

(Drainage area 3,950 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January.....	26	14	17	0 004	0 005	1,045
February.....	17	13	15	0 004	0 004	863
March.....	15	14	14	0 004	0 005	861
April.....	261	15	94	0 024	0 027	5,593
May.....	806	51	233	0 059	0 068	14,327
June.....	1,945	452	956	0 242	0 270	56,886
July.....	1,486	467	693	0 175	0 202	42,611
August.....	575	203	428	0 108	0 125	26,317
September.....	443	160	333	0 084	0 094	19,815
October.....	521	180	338	0 086	0 090	20,783
November.....			223 ¹	0 056	0 062	13,269
December.....			130 ¹	0 033	0 038	7,993
The year.....	1,945	13	290	0 073	0 089	210,363

NOTE.—Marked thus (1) estimated.

VALLEY RIVER.

The Valley river is a tributary of lake Dauphin; it rises on the western slope of the Duck mountains, flows south along the foot of the western slope of these mountains, then turns east and flows between the Duck and Riding mountains and continues this generally easterly course to its mouth. There are two tributaries to the Valley which are of fair size; these are Short creek, which rises on the slope of the Riding mountains, and Drifting river, which joins the Valley three miles west of Valley River station on the C.N.R.

The valley between the Riding and Duck mountains, through which the river flows and from which it takes its name, is about one hundred feet deep and from seven hundred to twenty-five hundred feet wide. The river at ordinary summer stages has a width of between one hundred and two hundred feet. The river bed is composed of gravel and boulders, the banks being of clay which overlies a gravel and boulder bed.

The upper part of the drainage area is practically all within the Duck Mountain Forest Reserve, where considerable stands of spruce, jackpine and poplar are to be found. In the immediate vicinity of the river little clearing has been done, though in the lower part of the valley, and somewhat back from the river, farming is carried on to a considerable extent.

VALLEY RIVER AT VALLEY RIVER.

STATION No. 5. L.J₄

History.—The station was established by W. G. Worden on October 25, 1912 and since that date has been in practically continuous operation.

Location of Section.—The metering section is located on the downstream side of the Canadian Northern Railway bridge across the Valley river and fifteen hundred feet north of the railroad station of Valley river.

Drainage Area.—The drainage area of the river above this station is 1,028 square miles.

Channel.—At low stages the water is confined to one channel, while under high water conditions there are two, but at all stages the discharge is confined within the limits of the section. The bed of the channel is of a permanent nature composed of gravel and boulders.

Gauge.—A vertical staff gauge secured to the downstream side of the south bridge abutment was the gauge used in connection with the operation of the station until April 4, 1916, when a chain gauge was installed. Readings were obtained on this gauge from the above date to May 26, 1916, when the chain gauge was removed owing to the dismantling of the bridge for repairs. From the latter date to December 31, 1916 gauge readings have been obtained on the old staff gauge.

Discharge Measurements.—Since the station was established discharge measurements have been obtained over a range in stage of 6.87 feet, corresponding to a range in discharge of from zero to 3,000 c.f.s.

Records Available.—From October 25, 1912 to December 19, 1914 continuous records of daily gauge height throughout the open water season and intermittent records of gauge readings for the winter seasons have been obtained.

From March 29, 1915 to December 31, 1916 continuous records of daily gauge height have been obtained.

Based on these gauge readings, estimates of daily discharge for the open water seasons are available.

Estimates of mean monthly discharge based on gauge readings and actual discharge measurements are available for practically the whole of the above period.

Accuracy.—The discharge curve is well defined between gauge heights 99.5 and 101.7; beyond these limits the curve is not well defined.

Discharge Measurements of Valley River at Valley River for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. Ft.
Feb. 4	C. O. Allen	1,912	34	10.8	0.12	102.91	1.20 ¹
April 4	C. O. Allen	1,912	52	96.8	1.66	101.43	160.6 ¹
May 26	C. O. Allen	1,435	64	190.0	3.06	102.00	331.4
May 26	C. O. Allen	1,435	9	3.7	1.24	102.00	4.6
June 24	R. C. Robinson	1,196	69	228.6	3.88	102.59	887.0
June 24	R. C. Robinson	1,196	35	15.0	1.78	102.59	29.7
July 14	R. C. Robinson	1,196	61	162.3	2.29	101.48	371.7
Aug. 18	R. C. Robinson	1,196	53	97.1	1.19	100.42	106.8
Sept. 20	R. C. Robinson	1,614	50	80.3	0.68	100.10	54.6
Nov. 1	C. O. Allen	1,551	52	89.3	1.17	100.48	104.5

¹Ice measurement.

²H. W. Channel.

MANITOBA HYDROMETRIC SURVEY

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Daily Gauge Height and Discharge of Valley River at Valley River for 1916.

(Drainage area 1,028 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	99 37	.....	98 85	.....	98 42	.....	100 98	.....	100 92	195	102 12	614
2	99 37	.....	98 84	.....	98 62	.....	101 00	.....	100 74	154	102 03	374
3	99 37	.....	98 84	.....	98 82	.....	101 62	.....	100 87	183	101 91	322
4	99 38	.....	98 82	.....	98 83	.....	101 48	101	101 10	328	101 87	505
5	99 37	.....	98 82	.....	98 84	.....	101 46	.....	101 66	422	101 85	497
6	99 36	.....	98 81	.....	98 92	.....	101 27	.....	101 72	445	101 74	453
7	99 36	.....	98 81	.....	99 12	.....	101 12	.....	101 47	353	102 35	722
8	99 30	.....	98 80	.....	99 42	.....	101 10	.....	101 47	353	102 70	895
9	99 31	.....	98 80	.....	99 42	.....	101 08	.....	101 47	353	102 72	905
10	99 27	.....	98 78	.....	99 02	.....	101 05	.....	101 50	363	102 47	780
11	99 22	.....	98 77	.....	99 02	.....	101 52	.....	101 51	367	102 23	664
12	99 17	.....	98 75	.....	99 00	.....	101 77	.....	101 52	376	102 02	569
13	99 16	.....	98 74	.....	98 92	.....	102 18	.....	101 55	382	101 72	445
14	99 12	.....	98 74	.....	98 87	.....	102 77	.....	101 44	342	101 62	407
15	99 10	.....	98 80	.....	98 82	.....	102 88	990	101 52	370	101 44	342
16	99 08	.....	98 82	.....	98 72	.....	102 62	855	101 82	484	101 37	318
17	99 04	.....	98 84	.....	98 71	.....	102 56	825	101 74	433	101 30	296
18	99 02	.....	98 87	.....	98 69	.....	102 22	660	101 72	445	101 22	273
19	99 02	.....	98 87	.....	98 71	.....	102 08	596	101 94	535	101 13	248
20	99 00	.....	98 88	.....	98 82	.....	102 12	614	101 92	526	101 10	240
21	98 92	.....	98 86	.....	99 02	.....	102 22	660	101 82	484	101 07	233
22	98 88	.....	98 84	.....	99 08	.....	102 25	674	101 72	445	101 04	225
23	98 88	.....	98 82	.....	99 12	.....	101 92	526	101 68	430	101 07	243
24	98 82	.....	98 82	.....	99 12	.....	101 65	419	101 72	445	102 73	910
25	98 78	.....	98 81	.....	99 22	.....	101 64	415	101 72	445	104 27	1,860
26	98 76	.....	98 80	.....	99 24	.....	101 61	415	101 99	556	104 47	2,000
27	98 74	.....	98 82	.....	99 28	.....	101 62	407	102 02	569	104 84	2,265
28	98 72	.....	98 82	.....	99 41	.....	101 12	335	102 21	655	104 80	2,240
29	98 62	.....	98 42	.....	99 62	.....	101 27	287	102 22	660	104 32	1,895
30	98 86	.....	.....	.....	99 80	.....	101 12	245	102 23	664	104 02	1,690
31	98 86	.....	.....	.....	100 02	.....	.....	.....	102 21	655	.....	.....

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	103 65	1,450	100 74	154	100 65	134	99 94	36	100 51	112	100 02	.....
2	103 24	1,195	100 82	172	100 63	133	99 92	34	100 53	115	100 07	.....
3	103 03	1,070	101 02	220	100 62	131	99 94	36	100 58	124	100 08	.....
4	102 62	855	100 62	131	100 44	101	99 97	40	100 62	131	100 04	.....
5	102 43	760	100 47	106	100 30	80	100 00	43	100 58	124	100 02	.....
6	102 24	669	100 34	86	100 12	57	99 96	42	100 52	113	99 98	.....
7	102 77	930	100 31	82	100 08	52	100 00	43	100 53	115	99 95	.....
8	102 52	805	100 27	76	100 02	45	100 03	46	100 52	113	99 92	.....
9	102 27	684	100 25	71	99 93	35	100 07	51	100 42	98	99 87	.....
10	102 22	660	100 22	70	99 89	31	100 08	52	100 37	90	99 86	.....
11	102 14	623	100 22	70	99 87	29	100 08	52	100 27	.....	99 82	.....
12	102 01	565	100 34	86	100 12	57	100 09	53	100 24	.....	99 82	.....
13	101 72	445	100 50	110	100 33	85	100 07	51	100 21	.....	99 82	.....
14	101 52	370	100 44	101	100 32	83	100 08	52	100 18	.....	99 77	.....
15	101 31	299	100 42	98	100 27	76	100 09	53	100 13	.....	99 72	.....
16	101 22	273	100 75	157	100 20	67	100 10	54	100 12	.....	99 67	.....
17	101 17	259	100 62	131	100 18	64	100 11	55	100 02	.....	99 47	.....
18	101 14	251	100 42	98	100 12	57	100 13	58	99 92	.....	99 32	.....
19	101 09	238	100 32	83	100 08	52	100 14	59	99 94	.....	99 27	.....
20	101 03	223	100 17	63	100 10	54	100 17	63	99 93	.....	99 12	.....
21	101 00	215	100 14	59	100 09	53	100 20	67	99 93	.....	99 10	.....
22	100 80	188	100 13	58	100 06	50	100 20	67	99 92	.....	99 07	.....
23	100 77	161	100 02	45	100 02	45	100 22	70	99 92	.....	99 04	.....
24	100 70	146	99 94	36	100 00	43	100 24	72	99 92	.....	99 02	.....
25	100 89	188	99 82	25	99 98	41	100 27	76	99 91	.....	99 12	.....
26	100 82	172	100 92	195	99 98	41	100 29	79	99 91	.....	99 27	.....
27	100 78	163	100 82	172	99 99	42	100 30	80	99 90	.....	99 32	.....
28	100 80	188	100 77	161	99 97	40	100 34	86	99 92	.....	99 35	.....
29	100 95	203	100 72	150	99 95	38	100 46	104	99 93	.....	99 42	.....
30	100 88	185	100 70	146	99 95	38	100 48	107	99 96	.....	99 41	.....
31	100 82	172	100 67	140	.....	.....	100 50	110	.....	.....	99 48	.....

NOTES—Ice conditions from January 1 to April 14 and November 11 to December 31.
Data insufficient to compute daily discharge.

Monthly Discharge of Valley River at Valley River for 1916.

(Drainage area 1,028 square miles.)

MONTH.	DISCHARGE IN SECOND-FOOT.				RUN-OFF	
	Maximum	Minimum.	Mean	Per Square mile.	Depth in inches on Drainage area	Total in acre-feet.
January			1 ^a	0.001	0.001	.61
February		0 ^b	1 ^a	0.001	0.001	.58
March			12 ^a	0.012	0.014	7.38
April			460 ^a	0.447	0.499	27,372
May	664	151	433	0.421	0.485	29,624
June	2,265	225	794	0.772	0.861	47,246
July	1,450	146	471	0.458	0.528	28,060
August	220	25	108	0.105	0.121	6,641
September	137	29	62	0.060	0.067	3,689
October	110	34	61	0.059	0.068	3,751
November	131		50 ^a	0.049	0.055	2,975
December			5 ^a	0.005	0.006	307
The year	2,265	0	205	0.199	2.706	148,422

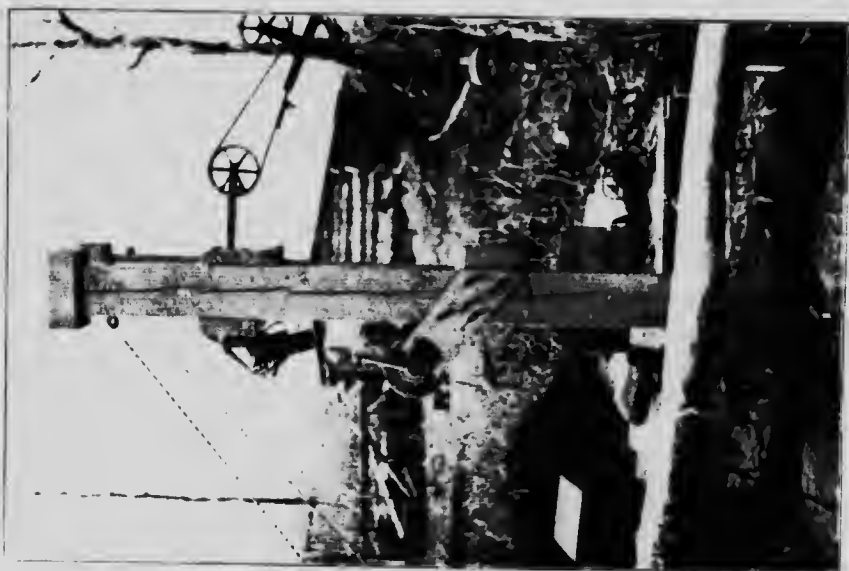
NOTE.—Marked thus (b) estimated.

OCHRE RIVER.

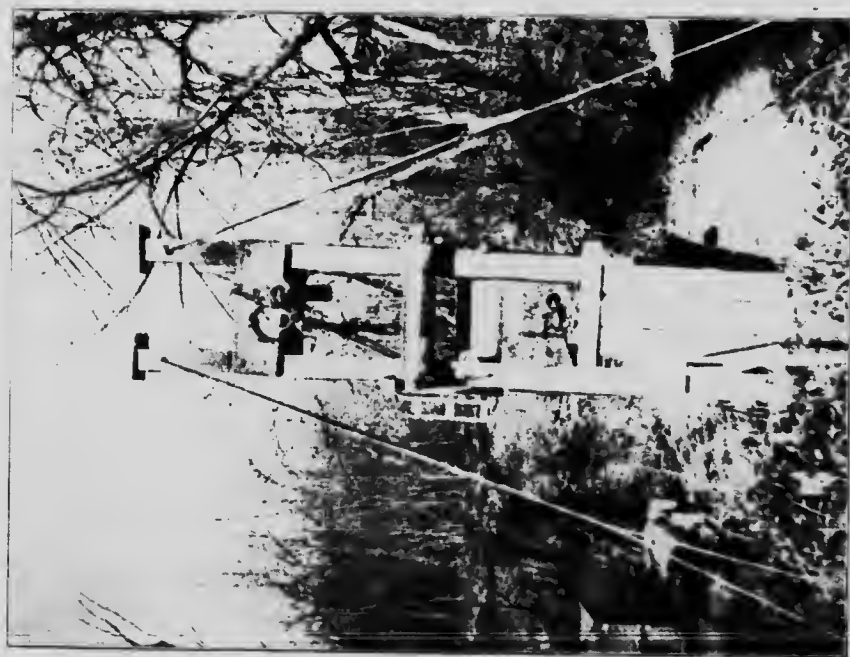
The Ochre river is a small tributary of lake Dauphin. It rises on the north-eastern slope of Riding mountain and flows northeast to the lake, its mouth being in Tp. 20, R. 17 west of the First Meridian. The total drainage area of the river is approximately 270 square miles, of which 250 square miles lie above the metering station at Ochre river.



Ochre River at Ochre River—Meter Section.
Showing installation of Cable Carrier.



Ochre River at Ochre River—Right Bank.
Side view of Cable Carrier, showing equipment.



Ochre River at Ochre River -Right Bank.
Front view of Cable Carrier, showing equipment.

OCHRE RIVER AT OCHRE RIVER.

STATION No. 5. L.J. 5

History.—The station was established by W. G. Worden on October 18, 1912 and since that date it has been in practically continuous operation.

Location of Section.—From the time of the establishment of the station up to June 1, 1916 the station was located at the downstream side of a traffic bridge across the Ochre river about one-quarter of a mile north of the railway station of the town of Ochre River. During low water stages in the above period, measurements were frequently taken by wading at a point one hundred feet above the regular section.

On June 1, 1916 a cable carrier station was established at a point four hundred feet downstream from the old station.

Drainage Area.—The drainage area of the river above this station is 250 square miles.

Channel.—The bed of the channel at this point is a sandy gravel and not liable to shift, except in extreme stages of the river. There is liable to be an overflow of the banks at extremely high stages.

Gauge.—A vertical staff gauge is secured to a pile at the southerly end of the traffic bridge, four hundred feet upstream from the cable carrier station. This gauge which has been in the same location since the establishment of the station is referred to a permanent M.H.S. bench mark set to an arbitrary datum.

Discharge Measurements.—Since this station was established, discharge measurements have been obtained over a range in stage of 8.46 feet, corresponding to a range in discharge of from 3 to 1,200 c.f.s.

Records Available.—From October 18, 1912 to December 31, 1916 continuous records of daily gauge height for open water periods, and intermittent records of gauge height for the winter periods have been obtained.

Based on these gauge readings, estimates of daily discharge throughout the open water periods are available.

Estimates of mean monthly discharge based on gauge heights and actual discharge measurements are also available over the above period.

Accuracy.—Between gauge heights 99.5 and 101.0 the discharge curve is well defined, between 101.0 and 108.0 it is fairly well defined. Beyond this upper limit it is not well defined.

Discharge Measurements of Ochre River at Ochre River for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 31	R. C. Robinson.....	1,496	51	197	2.47	104.14	487
May 31	R. C. Robinson.....	1,496	72	171	2.43	103.00	416
June 1	R. C. Robinson.....	1,496	50	159	2.34	103.29	372
June 25	R. C. Robinson.....	1,196	63	435	2.68	108.01	1,166
July 18	R. C. Robinson.....	1,196	44	51	0.81	100.32	41
Aug. 11	R. C. Robinson.....	1,196	42	37	0.56	100.06	21
Sept. 22	R. C. Robinson.....	1,614	38	23	0.29	99.74	7
Nov. 3	C. O. Allen.....	1,551	47	40	0.52	100.13	21

SESSIONAL PAPER No. 25a

Daily Gauge Height and Discharge of Ochre River at Ochre River for 1916.
(Drainage area 250 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1									101.31	118	103.24	356
2									101.23	110	103.43	385
3									101.06	94	103.04	327
4									101.16	103	103.05	328
5									101.13	101	103.04	327
6									101.05	94	103.73	430
7							100.05		100.96	85	103.74	431
8							100.05		100.96	85	103.48	392
9							100.15		100.93	83	101.93	183
10							100.16		100.93	83	101.56	143
11								45	101.03	92	101.36	123
12							100.26	102	101.11	99	101.18	105
13							100.16	170	101.44	131	101.06	94
14							100.26	222	101.56	143	101.03	92
15							103.51	307	101.47	134	101.03	92
16												
17							103.51	307	101.29	116	100.96	85
18							102.96	315	101.13	101	100.96	85
19							102.35	233	101.04	93	100.96	85
20							102.34	232	100.95	85	100.86	76
21							101.78	167	100.86	76	100.68	61
22												
23							101.65	153	100.81	72	100.56	52
24							101.41	128	101.06	94	100.83	57
25							101.46	133	100.89	79	108.16	1,192
26							101.66	154	101.06	94	110.31	1,579
27							101.66	154	101.83	172	107.68	1,105
28												
29							101.74	162	102.84	299	104.96	633
30							101.86	176	103.20	350	104.26	515
31							102.04	196	102.56	261	103.76	435
							101.85	175	101.98	189	103.56	404
							101.57	144	101.68	156	103.46	380
									103.99	471		

	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	102.76	287	100.14	23	99.66	4	99.78	7	100.28	31		
2	102.26	222	100.14	23	99.65	4	99.76	7	100.26	30		
3	101.86	176	100.06	19	99.65	4	99.93	13	100.26	30		
4	101.74	159	100.01	17	99.74	6	100.44	42	100.23	28		
5	101.43	130	100.01	17	99.81	8	100.24	28	100.23	28		
6	101.26	113	100.04	18	99.77	7	100.15	24	100.44	42		
7	101.23	110	100.04	18	99.74	6	100.07	20	100.55	51		
8	101.14	102	100.04	18	99.68	5	100.05	19	100.34	35		
9	100.96	85	99.96	14	99.66	4	100.00	16	100.43	41		
10	100.80	70	100.05	19	99.65	4	99.99	16	100.26	25		
11	100.76	68	100.06	19	99.65	4	99.96	14	100.26	25		
12	100.66	60	99.96	14	99.65	4	99.96	14				
13	100.56	52	99.94	14	99.66	4	99.96	14				
14	100.46	44	99.86	10	99.76	7	99.96	14				
15	100.46	44	99.86	10	99.83	9	100.01	17				
16	100.36	36	99.85	10	99.76	7	100.06	19				
17	100.33	34	99.81	8	99.75	7	100.06	19				
18	100.35	36	99.78	7	99.74	6	100.11	22				
19	100.36	36	99.76	7	99.73	6	100.07	20				
20	100.26	30	99.71	5	99.76	7	100.06	19				
21	100.16	25	99.69	5	99.73	6	100.16	25				
22	100.16	25	99.67	4	99.74	6	100.09	21				
23	100.11	22	99.66	4	99.72	6	100.07	20				
24	100.08	20	99.65	4	99.75	7	100.09	21				
25	100.06	19	99.65	4	99.75	7	100.24	28				
26	100.05	19	99.65	4	99.75	7	100.28	31				
27	100.05	19	99.65	4	99.80	8	100.28	31				
28	100.09	21	99.67	4	99.83	9	100.28	31				
29	100.96	85	99.71	5	99.81	8	100.24	28				
30	100.66	60	99.66	5	99.79	8	100.22	27				
31	100.36	36	99.66	4			100.26	30				

*Monthly Discharge of Ochre River at Ochre River for the Period
April—November, 1916.*

[Drainage area 250 square miles.]

MONTH	DISCHARGE IN SECOND-FEET.				RUN-OFF	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April...	397	0	129	0 516	0 576	7,676
May...	171	72	138	0 552	0 636	8,485
June...	1,570	52	352	1 408	1 571	20,945
July...	287	19	73	0 292	0 337	4,480
August...	23	4	11	0 044	0 051	676
September...	0	1	6	0 024	0 027	357
October...	42	7	21	0 084	0 097	1,291
November...	51	.....	23	0 092	0 103	1,414
The period.	1,570	0	94	0 376	3 398	45,333

NOTE. —Marked thus (†) estimated.

TRIBUTARIES OF LAKE WINNIPEG ON THE WEST.

GENERAL.

The rivers coming under this head are the Saskatchewan, Fairford and Dauphin, though they are included in that part known for administration purposes as the district west of lake Winnipegosis.

The Saskatchewan is very important from a navigation, reclamation and power standpoint. The Fairford is also important and to some extent for the above reasons. Its chief importance is that it forms the only outlet of lake Manitoba and through it lake Winnipegosis, lake Dauphin, Swan lake and Red Deer lake are drained.

SASKATCHEWAN RIVER.

The Saskatchewan river is one of the principal tributaries of lake Winnipeg: it flows into that lake near the northern end and drains a large territory to the west of the lake. The total drainage area is 155,000 square miles, extending from the summit of the Rocky mountains eastward to lake Winnipeg. There are two main branches of the river, known as the North and South Saskatchewan. The north branch heads in the Rockies southwest of Edmonton, and flows generally east to its junction with the south branch about fifty miles east of Prince Albert. The tributaries entering the river from the north are small, as the northern limit of the basin follows the river itself closely. The south branch is formed by the junction of the Bow and Old Man rivers, and below the junction of these two the Red Deer enters.

In the province of Manitoba, the country adjacent to the river is low lying and swampy, a considerable portion of the level being liable to flooding during high water. Near the mouth the river enlarges into two lake-like expanses, known as Cedar lake and Cross lake; from the latter lake the river flows into lake Winnipeg. Cross Lake rapids, Red Rock rapids and Grand rapids occur in this stretch of the river.

In Manitoba, the river has an average width of one thousand feet, though above Grand rapids a minimum width of five hundred feet occurs. The river bottom above Cedar lake is composed of clay and gravel, below that point limestone ridges occur, between which the bottom is covered with boulders. Valuable timber is to be found along the river at various points, but generally speaking, as the lake is approached, the growth becomes stunted, being for the most part second growth.

Above Grand rapids the river is navigable at certain stages and steamers have been operating as far upstream as Edinonton. At present all navigation below Pas is confined to gasoline launches and like small craft.

Considerable work in the way of reconnaissance and detailed surveys for various purposes has been done by the Dominion Water Power Branch in this part of the river, and in order to further the work, two metering stations have been established by the Manitoba Hydrometric Survey, one at Pas and the other at the head of Grand rapids.

SASKATCHEWAN RIVER AT PAS.

STATION NO. 5. K.J₁

History.—The station was established by W. G. Worden on October 21, 1912. On May 21, 1913 a new station was located by E. Bankson, which has been in continuous operation since that date.

Location of Section.—The metering section as originally located was a boat station situated about a quarter of a mile below the bridge (then in course of construction) of the Hudson Bay Railway across the Saskatchewan at Pas. On the completion of this bridge the metering section was located at the downstream side of same. All open water measurements are taken from this bridge. Under winter conditions the measurements are made from the ice, at a point about two hundred feet downstream from the regular section.

Drainage Area.—The drainage area of the river above the section is 149,500 square miles.

Channel.—The river is divided by bridge piers into six channels at ordinary stages. The section is located on a straight stretch of the river approximately 4,000 feet long. The bed of the channel is composed of clay, gravel and boulders, but is liable to a certain amount of shifting during flood periods each year. The right bank is high and not liable to overflow, though there is likely to be a certain amount of overflow of the left bank during high stages. At extreme high stage there is a small discharge through an overflow channel about five hundred yards south of the bridge.

Gauge.—A vertical staff gauge is secured to the downstream side of the south pier and ten feet upstream from the metering section. This gauge is referred to a permanent M.H.S. bench-mark which is set to Hudson Bay Railway datum.

Discharge Measurements.—Since this station was established, discharge measurements have been obtained over a range in stage of 16.30 feet, corresponding to a range in discharge of from 5,100 to 102,000 c.f.s.

Records Available.—From February 9, 1913 to April 30, 1914 a continuous record of daily gauge height for open water periods and an intermittent record of gauge height for winter periods have been obtained. From May 1, 1914 to December 31, 1915 and from February 1 to December 31, 1916 records of daily gauge height have been obtained.

Based on these gauge readings, estimates of daily discharge are available.

Estimates of mean monthly flow, based on gauge readings and actual discharge measurements are available for the years 1913 to 1916.

Accuracy.—The discharge curve for the station is well defined between gauge heights 818.5 and 822.7. Between 822.7 and 828.0, the discharge curve exhibits all the characteristics that are peculiar to certain large rivers, in that the discharge for the same gauge height varies according as the river is on a rising or a falling stage. Above gauge height 827.0 and below 818.5 the discharge curve is fairly well defined.

Discharge Measurements of Saskatchewan River at Pas for 1916.

Date	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height	Discharge.
			Feet.				
				Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 27	C. O. Allen	1,912	725	9,200	0.45	817.13	4,140
Jan. 28	C. O. Allen	1,912	725	9,200	0.45	817.10	4,140
Mar. 30	C. O. Allen	1,912	710	10,267	0.70	817.20	7,187
Mar. 31	C. O. Allen	1,912	710	10,267	0.71	817.22	7,200
May 21	C. O. Allen	1,435	750	15,816	2.60	823.53	41,440
June 18	R. C. Robinson	1,196	793	18,828	3.41	828.06	64,202
June 19	R. C. Robinson	1,196	794	18,778	3.50	828.21	65,722
July 11	R. C. Robinson	1,196	1,044	22,336	3.93	831.56	87,780
July 11	R. C. Robinson	1,196	230	699	0.28	831.56	196
Aug. 13	R. C. Robinson	1,196	231	786	0.53	831.93	417
Aug. 13	R. C. Robinson	1,196	1,044	22,180	3.08	831.93	88,276
Sept. 16	R. C. Robinson	1,615	794	20,041	3.35	828.66	67,138
Oct. 28	C. O. Allen	1,550	755	15,705	2.34	825.12	36,815

¹Ice measurement.

²Flood Channel.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26a

Daily Gauge Height and Discharge of Saskatchewan River at Pas for 1916. (Drainage area 149,500 square miles)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	16.27	6,540	14.63	4,610	14.81	4,360	17.24	6,650	20.01	53,150	24.45	44,750
2	16.15	6,360	14.58	4,550	14.80	4,345	17.54	7,040	23.85	52,300	24.57	45,380
3	16.95	6,140	14.54	4,490	14.82	4,345	17.93	7,630	25.31	49,300	24.72	46,150
4	16.84	6,070	14.52	4,460	14.81	4,325	18.60	8,450	25.55	50,650	24.77	46,480
5	16.75	5,940	14.50	4,420	14.80	4,295	19.05	9,380	25.40	49,800	25.00	47,650
6	15.63	5,780	14.48	4,300	14.66	4,175	19.42	10,120	25.26	49,050	25.30	49,250
7	15.52	5,650	14.45	4,245	14.68	4,155	19.72	10,770	25.17	48,550	25.55	50,650
8	15.45	5,560	14.36	4,250	14.80	4,255	20.05	11,550	24.97	47,500	25.82	52,100
9	15.36	5,450	14.42	4,285	14.79	4,230	20.46	12,710	24.67	45,900	26.01	53,150
10	15.32	5,430	14.40	4,255	14.79	4,220	20.77	13,530	24.60	45,550	26.33	54,950
11	15.26	5,350	14.36	4,200	14.83	4,240	21.57	16,780	24.26	43,750	26.42	55,400
12	15.25	5,330	14.33	4,165	14.91	4,305	21.85	19,900	24.15	43,200	26.80	57,550
13	15.23	5,300	14.31	4,130	14.99	4,360	22.85	24,790	24.05	42,650	27.05	58,950
14	15.18	5,220	14.26	4,100	15.16	4,520	23.30	30,180	24.00	42,400	27.30	60,350
15	15.15	5,230	14.28	4,075	15.35	4,680	23.90	36,230	23.66	40,850	27.50	61,500
16	15.16	5,230	14.28	4,065	15.54	4,870	24.84	44,200	23.60	40,300	27.70	62,650
17	15.16	5,230	14.29	4,055	15.77	5,080	25.31	47,100	23.37	39,150	27.87	63,650
18	15.18	5,240	14.23	4,085	15.96	5,270	25.49	49,300	23.45	39,550	28.05	64,750
19	15.25	5,310	14.28	4,120	16.04	5,340	25.75	51,200	23.44	39,500	28.35	66,500
20	15.25	5,330	14.47	4,185	16.26	5,580	26.15	53,100	23.52	39,000	28.67	68,450
21	15.26	5,380	14.53	4,230	16.33	5,670	26.66	54,200	23.51	39,850	28.71	68,700
22	15.25	5,370	14.59	4,265	16.37	5,920	27.86	54,800	23.49	39,750	28.96	69,600
23	15.25	5,350	14.59	4,250	16.74	6,110	27.28	55,000	23.46	39,600	29.05	70,800
24	15.23	5,330	14.56	4,240	16.80	6,280	27.31	54,900	23.67	40,700	29.08	71,000
25	15.05	5,130	14.60	4,240	16.92	6,300	27.07	54,800	23.81	41,400	29.25	72,100
26	14.84	4,900	14.73	4,345	16.70	6,020	26.68	54,500	23.91	41,050	29.47	73,500
27	14.76	4,800	14.74	4,345	16.86	6,200	26.40	54,200	23.94	42,100	29.61	74,400
28	14.78	4,770	14.82	4,390	17.14	6,530	26.17	53,700	24.13	43,100	29.80	75,600
29	14.79	4,750	14.81	4,380	17.17	6,550	26.05	53,400	24.16	43,250	29.87	75,100
30	14.68	4,690			17.19	6,580	25.45	50,100	24.24	43,650	30.05	77,250
31	14.67	4,670			17.21	6,600			24.25	44,200		
Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	30.24	78,550	32.50	100,100	29.64	74,600	28.29	66,100	22.90	36,760	19.50	15,080
2	30.26	79,400	32.55	100,800	29.56	74,050	28.26	65,950	22.85	36,520	19.45	14,780
3	30.45	80,050	32.40	98,500	29.41	73,100	28.29	66,100	22.78	36,030	19.45	14,580
4	30.66	81,650	32.39	98,700	29.28	72,250	28.29	66,100	22.70	35,780	19.44	14,410
5	30.83	83,050	32.37	98,400	29.23	71,950	27.75	62,950	22.60	35,200	19.15	13,180
6	31.10	85,450	32.31	97,700	29.20	71,750	27.38	60,800	22.60	35,290	18.94	12,400
7	31.10	85,450	32.23	96,700	29.19	71,650	27.18	59,700	22.58	35,180	18.70	11,670
8	31.20	86,300	32.13	95,600	29.11	71,200	27.12	59,250	22.50	34,800	18.24	10,520
9	31.28	87,050	32.24	96,900	29.01	70,550	26.55	56,150	22.65	35,540	18.25	10,480
10	31.45	88,550	32.15	95,800	29.00	70,500	26.37	55,150	22.70	35,780	18.29	10,480
11	31.43	88,350	32.15	95,800	28.94	70,100	26.27	54,600	22.70	35,780	18.35	10,500
12	31.57	89,650	32.01	94,200	28.80	69,250	26.15	53,950	22.63	35,440	18.35	10,500
13	31.80	91,900	31.92	93,200	28.76	69,000	25.97	53,220	22.45	35,220	18.35	10,440
14	31.86	92,600	31.65	90,400	28.72	68,750	25.79	51,980	22.85	35,920	18.33	10,330
15	32.05	94,700	31.62	90,100	28.69	68,550	25.51	50,400	24.05	32,680	18.29	10,160
16	32.24	96,900	31.55	89,450	28.67	68,450	25.15	48,450	23.95	32,430	18.27	10,080
17	32.15	95,800	31.30	88,000	28.67	68,450	25.06	47,900	23.95	32,090	18.25	9,960
18	32.23	96,700	31.22	86,500	28.67	68,450	24.85	46,850	23.84	31,750	18.20	9,820
19	32.70	102,900	31.14	85,800	28.67	68,450	24.68	46,950	23.75	31,360	18.10	9,550
20	32.51	100,200	31.17	86,050	28.60	68,550	24.54	45,200	23.60	30,870	17.99	9,260
21	32.53	100,500	30.97	84,250	28.75	68,950	24.45	44,750	23.33	30,280	17.93	9,110
22	32.55	100,800	30.63	83,900	28.67	68,450	24.28	43,850	22.95	29,490	17.65	8,600
23	32.63	101,900	30.60	83,650	28.61	68,050	23.95	42,150	22.68	28,710	17.57	8,430
24	32.63	101,900	30.58	81,100	28.53	67,550	23.80	41,350	20.85	22,680	17.50	8,270
25	32.67	102,500	30.29	78,900	28.53	67,550	23.55	40,050	20.25	15,610	17.36	8,020
26	32.55	100,800	30.26	78,700	28.53	67,550	23.38	39,200	19.57	16,200	17.25	7,910
27	32.68	102,600	30.19	78,200	28.43	66,950	23.29	38,750	19.57	16,080	17.21	7,700
28	32.60	101,500	30.00	76,950	28.33	66,350	23.12	37,850	19.54	15,770	17.05	7,410
29	32.60	101,500	29.92	76,400	28.25	66,100	22.75	36,030	19.56	15,880	16.99	7,280
30	32.58	100,900	29.93	76,450	28.29	66,100	22.87	36,610	19.53	15,430	16.89	7,110
31	32.65	102,200	29.77	75,450			22.80	36,270			16.81	6,950

Notes.—Marked thus (i) interpolated.

800.00 should be added to gauge heights to reduce to station datum, and 826.63 to bring to mean sea-level datum.

Ice conditions from January 1 to April 15, and November 12 to December 31.

Monthly Discharge of Saskatchewan River at Pas for 1916.

(Drainage area 140,500 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth. in inches on Drainage area.	Total in acre-feet.
January.....	6,540	4,670	5,282	0.036	0.042	330,926
February.....	4,810	4,065	4,573	0.029	0.031	245,750
March.....	6,900	4,185	5,122	0.034	0.039	316,784
April.....	86,000	6,850	23,684	0.225	0.251	2,004,237
May.....	88,150	29,150	43,947	0.294	0.239	2,702,196
June.....	77,280	64,750	61,206	0.410	0.457	3,648,079
July.....	102,900	78,550	90,623	0.626	0.722	5,756,664
August.....	100,800	75,480	88,208	0.594	0.665	5,460,407
September.....	74,800	66,100	69,440	0.464	0.516	4,121,367
October.....	62,940	26,370	50,110	0.235	0.266	3,081,144
November.....	26,780	18,420	20,848	0.200	0.223	1,776,080
December.....	18,080	6,950	10,160	0.068	0.078	624,863
The year.....	102,900	4,065	41,444	0.277	3.771	30,079,013

SASKATCHEWAN RIVER AT HEAD OF GRAND RAPIDS.

STATION NO. 5. K.L₁

History.—The station was established by E. B. Patterson on July 31, 1912 and has been in continuous operation since that date.

Location of Section.—The metering section is located 3,200 feet above the head of Grand rapids on the Saskatchewan river, and is 640 feet below the Hudson's Bay Company's wharf, situate. at the upper end of their tramway. The station is operated as a boat station during open water periods. During winter periods, measurements are made on the same cross section.

Drainage Area.—The drainage area of the river above the station is 155,100 square miles.

Channel.—The section is located on a straight stretch of the river about 1,300 feet long. The banks are high and not liable to overflow. The bed of the channel is partly rock and partly of gravel and boulders and not liable to shift.

Gauge.—A vertical staff gauge is located at the left bank on the section. It is secured to a crib which acts as a retaining wall for the bank. This gauge was set on November 10, 1913. Prior to this date a vertical staff gauge was secured to the Hudson's Bay Company's wharf above the section.

Both of these gauges are referred to M.H.S. datum, this being approximately mean sea level datum.

Discharge Measurements.—Since this station was established, discharge measurements have been obtained over a range in stage of 4.68 feet, corresponding to a range in discharge of from 7,000 to 76,000 c.f.s.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 25a

Records Available.—Intermittent records of daily gauge heights extend over a period from August 3, 1912 to November 6, 1913 during the open water seasons. Continuous records of daily gauge height have been obtained over the periods from November 7, 1913 to September 5, 1914 and from March 2, 1915 to December 31, 1916.

Based on these gauge heights, estimates of daily discharge are available for the following periods:—August 1 to November 30, 1912; May 19 to November 11, 1913; April 23 to September 5, 1914; March 2 to December 31, 1915; and from April 15 to December 31, 1916.

Accuracy.—The discharge curve is fairly well defined between gauge heights 85.04 and 89.72, which is the range over which most discharge measurements extend.

Discharge Measurements of St. Charles River at Grand Rapids for 1916.

Date.	Engineer.	Area Sq. ft.	Wetted Perim. Feet.	Area of Surface Sq. ft.	Mean Velocity, ft. per sec.	Gauge Height, Feet.	Discharge, Sec.-ft.
Sept. 19	C. O. Allen	1,550	1,064	16,879	4.31	789.40	72,680
Sept. 20	C. O. Allen	1,550	1,064	16,877	4.38	789.52	74,292
Sept. 21	C. O. Allen	1,550	1,064	16,877	4.44	789.72	76,320
Sept. 22	C. O. Allen	1,550	1,064	16,877	4.39	789.63	74,470
Sept. 23	C. O. Allen	1,550	1,064	16,766	4.29	789.40	71,916
Sept. 24	C. O. Allen	1,550	1,064	16,766	4.30	789.34	72,180
Sept. 25	C. O. Allen	1,550	1,064	16,661	4.25	789.28	70,832
Sept. 26	C. O. Allen	1,550	1,064	16,766	4.26	789.32	71,416
Sept. 27	C. O. Allen	1,550	1,064	16,766	4.22	789.34	70,816
Sept. 27	C. O. Allen	1,550	1,064	16,661	4.27	789.29	71,137
Sept. 28	C. O. Allen	1,550	1,064	16,766	4.25	789.31	71,179
Sept. 29	C. O. Allen	1,550	1,064	16,661	4.26	789.29	71,014
Sept. 30	C. O. Allen	1,550	1,064	16,661	4.27	789.34	71,076
Sept. 30	C. O. Allen	1,550	1,064	16,556	4.18	789.17	69,103
Oct. 1	C. O. Allen	1,550	1,064	16,556	4.14	789.18	68,882
Oct. 2	C. O. Allen	1,550	1,064	16,977	4.30	789.82	72,943
Oct. 3	C. O. Allen	1,550	1,064	16,766	4.23	789.35	70,960
Oct. 3	C. O. Allen	1,550	1,064	16,661	4.14	789.21	68,999
Oct. 4	C. O. Allen	1,550	1,064	16,556	4.12	789.17	68,285
Oct. 5	C. O. Allen	1,550	1,064	16,556	4.09	789.13	67,747
Oct. 5	C. O. Allen	1,550	1,064	16,556	4.08	789.11	67,603
Oct. 6	C. O. Allen	1,550	1,062	16,449	4.05	789.06	66,586
Oct. 7	C. O. Allen	1,550	1,064	16,556	4.17	789.19	69,086
Oct. 7	C. O. Allen	1,550	1,064	16,556	4.18	789.19	69,123
Oct. 8	C. O. Allen	1,550	1,064	16,556	4.19	789.18	69,316
					4.16	789.21	69,310

*Daily Gauge Height and Discharge of Saskatchewan River at Head of Grand Rapids
for 1916:*

(Drainage area 155,100 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	86.58		85.51		84.31		84.67		85.43	17,700	87.33	41,200
2	86.97		85.45		84.31		84.70		85.62	19,400	87.21	39,500
3	86.66		85.42		84.31		84.71		85.76	20,750	87.34	41,400
4	86.61		85.34		84.31		86.71		86.02	20,300	87.29	40,600
5	86.35		85.10		84.30		84.73		86.08	24,100	87.26	40,200
6	86.23		85.08		84.30		84.71		86.27	26,300	87.35	41,500
7	86.31		85.00		84.30		84.74		86.41	28,000	87.48	43,400
8	86.37		84.96		84.28		84.75		86.53	29,500	87.77	47,600
9	86.39		84.78		84.24		84.73		86.66	31,400	87.86	49,000
10	86.28		84.83		84.28		84.71		86.77	33,000	87.83	48,500
11	86.32		84.77		84.26		84.64		86.80	33,500	87.81	48,200
12	86.36		84.78		84.28		84.08		86.91	35,100	87.78	47,800
13	86.19		84.75		84.25		83.82		86.98	36,100	87.87	49,100
14	86.01		84.87		84.24		83.43		87.00	36,400	88.01	51,100
15	85.88		84.96		84.22		83.15	6,760	87.03	36,800	88.05	51,700
16	85.80		84.91		84.28		83.18	6,832	87.02	36,700	87.98	50,700
17	86.37		84.82		84.25		83.07	6,460	87.03	36,800	87.89	49,400
18	85.90		84.77		84.26		83.13	6,712	87.06	37,300	87.92	49,800
19	85.86		84.61		84.28		83.26	7,020	87.08	37,600	87.95	50,300
20	85.86		84.58		84.20		83.38	7,310	87.07	37,400	88.01	51,100
21	85.88		84.53		84.30		83.54	7,740	87.09	37,700	88.04	51,600
22	85.83		84.45		84.32		83.65	8,110	87.05	37,100	87.97	50,800
23	85.77		84.40		84.29		83.76	8,480	87.08	37,600	88.16	53,300
24	85.81		84.32		84.31		83.91	8,994	87.01	36,500	88.25	54,600
25	85.78		84.32		84.28		84.08	9,070	87.03	36,800	88.31	55,500
26	85.74		84.32		84.31		84.25	10,450	87.09	37,700	88.26	55,100
27	85.68		84.32		84.48		84.48	11,510	87.15	38,600	88.33	55,800
28	85.63		84.32		84.53		84.66	12,580	87.23	39,800	88.42	57,100
29	85.61		84.32		84.56		84.95	14,200	87.28	40,500	88.43	57,300
30	85.57				84.64		85.18	15,850	87.30	40,800	88.38	56,500
31	85.50				84.65				87.35	41,500		
	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
1	88.54	58,900	89.73	76,300	90.02	80,500	89.37	71,000	87.81	48,200	89.83	25,300
2	88.58	59,500	89.79	77,100	89.86	78,200	89.44	72,000	87.70	46,600	89.85	24,900
3	88.55	59,000	89.85	78,000	89.68	75,500	89.19	68,400	87.63	45,600	89.57	24,700
4	88.53	58,700	89.96	79,600	89.50	72,900	89.13	67,500	87.57	44,600	89.17	24,400
5	88.78	62,400	89.92	79,000	89.47	72,500	89.10	67,100	87.43	42,700	89.12	24,200
6	88.76	62,100	89.89	78,600	89.74	76,400	89.21	68,700	87.49	43,600	89.15	23,900
7	88.71	61,400	89.96	79,600	89.72	76,100	89.17	68,100	87.70	46,600	89.07	23,600
8	88.73	61,700	89.98	79,900	89.71	76,000	89.19	68,400	87.53	44,000	89.10	23,200
9	88.79	62,500	89.95	79,500	89.58	74,100	89.18	68,200	87.42	42,500	89.10	22,800
10	88.84	63,300	90.07	81,200	89.64	74,900	89.13	67,500	86.77	40,800	89.12	22,300
11	88.88	63,800	90.80	83,100	90.00	80,200	89.04	66,200	86.14	39,200	89.08	21,650
12	89.05	66,300	90.31	84,700	90.97	79,800	89.00	66,600	85.93	38,600	89.06	20,650
13	89.12	67,400	90.24	83,700	90.95	79,500	89.94	64,700	86.85	37,100	89.50	19,950
14	89.04	66,200	90.22	83,400	90.94	79,300	89.87	63,700	87.46	36,400	89.43	19,200
15	89.08	66,800	90.25	83,900	89.83	77,700	89.83	63,100	86.97	34,900	89.45	18,600
16	89.15	67,800	90.17	82,700	89.84	77,900	89.80	62,700	86.50	34,200	89.40	18,050
17	89.13	67,500	90.23	83,600	89.66	75,200	89.76	62,100	86.18	33,500	89.37	17,850
18	89.09	66,900	90.20	83,100	89.57	73,900	89.70	61,200	85.97	32,800	89.33	17,700
19	89.18	68,200	90.08	81,400	89.50	72,900	89.65	60,500	86.63	32,000	89.39	17,900
20	89.51	73,000	90.50	87,500	89.54	73,500	89.61	59,800	86.05	31,300	89.44	17,600
21	89.38	71,100	90.32	84,900	89.73	76,300	89.54	58,900	86.01	30,600	89.58	17,750
22	89.31	70,100	90.18	82,800	89.52	73,200	89.40	56,800	85.98	29,800	89.62	18,050
23	89.40	71,400	90.23	83,600	89.40	71,400	89.39	56,700	85.97	29,100	89.64	18,200
24	89.52	73,200	90.25	83,900	89.35	70,700	89.35	56,100	87.15	28,500	89.80	18,500
25	89.51	73,000	90.21	83,300	89.27	69,500	89.32	55,700	86.81	27,900	89.75	18,700
26	89.49	72,800	90.15	82,400	89.34	70,600	89.27	54,900	86.55	27,300	89.73	18,900
27	89.50	72,900	90.17	82,700	89.20	70,000	89.14	53,000	87.16	27,100	89.66	18,600
28	89.57	73,900	90.14	82,200	89.29	69,800	89.00	51,000	86.91	26,300	89.69	18,600
29	89.60	75,700	90.08	81,400	89.25	69,300	89.92	49,800	86.32	26,100	89.65	18,900
30	89.78	77,000	90.03	80,600	89.17	68,100	87.84	48,700	87.20	25,500	89.70	19,000
31	89.81	77,400	90.06	81,100			87.75	47,400			89.82	19,200

NOTES.—Marked thus (i) interpolated.

Ice conditions from January 1 to April 14 and November 15 to December 31.

700.00 should be added to gauge heights to reduce to station datum.

Monthly Discharge of Saskatchewan River at Head of Grand Rapids for 1916.
(Drainage area 155,100 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January			11,000 ¹	0.071	0.082	676,364
February			7,600 ¹	0.049	0.053	437,167
March			5,400 ¹	0.035	0.040	332,083
April			7,755 ¹	0.050	0.056	461,455
May	41,500	17,700	33,605	0.217	0.250	2,066,291
June	57,300	39,500	49,317	0.318	0.355	2,934,565
July	77,400	54,700	67,481	0.435	0.502	4,149,245
August	87,500	76,300	81,768	0.527	0.608	5,027,718
September	80,500	68,100	74,530	0.481	0.537	4,424,843
October	72,000	47,400	61,529	0.397	0.458	3,783,271
November	48,200	25,500	35,790	0.231	0.258	2,129,664
December	25,300	17,600	20,420	0.132	0.152	1,255,577
The year	87,500		38,150	0.246	3.351	27,688,173

NOTE.—Marked thus (¹) estimated.

FAIRFORD RIVER.

The Fairford river forms the outlet of lake Manitoba. It empties into lake St. Martin, which in turn is drained by the Dauphin river. The Fairford river is quite short, a lake-like expanse known as lake Pinemuta occurring between lake Manitoba and lake St. Martin.

Lake Manitoba, which has an area of 1,711 square miles, forms the basin into which practically all the territory, lying between the Assiniboine and the Saskatchewan rivers and to the east of the Riding, Duck and Porcupine mountains, drains. The soil is generally clay and suitable for agriculture. A considerable proportion of the area is timbered and in certain sections rock outcrops occur. Numerous lakes are also to be found; among these are lake Winnipegosis, lake Dauphin, Red Deer lake, Swan lake and many others varying in size from mere ponds to lakes of the size mentioned.

The banks of the Fairford river vary from three to ten feet in height. At the upper or lake Manitoba end they are well defined, gradually flattening out below Fairford until they open out into wide, low lying marshy ground in the vicinity of lake Pinemuta. Below this lake they are somewhat higher but again change until they merge with the low swampy shores of lake St. Martin.

The Fairford river varies in width from 500 to 900 feet and at two points, one about one-half mile below the outlet of lake Manitoba, flows over a low limestone ridge or bar.

Some surveys of the river have been made by the Dominion Department of Public Works with a view to improving it for navigation purposes. In addition to this a water power reconnaissance survey was made in the year 1913 by the Manitoba Hydrometric Survey.

TRIBUTARIES OF LAKE WINNIPEG FROM EAST.

GENERAL.

The rivers of importance entering lake Winnipeg from the East are:—

Brokenhead,
Winnipeg,
Manigotagan,
Bloodvein,
Pigeon,
Berens.

These tributaries drain the territory to the west of the watershed of the Great Lakes and Hudson bay. Practically all of this country is unsurveyed so that it is not possible to delimit accurately their actual drainage basins. Practically all the drainage area lies in the Laurentian formation, small lakes and ponds abound and a considerable portion of the surface is covered by muskeg. The rivers are generally in the nature of a series of pools or small lake-like expanses, connected by short narrow channels which are interrupted by falls and rapids. Small stands of merchantable timber are to be found throughout the district, being composed of spruce, jack pine, poplar and birch.

Of the above rivers, the Winnipeg is dealt with separately, and of the remainder, continuous records of discharge are available for the Brokenhead and Manigotagan; for the Berens and Pigeon rivers, individual meterings have been obtained.

BROKENHEAD RIVER.

The drainage basin of the Brokenhead river lies in the narrow strip of country between the basin of the Winnipeg and Whitemouth rivers on the east and of the Red river on the west. It flows northwesterly and empties into lake Winnipeg.

The drainage area is 910 square miles, the basin being 22 miles in width at the widest point and approximately 75 miles long. The greater portion is low lying, though at the lower end part has been placed under cultivation by the aid of drainage work. The whole area can be reclaimed.

The banks are low and the stream bed is of clay with boulders occurring in some sections.

BROKENHEAD RIVER AT SINNOT.

STATION NO. 5. S.A₁

History.—The station was established by G. H. Burnham on May 30, 1912 and since that date has been in practically continuous operation.

Location of Section.—The metering section is located at the downstream side of the traffic bridge across the Brokenhead river, nine hundred feet northeast of the Canadian Pacific Railway station of Sinnott.

Drainage Area.—The drainage area of the river above the station is 530 square miles.

Channel.—The section is located in the centre of a straight stretch of the river about six hundred feet long.

The bed of the channel is of clay and boulders and fairly permanent. The full discharge of the river is confined within the limits of the banks at all stages.

Gauge.—A vertical staff gauge is secured to a pile on the downstream side of the bridge and is referred to a permanent M.H.S. bench mark, located twenty-three feet southeast of the bridge. This bench mark is set to an arbitrary datum.

Discharge Measurements.—Since the station was established, discharge measurements have been obtained over a range in stage of 4.95 feet, corresponding to a range in discharge of from 3 to 1,100 c.f.s.

Records Available.—Continuous records of daily gauge height have been obtained for the following periods:—From June 8 to November 30, 1912, from April 29 to November 30, 1913, and from April 2, 1914, to December 31, 1916, excepting from the 7th to the 10th of April, 1914. Intermittent records were also obtained during December of 1912.

Based on these gauge heights, estimates of daily discharge are available for the open water periods.

Estimates of mean monthly flow based on gauge heights and actual discharge measurements are also available for the whole of the above periods.

Accuracy.—For the open water seasons, the discharge curve is well defined between gauge heights 90.3 and 92.5, from 92.5 to 95.5 it is fairly well defined.

Discharge Measurements of Brokenhead River at Sinnot for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 19	C. O. Allen.....	1,374	50	18	0.20	90.60	4 ¹
Feb. 16	C. O. Allen.....	1,912	41	14	0.42	90.82	6 ¹
April 11	C. O. Allen.....	1,912	29	16	0.62	91.27	10 ¹
April 28	C. O. Allen.....	1,912	89	507	2.24	95.36	1,136
May 16	C. O. Allen.....	1,435	89	354	1.87	93.86	661
Aug. 1	R. C. Robinson.....	1,196	87	285	1.08	92.85	286
Sept. 6	R. C. Robinson.....	1,196	80	142	0.44	91.36	62
Sept. 25	R. C. Robinson.....	1,614	80	151	0.45	91.44	68
Oct. 27	R. C. Robinson.....	1,496	82	168	0.60	91.70	101

(¹) Ice measurements.

Daily Gauge Height and Discharge of Brokenhead River at Sinnot for 1916.

(Drainage area 530 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	90.74		90.79		90.77		91.20		94.63		92.98	342
2	90.73		90.80		90.76		91.27		94.44		92.90	322
3	90.72		90.78		90.73		91.32		94.30		92.88	317
4	90.72		90.76		90.73		91.37		94.29		92.77	292
5	90.71		90.74		90.72		91.32		94.25		92.71	278
6	90.69		90.71		90.81		91.27		94.09		92.69	274
7	90.58		90.78		90.82		91.04		94.10		92.65	265
8	90.40		90.73		90.88		91.05		94.14		92.61	255
9	90.39		90.74		90.85		91.15		94.10		92.58	249
10	90.48		90.73		90.85		91.24		94.13		92.52	236
11	90.46		90.73		90.84		91.27	10	94.18	723	92.48	228
12	90.44		90.73		90.84		91.57		94.11		92.44	210
13	90.30		90.74		90.83		92.04		94.09		92.39	200
14	90.10		90.74		90.83		93.13		94.04		92.36	204
15	90.40		90.75		90.82		93.32	435	93.89	622	92.26	185
16	90.35		90.82		90.82		95.42	1,161	93.86	611	92.18	172
17	90.30		90.85		90.81		95.41	1,510	93.74	571	92.10	150
18	90.60		90.85		90.80		96.82	1,653	93.70	537	92.06	153
19	90.69	4	90.86		90.80		96.83	1,857	93.69	554	91.97	139
20	90.78		90.86		90.80		96.66	1,597	93.58	510	91.88	126
21	90.78		90.86		90.80		96.45	1,524	93.48	484	91.78	112
22	90.70		90.87		90.81		96.31	1,475	93.44	471	91.67	97
23	90.82		90.87		90.82		96.20	1,436	93.39	456	91.68	98
24	90.79		90.87		90.82		96.06	1,387	93.48	484	91.71	102
25	90.75		90.83		90.83		95.88	1,324	93.42	465	91.74	107
26	90.75		90.83		90.83		95.69	1,258	93.39	456	91.93	133
27	90.75		90.83		90.84		95.51	1,194	93.32	435	92.18	172
28	90.74		90.82		90.84		95.31	1,129	93.20	401	92.32	197
29	90.74		90.82		90.90		95.08	1,039	93.18	395	92.48	228
30	90.76				90.94		94.84	954	93.08	368	92.65	265
31	90.78				91.10				92.90	345		

	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
1	92.69	2.4	92.85	311	91.47	73	91.32	57	91.97	139	90.90	
2	92.66	267	92.77	292	91.46	72	91.30	55	92.05	151	90.90	
3	92.58	240	92.56	245	91.45	71	91.31	56	92.10	159	90.89	
4	92.46	224	92.47	226	91.45	71	91.46	72	92.15	167	90.92	
5	92.32	197	92.38	207	91.41	66	91.50	76	92.12	162	90.95	
6	92.18	172	92.36	204	91.36	61	91.55	82	92.11	161	90.90	
7	92.14	165	92.32	197	91.35	60	91.52	78	92.10	159	90.87	
8	92.02	146	92.27	188	91.35	60	91.50	76	92.09	157	90.87	
9	91.97	139	92.29	191	91.34	59	91.47	73	92.08	156	90.89	
10	91.89	128	92.41	213	91.43	68	91.42	67	92.07	154	90.89	
11	91.78	112	92.48	228	91.47	73	91.37	62	92.07	154	90.86	
12	91.66	96	92.57	247	91.51	77	91.31	56	92.08	156	90.86	
13	91.49	75	92.62	258	91.52	78	91.29	54	92.09	157	90.86	
14	91.38	63	92.69	274	91.50	76	91.29	54	91.77		90.85	
15	91.30	55	92.57	248	91.47	73	91.28	53	91.50		90.87	
16	91.25	50	92.52	236	91.46	72	91.27	52	91.35		90.91	
17	91.08	37	92.39	200	91.45	71	91.30	55	91.27		90.80	
18	91.19	45	92.27	188	91.42	67	91.35	60	91.17		90.87	
19	92.06	153	92.22	179	91.40	65	91.41	66	91.12		90.87	
20	92.70	276	92.11	161	91.37	62	91.46	72	91.08		90.77	
21	93.17	393	92.04	149	91.36	61	91.48	74	91.06		90.62	
22	98.50	490	91.97	139	91.35	60	91.47	73	91.03		90.52	
23	93.86	611	91.87	125	91.35	60	91.46	72	91.01		90.47	
24	93.70	557	91.78	112	91.37	62	91.45	71	90.97		90.43	
25	93.48	484	91.75	108	91.42	67	91.48	74	90.96		90.30	
26	93.27	421	91.67	97	91.37	62	91.56	86	90.96		90.17	
27	93.06	363	91.63	92	91.35	60	91.69	100	90.94		90.07	
28	92.88	317	91.56	83	91.36	61	91.74	107	90.92		90.25	
29	92.96	337	91.50	76	91.37	62	91.78	112	90.92		90.27	
30	92.86	313	91.46	72	91.35	60	91.87	125	90.91		90.27	
31	92.87	315	91.48	74			91.93	133			90.37	

NOTE.—Ice condition from November 14 to December 31.
Data insufficient to compute daily discharge

Monthly Discharge of Brokenhead River at Sinnot for 1916.
(Drainage area 530 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January			5 ¹	0.009	0.010	307
February			5 ¹	0.009	0.010	286
March			5 ¹	0.009	0.010	307
April	1,657		695 ¹	1.311	1.484	41,355
May	881	345	595	1.123	1.294	36,585
June	342	97	205	0.387	0.432	12,198
July	611	37	243	0.458	0.528	14,941
August	311	72	182	0.343	0.395	11,191
September	78	50	66	0.125	0.140	3,927
October	133	52	78	0.147	0.169	4,796
November			90 ¹	0.170	0.190	5,355
December			10 ¹	0.019	0.022	615
The year	1,657		182	0.343	4.684	131,865

NOTE.—Marked thus (1) estimated.

MANIGOTAGAN RIVER.

The Manigotagan river, also known as the Bad Throat river, empties into lake Winnipeg from the east about fifty miles north of Fort Alexander. The drainage area is approximately three hundred square miles, though it cannot be definitely determined as the river lies almost entirely in unsurveyed territory. The general course of the river from source to mouth is northwest. There are a number of lake-like expanses in the river between Long lake and Turtle lake; these are known as Caribou, Musk Rat, Moose and Bull Frog lakes.

At the mouth of the river the land is adapted to agriculture, being good clay land. Above Wood falls the country changes and rock outcrops occur; these form barriers across the river causing falls or rapids; between these, the banks are high and rocky, or low, with valleys leading back into muskegs.

The river above Wood falls for a distance of twenty-five miles has an average width of 175 feet. Above this point it is a series of small lake-like expanses or pools of several hundred feet in width joined by narrow stretches, which in the majority of cases are broken by falls or rapids.

The entire drainage area is more or less covered with timber growth; this is not of merchantable size and is of inferior quality, consisting of spruce, scrub, oak, birch and poplar. In the upper part a fringe of good spruce timber is to be found bordering on the lakes.

In 1913 a reconnaissance survey of the power possibilities of the river was made by a party sent out by the Manitoba Hydrometric Survey.

MANIGOTAGAN RIVER AT WOOD FALLS.

STATION No. 5. R.A₁

History.—The station was established by G. J. Lamb on December 21, 1912 and from that time to the end of 1916 has been in practically continuous operation.

Location of Section.—The metering section is located two hundred feet above Wood falls, which are the first falls above the mouth of the river and one mile northeast of the village of Manigotagan. The station is operated as a boat station and in winter measurements are made from the ice on the same cross section.

Drainage Area.—The drainage area of the river above the station is 375 square miles.

Channel.—The discharge of the river at this point is confined to one channel during all stages. The bed of the channel is composed of clay and boulders and is not liable to shift.

Gauge.—There are two vertical staff gauges on which records of river stage are observed at this station. The first is driven into the bed of the stream, in a small bay on the right bank above the falls and about 135 feet below the metering section. The second is secured to the vertical face of rock on the right shore 40 feet below and facing Wood falls. Both of these gauges are referred to U.S. datum.

Discharge Measurements.—Estimates of mean monthly discharge based on stage readings and discharge measurements for the undermentioned periods, are available.

Records Available.—From January 4, 1913 to December 5, 1914 a continuous record of daily gauge height for open water seasons and intermittent record of gauge height for the winter seasons have been obtained.

From December 12, 1914 to May 28, 1916 a continuous record of daily gauge height has been obtained.

Based on these records, estimates of daily discharge for open water seasons are available.

Accuracy.—On account of the small number of measurements taken at this point the discharge curve is not well defined.

Discharge Measurements of Manigotagan River at Wood Falls for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Ft.	Sec. Ft.
Mar. 16	C. O. Allen.....	1,912	89	289	0.27	731.14	107.

¹Ice measurement.

MANITOBA HYDROMETRIC SURVEY

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Mean Daily Gauge Height, in Feet, of Manigotagan River Below Wood Falls
for 1913 and 1914.

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2		712.10	712.06		711.75	711.78	712.45	712.55	711.74	712.10	712.08	
3					711.75	712.70	711.95	712.55	712.84	712.32		
4	712.15				711.69	711.75	712.06	712.55	711.84	712.28		
5				712.15	711.68	711.70	712.55	712.55	712.13	712.54		
6					712.06	711.45	712.06	712.55	712.18	712.53		
7					711.55	712.95	712.05	712.25	712.53	712.64		711.74
8		712.10	712.15		711.80	711.77	712.15	712.05	712.53	712.32		
9					711.70	711.95	712.15	712.25	710.82	711.84	712.63	
10					711.65	712.40	712.45	711.85	712.50	711.80		
11	712.15				711.51	711.25	712.55	712.05	712.14	712.32		
12				711.75	712.25	712.55	712.25	712.25	712.53	712.62		711.93
13					711.85	711.79	712.55	712.05	711.50	711.95		
14					711.75	712.05	711.95	712.05	712.11	712.31		
15		712.00			711.65	712.27	712.25	711.65	712.28	712.31	711.93	
16			712.15		711.45	712.85	712.45		711.93	712.63		
17					712.35	712.35	712.45		711.92	712.84		
18	712.10				712.45	712.15	712.55		711.91	712.53		
19					711.55	711.55	712.15		711.88	712.41		
20					711.50	711.55	712.45		712.58	712.60		
21				711.48	712.15	711.95	712.55		712.63	712.11		
22		712.05		711.45	711.75	711.75	712.25		712.52	711.98	711.76	
23				711.45	712.15	711.64	712.55	712.63	712.24	712.11		
24				711.45	711.85	712.95	712.05	712.64	712.00	712.21		
25	712.10			711.75	711.35	712.15	712.35	712.63	712.43	712.52		
26				711.45	711.95	712.65	711.65	712.78	712.00	712.24		
27				711.55	712.05	712.35	711.95	712.83	712.18	712.03		
28				711.75	711.45	711.55	712.65	712.83	712.31	712.43		
29			712.15	711.75	712.45	712.05	712.65	712.45	711.60			
30				712.35	711.75	712.55	712.15	712.45			711.65	
31					712.25		712.45	712.43				

1914

1					710.65	711.48	710.48	710.68	710.08	710.58		
2					710.83	710.28	711.08	710.48	710.68	709.88		
3	711.63				710.83	710.68	711.68	711.28	712.18	710.18		
4				710.68	710.68	710.88	711.38	710.88	710.88	710.38		
5				710.68	711.73	710.48	710.98	711.68	710.88	710.68		
6				710.68	711.95	711.48	710.38	711.48	710.78	710.48		
7		711.60		710.68	710.88	710.45	710.68	710.88	710.48	710.08		
8				710.68	710.93	711.58	711.38	710.88	709.88	710.58		
9				710.68	711.28	711.48	711.08	710.08	709.88	710.68		
10	711.58			710.68	711.48	711.78	710.78	710.08	709.88	711.08		
11				710.68	711.08	711.68	710.48	710.48	709.98	711.78		
12				710.68	710.88	711.88	711.28	711.48	710.48	710.58		
13				710.68	711.48	711.78	711.38	710.88	710.58	709.88		
14		711.63	710.68	710.68	710.68	711.88	710.48	710.88	710.28	709.48		
15				710.68	710.73	711.48	710.48	710.48	710.88	709.68		
16				710.68	710.78	711.48	710.98	710.68	711.08	709.88		
17	711.60			710.68	710.88	711.68	711.18	711.08	710.48	710.58		
18				710.78	711.48	711.58	710.58	710.58	710.38	709.98		
19				710.78	710.98	711.28	709.88	711.88	709.88	710.28		
20				710.68	711.13	710.48	710.68	710.48	710.08	710.58		
21		712.05	710.68	710.68	711.08	710.98	711.48	710.88	709.88	710.58		
22				710.68	711.48	711.08	711.28	711.48	710.18	711.78		
23				710.78	711.28	710.68	710.38	711.78	710.28	711.08		
24	711.63			710.68	711.48	711.18	710.08	711.64	710.68	710.98		
25				710.83	711.78	710.68	710.48	711.48	710.88	711.48		
26				710.68	712.08	710.33	710.83	711.43	710.88	711.78		
27				710.78	711.48	711.28	710.28	710.88	711.48	711.28		
28		712.68	710.68	710.68	710.88	710.48	710.88	710.48	711.68	710.88		
29				710.78	711.38	710.98	711.28	710.58	711.08	711.28		
30				710.68	710.68	711.28	710.68	711.68	710.78	709.98		
31	711.63				710.83		711.08	711.78		710.58		

Levels reduced to M.H.S. datum (approximate sea level).

*Mean Daily Gauge Height, in Feet, of Manigotagan River Below Wood Falls for
1915 and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	709.98	709.98	709.98	709.98	710.28	709.98	710.98	711.08	710.98	711.68	711.08	711.48
2	709.98	709.98	709.98	709.98	710.28	710.18	710.48	711.18	711.08	711.68	711.68	711.48
3	709.98	709.98	709.98	709.98	710.58	709.78	710.38	711.28	711.08	711.68	710.18	711.53
4	709.98	709.98	709.98	709.98	710.38	710.38	710.38	711.28	710.38	711.38	711.78	711.38
5	709.98	709.98	709.98	709.98	710.38	710.48	710.48	711.28	711.18	710.88	709.68	711.38
6	709.98	709.98	709.98	709.98	710.68	709.78	710.58	711.58	711.38	711.08	710.28	711.48
7	709.98	709.98	709.98	710.08	710.48	710.08	709.98	711.68	711.68	711.48	711.28	711.98
8	709.98	709.98	709.98	710.08	710.58	710.28	709.98	711.68	711.38	711.48	712.08	711.98
9	709.98	709.98	709.98	710.08	710.08	710.58	709.78	711.78	711.98	711.28	711.98	711.88
10	709.98	709.98	709.98	710.08	710.08	710.88	709.88	711.78	711.98	710.98	710.08	711.88
11	709.98	709.98	709.98	710.12	710.18	710.58	710.18	711.68	712.08	710.98	711.88	711.88
12	709.98	709.98	709.98	710.18	709.98	710.28	710.28	711.68	712.13	711.08	711.28	711.78
13	709.98	709.98	709.98	710.28	709.98	710.68	710.28	711.68	712.18	711.28	712.18	711.88
14	709.98	709.98	709.98	710.28	709.98	710.68	710.68	711.78	711.18	711.38	712.28	711.88
15	709.98	709.98	709.98	710.28	709.98	710.48	710.68	711.68	711.68	711.18	712.08	711.88
16	709.98	709.98	709.98	710.28	710.48	709.98	710.98	711.78	711.68	711.08	712.48	711.78
17	709.98	709.98	709.98	710.28	710.58	710.18	710.68	711.48	711.88	710.88	711.28	711.78
18	709.98	709.98	709.98	710.28	710.48	710.38	710.58	711.18	711.88	710.88	711.48	711.78
19	709.98	709.98	709.98	710.28	710.28	709.78	710.88	710.48	711.68	711.08	712.18	711.78
20	709.98	709.98	709.98	710.43	710.28	709.58	710.78	710.68	711.68	711.98	712.38	711.68
21	709.98	709.98	709.98	710.43	709.78	709.98	710.38	711.58	711.68	711.88	712.48	711.78
22	709.98	709.98	709.98	710.48	709.98	709.98	710.48	711.68	711.48	711.78	711.38	711.78
23	709.98	709.98	709.98	710.48	709.58	709.78	710.58	712.18	711.38	711.78	711.68	711.58
24	709.98	709.98	709.98	710.88	709.58	709.78	710.68	711.68	711.28	711.58	711.78	711.58
25	709.98	709.98	709.98	710.58	709.98	709.98	711.48	711.58	711.48	711.68	711.68	711.58
26	709.98	709.98	709.98	710.28	709.98	709.38	711.68	711.38	711.68	711.48	711.78	711.58
27	709.98	709.98	709.98	710.68	709.58	709.78	711.78	711.58	711.88	710.88	711.93	711.58
28	709.98	709.98	709.98	711.48	709.78	710.08	710.88	711.48	712.18	710.78	711.98	711.58
29	709.98	709.98	709.98	710.58	709.98	710.18	710.88	712.18	712.18	710.78	711.98	711.58
30	709.98	709.98	709.98	709.98	709.98	710.38	710.58	711.38	711.98	710.38	711.68	711.48
31	709.98	709.98	709.98	710.28	710.28	710.28	710.98	711.38	711.08	711.08	711.48	711.48

1916

1	711.37	710.97	710.97	710.97	711.77	713.97	713.97					
2	711.37	710.97	710.97	710.97	711.67	713.97	713.97					
3	711.42	710.97	710.97	710.97	711.67	714.07	714.02					
4	711.47	710.97	710.97	710.97	711.37	714.07	713.07					
5	711.47	710.97	710.97	710.97	711.67	713.97	714.17					
6	711.47	710.97	710.97	710.97	711.67	714.37	714.17					
7	711.47	710.97	710.97	710.97	711.67	714.32	714.17					
8	711.47	710.97	710.97	710.97	711.67	714.37	714.22					
9	711.37	710.97	710.97	710.97	711.67	714.37	714.17					
10	711.37	710.97	710.97	710.97	712.87	714.17						
11	711.27	710.97	710.97	710.97	711.37	714.17						
12	711.27	710.97	710.97	710.97	712.87	714.07						
13	711.27	710.97	710.97	711.08	711.67	714.12						
14	711.27	710.97	710.97	711.08	711.67	714.27						
15	711.27	710.97	710.97	711.17	712.87	714.22						
16	711.17	710.97	710.98	711.17	713.02	714.27						
17	711.17	710.97	710.97	711.57	713.02	714.27						
18	711.17	710.97	710.97	711.77	713.17	714.27						
19	711.17	710.97	710.97	711.87	713.87	714.17						
20	711.07	710.97	710.97	711.37	713.37	714.17						
21	711.07	710.97	710.97	711.58	713.27	714.37						
22	711.07	710.97	710.97	711.77	713.22	714.17						
23	710.97	710.97	710.97	711.87	713.27	713.97						
24	710.97	710.97	710.97	711.72	713.27	713.97						
25	710.97	710.97	710.97	711.72	713.22	714.37						
26	710.97	710.97	710.97	711.87	713.47	714.37						
27	710.97	710.97	710.97	711.47	712.47	714.37						
28	710.97	710.97	710.97	711.82	712.67	714.27						
29	710.97	710.97	710.97	712.07	711.72	714.07						
30	710.97	710.97	710.97	711.77	711.67	713.97						
31	710.97	710.97	710.97	711.77	711.67	713.97						

Levels reduced to M. H. S. datum (approximate sea level).

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 25e

Mean Daily Gauge Height, in Feet, of Manigotagan River Above Wood Falls for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	731.08	731.43	731.23	731.13	732.66	732.53	732.28					
2	731.08	731.43	731.23	731.13	732.78	732.48	732.23					
3	731.08	731.43	731.23	731.13	732.78	732.48	732.23					
4	731.08	731.43	731.23	731.13	732.68	732.48	732.23					
5	730.98	731.43	731.23	731.13	732.83	732.48	732.23					
6	730.98	731.43	731.23	731.13	732.83	732.48	732.23					
7	731.08	731.28	731.23	731.13	732.83	732.43	732.18					
8	731.08	731.28	731.18	731.13	732.83	732.43	732.13					
9	731.08	731.28	731.18	731.23	732.83	732.43	732.18					
10	731.08	731.28	731.18	731.23	732.83	732.43	732.13					
11	731.08	731.28	731.18	731.23	732.78	732.43						
12	731.08	731.23	731.18	731.23	732.78	732.43						
13	731.13	731.28	731.18	731.23	732.78	732.43						
14	731.13	731.28	731.18	731.23	732.78	732.43						
15	731.13	731.28	731.14	741.83	732.78	732.38						
16	731.13	731.23	731.18	731.23	732.78	732.38						
17	731.13	731.23	731.18	731.23	732.78	732.38						
18	731.13	731.23	731.18	732.13	732.78	732.38						
19	731.13	731.23	731.18	732.13	732.78	732.38						
20	731.23	731.28	731.08	732.13	732.73	732.38						
21	731.28	731.28	731.03	732.18	732.73	732.38						
22	731.28	731.28	731.03	732.23	732.73	732.33						
23	731.23	731.28	731.03	732.28	732.73	732.33						
24	731.23	731.28	731.03	732.33	732.68	732.33						
25	731.23	731.28	731.03	732.38	732.68	732.33						
26	731.28	731.23	731.03	732.38	732.68	732.33						
27	731.28	731.23	731.03	732.43	732.68	732.33						
28	731.28	731.23	731.03	732.48	732.68	732.28						
29	731.43	731.28	731.03	732.58	732.53	732.28						
30	731.43		731.08	732.63	732.53	732.28						
31	731.43		731.08		732.53							

Levels reduced to M.H.S. datum (approximate sea level).

NELSON RIVER.

GENERAL.

The Nelson river forms the outlet of lake Winnipeg, flowing through the central portion of northern Manitoba and emptying into Hudson bay at Port Nelson. The Nelson river discharges all the water collected by lake Winnipeg from an immense drainage area, and it forms one of the principal systems of the North American Continent, the basin comprising an area of 450,000 square miles.

The territory drained varies from the open prairie forming the great central plain to the rugged and magnificent country found in the Rockies; between these extremes of physical characteristics, all graduations may be found in the basin. The vegetation to be found covers as wide a range.

The western part of the drainage area is practically devoid of lakes, but in the south and eastern portions are to be found some of the largest fresh water bodies on the continent. These lakes are so situated in relation to the Nelson river that the maximum natural storage effect is exerted upon the flow of that river; in consequence, the maximum discharge may be expected to approximate closely to the mean discharge.

The river has a length of 430 miles, and in this distance the drop aggregates 712 feet. The potential power possibilities of the river are therefore apparent. In the upper reaches the river has the appearance of a chain of lakes connected by short stretches of river which are interrupted by falls and rapids. These characteristics which hold for the upper 250 miles of river gradually change as the mouth is approached, the drop in the river not being as distinct but more in the nature of swifts and flat rapids, though the banks become high as the Bay is approached.

The first expanse below the lake Winnipeg outlet is known as Playgreen lake, below which there are two channels known as East and West rivers. Sea falls is to be found on East river and the latter then expands into Pipestone lake. The junction of these two branches occurs in Cross lake. Below that point are Sepewesk, Split lake and Gull lake. The rapids and falls in order are Ebb and Flow rapids, Whitemud falls, Bladder rapids, Over the Hill, Red Rock and Chain of Rock rapids; Manitou or Devil's rapids, Grand rapids, Chain of Islands rapids, all being above Split lake. Below Split lake are Gull, Kettle, Long Spruce and Limestone rapids.

The country adjacent to the Nelson river is practically unsettled, though on account of the building of the Hudson Bay Railway there has been considerable activity along the river. The timber growth is scattered, including spruce, birch and poplar, and it is found that the clay soil is very fertile.

A reconnaissance survey of the river was made by the late William Ogilvie in 1910 for the Dominion Water Power Branch, also discharge measurements were obtained. After gathering miscellaneous records in 1912-1913, a metering station was established in 1914 by the Manitoba Hydrometric Survey above Manitou rapids and this has been operated since that date.

NELSON RIVER ABOVE SHELL RAPIDS.
STATION No. 5. U.E1

History.—The station was established by G. J. Lamb on July 18, 1914 and since that date has been in periodical operation.

Location of Section.—The metering section is located at a point three and one-half miles upstream from Manitou Landing and four miles above Shell rapids. All discharge measurements during open water seasons are taken from a boat and during periods of ice cover are taken from the ice on the same cross section of the river.

Drainage Area.—The total drainage area of the river is 450,000 square miles, while that above Shell rapids is 426,000 square miles. This total drainage area includes practically all Canadian territory lying south of latitude 53 and between the summit of the Rockies and lake Superior.

Channel.—The section is located near the head of a straight stretch of the river practically two miles long. The bed of the channel is composed of gravel and boulders and not liable to shift; the depth of the section varies from twenty to seventy feet. The banks at the section are high and the total discharge of the river is confined within its limits at all stages.

Gauge.—A vertical staff gauge is secured to a post driven into the bed of the river at a point forty feet downstream from the metering section on the right bank.

Discharge Measurements.—Since this station was established, discharge measurements have been obtained over a range in stage of 7.78 feet, corresponding to a range in discharge of from 42,000 to 114,000 c.f.s.

Records Available.—Records of daily gauge height are available for the following periods:—From July 2 to October 14, 1914; from February 7 to April 10, and from June 27 to October 9, 1915; and from July 24 to August 12, 1916. These records of gauge height cover the periods during which discharge measurements have been obtained at this station.

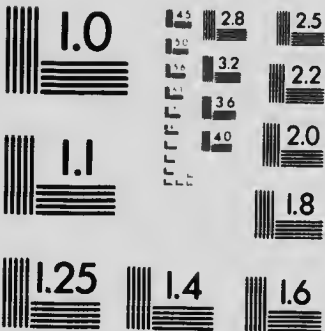
Discharge Measurements of Nelson River Four Miles above Shell Rapids for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
July 29	C. O. Allen	1,435	940	36,768	2.99	567.80	109,907
July 31	C. O. Allen	1,435	940	36,702	2.80	567.74	106,231
Aug. 1	C. O. Allen	1,435	940	36,722	3.02	567.76	110,899
Aug. 2	C. O. Allen	1,435	940	36,737	3.01	567.78	110,586
Aug. 3	C. O. Allen	1,435	940	36,737	2.99	567.78	109,881
Aug. 4	C. O. Allen	1,435	940	36,899	3.03	567.95	111,803
Aug. 5	C. O. Allen	1,435	940	36,880	2.99	567.93	110,271
Aug. 6	C. O. Allen	1,435	940	36,926	3.06	567.96	113,734
Aug. 7	C. O. Allen	1,435	940	36,889	3.03	567.94	111,775
Aug. 8	C. O. Allen	1,435	940	36,917	3.00	567.97	114,074
Aug. 9	C. O. Allen	1,435	940	36,926	2.98	567.98	110,041
Aug. 10	C. O. Allen	1,435	940	36,730	3.03	567.77	110,558
Aug. 11	C. O. Allen	1,435	940	36,992	3.04	568.05	112,457
Aug. 12	C. O. Allen	1,435	940	36,978	3.04	568.04	112,414



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MISCELLANEOUS RECORDS.

In a number of cases where stations have been established, after one or several meterings have been taken, it was found that the location was not a desirable one, either on account of the difficulty in obtaining an observer for the daily gauge heights or on account of the physical features prevailing at the station preventing accurate records being obtained.

In other cases, sufficient information has not been obtained to properly define a discharge curve, though the records secured would indicate that a curve may be defined by fuller information. In this case the gauge heights are on file, and when the necessary additional data are secured, estimates of daily discharge will be made.

Where the above conditions have been encountered, and as the discharges obtained may be of some immediate value, the records are published under the heading "Miscellaneous Meterings."

Discharge Measurement of Pigeon River above First Rapids for 1916.

Date	Engineer.	Meter No.	Width.	Area of Section	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 1	C. O. Allen	1,912	90	793	1.69	80-32	1,340 ⁷¹

¹Ice measurement.

Discharge Measurements of Winnipeg River below Sharkey's Dam for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	
Mar. 3	M. S. Madden	1,460	114	830	4.53	899-65	3,762	Above Sharkey's Dam.
July 10	E. B. Patterson	1,911	318	6,963	1.56	901-14	10,862	900-97
July 10	E. B. Patterson	1,911	318	6,963	1.55	901-14	10,792	900-97

Discharge Measurements of Roseau River below Dominion City for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 14	C. O. Allen	1,374	47	56	0.17	87-68	10 ¹
Feb. 10	C. O. Allen	1,912	44	58	0.14	87-95	7 ¹
Mar. 22	C. O. Allen	1,912	40	62	0.14	88-38	6 ¹
June 8	C. O. Allen	1,496	85	563	2.06	94-67	1,161 ²

¹Ice measurement.

²Traffic Bridge backwater at gauge from Red River.

SESSIONAL PAPER No. 26e

Discharge Measurements of Whitemud River at Holmfeld for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. Ft.
June 26	C. O. Allen.....	1,435	16	16.85	0.64	96.98	10.66
June 26	C. O. Allen.....	1,435	25	59.64	0.30	97.00	17.89

Discharge Measurements of Winnipeg River at Intake Point du Bois for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	
Aug. 5	E. B. Patterson....	1,911	156	3,109	4.45	980.18	13,845	City Gauge above Intake.
Aug. 10	E. B. Patterson....	1,911	156	3,107	4.35	980.03	13,519	City Gauge above Intake.

Discharge Measurements of Winnipeg River at Throat Rapids for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
July 1	M. S. Madden.....	1,939	240	2,613	3.75	43.83	9,798
Aug. 12	M. S. Madden.....	1,939	235	2,445	3.47	43.15	8,485

Discharge Measurements of Clear Creek River at Outlet Clear Lake for 1916.

Date	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 28	G. K. Gainsford.....	1,939	9.0	6.80	1.28	94.94	8.7

Discharge Measurements of La Salle River at Sanford for 1916.

Date.	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
June 15	C. O. Allen.....	1,496	87	159.4	0.15	89.76	23.9

Discharge Measurements of Bloodvein River above 1st Rapids for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 13	C. O. Allen.....	1,912	52	251.5	2.02	715.95	508.04

Discharge Measurements of Pembina River near Manitou for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
June 27	C. O. Allen.....	1,496	49	157.2	1.40	-18.2	220.0

Discharge Measurements of Boyne River at Carman for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
June 14	C. O. Allen.....	1,496	26	52.4	0.65	84.37	7.1

Discharge Measurements of Morris River at Rosenort for 1916.

Date	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
June 10	C. O. Allen.....	1,496	40	81.7	0.51	86.08	41.7
June 29	C. O. Allen.....	1,496	43	111.4	0.55	86.74	61.3

Discharge Measurements of Berens River above Little Grand Rapids for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 6	C. O. Allen.....	1,912	150	754	1.89	93.34	1,425

Discharge Measurements of Berens River 8½ miles from Mouth for 1916.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 10	C. O. Allen.....	1,912	102	946.1	0.60	716.89	567.7

¹Ice Measurements.

PROGRESS REPORT
OF THE
MANITOBA HYDROMETRIC SURVEY
FOR
THE CALENDAR YEAR 1916

PART III.
GAUGE RECORDS

PART III.

GAUGE RECORDS.

LAKE OF THE WOODS OUTLETS (GAUGING STATIONS).

Various gauging stations, the location of which is shown on Plate 1, have been maintained around the outlets of Lake of the Woods. As set out hereafter in the individual descriptions of the gauging points, certain of these gauges were originally established by the province of Ontario, but during the past four years they have been re-established and maintained by officers of the Manitoba Hydrometric Survey.

The gauges are as follows.—

Ontario D.P.W. Lake gauge, Keewatin.

Automatic gauge (Lake) Kenora.

Tailrace Norman dam, Western Outlets.

Ontario D.P.W. river gauge, Winnipeg river.

Western Outlet slope gauges.

Gauge readings at control points below outlets.

LAKE OF THE WOODS, ONTARIO D.P.W. LAKE GAUGE AT KEEWATIN.

History.—This gauge was originally set by the Ontario Department of Public Works. In 1911 it was tied into W.P.S. datum by this survey in connection with Winnipeg River Power Surveys, and from May 1, 1913 gauge readings have been obtained by members of this survey.

Location.—The staff gauge is secured to a pile on the west side and near the south end of the Keewatin Lake bridge.

Records Available.—From May 1, 1913 continuous daily records of gauge readings at this point are available.

Mean Daily Gauge Height, in Feet, of Ont. D.P.W. Lake Gauge, Keewatin for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	99.16	99.42	99.16	99.04	100.65	102.00	102.75	102.40	100.92	100.20	99.58	99.07
2	99.21	99.40	99.18	99.05	100.70	102.00	102.75	102.33	100.94	99.83	99.54	99.02
3	99.20	99.42	99.20	99.05	100.72	102.12	102.77	102.29	101.00	99.92	99.63	99.08
4	99.17	99.44	99.12	99.04	100.78	102.00	102.70	102.19	100.80	100.11	99.52	99.01
5	99.22	99.44	99.15	99.03	100.83	102.18	102.81	102.11	100.98	100.03	99.72	99.02
6	99.20	99.44	99.10	99.02	100.80	102.33	102.76	102.20	100.89	100.11	99.82	98.95
7	99.17	99.44	99.11	99.02	100.92	102.25	102.68	102.08	100.85	99.89	99.78	98.95
8	99.20	99.38	99.16	99.02	100.95	102.17	102.74	102.09	100.84	99.93	99.60	99.02
9	99.20	99.41	99.15	99.06	101.00	102.23	102.85	102.18	100.87	99.65	99.46	99.03
10	99.21	99.39	99.15	99.03	101.07	102.28	102.83	102.00	101.38	99.93	99.30	99.05
11	99.26	99.37	99.15	99.03	100.85	102.37	102.71	101.81	101.16	99.90	99.40	99.00
12	99.28	99.34	99.18	99.00	101.05	102.39	102.73	101.76	100.80	99.66	99.47	99.00
13	99.30	99.38	99.13	99.07	101.07	102.47	102.67	101.82	100.78	99.70	99.43	99.02
14	99.30	99.35	99.11	99.13	101.02	102.43	102.75	101.90	100.83	99.70	99.37	99.02
15	99.31	99.35	99.13	99.20	100.65	102.33	102.70	101.72	100.50	99.65	99.47	99.03
16	99.33	99.30	99.08	99.28	100.90	102.25	102.60	101.72	100.49	99.33	99.30	99.00
17	99.28	99.30	99.10	99.38	101.14	102.32	102.64	101.66	100.50	99.62	99.26	99.03
18	99.31	99.28	99.10	99.45	101.33	102.32	102.81	101.59	100.64	99.45	99.24	99.00
19	99.30	99.25	99.13	99.53	101.41	102.37	102.85	101.61	100.50	99.30	99.29	98.98
20	99.34	99.26	99.08	99.62	100.46	102.37	102.80	101.60	100.40	99.45	99.23	99.01
21	99.30	99.30	99.10	99.78	101.55	102.43	102.72	101.51	100.20	99.59	99.33	99.03
22	99.35	99.23	99.08	99.89	101.57	102.44	102.69	101.51	100.24	99.40	99.41	99.00
23	99.31	99.25	99.08	100.03	101.58	102.55	102.80	101.43	100.45	99.52	99.05	99.01
24	99.30	99.20	99.09	100.15	101.63	102.44	102.50	101.27	100.35	99.81	99.15	99.00
25	99.25	99.20	99.11	100.15	101.62	102.57	102.51	101.20	100.47	99.20	99.18	99.00
26	99.21	99.20	99.12	100.25	101.75	102.49	102.50	101.24	100.46	99.67	99.22	98.92
27	99.26	99.23	99.10	100.38	102.00	102.61	102.40	101.23	100.14	99.50	99.09	99.00
28	99.30	99.18	99.07	100.50	101.92	102.63	102.51	101.32	100.04	99.53	99.07	98.98
29	99.34	99.16	99.03	100.48	101.81	102.66	102.40	101.01	100.26	99.57	99.09	99.00
30	99.44	.....	99.01	100.60	101.85	102.86	102.43	101.19	100.36	99.61	99.08	98.98
31	99.42	.....	99.02	.....	102.10	.....	102.32	100.95	.....	99.53	.....	99.02

Zero of gauge = 959.76. W.P.S. Datum = 961.07 U.S.C. and G.S. Datum.

LAKE OF THE WOODS, KENORA. (AUTOMATIC GAUGE).

History.—The station was established by W. J. Ireland on February 15, 1915 and has been in continuous operation since that date.

Location.—The gauge which is a Gurley, printed record, Automatic Water Stage Register, is located on the outer end of the Department of Public Works dock at Kenora, near the Canadian Pacific Railway main line, and directly opposite the Post Office.

Records Available.—A continuous record of half-day mean gauge height derived from quarter hourly readings is available from February 15, 1915 to December 31, 1916 with the exception of periods from December 19 to 21, 1915, and February 5, to March 8, and December 23 to December 29, 1916.

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**Mean Half-daily Gauge Height, in Feet, of Lake of the Woods at Kenora
(Automatic Gauge), for 1915.**

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...			10 75	10 65	10 71	11 00	11 65	11 21	10 06	10 37	10 10	10 18
2...			10 73	10 64	10 71	10 98	11 61	11 17	10 55	10 33	10 00	10 18
3...			10 73	10 63	10 76	10 96	11 68	11 16	10 57	10 41	10 03	10 18
4...			10 71	10 65	10 77	10 91	11 68	11 22	10 67	10 35	10 11	10 15
5...			10 71	10 66	10 72	10 91	11 68	11 22	10 69	10 25	10 17	10 15
6...			10 71	10 64	10 75	10 92	11 68	11 20	10 53	10 11	10 21	10 16
7...			10 71	10 67	10 81	10 95	11 57	11 16	10 57	9 95	10 06	10 15
8...			10 69	10 69	10 85	11 03	11 40	11 16	10 58	10 04	10 14	10 16
9...			10 67	10 69	10 85	11 17	11 59	11 15	10 61	10 30	10 30	10 16
10...			10 66	10 71	10 76	11 03	11 71	11 17	10 66	10 41	10 33	10 18
11...			10 67	10 73	10 74	10 85	11 72	11 13	10 50	10 20	10 17	10 18
12...			10 67	10 73	10 87	10 84	11 70	11 09	10 54	10 03	10 17	10 18
13...			10 68	10 72	10 91	10 81	11 69	11 06	10 55	9 82	10 03	10 20
14...			10 70	10 74	10 70	10 88	11 69	11 07	10 54	9 79	9 92	10 21
15...			10 71	10 74	10 48	10 75	11 70	11 06	10 65	9 88	10 06	10 19
16...			10 72	10 72	10 71	10 77	11 71	11 08	10 53	10 18	9 91	10 18
17...			10 71	10 72	10 95	10 91	11 74	11 08	10 51	10 43	10 09	10 15
18...			10 71	10 74	10 98	10 98	11 78	11 07	10 54	10 63	10 27	10 17
19...			10 70	10 75	10 92	10 99	11 79	11 07	10 49	10 37	10 41	10 17
20...			10 70	10 73	10 93	10 96	11 77	11 08	10 40	10 21	10 33	10 18
21...			10 69	10 74	10 99	10 89	11 77	11 09	10 45	10 21	10 18	10 21
22...			10 70	10 72	10 99	10 94	11 79	11 09	10 40	10 22	10 37	10 20
23...			10 70	10 73	10 98	10 95	11 74	11 04	10 40	10 33	10 45	10 20
24...			10 69	10 73	10 97	10 88	11 77	11 02	10 45	10 38	10 31	10 21
25...			10 68	10 73	10 99	10 76	11 73	11 00	10 40	10 27	10 20	10 22
26...			10 68	10 73	11 00	10 88	11 70	10 99	10 35	10 23	10 22	10 21
27...			10 68	10 72	11 01	11 10	11 60	10 95	10 34	10 26	10 61	10 20
28...			10 69	10 72	10 97	11 08	11 56	10 92	10 35	10 28	10 15	10 18
29...			10 67	10 70	10 95	10 95	11 67	10 90	10 47	10 31	10 20	10 17
30...			10 77	10 67	10 70	11 06	11 70	10 90	10 75	10 28	10 18	10 18
31...			10 76	10 68	10 71	10 86	10 85	11 72	10 78	10 64	10 24	10 22
1...		10 76	10 69	10 71	10 87	10 85	11 72	10 75	10 31	10 24	10 24	10 23
2...		10 74	10 69	10 72	10 91	11 08	11 53	10 86	10 37	10 24	10 30	10 23
3...		10 74	10 68	10 72	10 80	11 11	11 54	10 86	10 47	10 27	10 31	10 24
4...		10 75	10 63	10 72	10 97	11 03	11 57	10 84	10 31	10 25	10 31	10 24
5...		10 75	10 65	10 74	11 01	11 00	11 61	10 81	10 30	10 29	10 21	10 23
6...		10 75	10 68	10 74	11 04	11 08	11 57	10 79	10 40	10 34	10 04	10 23
7...		10 74	10 66	10 70	11 03	11 16	11 56	10 79	10 39	10 31	10 01	10 23
8...		10 76	10 67	10 70	11 02	11 20	11 56	10 77	10 02	10 19	10 13	10 23
9...		10 75	10 68	10 68	11 03	11 30	11 56	10 78	9 98	10 30	10 05	10 23
10...		10 76	10 68	10 72	11 01	11 34	11 56	10 72	10 28	10 10	10 00	10 23
11...		10 74	10 69	10 73	11 00	11 21	11 59	10 75	10 32	10 10	10 13	10 23
12...		10 72	10 67	10 70	11 07	11 12	11 61	10 77	10 39	10 16	10 21	10 23
13...		10 72	10 70	10 67	11 12	11 23	11 63	10 78	10 43	10 11	10 16	10 21
14...		10 72	10 70	10 70	11 11	11 38	11 48	10 83	10 29	10 10	10 19	10 24
15...		10 73	10 71	10 72	11 11	11 22	11 40	10 52	10 13	10 14	10 24	10 26
16...		10 73	10 69	10 79	11 05	11 28	11 40	10 46	10 14	10 23	10 21	10 25
17...		10 73	10 64	10 79	11 05	11 33	11 51	10 72	10 22	10 22	10 15	10 26
18...		10 73	10 66	10 83	10 94	11 37	11 51	10 57	10 27	10 40	10 08	10 27
19...		10 73	10 68	10 86	10 94	11 32	11 54	10 45	10 14	10 18	10 13	10 25
20...		10 73	10 71	10 82	11 04	11 33	11 51	10 65	10 06	10 03	10 17	10 24
21...		10 73	10 72	10 80	11 07	11 39	11 48	10 73	10 17	10 11	10 18	10 28
22...		10 73	10 70	10 82	11 11	11 47	11 44	10 81	10 27	10 14	10 17	10 28
23...		10 74	10 64	10 85	11 04	11 37	11 44	10 78	10 32	10 12	10 18	1 27
24...		10 74	10 66	10 86	11 03	11 57	11 44	10 70	10 37	10 12	10 21	10 24
25...		10 75	10 68	10 70	11 01	11 57	11 47	10 37	10 32	10 13	10 18	10 22
26...		10 67	10 77	11 00	11 51	11 46	10 48	10 48	10 32	10 21	10 16	10 24
27...		10 67	10 72	10 97	11 64	11 38	10 61	10 33	10 18	10 18	10 17	10 23
28...		10 67	10 76	11 00	11 65	11 37	10 71	10 35	10 15	10 15	10 18	10 25
29...		10 67	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
30...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
31...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
1...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
2...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
3...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
4...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
5...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
6...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
7...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
8...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
9...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
10...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
11...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
12...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
13...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
14...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
15...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
16...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
17...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
18...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
19...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
20...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
21...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
22...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
23...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
24...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
25...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
26...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
27...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
28...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
29...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
30...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26
31...		10 66	10 72	11 00	11 55	11 33	10 60	10 30	10 15	10 15	10 17	10 26

Zero of gauge = 1,050.00. U.S.C. and G.S. Datum = 1,048.69 W.P.S. Datum.

A.M. (12.00 midnight to 12.00 noon) and P.M. (12.00 noon to 12.00 midnight). Mean from Automatic

Record.

NOTE.—Part time, interpolated.

*Mean Half-daily Gauge Height, in Feet, of Lake of the Woods at Kenora
(Automatic Gauge) for 1916.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	10-26	10-47	.....	10-09	11-66	12-06	12-79	12-45	12-08	11-31	10-63	10-11
	10-25	10-46	.....	10-07	11-66	12-06	12-75	12-45	11-97	11-11	10-60	10-09
2...	10-27	10-46	.....	10-08	11-71	12-08	12-75	12-50	11-99	10-63	10-56	10-07
	10-26	10-46	.....	10-09	11-77	12-09	12-76	12-50	12-01	10-91	10-56	10-04
3...	10-29	10-47	.....	10-08	11-75	12-15	12-77	12-32	12-04	10-96	10-63	10-05
	10-27	10-49	.....	10-07	11-80	12-13	12-77	12-32	11-64	11-00	10-62	10-07
4...	10-24	10-49	.....	10-09	11-81	12-00	12-84	12-30	11-88	11-16	10-52	10-05
	10-28	10-49	.....	10-09	11-79	12-09	12-80	12-17	11-93	11-16	10-56	10-04
5...	10-29	.....	.....	10-07	11-85	12-19	12-82	12-18	12-07	11-07	10-66	10-04
	10-30	.....	.....	10-07	11-86	12-23	12-83	12-16	12-04	11-11	10-73	10-04
6...	10-28	.....	.....	10-07	11-85	12-33	12-78	12-27	11-96	11-22	10-78	10-00
	10-25	.....	.....	10-06	11-88	12-24	12-78	12-15	11-95	11-10	10-99	9-94
7...	10-26	.....	.....	10-03	11-91	12-28	12-76	12-16	11-91	11-03	11-06	9-92
	10-25	.....	.....	10-04	11-98	12-25	12-70	12-14	11-94	10-84	10-73	9-98
8...	10-28	.....	.....	10-05	12-04	12-21	12-88	12-16	11-94	10-85	10-57	10-04
	10-28	.....	.....	10-07	11-80	12-24	12-88	12-15	11-90	10-95	10-63	10-05
9...	10-26	.....	.....	10-08	12-01	12-29	12-82	12-19	11-92	10-78	10-56	10-05
	10-23	.....	10-06	10-07	12-02	12-29	12-89	12-30	11-96	10-84	10-80	10-05
10...	10-21	.....	10-19	10-06	12-09	12-31	12-94	12-24	12-19	11-00	10-37	10-04
	10-21	.....	10-20	10-07	12-13	12-32	12-80	12-97	12-43	10-96	10-80	10-01
11...	10-21	.....	10-19	10-07	11-89	12-36	12-78	12-96	12-55	10-98	10-41	10-02
	10-21	.....	10-19	10-05	11-97	12-40	12-77	12-90	12-08	10-95	10-46	10-02
12...	10-21	.....	10-20	10-01	12-06	12-42	12-76	12-87	11-88	10-87	10-46	10-00
	10-33	.....	10-19	10-03	12-11	12-50	12-79	12-82	11-81	10-96	10-46	10-01
13...	10-37	.....	10-14	10-09	12-11	12-49	12-73	12-85	11-87	10-73	10-45	10-04
	10-38	.....	10-14	10-13	12-09	12-49	12-72	12-91	11-83	10-78	10-45	10-04
14...	10-34	.....	10-14	10-16	12-04	12-46	12-80	12-95	11-72	10-90	10-44	10-05
	10-38	.....	10-16	10-18	12-01	12-42	12-78	12-91	11-56	10-60	10-40	10-02
15...	.....	.....	10-17	10-20	11-77	12-40	12-81	12-84	11-57	10-61	10-43	10-02
	.....	.....	10-15	10-23	11-61	12-33	12-74	12-76	11-62	10-75	10-52	10-04
16...	.....	.....	10-12	10-27	11-90	12-30	12-63	12-73	11-64	10-63	10-49	10-01
	10-38	.....	10-12	10-33	12-07	12-34	12-64	12-82	11-51	10-34	10-40	10-02
17...	10-36	.....	10-12	10-39	12-18	12-36	12-70	12-77	11-56	10-58	10-36	10-03
	10-35	.....	10-12	10-45	12-22	12-35	12-68	12-72	11-55	10-68	10-41	10-04
18...	10-36	10-33	10-13	10-48	12-36	12-37	12-83	12-67	11-65	10-61	10-38	10-02
	10-37	10-33	10-13	10-50	12-38	12-37	12-86	12-68	11-67	10-40	10-35	9-99
19...	10-36	.....	10-13	10-55	12-43	12-39	12-94	12-77	11-56	10-35	10-31	9-98
	10-34	.....	10-13	10-57	12-51	12-37	12-91	12-62	11-55	10-35	10-30	10-02
20...	10-33	.....	10-11	10-62	12-50	12-39	12-89	12-63	11-58	10-44	10-27	10-03
	10-35	.....	10-11	10-69	12-51	12-41	12-87	12-66	11-40	10-53	10-25	10-02
21...	10-36	.....	10-11	10-76	12-56	12-46	12-84	12-61	11-39	10-61	10-31	10-00
	10-36	.....	10-06	10-82	12-62	12-45	12-73	12-59	11-17	10-61	10-38	10-00
22...	10-39	.....	10-07	10-90	12-58	12-46	12-74	12-65	11-20	10-45	10-44	10-01
	10-39	.....	10-11	10-98	12-60	12-52	12-76	12-57	11-37	10-48	10-36	.....
23...	10-34	.....	10-09	11-04	12-62	12-50	12-84	12-56	11-48	10-52	10-16	.....
	10-35	.....	10-08	11-11	12-76	12-58	12-73	12-46	11-50	10-62	10-07	.....
24...	10-37	.....	10-08	11-16	12-69	12-59	12-64	12-38	11-42	10-82	10-11	.....
	10-36	.....	10-10	11-17	12-68	12-59	12-66	12-33	11-40	10-83	10-20	.....
25...	10-33	.....	10-13	11-19	12-67	12-56	12-62	12-36	11-49	10-49	10-19	.....
	10-33	.....	10-14	11-21	12-67	12-60	12-56	12-24	11-53	10-27	10-18	.....
26...	10-30	.....	10-14	11-28	12-77	12-56	12-59	12-30	11-52	10-56	10-17	.....
	10-30	.....	10-13	11-34	12-87	12-52	12-55	12-27	11-42	10-63	10-17	.....
27...	10-32	.....	10-11	11-39	12-98	12-63	12-57	12-29	11-26	10-44	10-13	.....
	10-35	.....	10-11	11-44	12-04	12-63	12-50	12-29	11-13	10-62	10-11	.....
28...	10-37	.....	10-12	11-49	12-96	12-65	12-55	12-37	11-06	10-66	10-12	.....
	10-37	.....	10-09	11-57	12-95	12-52	12-59	12-33	11-17	10-52	10-14	.....
29...	10-38	.....	10-07	11-53	12-85	12-61	12-58	12-08	11-30	10-56	10-13	.....
	10-46	.....	10-06	11-56	12-80	12-70	12-43	12-12	11-34	10-62	10-12	.....
30...	10-48	.....	10-06	11-60	12-88	12-78	12-44	12-19	11-40	10-69	10-11	.....
	10-47	.....	10-07	11-66	12-94	12-82	12-50	12-22	11-44	10-60	10-09	10-01
31...	10-48	.....	10-08	.....	12-96	.....	12-41	12-08	.....	10-55	.....	.....
	10-47	.....	10-09	.....	12-13	.....	12-40	12-00	.....	10-61	.....	.....

Zero of Gauge = 1,050 ft. U.S.C. and G.S. Datum = 1,048.69 W.P.S. Datum.

A.M. (12.00 midnight to 12.00 noon) and P.M. (12.00 noon to 12.00 midnight). Mean from Automatic Recorder.

WEST BRANCH WINNIPEG RIVER, TAILRACE NORMAN DAM.

History.—The staff gauge in the tailrace of the Norman dam was originally set in place by the Ontario Department of Public Works, but the taking of records on same was discontinued in 1907 or 1908. In October of 1913 the gauge was tied in to W.P.S. datum and records have been taken since that time by this survey.

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Location.—The gauge is secured to the north side of a timber crib at the lower end of the fishway at the southerly end of the rock fill section of the Norman dam.

Records Available.—Records of daily readings on this gauge are available for the year 1913 from October 8 to the end of the year, with the exception of one day in October and six days in November. For the year 1914 the record is complete with the exception of ten days in September, for the year 1915 with the exception of four days in December, and for the year 1916 with the exception of two days in May and one day in December.

Mean Daily Gauge Height, in Feet, of West Branch Winnipeg River near Tailrace, Norman Dam for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	35.80	35.80	36.38	36.20	41.95	45.33	46.40	46.15	44.33	42.98	39.45	40.45
2	35.77	35.80	36.40	37.93	.....	45.43	46.35	46.29	44.23	43.04	39.35	40.45
3	35.76	35.85	36.40	37.94	.....	45.48	46.40	46.15	44.08	42.93	39.35	40.20
4	35.80	35.85	36.42	38.20	42.83	45.43	46.55	46.10	43.93	43.13	39.35	40.30
5	35.80	35.68	36.27	38.25	42.98	45.63	46.57	46.08	43.98	43.03	39.15	40.35
6	35.77	35.30	36.33	36.15	43.08	45.63	46.55	45.28	43.93	43.18	39.15	40.40
7	35.85	35.57	36.38	36.10	43.06	45.73	46.60	45.83	43.53	43.18	39.25	40.40
8	35.80	35.75	36.40	36.05	43.22	45.73	46.60	45.86	43.28	42.83	39.25	40.25
9	35.50	36.05	36.35	37.87	43.33	45.78	46.40	45.88	43.13	42.88	39.25	40.05
10	35.60	36.80	36.30	37.83	43.48	45.83	46.62	45.88	43.08	42.87	39.45	39.65
11	35.80	37.30	36.28	37.38	43.43	45.85	46.60	45.73	43.18	42.88	39.85	39.55
12	35.80	37.60	36.10	38.05	43.61	45.81	46.60	45.68	43.12	42.83	39.75	39.45
13	35.70	37.73	36.07	38.18	43.68	45.83	46.62	45.43	43.08	42.80	39.90	39.10
14	35.70	37.82	36.25	38.20	43.56	45.88	46.65	45.43	42.88	42.78	40.30	39.05
15	35.65	38.05	36.30	38.25	43.46	45.93	46.67	45.33	42.83	42.53	40.45	38.85
16	35.40	38.10	36.25	38.13	43.68	45.93	46.45	45.30	42.73	42.48	40.45	38.70
17	35.53	38.10	36.30	38.80	43.63	45.93	46.45	45.30	42.43	42.53	40.50	.....
18	35.67	38.20	36.33	38.53	43.98	45.98	46.80	45.28	42.33	42.58	40.50	38.55
19	35.68	38.20	36.15	38.85	44.13	46.03	47.00	45.28	42.38	42.55	40.30	38.50
20	35.65	38.05	36.10	39.50	44.23	46.08	46.90	44.98	42.46	42.53	40.45	38.40
21	35.62	38.13	37.95	39.90	44.01	46.03	46.95	45.08	42.46	42.38	40.55	38.35
22	35.68	38.25	37.90	40.15	44.11	46.13	46.83	45.03	42.43	41.88	40.60	38.30
23	35.40	38.27	37.88	40.13	44.43	46.33	46.55	45.00	42.68	41.83	40.50	38.25
24	35.51	38.35	37.85	40.40	44.43	46.38	46.57	44.88	42.48	41.63	40.60	38.10
25	35.70	38.38	37.90	40.95	44.58	46.33	46.60	44.87	42.53	40.83	40.55	38.00
26	35.75	38.35	37.85	41.10	44.83	46.38	46.55	44.83	43.03	40.33	40.30	38.15
27	35.77	38.20	37.89	41.25	44.93	46.53	46.60	44.78	43.03	39.95	40.40	38.25
28	35.78	38.19	38.05	41.55	44.95	46.45	Not read	44.68	43.08	39.85	40.45	38.30
29	35.80	38.35	37.95	41.75	44.86	46.60	46.45	44.68	43.13	39.45	40.45	38.25
30	35.60	.....	38.10	41.83	45.18	46.60	46.25	44.53	43.23	39.45	40.50	38.25
31	35.80	.....	38.15	.....	45.28	.....	46.18	44.33	.....	39.45	.....	38.00

Zero of Gauge = 1,000.00, W.P.S. Datum = 1,001.31 U.S.C. and G.S. Datum.

WESTERN OUTLET—SLOPE GAUGES.

(LAKE OF THE WOODS OUTLETS.)

In connection with studies of flow and channel conditions on the Western outlets, gauges were established at various control points between the lake and the Norman dam as shown on Plate 2. These slope gauges are read at such times as measurements of flow through the outlet are made at the Norman Traffic Bridge.

NOTE.—1,000.00 should be added to each reading to reduce to W.P.S. Datum, or 1,001.31 should be added to each reading to reduce to U.S.C. and G.S. Datum.

Table of Discharges and Slope Gauge Readings at Lake of the Woods Western Outlet for 1916.

Date.	Discharge in Sec.-Ft.	GAUGE NUMBER.																														
		1	2	2a	3	4	5	6	7	8	9	10	11	12	12a	13																
Jan. 14..	7,050 7,287	50	12	59	00	58	08	50	00	58	90	58	00	58	95	58	78	58	73	.....	35	70										
Jan. 17..	7,108 6,900	50	12	50	02	58	08	58	90	58	00	58	94	58	77	58	83	58	80	58	77	58	73	58	73	.....	35	62				
Jan. 21..	6,941 6,704	50	15	50	01	58	08	50	00	58	80	58	05	58	95	58	70	58	84	58	80	58	77	58	73	58	70	.....	35	72		
Jan. 24..	7,071 7,045	50	17	50	00	58	08	50	00	58	00	58	88	58	95	58	77	58	84	58	84	58	76	58	76	58	73	.....	35	60		
Jan. 31..	7,080 7,154	50	20	50	11	50	08	50	11	59	00	59	00	59	01	58	80	58	93	58	97	58	88	58	87	58	84	.....	35	75		
Feb. 4..	7,051 6,981	50	25	50	11	50	07	50	10	58	98	58	98	50	02	58	84	50	92	58	94	58	85	58	85	58	81	.....	35	88		
Feb. 11..	11,430 11,048	50	20	58	04	58	87	58	03	58	65	58	62	58	73	58	18	38	37	58	47	58	26	.....	58	18	.....	37	30			
Feb. 14..	13,433 13,322	50	10	58	80	58	76	58	82	58	40	58	36	58	59	57	94	58	08	58	20	67	68	67	68	67	63	.....	37	00		
Feb. 18..	13,612 13,545	50	11	58	70	58	70	58	74	58	38	58	36	58	55	57	89	67	98	58	12	67	86	57	82	57	79	.....	38	25		
Feb. 28..	13,200 13,515	50	00	58	67	58	58	58	64	58	23	58	28	58	42	57	80	67	93	58	02	67	75	57	71	57	68	.....	38	27		
Mar. 8..	13,182 13,281	50	02	58	70	58	50	58	64	58	58	58	20	58	44	57	70	59	58	04	57	74	57	66	57	68	.....	38	41			
Mar. 15..	13,156 13,293	58	09	58	64	58	56	58	70	58	12	58	13	58	37	57	76	57	85	58	00	57	70	57	18	57	63	.....	38	35		
Mar. 20..	12,874 13,258	58	02	56	57	58	50	58	53	58	18	58	08	58	35	57	60	57	80	57	05	57	67	57	11	57	61	.....	38	20		
Mar. 30..	13,252 13,512	58	89	58	55	58	46	58	51	58	11	58	07	58	29	57	70	57	80	57	02	57	66	57	54	57	60	.....	38	75		
April 7..	13,128 12,663	58	87	58	52	58	45	58	47	58	10	58	06	58	27	57	66	57	77	57	02	57	62	57	40	57	56	.....	38	15		
April 10..	12,608 13,067	58	87	58	54	58	46	58	50	58	10	58	08	58	29	57	71	57	80	58	00	57	66	57	42	57	60	.....	37	96		
April 14..	13,238 25,503	50	00	58	68	58	58	58	62	58	24	58	24	58	45	67	81	57	93	58	04	57	70	57	53	57	70	.....	38	21		
May 1..	26,017 28,284	00	50	50	56	50	45	50	42	58	20	57	78	58	70	56	79	56	22	56	57	55	50	55	08	55	47	.....	42	07		
May 9..	28,309 28,647	00	85	50	81	58	67	50	71	58	15	57	53	58	80	55	29	Out of water	"	56	02	54	80	Out of water	"	54	43	.....	42	06		
May 12..	28,751 28,765	00	90	50	91	58	77	50	87	58	30	57	58	58	97	56	44	"	"	56	22	54	90	"	54	43	.....	43	50			
May 17..	30,000 30,272	61	00	59	06	58	78	50	79	58	20	57	58	59	02	55	49	"	"	56	52	54	98	"	54	68	.....	43	83			
May 19..	32,150 32,374	61	27	60	26	60	12	60	18	58	65	57	08	59	47	35	74	"	"	56	28	55	14	"	54	58	.....	44	06			
May 29..	33,022 35,698	61	51	60	61	60	34	60	23	58	48	57	70	50	76	54	45	"	"	55	65	Out of water	"	.....	.....	.....	.....	.....	44	88		
June 1..	35,786 35,881	61	64	60	80	59	41	60	38	58	60	57	00	59	75	53	69	54	41	54	80	53	72	52	22	52	81	.....	44	95		
June 20..	35,916 35,521	62	"	61	44	60	71	60	75	58	68	57	00	59	20	53	08	54	06	53	99	51	92	49	93	50	70	50	18	46	08	
June 21..	35,528 35,751	62	21	61	21	60	60	60	88	58	98	57	05	60	12	53	03	54	03	54	20	51	92	49	98	50	58	50	20	46	05	
June 24..	36,119 36,418	62	16	61	11	60	05	60	80	58	97	56	30	60	01	83	08	54	23	54	51	92	07	50	58	50	72	50	30	46	38	
June 26..	36,283 36,617	62	21	61	23	60	60	60	89	59	06	55	10	60	37	53	38	54	73	54	30	51	97	50	50	50	75	50	25	46	38	
June 27..	36,119 36,418	62	32	61	36	61	04	60	91	59	06	57	40	60	22	53	43	54	23	54	60	52	07	50	11	50	69	50	35	46	38	
June 28..	36,708 36,786	62	29	61	36	61	04	61	00	59	10	57	35	60	22	53	43	54	30	54	60	52	12	50	18	50	70	50	37	46	15	
July 4..	35,679 36,227	62	3	61	51	61	28	61	10	50	55	67	60	60	52	57	45	54	68	54	60	52	22	50	23	50	77	50	50	46	55	
July 5..	36,283 36,617	62	4	61	56	61	21	61	26	50	48	57	50	60	62	53	54	53	54	70	52	17	20	53	20	52	50	82	50	46	57	
July 6..	36,119 36,418	62	4	61	66	61	15	61	11	59	40	57	60	60	62	53	25	54	63	54	60	52	22	50	23	50	80	50	48	46	55	
July 7..	36,283 36,617	62	36	61	50	61	04	61	06	59	33	87	50	60	22	53	26	54	53	54	60	52	12	50	18	50	80	50	40	46	60	
July 8..	36,119 36,418	62	45	61	56	61	14	61	08	59	51	57	40	60	37	53	33	54	58	54	60	52	17	50	25	50	82	50	45	46	60	
July 10..	36,708 36,786	62	51	61	51	61	25	61	10	50	55	67	45	60	42	53	43	54	63	54	70	52	27	50	25	50	80	50	50	46	62	
July 11..	36,153 36,053	62	43	61	50	61	15	61	11	59	38	57	40	60	30	53	33	54	58	54	85	52	19	20	53	20	52	50	80	45	46	60
July 12..	36,296 36,439	62	46	61	40	61	13	61	14	59	38	57	20	60	37	53	38	54	58	54	80	52	12	20	50	50	80	50	40	46	62	
July 13..	36,267 36,221	62	37	61	45	61	06	61	09	59	33	57	20	60	32	53	48	54	58	54	70	52	10	50	20	50	92	50	45	46	62	
July 14..	36,367 36,221	62	44	61	50	61	16	61	16	59	33	57	40	60	57	53	48	54	58	54	60	52	22	50	20	80	80	50	50	40	65	
July 15..	36,221 36,221	62	37	61	45	61	17	61	04	59	38	57	55	60	37	53	48	54	58	54	70	52	14	50	24	50	90	50	50	40	67	
July 17..	36,277 37,033	62	36	61	40	61	07	61	06	59	31	87	20	60	27	53	81	54	63	54	70	52	12	22	50	80	80	50	40	46	55	
July 19..	36,506 36,506	62	56	61	76	61	28	61	26	59	36	63	67	60	57	48	54	63	54	60	52	20	50	36	50	80	80	50	40	46	55	
July 21..	36,445 36,506	62	38	61	41	61	23	61	16	59	46	57	45	60	46	43	58	54	63	54	60	52	20	33	24	60	90	50	82	46	65	
July 22..	36,383 36,383	62	40	61	45	61	18	61	12	59	38	57	60	60	37	53	35	54	63	54	70	52	20	50	23	50	80	50	47	46	83	
July 25..	35,838 36,267	62	30	61	46	61	08	61	09	59	29	57	25	60	27	53	23	54	64	54	80	52	02	50	15	60	87	60	38	46	57	
July 26..	36,267	62	20	61	26	60	83	61	01	59	10	57	00	60	22	53	28	54	63	54	60	52	02	50	08	50	83	50	35	46	60	

MANITOBA HYDROMETRIC SURVEY

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Table of Discharges and Slope Gauge Readings at Lake of the Woods Western Outlet for 1916.

Date.	Discharge in Sec. Ft.	GAUGE NUMBER														
		1	2	3	4	5	6	7	8	9	10	11	12	12a	13	
July 27.	35,504 30,149	62-13	61-15	60-85	60-58	59-08	57-00	60-14	53-18	54-43	54-50	51-02	50-10	50-80	50-28	46-60
July 29.	35,760	62-12	61-21	60-75	60-81	58-98	57-10	60-08	53-18	54-28	54-50	51-09	50-03	50-70	50-28	46-48
July 31.	35,315	62-05	61-18	60-71	60-80	59-03	56-00	60-02	53-16	54-18	54-40	51-82	49-03	50-60	50-20	46-18
Aug. 1.	35,662	62-11	61-20	60-85	60-86	58-73	56-95	60-07	53-08	54-28	54-40	51-97	50-00	50-73	50-20	46-15
Aug. 2.	35,236 34,686	61-95	61-16	60-77	60-77	50-03	50-85	60-02	53-18	54-18	54-50	51-02	49-03	50-75	50-25	46-20
Aug. 3.	34,920	62-01	60-70	60-60	60-72	58-93	56-95	60-12	52-88	54-23	54-50	51-82	49-00	50-50	50-20	46-15
Aug. 4.	34,749	61-84	60-08	60-60	60-64	58-78	56-70	59-97	53-11	54-13	54-40	51-77	49-88	50-60	50-12	46-10
Aug. 5.	34,664	61-85	60-89	60-52	60-60	58-73	56-80	59-87	53-01	54-23	54-30	51-70	49-83	50-58	50-02	46-08
Aug. 8.	34,000 34,416	61-81	60-94	60-47	60-54	58-78	56-80	59-87	53-01	54-03	54-50	51-07	49-83	50-48	49-98	45-80
Aug. 9.	34,246	61-93	61-06	60-57	60-65	58-85	56-85	60-02	53-06	54-03	54-40	51-74	49-82	50-55	50-08	45-88
Aug. 17.	32,221	61-39	60-44	60-18	60-17	58-38	56-40	59-47	52-61	53-63	53-60	51-37	49-47	50-32	49-07	45-30
Aug. 18.	32,021	61-32	60-51	60-05	59-92	58-45	56-10	59-37	52-56	53-68	54-00	51-37	49-53	50-20	49-05	45-28
Aug. 23.	32,131	61-16	60-21	59-93	60-00	58-03	56-10	59-22	52-21	53-43	53-80	51-34	49-40	50-20	49-04	45-00
Aug. 24.	31,144	60-90	60-10	59-78	59-68	57-88	56-00	58-92	51-06	53-13	53-60	51-12	49-23	50-10	49-40	44-88
Aug. 25.	30,874	60-90	60-01	59-71	59-65	57-88	55-70	58-92	51-06	53-13	53-60	51-15	49-23	50-10	49-40	44-87
Aug. 28.	30,825 31,360	61-01	60-10	59-70	59-80	58-03	56-05	59-12	52-26	53-33	53-60	51-20	49-33	50-10	49-17	44-64
Aug. 29.	30,029	60-75	59-80	59-54	59-53	57-60	55-60	58-07	52-46	53-13	53-30	51-02	49-20	50-00	49-26	44-64
Sept. 8.	25,087 25,075	60-57	59-96	59-77	59-72	58-58	56-25	59-07	50-80	57-13	57-55	56-51	56-27	56-30	.....	13-28
Sept. 9.	25,230 25,472	60-46	59-92	59-76	59-73	58-60	56-30	59-22	50-85	57-13	57-50	56-50	56-27	56-30	.....	13-13
Sept. 11.	25,501	60-73	60-10	60-02	59-95	58-92	56-55	59-47	57-08	57-50	57-77	56-66	56-15	56-45	.....	13-18
Sept. 12.	25,357	60-51	59-81	59-08	59-63	58-53	56-17	59-15	56-77	57-15	57-45	56-45	56-22	56-30	.....	13-13
Sept. 16.	23,864	60-15	59-45	59-44	59-40	58-25	57-05	58-77	50-60	56-95	57-30	56-27	56-07	56-15	.....	42-73
Sept. 19.	25,131	60-20	59-40	59-38	59-37	58-30	56-05	58-80	56-00	56-90	57-15	56-24	56-04	56-15	.....	42-48
Sept. 20.	23,936	60-02	59-35	59-27	59-23	58-81	57-72	58-04	56-45	56-79	57-05	56-22	56-00	55-95	.....	42-53
Sept. 27.	26,727	59-80	58-95	58-74	58-70	57-05	54-76	.....	53-05	54-13	54-40	53-05	52-48	52-50	.....	43-08
Sept. 29.	27,143	59-08	59-05	58-88	58-90	57-20	55-70	58-30	53-65	54-13	54-40	53-02	52-38	52-30	.....	43-08
Sept. 30.	27,336	60-10	59-15	58-90	59-00	57-25	55-70	58-34	53-65	54-28	54-40	53-02	52-38	52-30	.....	43-23
Oct. 3.	26,968	59-02	58-83	58-58	58-55	56-90	55-35	57-78	53-25	53-93	54-10	52-80	52-13	52-00	.....	43-03
Oct. 4.	20,210	59-85	58-87	58-70	58-72	57-05	55-35	57-78	53-25	53-93	54-10	52-80	52-13	52-00	.....	43-13
Oct. 5.	20,336	59-68	58-90	58-60	58-63	56-05	55-40	57-94	53-45	53-03	54-10	52-07	52-08	52-00	.....	43-18
Oct. 7.	25,334	59-55	58-07	58-48	58-50	56-85	55-45	57-74	53-25	53-03	54-10	52-07	52-08	52-00	.....	43-18
Oct. 10.	25,173	59-63	58-75	58-58	58-53	56-90	55-35	57-84	53-45	53-03	54-10	52-07	52-08	52-00	.....	43-18
Oct. 11.	25,309	59-60	58-73	58-54	58-53	56-85	55-30	57-79	53-30	53-03	54-10	52-07	52-08	52-00	.....	42-87
Oct. 13.	24,803	59-42	58-55	58-36	58-27	56-58	55-00	57-57	53-15	53-78	53-80	52-35	52-31	52-31	.....	42-88
Oct. 16.	22,633	58-07	58-08	57-85	57-87	56-17	54-58	57-00	52-80	53-33	53-55	52-32	52-31	52-31	.....	42-78
Oct. 19.	23,397	58-64	58-10	57-87	57-87	56-17	54-58	57-00	52-80	53-33	53-55	52-32	52-31	52-31	.....	42-38
Oct. 20.	23,151	59-18	58-42	58-14	58-10	56-50	55-43	57-35	53-02	54-18	54-40	53-32	52-08	52-00	.....	42-48
Oct. 21.	22,942	59-33	58-57	58-34	58-34	56-35	55-70	54-80	55-04	55-45	54-50	54-05	54-10	.....	42-43	
Oct. 23.	21,536	59-26	58-63	58-42	58-34	57-17	56-75	57-55	55-52	55-82	55-95	55-21	54-08	55-13	.....	41-83
Oct. 24.	19,660	59-50	59-03	58-88	58-90	58-03	57-70	58-52	56-90	57-03	57-30	56-00	56-50	56-45	.....	41-63
Oct. 25.	15,439	59-01	58-04	58-55	58-57	58-10	56-80	58-35	57-50	57-60	57-77	57-37	57-33	57-28	.....	41-00
Oct. 26.	11,263	59-30	59-08	58-58	58-60	58-57	58-58	58-85	58-11	58-22	58-33	58-00	57-94	57-80	.....	40-23
Oct. 27.	14,427	59-10	58-07	58-85	58-90	58-42	58-50	58-73	58-00	58-10	58-20	57-89	57-83	57-78	.....	39-95
Oct. 28.	14,605	59-35	59-10	59-04	58-90	58-55	58-60	58-82	58-07	58-17	58-33	57-93	57-90	57-87	.....	39-85
Oct. 30.	14,771	59-33	59-05	59-03	59-03	58-01	58-03	58-88	58-10	58-22	58-38	58-04	57-96	57-92	.....	39-45
Oct. 31.	14,777	59-25	59-00	58-95	58-95	58-48	58-57	58-77	58-05	57-15	58-35	57-94	57-88	57-84	.....	39-45
Nov. 2.	14,561	59-24	59-00	58-93	58-94	58-48	58-57	58-77	58-05	57-15	58-35	57-94	57-88	57-85	.....	39-45
Nov. 3.	14,492	59-34	59-10	59-02	59-03	58-58	58-67	58-90	58-15	57-20	58-40	58-02	57-97	57-94	.....	39-42
Nov. 4.	14,466	59-19	59-00	58-80	58-80	58-38	58-47	58-53	58-72	58-00	58-08	58-20	57-90	57-85	.....	39-35
Nov. 6.	14,988	59-43	59-20	59-14	59-15	58-73	58-78	58-90	58-22	58-28	58-62	58-11	58-03	58-02	.....	39-15
Nov. 8.	13,950	59-29	59-02	58-97	58-90	58-54	58-58	58-85	58-07	58-16	58-31	57-96	57-90	57-85	.....	39-30
Nov. 10.	15,086	59-10	58-74	58-54	58-50	58-20	58-20	58-43	57-07	57-79	58-03	57-52	57-48	57-45	.....	39-42
Nov. 11.	17,490	59-13	58-74	58-54	58-50	57-05	57-83	58-31	57-17	57-25	57-43	56-98	56-88	56-80	.....	39-40
Nov. 13.	10,041	59-10	58-79	58-57	58-55	57-86	57-73	58-25	56-93	57-17	57-45	56-98	56-88	56-80	.....	39-40
Nov. 14.	19,303	59-10	58-56	58-47	58-43	57-68	57-65	58-08	56-55	56-80	56-95	56-38	56-30	56-30	.....	40-25
Nov. 15.	19,064	59-22	58-70	58-55	58-54	57-73	57-65	58-22	56-85	56-80	57-10	56-47	56-34	56-30	.....	40-35
Nov. 16.	10,023	59-08	58-58	58-38	58-41	57-63	57-40	57-98	56-55	56-80	57-05	56-39	56-27	56-25	.....	40-45
Nov. 17.	18,895	59-10	58-56	58-44	58-42	57-70	57-40	58-06	56-60	56-78	56-92	56-38	56-28	56-25	.....	40-50
Nov. 21.	18,616	59-06	58-56	58-39	58-43	57-62	57-45	58-04	56-60	56-67	56-93	56-40	56-25	56-30	.....	40-55
Nov. 23.	18,108	58-74	58-28	58-14	58-10	57-27	57-25	57-30	56-40	56-50	56-75	56-18	56-07	56-10	.....	40-60
Nov. 28.	18,271	58-81	58-35	58-17	58-18	57-40	57-30	57-78	56-43	56-65	56-85	56-23	56-15	56-10	.....	40-35
Nov. 30.	18,438 18,526	58-78	58-32	58-18	58-14	57-37	57-17	57-73	56-40	56-60	56-80	56-20	56-10	56-10	.....	40-50
Dec. 5.	18,168	58-75	58-25	58-07	58-08	57-31	57-25	57-72	56-35	56-53	56-75	56-18	56-08	56-10	.....	40-35
Dec. 8.	18,036	58-72	58-29	58-17	58-15	57-47	57-35	57-80	56-05	56-80	56-95	56-40	56-27	56-30	.....	40-32
Dec. 9.	17,425 16,104 15,493	58-75	58-40	58-28	58-29	57-72	57-52	57-88	56-27	56-57	560					

Date.	Discharge in Sec. Ft	GAUGE NUMBER.														
		1	2	2a	3	4	5	6	7	8	9	10	11	12	12a	13
Dec. 11..	{ 14.114 13.553	58-70	58-47	58-35	58-16	57-91	57-90	58-14	57-28	57-45	57-58	57-24	57-13	57-10	.....	39-45
Dec. 12..	{ 13.653 13.653	58-70	58-45	58-37	58-13	57-96	57-99	58-20	57-51	57-55	57-70	57-42	57-22	57-82	.....	39-50
Dec. 13..	{ 13.325	58-72	58-50	58-40	58-15	58-09	58-10	58-28	57-63	57-70	57-83	57-54	57-29	57-52	.....	39-20
Dec. 14..	{ 12.667	58-73	58-55	58-47	58-15	58-13	58-11	58-23	57-72	57-77	57-93	57-65	57-34	57-85	.....	39-05
Dec. 15..	{ 12.501	58-74	58-57	58-45	58-14	58-19	58-13	58-35	57-79	57-85	57-97	57-71	57-88	57-73	.....	38-75
Dec. 16..	{ 12.237 12.056	58-72	58-54	58-45	58-13	58-13	58-20	58-33	57-80	57-83	57-98	57-72	.....	57-60	.....	38-75
Dec. 19..	{ 12.308	58-68	58-51	58-42	58-10	58-10	58-15	57-77	58-29	57-85	57-65	57-09	57-32	57-61	.....	38-45
Dec. 20..	{ 12.368	58-70	58-51	58-43	58-11	58-14	58-10	58-34	57-77	57-83	57-96	57-09	57-34	57-60	.....	38-45
Dec. 22..	{ 12.410	58-68	58-50	58-44	58-11	58-13	58-20	58-33	58-75	57-83	57-92	57-68	57-31	57-53	.....	38-25
Dec. 28..	{ 11.923 11.999	58-70	58-50	58-42	58-12	58-10	58-14	58-28	58-74	57-81	57-96	57-67	57-32	57-60	.....	38-05

WINNIPEG RIVER BELOW OUTLETS.

ONTARIO D.P.W. GAUGE AT MILL "A" KEEWATIN.

History.—This gauge, which was originally established by the Ontario Department of Public Works was tied in to W.P.S. datum on June 25, 1912. From June 1, 1913 gauge readings have been taken at this point by members of this survey.

Location.—The gauge is located on the arm of the Winnipeg river known as Darlington bay, and is about 50 ft. north of the head gates of Mill "A" of the Lake of the Woods Milling Co. at Keewatin.

Records Available.—From the 1st of June, 1913 continuous records of gauge readings at this point are available.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Ontario D.P.W. Gauge Keewatin Mill "A" for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	76.00	76.65	79.17	78.95	82.80	86.10	87.20	86.98	85.22	83.80	80.28	81.32
2	76.04	76.70	79.17	78.76	83.15	86.12	87.10	86.99	85.10	83.76	80.21	81.31
3	76.55	76.72	79.20	78.65	83.30	86.25	87.16	86.84	84.82	83.77	80.22	81.04
4	76.65	76.72	79.22	78.93	83.40	86.10	87.83	86.90	84.72	83.92	83.15	81.02
5	76.07	76.55	79.15	79.02	83.62	86.10	87.30	86.84	84.91	83.94	79.96	81.17
6	76.67	76.35	79.10	79.05	83.78	86.30	87.35	86.70	84.77	84.00	79.98	81.18
7	76.70	76.33	79.24	78.92	88.80	86.45	87.35	86.60	84.51	83.93	80.14	81.24
8	76.70	76.60	79.25	78.92	83.90	86.47	87.36	86.65	84.27	83.62	80.09	81.24
9	76.38	76.63	79.18	78.82	84.00	86.50	87.20	86.60	84.13	83.53	80.05	80.98
10	76.40	77.24	79.10	78.64	84.10	86.55	87.27	86.70	84.00	83.73	80.05	80.44
11	76.60	77.90	79.07	78.84	84.10	86.45	87.35	86.57	84.02	83.71	80.46	80.23
12	76.73	78.02	78.91	78.88	84.32	86.38	87.35	86.45	83.92	83.71	80.47	80.10
13	76.60	78.12	78.87	78.93	84.42	86.52	87.35	86.25	83.90	83.61	80.80	80.00
14	76.57	78.17	79.08	79.00	84.35	86.57	87.33	86.25	83.75	83.63	81.10	79.83
15	76.50	78.33	79.13	79.00	84.15	86.70	87.87	86.19	83.66	83.28	81.24	79.73
16	76.35	78.45	79.20	78.98	84.37	86.70	87.15	86.16	83.61	83.23	81.32	79.60
17	76.34	78.97	79.20	79.05	84.55	86.80	87.15	86.11	83.33	83.36	81.36	79.35
18	76.55	78.95	79.20	79.32	84.70	86.70	87.60	86.08	83.30	83.47	81.40	79.30
19	76.60	79.02	79.03	79.43	84.80	86.70	87.70	86.08	83.39	83.39	81.20	79.32
20	76.55	78.94	78.84	79.95	84.97	86.82	87.60	85.77	83.43	83.30	81.21	79.27
21	76.55	78.85	78.80	80.60	84.87	86.85	87.68	85.75	83.40	83.24	81.36	79.17
22	76.55	79.07	78.74	80.92	84.82	86.95	87.59	85.82	83.41	82.82	81.42	79.14
23	76.20	79.15	78.70	81.02	85.00	87.09	87.45	87.82	83.65	82.75	81.39	79.07
24	76.28	79.17	78.76	81.00	85.20	87.14	87.33	85.72	83.50	82.57	81.41	78.92
25	76.55	79.17	78.68	81.75	85.35	87.00	87.35	85.66	83.63	81.81	81.40	78.80
26	76.63	79.20	78.61	81.88	85.50	87.09	87.34	85.58	83.94	81.18	81.16	78.95
27	76.62	79.05	78.59	82.13	85.65	87.24	87.30	85.52	83.94	80.86	81.17	79.10
28	76.65	78.90	78.85	82.37	85.75	87.26	87.28	85.52	83.92	80.73	81.26	79.13
29	76.70	79.15	78.90	82.65	85.72	87.30	87.24	85.47	83.97	80.85	81.30	79.14
30	76.45	.....	78.92	82.75	85.80	87.38	87.00	85.45	84.04	80.28	81.30	79.15
31	76.45	.....	78.93	.....	85.95	.....	87.92	85.37	.....	80.30	.....	78.94

Zero of Gauge = 959.03, W.P.S. Datum = 960.34 U.S.C. & G.S. Datum.

WATER LEVELS AT CONTROLS BELOW THE OUTLETS.

The readings given herewith are actual water levels observed at various control points below the Lake of the Woods Outlets, the locations of which are shown on Plate 1.

Elevations are referred to W.P.S. Datum; to reduce U.S.C. and G.S. Datum add 1.31 feet.

Water Levels at Controls at Outlets, Lake of the Woods.
(See Plate 1.)

Control No.	Date	Water Level	Location
1	Aug. 16, 1916	1,044.12	Above 1st control, right bank.
1	Aug. 16, 1916	1,044.11	Above 1st control, left bank.
1	Aug. 16, 1916	1,043.96	Below 1st control, right bank.
1	Aug. 16, 1916	1,043.95	Below 1st control, left bank.
2	Aug. 16, 1916	1,043.93	Above 2nd control, right bank.
2	Aug. 16, 1916	1,043.92	Above 2nd control, left bank.
2	Aug. 16, 1916	1,043.86	Below 2nd control, right bank.
2	Aug. 16, 1916	1,043.88	Below 2nd control, left bank.
2	Aug. 16, 1916	1,044.43	Water level at gauge point above outlets.
2	Aug. 16, 1916, 11:30 a.m.	1,043.87	Water level at gauge point below outlets.
2	Aug. 16, 1916, 8:30 p.m.	1,043.87	Water level at gauge point below outlets.
3	Aug. 15, 1916	1,044.415	Above 3rd control, right bank.
3	Aug. 15, 1916	1,044.455	Above 3rd control, left bank.
3	Aug. 15, 1916	1,043.96	Below 3rd control, right bank.
3	Aug. 15, 1916	1,043.93	Below 3rd control, left bank.
3	Aug. 15, 1916, 1:00 p.m.	1,044.48	Water level at gauge point above outlets.
3	Aug. 15, 1916, 5:15 p.m.	1,043.92	Water level at gauge point below outlets.
4	Aug. 15, 1916	1,044.405	Above 4th control, right bank.
4	Aug. 15, 1916	1,044.415	Above 4th control, left bank.
4	Aug. 15, 1916	1,044.195	Below 4th control, right bank.
4	Aug. 15, 1916	1,043.955	Below 4th control, left bank.
4	Aug. 15, 1916	1,043.945	Foot of island, right bank.
4	Aug. 15, 1916	1,043.955	Foot of island, left bank.
5	Aug. 15, 1916	1,043.97	Above 5th control, right bank.
5	Aug. 15, 1916	1,044.19	Above 5th control, left bank.
5	Aug. 15, 1916	1,043.99	Below 5th control, right bank.
5	Aug. 15, 1916	1,043.89	Below 5th control, left bank.
6	Aug. 15, 1916	1,044.30	Above 6th control, right bank.
6	Aug. 15, 1916	1,044.51	Above 6th control, left bank.
6	Aug. 15, 1916	1,043.95	Below 6th control, right bank.
6	Aug. 15, 1916	1,043.96	Below 6th control, left bank.
6	Aug. 15, 1916, 11:15 p.m.	1,044.48	Water level at gauge point above outlets.
7	Aug. 15, 1916	1,044.57	Above 7th control, right bank.
7	Aug. 15, 1916	1,044.45	Above 7th control, left bank.
7	Aug. 15, 1916	1,044.41	Below 7th control, right bank.
7	Aug. 15, 1916	1,044.37	Below 7th control, left bank.
8	Aug. 16, 1916	1,044.35	Above 8th control, right bank.
8	Aug. 16, 1916	1,044.40	Above 8th control, left bank.
8	Aug. 16, 1916	1,044.25	Below 8th control, right bank.
8	Aug. 16, 1916	1,044.26	Below 8th control, left bank.
9	Aug. 16, 1916	1,044.96	Above 9th control, right bank.
9	Aug. 16, 1916	1,044.90	Above 9th control, left bank.
9	Aug. 16, 1916	1,044.76	Below 9th control, right bank.
9	Aug. 16, 1916	1,044.75	Below 9th control, left bank.
10	Aug. 15, 1916	1,044.77	Above 10th control, right bank.
10	Aug. 15, 1916	1,044.89	Above 10th control, left bank.
10	Aug. 15, 1916	1,044.77	Below 10th control, right bank.
10	Aug. 15, 1916	1,044.76	Below 10th control, left bank.
11	Aug. 15, 1916	1,045.04	Above 11th control, right bank.
11	Aug. 15, 1916	1,045.05	Above 11th control, left bank.
12	Aug. 16, 1916	1,045.59	Above 12th control, right bank.
12	Aug. 16, 1916	1,045.35	Above 12th control, left bank.
12	Aug. 16, 1916	1,044.93	Below 12th control, right bank.
12	Aug. 16, 1916	1,045.14	Below 12th control, left bank.
12	Aug. 16, 1916	1,045.53	'Pie-up' on point, right bank.
N.T. Island			
M. Sec.	Aug. 16, 1916	1,044.75	Above control, right bank, slack water in bay
do	Aug. 16, 1916	1,044.51	Above control, left bank.
do	Aug. 16, 1916	1,044.27	Below control, right bank.
do	Aug. 16, 1916	1,044.39	Below control, left bank.
.....	Aug. 15, 1916, 5:50 p.m.	1,045.15	Keewatin, right bank gauge.
.....	Aug. 16, 1916, 7:45 a.m.	1,045.10	Keewatin, right bank gauge.
.....	Aug. 15, 1916, 8:30 a.m.	1,045.11	Keewatin, right bank gauge.
.....	Aug. 15, 1916, 9:30 a.m.	1,044.53	N.T. Island gauge.
.....	Aug. 15, 1916, 5:25 p.m.	1,044.55	N.T. Island gauge.
.....	Aug. 16, 1916, 1:15 p.m.	1,044.45	N.T. Island gauge.
.....	Aug. 16, 1916, 2:30 p.m.	1,050.18	Gauge No. 12.
.....	Aug. 16, 1916, 2:30 p.m.	1,049.65	Gauge No. 12a.
.....	Aug. 16, 1916, 2:30 p.m.	1,045.30	Gauge No. 13.

Water Levels at the Outlets, Lake of the Woods.

Date 1916	North Tunnel Island	Above Outlets	Below Outlets	Drop between N.T. Island and W.L. above Outlets	Drop through Outlets	Keewatin River Bridge Gauge	Drop between K.R.B. Gauge and N.T. Island
June 5	1,044.50	1,044.44	1,043.83	0.06	0.61	.....	.....
June 7	1,044.70	1,044.60	1,044.07	0.01	0.62	.....	.....
June 8	1,044.73	1,044.69	1,044.11	0.04	0.58	.....	.....
June 10	1,044.80	1,044.70	1,044.22	0.01	0.57	.....	.....
June 13	1,044.75	1,044.74	1,044.17	0.01	0.57	.....	.....
June 15	.....	1,044.80	1,044.27	.....	0.62	1,045.08	.....
June 20	1,045.14	1,045.04	1,044.48	0.10	0.56	.....	.....
June 24	1,045.43	1,045.39	1,044.82	0.04	0.57	.....	.....
June 27	1,045.48	1,045.40	1,044.85	0.08	0.56	.....	.....
June 30	1,045.71	1,045.55	1,044.08	0.16	0.57	1,046.20	0.72
July 3	1,045.33	1,045.31	1,044.78	0.02	0.53	1,046.38	0.67
July 13	1,045.59	1,045.56	1,044.99	0.03	0.57	1,046.14	0.81
July 22	1,045.93	1,045.80	1,045.27	0.13	0.53	1,046.34	0.75
July 27	1,045.63	1,045.54	1,044.97	0.09	0.57	1,046.57	0.64
Aug. 4	1,045.23	1,045.19	1,044.62	0.04	0.57	1,046.29	0.66
Aug. 11	1,044.93	1,044.84	1,044.26	0.09	0.58	.....	.....
Aug. 14	1,044.33	1,044.27	1,043.86	0.06	0.41	.....	.....
Aug. 15	1,044.53	1,044.48	1,043.92	0.05	0.56	.....	.....
Aug. 16	1,044.45	1,044.43	1,043.87	0.02	0.56	.....	.....
Sept. 6	1,043.20	1,043.19	1,042.62	0.01	0.57	1,043.78	0.58
Sept. 15	1,042.15	1,042.14	1,041.62	0.01	0.52	1,042.62	0.47
Sept. 22	1,041.86	1,041.85	1,041.27	0.01	0.58	1,042.33	0.47
Sept. 30	1,042.48	1,042.42	1,041.74	0.06	0.68	1,043.02	0.54

WINNIPEG RIVER GAUGING STATIONS.

The Manitoba Hydrometric Survey has had in operation a number of gauges at various points on the river since the organization of the survey. The records are now presented.

For convenience, the river has been divided into sections, the gauge records belonging to each section being given in order down stream. The sections are as follows:—

1. From Minaki to Slave falls.
2. Pinawa channel.
3. From below the main diversion dam to Lac du Bonnet.
4. From Lac du Bonnet to lake Winnipeg.

FROM MINAKI TO SLAVE FALLS.

The gauges in this section of the river have been operated for various periods. Those in the vicinity of the city of Winnipeg power plant, Point du Bois, were generally established and read by city employees. Through the courtesy of the city these have been made available.

The gauges operated are placed at the following points:—

Minaki (below the T.C.R. bridge).
Above the Intake, Point du Bois plant.
Forebay, Point du Bois plant.
Tailrace, Point du Bois plant.
Head of Eightfoot falls.
Foot of Eightfoot falls.
Hunt club landing.
Head of Slave falls.
Foot of Slave falls.

WINNIPEG RIVER AT MINAKI (GAUGING STATION).

History.—The station was established by A. Pirie on June 15, 1912 and has been in operation since that date.

Location.—A vertical staff gauge is secured to cribwork on the downstream side of the east abutment of the Grand Trunk Pacific Railway bridge across the Winnipeg river, three quarters of a mile east of the station of Minaki.

Records Available.—Continuous records of daily gauge height are available for the periods September 24, 1913 to December 5, 1914 and May 18, 1915 to December 31, 1916.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Minaki for 1913
and 1914.*

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2										1,033.14	1,032.22	1,032.20
3										1,033.09	1,032.22	1,032.27
4										1,032.99	1,032.22	1,032.32
5										1,032.84	1,032.12	1,032.22
6										1,032.79	1,032.12	1,032.27
7										1,032.79	1,032.22	1,032.22
8										1,032.87	1,032.32	1,032.27
9										1,032.52	1,032.32	1,032.32
10										1,032.62	1,032.22	1,032.22
11										1,032.52	1,032.12	1,032.27
12										1,032.52	1,032.22	1,032.37
13										1,032.52	1,032.32	1,032.37
14										1,032.57	1,032.32	1,032.37
15										1,032.42	1,032.22	1,032.37
16										1,032.37	1,032.22	1,032.32
17										1,032.32	1,032.22	1,032.22
18										1,032.27	1,032.22	1,032.22
19										1,032.32	1,032.32	1,032.32
20										1,032.37	1,032.22	1,032.22
21										1,032.22	1,032.27	1,032.27
22										1,032.22	1,032.22	1,032.22
23										1,032.22	1,032.17	1,032.22
24										1,032.22	1,032.22	1,032.22
25									1,033.64	1,032.22	1,032.27	1,032.22
26									1,033.54	1,032.22	1,032.22	1,032.22
27									1,033.59	1,032.22	1,032.27	1,032.22
28									1,033.49	1,032.17	1,032.22	1,032.17
29									1,033.44	1,032.22	1,032.22	1,032.22
30									1,033.34	1,032.22		1,032.27
31									1,033.29	1,032.22	1,032.22	1,032.22

1914

1	1032.22	1032.12	1032.12	1032.97	1033.11	1034.51	1035.61	1035.56	1034.46	1033.94	1033.09	1032.92
2	1032.27	1032.12	1032.12	1032.92	1033.11	1034.56	1035.60	1035.58	1034.41	1033.91	1033.03	1032.96
3	1032.32	1032.12	1032.22	1032.92	1033.06	1034.80	1035.58	1035.56	1034.36	1033.86	1033.04	1032.94
4	1032.32	1032.12	1032.22	1032.92	1033.16	1034.91	1035.56	1035.52	1034.26	1033.90	1032.97	1032.93
5	1032.27	1032.12	1032.32	1032.97	1033.11	1034.06	1035.61	1035.46	1034.16	1033.89	1032.96	1032.31
6	1032.22	1032.12	1032.42	1032.92	1033.21	1034.98	1035.60	1035.44	1034.06	1033.88	1032.93	Discontinued.
7	1032.22	1032.07	1032.52	1032.97	1033.26	1035.06	1035.56	1035.46	1034.01	1033.86	1032.89	
8	1032.22	1032.07	1032.52	1033.02	1033.26	1035.08	1035.52	1035.41	1033.96	1033.84	1032.92	
9	1032.22	1032.02	1032.52	1033.02	1033.32	1035.14	1035.56	1035.50	1034.04	1033.86	1032.86	
10	1032.22	1032.02	1032.52	1032.92	1033.34	1035.22	1035.46	1035.46	1034.00	1033.87	1032.92	
11	1032.22	1032.02	1032.72	1032.92	1033.35	1035.26	1035.56	1035.41	1033.94	1034.04	1032.90	
12	1032.22	1032.02	1032.72	1032.92	1033.38	1035.31	1035.66	1035.36	1033.91	1034.11	1032.88	
13	1032.27	1032.02	1032.82	1032.92	1033.38	1035.36	1035.66	1035.32	1033.94	1034.02	1032.89	
14	1032.22	1032.02	1032.92	1032.87	1033.36	1035.34	1035.61	1035.26	1033.96	1033.96	1032.90	
15	1032.22	1032.02	1032.92	1032.87	1033.36	1035.36	1035.61	1035.21	1033.94	1033.97	1032.96	
16	1032.22	1031.92	1032.92	1032.82	1033.41	1035.32	1035.66	1035.26	1033.96	1033.84	1032.91	
17	1032.22	1031.92	1032.92	1032.82	1033.42	1035.31	1035.70	1035.25	1033.94	1033.74	1032.94	
18	1032.22	1031.92	1032.92	1032.97	1033.43	1035.36	1035.72	1035.36	1034.00	1033.63	1032.86	
19	1032.22	1031.92	1033.02	1032.87	1033.53	1035.36	1035.61	1035.30	1034.01	1033.50	1032.95	
20	1032.22	1031.92	1033.02	1032.92	1033.46	1035.36	1035.66	1035.26	1034.02	1033.46	1032.91	
21	1032.22	1031.92	1033.02	1032.92	1033.46	1035.41	1035.66	1035.26	1034.01	1033.38	1032.95	
22	1032.22	1031.92	1033.02	1032.92	1033.50	1035.44	1035.71	1035.21	1034.06	1033.33	1032.92	
23	1032.17	1031.92	1033.12	1032.97	1033.56	1035.40	1035.70	1035.16	1034.06	1033.29	1032.91	
24	1032.17	1031.92	1033.12	1033.02	1033.56	1035.44	1035.68	1035.10	1034.01	1033.24	1032.92	
25	1032.17	1031.92	1033.02	1032.97	1033.72	1035.48	1035.66	1035.02	1034.00	1033.19	1032.96	
26	1032.17	1031.92	1033.02	1033.02	1033.91	1035.52	1035.66	1034.96	1033.98	1033.13	1033.00	
27	1032.12	1031.92	1033.02	1033.07	1033.96	1035.56	1035.61	1034.90	1033.96	1033.06	1032.95	
28	1032.12	1031.92	1033.02	1033.02	1034.02	1035.58	1035.56	1034.82	1033.96	1033.04	1032.95	
29	1032.12	1031.92	1033.02	1033.12	1034.18	1035.51	1035.46	1034.70	1033.97	1033.03	1032.91	
30	1032.12	1031.92	1033.07	1033.07	1034.33	1035.56	1035.60	1034.61	1033.96	1033.04	1032.94	
31	1032.12	1031.92	1033.07	1033.07	1034.44	1035.56	1035.60	1034.56	1033.96	1033.06		

Levels reduced to Water Power Survey Datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Minaki for 1915
and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						1035 30	1035 58	1036 46	1034 85	1033 53	1032 97	1032 98
2						1035 37	1035 71	1036 43	1034 69	1033 49	1032 96	1032 99
3						1035 38	1035 92	1036 41	1034 46	1033 45	1032 96	1032 99
4						1035 37	1035 94	1036 40	1034 25	1033 38	1032 96	1032 99
5						1035 37	1036 00	1036 40	1034 20	1033 34	1032 95	1032 96
6						1035 43	1036 21	1036 38	1033 76	1033 25	1032 96	1032 94
7						1035 33	1036 41	1036 36	1033 78	1033 19	1032 99	1032 93
8						1035 29	1036 46	1036 32	1033 81	1033 16	1033 03	1032 92
9						1035 34	1036 34	1036 28	1033 66	1033 12	1033 06	1032 91
10						1035 36	1036 26	1036 16	1033 66	1033 09	1033 08	1032 91
11						1035 43	1036 30	1036 14	1033 66	1033 05	1033 10	1032 93
12						1035 38	1036 34	1036 13	1033 66	1033 04	1033 09	1032 93
13						1035 37	1036 37	1036 06	1033 66	1033 04	1033 07	1032 94
14						1035 32	1036 37	1036 04	1033 63	1033 03	1033 06	1032 94
15						1035 37	1036 36	1036 04	1033 63	1033 02	1033 05	1032 95
16						1035 34	1036 38	1036 04	1033 63	1033 02	1033 04	1032 98
17						1035 39	1036 34	1036 02	1033 63	1033 01	1033 03	1032 99
18					1034 66	1035 41	1036 33	1036 02	1033 63	1032 99	1033 03	1032 98
19					1034 08	1035 39	1036 31	1036 01	1033 61	1032 98	1033 02	1032 99
20					1035 34	1035 39	1036 30	1036 00	1033 61	1032 96	1033 03	1033 00
21					1035 42	1035 42	1036 32	1035 99	1033 61	1032 94	1033 02	1033 00
22					1035 47	1035 41	1036 31	1035 98	1033 61	1032 93	1033 01	1033 00
23					1035 47	1035 44	1036 30	1036 75	1033 58	1032 92	1033 01	1033 00
24					1035 49	1035 45	1036 29	1035 71	1033 58	1032 95	1033 00	1033 00
25					1035 48	1035 49	1036 22	1035 61	1033 58	1032 95	1032 99	1033 00
26					1035 46	1035 52	1036 27	1035 52	1033 57	1032 96	1032 99	1032 97
27					1035 46	1035 42	1036 29	1035 46	1033 57	1032 96	1032 98	1032 94
28					1035 46	1035 46	1036 33	1035 42	1033 57	1032 97	1032 98	1032 92
29					1035 45	1035 49	1036 38	1035 29	1033 56	1032 97	1032 97	1032 91
30					1035 45	1035 52	1036 43	1035 17	1033 56	1032 97	1032 97	1032 92
31					1035 44	.....	1036 44	1035 04	.....	1032 98	.....	1032 94

1916

1	1032 05	1032 03	1034 28	1034 14	1036 35	1038 40	1039 25	1039 24	1038 08	1037 20	1035 34	1035 08
2	1032 06	1032 04	1034 30	1034 13	1036 46	1038 44	1039 25	1039 22	1038 05	1037 21	1035 29	1035 08
3	1032 07	1032 04	1034 32	1034 11	1036 57	1038 51	1039 17	1039 19	1038 03	1037 22	1035 21	1035 07
4	1032 07	1032 05	1034 33	1034 09	1036 73	1038 54	1039 18	1039 16	1038 00	1037 19	1035 15	1035 03
5	1032 07	1032 03	1034 34	1034 08	1036 85	1038 56	1039 21	1039 12	1037 97	1037 17	1035 13	1035 03
6	1032 08	1032 02	1034 35	1034 11	1036 94	1038 60	1039 20	1039 09	1037 90	1037 20	1035 10	1035 01
7	1032 08	1032 01	1034 35	1034 12	1037 06	1038 63	1039 18	1039 13	1037 83	1037 20	1035 09	1035 00
8	1032 08	1032 09	1034 35	1034 14	1037 14	1038 67	1039 22	1038 98	1037 74	1037 17	1035 03	1035 00
9	1032 08	1032 04	1034 34	1034 05	1037 20	1038 70	1039 24	1039 02	1037 73	1037 12	1035 02	1035 00
10	1032 07	1032 09	1034 33	1034 16	1037 25	1038 73	1039 25	1038 95	1037 64	1037 10	1035 01	1035 00
11	1032 06	1033 07	1034 33	1034 15	1037 30	1038 79	1039 25	1039 01	1037 55	1037 06	1035 00	1035 03
12	1032 07	1033 19	1034 31	1034 14	1037 34	1038 83	1039 25	1038 87	1037 45	1037 05	1035 00	1035 03
13	1032 07	1033 40	1034 28	1034 19	1037 37	1038 84	1039 25	1038 93	1037 35	1037 05	1034 97	1035 00
14	1032 07	1033 47	1034 24	1034 23	1037 45	1038 75	1039 24	1038 80	1037 27	1037 04	1035 04	1035 03
15	1032 07	1033 59	1034 25	1034 30	1037 49	1038 86	1039 23	1038 74	1037 19	1037 03	1035 14	1035 19
16	1032 07	1033 09	1034 27	1034 34	1037 51	1038 87	1039 27	1038 69	1037 15	1037 03	1035 29	1035 15
17	1032 05	1033 75	1034 28	1034 40	1037 53	1038 87	1039 32	1038 64	1037 10	1037 01	1035 43	1035 07
18	1032 04	1033 85	1034 27	1034 44	1037 55	1038 88	1039 49	1038 61	1037 08	1036 99	1035 53	1035 04
19	1032 03	1034 00	1034 25	1034 48	1037 61	1038 88	1039 57	1038 57	1037 06	1036 95	1035 54	1035 00
20	1032 01	1034 05	1032 24	1034 56	1037 67	1038 85	1039 60	1038 54	1037 05	1036 92	1035 52	1034 94
21	1032 09	1034 08	1034 21	1034 73	1037 74	1038 86	1039 60	1038 49	1037 02	1036 89	1035 61	1034 85
22	1032 08	1034 11	1034 19	1034 84	1037 80	1038 91	1039 58	1038 44	1037 00	1036 87	1035 64	1034 77
23	1032 08	1034 15	1034 14	1035 08	1037 86	1039 04	1039 55	1038 41	1036 99	1036 75	1035 66	1034 83
24	1032 07	1034 10	1034 09	1035 34	1037 92	1039 07	1039 51	1038 38	1036 96	1036 70	1035 69	1034 84
25	1032 06	1034 22	1034 05	1035 43	1037 96	1039 11	1039 47	1038 34	1036 90	1036 65	1035 72	1034 95
26	1032 05	1034 24	1034 13	1035 57	1038 03	1039 14	1039 43	1038 31	1036 98	1036 57	1035 73	1034 96
27	1032 04	1034 26	1033 99	1035 76	1038 12	1039 16	1039 40	1038 25	1037 03	1036 35	1035 73	1034 97
28	1032 03	1034 26	1034 03	1035 93	1038 15	1039 19	1039 55	1038 20	1037 03	1036 10	1035 72	1034 98
29	1032 03	1034 27	1034 05	1036 04	1038 25	1039 22	1039 55	1038 15	1037 09	1035 77	1035 70	1034 98
30	1032 05	.....	1034 09	1036 24	1038 30	1039 24	1039 51	1038 13	1037 14	1035 57	1035 69	1034 97
31	1032 03	.....	1034 11	.....	1038 36	.....	1039 26	1038 11	.....	1035 40	.....	1034 96

Levels reduced to Water Power Survey Datum.

WINNIPEG RIVER—ABOVE INTAKE, POINT DU BOIS POWER PLANT.
(GAUGING STATION.)

History.—The station was established by E. B. Patterson on June 2, 1916.

Location of Section.—A vertical staff gauge is located on the right bank of the river, five hundred feet above the intake of the power plant of the city of Winnipeg at Point du Bois.

Records Available.—A practically continuous record of daily gauge height is available from July 1 to November 18, 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Point du Bois above Intake, for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							979.98	980.13	979.58		978.48	
2							979.98		979.58	979.03	978.48	
3							980.01	980.08		979.03	978.63	
4							979.92	980.06	979.71	979.03	978.38	
5							979.98	980.07	979.71	979.01		
6							979.98	980.03	979.03	979.03	978.26	
7							979.98	980.03	979.01	979.01	978.26	
8							980.00	980.03	979.56		978.26	
9								980.03	979.48		978.18	
10							979.99	980.00	979.45	979.01	978.13	
11							979.98	979.98	979.43	978.98	978.09	
12							979.98	979.93	979.43	978.98		
13							980.00	979.93	979.38	978.98	978.13	
14							979.98	979.93	979.33	978.96	978.13	
15							980.00	979.88	979.23		978.13	
16								979.88	979.23	978.98	978.13	
17							980.03	979.85		978.93	978.13	
18							980.03	979.85	979.18	978.96	978.18	
19							980.03	979.83	979.18	978.91		
20							980.08		979.08	978.88		
21							980.11	979.78	979.08	978.88		
22							980.13	979.78	979.08			
23							980.16	979.73	979.06	978.86		
24							980.16	979.70		978.83		
25							980.13	979.68	979.06	978.78		
26												
27							980.13	979.70	979.06	978.78		
28							980.13		979.03	978.78		
29							980.13	979.68	979.03	978.76		
30							980.13	979.63	979.06			
31							980.13	979.63	979.08	978.63		
							980.11	979.60		978.58		

Levels reduced to Water Power Survey Datum.

WINNIPEG RIVER—FOREBAY—POINT DU BOIS (GAUGING STATION).

History.—The station was established by the city of Winnipeg and all observations at this point have been made by the officers of the City Power Department.

Gauge.—A point of known elevation was established on the concrete about twenty feet upstream from the screens in the headrace of the power plant and measurements from this point to water surface are recorded.

An automatic gauge has been installed at this point and though the readings obtained from this gauge for part of the year of 1913 are recorded, it has not been found satisfactory and preference is given to the readings as obtained above.

Records Available.—An intermittent record of daily gauge height is available from December 1, 1911 to December 31, 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Point du Bois Forebay for 1911.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1												976.39
2												976.39
3												976.38
4												976.36
5												976.35
6												976.35
7												976.33
8												976.33
9												976.32
10												976.32
11												976.32
12												976.32
13												976.33
14												976.35
15												976.38
16												976.41
17												976.45
18												976.44
19												976.43
20												976.43
21												976.42
22												976.42
23												976.41
24												976.38
25												976.36
26												976.36
27												976.32
28												976.31
29												976.31
30												976.31
31												976.41

Levels reduced to Water Power Survey Datum.

MANITOBA HYDROMETRIC SURVEY

SESSIONAL PAPER No. 26e

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Mean Daily Gauge Height, in Feet, of Winnipeg River at Point du Bois
Forebay for 1912 and 1913.

1912

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	976.38	976.30	976.47	.....	.....	977.08	978.07	977.93	977.93	.....	978.33	978.06
2	976.38	976.30	976.47	.....	977.22	978.08	976.07	977.93	977.93	.....	978.33	978.06
3	976.38	976.30	976.45	.....	977.26	978.08	978.06	977.94	977.94	.....	978.33	978.06
4	976.38	976.30	976.45	.....	977.30	978.01	978.05	977.95	978.08	.....	978.33	978.06
5	976.43	976.30	976.36	976.62	977.36	978.02	978.06	977.94	978.03	.....	978.33	978.06
6	976.53	976.30	976.33	976.62	977.35	978.02	976.06	977.94	978.03	.....	978.33	978.06
7	976.63	976.30	976.33	.....	977.36	978.02	976.06	977.94	978.03	978.06	978.33	978.06
8	976.63	976.30	976.31	.....	977.40	978.03	976.07	977.94	978.02	978.06	978.33	978.06
9	976.60	976.30	976.28	.....	977.43	.....	978.07	977.94	977.96	978.06	978.33	977.98
10	976.54	976.30	976.27	.....	.....	.....	978.04	977.94	977.97	978.18	978.33	977.98
11	976.50	976.30	976.26	.....	977.50	.....	978.04	977.94	977.97	976.28	978.33	977.98
12	976.43	976.31	976.25	986.75	.....	.....	978.04	977.95	977.95	978.28	978.33	977.98
13	976.43	976.31	.....	.....	977.56	.....	978.06	977.95	977.93	978.28	978.33	977.98
14	976.43	976.31	.....	.....	977.60	.....	978.05	977.95	.....	978.33	978.18	977.98
15	976.43	976.31	.....	.....	977.63	977.93	978.05	977.95	.....	978.33	978.13	977.98
16	976.43	976.33	.....	.....	.....	977.98	978.06	977.95	.....	978.33	978.13	977.98
17	976.43	976.36	.....	.....	977.70	977.93	978.06	977.95	.....	978.33	978.13	977.98
18	976.43	976.36	.....	.....	977.73	977.99	978.07	977.95	.....	978.33	978.13	977.98
19	976.41	976.37	.....	976.80	.....	977.98	978.06	977.95	.....	978.33	978.13	977.98
20	976.41	976.39	.....	.....	977.78	977.99	978.06	.....	.....	978.34	978.13	977.98
21	976.41	976.41	.....	.....	977.79	977.97	978.05	.....	978.08	978.35	978.13	977.98
22	976.41	976.44	976.37	.....	977.81	977.96	978.05	.....	978.04	978.38	978.13	977.98
23	976.38	976.45	.....	.....	977.83	977.95	978.03	.....	978.03	978.38	978.13	977.98
24	976.38	976.47	.....	.....	977.85	977.95	978.03	.....	978.03	978.38	978.13	977.98
25	976.36	977.49	976.42	.....	977.87	977.95	978.01	.....	978.08	978.38	978.13	977.98
26	976.33	977.50	.....	.....	.....	977.93	977.99	.....	978.01	978.38	978.13	977.98
27	976.33	977.50	.....	.....	977.90	977.92	977.98	.....	978.02	978.43	978.13	977.98
28	976.33	977.48	.....	.....	977.98	.....	977.97	.....	978.02	978.43	978.13	977.98
29	976.33	977.47	.....	.....	977.96	977.92	977.96	.....	978.09	978.43	978.13	977.98
30	976.31	.....	.....	.....	977.98	977.88	977.94	.....	.....	978.43	978.13	977.98
31	976.31	.....	.....	.....	977.98	.....	977.95	.....	.....	978.43	.....	977.98

1913

1	977.88	977.68	977.38	977.08	977.38	978.28	977.98	.....	.....	976.58	976.88	976.38
2	977.88	977.68	977.38	977.08	977.38	978.18	977.98	.....	.....	976.58	976.88	976.38
3	977.88	977.68	977.38	977.08	977.43	978.18	977.88	.....	.....	976.58	976.88	976.38
4	977.88	977.68	977.38	977.08	977.48	978.28	977.88	976.48	.....	976.48	976.88	976.46
5	977.88	977.68	977.38	977.08	977.48	978.28	977.98	976.48	.....	976.48	976.88	976.46
6	977.88	977.68	977.38	977.08	977.58	978.18	977.88	976.28	.....	976.38	976.78	976.48
7	977.88	977.68	977.38	977.08	977.58	978.18	977.88	976.18	.....	976.38	976.78	976.48
8	977.88	977.68	977.38	977.08	977.58	978.18	977.78	976.18	.....	976.38	976.78	976.48
9	977.88	977.68	977.38	977.08	977.68	978.18	977.68	975.98	.....	976.38	976.78	976.48
10	977.88	977.68	977.38	977.08	977.68	978.18	977.68	975.78	.....	976.38	976.68	976.28
11	977.88	977.68	977.38	977.08	977.78	978.18	977.78	975.68	.....	976.38	976.68	976.48
12	977.88	977.68	977.28	977.08	977.83	978.28	977.78	975.28	.....	976.38	976.68	976.48
13	977.88	977.68	977.28	977.08	977.88	978.28	977.68	975.18	.....	976.38	976.68	976.48
14	977.78	977.68	977.28	977.08	977.88	978.28	977.58	975.08	.....	976.38	976.68	976.48
15	977.78	977.68	977.28	977.08	977.88	978.28	977.48	974.08	.....	976.38	976.68	976.38
16	977.78	977.68	977.28	977.08	977.88	978.18	977.38	974.08	.....	976.78	976.78	976.48
17	977.78	977.68	977.28	977.08	977.88	978.08	977.38	974.28	.....	976.78	976.78	976.48
18	977.78	977.68	977.18	977.18	977.88	978.08	977.48	974.08	.....	976.78	976.78	976.48
19	977.78	977.68	977.18	977.18	977.88	978.08	977.38	973.88	.....	976.78	976.68	976.18
20	977.78	977.68	977.18	977.23	977.88	978.18	977.28	973.78	.....	976.78	976.68	976.38
21	977.78	977.48	977.18	977.23	977.98	978.28	977.18	973.38	.....	976.78	976.78	976.18
22	977.78	977.48	977.18	977.23	977.98	978.28	977.08	973.08	.....	976.78	976.68	976.28
23	977.78	977.48	977.08	977.23	977.98	978.08	976.98	972.68	.....	976.78	976.68	976.28
24	977.78	977.48	977.08	977.28	977.98	978.08	976.98	972.28	.....	976.78	976.68	976.28
25	977.78	977.48	977.08	977.28	978.08	978.08	977.08	972.28	.....	976.78	976.68	976.28
26	977.78	977.38	977.08	977.33	978.08	977.98	977.08	971.88	.....	976.68	976.38	976.28
27	977.78	977.38	977.08	977.33	978.18	978.08	976.88	971.48	.....	976.68	976.38	976.28
28	977.78	977.38	977.08	977.33	978.18	978.08	976.88	971.08	.....	976.68	976.38	976.28
29	977.78	.....	977.08	977.33	978.18	978.08	976.88	970.88	.....	976.68	976.38	976.28
30	977.78	.....	977.08	977.33	978.28	978.08	976.78	970.68	.....	976.68	976.38	976.28
31	977.68	.....	977.08	.....	978.28	978.08	.....	970.08	.....	976.78	.....	976.28

Levels reduced to Water Power Survey Datum.

Notes.—From August 4 to December 31, 1913, the gauge readings are those recorded by the Automatic gauge.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Pointe du Bois Forebay
for 1914, 1915 and 1916.*

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	976.68	976.58	976.58	976.68	976.78	977.48	978.18	978.13	977.88	977.53	977.38	977.18
2	976.68	976.58	976.58	976.68	976.78	977.48	978.18	978.13	977.88	977.53	977.38	977.18
3	976.68	976.58	976.58	976.68	976.78	977.48	978.18	978.13	977.88	977.53	977.38	977.18
4	976.68	976.58	976.58	976.68	976.78	977.48	978.18	978.13	977.88	977.53	977.38	977.18
5	976.68	976.58	976.58	976.68	976.78	977.48	978.18	978.13	977.88	977.53	977.38	977.18
6	976.68	976.58	976.63	976.73	976.83	977.78	978.18	978.13	977.78	977.53	977.33	977.18
7	976.68	976.58	976.63	976.73	976.83	977.78	978.18	978.08	977.78	977.53	977.33	977.18
8	976.68	976.58	976.63	976.73	976.83	977.78	978.18	978.08	977.68	977.53	977.33	977.18
9	976.68	976.58	976.63	976.73	976.83	977.78	978.18	978.08	977.68	977.53	977.33	977.18
10	976.68	976.58	976.63	976.68	976.88	977.98	978.18	978.08	977.68	977.53	977.28	977.18
11	976.63	976.58	976.63	976.68	976.98	977.98	978.18	978.08	977.63	977.58	977.28	977.18
12	976.63	976.58	976.63	976.68	976.98	977.98	978.18	978.08	977.58	977.63	977.28	977.18
13	976.63	976.58	976.68	976.68	976.98	977.98	978.18	978.08	977.58	977.63	977.28	977.18
14	976.63	976.58	976.68	976.68	976.98	977.98	978.18	978.08	977.58	977.63	977.28	977.18
15	976.63	976.58	976.68	976.73	976.98	978.03	978.18	978.03	977.58	977.63	977.28	977.18
16	976.63	976.58	976.68	976.73	977.08	978.03	978.18	978.03	977.58	977.63	977.28	977.18
17	976.63	976.58	976.73	976.73	977.08	978.03	978.18	978.03	977.58	977.63	977.28	977.18
18	976.63	976.58	976.73	976.73	977.08	978.03	978.18	978.03	977.58	977.63	977.28	977.18
19	976.63	976.58	976.73	976.73	977.08	978.03	978.18	978.03	977.58	977.63	977.28	977.18
20	976.63	976.58	976.73	976.78	977.08	978.08	978.18	977.98	977.58	977.58	977.28	977.08
21	976.63	976.58	976.73	976.78	977.08	978.08	978.18	977.98	977.58	977.58	977.28	977.08
22	976.63	976.58	976.73	976.73	977.13	978.08	978.18	977.98	977.58	977.58	977.28	977.08
23	976.63	976.58	976.68	976.73	977.18	978.08	978.18	977.98	977.58	977.58	977.28	977.08
24	976.63	976.58	976.68	976.78	977.18	978.08	978.18	977.98	977.58	977.58	977.28	977.08
25	976.63	976.58	976.68	976.78	977.28	978.08	978.18	977.98	977.58	977.48	977.18	977.08
26	976.63	976.58	976.68	976.78	977.28	978.08	978.18	977.98	977.58	977.48	977.18	977.08
27	976.63	976.58	976.68	976.78	977.28	978.13	978.18	977.98	977.58	977.48	977.18	977.08
28	976.63	976.58	976.68	976.78	977.28	978.13	978.18	977.93	977.58	977.48	977.18	977.08
29	976.63	.....	976.73	976.78	977.38	978.13	978.13	977.93	977.53	977.38	977.18	977.08
30	976.63	.....	976.73	976.78	977.38	978.13	978.13	977.93	977.53	977.38	977.18	977.08
31	976.63	.....	976.73	.....	977.48	.....	978.13	977.93	.....	977.38	.....	977.08

1915

1916

1	.....	.....	.....	977.43	.....	979.40	979.51	979.06	.....	978.23	977.98
2	.....	.....	.....	977.43	.....	979.43	979.46	979.12	978.62	978.19	978.03
3	.....	.....	.....	977.43	.....	979.43	979.46	979.12	978.62	978.17	977.98
4	.....	.....	.....	977.43	.....	979.38	979.50	979.20	978.62	978.14	977.96
5	.....	.....	.....	977.48	.....	979.38	979.58	979.20	978.51	.....	977.96
6	.....	.....	.....	.....	977.48	979.38	.....	979.13	978.63	977.82	977.91
7	.....	.....	.....	.....	977.48	979.38	.....	979.12	978.61	977.78	977.95
8	.....	.....	.....	.....	977.58	979.41	979.46	979.11	.....	977.98	977.96
9	.....	.....	.....	.....	977.58	.....	979.45	979.08	.....	977.93	977.96
10	.....	.....	.....	.....	977.58	979.43	979.42	979.08	978.61	977.6	.....
11	.....	.....	.....	.....	977.58	979.41	979.38	978.98	978.59	977.96	977.96
12	.....	.....	.....	.....	977.58	979.43	979.38	978.94	978.57	.....	977.91
13	.....	.....	.....	.....	977.58	979.41	.....	978.92	978.56	977.88	977.81
14	.....	.....	.....	.....	977.68	979.41	979.37	978.84	978.61	977.93	977.76
15	.....	.....	.....	.....	977.68	979.38	979.36	978.82	.....	977.93	977.71
16	.....	.....	.....	.....	977.68	.....	979.34	978.84	978.61	977.94	977.78
17	.....	.....	.....	.....	977.68	979.41	979.30	.....	978.55	977.88	.....
18	.....	.....	.....	.....	977.68	979.43	979.29	978.77	978.56	977.98	.....
19	.....	.....	.....	.....	977.68	979.46	979.36	978.74	978.54	.....	977.58
20	.....	.....	.....	.....	977.68	979.48	.....	978.68	978.52	977.98	977.53
21	.....	.....	.....	.....	977.68	979.53	979.27	978.68	978.52	977.98	977.48
22	.....	.....	.....	.....	977.78	979.53	979.24	978.68	.....	978.04	977.53
23	.....	.....	.....	.....	977.78	979.58	979.20	978.66	978.49	977.97	977.61
24	.....	.....	.....	.....	977.78	.....	979.56	978.18	978.49	.....	.....
25	.....	.....	.....	.....	977.88	979.53	979.19	978.65	978.45	978.01	.....
26	.....	.....	.....	.....	977.88	979.53	979.21	978.63	978.43	.....	977.58
27	.....	.....	.....	.....	977.88	979.53	.....	978.63	978.41	977.98	977.51
28	.....	.....	.....	.....	977.88	979.53	979.17	978.63	978.39	977.93	977.51
29	.....	.....	.....	.....	977.93	979.53	979.11	978.65	.....	977.96	977.50
30	.....	.....	.....	.....	977.93	979.53	979.11	978.66	978.33	977.96	977.51
31	.....	.....	.....	.....	977.93	979.53	979.09	.....	978.24	.....	.....

Levels reduced to Water Power Survey Datum.

WINNIPEG RIVER—TAILRACE—POINT DU BOIS. (GAUGING STATION).

History.—The gauge at this point was established by the city of Winnipeg in January 1907, during the construction of the hydro-electric plant at Point du Bois, and has been in continuous operation since that date. From January, 1907 to July 1, 1913 the gauge records were obtained by the officials of the city of Winnipeg and since that date by members of the staff of the Manitoba Hydro-metric Survey.

Location.—A vertical staff gauge was originally located in the westerly end of the bay in the tailrace. In 1913 the location was changed to a point about two hundred feet west of the end of the present power house. During the high water of the summer of 1916 this gauge was destroyed and a new gauge was secured to the concrete side wall of the test flume, which is the present location of the gauge.

Records Available.—A continuous record of daily gauge height is available from January 23, 1907 to December 31, 1916.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Point du Bois Tailrace
for 1915 and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	929.43	929.40	929.05	928.75	930.35	931.78	931.93	932.45	930.93	930.23	929.78	929.95
2	929.45	929.48	929.08	928.75	930.38	931.78	931.95	932.55	930.80	930.18	929.75	929.88
3	929.40	929.45	929.00	928.73	930.50	931.73	931.98	932.58	930.75	929.98	929.80	929.95
4	929.45	929.31	929.05	928.65	930.48	931.78	931.92	932.55	930.68	930.15	929.78	929.98
5	929.13	929.28	928.98	928.73	930.50	931.70	932.05	932.53	930.46	930.10	929.83	929.98
6	929.40	929.25	928.95	928.78	930.53	931.53	932.10	932.50	930.53	929.95	929.70	930.20
7	929.38	929.08	928.98	928.75	930.63	931.78	932.18	932.53	930.61	929.88	929.48	929.95
8	929.40	929.20	928.98	928.78	930.60	931.76	932.15	932.40	930.53	929.93	929.75	930.10
9	929.25	929.18	928.98	928.75	930.58	931.78	932.28	932.43	930.58	929.88	929.93	930.10
10	929.25	929.20	928.95	928.78	930.90	931.78	932.33	932.53	930.43	929.71	930.05	929.98
11	929.35	929.15	928.98	928.75	930.98	931.80	932.35	932.55	930.26	929.71	929.95	930.00
12	929.31	929.18	928.98	928.90	931.10	931.76	932.40	932.45	930.28	929.75	929.88	929.88
13	929.30	929.11	928.95	928.90	931.15	931.75	932.45	932.40	930.40	929.73	929.88	930.08
14	929.31	929.01	928.90	928.90	931.18	931.78	932.48	932.48	930.35	929.70	929.88	930.01
15	929.35	929.15	928.93	929.03	931.18	931.78	932.50	932.30	930.30	929.66	930.13	930.01
16	929.33	929.18	928.90	929.15	931.03	931.33	932.50	932.38	930.23	929.61	930.18	930.15
17	929.25	929.15	928.88	929.20	931.18	931.83	932.50	932.35	930.25	929.55	929.15	930.15
18	929.28	929.23	928.85	929.18	931.13	931.85	932.36	932.28	930.10	929.73	929.95	930.21
19	929.35	929.21	928.83	929.40	931.18	931.73	932.58	932.18	930.11	929.75	930.10	929.93
20	929.35	929.13	928.80	929.53	931.18	931.75	932.56	932.15	930.20	929.68	930.05	930.26
21	929.31	928.98	928.78	929.58	931.18	931.78	932.56	932.10	930.15	929.66	929.85	930.23
22	929.38	929.10	928.88	929.60	931.18	931.80	932.53	931.98	930.15	929.73	930.13	930.16
23	929.23	929.18	928.90	929.80	931.23	931.85	932.56	932.00	930.15	929.73	930.13	930.16
24	929.10	929.15	928.78	929.93	931.22	931.83	932.58	931.88	930.20	929.60	930.05	930.18
25	929.35	929.15	928.80	929.93	931.45	931.85	932.43	931.83	930.20	929.70	930.08	930.06
26	929.41	929.18	928.80	930.23	931.55	931.83	932.50	931.75	930.05	929.78	930.15	929.98
27	929.35	929.15	928.78	930.21	931.74	931.78	932.58	931.58	930.28	929.70	930.08	930.26
28	929.48	928.95	928.70	930.29	931.70	931.85	932.55	931.43	930.25	929.75	929.83	930.20
29	929.45	.....	928.78	930.28	931.70	931.85	932.55	931.18	930.23	929.73	930.00	930.15
30	929.48	.....	928.75	930.26	931.63	931.90	932.53	931.15	930.20	929.75	929.95	930.18
31	929.21	.....	928.73	.....	931.75	.....	932.53	931.08	.....	929.60	.....	930.10

1916

1	929.93	930.51	930.88	930.58	931.98	934.93	936.46	936.88	935.46	933.91	932.91	932.11
2	929.93	930.59	931.01	930.51	932.08	934.96	936.43	936.83	935.51	933.96	932.73	932.06
3	930.18	930.60	931.08	930.73	932.25	935.01	936.53	936.81	935.48	933.96	932.61	932.01
4	930.11	930.68	930.94	930.66	932.46	935.03	936.51	936.86	935.51	933.93	932.46	932.18
5	930.15	930.63	930.86	930.58	932.53	935.31	936.58	936.83	935.43	933.88	932.31	932.01
6	930.20	930.48	931.16	930.51	932.66	935.41	936.53	936.76	935.36	933.88	932.43	932.08
7	930.25	930.71	931.06	930.53	932.73	935.46	936.58	936.71	935.33	933.88	932.28	932.01
8	930.23	930.71	930.98	930.48	932.96	935.51	936.48	936.78	935.31	933.83	932.18	931.98
9	930.03	930.76	931.06	930.38	933.11	936.61	936.46	936.78	935.31	933.96	932.06	931.90
10	930.15	930.68	931.03	930.53	933.23	935.66	936.53	936.71	935.28	933.96	931.98	931.98
11	930.23	930.71	930.96	930.51	933.41	935.63	936.48	936.66	935.21	933.91	931.86	931.93
12	930.21	930.60	930.86	930.48	933.48	935.76	936.51	936.56	935.03	933.88	931.76	931.86
13	930.53	930.41	931.09	930.56	933.53	935.83	936.48	936.63	934.88	933.86	931.81	931.81
14	930.63	930.71	931.01	930.51	933.68	935.83	936.51	936.48	934.71	933.83	931.81	931.76
15	930.53	930.68	931.01	930.53	933.81	935.88	936.58	936.46	934.46	933.81	931.86	931.68
16	930.43	930.61	930.96	930.58	933.83	935.86	936.53	936.46	934.41	933.88	931.88	931.61
17	930.63	930.56	931.01	930.68	933.86	935.86	936.58	936.38	934.43	933.80	931.86	931.56
18	930.73	930.66	930.93	930.78	933.88	935.88	936.61	936.31	934.46	933.83	931.88	931.73
19	930.63	930.61	930.81	930.88	933.93	935.91	936.63	936.16	934.36	933.73	931.78	931.81
20	930.58	930.51	930.93	930.96	933.96	935.96	936.68	936.06	934.33	933.66	932.11	931.83
21	930.43	930.71	930.96	930.86	934.03	935.98	936.71	936.11	934.28	933.56	932.18	931.81
22	930.43	930.66	930.93	930.96	934.28	935.96	936.81	935.98	934.23	933.48	932.21	931.78
23	930.31	930.73	930.88	930.91	934.38	936.11	936.83	935.96	934.18	933.61	932.06	931.80
24	930.38	930.73	930.88	931.18	934.33	936.03	936.91	935.81	934.09	933.56	932.01	931.76
25	930.41	930.78	930.86	931.18	934.36	936.01	935.91	935.88	934.11	933.53	932.06	931.91
26	930.48	930.81	930.73	931.28	934.38	936.10	936.88	935.78	934.08	933.51	931.98	931.91
27	930.65	930.66	930.81	931.38	934.43	936.23	936.93	935.73	934.06	933.41	932.08	931.88
28	930.58	930.86	930.81	931.55	934.45	936.33	936.96	935.76	934.01	933.51	932.16	931.81
29	930.41	930.96	930.83	931.58	934.51	936.38	936.88	935.71	934.03	933.06	932.13	931.71
30	930.21	.....	930.78	931.66	934.61	936.41	936.78	935.69	933.98	933.16	932.18	931.71
31	930.48	.....	930.66	.....	934.86	.....	936.91	935.61	.....	933.01	.....	931.45

Levels reduced to Water Power Survey Datum.

WINNIPEG RIVER—HEAD OF EIGHTFOOT FALLS (GAUGING STATION).

History.—The station was established by E. B. Patterson on July 14, 1916.

Location.—A vertical staff gauge is located on the right bank of the river a short distance west of the head of the portage at Eightfoot falls, in the S.E. $\frac{1}{4}$ Sec. 25, Tp. 15, R. 14, E.P.M.

Records Available.—An intermittent record of daily gauge height is available from June 28 to November 9, 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River Above Eightfoot Falls for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								936.60			931.86	
2									934.90			
3												
4									935.33			
5								936.43	935.11		931.11	
6									935.16			
7										933.35		
8								936.25	934.91		931.02	
9									934.74		930.86	
10										933.28		
11									934.65	933.25		
12												
13									934.42	933.13		
14							936.20	936.00				
15							936.10					
16												
17							936.25		933.85			
18												
19									933.66			
20							936.44 936.56					
21								935.71		932.79		
22							936.58					
23									933.61	932.81		
24							936.73 936.68	935.46				
25												
26							936.58					
27							936.55					
28						935.92		935.36	933.33	932.29		
29							936.66	935.13	933.30			
30										932.19		
31							936.63			931.60		

Levels reduced to Water Power Survey Datum.

WINNIPEG RIVER—FOOT OF EIGHTFOOT FALLS (GAUGING STATION).

History.—The station was established by E. B. Patterson on July 14, 1916.

Location.—A vertical staff gauge was located on the right bank of the river a short distance west of the foot of the portage at Eightfoot falls.

Records Available.—An intermittent record of daily gauge height is available from June 28 to November 9, 1916.

*Mean Daily Gauge Height, in Feet, of Winnipeg River Below Eightfoot Falls
for 1916.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								930.46			924.39	
2									928.52			
3												
4									928.94			
5								930.28	928.81		923.59	
6									928.77			
7										926.34		
8								930.14	928.36		923.42	
9									928.32		923.24	
10										926.29		
11									928.14	926.25		
12												
13									927.79	926.10		
14								929.83				
15												
16									927.24			
17												
18									927.04			
19							930.29					
20							930.41					
21								929.40		925.71		
22							930.44					
23									926.64	925.09		
24							930.64	929.12				
25							930.62					
26							930.58					
27							930.44					
28						929.80		928.89	926.32	925.20		
29							930.62	928.84	926.39			
30										924.04		
31							930.54			924.61		

Levels reduced to Water Power Survey Datum.

WINNIPEG RIVER AT HUNT CLUB LANDING (GAUGING STATION).

History.—The station was established by E. B. Patterson on May 1, 1912.

Location.—A vertical staff gauge was secured to a small crib set near the left bank of the river at the lower end of the trail leading to the hunting and fishing club on lake George, and about one hundred feet east of the east boundary of the S.E. $\frac{1}{4}$ Sec. 24, Tp. 15, R. 14, E.P.M.

Records Available.—An intermittent record of daily gauge height is available over a period from May 12, 1912 to March 25, 1915.

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*Mean Daily Gauge Height, in Feet, of Winnipeg River at Hunt Club Landing
for 1912 and 1913.*

1912

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								921 71	921 46			
2						922 16					923 81	
3										922 61		
4						922 11	921 20	921 51	921 91			
5												
6						922 23	921 19			922 71		
7							921 26					
8							921 04	921 46	922 01			
9						922 16				922 79		
10						922 13						
11							921 18	921 48				
12					919 84				922 26			
13						921 04	921 18			923 11		
14					920 13		921 17					
15					920 31		921 17	921 49	922 11			
16												
17					920 39	921 81	921 23			923 41		
18						921 81	921 23					
19					920 51		921 19	921 46				
20						921 71	921 16		922 31			
21							921 15	921 53		923 06		
22							921 43					
23								921 46	922 36			
24					920 84	921 04				923 73		
25						921 60						
26							921 84	921 41				
27					921 21	921 46			922 41			
28							921 86			923 71		
29					921 47			921 41				
30						921 31			922 52	923 81		
31												

1913

1					919 70		923 22	921 23	921 73	920 96	918 42	
2						923 23	923 23		921 42	920 92	918 29	917 68
3					920 57			921 23	921 33	920 63	918 26	917 65
4						923 35			921 32	920 08	918 23	
5							923 00	921 23		920 32	918 04	917 62
6					920 80	923 37		921 24	921 32	920 26	918 08	
7							922 97		921 37	920 05	918 07	917 47
8					921 46			921 43	921 38	919 97	918 03	
9						923 42	922 85		921 86	919 63	918 02	
10					921 70			921 45	921 33	919 72	918 02	
11						923 43	922 84	921 54	921 30	919 52		
12						923 45	922 83	921 57	921 27	919 37	917 97	
13					921 85	923 43	922 82	921 63	921 25	919 33	917 93	
14					921 87			921 65	921 20	919 27	917 93	
15						923 42	922 86		921 16	919 24		
16							922 85	921 67	921 14	919 21		
17					921 94	923 42	922 47		921 12	919 18		
18								921 73	921 10	919 15		
19						923 39	922 27	921 75		919 13		
20						923 41		921 77	921 06	919 10		
21												
22					922 45	923 39		921 78	921 05	919 07		
23						923 35	922 19	921 76		919 03		
24					922 57		922 17		921 04	919 00		
25					922 58	923 17	921 43	921 75		918 97		
26					922 59		921 32	921 62	921 02	918 93	917 78	
27					922 06	923 16	921 23	921 58		918 90		
28					922 07		921 17	921 52	921 00	918 87		
29						923 16		921 62	920 99	918 83	917 72	
30					923 06		921 13		920 98	918 79		
31					923 01	923 20		921 67	920 97	918 76		
								921 66		918 72		

Levels reduced to Water Power Survey Datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Hunt Club Landing
for 1914 and 1915.*

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						920.40	923.11	923.24		920.67		
2							923.46	923.07	922.02		919.87	
3							923.54	923.20		920.62		
4						921.69	923.09	923.14	921.64		919.79	
5						921.93	923.34	922.99		920.73		
6							923.54	922.92	921.36		919.74	
7					917.95		923.44	922.96		920.56		
8					917.99		923.38	922.84	921.24		919.48	
9					918.14	922.79	923.34			920.59		
10									921.06		919.59	
11					918.34			922.80	920.96			
12					918.38					920.04	919.55	
13					918.64	922.37		922.64				
14					918.67					920.92	919.52	919.05
15					918.72	922.54		922.66	920.92			
16					918.75	922.54				920.86		918.93
17					918.72	923.02		922.55	920.74			
18					918.45	923.04				920.79		918.89
19					918.58	923.09		922.48	920.74			
20					918.89	923.09				920.78		918.83
21					918.92	923.09		922.42				
22					919.15	923.11			920.74	920.64		
23					919.35	923.14		922.34				918.73
24				918.94	919.38				920.76	920.44		
25				917.04	919.75					920.29		
26				917.04	919.84			922.46	920.72			918.74
27				917.57	919.86	923.19		922.39	920.59	920.22		
28					920.16	923.29						918.75
29				917.44	920.39	923.49		922.32	920.69	920.04		
30				917.64		923.50						918.74
31								922.09		919.89		

1915

1												
2	918.76	918.62	918.30									
3												
4	918.75	918.44	918.26									
5												
6	918.75	918.34	918.24									
7												
8	918.74	918.64	918.19									
9												
10		918.64	918.06									
11	918.73											
12		918.64	918.04									
13	918.73											
14												
15	918.72	918.54	917.96									
16												
17			917.90									
18	918.66											
19			917.86									
20	918.64											
21												
22	918.61	918.44										
23			917.89									
24		918.36										
25			917.84									
26	918.59	918.34										
27												
28	918.57											
29												
30	918.54											
31												

Levels reduced to Water Power Survey Datum.

WINNIPEG RIVER ABOVE SLAVE FALLS (STAFF GAUGE).

History.—This gauge was established by D. L. McLean on October 11, 1911, at the time of the installation of the metering station at this point, and is the gauge which has always been read during meterings at this section.

Location.—A vertical staff gauge is located about seventy-five feet downstream from the meter section on the right bank of the river.

Records Available.—An intermittent record of gauge height is available for this point from the time of its establishment to the end of 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River above Slave Falls for 1911 and 1912.

1911					1912							
Day.				Oct.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2						921-51						
3						921-56						
4						921-77						
5						921-93						
						921-97	921-01					
6						921-97	920-99					
7					919-00	921-90						
8					919-12	921-91	920-96					
9						921-89						
10						921-89	920-91					
11				920-93			920-91					
12				920-96			921-02					
13				920-96			920-98					
14				920-97	919-98		920-99					
15				920-96			920-96					
16							921-03					
17					920-37	921-61	921-01					
18					920-44		920-95					
19					920-53		920-97					
20					920-62		920-97	921-33				
21					920-69						922-74	
22					920-78							
23					920-85							
24					920-89	921-41				923-42		
25					920-97							
26					921-02							
27					921-18							
28					921-28							
29				920-77	921-39	921-13						
30					921-51							
31					921-54							921-62

Levels reduced to Water Power Survey Datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River above Slave Falls for
1913 and 1914.*

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					919.68				921.22	918.83		
2												
3												
4			918.04									
5			918.85								917.85	
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18							921.83					
19							921.67					
20												
21												
22												
23												
24						923.01						
25						923.05						
26												
27												
28												
29												
30								921.26				
31												

1914

1								923.16		920.66		919.34
2						920.06	923.49	922.98	921.96	920.61	919.94	919.33
3							923.49	923.15		920.57	919.77	919.24
4						921.65	923.47	923.10	921.66		919.78	919.24
5						921.66	923.41	922.96		920.67	919.73	919.23
6					918.10		923.49	922.86	921.26		919.73	919.13
7							923.36	922.94		920.56	919.62	919.21
8				917.14			923.46	922.88	921.08	920.56	919.47	918.18
9						922.04	923.33			920.57	919.84	919.11
10						922.66			921.03		919.55	919.08
11		916.47				922.74	923.36	922.84	920.93		919.51	
12							923.41			920.91	919.51	919.04
13	916.64					922.82	923.60	922.74			919.48	
14							923.59		920.91	920.87	919.48	919.04
15						922.86	923.57	922.66	920.88			
16					918.66	922.96	923.58		920.84	920.84		918.92
17					918.81	923.06	923.58	922.56	920.71		919.46	
18					918.83	923.13	923.60		920.76	920.76	919.41	918.86
19					918.90	923.13	923.36	922.47	920.71		919.42	
20					919.06	923.13	923.55			920.76	919.41	
21					919.05	922.96	923.55	922.39			919.25	918.76
22					919.10	923.18	923.56		920.76	920.66	919.21	
23					919.77	923.11	923.51	922.26	920.84		919.24	918.66
24					919.41	923.11	923.52		920.76	920.41	919.33	
25						923.14	923.46		920.70	920.26	919.33	
26						923.26	923.33	922.42	920.73	920.24	919.29	918.76
27					919.87	923.26	923.46	922.37	920.56	920.17	919.24	
28						923.16	923.41		920.78	920.07	919.24	918.76
29						923.41	923.36	922.26	920.68	919.99	919.14	
30						932.41	923.32		920.70	919.99	919.33	
31					920.08		923.22	922.03		919.88		918.96

Levels reduced to Water Power Survey Datum.

¹Gauge heights taken during metering.

*Mean Daily Gauge Height, in Feet, of Winnipeg River above Slave Falls for
1915 and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1									921 21			
2	918 76	918 44						923 74				
3								923 65		919 61		
4	918 76	918 38						923 62	920 71			
5								923 60	920 52			
6	918 76	918 30						923 60	920 51			
7								923 61	920 48			
8	918 74	918 31							920 50			
9									920 35			
10		918 31							920 24			
11	918 73					922 57						
12		918 35				922 52						
13	918 73					922 47						
14						922 61	923 64					
15	918 73	918 31				922 57	923 63		920 09			
16						922 50	923 67					
17						922 45	923 61		919 97			
18	918 66							923 34	919 87			
19		918 20						923 23				
20	918 61	918 15						923 19				
21								923 13				
22	918 56	918 24						923 05				
23								922 97				
24		918 20						923 08				
25							923 56	922 81				
26	918 54	918 16						922 70				
27							923 68	922 54				
28	918 52							922 30				
29								922 16				
30	918 47							921 71				
31							923 61	921 41				

1916

1						926 92		929 39	927 73		924 12	
2									927 71		923 89	
3							928 98				923 73	
4							928 95				923 50	
5								929 24			923 41	
6												
7	919 54				921 06			929 22	927 85		923 44	
8								929 20	927 77	925 83	923 15	
9	919 44							929 20	927 63		923 10	
10						927 67			927 57	925 73	923 01	
11										925 75		
12							929 03		927 24	925 70		
13						927 79	929 05		927 13	925 66		
14						927 78	929 06		927 05	925 58		
15						927 79	929 07		926 80			
16						927 86	929 02	928 71	926 74			
17					925 57	927 89	929 02	928 59	926 61			
18					925 59	927 92	929 09					
19							929 20		926 48			
20						928 06	929 21					
21						928 05	929 26					
22						928 05	929 33			925 26		
23						928 13	929 40					
24						928 36		928 35	926 06	925 28		
25						928 24	929 58	928 19	925 92	925 19		
26						928 22	929 50		925 92	925 03		
27												
28					926 50	928 52	929 51			925 02		
29						928 64	929 48			924 94		
30					926 68	928 69	929 48		925 87	924 85		
31					926 72	928 71	929 57	927 92	925 80	924 56		
					926 92	928 84		927 91				
							929 47	927 81		924 24		

Levels reduced to Water Power Survey Datum.

WINNIPEG RIVER BELOW SLAVE FALLS (GAUGING STATION).

History.—The station was established by A. Pirie on May 7, 1914.

Location.—A vertical staff gauge was located about two hundred yards to the left of the foot of the portage on the right bank of the river at Slave falls.

Records Available.—During the years 1914, 1915 and 1916, an intermittent record of daily gauge height is available at this point.

MANITOBA HYDROMETRIC SURVEY

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Mean Daily Gauge Height, in Feet, of Winnipeg River below Slave Falls for 1914, 1915 and 1916.

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								904.17		902.15		901.21
2						902.29	904.45	904.08	903.10		901.59	
3							904.45	904.18		902.10		901.18
4							904.45	904.09	902.85		901.51	
5							904.43	903.95		902.21		901.16
6					898.49		904.44	903.92	902.68		901.42	
7							904.43	903.94		902.08		901.12
8							904.41	903.92	902.58		901.30	
9							904.39			902.10		901.13
10									902.44		901.34	
11							904.35	903.85				
12							904.40					
13							904.57	903.73		902.38	901.31	901.12
14							904.57			902.35	901.28	901.15
15						904.39	904.56	903.68	902.40			
16					901.19	904.59	904.56			902.30		901.11
17					900.99	904.59	904.56	903.63	902.20			901.10
18					901.22	904.60	904.57		902.18			901.10
19					901.26	904.59	904.40	903.53		902.22		
20					901.39	904.54	904.53					
21					901.38	904.49	904.53	903.52				901.06
22					901.37	904.49	904.54		902.20	902.12		
23					901.46	904.49	904.48	903.50				901.00
24					901.55	904.49	904.47		902.22	901.95		
25						904.49	904.41			901.83		
26												
27						904.23	904.36	903.56	902.20			901.09
28					902.09	904.23	904.40	903.53	902.10	901.80		
29						904.22	904.36					901.09
30						904.33	904.30	903.46	920.17	901.68	901.13	
31					903.31	904.35	904.28	903.19		901.59		901.00

1915

1916

1												
2	901.00					907.54		909.87	908.27		904.90	
3						907.54			908.23		904.75	
4	901.00						909.37				904.61	
5								909.64	908.52		904.38	
6	900.98										904.32	
7								909.59	908.39			
8	900.98							909.54	908.29	906.47	904.20	
9								909.53	908.13		904.00	
10						908.17	909.52		908.07	906.37	904.01	
11	900.97									906.42		
12						908.32	909.39		907.87	906.37		
13	900.97					908.33	909.41		907.72	906.29		
14						908.35	909.44	909.28		906.24		
15	900.97					908.38	909.39	909.12	907.51			
16									907.32			
17						908.46		909.10	907.21			
18	900.95					908.42	909.50					
19							909.55		907.02			
20	900.90					908.52	909.61					
21						908.51	909.70					
22						908.56	909.71			906.00		
23	900.87					908.60	909.76					
24						908.72			906.67	905.92		
25						908.69	909.01		906.53	905.90		
26							909.84		906.62	905.75		
27						908.92	909.87					
28						909.07	909.82			905.74		
29						909.12				905.67		
30						909.18	909.89	908.44	906.47	905.57		
31						909.22		908.82	906.42			
							909.81	908.34				

Levels reduced to Water Power Survey Datum.
Readings for 1915 submitted by S. S. Square, Point du Bois, not considered reliable.

GAUGES ON PINAWA CHANNEL.

A number of gauges have been established at different times on the Pinawa channel and on the Winnipeg river just at the entrance to the channel, and records covering periods of various lengths have been obtained. Several of these gauges were installed and the records obtained entirely by the staff of the Winnipeg Electric Railway Company, others were installed and operated by members of the staff of the Manitoba Hydrometric Survey, while again in other cases the records were obtained by members of both organizations at different times. Plates 3 and 4 show the location of the greater number of these gauges.

The gauges which have been set by the Company are as follows:—

The tailrace gauge at the plant of the W.E.R. Co.

The forebay gauge at the plant of the W.E.R. Co.

Gauge below control dam.

Gauge above control dam.

Intake gauge.

Gauge above main diversion dam.

Gauge below main diversion dam.

The gauges set by the Manitoba Hydrometric Survey are as follows:—

Gauge A (In the Pinawa Channel).

Gauge B (In the Pinawa Channel).

Gauge C (In the Pinawa Channel).

Gauge D (In the Pinawa Channel).

Automatic gauge above control dam.

M.H.S. gauge above the main diversion dam.

M.H.S. gauge below the main diversion dam.

M.H.S. gauge above Sharkey's (small) diversion dam.

W.E. Ry. Co's. GAUGES ABOVE AND BELOW MAIN DIVERSION DAM, PINAWA CHANNEL.

History.—These gauges were set and maintained by the Winnipeg Electric Railway Company after the erection of the dams on the main river built for the purpose of diverting the water required to operate its plant on the Pinawa channel.

Location.—These gauges are bolted to the upper and lower ends, respectively, of the concrete wall separating the fishway from the log chute.

Records Available.—During the years 1909, 1910, 1911, 1913 a few isolated gauge readings on the gauge above the dam have been obtained by the officers of the company.

From June 14, 1914 to February 24, 1915 and during the months of June and July intermittent readings have been obtained on the upper gauge by officers of the company and members of the staff of the Manitoba Hydrometric Survey.

On the lower gauge, intermittent readings have been obtained over a period from June 14 to October 3, 1914 and during the months of June and July of 1916.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 25a

Mean Daily Gauge Height, in Feet, of Winnipeg River above Main Diversion Dam (W.E. Rly. Gauge) for Years 1909-1913.

Year.	Day.	Gauge Reading.	Year.	Day.	Gauge Reading.	Year.	Day.	Gauge Reading.	Year.	Day.	Gauge Reading.
1909	June 15	898.17	1910	Sept. 4	890.07	1911	May 19	897.87	1918	April 30	898.27
	Nov. 9	898.29	1910	Sept. 10	898.37	1911	July 16	898.47	1913	July 21	898.77
						1911	July 30	898.77	1913	July 23	898.73
						1911	Aug. 20	898.67	1913	July 25	898.68
									1913	July 29	898.47
									1913	July 30	898.67
									1913	July 31	898.73

Levels reduced to Water Power Survey Datum.

Mean Daily Gauge Height, in Feet, of Winnipeg River above Diversion Dam (W. E. Rly. Gauge) for Years 1914-1916.

1914

1915

1916

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	June	July
1											
2		899.27				898.32					
3		899.32	899.17	898.97							
4		899.35		898.97	898.47						
5		899.32	899.15			898.27			898.17	900.16	
6											
7				898.72							
8					898.47	898.17			898.07	900.24	
9		899.32						898.07			900.66
10			899.07	898.65			898.12			900.31	
11				898.62					898.02		900.63
12		899.38	899.02	898.57	898.57						
13		899.38									
14	899.02	899.40		898.55			898.12		897.97		
15		899.45	899.02	898.55	898.62			898.02			
16		899.37	899.02								
17		899.37		898.53			898.12				
18	899.15			898.50					897.97		
19		899.27	898.29		898.57						
20		899.27					898.12	898.07	897.97		
21	899.17			898.52							
22	899.17	899.28			898.52						
23		899.26	898.97				898.12	898.12			
24	899.22		898.97	898.52					897.97		
25											
26		899.22	898.97		898.37		898.12				
27				898.49				898.17		900.56	
28	899.24		898.95								
29		899.22	898.95		898.34						
30			898.92	898.49			898.27	898.27			
31											

*Mean Daily Gauge Height, in Feet, of Winnipeg River below Diversion Dam
(W. E. Rly. Gauge) for 1914 and 1916.*

1914						1916						
Day.						June.	July.	Aug.	Sept.	Oct.	June	July
1							890.46					806.13
2							890.46	889.96	888.86			
3							890.56		888.86	887.26	804.1N	
4												
5							890.36	889.91				
6									888.46		804.5N	
7												806.28
8							890.46					
9								889.96	888.16		804.6N	
10									888.06			806.31
11												
12							890.56	889.91	887.66			
13							890.56					
14						889.96	890.76		887.96			
15							890.86	889.56	887.66			
16							890.76	889.50				806.38
17							890.76		887.66			
18						890.06			887.76			
19							890.51	889.36				
20							890.56					
21						890.06			887.76			
22						890.16	890.51					
23							890.36	889.56				
24						890.26		889.26	887.26			
25								889.36				
26							890.16	889.36				
27									887.26		805.88	
28						890.31		889.16				
29							890.06	889.26				
30								889.16	887.26			
31												

Levels reduced to Water Power Survey Datum.

M.H.S. GAUGES ABOVE AND BELOW MAIN DIVERSION DAM, PINAWA CHANNEL.

History.—The upper gauge was established by S. C. O'Grady on July 17, 1913. The lower gauge was established by E. B. Patterson on June 18, 1914.

Location. The gauge above the dam is secured to a post driven into the bed of the river about fifty feet southwest of the fishway at the end of the dam.

The gauge below the dam is secured to a post driven into a crevice in the rock about two hundred feet southwest of the lower end of the fishway.

Records Available.—An intermittent record of daily gauge height on the upper gauge is available over periods from July 17 to August 1, 1913; from June 18 to November 7, 1914, and from June 6 to July 16, 1916.

On the lower gauge an intermittent record of daily gauge height is available for a period from June 18 to November 7, 1914.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26a

Mean Daily Gauge Height, in Feet, of Winnipeg River Above Main Diversion Dam (M.H.S. Gauge) for 1913, 1914 and 1916.

Day.	1913			1914					1916		
		July.	Aug.	June.	July.	Aug.	Sept.	Oct.	Nov.	June.	July
1											
2			808.70		800.57				808.48		
3					800.58	800.45	800.03				901.08
4					800.61		800.03	808.66			
5					800.63	800.28			808.41		
6											
7							808.56			900.51	
8								808.61	808.38		901.08
9					800.58						
10						800.31	808.81			900.63	901.09
11						808.78					
12											
13					800.65	800.28	808.74	808.73			
14					800.68						
15					800.69		808.73				
16					800.72	800.23	808.71	808.75			
17											
18		808.90			800.60	800.23					901.09
19				800.38	800.59		808.70				
20		808.86			800.58	800.22	808.68	808.73		900.71	
21		808.78			800.56						
22				800.43			808.65				
23				800.53	800.55			808.65			
24		808.78			800.55	800.23					
25		808.70		800.44		800.18	808.70				
26											
27		808.66			809.53	800.18		808.53			
28							808.69			900.97	
29				800.48		809.15					
30		808.64			809.47	809.16		808.48			
31		808.73				809.13	808.68				
		808.66									

Levels reduced to Water Power Survey Datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River Below Diversion Dam
(M.H.S. Gauge) for 1914.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							890.66				887.28	
2							890.64	890.15	888.98			
3							890.73		888.98	887.80		
4							890.64	890.06			887.12	
5												
6									888.61			
7										887.79	887.08	
8							890.64					
9								890.86	888.24			
10									888.23			
11												
12							890.81	890.70	888.08	886.00		
13							890.81					
14							890.96		888.00			
15							891.03	890.68	888.01	888.21		
16							890.93	890.64				
17							890.95		887.98			
18						890.33			890.94			
19							890.73	890.56		888.15		
20							890.70					
21												
22						890.38			887.88			
23						890.48	890.70			887.90		
24						890.50	890.50	890.48				
25						890.48		890.48	887.00			
26							890.46	890.53		887.73		
27									887.84			
28						890.60		889.43				
29							890.7	890.44		887.38		
30								890.36	887.83			
31												

Levels reduced to Water Power Survey Datum.

GAUGE ABOVE SHARKEY'S (SMALL DIVERSION DAM) PINAWA CHANNEL.

History.—The gauge was established by S. C. O'Grady on June 6, 1913 but on July 2, 1914 the location was changed and a new gauge was set in place across the river from the original location, by E. B. Patterson.

Location.—This gauge was originally located on the right bank of the river about one hundred feet upstream from the small diversion dam. The gauge set by E. B. Patterson is located on the left bank of the river just above the small diversion dam.

Records Available.—Intermittent records of daily gauge height are available over periods from June 1 to August 1, 1913; from June 14 to November 7, 1914, and from June 3 to August 13, 1916.

SESSIONAL PAPER No. 28a

Mean Daily Gauge Height, in Feet, of Winnipeg River above Sharkey's Dam
(Small Diversion Dam) for 1913, 1914 and 1916.

1913

1914

1916

Day.	June.	July.	Aug.	June.	July.	Aug.	Sept.	Oct.	Nov.	June.	July.	Aug.
1		899.34	898.65						898.52			
2					899.58	899.37	898.98					
3		899.34				899.37	898.98	898.65		900.38		
4		899.34							898.42			
5		899.39			899.58	899.30						
6	899.35						898.90			900.48		901.08
7		899.17						898.64	898.38		900.98	
8		899.17			899.58		898.83					
9					899.58	899.27	898.80			900.53		
10							898.78				900.97	
11							898.75					
12					899.63	899.28	898.75	898.73				
13					899.63							
14	899.41			898.94	899.67		898.69					900.88
15		898.93			899.70	899.21	898.70	898.78				
16		898.89			899.59	899.21	898.72					
17					899.59		898.70					
18	899.34						898.64					
19	899.36	898.68			899.53	899.20	898.68	898.76		900.65		
20	899.36				899.54							
21	899.36	898.73					898.64					
22	899.35				899.52		898.64					
23					899.40	899.16		898.64				
24	899.33			899.29		899.16	898.64					
25												
26	899.29				899.46	899.17		898.56				
27							898.67					
28	899.38					899.15				900.87		
29	899.36	898.66			899.42	899.10		898.53				
30	899.33	898.66				899.11	898.65					
31		898.66										

Levels reduced to Water Power Survey datum.

INTAKE GAUGE (PINAWA CHANNEL).

History.—The gauge was established by the Winnipeg Electric Railway Company during the latter part of the year 1905 and has been in operation since that date.

Location.—A vertical staff gauge is secured to the rock bank on the left side of the channel just below the point where the channel leaves the main river.

Records Available.—From the time of the establishment of this gauge a practically continuous record of daily gauge height was obtained by the company up to June 24, 1912. From this latter date an intermittent record of daily gauge height has been obtained by officers of the company and members of the staff of the Manitoba Hydrometric Survey. All of these records are available.

Mean Daily Gauge Height, in Feet, of Pinawa Channel at Intake for 1905 (See Footnote), 1906 and 1907.

1906

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		891.24	890.94	890.04	890.54	893.14	892.19				889.54	889.00
2		891.10	890.91	890.01	890.61	893.09			891.14	889.64	889.54	889.09
3	891.09	891.24	890.94	890.94	890.81	893.09				889.54	889.44	889.14
4		891.31	890.94	890.94	891.24	893.09				889.54	889.44	889.29
5		891.34	890.91	890.91	891.41	893.04				889.54	889.44	889.34
6		891.34	890.81	890.89	892.14	893.04		891.94		889.44	889.44	889.39
7		891.31	890.81	890.74	892.34	893.04				889.34	889.44	889.34
8		891.31	890.81	890.99	892.54	893.04	892.34	891.99		889.34	889.44	889.29
9	890.84	891.44	890.84	890.21	892.64	892.99				889.24	889.49	889.44
10	890.94	891.11	890.71	890.24	892.79	892.99				889.14	889.49	889.54
11		891.04	891.11	890.74	892.89	892.84				889.14	889.54	889.59
12		891.24	891.11	890.74	892.94	892.79			891.44	889.24	889.49	889.54
13		891.24	891.11	890.74	893.21	893.04	892.74			889.14	889.49	889.59
14		891.14	891.11	890.74	893.09	892.64				889.14	889.49	889.64
15		891.24	891.11	890.74	893.19	892.54	892.21			889.14	889.44	889.64
16		891.34	891.11	890.74	893.21	892.44				889.24	889.44	889.64
17		891.24	891.11	890.74	893.24	892.44	892.21			889.24	889.44	889.69
18		891.14	891.44	890.74	893.64	893.29	892.41	891.99	891.14	889.24	889.44	889.64
19		891.09	891.44		893.64	893.34	892.41	892.19		889.34	889.34	889.74
20			891.14	890.54	893.64	893.34	892.39			889.44	889.34	889.54
21		891.34	890.54	890.74	893.34	892.39	892.14			889.49	889.29	889.49
22	891.34	891.14	890.44	890.79	893.34	892.34	892.01		890.89	889.54	889.24	889.44
23	891.29	891.11	890.44	890.79	893.34	892.34				889.44	889.24	889.44
24	891.29	891.14	890.39	890.84	893.34	892.39				889.64	889.14	889.44
25	891.29	891.04	890.34	890.89	893.34	892.14			890.54	889.64	889.14	889.34
26	891.29	891.04	890.34	890.94	893.34	892.19				889.64	889.14	889.34
27	891.34	891.04	890.14	890.04	893.29	892.19		891.34		889.64	889.09	889.34
28	891.34	890.94	890.14	890.09	893.24	892.19			890.04	889.54	889.04	889.29
29	891.39	890.94	890.24	890.21	893.19	892.54			889.94	889.59	889.01	889.29
30	891.39		890.09	890.39	893.19	892.54			889.84	889.59	889.09	889.29
31	891.34		890.04		893.14		891.84			889.54		889.29

1907

1	892.24	890.39	890.99	891.08	893.94	894.06	895.94	896.07	896.14	896.99	896.39
2	892.24	890.31	891.29	891.04	893.94	894.09	895.94	896.01	896.14	896.99	896.39
3	892.29	890.34	891.34	891.04	893.94	895.01	895.94	896.17	896.04	896.45	896.99
4	892.34	890.34	891.51	893.94	893.97	895.05	895.94	896.17	896.04	896.45	896.99
5	892.34	890.34	891.51	893.84	894.04	895.11	895.94	896.17	896.04	896.47	896.99
6	892.34	890.34	892.24	893.81	894.04	895.17	895.92	896.17	896.09	896.49	897.19
7	892.34	890.34	892.64	893.84	894.09	895.01	895.89	896.17	896.09	896.49	897.19
8	892.34	890.34	892.99	893.84	894.15	895.25	895.89	896.17	896.09	896.53	897.19
9	892.39	890.36	893.09	893.84	894.16	895.26	895.84	896.17	896.09	896.58	897.19
10	892.34	890.34	893.14	893.84	894.11	895.35	895.84	896.17	896.09	896.58	897.19
11	892.34	890.34	893.19	893.84	894.14	895.40	895.81	896.17	896.09	896.60	897.19
12	892.34	890.34	893.29	893.84	894.19	895.46	895.81	896.12	896.02	896.89	897.19
13	892.34	890.34	893.54	893.84	894.21	895.54	895.84	896.17	896.04	896.89	897.19
14	892.11	893.36	893.91	893.84	894.24	895.50	895.84	896.17	896.04	896.87	897.19
15	892.11	893.39	894.09	893.84	894.24	895.62	895.84	896.17	896.04	896.87	897.19
16	892.39	890.59	894.24	893.81	894.34	895.67	895.84	896.17	896.04	896.87	897.19
17	892.39	890.39	894.34	893.84	894.34	895.73	895.84	896.17	896.04	896.89	897.19
18	892.44	890.39	894.39	893.84	894.41	895.75	895.84	896.17	896.04	896.89	897.19
19	892.44	890.54	894.59	893.84	894.45	895.76	895.84	896.17	896.04	896.89	897.19
20	892.49	890.56	894.66	893.85	894.51	895.78	895.84	896.17	896.04	896.89	897.19
21	892.44	890.59	894.54	893.84	894.54	895.81	895.84	896.17	896.04	896.89	897.19
22	892.44	890.74	894.64	893.84	894.59	895.84	895.84	896.17	896.04	896.89	897.19
23	892.39	890.71	894.59	893.84	894.59	895.82	895.84	896.17	896.04	896.89	897.19
24	892.44	890.79	894.56	893.84	894.61	895.94	895.81	896.17	896.04	896.89	897.19
25	892.39	890.74	894.74	893.84	894.64	895.93	895.84	896.17	896.04	896.89	897.19
26	892.44	890.04	894.44	893.84	894.64	895.94	895.84	896.17	896.04	896.89	897.19
27	892.39	890.19	894.34	893.84	894.69	895.94	895.82	896.17	896.04	896.89	897.19
28	892.11	890.59	894.29	893.86	894.74	895.94	895.82	896.07	896.34	896.99	897.19
29	892.39		894.21	893.89	894.81	895.94	895.82	896.07	896.38	896.99	897.19
30	892.39		894.16	893.89	894.90	895.94	895.82	896.10	896.10	896.99	897.19
31	892.39		894.11		894.92		895.79	896.12	896.99		897.19

NOTE.—The only reading available for 1905, taken December 21, shows a gauge height of 890.9.
Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Pinawa Channel at Intake
for 1908 and 1909.*

1908

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	896.54	896.54	896.19	895.7	895.22	896.54	897.04	897.19	897.29	897.51	897.61	896.99
2	896.49	896.54	896.14	895.9	895.39	896.54	897.04	897.19	897.34	897.59	897.64	896.94
3	896.49	896.64	896.14	895.9	895.34	896.54	897.04	897.19	897.39	897.59	897.59	896.84
4	896.64	896.64	896.14	895.9	895.34	896.54	897.04	897.19	897.39	897.59	897.59	896.84
5	896.64	896.69	896.09	895.5	895.34	896.54	897.04	897.19	897.44	897.61	897.59	896.44
6	896.64	896.74	896.04	895.5	895.39	896.54	897.04	897.19	897.44	897.64	897.59	896.44
7	896.74	896.79	896.04	895.6	895.39	896.59	897.14	897.19	897.51	897.64	897.59	896.44
8	896.74	896.84	896.04	895.64	895.34	896.54	897.14	897.19	897.54	897.64	897.59	896.44
9	896.64	896.74	896.04	895.64	895.74	896.64	897.14	897.24	897.59	897.64	897.59	896.34
10	896.54	896.64	896.04	895.59	895.79	896.64	897.14	897.29	897.49	897.64	897.59	896.34
11	896.59	896.59	896.04	895.54	895.79	896.69	897.14	897.24	897.44	897.64	897.59	896.24
12	896.64	896.59	896.04	895.49	895.79	896.74	897.14	897.21	897.44	897.64	897.54	896.24
13	896.64	896.54	896.04	895.44	895.89	896.84	897.09	897.24	897.44	897.64	897.54	896.24
14	896.64	896.44	896.04	895.44	895.89	896.84	897.09	897.24	897.39	897.69	897.54	896.14
15	896.64	896.34	896.04	895.44	895.89	896.84	897.09	897.24	897.29	897.69	897.54	896.04
16	896.61	896.34	896.04	895.44	895.89	896.89	897.09	897.24	897.29	897.69	897.54	896.04
17	896.54	896.34	896.04	895.44	895.89	896.94	897.09	897.24	897.29	897.69	897.54	896.04
18	896.64	896.34	896.04	895.44	895.89	896.94	897.09	897.24	897.29	897.69	897.54	896.04
19	896.59	896.29	896.04	895.44	895.89	896.94	897.09	897.24	897.29	897.69	897.54	896.04
20	896.54	896.29	895.99	895.44	895.89	897.04	897.14	897.21	897.34	897.74	897.49	895.94
21	896.54	896.24	895.99	895.44	895.94	896.99	897.14	897.24	897.29	897.74	897.49	895.94
22	896.49	896.24	895.99	895.39	896.14	896.94	897.14	897.24	897.29	897.74	897.49	895.94
23	896.49	896.24	895.94	895.39	896.14	897.04	897.14	897.24	897.29	897.74	897.46	895.94
24	896.44	896.19	895.94	895.34	896.14	897.04	897.19	897.24	897.34	897.64	897.44	895.94
25	896.44	896.19	895.89	895.34	896.14	897.04	897.19	897.24	897.34	897.64	897.39	895.94
26	896.44	896.19	895.84	895.34	896.19	897.04	897.19	897.24	897.39	897.64	897.34	896.04
27	896.44	896.19	895.84	895.34	896.19	897.04	897.19	897.24	897.44	897.64	897.29	896.04
28	896.44	896.19	895.84	895.34	896.19	897.04	897.19	897.24	897.44	897.64	897.24	896.04
29	896.44	896.19	895.79	895.36	896.19	897.04	897.24	897.24	897.54	897.64	897.14	895.94
30	896.54	895.79	895.29	895.19	896.19	897.04	897.24	897.29	897.54	897.64	897.04	895.94
31	896.54	895.74	895.29	895.19	896.34	897.04	897.19	897.29	897.54	897.59	897.04	895.84

1909

1	895.84	895.94	895.84	895.44	894.94	897.44	897.89	898.14	897.99	898.10	898.04
2	895.74	895.94	895.84	895.44	894.84	897.44	897.89	898.09	897.99	898.19	898.04
3	895.74	896.04	895.84	895.34	894.84	897.34	897.89	898.09	897.99	898.19	898.04
4	895.84	896.04	895.84	895.34	894.94	897.54	897.94	898.09	897.99	898.24	898.04
5	895.84	895.94	895.84	895.24	895.04	897.69	897.94	898.09	897.94	898.24	898.04
6	895.94	895.94	895.84	895.24	895.14	897.74	897.94	898.09	897.94	898.44	898.14
7	895.94	895.94	895.84	895.24	895.24	897.69	897.94	898.14	897.94	898.44	898.14
8	896.04	895.94	895.74	895.24	895.24	897.79	897.94	898.14	897.94	898.44	898.14
9	896.04	895.94	895.74	895.14	895.34	897.84	897.94	898.14	897.94	898.44	898.14
10	896.04	896.04	895.74	895.04	895.44	897.84	897.89	898.14	897.94	898.44	898.14
11	896.04	896.04	895.74	895.04	895.51	897.84	897.89	898.14	897.94	898.44	898.14
12	896.14	896.04	895.64	895.04	895.64	897.84	897.89	898.14	897.94	898.44	898.14
13	896.14	896.04	895.64	894.94	895.74	897.84	897.94	898.14	897.94	898.44	898.14
14	896.14	896.04	895.64	894.94	895.84	897.84	897.84	898.14	897.94	898.44	898.14
15	896.14	896.04	895.64	894.84	895.94	897.84	897.94	898.14	898.04	898.29	898.14
16	896.24	896.04	895.64	894.84	896.54	897.89	897.94	898.09	898.09	898.29	898.14
17	896.24	896.04	895.64	894.84	896.74	897.89	897.94	898.09	898.09	898.24	898.14
18	896.24	895.94	895.64	894.84	896.84	897.89	897.94	898.09	898.09	898.24	898.14
19	896.24	895.94	895.64	894.84	896.94	897.89	897.94	898.09	898.09	898.24	898.14
20	896.14	895.94	895.64	894.84	897.01	897.84	898.04	898.04	898.09	898.24	898.14
21	896.14	895.94	895.64	894.84	897.04	897.89	898.04	898.04	898.09	898.19	898.14
22	896.04	895.94	895.64	894.84	897.14	897.89	898.04	898.04	898.09	898.19	898.14
23	895.94	895.94	895.64	894.84	897.24	897.89	898.04	898.04	898.09	898.19	898.14
24	895.94	895.94	895.64	894.84	897.24	897.89	898.04	898.04	898.09	898.19	898.14
25	895.94	895.94	895.64	894.84	897.24	897.84	898.09	898.04	898.09	898.19	898.14
26	895.94	895.94	895.64	894.84	897.24	897.84	898.09	898.04	898.09	898.19	898.14
27	895.94	895.84	895.64	894.84	897.24	897.84	898.09	898.04	898.14	898.19	898.14
28	895.94	895.84	895.64	894.84	897.20	897.84	898.09	898.04	898.14	898.19	898.14
29	895.84	895.84	895.64	894.84	897.20	897.84	898.09	898.04	898.14	898.19	898.14
30	895.84	895.84	895.64	894.84	897.24	897.84	898.09	898.04	898.14	898.19	898.14
31	895.84	895.84	895.64	894.84	897.34	897.84	898.09	898.04	898.14	898.19	898.14

Levels reduced to Water Power Survey datum.

Mean Daily Gauge Height, in Feet, of Pinawa Channel at Intake for 1910 and 1911

1910

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	898.64	899.25	899.49	898.84	900.14	900.34	899.04	899.24	898.74	898.39	898.14	897.89
2	898.64	899.24	899.49	898.84	900.14	900.34	899.04	899.24	898.74	898.34	898.09	897.89
3	898.64	899.19	899.44	898.89	900.19	900.34	899.04	899.24	898.74	898.34	898.09	897.84
4	898.64	899.14	899.34	898.89	900.19	900.34	899.04	899.14	898.74	898.34	898.09	897.84
5	898.64	899.14	899.34	898.94	900.24	900.34	899.04	899.14	898.64	898.34	898.09	897.84
6	898.74	899.14	899.24	898.94	900.24	900.34	899.84	899.14	898.64	898.34	898.04	897.79
7	898.84	899.14	899.14	898.94	900.24	900.34	899.84	899.14	898.64	898.34	898.04	897.74
8	898.84	899.04	899.09	898.94	900.24	900.34	899.84	899.04	898.64	898.29	898.04	897.74
9	898.94	899.04	899.04	898.94	900.24	900.34	899.74	899.04	898.64	898.29	898.04	897.69
10	898.94	899.04	899.04	899.04	900.24	900.34	899.74	898.94	898.69	898.29	898.04	897.69
11	899.04	899.04	898.94	899.04	900.29	900.34	899.64	898.84	898.59	898.29	898.04	897.69
12	899.14	899.09	898.94	899.14	900.29	900.34	899.64	898.84	898.59	898.24	897.99	897.74
13	899.14	899.14	898.94	899.24	900.29	900.34	899.64	898.84	898.59	898.24	897.99	897.74
14	899.14	899.14	898.89	899.34	900.24	900.24	899.64	898.84	898.59	898.24	897.99	897.74
15	899.14	899.14	898.84	899.24	900.34	900.24	899.64	898.84	898.59	898.24	897.94	897.74
16	899.14	899.14	898.84	899.39	900.34	900.19	899.64	898.84	898.59	898.24	897.94	897.74
17	899.14	899.19	898.84	899.49	900.34	900.19	899.54	898.84	898.54	898.24	897.94	897.64
18	899.14	899.24	898.79	899.59	900.34	900.14	899.54	898.84	898.54	898.24	897.89	897.59
19	899.14	899.34	898.79	899.64	900.34	900.14	899.54	898.84	898.54	898.19	897.89	897.64
20	899.14	899.34	898.74	899.74	900.34	900.14	899.54	898.84	898.54	898.19	897.89	897.64
21	899.14	899.39	898.74	899.74	900.84	900.14	899.44	898.84	898.54	898.19	897.94	897.64
22	899.24	899.39	898.74	899.74	900.84	900.14	899.44	898.84	898.54	898.19	897.94	897.64
23	899.24	899.44	898.74	899.79	900.84	900.14	899.44	898.84	898.44	898.19	897.94	897.64
24	899.24	899.44	898.74	899.84	900.84	900.04	899.44	898.84	898.44	898.19	897.94	897.64
25	899.29	899.44	898.69	899.89	900.84	900.04	899.44	898.74	898.44	898.14	897.94	897.64
26	899.29	899.44	898.69	899.94	900.84	900.04	899.34	898.74	898.44	898.14	897.94	897.64
27	899.24	899.44	898.64	900.04	900.84	900.04	899.34	898.74	898.44	898.14	897.94	897.64
28	899.19	899.44	898.64	900.09	900.84	900.04	899.34	898.74	898.44	898.14	897.94	897.64
29	899.24	.....	898.64	900.09	900.84	900.04	899.34	898.74	898.39	898.14	897.94	897.64
30	899.24	.....	898.64	900.14	900.34	900.04	899.34	898.74	898.39	898.14	897.94	897.64
31	899.24	.....	898.64	.....	900.34	.....	899.24	898.74	.....	898.14	.....	897.64

1911

1	897.04	897.94	897.74	897.24	897.40	897.84	898.34	898.84	898.74	898.74	898.84	898.54
2	897.69	897.94	897.79	897.24	897.49	897.89	898.34	898.84	898.74	898.74	898.84	898.54
3	897.69	897.94	897.79	897.24	897.49	897.84	898.34	898.84	898.74	898.74	898.84	898.44
4	897.69	897.89	897.79	897.24	897.49	897.84	898.34	898.84	898.74	898.74	898.84	898.44
5	897.74	897.89	897.74	897.24	897.54	897.84	898.44	898.84	898.74	898.74	898.84	898.44
6	897.74	897.84	897.74	897.24	897.59	897.84	898.44	898.84	898.74	898.74	898.84	898.44
7	897.84	897.84	897.74	897.24	897.59	897.84	898.44	898.84	898.74	898.74	898.84	898.44
8	897.94	897.84	897.74	897.24	897.59	897.84	898.44	898.84	898.74	898.74	898.84	898.44
9	897.94	897.84	897.74	897.24	897.64	897.84	898.44	898.84	898.74	898.74	898.84	898.44
10	897.94	897.89	897.69	897.24	897.64	897.84	898.54	898.84	898.74	898.74	898.84	898.44
11	897.94	897.89	897.64	897.24	897.64	897.94	898.54	898.84	898.74	898.74	898.84	898.44
12	897.94	897.89	897.54	897.24	897.64	897.94	898.54	898.84	898.74	898.74	898.84	898.44
13	897.94	897.89	897.54	897.24	897.69	897.94	898.54	898.84	898.74	898.84	898.84	898.39
14	897.94	897.89	897.49	897.29	897.69	897.94	898.64	898.84	898.74	898.84	898.74	898.39
15	897.94	897.84	897.44	897.29	897.69	898.04	898.64	898.84	898.74	898.84	898.64	898.39
16	897.94	897.84	897.49	897.29	897.74	898.04	898.74	898.84	898.74	898.84	898.54	898.34
17	897.94	897.74	897.49	897.84	897.74	898.04	898.74	898.84	898.74	898.84	898.54	898.34
18	897.94	897.74	897.49	897.34	897.74	898.04	898.74	898.84	898.74	898.84	898.54	898.34
19	897.94	897.74	897.49	897.34	897.74	898.04	898.84	898.84	898.74	898.84	898.54	898.34
20	897.94	897.74	897.49	897.34	897.79	898.14	898.84	898.89	898.74	898.84	898.54	898.34
21	897.94	897.74	897.44	897.39	897.79	898.14	898.84	898.89	898.74	898.84	898.54	898.34
22	897.94	897.74	897.44	897.44	897.79	898.14	898.84	898.89	898.74	898.84	898.54	898.34
23	897.94	897.74	897.39	897.44	897.79	898.14	898.84	898.89	898.74	898.84	898.54	898.34
24	897.94	897.74	897.39	897.44	897.79	898.14	898.84	898.89	898.74	898.84	898.54	898.34
25	897.94	897.74	897.39	897.44	897.84	898.24	898.84	898.89	898.74	898.84	898.54	898.34
26	897.94	897.74	897.34	897.49	897.84	898.24	898.84	898.84	898.74	898.84	898.54	898.34
27	897.94	897.74	897.34	897.49	897.84	898.24	898.84	898.84	898.74	898.84	898.54	898.34
28	897.84	897.74	897.39	897.49	897.84	898.24	898.84	898.84	898.74	898.84	898.54	898.34
29	897.94	.....	897.24	897.49	897.84	898.24	898.84	898.84	898.74	898.84	898.54	898.34
30	897.94	.....	897.24	897.49	897.84	898.24	898.84	898.84	898.74	898.84	898.54	898.34
31	897.94	.....	897.24	.....	897.84	.....	898.84	898.74	898.74	898.84	898.54	898.34

Levels reduced to Water Power Survey datum.

Mean Daily Gauge Height, in Feet, of Pinawa Channel at Intake for 1912 and 1913.

1912

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	808.49	808.59	808.24	807.69	808.14	809.09						
2	808.50	808.59	808.24	807.69	808.19	809.09						
3	808.69	808.64	808.24	807.69	808.19	809.14						
4	808.74	808.64	808.24	807.74	808.19	809.19						
5	808.74	808.64	808.19	807.69	808.24	809.19						
6	808.84	808.64	808.19	807.69	808.34	809.19						
7	808.84	808.64	808.14	807.59	808.34	809.24						
8	808.64	808.74	808.14	807.59	808.34	809.24			809.14			
9	808.64	808.64	808.14	807.59	808.39	809.24						
10	809.04	808.64	808.14	807.49	808.44	809.24						
11	809.14	808.64	808.14	807.49	808.40	809.24		809.14				
12	809.24	808.59	808.14	807.49	808.40	809.24						
13	809.24	808.54	808.04	807.49	808.54	809.19						
14	809.19	808.54	808.04	807.49	808.59	809.19						
15	809.19	808.44	808.04	807.54	808.64	809.19						
16	809.04	808.39	807.94	807.54	808.64	809.14						
17	809.04	808.34	807.94	807.54	808.60	809.14	808.84					809.34
18	809.04	808.34	807.94	807.54	808.60	809.09						809.24
19	809.04	808.34	807.94	807.54	808.74	809.09						809.19
20	809.04	808.34	807.84	807.54	808.79	809.04						809.14
21	809.04	808.34	807.84	807.54	808.79	809.04	808.84					809.14
22	809.04	808.29	807.84	807.54	808.84	809.04						809.14
23	809.04	808.24	807.84	807.54	808.84	809.04						809.14
24	809.04	808.24	807.74	807.54	808.84	809.04						809.14
25	808.94	808.24	807.74	807.54	808.80							809.14
26	808.89	808.24	807.69	807.64	808.89							809.14
27	808.89	808.24	807.74	807.84	808.89							809.14
28	808.84	808.24	807.74	807.94	808.94			808.24				809.14
29	808.74	808.24	807.74	808.04	808.94			808.24				809.14
30	808.74		807.74	808.09	809.04							809.14
31	808.64		807.69		809.09							809.14

1913

1	809.14	809.44	809.04	808.44		809.44		808.87				
2	809.14	809.44	809.04	808.39								
3	809.14	809.44	809.04	808.34							807.94	
4	809.14	809.44	809.04	808.34				808.85				
5	809.09	809.54	809.04	808.24					808.74			
6	809.09	809.50	809.04	808.14								
7	809.09	809.64	809.04	808.14								
8	809.24	809.69	809.04	808.04								807.74
9	809.14	809.69	809.04	807.94								
10	809.14	809.74	808.04	807.94								807.74
11	809.14	809.74	808.89	807.94								807.74
12	809.14	809.79	808.89	807.94								807.74
13	809.14	809.84	808.84	807.94								807.74
14	809.19	809.84	808.84	808.04								807.64
15	809.19	809.79	808.79	808.04		808.54						807.64
16	809.24	809.74	808.74	808.04								807.64
17	809.24	809.69	808.74	808.04								807.64
18	809.24	809.64	808.69	808.09								807.64
19	809.24	809.54	808.69	808.09								807.64
20	809.24	809.49	808.69									807.64
21	809.24	809.44	808.64									807.64
22	809.24	809.39	808.64									807.64
23	809.24	809.34	808.64									807.54
24	809.34	809.24	808.64									807.54
25	809.34	809.14	808.64									807.54
26	809.89	809.04	808.64									807.54
27	809.89	809.04	808.64					808.84				807.54
28	809.39	809.04	808.59									807.54
29	809.39		808.49									807.54
30	809.39		808.49									807.54
31	809.39		808.49									807.54

Levels reduced to Water Power Survey datum.

Mean Daily Gauge Height, in Feet, of Pinawa Channel at I for
1914, 1915 and 1916
 1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	897.54	897.64	897.44	897.74	897.74	.....	899.56	.....	.....	.....	898.49	898.29
2	897.54	897.64	897.44	897.74	897.74	.....	899.61	899.38	899.14	.....	.....	898.29
3	897.44	897.54	897.54	897.74	897.74	.....	899.64	.....	899.14	898.64	.....	898.29
4	897.44	897.54	897.54	897.64	897.64	.....	.....	.....	.....	.....	898.41	898.29
5	897.44	897.54	897.54	897.34	897.84	.....	899.64	899.36	.....	.....	.....	898.24
6	897.44	897.54	897.54	897.64	897.84	.....	.....	.....	898.89	.....	.....	898.24
7	897.44	897.54	897.54	897.64	897.94	.....	899.62	.....	.....	898.62	898.39	898.24
8	897.44	897.54	897.74	897.54	897.94	.....	899.62	.....	898.84	.....	.....	898.24
9	897.44	897.54	897.74	897.54	898.04	.....	899.61	899.31	898.83	.....	.....	898.24
10	897.44	897.54	897.84	897.54	.....	.....	.....	.....	898.80	.....	.....	898.24
11	897.44	897.54	897.84	897.54	.....	.....	.....	.....	898.76	.....	.....	898.24
12	897.54	897.54	897.84	897.54	.....	899.24	899.65	899.29	898.76	898.76	.....	898.24
13	897.54	897.54	897.84	897.54	.....	.....	899.68	.....	.....	.....	.....	898.24
14	897.54	897.54	897.84	897.54	.....	899.29	899.72	.....	898.74	.....	.....	898.24
15	897.64	897.64	897.84	897.54	.....	899.32	899.71	899.21	898.73	898.79	.....	898.24
16	897.54	897.54	897.84	897.54	.....	.....	899.63	899.24	898.74	.....	.....	898.29
17	897.54	897.54	897.84	897.54	.....	.....	899.63	.....	898.72	.....	.....	898.29
18	897.54	897.54	897.84	897.64	.....	899.35	.....	.....	898.71	.....	.....	898.29
19	897.54	897.54	897.84	897.64	.....	.....	899.59	899.22	898.70	898.76	.....	898.29
20	897.54	897.54	897.84	897.64	.....	.....	899.56	.....	.....	.....	.....	898.29
21	897.54	897.54	897.74	897.74	.....	899.46	.....	.....	898.72	.....	.....	898.29
22	897.54	897.54	897.74	897.74	.....	899.45	899.55	.....	.....	.....	.....	898.29
23	897.54	897.54	897.74	897.74	.....	.....	899.54	899.19	.....	.....	.....	898.29
24	897.54	897.54	897.74	897.74	.....	899.44	.....	899.19	898.72	.....	.....	898.34
25	897.64	897.54	897.74	897.74	.....	.....	.....	.....	.....	.....	.....	898.44
26	897.54	897.44	897.74	897.74	.....	.....	899.54	899.19	.....	898.54	.....	898.44
27	897.64	897.44	897.74	897.74	.....	.....	.....	.....	898.70	.....	.....	898.54
28	897.64	897.44	897.74	897.74	.....	899.46	.....	899.16	.....	.....	.....	898.54
29	897.64	.....	897.74	897.74	.....	.....	899.45	899.15	.....	898.49	.....	898.64
30	897.64	.....	.....	897.74	.....	.....	.....	899.14	898.65	.....	.....	898.64
31	897.64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	898.64

1915

1916

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.
1	898.64	898.49	.....	.....	898.50	898.09	899.19	898.91
2	898.59	898.49	.....	.....	898.59	898.09	899.04	898.89
3	898.59	898.44	.....	.....	898.59	898.09	899.04	898.84
4	898.54	898.44	.....	.....	898.64	898.09	899.04	898.79
5	898.54	898.34	.....	.....	898.64	898.09	899.04	898.74
6	898.54	898.34	.....	.....	898.64	898.04	899.04	898.74
7	898.44	898.34	.....	.....	898.64	898.04	899.09	898.69
8	898.34	898.34	.....	.....	898.64	898.04	899.74	898.60
9	898.34	898.34	.....	.....	898.69	898.04	899.74	898.64
10	898.29	898.24	.....	.....	898.69	898.04	899.74	898.64
11	898.24	898.14	.....	.....	898.74	898.04	899.74	898.64
12	898.24	898.14	.....	.....	898.74	898.04	899.74	898.64
13	898.24	898.19	.....	.....	898.79	898.04	899.74	898.64
14	898.24	898.19	.....	.....	898.79	898.04	899.74	898.64
15	898.24	898.19	.....	.....	898.84	898.04	899.69	898.60
16	898.24	898.19	.....	.....	898.84	898.04	899.69	898.74
17	898.24	898.19	.....	.....	898.89	898.04	899.64	898.84
18	898.24	898.14	.....	.....	898.89	898.04	899.64	898.89
19	898.24	898.14	.....	.....	898.89	898.04	899.59	898.94
20	898.24	898.14	.....	.....	898.94	898.04	899.59	898.89
21	898.34	898.14	.....	.....	898.94	898.09	899.59	898.89
22	898.34	898.14	.....	.....	898.94	898.09	899.59	898.94
23	898.34	898.14	.....	.....	898.94	898.09	899.54	898.94
24	898.34	898.14	.....	.....	898.94	898.14	899.54	898.94
25	898.34	898.14	.....	.....	898.94	898.14	899.49	898.94
26	898.24	898.14	.....	.....	898.94	898.19	899.49	898.94
27	898.39	.....	.....	.....	898.94	898.29	899.44	898.99
28	898.39	.....	.....	.....	898.94	898.29	899.39	898.94
29	898.44	.....	.....	.....	898.94	898.39	899.24	899.04
30	898.54	.....	.....	.....	898.94	.....	899.14	.....
31	898.54	.....	.....	.....	898.94	.....	899.04	.....

Levels reduced to Water Power Survey Datum.

PINAWA CHANNEL—ABOVE CONTROL DAM (AUTOMATIC GAUGE).

History.—This gauge was established by W. J. Ireland on May 13, 1915 and since that date has been in practically continuous operation.

Location.—The gauge which is a Gurley (printed record) Automatic Water Stage Register is located near the right bank of the channel on the upstream side of the control dam of the Winnipeg Electric Railway Company.

Records Available.—A continuous record of gauge heights reduced to the half day mean derived from quarter-hourly readings is available for the following periods,—From May 13 to December 31, 1915, from January 1 to January 17, from February 19 to March 17, and from April 18 to November 10, 1916.

*Mean Half-Daily Gauge Height, in Feet, of Pinawa Channel above Control Dam
(Automatic Gauge) for 1915.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...						895-06	895-87	896-01	895-42	895-04	894-80	894-96
2...						895-07	895-85	896-01	895-40	895-02	894-82	894-98
3...						895-07	895-87	896-01	895-40	895-03	894-83	894-97
4...						895-08	895-87	896-01	895-36	895-00	894-82	895-00
5...						895-08	895-88	896-02	895-34	895-02	894-85	895-00
6...						895-03	895-87	896-01	895-31	894-98	894-85	895-19
7...						895-08	895-88	896-01	895-30	894-97	894-84	895-03
8...						895-87	895-87	896-00	895-27	894-98	894-84	895-01
9...						895-85	895-89	896-01	895-26	895-01	894-87	894-98
10...						895-82	895-91	896-00	895-22	894-98	894-84	895-04
11...						895-81	895-92	896-00	895-23	894-99	894-85	895-12
12...						895-79	895-92	895-99	895-22	894-95	894-83	895-32
13...						895-80	895-94	896-00	895-21	894-92	894-85	895-46
14...						895-82	895-94	896-00	895-22	894-89	894-84	895-58
15...						895-83	895-95	895-99	895-23	894-90	894-86	895-58
16...						895-82	895-96	896-00	895-19	894-89	894-88	895-68
17...						895-83	895-98	896-00	895-18	894-93	894-87	895-75
18...						895-84	896-04	896-00	895-14	894-91	894-92	895-77
19...						895-84	896-03	896-00	895-13	894-90	894-99	895-66
20...						895-85	896-01	896-01	895-11	894-86	894-98	895-71
21...						895-84	896-01	896-01	895-10	894-86	894-96	895-73
22...						895-84	896-00	896-01	895-09	894-85	894-94	895-83
23...						895-84	896-01	896-00	895-10	894-87	894-96	895-91
24...						895-83	896-02	896-00	895-08	894-86	894-92	895-93
25...						895-44	896-02	895-98	895-08	894-88	894-96	895-98
26...						895-41	896-00	895-98	895-08	894-85	894-94	896-07
27...						895-43	896-02	895-98	895-08	894-86	894-96	896-07
28...						895-43	896-02	895-98	895-08	894-85	894-95	896-11
29...						895-45	896-03	895-97	895-08	894-84	894-99	896-09
30...						895-43	896-04	895-95	895-05	894-81	894-99	896-20
31...						895-43	896-03	895-96	895-04	894-83	894-91	896-16
1...						895-39	896-03	895-97	895-03	894-80	894-91	896-15
2...						895-42	896-03	895-96	895-05	894-82	894-95	896-11
3...						895-43	896-02	895-95	895-02	894-79	894-90	896-10
4...						895-44	896-03	895-94	895-02	894-80	894-91	895-97
5...						895-45	896-02	895-93	895-02	894-81	894-92	895-94
6...						895-45	896-02	895-93	895-05	894-85	894-95	895-79
7...						895-44	896-02	895-91	895-02	894-78	894-94	895-74
8...						895-45	896-02	895-91	895-01	894-81	894-95	895-77
9...						895-45	896-02	895-90	895-01	894-80	894-96	895-86
10...						895-45	896-02	895-90	895-01	894-80	894-96	895-86
11...						895-56	896-03	895-89	895-02	894-80	894-91	895-92
12...						895-63	896-02	895-88	895-00	894-78	894-91	896-00
13...						895-65	896-02	895-88	895-03	894-83	894-95	895-94
14...						895-67	896-01	895-87	895-01	894-81	894-95	895-89
15...						895-72	896-03	895-88	895-01	894-82	894-95	895-95
16...						895-73	896-02	895-88	895-00	894-81	894-95	896-04
17...						895-77	896-02	895-85	895-02	894-83	894-94	896-09
18...						895-80	896-02	895-82	895-04	894-81	894-95	896-12
19...						895-84	896-01	895-80	895-05	894-79	894-96	896-16
20...						895-86	896-00	895-78	895-03	894-79	894-99	896-27
21...						895-87	896-01	895-78	895-06	894-82	894-96	896-31
22...						895-90	896-01	895-74	895-03	894-80	894-99	896-38
23...						895-92	896-01	895-73	895-04	894-84	894-98	896-36
24...						895-94	896-01	895-70	895-05	894-80	894-99	896-39
25...						895-95	896-00	895-66	895-07	894-80	894-97	896-43
26...						895-94	896-00	895-62	895-04	894-82	894-99	896-45
27...						895-95	896-00	895-59	895-06	894-82	894-96	896-41
28...						895-95	896-00	895-55	895-04	894-80	894-99	896-47
29...						895-97	896-00	895-54	895-04	894-84	895-00	896-45
30...						895-95	896-00	895-51	895-02	894-85	894-99	896-39
31...						895-96	896-00	895-51	895-01	894-83	894-99	896-30
32...						895-97	896-00	895-46	895-00	894-79	894-99	896-30

Levels reduced to Water Power Survey datum.

Mean Half-Daily Gauge Height, in Feet, of Pinawa Channel above Control Dam
(Automatic Gauge) for 1916.

Dec.	Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
4-96	1...	896-30		896-39		895-73	896-04	897-80	897-08		897-36	897-03	
4-98		896-30		896-43		895-76	896-01	897-79	897-08		897-36	897-03	
4-97	2	896-29		896-50		895-79	896-06	897-81	897-07		897-37	896-95	
5-00		896-29		896-51		895-81	897-12	897-82	897-06		897-38	896-97	
5-00	3...	896-29		896-55		895-84	897-15	897-84	897-07		897-39	896-99	
5-19		896-29		896-68		895-88	897-14	897-86	897-07		897-39	896-99	
5-03	4	896-03		896-70		895-88	897-15	897-85	897-06		897-38	896-94	
5-01		896-03		896-71		895-90	897-17	897-85	897-05		897-37	896-94	
4-98	5	896-03		896-75		895-93	897-20	897-85	897-05		897-37	896-95	
5-04		896-02		896-68		895-99	897-22	897-84	897-05		897-39	896-94	
5-12	6	896-02		896-66		895-98	897-23	897-84	897-04		897-35	896-95	
5-32		896-02		896-66		896-00	897-24	897-85	897-04		897-35	896-91	
5-46	7	896-02		896-64		896-03	897-23	897-85	897-04		897-35	896-88	
5-58		896-02		896-61		896-02	897-23	897-84	897-03		897-34	896-84	
5-58	8	896-02		896-65		896-04	897-22	897-85	897-03		897-35	896-83	
5-75		896-02		896-61		896-08	897-24	897-85	897-04		897-37	896-74	
5-77	9	896-02		896-63		896-11	897-24	897-86	897-06		897-39	896-71	
5-68		896-02		896-63		896-15	897-25	897-87	897-04		897-37	896-69	
5-71	10	896-03		896-68		896-12	897-28	897-86	897-02		897-39	896-68	
5-73		896-03		896-62		896-14	897-29	897-86	897-01		897-36	896-64	
5-83	11	896-03		896-63		896-14	897-30	897-86	897-00		897-32	896-61	
5-91		896-03		896-58		896-15	897-30	897-86	897-00		897-32	896-61	
5-98	12	896-03		896-55		896-17	897-33	897-86	897-00		897-32	896-61	
5-98		896-03		896-52		896-18	897-33	897-86	897-00		897-32	896-61	
6-07	13	896-03		896-56		896-20	897-34	897-86	897-00		897-32	896-61	
6-07		896-03		896-57		896-23	897-34	897-87	897-01		897-32	896-61	
6-11	14	896-03		896-58		896-24	897-34	897-88	897-01		897-32	896-61	
6-09		896-03		896-53		896-23	897-35	897-88	897-01		897-32	896-61	
6-20	15	896-03		896-54		896-25	897-35	897-88	897-01		897-32	896-61	
6-16		896-03		896-49		896-24	897-36	897-87	897-01		897-32	896-61	
6-15	16	896-03		896-51		896-24	897-36	897-88	897-01		897-32	896-61	
6-11		896-03		896-46		896-24	897-35	897-87	897-01		897-32	896-61	
6-10	17	896-03		896-46		896-25	897-35	897-88	897-01		897-32	896-61	
5-97		896-03		896-42		896-26	897-36	897-90	897-01		897-32	896-61	
5-93	18				895-38	896-27	897-36	897-90	897-01		897-32	896-61	
5-79					895-40	896-28	897-36	897-92	897-01		897-32	896-61	
5-74	19		896-24		895-43	896-28	897-35	897-91	897-01		897-32	896-61	
5-77			896-19		895-44	896-29	897-35	897-91	897-01		897-32	896-61	
5-86	20		896-21		895-42	896-31	897-36	897-93	897-01		897-32	896-61	
5-92			896-21		895-46	896-32	897-36	897-93	897-01		897-32	896-61	
6-00	21		896-19		895-44	896-33	897-36	897-93	897-01		897-32	896-61	
5-94			896-17		895-45	896-34	897-36	897-94	897-01		897-32	896-61	
5-89	22		896-10		895-45	896-34	897-36	897-95	897-01		897-32	896-61	
5-95			896-18		895-45	896-39	897-37	897-96	897-01		897-32	896-61	
6-04	23		896-23		895-44	896-36	897-36	897-99	897-01		897-32	896-61	
6-09			896-21		895-40	896-36	897-37	897-99	897-01		897-32	896-61	
6-12	24		896-25		895-42	896-37	897-37	897-99	897-01		897-32	896-61	
6-16			896-23		895-43	896-37	897-37	897-99	897-01		897-32	896-61	
6-27	25		896-25		895-44	896-39	897-37	897-99	897-01		897-32	896-61	
6-31			896-23		895-45	896-40	897-39	897-99	897-01		897-32	896-61	
6-38	26		896-23		895-49	896-41	897-39	898-00	897-01		897-32	896-61	
6-39			896-25		895-50	896-41	897-39	898-00	897-01		897-32	896-61	
6-43	27		896-24		895-52	896-42	897-41	897-99	897-01		897-32	896-61	
6-45			896-26		895-54	896-44	897-41	897-99	897-01		897-32	896-61	
6-41	28		896-26		895-60	896-44	897-41	897-99	897-01		897-32	896-61	
6-47			896-29		895-60	896-44	897-41	897-99	897-01		897-32	896-61	
6-15	29		896-34		895-62	896-46	897-41	897-99	897-01		897-32	896-61	
6-30			896-38		895-62	896-46	897-41	897-99	897-01		897-32	896-61	
6-30	30				895-66	896-61	897-41	897-99	897-01		897-32	896-61	
6-30					895-67	896-63	897-41	897-99	897-01		897-32	896-61	
6-30	31				896-64	896-64	897-41	897-99	897-01		897-32	896-61	
6-30					896-64	896-64	897-41	897-99	897-01		897-32	896-61	

Levels reduced to Water Power Survey datum.

GAUGES ABOVE AND BELOW CONTROL DAM, PINAWA CHANNEL.
(GAUGES E. AND F.)

History.—These gauges were established by the Winnipeg Electric Railway Company early in the year of 1906, and records have been obtained from them more or less continuously since that time.

Location.—The gauge below the dam is a vertical staff gauge secured to the concrete at the side of the first sluice on the left side of the channel. (Gauge E.)

The gauge above the dam is a vertical staff gauge secured to the upstream face of the left shore abutment of the dam. (Gauge F.)

Records Available.—On the gauge above the dam, practically continuous records of daily gauge height were obtained by officers of the company from February 3, 1906 to June 24, 1912; from this latter date to the end of 1916 intermittent records have been obtained by officers of the company and members of the staff of the Manitoba Hydrometric Survey.

On the gauge below the dam, records of daily gauge height are available during the months from April to July of 1906 and practically continuous records from January 1, 1907 to June 24, 1912. These records were obtained by officers of the company. Following the latter date and up to the end of 1916, intermittent records of gauge heights have been obtained by officers of the company and members of the staff of the Manitoba Hydrometric Survey.

Mean Daily Gauge Height, in Feet, of Pinawa Channel above Control Dam
(Gauge "F") for 1906 and 1907.

1906

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			891.05	889.35	889.10	890.65	890.35				887.75	887.35
2			891.05	889.35	889.15	890.60			889.15		887.75	887.55
3		891.35	891.05	888.65	889.15	890.60		889.75		887.65		887.45
4		891.45	891.05	888.65	889.60	890.60				887.65	887.65	888.05
5		891.45	891.05	888.70	889.70	890.55				887.65	887.65	888.20
6		891.45	890.95	888.75	889.90	890.55		889.95		887.60	887.65	888.15
7		891.45	890.95	888.75	889.95	890.55		889.70			887.65	888.05
8		891.45	890.95	888.80	890.20	890.65	890.20			887.40	887.65	888.25
9		891.55	890.95	887.85	890.30	890.50				887.35	887.65	888.45
10		891.55	890.85	888.00	890.40	890.45				887.35	887.75	888.75
11		891.55	890.85	888.00	890.45	890.40			889.05	887.30	887.75	888.95
12		891.55	890.85	887.95	890.50	890.35			889.05	887.25	887.65	889.00
13		891.55	890.85	887.95	890.55	890.30				887.30	887.65	889.15
14		891.55	890.85	887.95	890.60	890.35				887.25	887.65	889.25
15		891.55	890.85	888.05	890.65	890.35	890.10			887.25	887.70	889.15
16		891.55	890.85	888.15	890.70	890.35			889.05	887.40	887.60	888.75
17		891.55	890.85	888.25	890.70	890.35	890.10		889.05	887.40	887.65	888.75
18		891.55	890.75	888.35	890.75	890.35	889.85	889.50		887.40	887.60	889.05
19		891.55	890.75	888.35	890.75	890.35	889.80		889.15	887.50	887.55	888.95
20		891.55	890.55	888.35	890.75	890.30	889.80				887.55	888.65
21		891.45	890.55	888.40	890.80	890.30	889.80				887.50	888.55
22		891.25	890.40	888.45	890.80	890.25	889.80			887.70	887.45	888.45
23		891.25	890.40	888.45	890.80	890.25					887.45	888.35
24		891.25	890.35	888.55	890.80	890.30				887.75	887.40	888.25
25		891.15	890.20	888.60	890.80	890.35				887.75	887.35	888.15
26		891.15	890.20	888.65	890.75	890.35				887.75	887.35	888.05
27		891.05	890.70	888.70	890.70	890.35		889.35		887.75	887.35	887.95
28			889.80	888.75	890.70	890.35				887.75	887.30	887.95
29			889.80	888.85	890.70	890.45				887.75	887.25	887.85
30			889.25	889.00	890.70	890.40				887.75	887.25	
31			889.30		890.65		889.90			887.75		887.75

1907

1	887.70	887.80	889.45	892.50	891.95	892.85	893.70	893.50	893.75	894.05	895.85	894.55
2	887.65	887.78	889.65	892.43	891.95	892.80	893.70	893.50	893.75	894.05	895.83	894.15
3	887.65	887.75	889.95	892.30	891.95	892.85	893.70	893.50	893.75	894.10	895.83	894.25
4	887.65	887.75	890.05	892.12	892.05	892.95	893.70	893.45	893.75	894.10	895.83	894.35
5	887.68	887.75	890.45	892.05	892.05	892.95	893.70	893.45	893.75	894.10	895.83	894.45
6	887.65	887.75	890.85	891.90	892.05	892.95	893.70	893.45	893.85	894.10	895.80	894.45
7	887.70	887.75	891.25	891.95	892.05	893.05	893.70	893.45	893.85	894.10	895.80	894.25
8	887.70	887.75	891.50	891.95	892.15	893.05	893.65	893.45	893.85	894.15	895.78	894.20
9	887.80	887.75	891.68	891.92	892.05	893.15	893.65	893.45	893.85	894.18	895.75	894.05
10	887.65	887.75	891.75	891.92	892.05	893.18	893.60	893.45	893.85	894.20	895.75	894.05
11	887.65	887.75	891.68	891.90	892.15	893.25	893.60	893.45	893.85	894.23	895.73	894.03
12	887.65	887.75	891.60	891.90	892.15	893.33	893.55	893.45	893.85	894.23	895.73	894.03
13	887.68	887.75	891.92	891.92	892.18	893.35	893.55	893.45	893.85	894.23	895.73	894.03
14	887.75	887.75	892.30	891.90	892.20	893.40	893.55	893.45	893.90	894.25	895.55	894.03
15	887.75	887.85	892.50	891.82	892.20	893.43	893.55	893.45	893.90	894.25	895.55	891.00
16	887.70	887.85	892.65	891.90	892.25	893.48	893.55	893.45	893.85	894.25	895.55	894.00
17	887.75	887.85	892.65	891.85	892.30	893.50	893.55	893.45	893.85	894.25	895.55	894.00
18	887.80	887.85	892.80	891.85	892.32	893.53	893.55	893.45	893.85	894.25	895.55	894.00
19	887.85	887.95	893.00	891.85	892.45	893.53	893.55	893.45	893.85	894.25	895.55	894.00
20	887.85	887.95	893.13	892.87	892.45	893.55	893.55	893.45	893.85	894.25	895.55	894.00
21	887.85	887.98	893.10	891.85	892.45	893.58	893.55	893.45	893.88	894.25	895.55	894.00
22	887.85	888.10	893.10	891.85	892.50	893.60	893.55	893.45	893.90	894.25	895.55	894.00
23	887.78	888.20	893.00	891.85	892.50	893.68	893.55	893.45	893.90	894.25	895.55	894.00
24	887.78	888.15	893.00	891.88	892.45	893.68	893.55	893.45	893.90	894.25	895.55	894.00
25	887.78	888.15	892.95	891.88	892.50	893.68	893.55	893.45	893.94	894.25	895.55	894.00
26	887.80	888.25	893.00	891.90	892.50	893.68	893.55	893.45	893.95	894.25	895.55	894.00
27	887.80	888.65	892.90	891.88	892.55	893.70	893.55	893.45	893.98	894.25	895.55	894.00
28	887.85	888.85	892.80	891.88	892.60	893.70	893.50	893.45	894.00	894.25	895.55	894.00
29	887.90		892.75	891.90	892.70	893.70	893.50	893.45	894.00	894.25	895.55	894.00
30	887.90		892.75	891.90	892.78	893.70	893.50	893.45	894.00	894.25	895.55	894.00
31	887.90		892.63		892.70		893.50	893.45	894.00	894.25	895.55	894.00

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Pinawa Channel above Control Dam
(Gauge "F") for 1908 and 1909.*

1908

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	894.45	895.05	894.45	893.45	892.90	895.70	896.25	899.35	896.40	896.60	896.65	895.65
2	894.45	894.95	894.35	894.80	892.90	895.75	896.25	896.35	896.45	896.55	896.65	895.65
3	894.45	895.05	894.35	894.80	892.45	895.75	896.30	896.35	896.50	896.55	896.65	895.65
4	894.75	895.05	894.25	893.75	892.85	895.75	896.35	896.35	896.55	896.55	896.65	895.65
5	894.75	895.15	894.20	893.70	892.85	895.75	896.40	896.35	896.60	896.60	896.65	894.85
6	894.80	895.25	894.15	893.55	892.90	895.75	896.35	90.25	896.35	896.50	896.65	894.85
7	894.75	895.35	894.35	893.55	892.90	895.75	896.35	896.25	896.70	896.65	896.65	894.85
8	894.75	895.35	894.35	893.55	892.90	895.75	896.35	896.25	896.70	896.65	896.65	894.85
9	894.75	895.05	894.35	893.55	894.10	895.75	896.35	896.10	896.75	896.65	896.65	894.85
10	894.75	895.15	894.30	893.45	894.15	895.75	896.35	896.40	896.65	896.70	896.65	894.85
11	894.85	894.75	894.30	893.35	894.45	895.85	896.25	896.40	896.60	896.70	896.65	894.85
12	894.95	894.65	894.25	893.25	894.45	896.00	896.30	896.40	896.55	896.70	896.60	894.85
13	895.05	894.55	894.25	893.25	894.45	896.05	896.25	896.40	896.50	896.70	896.50	894.85
14	894.75	894.50	894.25	893.25	894.45	896.00	896.25	896.40	896.50	896.75	896.50	894.85
15	894.85	894.50	894.30	893.15	894.45	896.05	896.25	896.40	896.45	896.75	896.50	894.85
16	894.85	894.60	894.25	893.15	894.45	896.05	896.25	896.40	896.45	896.75	896.50	894.85
17	894.75	894.65	894.25	893.15	894.45	896.10	896.25	896.40	896.45	896.75	896.50	894.85
18	894.85	894.65	894.25	893.15	894.45	896.10	896.25	896.40	896.45	896.75	896.50	894.85
19	894.85	894.75	894.25	893.15	894.45	896.15	896.30	896.40	896.50	896.80	896.45	894.85
20	894.75	894.75	894.15	893.05	894.95	896.15	896.30	896.40	896.50	896.85	896.45	894.85
21	894.75	894.70	894.05	893.05	895.05	896.10	896.30	896.40	896.45	896.85	896.45	894.85
22	894.75	894.70	894.15	893.05	895.15	896.10	896.30	896.40	896.45	896.80	896.45	894.85
23	894.75	894.70	894.10	893.00	895.15	896.20	896.35	896.40	896.40	896.80	896.40	894.85
24	894.85	894.55	894.05	892.95	895.15	896.25	896.45	896.40	896.40	896.80	896.45	894.85
25	894.85	894.50	894.05	892.95	895.20	896.30	896.45	896.40	896.45	896.75	896.45	894.85
26	894.90	894.50	894.05	892.95	895.25	896.25	896.40	896.40	896.50	896.65	896.45	894.85
27	894.90	894.55	894.00	892.95	895.30	896.25	896.40	896.40	896.50	896.65	896.45	894.85
28	894.90	894.50	894.00	892.90	895.30	896.25	896.40	896.40	896.50	896.65	896.45	894.85
29	894.85	894.50	893.95	892.90	895.30	896.25	896.40	896.40	896.50	896.65	896.45	894.85
30	894.85	894.50	893.95	892.90	895.30	896.25	896.40	896.40	896.50	896.65	896.45	894.85
31	895.05	894.50	893.95	892.95	895.35	896.25	896.35	896.40	896.50	896.60	896.45	894.85

1909

1	893.55	894.55	894.05	893.25	892.45	896.40	897.10	897.45	897.25	897.25	896.65	895.65
2	893.65	894.65	893.95	893.25	892.45	896.45	897.10	897.25	897.15	897.25	896.65	895.65
3	893.65	894.45	894.05	893.25	892.45	896.50	897.10	897.25	897.15	897.25	896.65	895.65
4	893.85	894.35	894.05	893.15	892.45	896.45	897.10	897.25	897.15	897.25	896.65	895.65
5	893.85	894.35	893.95	893.15	892.55	897.05	897.10	897.25	897.05	897.35	896.70	895.65
6	893.95	894.35	893.95	893.15	892.65	897.05	897.10	897.25	897.05	897.45	896.70	895.65
7	894.05	894.25	893.95	893.15	892.75	897.10	897.05	897.35	897.05	897.35	896.65	895.65
8	894.15	894.25	893.95	893.15	892.85	897.10	897.05	897.35	897.05	897.35	896.65	895.65
9	894.25	894.55	893.95	892.95	892.95	897.10	897.05	897.25	897.05	897.35	896.65	895.65
10	894.35	894.75	893.85	892.85	893.05	897.10	897.15	897.35	897.15	897.35	896.65	895.65
11	894.45	894.75	893.75	892.75	893.05	897.15	897.15	897.35	897.15	897.35	896.65	895.65
12	894.55	894.75	893.75	892.75	893.25	897.15	897.15	897.25	897.15	897.25	896.65	895.65
13	894.55	894.75	893.75	892.75	893.35	897.15	897.10	897.25	897.15	897.15	896.60	895.65
14	894.65	894.75	893.75	892.65	893.85	897.20	897.05	897.25	897.15	897.15	896.60	895.65
15	894.65	894.75	893.75	892.45	894.35	897.20	897.05	897.25	897.15	897.15	896.60	895.65
16	894.85	894.75	893.75	892.45	895.65	897.20	897.05	897.25	897.15	897.15	896.60	895.65
17	894.85	894.65	893.75	892.45	895.85	897.20	897.05	897.25	897.15	897.15	896.60	895.65
18	894.75	894.55	893.65	892.45	896.05	897.20	897.05	897.25	897.15	897.15	896.60	895.65
19	894.75	894.45	893.55	892.45	896.05	897.20	897.10	897.25	897.15	897.15	896.60	895.65
20	894.35	894.35	893.55	892.45	896.05	897.15	897.10	897.25	897.15	896.95	896.60	895.65
21	894.25	894.35	893.45	892.45	896.05	897.20	897.15	897.25	897.15	896.95	896.60	895.65
22	894.15	894.35	893.45	892.45	896.20	897.20	897.15	897.25	897.15	896.95	896.60	895.65
23	893.95	894.25	893.45	892.45	896.25	897.15	897.15	897.25	897.15	896.95	896.60	895.65
24	893.95	894.25	893.45	892.45	896.30	897.15	897.15	897.25	897.15	896.95	896.60	895.65
25	894.05	894.25	893.55	892.45	896.30	897.10	897.15	897.25	897.15	896.95	896.60	895.65
26	894.05	894.25	893.55	892.45	896.25	897.10	897.15	897.25	897.15	896.95	896.60	895.65
27	894.05	894.25	893.55	892.45	896.25	897.15	897.25	897.25	897.15	896.95	896.60	895.65
28	893.95	894.15	893.45	892.45	896.30	897.15	897.25	897.25	897.15	896.95	896.60	895.65
29	894.05	894.15	893.45	892.45	896.40	897.15	897.25	897.25	897.15	896.95	896.60	895.65
30	894.15	894.15	893.35	892.45	896.35	897.15	897.25	897.25	897.15	896.95	896.60	895.65
31	894.45	894.15	893.35	892.45	896.35	897.15	897.25	897.25	897.15	896.95	896.60	895.65

Levels reduced to Water Power Survey datum.

MANITOBA HYDROMETRIC SURVEY

227

SESSIONAL PAPER No. 25c

Mean Daily Gauge Height, in Feet, of Pinawa Channel above Control Dam
(Gauge "F") for 1910 and 1911.

1910

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	806.55	806.35	807.35	805.65	806.55	806.65	807.75	807.35	807.25	806.95	806.25	805.45
2	806.55	806.65	807.35	805.75	806.55	806.55	807.75	807.35	807.25	806.95	806.15	805.25
3	806.65	806.45	807.15	805.75	806.55	806.65	807.75	807.35	807.25	806.95	806.15	805.15
4	806.65	806.65	806.95	805.75	806.55	806.55	807.75	807.35	807.25	806.95	806.15	805.15
5	806.65	806.75	806.85	805.75	806.55	806.55	807.75	807.35	807.25	806.95	806.15	805.15
6	806.75	806.75	806.85	805.85	806.55	806.65	807.75	807.35	807.25	806.95	806.15	805.15
7	806.85	806.55	806.75	805.85	806.60	806.65	807.75	807.35	807.25	806.95	806.15	805.15
8	85	806.45	806.75	805.85	806.65	806.65	807.75	807.35	807.25	806.95	806.15	805.15
9	85	806.45	806.75	805.85	806.65	806.65	807.75	807.35	807.25	806.95	806.15	805.15
10	807.05	806.65	806.50	805.95	806.65	806.65	807.75	807.25	807.15	806.75	805.95	804.55
11	807.15	806.65	806.35	805.95	806.65	806.55	807.75	807.15	807.15	806.75	805.95	804.65
12	807.15	806.75	806.35	806.05	806.65	806.65	807.75	807.15	807.15	806.75	805.95	804.65
13	807.15	806.75	806.35	806.05	806.65	806.65	807.75	807.15	807.15	806.75	805.95	804.65
14	807.15	806.75	806.25	806.15	806.75	806.65	807.75	807.15	807.15	806.75	805.95	804.65
15	807.15	806.95	806.05	806.15	806.75	806.65	807.75	807.15	807.15	806.75	805.95	804.65
16	807.15	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
17	807.15	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
18	807.25	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
19	807.25	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
20	807.25	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
21	807.25	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
22	807.25	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
23	807.25	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
24	807.25	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
25	807.25	807.35	806.05	806.25	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
26	806.95	807.05	806.55	806.45	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
27	806.95	807.05	806.55	806.45	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
28	806.95	807.05	806.55	806.45	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
29	806.95	807.05	806.55	806.45	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
30	806.95	807.05	806.55	806.45	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35
31	806.95	807.05	806.55	806.45	806.65	806.65	807.75	807.05	807.15	806.65	805.85	804.35

NOTE.—Log Jan. February 16, April 9, 10, May 13, 15. Stop logs placed June 7, 13, 24, 25, 26. Stop logs removed October 20, November 17 and 30, December 2, 5, and 9.

1911

1	804.75	805.45	804.85	804.85	804.15	804.75	805.05	805.35	805.25	805.25	807.35	805.15
2	804.95	805.45	804.85	804.85	804.15	804.75	805.05	805.35	805.25	805.25	807.35	805.15
3	805.05	805.45	804.85	804.85	804.15	804.75	805.05	805.35	805.25	805.25	807.35	805.15
4	805.05	805.45	804.85	804.85	804.15	804.75	805.05	805.35	805.25	805.25	807.35	805.15
5	805.15	805.45	804.75	804.85	804.25	804.85	805.15	805.35	805.25	805.25	807.35	805.05
6	805.25	805.35	804.75	804.85	804.25	804.85	805.15	805.35	805.25	805.25	807.35	805.05
7	805.45	805.25	804.65	804.65	804.25	804.85	805.15	805.35	805.25	805.25	807.35	805.05
8	805.55	805.15	804.65	804.65	804.25	804.85	805.15	805.35	805.25	805.25	807.35	805.05
9	805.55	805.15	804.65	804.65	804.25	804.85	805.15	805.35	805.25	805.25	807.35	805.05
10	805.45	805.15	804.55	804.65	804.35	804.95	805.15	805.35	805.25	805.25	807.35	805.05
11	805.45	805.15	804.45	804.65	804.35	804.95	805.25	805.35	805.25	805.25	807.35	805.05
12	805.45	805.15	804.45	804.65	804.35	804.95	805.25	805.35	805.25	805.25	807.35	805.05
13	805.55	805.05	804.45	804.65	804.35	804.95	805.25	805.35	805.25	805.25	807.35	805.05
14	805.65	804.95	804.45	804.65	804.35	804.95	805.25	805.35	805.25	805.25	807.35	805.05
15	805.65	804.45	804.45	804.65	804.45	804.95	805.25	805.35	805.25	805.25	807.35	805.05
16	805.75	804.85	804.55	804.55	804.55	804.95	805.25	805.35	805.25	805.25	807.35	805.05
17	805.75	804.75	804.45	804.55	804.55	804.95	805.25	805.35	805.25	805.25	807.35	805.05
18	805.75	804.75	804.45	804.55	804.55	804.95	805.25	805.35	805.25	805.25	807.35	805.05
19	805.85	804.75	804.35	804.55	804.55	804.95	805.25	805.35	805.25	805.25	807.35	805.05
20	805.75	804.75	804.25	804.55	804.55	804.95	805.35	805.35	805.25	805.25	807.35	805.05
21	805.75	804.75	804.25	804.55	804.55	804.95	805.35	805.35	805.25	805.25	807.35	805.05
22	805.85	804.75	804.15	804.55	804.55	805.05	805.35	805.35	805.25	805.25	807.35	805.05
23	805.85	804.75	804.15	804.55	804.55	805.05	805.35	805.35	805.25	805.25	807.35	805.05
24	805.75	804.65	804.05	804.55	804.55	805.05	805.35	805.35	805.25	805.25	807.35	805.05
25	805.70	804.65	804.05	804.55	804.55	805.05	805.35	805.35	805.25	805.25	807.35	805.05
26	805.55	804.65	804.05	804.15	804.75	805.05	805.35	805.35	805.25	805.25	807.35	805.05
27	805.55	804.75	804.05	804.15	804.75	805.05	805.35	805.35	805.25	805.25	807.35	805.05
28	805.55	804.85	803.95	804.15	804.75	805.05	805.35	805.35	805.25	805.25	807.35	805.05
29	805.55	804.85	803.95	804.15	804.75	805.05	805.35	805.35	805.25	805.25	807.35	805.05
30	805.55	804.85	803.95	804.15	804.75	805.05	805.35	805.35	805.25	805.25	807.35	805.05
31	805.55	804.85	803.95	804.15	804.75	805.05	805.35	805.35	805.25	805.25	807.35	805.05

NOTE.—Stop logs placed October 10, 20. Stop logs removed November 12, 16.
Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Pinawa Channel above Control Dam
(Gauge "F") for 1912 and 1913.*

1912

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	805.95	806.15	805.35	804.45	804.75	805.65		807.05				
2	806.05	806.15	805.35	804.45	804.85	805.65						
3	806.15	806.25	805.35	804.45	804.85	805.65						
4	806.05	806.25	805.25	804.55	804.85	805.75						
5	805.95	806.25	805.25	804.45	804.85	805.75						
6	806.15	806.25	805.25	804.45	804.95	805.75						
7	806.15	806.25	805.15	804.45	804.95	805.75			805.55			
8	806.45	806.45	805.15	804.35	804.95	805.75						
9	806.55	806.45	805.15	804.25	804.95	805.75						
10	806.55	806.35	805.15	804.15	805.05	805.75						
11	806.65	806.25	805.15	804.25	805.05	805.75		807.05				
12	806.85	806.05	805.15	804.25	805.05	805.75						
13	806.05	805.85	805.05	804.15	805.05	805.75						
14	806.95	805.85	805.05	804.15	805.15	805.75						
15	806.95	805.85	805.05	804.15	805.25	805.75			805.55			806.75
16	806.85	805.45	804.95	804.15	805.25	805.65						806.45
17	806.85	805.35	804.95	804.15	805.25	805.65	805.35					806.15
18	806.95	805.45	804.85	804.15	805.25	805.65						806.05
19	807.05	805.35	804.85	804.15	805.35	805.65						805.95
20	806.95	805.35	804.85	804.15	805.35	805.65				805.05		805.95
21	806.95	805.35	804.85	804.15	805.35	805.65	805.35					805.95
22	806.95	805.35	804.85	804.15	805.45	805.55						806.05
23	806.85	805.25	804.85	804.15	805.45	805.55						806.05
24	806.75	805.25	804.75	804.15	805.45	805.55						806.15
25	806.75	805.35	804.65	804.15	805.45							806.35
26	806.75	805.25	804.55	804.35	805.45			805.35				806.55
27	806.75	805.25	804.55	804.55	805.45			805.35				806.55
28	806.75	805.25	804.55	804.55	805.55			805.35				806.55
29	806.35	805.35	804.55	804.55	805.55							806.55
30	806.35		804.55	804.75	805.65							806.55
31	806.25		804.55		805.65							806.75

1913

1	806.55	807.05	806.15	805.35		805.75						
2	806.55	806.95	806.25	805.35							804.45	
3	806.55	807.05	806.25	805.25								
4	806.25	807.05	806.25	805.25								
5	806.45	807.15	806.15	805.05						804.85		
6	806.35	807.25	806.15	805.05								804.35
7	806.45	807.15	806.15	805.05								
8	806.65	807.25	806.05	805.05								
9	806.65	807.35	806.05	805.85								
10	806.85	807.45	805.95	805.85								804.35
11	806.85	807.45	805.85	805.85								804.15
12	806.85	807.55	805.85	805.75								804.15
13	806.95	807.55	805.85	805.75								804.25
14	806.95	807.45	805.85	805.65								804.25
15	806.95	807.45	805.85	805.65		805.85						804.25
16	806.95	807.25	805.85	805.65			805.65					804.25
17	806.85	807.05	805.85	805.65								804.25
18	806.85	806.95	805.85	805.65								804.25
19	806.85	806.75	805.85									804.25
20	806.85	806.65	805.85									804.25
21	806.95	806.55	805.75									804.25
22	806.95	806.45	805.75									804.25
23	807.05	806.45	805.85									804.25
24	807.05	806.45	805.75									804.25
25	807.15	806.35	805.75									804.25
26	807.15	806.15	805.75									804.25
27	807.15	806.15	807.75									804.25
28	807.15	806.15	807.55						805.15			804.25
29	807.15		807.45									804.25
30	807.05		807.45									804.25
31	807.05		807.45									804.25

Levels reduced to Water Power Survey datum.

NOTE.—Stop logs placed July 25-31, 1912. Stop logs removed August 22-26, 1912.

Mean Daily Gauge Height, in Feet, of Pinawa Channel above Control Dam
(Gauge "F") for 1914 and 1916.

1914

Day.	Jan.	Feb.	Mar.	April	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	804 15	805 25	804 65	804 35	804 35	805 15	806 04	805 88	805 90			
2	804 15	805 15	804 65	804 35	804 35	805 15	806 05	805 80	805 55		805 05	804 95
3	804 15	805 05	804 65	804 35	804 35	805 50	806 00	805 85	805 52			804 95
4	804 15	805 05	804 65	804 25	804 35	805 55	806 07	805 80	805 49	805 25		804 95
5	804 25	805 15	804 65	804 25	804 15	805 60	806 05	805 84	805 50		805 00	804 95
6	804 25	805 25	804 65	804 25	804 15	805 65	806 05	805 80	805 44			804 85
7	804 25	805 25	804 65	804 25	804 15	805 65	806 03	805 75	805 41			804 85
8	804 25	805 25	804 65	804 15	804 15	805 65	806 05	805 80	805 41	805 20	805 00	804 85
9	804 25	805 35	804 75	804 15	804 15	805 75	806 02	805 80	805 38			804 85
10	804 45	805 35	804 75	804 15			806 04	805 78	805 33			804 85
11	804 45	805 35	804 75	804 15		805 80	806 02	805 78	805 34			804 85
12	804 55	805 35	804 75	804 15		805 80	806 02	805 77	805 35			804 85
13	804 85	805 25	804 75	804 15		805 80	806 08	805 74	805 32	805 30		804 85
14	805 05	805 35	804 75	804 15		805 85	806 12	805 74	805 30			804 85
15	804 85	805 15	804 55	804 15		805 83	806 12	805 74	805 30	805 35		805 25
16	804 65	805 15	804 55	804 25		805 84	806 05	805 74	805 25			805 55
17	804 65	805 35	804 55	804 25		805 80	806 05	805 74	805 27			805 05
18	804 65	805 35	804 55	804 25		805 80	806 02	805 73	805 28			805 65
19	804 25	805 15	804 55	804 35		805 95	806 00	805 73	805 25	805 35		805 05
20	804 25	805 15	804 55	804 35		805 94	806 02	805 72	805 25			805 05
21	804 55	805 15	804 15	804 35		805 95	806 02	805 72	805 25			805 05
22	804 55	805 05	804 15	804 35		805 96	805 07	805 72	805 25			805 05
23	804 55	805 05	804 15	804 35		805 95	805 08	805 71	805 25	805 30		805 05
24	804 55	805 05	804 15	804 35		805 95	805 08	805 71	805 25			805 05
25	805 05	805 05	804 45	804 35	804 85	805 96	805 05	805 71	805 30			805 95
26	805 05	804 75	804 45	804 35	804 95	805 97	805 05	805 71				805 85
27	805 25	804 65	804 35	804 35	804 95	805 97	805 06	805 71	805 30	805 15		805 25
28	805 25	804 65	804 35	804 35	805 05	805 97	805 05	805 71				805 25
29	805 15		804 35	804 15	805 05	805 99	805 04	805 66		805 10		805 25
30	805 15		804 35	804 35	805 05	806 05	805 00	805 60	805 25			805 45
31	805 15				805 05		805 80	805 64				805 45

1916

1	806 25	806 95	806 40	805 65								
2	806 35	806 95	806 55	805 55								
3	806 45	806 95	806 65	805 55								
4	806 45	806 95	806 75	805 55		807 30	808 00					
5	806 45	806 95	806 75	805 45								
6	806 35	806 95	806 65	805 35								
7	806 35	806 95	806 65	805 25								
8	806 45	806 95	806 65	805 15				808 10				
9	806 55	806 95	806 65	805 15								
10	806 45	806 95	806 65	805 15	806 15							
11	806 45	806 95	806 55	805 15								
12	806 45	806 95	806 55	805 15								
13	806 45	806 95	806 55	805 15								
14	806 45	806 95	806 55	805 15				808 05				
15	806 45	806 95	806 45	805 25								
16	806 45	806 95	806 45	805 35	806 25		808 10					
17	806 45	806 95	806 45	805 35								
18	806 45	806 95	806 45	805 35	806 35	807 15						
19	806 45	806 95	806 45	805 35								
20	806 45	806 95	806 45	805 35				808 00				
21	806 45	806 95	806 45	805 35								
22	806 45	806 95	806 45	805 35								
23	806 45	806 95	806 45	805 35								
24	806 45	806 95	806 45	805 35								
25	806 45	806 95	806 45	805 35								
26	806 45	806 95	806 45	805 35								
27	806 45	806 95	806 45	805 35								
28	806 45	806 95	806 45	805 35								
29	806 45	806 95	806 45	805 35								
30	806 45	806 95	806 45	805 35								
31	806 45	806 95	806 45	805 35								

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Pinawa Channel below Control Dam
(Gauge "E") for 1906 and 1907.*

1906

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					888.50	890.25	889.95					
2					888.65	890.20						
3					888.85	890.20						
4					889.15	890.20						
5					889.35	890.15						
6					889.55	890.15						
7					889.65	890.15						
8					889.80	890.15	889.85					
9					889.90	890.05						
10					889.95	890.00						
11					890.05	889.95						
12					890.05	889.95						
13					890.15	889.90						
14					890.20	889.95						
15					890.25	889.95	889.70					
16					890.25	889.95						
17					890.25	889.95	889.70					
18					890.35	889.95	889.85					
19					890.35	889.90	889.80					
20					890.35	889.90						
21					890.40	889.85	889.80					
22					890.40	889.85	889.80					
23					890.40	889.90						
24					890.40	889.95						
25					890.40	889.95						
26					890.35	890.00						
27					890.40	890.00						
28				888.15	890.40	889.95						
29				888.25	890.35	889.95						
30				888.40	890.35	889.95						
31					890.25							

1907

1	887.70	887.80	889.45	892.55	891.95	892.85	893.70	893.50	893.75	894.05	892.05	893.85
2	887.65	887.72	889.05	892.45	891.95	892.80	893.70	893.50	893.75	894.05	892.05	894.05
3	887.65	887.75	889.05	892.35	891.95	892.85	893.70	893.50	893.75	894.10	892.05	894.15
4	887.65	887.75	890.05	892.15	892.05	892.95	893.70	893.45	893.75	894.10	892.05	894.25
5	887.67	887.75	890.35	892.05	892.05	892.95	893.70	893.45	893.75	894.10	892.05	894.25
6	887.65	887.75	890.85	892.00	892.05	892.95	893.70	893.45	893.85	894.10	892.05	894.25
7	887.70	887.75	891.25	891.95	892.05	893.05	893.70	893.45	893.85	894.10	892.05	894.25
8	887.70	887.75	891.55	891.95	892.15	893.05	893.65	893.45	893.85	894.15	892.05	894.25
9	887.80	887.75	891.65	891.90	892.05	893.15	893.65	893.45	893.85	894.15	892.05	894.25
10	887.65	887.75	891.75	891.90	892.05	893.17	893.60	893.45	893.85	894.20	892.05	894.25
11	887.65	887.75	891.65	891.90	892.15	893.25	893.60	893.45	893.85	894.25	892.05	894.25
12	887.65	887.75	891.00	891.90	892.15	893.35	893.55	893.45	893.85	894.25	892.05	894.25
13	887.67	887.75	891.80	891.90	892.20	893.35	893.55	893.15	893.85	894.25	892.05	894.25
14	887.75	887.75	892.35	891.85	892.20	893.40	893.55	893.45	893.90	894.25	892.25	894.25
15	887.75	887.85	892.55	891.85	892.20	893.45	893.55	893.45	893.90	894.25	892.25	894.25
16	887.70	887.85	892.65	891.85	892.25	893.45	893.55	893.45	893.85	894.25	892.25	894.25
17	887.75	887.85	892.65	891.85	892.50	893.50	893.55	893.45	893.85	894.25	892.25	894.25
18	887.80	887.85	893.85	891.85	892.35	893.55	893.55	893.50	893.85	894.15	892.25	894.25
19	887.85	887.95	893.05	891.85	892.45	893.55	893.55	893.55	893.85	892.05	892.25	894.25
20	887.85	887.95	893.15	891.85	892.45	893.55	893.55	893.55	893.85	892.05	892.25	894.25
21	887.85	887.97	893.10	891.85	892.45	893.55	893.55	893.55	893.85	892.05	892.25	894.25
22	887.85	888.10	893.10	891.85	892.50	893.60	893.55	893.55	893.90	892.05	892.25	894.25
23	887.77	888.20	893.05	891.85	892.50	893.55	893.55	893.55	893.90	892.05	892.25	894.25
24	887.77	888.15	893.00	891.85	892.45	893.65	893.55	893.55	893.90	892.05	892.25	894.25
25	887.75	888.15	892.65	891.85	892.50	893.65	893.55	893.55	893.95	892.05	892.25	894.25
26	887.80	888.25	892.95	891.90	892.50	893.65	893.60	893.55	893.95	892.05	892.25	894.25
27	887.80	888.65	892.90	891.85	892.55	893.70	893.60	893.55	893.95	892.05	892.25	894.25
28	887.82	888.85	892.85	891.90	892.60	893.70	893.60	893.55	893.95	892.05	892.25	894.25
29	887.80	.....	892.75	891.90	892.70	893.70	893.70	893.75	894.00	892.05	892.15	894.25
30	887.75	.....	892.70	891.90	892.77	893.70	893.60	893.75	894.05	892.05	892.45	894.25
31	887.80	.....	892.55	.....	892.70	.....	893.50	893.75	.....	892.05	.....	894.25

Levels reduced to Water Power Survey datum.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 25a

Mean Daily Gauge Height, in Feet, of Pinawa Channel below Control Dam
(Gauge "E") for 1908 and 1909.

1908

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	804.35	804.95	804.35	803.75	802.80	800.85	800.95	800.85	801.05	801.05	801.55	802.65
2	804.35	804.85	804.25	803.70	802.80	800.75	800.85	800.85	801.10	801.05	801.55	802.55
3	804.35	804.95	804.25	803.70	802.75	800.75	800.90	800.85	801.10	801.05	801.55	802.45
4	804.65	804.95	804.15	803.65	802.75	800.75	800.95	800.85	801.10	801.05	801.55	802.45
5	804.65	805.05	804.10	803.60	802.75	800.75	800.95	800.85	801.15	801.05	801.55	803.05
6	804.70	805.05	804.95	803.45	802.80	800.75	800.95	800.85	801.15	801.05	801.55	803.55
7	804.65	805.25	804.25	803.45	802.80	800.75	800.95	800.85	801.15	801.05	801.55	803.65
8	804.65	804.25	804.25	803.45	802.25	800.75	800.95	800.90	801.15	801.05	801.55	803.65
9	804.65	804.05	804.25	803.45	801.75	800.70	800.95	800.90	801.15	801.05	801.55	803.65
10	804.65	805.05	804.20	803.35	801.75	800.70	800.95	800.90	801.05	801.05	801.55	803.75
11	804.75	804.65	804.20	803.25	801.75	800.80	800.90	800.95	801.05	801.05	801.55	803.85
12	804.85	804.55	804.15	803.15	801.85	800.85	800.90	800.95	801.05	801.05	801.55	803.75
13	804.95	804.45	804.15	803.15	801.25	801.05	800.95	800.95	801.05	801.05	801.55	803.75
14	804.85	804.40	804.15	803.05	801.25	801.05	800.90	800.95	801.05	801.05	801.55	803.45
15	804.75	804.40	804.20	803.05	801.25	801.05	800.90	800.95	801.05	801.05	801.55	803.45
16	804.75	804.50	804.15	803.05	801.25	801.05	800.90	801.00	801.05	801.05	801.55	803.45
17	804.75	804.55	804.15	803.05	801.25	801.05	800.90	801.00	801.05	801.05	801.55	803.45
18	804.75	804.55	804.15	803.05	801.25	801.05	800.85	801.00	801.05	801.05	801.55	803.45
19	804.75	804.65	804.15	803.05	801.25	801.05	800.85	801.00	801.05	801.05	801.55	803.45
20	804.65	804.60	804.05	802.95	801.50	801.05	800.90	801.00	801.05	801.05	801.55	803.35
21	804.55	804.60	803.05	802.95	801.55	800.95	800.90	800.95	801.05	801.05	801.55	803.55
22	804.65	804.60	803.05	802.95	801.55	800.95	800.90	800.95	801.05	801.05	801.55	803.55
23	804.65	804.60	803.05	802.95	801.55	800.95	800.90	800.95	801.05	801.05	801.55	803.55
24	804.75	804.45	803.05	802.85	801.55	800.95	800.90	800.95	801.05	801.05	801.55	803.65
25	804.75	804.40	803.05	802.85	801.55	800.95	800.85	800.95	801.05	801.05	801.55	803.65
26	804.75	804.40	803.05	802.85	801.55	800.95	800.85	800.95	801.05	801.05	801.55	803.55
27	804.75	804.45	803.05	802.85	801.55	800.95	800.85	800.95	801.05	801.05	801.55	803.55
28	804.75	804.40	803.05	802.85	801.55	800.95	800.85	800.95	801.05	801.05	801.55	803.55
29	804.75	804.40	803.05	802.85	801.55	800.95	800.85	800.95	801.05	801.05	801.55	803.55
30	804.75	804.40	803.05	802.85	801.55	800.95	800.85	800.95	801.05	801.05	801.55	803.55
31	804.95	804.40	803.05	802.85	801.55	800.95	800.85	800.95	801.05	801.05	801.55	803.55

1909

1	803.35	804.45	803.95	803.15	802.35	801.90	800.65	800.65	800.75	801.05	802.75	803.65
2	803.45	804.55	803.85	803.15	802.35	801.75	800.75	800.75	800.75	801.05	802.75	803.65
3	803.65	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
4	803.65	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
5	803.65	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
6	803.75	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
7	803.95	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
8	804.05	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
9	804.15	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
10	804.25	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
11	804.35	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
12	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
13	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
14	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
15	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
16	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
17	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
18	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
19	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
20	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
21	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
22	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
23	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
24	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
25	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
26	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
27	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
28	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
29	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
30	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65
31	804.45	804.55	803.85	803.15	802.35	801.90	800.75	800.75	800.75	801.05	802.75	803.65

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Pinawa Channel below Control Dam
(Gauge "E") for 1910 and 1911.*

1910

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	806.35	806.35	806.75	805.45	806.25	806.15	801.65	801.15	801.05	801.15	802.55	803.65
2	806.35	806.35	806.75	805.55	806.25	806.15	801.65	801.15	801.05	801.15	802.55	803.85
3	806.35	806.25	806.75	805.55	806.25	806.15	801.65	801.15	801.05	801.15	802.55	803.85
4	806.35	806.45	806.65	805.55	806.25	806.15	801.55	801.15	801.05	801.15	802.55	803.85
5	806.35	806.55	806.55	805.65	806.25	806.15	801.45	801.15	801.05	801.25	802.55	803.85
6	806.45	806.55	806.55	805.65	806.25	806.15	801.45	801.15	800.95	801.25	802.55	804.25
7	806.45	806.35	806.55	805.65	806.35	806.05	801.45	801.15	800.95	801.25	802.55	804.35
8	806.45	806.25	806.45	805.65	806.35	806.05	801.45	801.15	800.95	801.25	802.55	804.35
9	806.65	806.25	806.35	805.65	806.35	806.05	801.45	801.15	800.95	801.35	802.55	804.45
10	806.75	806.45	806.35	805.75	806.35	806.05	801.45	801.05	800.95	801.35	802.55	804.45
11	806.85	806.45	806.15	805.75	806.35	806.05	801.55	800.95	800.95	801.35	802.55	804.55
12	806.85	806.55	806.15	805.85	806.35	806.05	801.55	800.95	800.95	801.45	802.55	804.75
13	806.85	806.55	806.15	805.85	806.05	805.95	801.65	800.85	800.95	801.45	802.55	804.75
14	806.85	806.55	806.05	805.95	806.15	805.95	801.55	800.85	800.95	801.45	802.55	804.75
15	806.85	806.75	805.95	805.95	806.45	805.95	801.55	800.85	800.95	801.45	802.55	804.75
16	806.95	806.45	805.95	805.95	806.35	805.95	801.55	800.85	800.95	801.45	802.65	804.75
17	806.95	806.75	805.75	805.95	806.35	805.15	801.45	800.85	800.95	801.45	802.65	804.75
18	807.05	806.75	805.65	806.05	806.35	805.05	801.45	800.85	800.95	801.55	802.75	804.75
19	806.95	806.95	805.65	806.05	806.35	805.05	801.45	800.85	800.95	801.55	802.75	804.75
20	806.85	806.95	805.55	806.05	806.35	805.05	801.45	800.85	800.95	801.55	802.75	804.75
21	806.95	806.95	805.45	806.05	806.35	805.05	801.45	800.95	800.95	801.55	802.75	804.75
22	806.95	806.95	805.45	806.05	806.35	805.05	801.35	800.95	800.95	802.45	802.75	804.75
23	807.05	807.05	805.45	806.15	806.35	805.05	801.25	800.95	801.05	802.45	802.75	804.75
24	806.95	807.05	805.45	806.15	806.35	805.05	801.25	800.95	801.05	802.45	802.75	804.75
25	807.05	807.05	805.35	806.15	806.35	805.15	801.25	800.95	801.05	802.45	802.75	804.75
26	806.75	807.05	805.35	806.25	806.25	802.35	801.25	800.95	801.05	802.45	802.75	804.75
27	806.65	807.05	805.35	806.25	806.25	802.35	801.25	800.95	801.05	802.45	802.75	804.75
28	806.55	806.95	805.35	806.25	806.25	801.45	801.25	800.95	801.05	802.45	802.75	804.75
29	806.45	806.95	805.35	806.25	806.25	801.15	801.15	800.95	801.05	802.45	802.75	804.75
30	806.55	806.95	805.35	806.25	806.25	801.15	801.15	801.05	801.15	802.45	802.75	804.75
31	806.55	806.95	805.35	806.25	806.25	801.15	801.15	801.05	801.15	802.45	802.75	804.75

1911

1	804.65	805.35	804.75	803.75	804.05	804.65	804.95	805.25	805.15	805.15	802.85	805.05
2	804.85	805.35	804.75	803.75	804.05	804.65	805.05	805.25	805.15	805.15	802.85	805.05
3	804.95	805.35	804.75	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
4	804.95	805.35	804.75	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
5	805.05	805.35	804.65	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
6	805.15	805.25	804.65	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
7	805.25	805.15	804.55	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
8	805.45	805.05	804.55	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
9	805.45	805.05	804.55	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
10	805.35	805.05	804.45	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
11	805.35	805.05	804.35	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
12	805.35	805.05	804.35	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
13	805.35	804.95	804.35	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
14	805.35	804.85	804.35	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
15	805.35	804.75	804.35	803.75	804.15	804.75	805.05	805.25	805.15	805.15	802.85	804.95
16	805.65	804.75	804.45	803.85	804.45	804.85	805.15	805.25	805.15	803.75	805.25	804.85
17	805.65	804.65	804.35	803.95	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
18	805.65	804.65	804.35	803.95	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
19	805.75	804.65	804.25	803.95	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
20	805.65	804.65	804.15	803.95	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
21	805.65	804.65	804.15	803.95	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
22	805.75	804.65	804.05	803.95	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
23	805.75	804.65	804.05	803.95	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
24	805.65	804.55	803.95	803.95	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
25	805.65	804.55	803.95	803.95	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
26	805.45	804.55	803.95	804.05	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
27	805.45	804.55	803.95	804.05	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
28	805.45	804.55	803.95	804.05	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
29	805.45	804.55	803.95	804.05	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
30	805.45	804.55	803.95	804.05	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85
31	805.45	804.55	803.95	804.05	804.45	804.85	805.15	805.25	805.15	803.55	805.25	804.85

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Pinawa Channel below Control Dam
(Gauge "E") for 1912 and 1913.*

1912

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	895.75	896.05	895.25	894.35	894.55	895.55						
2	895.75	896.15	895.25	894.35	894.75	895.55						
3	895.85	896.15	895.25	894.35	894.75	895.55						
4	895.75	896.15	895.15	894.45	894.75	895.55						
5	895.65	896.15	895.15	894.35	894.75	895.65						
6	895.85	896.15	895.15	894.35	894.85	895.65						
7	895.85	896.15	895.05	894.35	894.85	895.65						
8	896.15	896.35	895.05	894.25	894.85	895.65			895.45			
9	896.25	896.35	895.05	894.15	894.85	895.65						
10	896.25	896.25	895.05	894.05	894.95	895.65						
11	896.35	896.15	895.05	894.15	894.95	896.65		893.05				
12	896.55	895.05	895.05	894.15	894.95	895.65						
13	896.65	895.75	894.95	894.05	894.95	895.65						
14	896.65	895.75	894.95	894.05	895.05	895.65						
15	896.65	895.55	894.95	894.05	895.15	895.65			895.45			
16	896.55	895.35	894.85	894.05	895.15	895.55						896.15
17	896.55	895.25	894.85	894.05	895.15	895.55	895.25					896.05
18	896.65	895.35	894.75	894.05	895.15	895.55						895.95
19	896.75	895.25	894.75	894.05	895.25	895.55						895.85
20	896.65	895.25	894.75	894.05	895.25	895.45				895.85		895.35
21	896.65	895.25	894.75	894.05	895.25	895.45	895.25					895.85
22	896.65	895.25	894.75	894.05	895.35	895.45						895.95
23	896.65	895.15	894.75	894.05	895.35	895.45						895.95
24	896.55	895.15	894.65	894.05	895.35	895.45						895.95
25	896.55	895.25	894.55	894.05	895.35							896.15
26	896.55	895.15	894.45	894.25	895.35							896.35
27	896.55	895.15	894.45	894.45	895.35			895.25				896.35
28	896.55	895.15	894.45	894.45	895.35			895.25				896.35
29	896.25	895.25	894.45	894.55	895.35			895.25				896.35
30	896.25		894.45	894.55	895.35							896.35
31	896.15		894.45		895.35							896.35

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	896.35	896.85	896.05			895.65						
2	896.35	896.75	896.15									
3	896.35	896.75	896.15							894.35		
4	896.25	896.75	896.15									
5	896.25	896.75	896.05									
6	896.15	896.85	896.05									
7	896.25	896.85	896.05									894.25
8	896.45	896.95	895.95									
9	896.45	897.05	895.95									
10	896.45	897.15	895.85									894.25
11	896.55	897.15	895.75									
12	896.55	897.25	895.75									894.25
13	896.65	897.25	895.75									894.25
14	896.65	897.25	895.75									894.15
15	896.65	897.25	895.75			895.75						894.15
16	896.65	897.05	895.75				895.55					894.15
17	896.55	896.85	895.75									894.15
18	896.55	896.85	895.75									894.15
19	896.55	896.85	895.75									894.15
20	896.55	896.55	895.75									894.15
21	896.55	896.45	895.65									894.15
22	896.55	896.35	895.65									894.15
23	896.55	896.25	895.75									894.15
24	896.55	896.25	895.65									894.15
25	896.65	896.25	895.65							894.45		894.15
26	896.65	896.05	896.65									894.15
27	896.75	896.05	895.65									894.15
28	896.75	896.05	895.45									894.15
29	896.85											894.15
30	896.85											894.05
31	896.85											894.05

Levels reduced to Water Power Survey Datum.

*Mean Daily Gauge Height, in Feet, of Pinawa Channel below Control Dam
(Gauge "E") for 1914.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	804.05	805.15	804.55	804.25	804.25	.....	805.94	805.78	805.49	.....	804.95	804.85
2	804.05	805.05	804.55	804.25	804.25	.....	805.95	805.76	805.45	.....	.....	804.85
3	804.05	804.95	804.55	804.25	804.25	.....	805.98	805.75	805.42	805.15	.....	804.85
4	804.05	804.05	804.55	804.15	804.25	.....	805.98	805.76	805.40	.....	804.90	804.85
5	804.15	805.05	804.55	804.15	804.35	.....	805.05	805.74	805.41	.....	.....	804.85
6	804.15	805.15	804.55	804.15	804.45	.....	805.95	805.70	805.34	.....	.....	804.75
7	804.15	805.15	804.55	804.15	804.55	.....	805.95	805.68	805.30	.....	.....	804.75
8	804.15	805.15	804.55	804.05	804.45	.....	805.95	805.70	805.31	805.10	804.90	804.75
9	804.15	805.25	804.65	804.05	804.45	.....	805.92	805.70	805.28	.....	.....	804.75
10	804.35	805.25	804.65	804.05	.....	.....	805.95	805.67	805.25	.....	.....	804.75
11	804.35	805.25	804.65	804.05	.....	.....	805.92	805.67	805.25	.....	.....	804.75
12	804.45	805.25	804.65	804.05	.....	805.70	805.92	805.67	805.25	805.20	.....	804.75
13	804.75	805.15	804.65	804.05	.....	805.70	806.00	805.64	805.22	.....	.....	804.85
14	804.95	805.25	804.65	804.05	.....	805.70	806.02	805.64	805.20	.....	.....	805.15
15	804.75	805.35	804.45	804.05	.....	.....	806.02	805.64	805.20	805.25	.....	805.15
16	804.55	805.35	804.45	804.15	.....	.....	805.95	805.64	805.15	.....	.....	805.45
17	804.55	805.25	804.45	804.15	.....	.....	805.95	805.64	805.18	.....	.....	805.65
18	804.55	805.25	804.45	804.15	.....	805.90	805.92	805.63	805.18	.....	.....	805.55
19	804.15	805.05	804.45	804.25	.....	805.85	805.90	805.63	805.17	805.25	.....	805.55
20	804.15	805.05	804.45	804.25	.....	805.85	805.92	805.62	805.15	.....	.....	805.65
21	804.45	805.05	804.35	804.25	.....	805.85	805.92	805.62	805.15	.....	.....	805.55
22	804.65	804.95	804.35	804.25	.....	805.86	805.88	805.62	805.15	805.20	.....	805.55
23	804.65	804.95	804.35	804.25	.....	805.85	805.88	805.62	805.15	.....	.....	805.55
24	804.75	804.95	804.35	804.25	.....	805.87	805.86	805.60	805.20	.....	.....	805.55
25	804.95	804.85	804.35	804.25	.....	805.87	805.85	805.62	.....	.....	.....	805.65
26	804.95	804.65	804.35	804.25	.....	805.88	805.85	805.62	.....	805.05	.....	805.75
27	805.15	804.55	804.25	804.25	.....	805.88	805.86	805.62	805.20	.....	.....	806.05
28	805.15	804.55	804.25	804.25	.....	805.88	805.85	805.61	.....	.....	.....	806.05
29	805.05	.....	804.25	804.25	.....	805.89	805.84	805.58	.....	805.00	.....	806.25
30	805.05	.....	.....	804.25	.....	805.95	805.82	805.56	805.15	.....	.....	806.25
31	805.05	.....	.....	.....	.....	.....	805.80	805.53	.....	.....	.....	806.25

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Pinawa Channel below Control Dam
(Gauge "E") for 1915 and 1916.*

1915

1916

Day.	Jan.	Feb.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	806.25	807.95	806.15	806.85	806.30	805.55	.....	.....	803.65	.....	.....	.....	.....
2	806.05	805.95	806.25	806.85	806.45	805.45	.....	.....	.....	.....	.....	.....	.....
3	806.15	805.85	806.35	806.85	806.55	805.45	.....	804.06	.....	.....	.....	.....	.....
4	805.95	805.55	806.35	806.85	806.65	805.25	.....	.....	.....	.....	.....	.....	.....
5	805.75	805.45	806.35	806.85	806.65	805.35	.....	.....	.....	.....	.....	803.28	.....
6	805.75	805.45	806.25	806.85	806.55	805.25	.....	.....	.....	.....	.....	.....	.....
7	805.35	805.45	806.25	806.85	806.55	805.15	.....	.....	803.65	803.55	.....	.....	.....
8	805.45	805.45	806.35	806.85	806.55	805.05	.....	.....	.....	.....	.....	.....	.....
9	805.45	805.45	806.45	806.85	806.55	805.05	.....	.....	.....	.....	.....	.....	.....
10	805.25	805.45	806.35	806.85	806.55	805.05	.....	.....	.....	.....	.....	.....	.....
11	805.25	805.25	806.25	806.85	806.45	805.05	.....	.....	.....	.....	.....	.....	803.55
12	805.65	805.15	806.55	806.85	806.45	805.05	.....	.....	.....	.....	.....	.....	.....
13	805.65	805.15	806.55	806.75	806.45	805.05	.....	.....	.....	.....	.....	.....	.....
14	805.95	805.05	806.45	806.65	806.45	805.05	.....	.....	.....	803.35	.....	.....	.....
15	805.95	805.05	806.55	806.45	806.35	805.15	.....	.....	.....	.....	.....	.....	.....
16	805.05	805.05	806.55	806.35	806.35	805.25	806.15	.....	803.65	.....	.....	.....	.....
17	805.15	805.05	806.55	806.25	806.35	805.25	.....	.....	.....	.....	.....	.....	.....
18	805.15	804.95	806.55	806.15	806.35	805.35	806.25	803.75	.....	.....	.....	.....	.....
19	805.15	804.95	806.55	806.05	806.25	805.35	.....	.....	.....	.....	.....	.....	.....
20	805.35	804.85	806.55	806.05	806.15	805.35	.....	.....	803.35	.....	.....	.....	.....
21	805.55	804.85	806.45	806.05	806.15	806.35	.....	.....	.....	.....	.....	.....	.....
22	805.65	804.75	806.35	806.05	806.15	805.35	.....	.....	.....	.....	.....	.....	.....
23	805.65	804.85	806.35	806.15	806.05	805.35	.....	.....	.....	.....	.....	.....	.....
24	805.75	804.85	806.35	806.15	806.05	805.35	.....	.....	.....	.....	.....	803.55	.....
25	805.75	804.75	806.55	806.15	806.05	805.35	.....	803.75	.....	.....	.....	.....	.....
26	805.75	804.75	806.75	806.15	806.05	805.35	.....	.....	.....	.....	803.65	.....	.....
27	805.75	.....	806.65	806.15	806.05	805.45	.....	803.75	.....	803.35	.....	.....	.....
28	805.85	.....	806.65	806.15	806.05	805.45	.....	.....	.....	.....	.....	.....	.....
29	805.95	.....	806.65	806.25	806.05	805.45	.....	.....	.....	.....	.....	.....	.....
30	806.15	.....	806.65	.....	806.05	.....	.....	.....	.....	.....	.....	.....	.....
31	805.95	.....	806.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Levels reduced to Water Power Survey datum.

GAUGES A, B, C AND D—PINAWA CHANNEL.

History.—These gauges were established by E. B. Patterson on May 25 and 26, 1914.

Location.—Gauge A was a vertical staff gauge secured to the side of a small dock just below the first rock cut above the plant.

Gauge B is a vertical staff gauge secured to a post driven into the bed of the stream on the left bank just above the first rock cut above the plant.

Gauge C is a vertical staff gauge secured to a post driven into the bed of the stream on the left bank close to the mouth of a small creek entering the channel above the second rock cut above the plant.

Gauge D is a vertical staff gauge secured to a post driven into the bed of the stream near the left bank above the third rock cut above the plant.

Records Available.—From May 25 to November 7, 1914 intermittent records of daily gauge height are available on these gauges.

*Mean Daily Gauge Height, in Feet, of Pinawa Channel (Gauge "D")
for 1914 and 1916.*

1914

1916

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Oct.
1						888.75	889.38				888.66	
2						888.77	889.32	889.27	888.99			
3						889.07	889.37			888.75		
4								889.17			888.57	
5							889.37	889.14	888.91			
6									888.96			
7									888.89	888.69	888.57	
8							889.37					
9								889.14				
10									888.89			
11						889.17						
12						889.10	889.39	889.14		888.81		
13												
14						889.21	889.37		888.73			
15						889.21				888.80		
16						889.17		889.67				
17							889.33		888.78			
18						889.24				888.77		
19							889.29	889.27				
20												
21						889.31	889.30		888.72			
22								889.07	888.74	888.77		
23							889.27	889.07				
24						889.27		889.05	888.72			887.30
25						889.26						
26					888.61	889.32	889.33	889.04		888.63		
27							889.29		888.80			
28						889.34	889.28	889.06				
29							889.27			888.59		
30						889.31		889.06	888.74			
31												

Levels reduced to Water Power Survey Datum.

Mean Daily Gauge Height, in Feet, of Pinawa Channel (Gauge "C") for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						886.35	886.98				886.30	
2						886.39	886.98	886.89	886.62			
3						886.70	887.01			886.35		
4								886.80			886.20	
5						886.70	887.00	886.79	886.53			
6									886.60			
7									886.51	886.30	886.17	
8							886.92					
9								886.82				
10									886.40			
11												
12						886.80	887.03	886.74		886.45		
13												
14						886.87	886.98		886.40			
15						886.80				886.13		
16								886.75				
17						886.78			886.40			
18							886.98					
19						886.80	887.05	886.68		886.41		
20												
21						886.95	886.94		886.37			
22								886.74	886.35	886.38		
23							886.90		886.72			
24						886.88		886.65	886.35			
25						886.87						
26					886.26		886.95	886.65		886.28		
27									886.45			
28						886.97		886.70				
29							886.88			886.21		
30						886.03		886.74	886.31			
31					886.38							

Levels reduced to Water Power Survey Datum.

Mean Daily Gauge Height, in Feet, of Pinawa Channel (Gauge "B") for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						883.84	884.37				883.95	
2						883.91	884.37	884.41	884.08			
3						884.17	884.41			883.86		
4						884.16		884.21			883.72	
5						884.12	884.42	884.23	883.97			
6												
7						884.11	884.27		884.17			
8						884.26			884.00	883.77	883.61	
9						884.24	884.27					
10						884.17		884.38				
11						884.20			883.92			
12												
13						884.17	884.47	884.17		883.97		
14						884.22						
15						884.35	884.29		883.88			
16						884.31				883.92		
17								884.26				
18						884.16			883.89			
19						884.22	884.40					
20							884.49	884.06		883.94		
21												
22						884.42	884.36		883.88			
23								884.17	883.83	883.88		
24							884.29	884.24				
25						884.25		884.06	883.86			
26												
27					883.79		884.45	884.09		883.79		
28					883.83	884.45			883.98			
29					883.86		884.27	884.09				
30					883.97	884.30			883.69			
31					884.01			884.30	883.77			

Levels reduced to Water Power Survey Datum.

Mean Daily Gauge Height, in Feet, of Pinawa Channel (Gauge "A") for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						881.89	882.26				882.02	
2						881.88	882.24	882.41	881.85			
3						882.20	882.35			881.69		
4						881.87		881.92			881.62	
5						882.04	882.41	882.04	881.75			
6												
7						882.11	881.99		882.19			
8						882.47			881.88	881.42	881.60	
9						882.19	881.99					
10						882.08		882.46				
11						882.00			881.70			
12												
13						882.24						
14						881.99	882.51	881.94	881.54	881.94		
15						881.99						
16						882.41	881.97		881.71			
17						882.28				881.78		
18												
19						881.97		882.21				
20						881.99	882.27		881.77			
21							882.51	881.73		881.80		
22												
23						882.54	882.22		881.69			
24							882.03	882.07	881.66	881.76		
25						882.01		882.24				
26					881.83			881.71	881.60			
27					881.81							
28					881.73		882.48	881.76		881.59		
29					881.71	882.57			881.99			
30					881.78		882.03	881.84		881.49		
31					882.07	882.11		882.39	881.47			

Levels reduced to Water Power Survey Datum.

TAILRACE AND FOREBAY GAUGES AT THE PLANT OF THE WINNIPEG ELECTRIC RAILWAY COMPANY, PINAWA CHANNEL.

History.—These gauges were installed at or about the time the plant commenced to operate and since that time continuous records have been obtained.

Records Available.—The records on these gauges have been obtained from the plant records of the company and are available for periods as follows:—Tailrace gauge records from August 19, 1906 to December 31, 1916, and Forebay gauge records from July 4, 1906 to December 31, 1916. These records as available for 1906 are for daily gauge heights, while for the years following they are the maximum and minimum observed gauge readings. Readings on these gauges are observed hourly.

Mean Daily Gauge Height, in Feet, of Pinawa W.E. Ry. Power Plant at Forebay for 1906.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								84.60	84.40	84.20	83.40	82.80
2								84.70	84.80	84.50	83.70	83.10
3								84.70	84.80	84.60	83.30	82.70
4							85.00	84.70	84.40	83.70	83.80	83.10
5							85.00	84.80	84.00	83.30	83.20	83.00
6							85.00	84.70	84.20	82.20	83.50	82.80
7							85.00	84.60	84.30	83.50	83.80	83.10
8							85.05	84.70	84.20	83.42	84.00	83.10
9							85.00	84.70	84.50	83.90	83.40	83.80
10							84.90	84.80	84.30	83.40	83.90	83.10
11							85.10	85.00	84.70	84.00	83.70	83.20
12							84.90	84.80	84.00	82.50	83.50	83.20
13							84.90	84.80	84.00	82.80	83.60	83.10
14							84.80	84.60	84.00	83.70	83.60	83.00
15							84.80	84.60	84.00	83.80	83.80	83.10
16							84.80	84.40	84.70	83.20	83.80	83.10
17							84.70	84.35	84.20	83.50	83.80	83.10
18							84.80	84.40	84.00	83.20	83.50	83.10
19							84.70	84.70	84.00	83.50	84.00	83.10
20							84.70	84.50	84.00	82.80	84.50	83.10
21							84.70	84.50	84.00	84.00	84.40	84.10
22						85.15	85.00	84.60	84.00	83.80	84.60	84.10
23						85.10	85.80	84.50	84.50	83.80	84.60	84.10
24							85.70	84.60	83.50	83.50	84.50	84.10
25							85.50	84.50	82.90	83.50	84.30	84.10
26							84.80	84.90	83.50	83.40	84.40	84.20
27							84.80	84.60	83.40	83.50	83.40	84.10
28							84.80	84.60	83.00	84.00	83.00	84.10
29							85.00	84.50	83.60	84.00	83.00	84.10
30							84.80	84.40	84.40	83.00	83.30	84.10
31							84.80	84.50	83.80	83.80	83.80	83.80

Relation between Gauge Reading and Datum:—791.78 = Zero of Gauge to W.P.S. datum.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26a

Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1907.

Day.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
1...	84.7	85.0	85.4	86.1	85.7	85.7	86.3	86.1	86.3	86.2	85.9	88.4
2...	83.5	83.9	83.3	84.8	84.9	85.3	85.8	85.6	85.9	85.7	85.1	87.9
3...	84.0	84.9	85.6	86.0	85.8	85.9	86.3	86.1	86.1	86.3	85.9	88.2
4...	83.0	83.9	83.2	84.5	84.8	85.7	85.7	85.6	85.8	85.6	85.2	87.4
5...	84.6	84.9	85.1	85.8	85.6	86.0	86.3	86.1	86.1	86.4	86.0	88.2
6...	82.9	84.0	83.5	84.7	84.9	85.3	85.8	85.6	85.7	85.6	85.7	87.4
7...	83.4	84.9	85.3	85.8	85.8	86.0	86.0	86.2	86.1	86.3	85.9	88.1
8...	83.2	83.8	83.5	84.8	84.9	85.4	85.7	85.9	85.9	85.6	85.0	87.3
9...	84.8	84.8	85.0	85.2	85.9	85.9	86.2	86.2	86.1	86.3	86.2	88.0
10...	83.7	83.8	83.2	84.7	85.5	85.5	85.6	85.5	85.7	85.7	85.3	87.4
11...	85.0	84.9	85.5	85.8	85.8	85.9	86.2	86.1	86.1	86.4	86.4	88.2
12...	84.0	84.0	83.6	84.5	84.5	85.1	85.7	85.6	85.5	86.2	85.4	87.4
13...	85.1	85.0	85.8	85.9	85.8	85.9	86.2	86.0	86.2	86.1	86.2	88.2
14...	83.9	84.0	84.2	85.1	85.0	85.4	86.0	85.6	85.6	86.3	85.3	87.5
15...	85.0	85.0	86.1	86.1	85.7	85.9	86.3	86.1	86.3	86.3	86.3	88.3
16...	84.0	84.3	84.4	85.1	85.0	85.4	85.6	85.6	85.6	85.0	85.0	87.6
17...	85.0	85.1	86.1	86.1	85.7	85.9	86.2	86.2	86.2	86.3	86.5	88.3
18...	83.9	84.1	84.2	85.2	85.0	86.0	86.2	86.2	86.2	86.3	86.5	87.9
19...	84.0	84.1	84.1	85.1	85.0	86.0	86.2	86.1	86.1	86.3	86.3	88.3
20...	83.9	84.1	84.2	85.2	85.1	86.1	86.2	86.2	86.2	86.3	86.5	87.9
21...	84.0	84.1	84.1	85.1	85.0	86.0	86.2	86.1	86.1	86.3	86.3	88.3
22...	85.0	85.1	86.1	86.1	85.7	85.9	86.2	86.2	86.2	86.3	86.5	87.9
23...	83.9	84.1	84.2	85.2	85.1	86.1	86.2	86.2	86.2	86.3	86.5	87.9
24...	84.0	84.1	84.1	85.1	85.0	86.0	86.2	86.1	86.1	86.3	86.3	88.3
25...	83.9	84.1	84.2	85.2	85.1	86.1	86.2	86.2	86.2	86.3	86.5	87.9
26...	84.0	84.1	84.1	85.1	85.0	86.0	86.2	86.1	86.1	86.3	86.3	88.3
27...	85.0	85.1	86.1	86.1	85.7	85.9	86.2	86.2	86.2	86.3	86.5	87.9
28...	83.9	84.1	84.2	85.2	85.1	86.1	86.2	86.2	86.2	86.3	86.5	87.9
29...	84.0	84.1	84.1	85.1	85.0	86.0	86.2	86.1	86.1	86.3	86.3	88.3
30...	83.9	84.1	84.2	85.2	85.1	86.1	86.2	86.2	86.2	86.3	86.5	87.9
31...	84.0	84.1	84.1	85.1	85.0	86.0	86.2	86.1	86.1	86.3	86.3	88.3

Relation between Gauge Reading and Datum:—791.78 = Zero of Gauge to W.P.S. datum.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1908.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	87.9 87.1	87.8 86.0	87.8 87.2	87.6 86.7	88.0 87.5	87.7 87.3	87.0 87.2	87.0 87.5	87.8 87.1	87.5 86.8	88.0 87.0	87.7 86.8
2...	87.0 86.3	88.0 87.3	87.7 86.5	87.0 86.8	88.0 87.5	87.0 87.3	87.0 87.4	87.0 87.7	87.8 87.1	87.5 86.9	87.8 86.7	87.9 86.7
3...	87.9 86.4	88.0 85.5	87.7 86.7	87.7 86.8	88.2 87.9	87.7 87.3	87.8 87.4	87.9 87.2	87.8 87.1	87.5 86.8	87.6 86.7	87.9 86.7
4...	87.7 86.2	87.8 83.9	87.6 86.7	87.7 86.8	88.2 87.6	87.7 87.3	87.7 87.4	87.8 87.2	87.8 87.3	87.9 87.5	87.5 86.7	87.9 86.0
5...	87.9 87.4	87.9 85.9	87.7 86.8	87.8 87.4	88.1 87.7	87.7 87.3	87.8 87.7	87.8 87.2	87.8 87.2	87.9 86.8	87.5 86.4	87.9 86.7
6...	87.9 86.7	88.0 85.1	87.7 86.8	87.8 86.6	88.1 87.8	87.7 87.3	87.8 87.2	87.8 87.4	87.9 87.6	87.0 87.9	87.5 86.7	88.1 87.6
7...	87.8 86.4	88.0 85.6	87.7 86.2	87.5 86.5	88.2 87.8	87.8 87.4	87.0 87.2	87.7 87.4	87.9 86.8	87.6 86.7	87.0 86.7	88.2 86.8
8...	87.7 86.5	87.9 86.0	87.7 87.2	87.6 86.8	88.1 87.6	87.7 87.1	87.6 87.2	87.6 87.4	87.9 86.8	87.6 86.8	87.0 86.5	88.1 87.9
9...	87.7 86.5	88.5 87.8	87.8 86.3	87.5 87.0	87.9 87.4	87.6 87.1	87.0 87.2	87.9 87.5	87.8 87.3	87.6 86.8	87.9 86.9	88.1 86.9
10...	87.8 86.5	88.5 86.0	87.7 86.7	87.7 87.0	87.9 87.7	87.6 87.2	87.0 87.2	87.9 87.5	87.9 87.3	87.6 86.7	87.6 86.5	88.1 86.9
11...	87.8 86.6	88.3 86.4	87.7 86.9	87.7 87.0	88.0 87.3	87.6 87.1	87.0 87.2	87.8 87.4	87.8 87.3	87.8 87.4	87.5 86.7	88.1 87.6
12...	87.9 87.4	88.3 86.0	87.8 86.8	87.9 87.7	87.7 87.3	87.7 87.3	87.7 87.6	87.8 87.4	87.8 87.3	87.9 86.8	87.7 86.6	88.1 86.2
13...	87.9 85.9	88.2 86.8	87.8 86.8	87.9 87.5	87.7 87.3	87.6 87.2	87.8 87.2	87.7 87.5	87.7 86.8	87.0 86.8	87.6 86.6	88.2 86.8
14...	87.7 85.8	88.2 86.5	87.8 86.6	88.0 87.5	87.7 87.3	87.7 87.6	87.7 87.3	87.9 87.5	88.0 87.3	87.6 86.8	87.0 86.7	88.2 87.0
15...	87.7 85.7	88.3 86.8	87.9 87.4	88.0 87.4	87.7 87.3	87.8 87.3	87.7 87.3	87.9 87.4	87.8 87.3	87.6 86.8	87.9 87.5	88.1 87.0
16...	87.8 85.8	88.4 87.7	87.9 86.6	88.0 87.5	87.7 87.3	87.8 87.3	87.7 87.2	87.9 87.7	87.8 87.3	87.6 86.7	87.9 86.6	88.1 87.0
17...	87.7 86.0	88.3 86.0	87.8 86.5	88.1 87.8	87.9 87.6	87.7 87.3	87.7 87.2	87.9 87.4	87.8 87.3	87.5 86.7	87.6 86.7	88.2 86.9
18...	87.7 86.1	88.0 86.8	87.8 86.6	88.2 87.8	87.9 87.3	87.7 87.3	87.7 87.2	87.9 87.5	87.8 87.1	87.8 87.6	87.6 86.7	88.1 86.9
19...	88.1 87.7	88.1 86.7	87.7 86.7	88.3 88.1	87.8 87.2	88.0 87.3	87.9 87.7	87.9 87.5	87.7 87.2	87.7 86.8	87.6 86.8	88.1 87.0
20...	88.2 86.7	87.8 86.7	87.8 86.7	88.3 87.8	87.8 87.1	87.8 87.3	87.8 87.4	87.8 87.4	87.8 87.7	87.0 86.7	87.7 86.8	88.2 87.7
21...	88.0 86.7	87.8 86.6	87.9 86.8	88.2 87.8	87.8 87.2	87.9 87.6	87.8 87.5	87.7 87.2	87.9 87.3	87.6 86.5	87.7 86.8	88.2 87.0
22...	88.0 86.5	87.7 86.7	88.1 87.5	88.1 87.8	87.8 87.2	87.9 87.4	87.8 87.4	87.7 87.3	87.8 87.1	87.6 86.8	87.0 86.7	88.0 86.8
23...	87.9 86.3	87.9 87.2	88.0 86.9	88.2 87.8	87.9 87.3	87.7 87.2	87.8 87.4	87.9 87.7	87.7 87.0	87.6 86.7	87.9 86.7	88.1 86.7
24...	87.7 85.9	87.7 86.8	87.8 86.8	88.1 87.6	87.9 87.7	87.8 87.2	87.8 87.4	87.8 87.3	87.7 86.9	87.7 86.8	87.6 86.6	88.1 86.6
25...	87.7 86.2	87.6 86.3	87.8 86.8	88.1 87.5	87.9 87.5	87.8 87.2	87.8 87.4	87.8 87.4	87.7 86.0	87.7 87.0	87.6 86.6	88.1 86.6
26...	87.9 87.6	87.6 86.8	87.7 86.9	88.1 87.8	87.9 87.3	87.8 87.2	87.9 87.7	87.8 87.4	87.6 86.9	87.9 86.7	87.7 86.7	88.2 86.7
27...	87.0 86.4	87.5 85.3	87.8 87.9	88.1 87.5	87.8 87.4	87.7 87.2	87.9 87.4	87.8 87.4	87.9 87.6	87.7 86.9	87.7 86.7	88.3 86.7
28...	87.7 86.1	87.6 86.1	87.8 86.9	88.0 87.5	87.7 87.4	88.0 87.6	87.8 87.4	87.8 87.5	87.9 86.9	87.7 86.9	87.9 87.1	88.3 87.1
29...	87.8 86.5	87.6 86.0	87.9 87.4	88.0 87.5	87.8 87.4	87.7 87.2	87.9 87.4	87.8 87.3	87.5 86.9	87.6 86.8	88.1 86.7	88.3 86.7
30...	87.8 86.4	.....	87.9 86.6	88.0 87.5	87.8 87.3	87.7 87.2	87.9 87.4	87.8 87.6	87.5 86.8	87.0 86.7	88.0 86.7	88.3 86.7
31...	87.9 86.1	.....	87.7 86.5	.....	87.6 87.5	.....	87.8 87.4	87.8 87.4	.....	87.6 86.8	.....	88.3 86.7

Relation between Gauge Reading and Datum:—791.75 = Zero of Gauge to W.P.S. datum.

MANITOBA HYDROMETRIC SURVEY

241

SESSIONAL PAPER No. 26a

Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1907.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	86.2	86.8	86.8	86.2	87.8	87.8	87.4	87.5	87.5	87.5	86.2	No
2...	87.5	86.7	86.6	86.4	86.9	87.0	86.8	86.8	86.4	86.4	86.8	Record
3...	87.2	85.3	86.4	86.3	87.8	87.0	86.8	86.2	86.6	86.4	86.8	86.7
4...	87.8	86.3	86.6	86.6	87.1	87.0	86.9	86.3	86.1	87.4	87.6	86.8
5...	87.1	86.8	86.4	87.5	87.2	87.0	87.1	86.2	86.8	86.3	86.9	86.6
6...	86.5	86.9	86.5	87.0	87.2	86.5	86.8	86.8	87.3	86.1	86.6	86.2
7...	87.0	86.8	86.3	86.9	87.2	87.0	86.8	86.5	87.7	87.3	87.8	86.4
8...	86.3	87.0	87.3	86.7	87.8	87.2	87.4	87.2	86.9	86.8	86.9	86.0
9...	87.8	86.5	86.4	86.8	87.1	86.3	86.6	86.4	86.6	86.2	86.1	86.4
10...	86.2	86.8	86.1	86.2	86.0	87.1	87.4	86.8	86.5	86.3	86.3	86.5
11...	87.9	88.1	88.0	88.4	87.8	87.1	87.5	87.3	87.5	87.8	88.4	88.8
12...	85.9	85.1	86.0	87.7	87.3	86.2	87.3	86.5	86.5	86.0	87.4	88.0
13...	87.7	88.0	88.1	88.4	87.8	86.1	87.5	87.5	87.7	87.4	88.3	88.6
14...	85.8	85.7	86.0	86.8	87.3	86.9	87.5	87.5	87.8	87.5	88.3	88.5
15...	87.6	88.1	88.2	88.1	87.8	87.2	87.3	87.8	87.4	87.5	88.5	88.5
16...	86.8	86.4	87.0	87.0	87.2	86.3	86.2	86.8	86.4	86.3	88.1	88.0
17...	87.8	88.4	88.1	88.2	87.8	87.1	87.4	87.7	87.4	87.4	88.5	88.2
18...	86.3	84.7	85.0	86.9	87.2	86.3	86.4	87.4	86.8	86.3	87.3	87.9
19...	87.8	88.0	87.9	88.2	87.9	87.1	87.4	87.7	87.4	87.5	88.3	88.4
20...	86.7	85.3	84.2	86.9	87.3	86.2	86.4	86.9	86.4	86.8	87.4	87.8
21...	87.3	85.6	85.9	86.9	86.7	86.2	87.4	87.8	87.4	87.8	88.6	88.4
22...	87.0	88.1	88.2	88.2	87.4	87.1	87.5	87.6	87.5	87.4	87.4	87.8
23...	86.9	86.0	86.2	87.6	86.6	86.2	87.0	87.1	86.3	86.5	88.3	88.8
24...	87.9	88.2	88.1	88.2	87.3	87.1	87.5	87.6	87.7	87.5	87.4	87.7
25...	86.4	86.2	86.1	87.1	86.9	86.2	86.8	87.1	87.3	86.4	88.3	88.7
26...	87.8	88.3	88.1	88.1	87.4	87.3	87.4	87.5	87.6	87.7	88.2	88.0
27...	87.1	86.4	86.0	86.9	86.8	86.8	86.8	86.8	86.5	86.8	88.2	88.8
28...	88.0	88.5	88.4	88.1	87.5	87.3	87.4	87.4	87.5	87.8	88.5	88.4
29...	86.9	87.5	87.1	86.9	86.9	86.3	86.7	86.4	86.4	86.7	88.1	87.7
30...	87.1	86.4	85.8	86.8	86.9	87.1	87.4	87.6	87.5	87.7	88.5	88.4
31...	88.0	88.6	88.1	88.0	87.8	86.2	86.8	87.4	86.4	86.5	87.3	87.7
1...	87.3	86.1	85.7	87.0	87.5	86.1	86.8	87.8	87.5	87.7	88.3	88.5
2...	88.3	88.4	88.1	88.0	87.9	87.0	86.8	86.6	86.8	86.4	87.9	87.6
3...	87.7	85.6	85.7	87.0	87.1	86.0	86.9	86.8	86.4	87.6	87.6	88.5
4...	88.1	88.3	88.1	88.2	87.7	87.1	87.5	87.5	87.5	87.6	87.7	87.5
5...	87.2	86.3	85.7	87.6	87.0	86.2	87.8	86.1	86.4	86.9	88.1	87.7
6...	88.1	88.5	88.0	88.2	87.6	87.2	87.8	87.2	87.7	87.7	88.2	88.2
7...	87.0	86.1	85.8	86.8	87.0	86.5	86.8	86.1	87.4	86.1	88.2	88.2
8...	88.0	88.3	88.0	88.0	87.6	87.3	87.4	87.3	87.7	87.7	88.5	88.7
9...	87.0	86.0	85.9	86.9	87.0	87.1	86.4	86.2	86.5	86.5	87.9	88.0
10...	86.8	87.2	86.0	86.9	87.0	86.4	86.8	86.4	86.5	86.7	88.0	88.6
11...	87.9	86.4	85.7	87.9	87.5	87.3	87.2	87.5	87.5	87.8	88.6	88.4
12...	86.4	86.4	86.0	86.3	87.1	86.7	86.2	86.7	86.5	86.8	88.9	87.4
13...	87.9	86.7	86.3	86.0	87.5	86.6	86.2	86.4	86.4	86.4	88.9	88.6
14...	86.7	86.7	86.3	86.0	87.5	86.6	86.2	86.4	86.4	86.4	88.9	88.6
15...	88.2	86.2	86.2	86.0	87.8	87.0	87.2	87.3	87.3	87.3	88.9	88.6
16...	87.4	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
17...	88.2	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
18...	87.4	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
19...	88.2	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
20...	87.4	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
21...	88.2	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
22...	87.4	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
23...	88.2	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
24...	87.4	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
25...	88.2	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
26...	87.4	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
27...	88.2	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
28...	87.4	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
29...	88.2	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
30...	87.4	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6
31...	88.2	86.5	86.5	86.0	87.0	86.4	86.4	86.5	86.4	86.4	88.9	88.6

Relation between Gauge Reading and Datum:—791.78 = Zero of Gauge to W.P.S. datum.
At 4.38 shut down due to bursting of No. 7 Penstock.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1910.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	88.6	88.9	88.8	88.6	89.0	89.0	88.0	87.8	87.0	88.3	88.7	89.0
2...	87.8	87.8	87.2	88.1	88.7	88.4	87.6	86.9	86.1	86.6	87.1	87.5
3...	87.9	87.9	87.3	88.2	88.3	88.5	87.4	86.9	86.3	87.2	87.4	87.5
4...	88.6	88.9	88.8	88.8	88.9	89.0	88.1	87.8	87.1	88.6	88.9	89.0
5...	87.2	87.9	87.4	88.3	88.3	88.5	87.7	86.9	86.4	86.5	87.5	87.6
6...	88.4	89.0	89.0	88.7	88.8	89.0	88.0	87.6	87.7	87.9	88.9	89.1
7...	87.2	87.6	87.4	87.8	88.4	88.4	87.3	86.9	87.0	86.2	87.4	88.5
8...	88.4	89.0	89.0	88.6	88.9	89.0	87.9	87.7	87.5	88.2	88.5	89.2
9...	87.2	87.7	87.4	88.0	88.4	88.7	87.2	87.0	86.9	87.3	87.5	87.6
10...	88.3	89.1	89.1	88.7	88.9	89.0	87.8	87.8	87.5	88.6	88.7	88.8
11...	87.2	88.5	88.4	88.1	88.4	88.4	87.8	87.1	86.0	87.5	87.8	87.6
12...	88.3	89.2	89.1	88.7	88.9	89.0	87.8	87.8	87.5	88.7	88.7	88.9
13...	87.2	88.0	87.7	88.1	88.4	88.4	87.2	87.4	86.0	87.5	87.5	87.5
14...	88.3	89.0	89.1	88.7	88.9	89.0	87.2	87.1	86.0	87.3	87.7	87.8
15...	87.3	87.6	87.7	88.3	88.9	88.9	87.8	87.6	87.1	88.4	88.9	89.0
16...	88.7	88.9	87.8	88.1	88.4	88.4	87.2	86.9	85.9	88.0	87.5	87.6
17...	88.7	89.0	89.0	88.8	88.9	88.9	88.0	87.5	87.3	88.8	88.8	89.1
18...	87.2	87.4	87.7	88.5	88.9	88.9	87.6	86.9	86.2	87.6	87.6	87.6
19...	88.5	89.0	89.0	88.8	88.9	88.9	87.8	87.8	87.7	88.6	88.8	89.3
20...	87.4	87.0	87.5	88.0	88.7	88.3	87.0	86.6	86.2	87.6	87.3	87.6
21...	88.3	89.0	89.0	88.8	88.9	88.9	87.8	87.8	87.7	88.6	88.8	89.2
22...	87.1	87.5	87.6	88.2	88.3	88.4	87.1	86.5	86.2	87.6	87.4	88.7
23...	88.3	88.9	88.8	88.7	88.9	88.9	87.4	86.9	86.3	87.6	87.6	88.2
24...	87.3	87.7	87.5	88.1	88.4	88.7	87.1	86.7	86.2	87.6	87.5	87.3
25...	88.3	89.1	89.1	88.8	88.9	89.0	87.8	87.8	87.5	88.4	88.7	88.9
26...	88.4	89.2	89.2	88.8	88.8	88.8	87.2	86.7	86.2	87.6	87.6	88.0
27...	87.2	87.5	87.5	88.1	88.4	88.3	87.2	86.7	86.2	87.6	87.6	88.2
28...	88.4	89.2	89.2	88.8	88.8	88.8	87.2	86.7	86.2	87.6	87.6	88.0
29...	87.2	87.5	87.5	88.1	88.4	88.3	87.2	86.7	86.2	87.6	87.6	88.2
30...	88.4	89.2	89.2	88.8	88.8	88.8	87.2	86.7	86.2	87.6	87.6	88.0
31...	87.2	87.5	87.5	88.1	88.4	88.3	87.2	86.7	86.2	87.6	87.6	88.2

Relation between Gauge Reading and Datum:—701.78 = Zero of Gauge to W.P.S. datum.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1911.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	80.1	80.2	80.4	80.4	80.4	80.3	80.4	80.4	80.4	80.5	80.1	80.4
2...	88.5	87.3	88.0	88.0	88.4	88.8	89.0	88.9	88.7	80.2	87.4	87.9
3...	88.2	87.1	87.9	88.9	88.5	88.7	89.2	88.8	88.4	80.6	80.0	80.4
4...	88.0	87.2	88.0	88.2	88.6	88.8	88.8	88.8	88.2	80.3	87.4	87.9
5...	88.3	87.1	88.3	88.2	88.7	89.2	88.8	88.4	88.7	80.4	87.4	89.0
6...	88.1	87.3	87.8	88.2	88.7	89.3	88.8	88.8	88.1	80.4	89.1	89.5
7...	88.1	87.3	88.4	88.2	88.6	88.7	88.8	88.4	88.6	80.4	87.7	88.1
8...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
9...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
10...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
11...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
12...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
13...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
14...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
15...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
16...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
17...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
18...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
19...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
20...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
21...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
22...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
23...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
24...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
25...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
26...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
27...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
28...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
29...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
30...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5
31...	88.1	87.4	88.4	88.2	88.6	88.7	88.8	88.8	88.6	80.4	88.3	88.5

Relation between Gauge Reading and Datum:—791.78 = Zero of Gauge to W.P.S. datum.

¹Plant shut down for 7 hours.

²Plant shut down for two hours owing to slush ice.

³Plant shut down

⁴Sunday.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1912.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	89.6 88.0	89.3 87.6	89.7 87.5	89.6 87.8	88.8 87.9	88.9 88.2	89.0 88.4	88.1 87.0	89.6 89.1	89.5 88.6	89.5 88.4	89.7 88.9
2...	89.6 87.2	89.2 87.4	89.6 87.4	89.2 87.5	88.7 87.9	89.1 88.7	89.0 88.1	87.9 86.8	89.6 89.1	89.5 88.4	89.5 88.3	89.4 87.6
3...	89.4 87.4	89.2 87.4	89.6 88.6	89.2 87.9	88.7 87.9	89.1 88.2	88.7 88.1	88.1 87.0	89.6 89.0	89.5 88.6	89.6 89.2	89.2 88.7
4...	89.5 87.4	89.6 88.8	89.5 87.6	89.2 87.6	88.7 87.8	89.1 88.1	88.8 88.1	88.3 87.7	89.9 89.2	89.5 88.5	89.7 88.4	89.6 88.5
5...	89.6 87.4	89.6 87.6	89.4 87.6	89.2 88.3	88.8 88.3	89.9 88.1	88.7 88.2	88.4 86.4	89.6 88.9	89.5 88.7	89.5 88.4	89.5 88.5
6...	89.6 87.5	89.4 87.4	89.4 87.6	89.3 87.9	89.0 87.8	89.0 88.1	88.7 88.1	87.8 86.5	89.5 88.8	89.5 89.2	89.5 88.4	89.4 88.5
7...	89.6 88.6	89.4 87.4	89.5 87.5	89.4 88.7	88.9 87.8	88.9 88.0	89.0 88.3	87.8 86.6	89.5 89.0	89.6 88.4	89.6 88.5	89.5 88.2
8...	89.6 87.3	89.6 87.4	89.5 87.4	89.3 88.0	88.7 88.0	88.9 88.1	89.0 88.0	87.8 86.6	89.7 89.3	89.5 88.4	89.5 88.4	89.5 88.7
9...	89.5 87.5	89.4 87.6	89.6 87.6	89.2 87.6	88.8 87.6	89.1 88.0	88.8 88.6	87.9 86.2	89.6 88.8	89.5 88.4	89.5 88.4	89.5 88.1
10...	89.5 87.6	89.4 87.6	89.7 88.5	89.1 87.9	88.8 87.9	89.1 88.1	88.7 87.9	87.7 86.0	89.5 88.8	89.6 88.4	89.6 89.0	89.5 88.3
11...	89.5 87.4	89.4 88.2	89.5 87.4	89.1 87.9	88.8 87.9	88.8 88.2	88.8 87.9	88.1 86.6	89.6 88.7	89.5 88.4	89.6 88.4	89.5 88.0
12...	89.5 87.3	89.3 87.4	89.7 87.4	89.2 87.8	88.9 88.3	88.8 88.1	88.8 87.9	88.3 86.7	89.5 88.7	89.5 88.5	89.5 88.4	89.3 87.7
13...	89.5 87.3	89.8 87.5	89.7 87.4	89.2 87.6	88.9 87.9	88.8 88.1	88.8 88.1	87.9 86.4	89.5 88.7	89.6 89.1	89.6 88.3	89.1 87.4
14...	89.6 88.3	89.4 87.4	89.7 87.4	89.3 88.8	88.8 87.9	88.9 88.1	89.0 88.3	87.9 86.6	89.6 88.6	89.6 88.5	89.6 88.5	89.0 87.5
15...	89.6 87.4	89.4 87.4	89.7 87.6	89.4 87.7	89.9 88.0	89.8 88.1	89.0 87.8	88.0 86.7	89.5 89.0	89.5 88.5	89.6 88.5	89.4 88.8
16...	89.6 87.5	89.3 87.4	89.8 87.5	89.2 87.9	88.7 88.0	89.0 88.4	88.7 88.0	88.2 87.1	89.6 88.4	89.5 88.4	89.7 88.5	89.5 88.0
17...	89.6 87.4	89.4 87.3	89.6 88.4	89.1 88.1	88.8 87.8	89.1 88.2	88.7 87.7	88.4 87.4	89.4 88.5	89.5 88.5	89.7 88.4	89.5 87.7
18...	89.6 87.4	89.4 88.5	89.7 88.0	89.1 88.2	88.7 88.0	88.9 88.3	88.7 88.2	88.7 87.8	89.4 88.6	89.5 88.4	89.6 88.5	89.5 88.2
19...	89.4 87.3	89.7 87.6	88.8 86.4	89.2 88.3	89.0 88.3	88.9 88.2	88.7 88.3	88.7 87.3	89.6 88.6	89.5 88.5	89.7 89.5	89.6 88.1
20...	89.2 87.3	89.5 87.4	88.7 85.0	89.2 88.0	89.0 88.0	88.9 88.3	88.7 88.0	88.6 87.2	89.6 88.6	89.6 89.1	89.6 88.5	89.5 88.1
21...	89.3 88.2	89.6 87.4	87.7 86.0	89.3 88.7	88.8 88.0	88.9 88.2	89.0 88.3	88.5 87.6	89.5 88.6	89.6 88.4	89.6 88.6	89.6 88.1
22...	89.3 87.2	89.6 87.4	88.2 86.0	89.4 88.4	88.8 88.0	88.9 88.2	89.0 88.0	88.9 88.0	89.5 89.0	89.6 88.4	89.7 88.6	89.6 89.0
23...	89.2 87.4	89.6 87.3	89.0 86.9	89.3 88.3	88.8 88.1	89.1 88.4	88.7 88.0	89.2 88.5	89.6 88.5	89.6 88.5	89.6 88.5	89.6 88.1
24...	89.1 87.5	89.6 87.5	89.4 88.3	89.4 88.6	88.8 88.4	89.0 88.1	88.7 87.0	89.3 88.8	89.5 88.5	89.6 88.5	89.7 88.5	89.5 88.1
25...	89.1 87.4	90.0 87.7	89.4 86.6	89.4 88.5	89.0 88.2	88.7 88.1	88.8 87.9	89.6 89.0	89.5 88.5	89.5 88.5	89.7 88.6	89.5 88.6
26...	89.3 87.4	89.8 87.5	89.2 87.1	89.5 88.0	89.0 88.4	88.7 88.1	88.8 87.9	89.6 88.7	89.6 88.7	89.6 88.6	89.7 88.6	89.5 87.9
27...	89.3 87.3	89.7 87.5	89.3 86.0	89.4 88.0	89.1 88.0	88.7 88.1	88.8 88.1	88.7 88.6	89.5 88.5	89.6 89.0	89.6 88.6	89.4 87.9
28...	89.8 88.4	89.6 87.5	89.1 87.3	89.1 88.6	88.9 88.0	88.7 88.2	88.9 88.4	89.5 88.7	89.6 88.5	89.7 88.7	89.6 88.6	89.4 88.0
29...	89.6 87.4	89.7 87.5	89.0 87.0	89.1 87.9	88.9 88.1	88.7 88.2	89.0 87.9	89.5 88.7	89.5 88.9	89.6 89.1	89.6 88.6	89.5 88.0
30...	89.3 87.4	.....	89.1 87.1	89.1 87.8	88.8 88.1	89.0 88.4	88.6 87.5	89.5 88.7	89.6 88.5	89.5 89.0	89.6 88.6	89.5 87.9
31...	89.4 87.5	.....	89.1 88.7	89.1	88.9 88.0	.....	88.3 87.1	89.5 88.8	.....	89.5 88.3	.....	89.5 87.9

Relation between Gauge Reading and Datum:—791.78 = Zero of Gauge to W.P.S. datum. s Sunday.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1913.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	89.5	89.2	89.6	89.7	89.8	89.6	89.7	89.4	89.5	89.3	89.2	89.6
2...	88.6	87.2	87.3	87.4	88.2	89.1	89.0	88.3	88.9	88.2	88.1	87.6
3...	89.6	89.4	89.5	89.6	89.3	89.6	89.7	89.4	89.5	89.3	89.3	89.3
4...	88.0	88.4	88.5	87.4	88.3	88.6	88.6	88.6	88.6	88.3	88.7	87.7
5...	89.5	89.4	89.7	89.6	89.3	89.5	89.6	89.5	89.5	89.3	89.3	89.3
6...	87.7	87.3	87.4	87.4	88.5	88.7	88.5	89.0	88.5	88.2	87.8	87.6
7...	89.5	89.2	89.6	89.4	89.5	89.5	89.6	89.5	89.4	89.3	89.1	89.3
8...	87.7	87.3	87.6	87.7	89.0	88.6	88.6	88.6	88.5	88.2	87.8	87.7
9...	89.6	89.3	89.6	89.5	89.7	89.5	89.7	89.4	89.1	89.4	89.1	89.3
10...	88.8	87.3	87.2	88.0	88.4	88.6	88.9	88.5	88.4	88.0	87.9	87.6
11...	89.5	89.3	89.7	89.7	89.4	89.5	89.7	89.4	89.4	89.4	89.1	89.2
12...	87.7	87.3	87.2	88.9	88.4	88.5	89.2	88.5	88.4	88.1	87.8	87.3
13...	89.4	89.4	89.5	89.7	89.4	89.5	89.7	89.4	89.5	89.3	89.1	89.6
14...	87.4	87.4	87.5	87.8	88.4	88.7	88.6	88.4	89.0	88.1	87.7	89.1
15...	89.3	89.4	89.6	89.5	89.4	89.6	89.6	89.4	89.5	89.3	89.1	89.4
16...	87.5	87.0	87.3	87.8	88.4	89.2	88.4	88.4	88.4	88.0	87.8	88.1
17...	89.3	89.4	89.7	89.5	89.4	89.6	89.6	89.4	89.4	89.3	89.3	89.1
18...	87.5	88.3	88.5	87.8	88.4	88.7	88.6	88.4	88.4	88.0	88.6	88.0
19...	89.2	89.5	89.6	89.5	89.4	89.6	89.6	89.5	89.5	89.3	89.2	89.1
20...	87.4	87.4	87.4	88.0	88.6	88.7	88.7	89.0	88.4	88.0	87.6	87.9
21...	89.2	89.5	89.3	89.5	89.6	89.6	89.6	89.6	89.6	89.3	89.1	89.1
22...	87.4	87.3	87.3	88.1	89.1	88.7	88.5	88.8	88.3	88.1	87.7	87.7
23...	88.5	87.3	87.4	88.4	88.5	88.7	88.7	88.4	89.5	89.4	89.1	89.2
24...	89.3	89.6	89.4	89.7	89.5	89.6	89.6	88.4	88.4	88.8	87.7	87.8
25...	87.4	87.3	87.3	89.2	88.6	88.8	89.1	88.4	89.4	89.5	89.1	89.1
26...	89.2	89.5	89.3	89.7	89.5	89.6	89.6	88.4	88.4	89.1	87.6	87.7
27...	87.6	87.4	87.3	88.6	88.6	88.9	88.6	88.4	89.5	89.3	89.1	89.8
28...	89.3	89.6	89.4	89.0	89.5	89.7	89.5	89.6	89.5	89.2	87.6	88.5
29...	87.8	87.2	87.3	88.5	88.7	88.7	89.1	88.5	88.4	88.0	87.8	89.3
30...	89.4	89.7	89.6	89.5	89.6	89.6	89.6	89.4	89.4	89.4	89.1	89.1
31...	87.3	87.5	87.2	89.0	88.7	88.7	89.1	88.1	88.3	88.3	87.8	87.6
1...	89.4	89.7	89.6	89.5	89.5	89.6	89.5	89.5	89.4	89.2	89.3	89.1
2...	87.6	88.5	88.4	88.6	88.7	88.4	88.5	88.6	88.4	88.0	88.5	87.4
3...	89.3	89.8	89.5	89.5	89.6	89.5	89.5	89.6	89.4	89.3	89.4	89.1
4...	87.8	87.4	87.4	88.6	88.8	88.5	88.5	89.0	88.4	88.0	87.6	87.5
5...	89.4	89.7	89.3	89.5	89.6	89.5	89.5	89.5	89.4	89.2	89.1	89.0
6...	87.5	87.4	87.4	88.4	89.2	88.6	88.4	88.5	88.4	88.1	87.8	87.6
7...	89.4	89.8	89.4	89.4	89.7	89.5	89.5	89.5	89.4	89.4	89.1	89.1
8...	88.5	87.6	87.3	88.5	88.7	88.5	88.7	88.4	88.3	88.7	87.6	87.2
9...	89.4	89.8	89.3	89.4	89.5	89.5	89.5	89.4	89.4	89.3	89.1	89.0
10...	87.3	87.5	87.2	89.0	88.7	88.7	89.1	88.1	88.3	88.3	87.8	87.6
11...	89.3	89.7	89.3	89.4	89.5	89.5	89.6	89.4	89.5	89.3	89.2	89.0
12...	87.2	87.4	87.8	88.3	88.7	88.7	88.5	88.4	88.0	87.8	87.4	88.5
13...	89.1	89.7	89.3	89.3	89.6	89.6	89.4	89.4	89.5	89.2	89.1	89.2
14...	87.3	87.4	87.6	88.2	88.7	89.1	88.4	88.4	88.4	87.8	87.8	87.4
15...	89.1	89.7	89.6	89.2	89.6	89.6	89.5	89.4	89.4	89.3	89.3	89.0
16...	87.2	88.6	88.6	88.2	88.6	88.6	88.5	88.5	88.2	87.8	88.4	87.5
17...	89.1	89.7	89.5	89.2	89.6	89.6	89.4	89.5	89.3	89.2	89.3	88.9
18...	87.3	87.3	87.3	88.1	89.0	88.5	88.4	89.0	88.2	87.9	87.7	87.2
19...	89.0	89.6	89.3	89.2	89.7	89.5	89.4	89.5	89.4	89.2	89.2	89.2
20...	87.3	87.3	87.4	87.9	89.3	88.6	88.4	88.4	88.2	87.9	87.5	88.2
21...	89.1	89.7	89.4	89.2	89.7	89.5	89.4	89.4	89.4	89.4	89.2	89.3
22...	88.2	87.3	87.6	88.2	88.7	88.6	88.6	88.4	88.3	88.6	87.6	87.5
23...	89.2	89.6	89.4	89.4	89.6	89.5	89.4	89.4	89.4	89.3	89.2	89.2
24...	87.1	87.4	87.5	88.8	88.7	88.6	89.0	88.4	88.4	87.9	87.7	87.7
25...	89.0	89.6	89.4	89.4	89.5	89.7	89.5	89.4	89.5	89.2	89.2	89.2
26...	87.3	87.4	87.5	88.3	88.7	88.8	88.4	88.4	89.0	87.8	87.7	88.5
27...	89.1	89.4	89.3	89.3	89.7	89.7	89.4	89.4	89.3	89.2	89.3	89.1
28...	87.5	87.4	87.4	88.4	88.7	89.3	88.4	88.4	88.3	87.9	87.8	87.4
29...	89.2	89.6	89.3	89.3	89.6	89.7	89.5	89.4	89.4	89.2	89.4	89.2
30...	87.2	87.2	87.2	88.2	88.7	88.7	88.4	88.5	88.2	87.9	88.7	87.4
31...	89.3	89.6	89.6	89.6	89.6	89.6	89.4	89.5	89.5	89.2	89.1	89.1
1...	87.2	87.8	87.8	88.8	88.8	88.8	88.3	89.0	89.0	87.9	87.4	87.4

Relation between Gauge Reading and Datum: $-791.78 = \text{Zero of Gauge to W.P.S. datum.}$

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1914.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	89.2	89.3	89.6	89.5	89.1	89.4	89.6	89.4	89.3	89.1	89.1	89.0
	88.1	87.9	87.8	87.4	88.2	88.3	88.8	88.4	88.0	87.9	87.9	87.6
2...	89.2	89.1	89.6	89.5	89.2	89.3	89.6	89.4	89.3	89.2	89.2	89.2
	87.4	87.2	87.3	87.4	88.5	88.3	88.6	88.9	88.0	88.1	88.5	87.6
3...	89.1	89.0	89.4	89.4	89.4	89.7	89.6	89.4	89.2	89.2	89.3	89.6
	87.6	87.2	87.4	87.2	88.9	88.5	88.6	88.3	88.0	88.0	88.0	87.8
4...	89.3	89.1	89.5	89.4	89.4	89.4	89.5	89.4	89.2	89.3	89.2	89.1
	88.4	87.2	87.2	87.8	88.3	88.5	88.8	88.4	88.0	88.7	87.9	87.7
5...	89.1	89.2	89.6	89.3	89.2	89.4	89.7	89.4	89.3	89.3	89.2	89.1
	87.3	87.1	87.2	88.6	88.1	88.4	89.1	88.4	88.2	87.8	88.3	87.8
6...	89.1	89.1	89.4	89.3	89.2	89.4	89.7	89.4	89.3	89.1	89.1	89.3
	87.5	87.2	87.2	87.3	88.1	88.7	88.4	88.1	88.8	87.9	88.3	88.7
7...	89.1	89.2	89.5	89.3	89.2	89.5	89.5	89.3	89.3	89.1	89.2	89.3
	87.5	87.2	87.8	87.4	87.0	89.0	88.4	88.8	88.8	87.8	88.2	87.6
8...	89.1	89.5	89.7	89.2	89.1	89.5	89.5	89.3	89.3	89.1	89.1	89.7
	87.5	87.9	88.4	87.4	87.9	88.5	88.5	88.3	88.0	87.8	88.2	88.0
9...	89.0	89.3	89.5	89.3	89.2	89.4	89.5	89.5	89.2	89.1	89.2	89.7
	87.4	87.3	87.3	87.3	88.0	88.3	88.6	88.8	88.0	87.7	88.6	87.9
10...	89.0	89.1	89.4	89.5	89.2	89.4	89.5	89.5	89.2	89.1	89.3	89.2
	87.5	87.2	87.2	88.4	88.7	88.2	88.7	88.5	88.0	87.8	88.2	87.9
11...	89.2	89.2	89.5	89.4	89.2	89.4	89.5	89.3	89.2	89.3	89.0	89.1
	88.3	87.5	87.2	87.5	87.9	88.2	88.8	88.2	88.0	88.6	88.2	87.7
12...	89.0	89.1	89.5	89.2	89.1	89.4	89.7	89.4	89.3	89.3	89.1	89.2
	87.3	87.2	87.3	88.7	87.9	88.3	89.1	88.3	88.0	88.2	88.2	87.8
13...	88.9	89.0	89.6	89.4	89.1	89.4	89.6	89.3	89.3	89.3	89.0	89.0
	87.2	87.1	87.2	87.3	87.8	88.4	88.4	88.2	88.6	87.8	87.8	88.6
14...	88.8	89.1	89.5	89.2	89.0	89.5	89.5	89.3	89.3	89.1	89.1	89.3
	87.3	87.0	87.0	87.3	87.9	89.0	88.5	88.3	87.9	87.9	87.8	87.6
15...	89.0	89.4	89.7	89.2	89.1	89.5	89.5	89.3	89.3	89.2	89.0	89.1
	87.1	87.8	88.4	87.4	87.7	88.3	88.4	88.4	88.0	87.9	87.9	87.4
16...	89.1	89.5	89.7	89.4	89.2	89.4	89.4	89.4	89.3	89.1	89.2	89.1
	87.3	87.3	87.2	87.6	88.1	88.2	88.3	88.8	88.4	87.9	88.3	87.3
17...	89.0	89.1	89.3	89.4	89.2	89.4	89.4	89.5	89.2	89.3	89.2	89.1
	87.3	87.4	87.2	87.5	88.6	88.4	88.3	88.3	88.0	88.0	87.7	87.3
18...	89.2	89.1	89.3	89.4	89.4	89.4	89.5	89.3	89.2	89.3	88.9	89.1
	88.4	87.4	87.3	87.4	87.7	88.3	88.7	88.1	88.0	88.7	87.7	87.4
19...	89.2	89.5	89.5	89.3	89.2	89.4	89.4	89.3	89.3	89.4	89.0	89.1
	87.3	87.8	87.2	88.7	87.9	88.4	89.0	88.2	88.3	88.0	88.7	87.6
20...	89.0	89.4	89.3	89.4	89.1	89.5	89.5	89.3	89.4	89.2	88.9	89.2
	87.1	87.1	87.3	87.5	87.8	88.7	88.4	88.4	88.9	87.9	87.7	88.6
21...	88.9	89.5	89.4	89.4	89.1	89.5	89.4	89.3	89.4	89.2	88.9	89.2
	87.1	87.3	87.3	87.4	87.7	88.7	88.4	88.3	87.9	87.9	87.8	87.3
22...	88.9	89.8	89.5	89.3	89.1	89.5	89.4	89.3	89.2	89.1	88.9	89.2
	87.3	87.0	88.3	87.5	87.6	88.3	88.3	88.5	88.0	87.9	87.8	87.3
23...	88.9	89.5	89.5	89.1	89.1	89.4	89.4	89.4	89.2	89.2	89.1	89.0
	87.3	87.2	87.3	87.6	88.2	88.3	88.3	88.8	87.9	87.8	88.3	87.2
24...	88.9	89.4	89.6	89.2	89.4	89.4	89.4	89.4	89.2	89.1	89.0	89.0
	87.2	87.3	87.2	87.6	88.8	88.2	88.4	88.3	88.0	87.9	87.7	87.4
25...	89.0	89.6	89.3	89.3	89.4	89.4	89.3	89.3	89.2	89.3	89.0	89.1
	88.1	87.3	87.2	87.9	88.7	88.2	88.5	88.2	88.0	88.6	87.7	87.9
26...	89.0	89.6	89.6	89.4	89.4	89.4	89.5	89.3	89.2	89.2	89.0	89.0
	87.8	87.2	87.3	88.8	88.2	88.5	88.9	88.3	88.3	87.8	87.7	87.4
27...	89.0	89.5	89.6	89.3	89.8	89.4	89.5	89.3	89.4	89.1	89.0	89.1
	87.2	87.3	87.3	87.3	88.1	88.5	88.5	88.2	88.8	87.7	87.7	88.2
28...	88.9	89.5	89.6	88.9	89.3	89.5	89.5	89.3	89.3	89.1	89.0	89.0
	87.2	87.2	88.2	87.4	88.1	89.0	88.4	88.4	87.8	87.8	87.8	87.2
29...	88.9	.....	89.0	89.1	89.4	89.7	89.4	89.3	89.1	89.1	89.2	89.1
	87.2	.....	88.4	87.3	88.1	88.8	88.2	88.4	87.8	87.8	88.3	87.2
30...	88.9	.....	89.2	89.1	89.3	89.7	89.4	89.4	89.1	89.1	89.1	89.0
	87.2	.....	87.5	87.3	88.5	88.7	88.3	88.8	87.9	87.8	87.6	87.3
31...	88.9	.....	89.5	.....	89.4	.....	89.4	89.4	.....	89.1	.....	89.1
	87.4	.....	87.2	.....	88.8	.....	88.3	88.1	.....	87.9	.....	87.4

Relation between Gauge Reading and Datum:—791.78 = Zero of Gauge to W.P.S. datum

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1915.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	80.2	89.4	89.4	89.3	89.3	89.6	89.7	89.5	89.2	89.1	89.0	89.1
2...	88.0	87.4	87.3	88.0	88.8	88.8	89.1	89.0	88.2	87.9	87.6	87.9
3...	89.3	89.2	89.2	89.3	89.5	89.6	89.7	89.5	89.2	89.1	89.0	89.1
4...	87.6	87.3	87.4	88.4	89.1	88.8	88.9	88.6	88.2	87.9	87.8	87.9
5...	89.0	89.2	89.2	89.3	89.5	89.6	89.7	89.5	89.2	89.1	89.0	89.1
6...	88.3	87.4	87.6	88.4	88.7	88.8	89.0	88.5	88.2	88.5	87.7	89.3
7...	89.2	87.3	87.3	89.4	89.5	89.5	89.7	89.5	89.2	89.1	88.9	89.3
8...	87.7	87.3	87.5	88.9	88.6	88.6	89.3	88.6	88.5	87.8	87.6	88.0
9...	89.3	89.2	89.2	89.4	89.5	89.6	89.7	89.4	89.3	89.0	89.0	89.3
10...	87.7	87.3	87.5	88.4	88.5	88.8	88.9	88.6	89.1	87.7	87.7	88.7
11...	89.3	89.2	89.3	89.3	89.4	89.6	89.6	89.5	89.3	89.0	89.1	89.4
12...	87.7	87.3	87.6	88.3	88.5	89.1	88.9	88.6	88.6	88.7	87.8	87.9
13...	89.3	89.2	89.4	89.4	89.5	89.5	89.6	89.5	89.3	89.0	89.2	89.3
14...	87.0	88.4	88.6	88.5	88.5	88.8	88.9	88.8	88.0	87.7	88.5	87.8
15...	89.3	89.3	89.3	89.6	89.4	89.5	89.5	89.5	89.1	89.0	89.6	89.2
16...	87.6	87.3	87.2	88.1	88.7	88.7	88.9	88.9	89.1	87.9	87.7	87.8
17...	89.3	89.1	89.3	89.4	89.3	89.5	89.7	89.5	89.1	89.0	89.1	89.2
18...	87.8	87.3	87.6	88.1	89.0	88.7	88.9	88.8	89.1	89.0	89.1	89.2
19...	89.3	89.2	89.3	89.4	89.6	89.5	89.7	89.5	89.1	89.0	89.1	89.0
20...	88.6	87.3	87.2	88.3	88.7	88.7	89.0	88.7	88.0	88.3	87.8	87.7
21...	89.3	89.2	89.3	89.4	89.4	89.5	89.7	89.5	89.0	88.9	89.1	89.2
22...	87.4	87.3	87.4	88.8	88.5	88.8	89.4	88.6	88.0	88.0	89.0	89.2
23...	89.2	89.1	89.3	89.7	89.4	89.6	89.7	89.4	89.2	89.0	89.0	89.2
24...	87.5	87.3	87.3	88.1	88.6	88.9	89.0	88.6	88.7	87.6	87.7	88.3
25...	89.2	89.1	89.3	89.2	89.4	89.6	89.7	89.4	89.2	89.0	89.1	89.0
26...	87.3	87.5	87.8	88.2	89.0	89.2	89.0	88.5	87.9	87.7	87.9	87.5
27...	89.2	89.3	89.5	89.2	89.4	89.6	89.7	89.4	89.0	88.9	89.2	89.0
28...	87.5	87.3	87.3	88.2	88.7	88.8	88.9	88.6	87.9	87.6	88.4	87.4
29...	89.2	89.2	89.5	89.2	89.5	89.5	89.7	89.5	89.0	89.0	89.2	89.0
30...	87.2	87.3	87.3	88.1	88.7	88.7	88.9	88.7	88.4	88.3	87.8	87.8
31...	89.2	89.2	89.2	89.2	89.2	89.2	89.2	89.2	89.2	89.2	89.2	89.2

Relation between Gauge Reading and Datum:—791.78 = Zero of Gauge to W.P.S. datum.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Forebay for 1916.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	89.1	89.2	89.2	89.4	89.5	89.5	89.1	88.7	88.3	88.9	88.6	89.6
2...	87.0	86.7	86.8	87.4	88.4	88.4	88.5	87.2	87.1	87.1	86.0	87.7
3...	87.8	86.7	86.9	88.9	88.3	88.2	88.8	87.2	87.6	86.4	86.2	87.6
4...	86.9	86.6	86.7	87.5	88.4	88.8	87.9	87.5	88.5	86.6	86.0	88.7
5...	86.9	86.7	87.3	87.4	88.6	89.0	87.3	86.7	87.9	85.6	85.7	89.8
6...	86.9	86.7	88.5	87.5	88.6	87.9	87.6	87.8	86.6	86.0	86.4	87.4
7...	89.1	89.7	89.7	89.5	89.6	89.2	89.0	89.0	88.7	88.6	89.2	89.2
8...	87.1	87.4	87.0	87.5	88.8	88.0	87.8	88.5	86.3	86.5	86.1	87.7
9...	89.3	89.3	89.4	89.5	89.6	89.2	89.0	89.1	88.6	88.8	88.7	89.4
10...	87.0	86.6	86.9	87.6	89.2	88.1	87.8	87.7	86.6	86.2	86.1	87.4
11...	89.2	89.2	89.4	89.5	89.6	89.2	89.0	88.9	88.7	88.9	88.6	89.3
12...	86.8	87.0	86.9	88.0	88.7	88.1	88.0	87.1	87.0	87.0	86.2	87.3
13...	89.2	89.4	89.4	89.7	89.6	89.2	89.1	88.8	88.8	89.1	88.8	89.6
14...	86.6	86.6	86.9	88.9	88.7	88.1	88.7	87.0	87.7	87.7	85.8	87.3
15...	89.1	89.5	89.4	89.8	89.6	89.2	89.2	88.8	86.1	89.0	88.6	89.7
16...	86.8	86.8	86.9	88.0	88.4	88.4	87.7	86.8	87.7	86.1	86.2	88.4
17...	89.2	89.7	89.4	89.7	89.5	89.3	89.0	88.7	89.1	88.6	88.7	89.4
18...	86.6	86.6	86.8	88.2	88.5	88.9	87.7	86.4	86.4	86.0	86.8	87.3
19...	89.3	89.8	89.7	89.7	89.5	89.4	89.0	88.6	88.6	88.6	89.5	89.6
20...	87.0	86.6	86.6	87.0	88.0	88.0	87.7	87.5	86.8	86.3	88.0	89.0
21...	89.3	89.6	89.8	89.7	89.7	89.2	89.0	88.9	88.8	88.8	89.4	89.5
22...	86.6	87.3	86.0	88.1	88.7	87.0	87.6	87.6	86.2	86.2	87.1	89.5
23...	89.3	89.6	89.4	89.7	89.6	89.2	89.0	88.9	88.9	88.8	89.4	89.4
24...	86.6	87.0	86.8	88.5	88.6	88.9	87.1	87.4	86.6	87.0	87.3	86.6
25...	89.4	89.2	89.8	89.7	89.6	89.4	88.8	88.9	88.7	88.9	89.3	89.5
26...	87.0	86.7	88.5	88.7	88.6	88.3	87.4	87.9	86.5	86.0	88.0	86.6
27...	89.8	89.4	89.7	89.8	89.6	89.3	88.0	89.1	88.6	88.5	89.5	89.5
28...	86.9	88.2	87.0	88.5	88.9	88.2	87.3	88.5	86.6	86.1	87.5	86.5
29...	89.1	89.4	89.3	89.8	89.8	89.3	89.0	89.1	88.6	88.5	89.4	89.2
30...	87.5	87.1	86.6	88.9	88.9	88.0	87.7	87.1	87.1	86.2	87.5	87.0
31...	89.2	89.2	89.5	89.7	89.6	89.2	89.1	88.8	89.0	88.8	89.8	88.7
1...	86.9	86.7	86.9	88.4	88.5	88.3	87.1	87.4	88.1	86.6	87.6	87.4
2...	89.4	89.2	89.5	89.7	89.6	89.2	89.1	88.8	89.0	88.8	89.8	88.7
3...	86.9	86.7	86.9	88.4	88.5	88.3	87.1	87.4	88.1	86.6	87.6	87.4
4...	89.4	89.2	89.5	89.7	89.6	89.4	89.0	88.9	89.1	88.8	89.4	89.5
5...	86.9	87.0	86.8	88.5	88.6	88.9	87.1	87.4	86.6	87.0	87.3	86.6
6...	89.4	89.2	89.8	89.7	89.6	89.4	88.8	88.9	88.7	88.9	89.3	89.5
7...	87.0	86.7	88.5	88.7	88.6	88.3	87.4	87.9	86.5	86.0	88.0	86.6
8...	89.8	89.4	89.7	89.8	89.6	89.3	88.0	89.1	88.6	88.5	89.5	89.5
9...	86.9	88.2	87.0	88.5	88.9	88.2	87.3	88.5	86.6	86.1	87.5	86.5
10...	89.7	89.4	89.3	89.8	89.8	89.3	89.0	89.1	88.6	88.5	89.4	89.2
11...	87.5	87.1	86.6	88.9	89.3	88.0	87.4	86.9	86.2	86.4	87.2	86.6
12...	89.8	89.2	89.2	89.7	89.8	89.2	88.9	88.8	88.5	89.1	89.3	89.4
13...	86.9	86.9	87.0	88.7	88.6	87.8	87.9	87.0	86.2	87.1	87.6	86.8
14...	89.9	89.1	89.3	89.5	89.6	89.0	89.3	88.8	88.5	89.0	89.4	89.5
15...	88.5	86.8	87.0	89.1	88.5	87.6	88.5	86.7	86.0	86.1	87.5	86.6
16...	89.6	89.1	89.5	89.6	89.6	89.0	89.0	88.7	88.9	88.4	89.3	89.4
17...	86.7	86.8	86.8	88.3	89.1	87.8	87.0	86.5	87.5	86.4	87.5	87.5
18...	89.4	89.1	89.4	89.3	89.8	89.2	88.9	88.7	89.1	88.8	89.4	89.1
19...	86.6	86.8	87.5	88.1	88.5	88.8	87.1	86.6	86.5	86.4	87.9	86.9
20...	89.3	89.1	89.6	89.3	89.6	89.3	88.8	88.6	88.7	88.7	89.5	89.2
21...	86.7	86.6	88.7	88.3	88.6	87.8	87.2	87.2	86.4	86.2	88.6	86.9
22...	89.4	89.5	89.6	89.5	89.6	89.1	88.8	88.9	88.6	88.6	89.6	89.5
23...	86.9	88.1	88.0	88.3	88.7	87.6	87.1	88.3	86.1	86.5	88.0	86.5
24...	89.4	89.5	89.6	89.4	89.7	89.0	88.7	89.0	88.5	88.8	89.4	89.3
25...	86.6	86.9	87.7	88.3	89.1	87.5	87.3	86.7	86.1	86.2	87.8	86.8
26...	89.4	89.3	89.6	89.4	89.7	89.0	88.9	88.6	88.5	88.9	89.4	89.6
27...	86.7	86.7	87.2	88.5	88.5	87.5	87.7	86.2	86.1	86.8	87.7	86.5
28...	89.2	89.4	89.6	89.6	89.6	89.0	89.0	88.8	88.5	89.0	89.3	89.5
29...	89.3	89.4	87.3	89.0	88.5	87.6	88.4	86.5	86.3	86.2	88.1	86.8
30...	86.6	86.6	87.3	88.1	88.5	88.5	86.8	85.5	86.2	86.2	87.1	87.1

Relation between Gauge Reading and Datum:—791.78 = Zero of Gauge to W.P.S. datum.

Mean Daily Gauge Height, in Feet, of Pinawa W. E. Ry. Power Plant at Tail Race for 1906.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1									49.6	48.2	46.9	47.4
2									49.3	47.6	46.6	46.9
3										46.4	46.7	46.9
4									49.5	46.8	45.8	47.3
5									49.6	46.9	47.9	46.6
6												
7									49.6	46.8	46.9	46.8
8									49.5	44.5	46.7	46.9
9									49.5	47.4	46.7	46.4
10									48.9	46.9	46.8	47.2
11									49.0	47.0	47.8	46.2
12						50.8			49.5	46.5	46.0	46.9
13									49.6	47.0	48.1	46.9
14									49.5	46.5	46.7	46.9
15									49.6	45.3	46.6	46.6
16									49.5	47.4	47.4	47.7
17									49.3	47.3	47.8	45.1
18									49.4	46.8	46.9	46.8
19									49.5	46.7	44.9	47.0
20								80.10	49.4	47.3	47.1	47.6
21								50.20	49.3	47.3	46.8	47.4
22								50.10	49.2	45.8	46.9	47.8
23								50.10	49.0	47.9	46.9	46.6
24								50.10	48.8	47.7	46.8	48.2
25								50.90	49.5	47.6	46.8	47.3
26								49.90	48.8	47.5	45.3	46.1
27								49.60	48.3	47.5	47.4	47.5
28								49.80	48.7	47.6	47.0	47.0
29								49.85	48.2	46.2	47.0	47.8
30								49.75	47.7	47.8	47.0	48.1
31								49.75	46.0	47.5	47.0	44.9
								49.55		46.6		47.4

Relation between Gauge Reading and Datum:—791.83 = Zero of Gauge to W.P.S. datum.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Tail Race for 1907.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	48.7	49.3	50.9	53.3	52.5	52.0	52.4	52.4	52.5	52.6	51.7	52.8
2...	44.3	45.0	46.5	52.8	52.0	51.4	52.2	51.9	52.0	52.2	50.9	51.0
3...	49.0	49.4	50.9	53.3	52.6	51.7	52.6	52.3	52.6	52.7	51.5	53.1
4...	43.8	44.0	47.3	52.5	51.7	51.4	52.2	51.9	52.3	52.3	50.9	52.3
5...	48.8	49.3	50.9	53.3	52.4	52.2	52.6	52.4	52.6	52.6	51.5	53.1
6...	45.0	44.5	49.0	52.6	51.8	51.7	52.0	51.9	52.2	52.3	50.9	52.2
7...	48.9	49.3	51.0	53.3	52.4	52.0	52.6	52.3	52.6	52.7	51.6	52.9
8...	44.7	44.5	49.4	52.6	51.7	51.7	52.0	51.9	52.1	52.3	51.0	52.2
9...	48.6	49.3	51.5	53.4	52.3	52.0	52.6	52.5	52.6	52.7	51.6	52.8
10...	44.0	44.0	49.5	52.8	51.7	51.5	52.0	52.0	52.1	52.3	50.8	52.1
11...	48.8	49.3	51.6	53.5	52.4	52.1	52.6	52.3	52.6	52.6	51.8	52.7
12...	45.0	44.0	49.8	52.8	51.8	51.6	52.0	51.9	52.1	52.3	50.5	52.0
13...	49.0	49.4	51.9	53.5	52.3	52.3	52.3	52.3	52.6	52.7	51.8	52.8
14...	45.0	44.0	49.9	52.9	51.4	51.6	51.9	51.9	52.2	52.4	50.8	52.0
15...	48.9	49.2	52.0	53.7	52.0	52.2	52.5	52.3	52.5	52.8	51.8	52.6
16...	44.9	45.0	50.1	53.0	51.4	51.7	52.0	51.9	52.1	52.3	50.7	51.9
17...	49.1	49.3	52.6	53.3	52.2	52.1	52.5	52.4	52.6	52.8	51.8	52.7
18...	44.8	44.9	50.3	52.8	50.9	51.6	51.9	51.9	52.3	52.3	50.7	52.1
19...	49.0	48.8	52.1	53.4	51.9	52.4	52.5	52.4	52.8	52.7	51.5	52.7
20...	44.6	44.9	50.2	52.8	51.2	51.9	51.9	51.9	52.1	52.3	50.7	51.8
21...	49.0	49.2	52.5	53.3	51.9	52.4	52.5	52.0	52.7	52.8	51.6	52.6
22...	44.8	45.4	51.3	52.8	51.2	51.9	51.9	51.9	52.2	52.3	50.9	51.9
23...	48.8	49.3	52.3	53.4	51.8	52.4	52.5	52.4	52.6	52.8	51.7	52.5
24...	45.0	45.4	51.4	52.8	51.1	51.9	51.9	52.1	52.0	52.3	50.5	51.8
25...	49.0	49.2	52.4	53.2	52.0	52.5	52.5	52.4	52.9	52.7	51.7	52.5
26...	44.6	45.1	51.0	52.7	51.4	52.1	52.0	51.8	52.3	52.4	50.6	51.8
27...	49.1	49.0	52.6	53.3	51.8	52.5	52.3	52.3	52.7	52.8	51.6	52.6
28...	45.0	45.4	51.0	52.6	51.1	52.0	52.0	51.9	52.2	52.5	50.6	51.9
29...	49.2	49.2	52.8	53.5	51.8	52.5	52.5	52.4	52.5	52.9	52.0	52.5
30...	45.2	45.3	51.1	52.9	51.1	52.1	52.0	51.9	52.2	52.3	50.8	52.1
31...	49.2	49.3	52.9	53.3	51.7	52.4	52.5	52.4	52.7	52.9	51.9	52.5
32...	45.0	45.4	51.5	52.7	51.1	52.1	51.9	51.9	52.3	52.3	50.7	51.9
33...	44.9	45.2	51.6	52.7	51.2	52.2	51.9	51.9	52.2	52.5	50.8	51.8
34...	49.2	49.5	53.4	53.2	51.7	52.5	52.5	52.3	52.6	52.8	51.9	52.7
35...	45.0	45.5	52.4	52.7	51.1	52.0	51.9	51.9	52.2	51.8	50.0	52.0
36...	49.1	49.0	53.0	53.3	51.7	52.6	52.5	52.4	52.7	52.0	52.0	52.6
37...	45.4	45.0	52.0	52.8	51.1	52.1	52.0	52.1	52.2	51.2	50.0	51.9
38...	49.3	49.0	53.3	53.2	51.8	52.6	52.4	52.3	52.8	52.2	51.7	52.4
39...	45.1	45.5	51.9	52.6	51.3	52.1	51.9	51.9	52.2	51.2	50.7	51.8
40...	49.0	49.5	53.1	53.0	51.8	52.7	52.3	52.4	52.6	51.6	51.7	52.6
41...	45.3	45.3	52.0	52.7	51.2	52.2	51.9	51.9	52.1	51.0	50.7	51.6
42...	49.0	49.4	53.1	53.1	51.8	52.7	52.4	52.4	52.5	51.7	51.7	51.9
43...	44.9	45.3	52.1	52.2	51.2	52.2	51.2	52.0	52.1	50.8	50.5	51.5
44...	49.1	49.5	53.2	53.0	51.8	52.6	52.5	52.5	52.7	51.5	51.5	52.2
45...	45.3	45.3	52.1	52.4	51.2	52.2	51.9	52.0	52.2	50.8	50.6	51.4
46...	49.3	48.9	53.1	53.0	51.8	52.9	52.4	52.5	52.6	51.7	51.3	52.4
47...	45.4	47.5	52.0	52.3	51.2	52.3	52.0	52.0	52.1	50.8	50.5	51.3
48...	49.2	49.5	53.3	52.8	51.8	52.8	52.5	52.4	52.6	51.7	51.6	52.3
49...	45.7	46.3	52.6	52.2	51.2	52.1	52.0	51.9	52.1	50.7	50.8	51.4
50...	49.2	49.5	53.3	52.8	51.7	52.7	52.5	52.5	52.6	51.4	51.7	52.5
51...	45.1	45.6	52.2	52.3	51.2	52.1	52.0	52.1	52.1	50.6	50.5	51.6
52...	48.6	49.5	53.3	52.7	52.0	52.8	52.5	52.5	52.6	51.6	51.8	52.5
53...	45.0	45.6	52.4	52.2	51.4	52.1	52.0	52.1	52.1	50.7	50.5	51.7
54...	49.2	50.4	53.4	52.6	51.8	52.7	52.3	52.5	52.6	51.6	52.0	52.5
55...	48.0	46.2	52.4	52.1	51.2	52.1	51.9	52.0	52.1	51.0	50.5	51.8
56...	49.2	.....	53.2	52.8	51.9	52.6	52.5	52.5	52.5	51.6	52.2	52.5
57...	45.0	.....	52.4	52.4	51.3	52.1	52.0	52.1	52.2	51.0	50.7	51.7
58...	49.3	.....	53.3	52.6	51.9	52.4	52.5	52.5	52.6	51.8	52.7	52.6
59...	45.0	.....	52.5	52.1	51.4	52.1	52.0	52.1	52.3	50.9	51.5	51.9
60...	49.4	.....	53.2	.....	52.0	.....	52.4	52.6	.....	51.5	.....	52.6
61...	45.0	.....	52.3	.....	51.4	.....	51.9	52.1	.....	51.0	.....	51.6

Relation between Gauge Reading and Datum:—701.83 = Zero of Gauge to W.P.S. datum.

MANITOBA HYDROMETRIC SURVEY

251

SESSIONAL PAPER No. 25a

Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Tail Race for 1908.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	52.2	52.5	52.5	52.5	51.2	50.1	50.1	50.0	50.0	50.0	50.0	51.5
2...	51.7	51.3	51.3	51.5	50.5	49.5	49.5	49.5	49.4	49.3	49.1	50.2
3...	52.4	52.5	52.7	52.5	51.1	50.0	50.1	50.0	50.0	50.0	50.5	51.5
4...	51.5	51.2	52.0	51.5	50.4	49.3	49.5	49.4	49.4	49.4	49.6	50.4
5...	52.4	52.9	52.7	52.5	51.1	50.0	50.1	50.3	50.2	50.1	50.5	51.7
6...	51.3	51.8	51.7	51.5	50.4	49.3	49.5	49.6	49.3	49.5	49.1	50.4
7...	52.4	53.1	52.7	52.6	51.1	50.0	50.1	50.2	50.1	49.9	50.4	51.7
8...	51.5	50.9	51.9	51.7	50.6	49.3	49.6	49.5	49.3	48.9	49.2	50.4
9...	52.0	52.6	52.6	52.5	51.1	50.0	50.0	50.1	50.2	50.2	50.5	52.0
10...	51.3	50.6	51.7	51.7	50.5	49.3	49.4	49.5	49.3	49.5	49.2	50.8
11...	52.3	53.1	52.7	52.7	51.1	50.0	50.2	50.1	50.1	49.9	50.5	52.0
12...	51.6	51.1	51.7	52.0	50.5	49.3	49.7	49.4	49.3	49.1	49.1	51.2
13...	52.7	53.0	52.6	52.5	51.0	49.9	50.2	50.1	50.2	50.0	50.4	52.6
14...	51.2	51.0	51.8	51.7	50.6	49.3	49.5	49.4	49.5	49.2	49.2	51.6
15...	52.2	52.9	52.3	52.3	51.0	50.3	50.1	50.0	49.5	50.1	50.1	52.5
16...	51.3	51.1	51.2	51.5	50.6	49.5	49.6	49.5	49.4	49.2	49.0	51.4
17...	52.2	52.5	52.6	52.1	50.5	50.1	50.1	50.0	50.1	50.0	50.3	52.7
18...	51.1	51.1	51.7	51.6	50.0	49.3	49.6	49.5	49.4	49.1	49.3	51.4
19...	52.2	53.0	52.5	52.5	50.3	50.2	50.0	50.1	50.1	50.0	50.6	52.6
20...	51.2	51.8	51.3	51.6	49.7	49.3	49.6	49.6	49.4	49.1	49.1	51.4
21...	52.2	53.2	52.5	52.1	50.4	50.2	50.1	50.0	50.0	49.9	50.5	52.2
22...	51.2	51.3	51.5	51.5	49.8	49.3	49.5	49.5	49.3	49.0	49.5	51.0
23...	52.0	53.3	52.7	52.1	50.1	50.2	49.9	50.1	50.1	50.2	50.6	52.3
24...	51.2	51.7	51.6	51.5	49.4	49.3	49.4	49.5	49.3	49.2	49.2	51.2
25...	52.5	52.9	52.7	52.2	50.1	50.3	50.1	50.1	50.0	50.0	50.6	51.9
26...	51.5	51.6	51.5	51.7	49.4	49.4	49.6	49.5	49.2	49.1	49.1	51.1
27...	52.4	52.9	52.7	52.3	50.1	50.0	50.1	50.1	50.2	50.0	50.6	52.3
28...	51.1	51.7	51.5	51.8	49.4	49.3	49.5	49.4	49.4	49.0	49.1	51.2
29...	52.5	52.8	52.5	52.4	50.1	50.1	50.0	50.1	50.0	50.0	50.1	52.1
30...	51.1	51.6	51.4	51.9	49.4	49.7	49.3	49.5	49.2	49.0	49.1	51.0
31...	52.5	52.7	52.5	52.4	50.1	50.3	50.1	50.2	49.5	49.1	49.2	50.8
1...	51.0	51.5	51.4	51.9	49.4	49.4	49.3	49.5	49.2	49.0	49.1	51.0
2...	52.4	52.7	52.8	52.4	50.2	50.1	50.1	49.5	49.2	49.0	49.5	51.0
3...	51.1	51.8	51.5	51.7	49.4	49.8	49.3	49.6	49.2	49.3	49.1	51.0
4...	52.2	52.7	52.7	52.4	50.3	50.1	50.1	49.5	49.1	49.0	49.1	51.0
5...	51.0	51.5	51.5	51.8	49.7	49.6	49.3	49.5	49.2	49.0	49.1	51.0
6...	52.1	52.7	52.7	51.7	50.2	50.1	50.0	50.1	50.0	50.2	50.5	52.1
7...	51.0	51.4	51.5	51.4	49.5	49.5	49.3	49.5	49.2	49.4	49.1	50.9
8...	52.5	52.7	52.7	51.7	50.1	50.3	50.1	50.2	49.5	50.2	50.5	51.8
9...	51.6	51.5	51.5	51.2	49.5	49.5	49.6	49.5	49.2	49.1	49.2	50.8
10...	52.7	52.6	52.8	51.4	50.3	50.0	50.1	50.2	50.2	50.2	50.5	52.0
11...	51.6	51.5	51.6	51.0	49.6	49.5	49.4	49.5	49.4	49.0	49.2	51.0
12...	52.0	52.7	52.5	51.2	50.4	50.1	50.1	50.1	50.1	50.2	50.2	51.9
13...	51.6	51.4	51.5	50.8	49.5	49.6	49.6	49.5	49.3	49.1	49.0	50.7
14...	52.5	52.4	52.6	51.2	50.3	50.0	50.1	50.1	50.0	50.2	50.4	52.1
15...	51.6	51.4	52.0	50.5	49.5	49.4	49.5	49.4	49.2	49.0	49.5	50.8
16...	52.4	52.7	52.5	51.1	50.2	50.2	50.1	50.2	50.1	50.2	50.6	52.1
17...	51.3	51.9	51.9	50.5	49.5	50.4	49.5	49.5	49.1	49.0	49.0	50.8
18...	52.2	52.7	52.5	51.2	50.2	50.2	50.1	50.1	50.2	50.1	50.6	51.8
19...	51.0	51.8	51.4	50.4	49.7	49.4	49.5	49.4	49.2	49.1	48.9	50.9
20...	52.1	52.7	52.5	51.2	50.4	50.1	50.0	50.1	50.0	50.2	50.5	52.0
21...	51.0	51.6	51.4	50.4	49.8	49.4	49.4	49.4	49.1	49.6	49.0	51.1
22...	52.4	52.7	52.5	51.3	50.3	50.1	50.2	50.1	50.0	50.3	50.8	51.7
23...	51.5	51.3	51.3	50.7	49.7	49.3	49.7	49.4	48.9	49.2	49.0	50.9
24...	52.5	52.7	52.5	51.1	50.3	50.0	50.2	50.0	50.1	50.3	51.0	52.1
25...	51.3	51.0	51.4	50.5	49.5	49.4	49.5	49.4	49.3	49.2	49.9	51.1
26...	52.5	52.6	52.6	51.1	50.3	50.3	50.2	50.1	50.1	50.4	50.6	52.1
27...	51.4	51.4	51.4	50.4	49.7	49.7	49.5	49.4	49.6	49.2	49.9	51.0
28...	52.5	.....	52.8	51.1	50.3	50.2	50.2	50.2	50.1	50.4	51.1	52.0
29...	51.3	.....	52.0	50.5	49.7	49.6	49.5	49.5	49.3	49.1	49.7	51.0
30...	52.6	.....	52.6	51.2	50.1	.....	50.2	50.2	.....	50.4	.....	52.0
31...	51.5	.....	51.6	50.5	49.7	.....	49.5	49.6	.....	49.2	.....	50.8

Relation between Gauge Reading and Datum:—791.83 = Zero of Gauge to W.P.S. datum.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Tail Race for 1909.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	51.7	52.4	52.6	52.5	50.5	49.9	48.8	48.1	48.7	49.4	50.6	.....
2...	50.7	51.2	51.3	51.0	49.8	49.0	47.8	47.5	47.1	47.7	49.4	.....
3...	51.7	52.4	52.3	52.5	50.3	49.9	48.8	49.2	48.8	49.5	50.8	51.3
4...	50.6	50.4	50.8	51.0	49.3	49.0	47.8	47.6	47.0	47.7	49.1	51.3
5...	51.5	52.3	52.4	52.5	50.8	49.9	48.8	49.1	48.9	49.0	50.5	51.6
6...	50.4	50.4	50.8	51.0	49.6	49.0	47.9	47.5	47.1	47.6	49.0	51.2
7...	52.0	52.4	52.3	52.3	50.5	50.0	48.7	49.1	48.8	49.3	50.6	51.9
8...	50.8	51.0	50.7	51.0	49.5	49.0	47.6	47.5	46.7	48.3	49.2	51.3
9...	52.0	52.4	52.2	52.5	50.5	50.0	49.1	48.9	48.6	49.2	50.6	52.1
10...	50.4	51.2	50.7	51.6	49.5	49.0	48.2	47.5	47.1	47.2	49.3	51.2
11...	51.8	52.5	52.4	52.2	50.5	48.4	49.1	49.0	48.9	49.3	50.6	52.1
12...	50.4	51.2	50.8	51.1	49.5	47.2	47.9	47.8	48.0	47.3	49.2	51.3
13...	51.8	52.4	52.2	52.1	50.6	49.0	49.1	48.7	49.2	49.4	50.3	52.1
14...	50.4	50.8	50.7	51.0	49.5	47.8	47.9	47.5	47.8	47.4	49.2	51.3
15...	52.0	52.6	52.4	52.0	50.5	48.8	49.1	48.0	49.1	49.4	51.3	52.0
16...	50.4	51.5	51.1	50.8	49.5	47.2	47.8	47.4	47.8	47.6	49.5	51.3
17...	51.7	52.5	52.3	51.9	50.2	48.8	49.0	49.2	49.1	49.6	51.7	52.2
18...	50.4	51.2	50.6	50.8	49.5	47.1	47.7	47.4	47.8	47.7	50.2	51.2
19...	51.6	52.4	52.3	52.1	50.6	48.8	49.0	49.0	49.2	49.2	51.8	52.3
20...	50.5	51.0	50.6	50.9	49.8	47.1	47.8	47.4	47.6	47.6	50.5	51.7
21...	52.0	52.6	52.2	52.0	50.6	48.8	48.6	49.0	49.1	49.6	51.9	52.3
22...	50.8	50.8	50.6	50.7	49.7	47.2	47.5	47.7	47.6	48.3	50.6	51.7
23...	52.2	52.3	52.1	52.2	50.5	48.8	49.2	48.8	49.0	49.6	51.9	52.3
24...	50.3	50.1	50.3	51.3	49.7	47.1	48.1	47.7	47.5	47.5	50.6	51.7
25...	52.3	52.5	52.3	51.9	50.6	48.2	48.1	49.0	49.3	49.6	51.9	52.3
26...	50.4	50.3	50.8	50.8	49.8	47.0	47.9	47.6	47.8	47.9	50.6	51.9
27...	52.2	52.1	52.0	51.8	50.5	49.0	49.0	48.9	49.0	49.6	51.5	52.3
28...	50.6	50.4	50.4	50.8	49.7	47.7	47.3	47.7	47.6	47.8	50.6	51.9
29...	52.3	52.5	52.3	51.9	50.3	48.8	49.3	48.6	49.0	49.8	52.0	52.4
30...	50.9	51.1	51.1	50.9	49.7	47.0	47.5	47.4	47.5	48.0	51.0	51.9
31...	52.5	52.5	52.3	51.9	49.7	48.8	49.2	48.9	49.1	49.7	51.9	52.5
1...	51.1	50.1	50.0	50.8	48.9	47.0	47.4	48.0	47.5	48.0	50.7	51.8
2...	52.5	52.4	52.1	51.8	49.6	48.8	49.1	48.7	49.1	49.2	51.9	52.5
3...	51.4	50.4	49.5	50.8	48.6	47.0	47.5	48.0	47.6	47.9	50.7	51.9
4...	52.6	52.5	52.1	51.5	49.6	48.7	48.9	48.7	49.2	49.7	51.8	52.5
5...	51.7	50.4	50.3	50.6	48.5	47.0	47.8	47.7	47.8	48.6	50.7	51.9
6...	52.9	52.5	52.2	51.9	49.6	48.8	49.4	48.8	49.0	49.6	51.9	52.4
7...	51.8	50.8	50.5	50.9	48.6	47.0	48.2	47.7	47.6	48.2	50.7	51.8
8...	52.7	52.5	52.2	51.7	49.7	48.3	49.2	49.0	49.3	49.9	51.8	52.7
9...	51.7	51.0	50.4	50.4	48.7	47.0	48.0	47.4	47.4	48.4	50.7	51.9
10...	52.9	52.4	52.0	51.6	49.7	48.9	49.2	48.9	49.3	50.1	51.6	52.6
11...	52.0	51.0	50.3	50.2	48.7	47.7	48.0	47.5	47.8	48.9	50.7	52.0
12...	52.8	52.6	52.6	51.4	49.7	48.7	49.3	48.7	49.3	50.2	51.9	52.5
13...	51.8	51.4	51.1	50.4	48.7	46.9	48.0	47.5	47.8	48.9	51.0	51.8
14...	52.7	52.5	52.3	51.4	49.5	48.7	49.3	48.7	49.3	50.2	51.8	52.6
15...	51.9	50.9	50.6	50.0	48.7	46.9	48.0	47.9	47.5	48.6	50.8	51.9
16...	52.4	52.4	52.3	51.2	49.6	48.6	49.2	48.8	49.3	49.9	52.7	52.7
17...	51.7	50.7	50.5	50.0	49.0	46.9	48.0	47.2	47.5	48.4	.....	52.0
18...	52.5	52.3	52.2	51.0	49.8	48.6	49.0	48.9	49.4	50.0	.....	52.6
19...	51.8	50.3	50.5	50.0	48.7	47.0	48.0	47.1	47.7	49.1	.....	51.8
20...	52.5	52.4	52.4	51.3	49.8	48.8	49.2	48.6	49.1	50.3	.....	52.6
21...	51.5	50.8	50.5	50.2	48.7	47.1	48.5	47.5	47.6	48.8	.....	51.8
22...	52.4	52.4	52.4	51.1	49.8	48.5	49.4	48.6	49.3	50.3	.....	52.8
23...	51.4	50.8	50.5	49.7	48.7	47.3	48.3	46.5	47.6	48.6	.....	52.0
24...	52.5	52.2	52.3	51.1	49.9	49.0	48.9	48.6	49.3	50.6	.....	52.8
25...	51.3	50.5	50.6	49.7	48.7	47.9	47.7	46.6	47.8	49.0	.....	52.0
26...	52.5	.....	52.8	51.0	49.9	48.8	49.0	47.8	49.3	50.6	.....	52.6
27...	51.3	.....	51.4	49.7	48.8	47.6	47.6	46.6	47.7	49.1	.....	51.9
28...	52.4	.....	52.4	50.8	49.6	48.9	49.0	48.6	49.4	50.3	.....	52.5
29...	51.0	.....	50.6	49.6	49.0	47.8	47.5	46.8	47.8	49.2	.....	51.7
30...	52.1	.....	52.6	.....	50.0	.....	49.0	48.6	.....	50.3	.....	52.5
31...	50.9	.....	50.9	.....	49.0	.....	47.5	46.5	.....	49.2	.....	51.8

Relation between Gauge Reading and Datum:—791.83 = Zero of Gauge to W.P.S. datum.

MANITOBA HYDROMETRIC SURVEY

253

SESSIONAL PAPER No. 25a

Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Tail Race for 1910.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	52.7	54.0	54.1	51.9	51.9	51.9	48.8	48.7	47.9	48.0	49.4	50.2
2...	51.8	53.0	53.3	51.3	51.4	51.3	47.8	47.6	46.0	45.4	47.1	48.0
3...	52.6	54.0	54.1	51.9	52.1	51.9	49.0	48.5	47.9	46.9	49.6	50.2
4...	51.6	53.9	54.1	51.2	51.5	51.2	48.0	47.2	46.0	44.6	46.7	48.0
5...	51.6	53.0	53.1	51.0	51.4	51.9	48.6	48.6	48.0	48.0	49.7	50.1
6...	52.6	54.0	54.1	51.9	52.0	51.2	48.0	47.5	46.0	45.9	47.5	48.0
7...	51.5	52.9	53.1	51.1	51.4	51.2	48.0	48.6	47.6	48.4	49.6	50.1
8...	52.7	53.5	54.0	51.8	52.1	51.7	49.0	47.2	46.1	45.0	47.4	48.0
9...	51.6	52.5	53.1	51.0	51.4	51.2	47.8	47.3	46.5	45.0	47.9	49.0
10...	52.8	53.5	53.8	51.9	52.1	51.9	49.0	48.4	47.8	48.4	49.3	50.5
11...	51.5	52.5	53.0	51.0	51.4	51.3	47.8	47.4	46.3	46.2	47.6	48.4
12...	52.8	53.9	54.0	51.8	52.0	51.9	49.0	48.2	47.7	48.5	49.7	50.7
13...	52.8	53.8	53.8	51.8	51.9	51.7	48.9	47.0	46.4	46.4	48.2	49.1
14...	52.6	52.9	53.0	51.0	51.4	51.1	47.8	47.3	47.8	48.5	49.5	50.7
15...	52.8	53.5	53.7	51.8	52.1	51.5	48.9	48.3	45.9	46.5	47.4	49.2
16...	51.7	52.7	52.9	51.0	51.4	51.1	47.7	47.0	47.5	47.1	49.6	50.8
17...	52.8	53.5	53.8	51.7	52.1	51.7	49.6	48.5	47.6	48.4	49.6	50.7
18...	52.2	52.5	52.9	51.0	51.4	51.0	47.6	47.3	45.9	46.9	47.4	49.5
19...	52.9	51.6	53.8	52.0	52.0	51.7	48.9	48.4	47.0	48.6	49.7	50.8
20...	52.1	52.6	52.9	51.2	51.4	51.1	47.9	46.9	44.8	46.7	47.3	49.4
21...	52.8	53.9	53.9	51.9	52.1	51.4	48.8	48.1	48.0	48.7	49.6	51.0
22...	52.0	52.3	52.8	51.1	51.4	51.0	47.7	46.9	46.1	46.4	47.4	49.2
23...	53.0	53.5	53.8	51.8	52.0	51.8	48.8	48.2	47.9	48.6	49.0	51.0
24...	52.1	52.5	52.9	51.1	51.4	51.1	47.8	46.8	46.2	47.1	47.7	49.7
25...	53.0	53.9	54.0	51.9	51.9	51.7	48.8	48.0	47.9	48.4	49.4	51.2
26...	52.2	52.8	53.2	51.2	51.3	51.0	47.5	46.7	45.9	47.1	47.9	49.9
27...	53.1	53.6	54.0	52.0	51.9	51.6	48.8	48.0	47.9	48.3	49.6	51.2
28...	52.3	52.3	53.1	51.2	51.3	51.1	47.5	47.3	45.8	46.6	47.3	49.9
29...	53.1	53.4	54.0	51.9	52.1	51.7	48.9	48.0	48.0	47.6	49.6	50.8
30...	52.3	52.4	53.1	51.2	51.5	51.0	47.6	46.5	45.7	46.0	47.2	49.7
31...	53.2	53.4	53.9	51.9	52.0	51.9	48.5	47.8	47.8	48.6	49.6	50.8
32...	52.6	52.1	53.0	51.2	51.3	51.0	47.4	46.5	45.6	46.8	47.1	49.8
33...	53.2	53.6	54.0	52.0	52.2	51.6	48.9	48.0	47.5	48.8	49.6	50.5
34...	52.6	52.2	53.1	51.4	51.4	51.1	47.9	46.3	46.3	46.4	47.1	49.9
35...	53.2	53.4	53.9	52.0	52.2	51.4	48.9	48.1	48.1	48.3	49.8	50.9
36...	52.3	52.2	53.0	51.2	51.3	51.0	47.5	46.3	46.3	46.2	47.7	49.9
37...	53.4	53.5	53.9	52.0	51.9	51.6	48.8	47.9	47.8	48.9	49.3	51.0
38...	52.4	52.3	53.1	51.3	51.3	51.0	47.6	46.3	45.6	46.8	47.6	49.9
39...	53.1	53.4	54.0	51.9	52.1	51.7	48.9	48.0	48.0	47.6	49.6	50.8
40...	52.3	52.4	53.1	51.2	51.5	51.0	47.6	46.5	45.7	46.0	47.2	49.7
41...	53.2	53.4	53.9	51.9	52.0	51.9	48.5	47.8	47.8	48.6	49.6	50.8
42...	52.6	52.1	53.0	51.2	51.3	51.0	47.4	46.5	45.6	46.8	47.1	49.8
43...	53.2	53.6	54.0	52.0	52.2	51.6	48.9	48.0	47.5	48.8	49.6	50.5
44...	52.6	52.2	53.1	51.4	51.4	51.1	47.9	46.3	46.3	46.4	47.1	49.9
45...	53.2	53.4	53.9	52.0	52.2	51.4	48.9	48.1	48.1	48.3	49.8	50.9
46...	52.3	52.2	53.0	51.2	51.3	51.0	47.5	46.3	46.3	46.2	47.7	49.9
47...	53.4	53.5	53.9	52.0	51.9	51.6	48.8	47.9	47.8	48.9	49.3	51.0
48...	52.4	52.3	53.1	51.3	51.3	51.0	47.6	46.3	45.6	46.8	47.6	49.9
49...	53.1	53.4	54.0	51.9	52.1	51.7	48.9	48.0	48.0	47.6	49.6	50.8
50...	52.3	52.4	53.1	51.2	51.5	51.0	47.6	46.5	45.7	46.0	47.2	49.7
51...	53.2	53.4	53.9	51.9	52.0	51.9	48.5	47.8	47.8	48.6	49.6	50.8
52...	52.6	52.1	53.0	51.2	51.3	51.0	47.4	46.5	45.6	46.8	47.1	49.8
53...	53.2	53.6	54.0	52.0	52.2	51.6	48.9	48.0	47.5	48.8	49.6	50.5
54...	52.6	52.2	53.1	51.4	51.4	51.1	47.9	46.3	46.3	46.4	47.1	49.9
55...	53.2	53.4	53.9	52.0	52.2	51.4	48.9	48.1	48.1	48.3	49.8	50.9
56...	52.3	52.2	53.0	51.2	51.3	51.0	47.5	46.3	46.3	46.2	47.7	49.9
57...	53.4	53.5	53.9	52.0	51.9	51.6	48.8	47.9	47.8	48.9	49.3	51.0
58...	52.4	52.3	53.1	51.3	51.3	51.0	47.6	46.3	45.6	46.8	47.6	49.9
59...	53.1	53.4	54.0	51.9	52.1	51.7	48.9	48.0	48.0	47.6	49.6	50.8
60...	52.3	52.4	53.1	51.2	51.5	51.0	47.6	46.5	45.7	46.0	47.2	49.7
61...	53.2	53.4	53.9	51.9	52.0	51.9	48.5	47.8	47.8	48.6	49.6	50.8
62...	52.6	52.1	53.0	51.2	51.3	51.0	47.4	46.5	45.6	46.8	47.1	49.8
63...	53.2	53.6	54.0	52.0	52.2	51.6	48.9	48.0	47.5	48.8	49.6	50.5
64...	52.6	52.2	53.1	51.4	51.4	51.1	47.9	46.3	46.3	46.4	47.1	49.9
65...	53.2	53.4	53.9	52.0	52.2	51.4	48.9	48.1	48.1	48.3	49.8	50.9
66...	52.3	52.2	53.0	51.2	51.3	51.0	47.5	46.3	46.3	46.2	47.7	49.9
67...	53.4	53.5	53.9	52.0	51.9	51.6	48.8	47.9	47.8	48.9	49.3	51.0
68...	52.4	52.3	53.1	51.3	51.3	51.0	47.6	46.3	45.6	46.8	47.6	49.9
69...	53.1	53.4	54.0	51.9	52.1	51.7	48.9	48.0	48.0	47.6	49.6	50.8
70...	52.3	52.4	53.1	51.2	51.5	51.0	47.6	46.5	45.7	46.0	47.2	49.7
71...	53.2	53.4	53.9	51.9	52.0	51.9	48.5	47.8	47.8	48.6	49.6	50.8
72...	52.6	52.1	53.0	51.2	51.3	51.0	47.4	46.5	45.6	46.8	47.1	49.8
73...	53.2	53.6	54.0	52.0	52.2	51.6	48.9	48.0	47.5	48.8	49.6	50.5
74...	52.6	52.2	53.1	51.4	51.4	51.1	47.9	46.3	46.3	46.4	47.1	49.9
75...	53.2	53.4	53.9	52.0	52.2	51.4	48.9	48.1	48.1	48.3	49.8	50.9
76...	52.3	52.2	53.0	51.2	51.3	51.0	47.5	46.3	46.3	46.2	47.7	49.9
77...	53.4	53.5	53.9	52.0	51.9	51.6	48.8	47.9	47.8	48.9	49.3	51.0
78...	52.4	52.3	53.1	51.3	51.3	51.0	47.6	46.3	45.6	46.8	47.6	49.9
79...	53.1	53.4	54.0	51.9	52.1	51.7	48.9	48.0	48.0	47.6	49.6	50.8
80...	52.3	52.4	53.1	51.2	51.5	51.0	47.6	46.5	45.7	46.0	47.2	49.7
81...	53.2	53.4	53.9	51.9	52.0	51.9	48.5	47.8	47.8	48.6	49.6	50.8
82...	52.6	52.1	53.0	51.2	51.3	51.0	47.4	46.5	45.6	46.8	47.1	49.8
83...	53.2	53.6	54.0	52.0	52.2	51.6	48.9	48.0	47.5	48.8	49.6	50.5
84...	52.6	52.2	53.1	51.4	51.4	51.1	47.9	46.3	46.3	46.4	47.1	49.9
85...	53.2	53.4	53.9	52.0	52.2	51.4	48.9	48.1	48.1	48.3	49.8	50.9
86...	52.3	52.2	53.0	51.2	51.3	51.0	47.5	46.3	46.3	46.2	47.7	49.9
87...	53.4	53.5	53.9	52.0	51.9	51.6	48.8	47.9	47.8	48.9	49.3	51.0
88...	52.4	52.3	53.1	51.3	51.3	51.0	47.6	46.3	45.6	46.8	47.6	49.9
89...	53.1	53.4	54.0	51.9	52.1	51.7	48.9	48.0	48.0	47.6	49.6	50.8
90...	52.3	52.4	53.1	51.2	51.5	51.0	47.6	46.5	45.7	46.0	47.2	49.7
91...	53.2	53.4	53.9	51.9	52.0	51.9	48.5	47.8	47.8	48.6	49.6	50.8
92...	52.6	52.1	53.0	51.2	51.3	51.0	47.4	46.5	45.6	46.8	47.1	49.8
93...	53.2	53.6	54.0	52.0	52.2	51.6	48.9	48.0	47.5	48.8	49.6	50.5
94...	52.6	52.2	53.1	51.4	51.4	51.1	47.9	46.3	46.3	46.4	47.1	49.9
95...	53.2	53.4	53.9	52.0	52.2	51.4	48.9	48.1	48.1	48.3	49.8	50.9
96...	52.3	52.2	53.0	51.2	51.3	51.0	47.5	46.3	46.3	46.2	47.7	49.9
97...	53.4	53.5	53.9	52.0	51.9	51.6	48.8	47.9	47.8	48.9	49.3	51.0
98...	52.4	52.3	53.1	51.3	51.3	51.0	47.6	46.3	45.6	46.8	47.6	49.9
99...	53.1	53.4	54.0	51.9	52.1	51.7	48.9	48.0	48.0	47.6	49.6	50.8
100...	52.3	52.4	53.1	51.2	51.5	51.0	47.6	46.5	45.7	46.0	47.2	49.7

Relation between Gauge Reading and Datum: -791.83 = Zero of Gauge to W.P.S. datum.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Tail Race for 1911.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	50.7	53.2	52.6	51.2	49.7	50.0	49.7	50.2	50.0	49.5	49.2	50.0
	49.8	51.5	51.1	49.8	48.8	49.0	49.1	49.3	49.0	47.3	48.7	49.7
2...	50.8	53.1	52.7	51.2	49.5	49.9	49.6	50.2	49.8	50.0	49.2	50.4
	50.0	51.5	51.3	49.9	48.4	49.0	49.1	49.4	48.8	49.1	47.3	48.8
3...	51.1	53.1	52.5	51.4	49.5	49.9	50.1	49.9	49.7	50.0	49.2	50.0
	49.8	51.4	51.3	50.4	48.5	49.0	49.2	49.3	48.8	48.8	47.3	49.0
4...	51.1	53.0	52.5	51.2	49.3	49.7	50.1	49.9	49.9	50.0	49.2	50.5
	49.8	51.5	51.0	49.9	48.4	49.1	49.3	49.3	49.3	48.8	47.3	49.3
5...	51.3	52.9	52.4	50.9	49.1	50.2	50.0	50.0	49.8	50.0	48.7	50.3
	49.7	51.6	51.1	49.8	48.5	49.1	49.3	49.3	49.2	48.7	47.2	49.1
6...	51.4	53.3	52.4	51.1	49.5	49.8	50.1	49.9	49.7	50.0	49.4	50.4
	49.9	51.9	51.4	49.6	48.4	49.0	49.2	49.2	49.2	48.8	47.4	49.3
7...	51.3	53.0	52.4	50.9	49.2	50.0	50.1	50.3	50.2	49.9	49.3	50.5
	49.9	51.4	51.0	49.6	48.7	49.0	49.1	49.4	49.2	48.8	47.2	49.0
8...	51.0	53.1	52.3	50.7	49.6	50.1	50.1	50.2	49.8	49.6	49.2	50.5
	49.9	51.5	51.0	49.4	48.5	49.0	49.2	49.4	48.9	48.7	47.3	49.0
9...	51.6	53.1	52.3	50.2	49.5	50.1	49.7	50.2	49.8	50.0	49.2	50.3
	50.3	51.4	51.0	49.3	48.5	50.0	49.1	49.4	49.1	49.0	47.2	49.0
10...	51.7	53.1	52.3	50.7	49.5	50.0	50.2	50.1	49.5	50.0	49.2	49.8
	50.1	51.3	51.0	48.8	48.6	49.0	49.4	49.3	48.8	48.8	47.2	49.0
11...	51.7	53.0	52.0	50.5	49.6	49.6	50.1	50.2	49.8	50.0	49.2	50.2
	50.4	51.4	51.0	48.5	48.5	49.0	49.2	49.4	49.2	48.7	47.2	49.0
12...	51.8	53.0	51.9	49.5	49.7	49.8	50.1	50.1	49.8	49.9	48.7	50.2
	50.2	51.3	51.0	48.1	48.6	49.2	49.2	49.4	49.0	48.5	47.2	48.5
13...	51.8	52.9	52.1	49.6	49.5	49.8	50.0	49.9	49.8	49.7	49.6	50.3
	50.2	51.8	51.1	48.2	48.6	49.0	49.3	49.1	49.0	48.2	47.3	49.0
14...	51.9	52.9	52.1	49.5	49.4	49.8	50.1	50.1	49.8	49.6	50.0	50.2
	50.4	51.5	51.1	48.0	48.7	49.1	49.1	49.1	48.8	48.1	47.7	48.8
15...	51.9	52.8	51.9	49.7	50.1	49.7	50.1	50.0	49.9	49.4	50.0	50.4
	50.4	51.2	50.8	48.1	48.8	49.0	49.1	49.4	49.2	47.8	48.2	49.0
16...	52.4	52.7	52.1	49.5	49.8	49.8	49.8	50.1	49.8	49.7	50.0	50.2
	50.9	51.1	50.7	48.1	48.7	49.0	49.1	49.3	49.0	48.3	47.3	49.0
17...	52.4	52.7	52.0	49.8	49.8	49.7	49.9	50.0	49.6	49.5	50.0	50.0
	50.7	51.1	50.8	48.6	48.7	49.1	49.4	49.3	49.0	48.0	47.3	49.0
18...	52.4	52.8	52.1	49.6	49.9	49.6	49.8	50.0	49.8	49.5	50.4	50.3
	50.7	51.1	50.8	48.3	48.7	49.0	49.2	49.2	49.3	48.0	48.2	48.8
19...	52.3	52.6	52.0	49.5	49.8	49.8	49.9	50.0	49.8	49.5	49.8	50.4
	50.7	51.5	50.9	48.2	48.4	49.1	49.2	49.3	49.0	47.8	48.2	49.1
20...	52.4	52.6	52.1	49.4	49.9	49.8	49.9	49.6	49.8	49.4	50.2	50.4
	50.8	51.6	51.2	48.3	48.5	49.1	49.1	48.8	49.0	47.7	48.6	49.2
21...	52.4	52.7	52.1	49.4	49.6	49.8	50.2	50.2	50.0	49.3	50.3	50.3
	50.9	51.1	51.0	48.4	48.8	49.0	49.1	49.1	49.0	47.5	48.1	49.0
22...	52.3	52.6	52.0	49.5	50.0	49.7	50.0	50.0	50.0	48.9	50.0	50.1
	50.9	51.1	51.0	48.3	48.8	49.1	49.2	49.0	49.0	47.1	48.2	48.9
23...	52.8	52.6	52.0	49.3	50.0	50.1	49.9	49.9	50.0	49.4	50.2	49.9
	51.4	51.1	50.8	48.4	48.8	49.2	49.2	49.0	49.0	47.8	48.3	48.5
24...	52.8	52.6	51.8	49.7	49.7	49.9	49.9	49.9	49.8	49.3	50.0	49.6
	51.2	51.3	50.8	48.6	48.9	49.4	49.5	49.0	49.0	47.1	48.2	48.5
25...	52.8	52.5	51.7	49.5	50.0	49.7	49.9	50.0	50.0	49.2	50.1	49.5
	51.3	51.1	50.9	48.5	48.8	49.0	49.4	48.9	49.0	47.2	48.5	48.7
26...	52.9	52.4	51.5	49.5	50.1	49.9	49.9	50.0	49.9	49.3	49.7	50.0
	51.4	51.2	50.7	48.5	48.7	49.3	49.3	49.0	49.0	47.1	48.3	48.7
27...	52.9	52.4	51.6	49.5	50.0	50.1	49.9	49.4	50.0	49.3	50.1	49.9
	51.5	51.3	50.6	48.5	49.0	49.3	49.4	48.8	49.1	47.0	48.3	48.7
28...	52.9	52.5	51.3	49.6	49.5	50.1	49.9	50.0	50.0	49.2	50.0	50.1
	51.4	50.9	50.3	48.4	48.9	49.3	49.4	49.1	49.0	47.2	48.1	48.5
29...	52.8	.....	51.4	49.6	50.1	50.1	49.4	50.0	49.9	48.7	50.2	49.9
	51.5	.....	50.3	48.4	49.1	49.2	49.4	48.9	49.1	47.2	48.7	48.4
30...	53.2	.....	51.2	49.5	50.0	50.1	49.8	50.0	49.9	49.1	50.2	49.9
	51.9	.....	50.0	48.4	49.0	49.2	49.3	48.9	49.1	47.1	48.7	48.2
31...	53.3	.....	51.3	.....	49.9	.....	49.9	50.0	.....	49.3	.....	49.9
	51.5	.....	50.0	.....	49.0	.....	49.4	48.8	.....	47.3	.....	48.5

Relation between Gauge Reading and Datum:—701.83 = Zero of Gauge to W.P.S. datum.

Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Tailrace for 1912.

Day	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	49.8	52.8	52.3	52.0	49.7	49.8	49.4	48.4	49.3	49.9	50.3	49.8
2...	48.9	51.2	50.8	50.6	48.0	48.4	48.7	47.0	48.4	48.5	48.7	48.6
3...	50.4	52.6	52.2	51.9	49.4	49.8	49.7	48.4	49.4	50.0	50.2	50.5
4...	48.5	51.0	50.6	50.3	48.0	48.4	48.7	46.5	48.5	48.5	48.7	50.7
5...	50.4	52.7	52.0	51.9	49.3	50.0	49.6	48.3	49.5	49.9	49.7	50.7
6...	48.4	51.0	50.2	50.2	48.0	48.6	48.6	46.2	48.3	48.5	48.6	48.1
7...	50.6	52.5	52.5	51.8	49.5	49.7	49.5	47.8	50.4	49.9	50.4	50.3
8...	48.7	51.0	50.9	50.3	48.0	48.5	48.7	46.1	48.6	48.5	49.0	50.3
9...	50.9	52.9	52.2	51.7	49.0	50.0	49.5	48.5	49.0	49.9	50.2	50.2
10...	49.1	51.4	50.6	50.3	48.0	48.5	48.5	46.2	49.1	48.5	48.7	48.7
11...	50.0	52.8	52.3	52.0	49.7	50.0	49.7	48.4	49.0	49.5	50.2	50.1
12...	49.1	51.1	50.5	50.9	48.0	48.6	48.6	46.0	48.8	48.7	48.6	48.8
13...	50.0	52.8	52.2	51.9	49.5	50.0	49.3	48.1	49.7	50.0	50.2	50.4
14...	49.3	51.1	50.5	50.8	48.0	48.5	48.6	46.0	48.4	48.9	48.6	49.0
15...	51.5	52.6	52.3	52.3	49.4	49.9	49.8	48.2	49.5	50.0	50.3	50.2
16...	49.9	50.9	50.4	51.2	48.0	48.5	48.7	46.0	48.6	48.6	48.6	48.8
17...	51.5	52.6	52.4	52.2	49.4	49.6	49.6	46.5	49.9	50.1	50.3	50.4
18...	49.9	51.0	50.5	50.9	48.0	48.5	48.6	46.2	48.8	48.6	48.6	49.4
19...	51.8	52.7	52.0	52.1	49.5	50.0	49.6	48.4	49.7	50.1	49.8	50.1
20...	50.0	51.0	50.5	50.6	48.0	48.8	48.6	46.2	48.5	48.6	48.6	48.8
21...	51.8	52.5	52.3	52.2	49.5	49.9	49.5	47.9	49.9	50.1	50.4	50.3
22...	50.0	51.1	51.0	51.0	48.0	48.7	48.5	45.6	48.5	48.5	49.0	48.9
23...	51.8	52.7	52.3	52.1	49.1	49.9	49.6	48.3	49.0	50.0	50.4	50.0
24...	50.0	51.4	50.2	50.8	48.0	48.8	48.6	46.8	48.5	48.6	48.6	48.6
25...	51.9	52.7	52.3	51.0	49.8	49.9	49.5	48.4	49.8	49.6	50.3	49.9
26...	50.2	51.1	50.1	50.7	48.1	48.8	48.6	46.2	48.5	48.6	48.6	48.3
27...	51.9	52.5	52.4	51.5	49.5	49.8	49.1	48.4	50.0	50.0	50.3	49.5
28...	50.4	51.1	50.0	50.5	48.0	48.8	48.4	46.1	48.5	48.5	48.6	48.0
29...	52.3	52.7	52.2	52.0	49.0	49.9	49.7	48.2	49.4	50.1	50.2	49.6
30...	50.9	51.1	50.0	50.6	48.0	48.8	48.6	46.0	48.5	48.7	48.5	48.6
31...	52.4	52.8	52.1	51.8	49.6	49.4	49.6	48.2	49.0	50.0	50.3	50.4
32...	50.6	51.1	50.1	50.3	48.2	48.5	48.5	46.0	48.7	48.7	48.5	48.6
33...	52.4	52.5	51.9	51.6	49.6	49.9	49.6	48.3	49.8	50.1	49.7	49.5
34...	50.0	51.0	50.4	50.2	48.2	48.8	48.4	46.0	48.4	48.7	48.4	48.4
35...	52.3	52.2	52.3	51.2	49.7	49.8	49.1	47.9	48.4	48.7	48.4	48.4
36...	50.9	51.0	50.5	50.1	48.0	48.7	48.3	46.2	48.3	48.7	50.2	50.6
37...	52.4	52.8	51.9	50.4	49.1	49.8	49.4	48.3	49.8	50.1	50.2	49.2
38...	51.0	50.8	50.2	49.5	48.2	48.8	48.6	46.8	48.6	48.7	48.9	50.6
39...	52.6	52.6	51.0	50.7	49.9	49.7	49.7	48.1	49.9	49.7	50.2	49.2
40...	51.0	50.8	50.2	49.3	48.6	48.8	48.4	46.4	48.5	48.6	48.7	49.2
41...	52.3	52.5	51.8	50.0	49.7	49.8	49.3	48.3	49.9	50.3	50.2	50.6
42...	51.1	50.7	50.2	49.0	48.3	48.8	48.5	46.4	48.5	49.0	48.4	49.1
43...	52.6	52.5	51.8	50.3	49.6	49.7	49.8	48.0	49.5	50.2	50.2	50.1
44...	52.0	50.8	50.5	49.1	48.4	48.8	48.7	46.0	48.5	48.7	48.2	49.1
45...	52.7	52.5	52.0	49.4	49.7	49.4	49.7	48.8	50.0	50.2	50.2	50.7
46...	51.3	50.6	50.2	48.2	48.5	48.5	48.5	47.1	48.9	48.8	48.4	49.5
47...	52.7	52.5	51.9	49.2	49.2	49.7	49.7	49.3	50.0	50.0	49.7	50.7
48...	51.3	50.6	50.5	48.0	48.5	48.7	48.5	48.1	48.5	48.7	48.4	49.2
49...	52.8	52.1	52.2	49.9	49.7	49.7	49.6	49.1	49.9	50.2	50.3	50.1
50...	51.4	50.4	50.5	47.6	48.4	48.7	48.5	48.7	48.5	48.8	48.7	49.1
51...	52.8	52.6	52.0	49.5	49.3	49.7	49.6	49.8	49.9	50.2	50.2	50.6
52...	51.4	51.1	50.1	47.7	48.5	48.5	48.3	48.6	48.5	48.7	48.5	49.4
53...	52.7	52.5	51.9	49.5	49.8	49.0	49.5	49.6	49.9	49.7	50.2	50.5
54...	52.1	50.7	50.0	47.6	48.7	48.5	48.4	48.6	48.5	48.7	48.5	49.1
55...	52.5	52.4	52.0	48.9	49.0	49.0	49.3	49.7	49.8	49.9	50.1	50.7
56...	51.0	50.6	51.1	47.7	48.5	48.4	47.9	48.4	48.5	49.0	48.4	49.1
57...	53.0	52.3	52.0	49.6	49.8	49.6	49.7	49.6	49.5	49.8	50.2	50.0
58...	51.6	50.4	50.0	48.0	48.5	48.5	48.4	48.6	48.9	48.9	48.4	49.0
59...	52.8	52.8	52.2	49.4	49.8	49.3	49.2	49.6	50.0	49.7	50.2	50.7
60...	51.3	51.3	50.2	48.0	48.5	48.7	47.6	48.7	48.9	49.0	48.5	49.4
61...	52.8	51.6	51.6	49.8	49.8	49.8	48.4	49.5	49.5	50.3	50.6	50.6
62...	51.3	50.0	50.0	48.4	48.4	47.3	47.3	48.5	48.9	48.9	49.1	49.1

Relation between Gauge Reading and Datum:—791.83 = Zero of Gauge to W.P.S. datum.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Tail Race for 1913.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	50.2	52.5	52.4	51.3	49.8	49.4	49.4	49.4	48.8	49.1	48.6	49.1
	49.0	50.9	50.8	49.7	47.5	45.8	45.4	47.8	48.3	47.3	47.3	47.3
2	50.3	52.4	51.9	51.6	49.8	49.8	49.9	49.4	49.3	48.0	48.3	48.9
	49.4	51.0	50.5	49.6	47.6	45.7	45.4	47.8	48.0	47.8	47.8	47.3
3	50.6	53.4	52.4	51.8	49.8	49.9	49.8	48.3	49.8	49.0	48.9	48.8
	48.9	51.4	50.9	49.7	47.3	45.8	45.4	47.8	47.8	47.8	47.8	47.3
4	50.6	52.6	52.4	51.7	48.7	46.8	49.9	49.8	49.3	48.9	48.3	48.8
	48.6	51.1	50.8	49.3	47.8	45.5	45.4	45.1	47.7	47.3	47.8	47.3
5	50.0	52.7	52.4	51.8	49.8	49.9	49.8	49.4	49.8	48.6	48.7	46.9
	48.6	51.1	50.6	50.2	48.0	45.6	45.8	47.9	47.8	47.3	47.3	47.3
6	50.7	52.8	52.3	51.5	49.5	49.9	49.3	49.4	49.8	49.1	48.6	48.9
	49.1	51.1	50.3	50.1	47.9	45.5	45.4	48.0	47.7	47.6	47.3	47.3
7	50.6	52.4	52.3	52.2	49.5	49.9	49.9	49.8	48.8	49.0	48.9	48.5
	48.8	51.0	50.5	50.7	47.9	45.5	45.5	47.9	47.7	47.8	47.3	47.3
8	50.6	52.7	52.4	52.3	49.6	49.8	49.8	49.4	49.4	49.1	48.8	49.1
	48.7	51.1	50.5	50.6	47.9	45.4	45.3	48.0	48.0	47.3	47.3	47.9
9	50.5	52.3	51.9	52.2	49.5	49.9	49.3	49.4	49.3	49.0	48.2	48.8
	48.6	50.8	50.5	50.6	48.0	45.6	45.3	47.9	47.5	47.3	47.3	47.3
10	50.8	52.6	52.4	52.1	49.5	49.9	49.3	49.0	49.8	49.1	48.9	48.6
	48.6	51.2	51.0	50.5	43.1	48.4	45.8	47.9	47.6	47.3	47.3	47.3
11	50.5	52.7	52.2	51.9	48.9	49.8	49.8	49.1	49.8	48.9	48.8	46.6
	48.5	51.0	50.4	50.5	48.0	45.5	43.4	48.8	47.5	47.3	47.3	47.3
12	50.5	52.6	52.1	51.7	49.6	49.6	49.7	49.5	49.4	48.4	48.9	46.6
	48.6	51.0	50.5	50.2	48.4	46.4	48.8	46.0	47.5	47.3	47.3	47.3
13	51.0	52.7	52.1	50.5	49.6	49.9	49.1	49.4	49.3	48.9	48.8	48.8
	49.5	51.0	50.4	49.7	43.1	46.6	48.3	47.9	47.5	47.5	47.3	47.3
14	51.1	52.6	51.9	50.9	49.6	49.9	49.8	49.4	48.6	48.9	46.6	48.9
	49.2	51.0	50.0	49.6	48.1	45.6	45.5	47.6	47.6	47.3	47.3	47.3
15	51.3	52.8	51.9	50.5	49.5	49.8	49.6	49.6	49.8	48.9	48.6	48.7
	49.6	51.2	50.1	49.0	48.8	45.5	45.3	46.1	48.0	47.3	47.3	47.3
16	51.5	52.6	51.6	49.6	49.6	50.0	49.6	49.4	49.3	48.9	46.2	48.7
	49.9	51.1	50.1	48.0	48.3	48.5	48.1	47.9	47.7	47.3	47.3	47.3
17	51.7	52.6	52.0	49.1	49.9	49.9	49.5	49.3	49.3	48.9	48.9	48.8
	50.1	51.7	50.7	47.4	48.8	48.4	48.1	47.9	47.5	47.3	47.3	47.3
18	51.7	53.0	51.3	49.2	49.1	49.6	49.5	49.5	49.2	48.8	48.6	48.9
	50.1	51.2	50.1	47.5	48.2	45.4	48.1	48.3	47.5	47.3	47.3	47.3
19	51.4	53.0	51.9	49.1	49.7	49.8	49.4	49.4	49.3	48.3	48.8	48.9
	49.9	51.2	50.1	47.4	48.3	45.4	48.0	47.9	47.5	47.3	47.3	47.3
20	51.9	52.9	51.7	48.4	49.7	49.8	49.0	49.4	49.3	48.6	48.8	48.9
	50.5	51.2	50.0	47.5	48.3	45.4	48.0	47.3	47.5	47.3	47.3	47.3
21	51.9	52.8	51.6	49.2	49.7	49.9	49.6	49.4	48.7	49.1	48.8	48.7
	50.2	51.2	50.0	47.8	48.3	48.4	48.2	47.9	47.5	47.3	47.3	47.3
22	51.8	52.7	51.7	49.0	49.7	49.2	49.5	49.4	49.3	48.9	48.8	49.6
	50.1	51.1	50.2	47.5	48.3	45.3	48.0	47.9	47.9	47.3	47.3	48.0
23	51.9	52.2	51.4	49.1	49.7	49.8	49.4	49.3	49.3	48.9	48.1	49.4
	50.3	51.0	50.1	47.4	48.3	45.6	47.9	47.9	47.6	47.3	47.3	47.3
24	51.9	52.5	52.0	49.0	49.3	49.8	49.5	48.8	49.3	48.8	49.0	49.4
	50.3	51.4	50.5	47.6	48.4	45.4	47.9	47.7	47.5	47.3	47.3	47.4
25	51.9	52.6	51.8	49.1	49.3	49.6	49.4	49.5	49.2	48.8	48.9	49.1
	50.5	50.9	50.0	47.3	48.4	45.4	47.9	48.2	47.5	47.3	47.3	47.5
26	51.6	52.4	51.8	49.2	50.0	49.8	49.4	49.3	49.2	48.4	48.9	49.8
	50.4	50.5	50.0	47.3	48.7	45.3	47.8	47.9	47.4	47.3	47.3	48.5
27	52.0	53.2	51.8	48.7	49.8	49.9	48.8	49.4	49.2	48.9	48.8	49.5
	50.8	50.4	50.1	47.3	48.5	45.4	47.9	47.8	47.5	47.3	47.3	47.8
28	51.8	52.3	51.8	49.3	49.8	49.9	49.5	49.3	48.7	49.1	48.9	49.2
	50.3	50.4	49.9	47.9	48.5	45.3	48.2	47.6	47.4	47.3	47.3	47.1
29	52.0	.....	51.7	49.3	49.8	49.2	49.3	49.4	49.4	48.9	48.8	49.7
	50.5	.....	49.9	47.6	48.5	48.4	47.6	47.8	47.9	47.3	47.3	48.3
30	52.3	.....	51.1	49.3	49.8	49.9	49.3	49.3	49.1	48.8	48.1	49.7
	50.6	.....	49.8	47.6	48.5	48.7	47.6	47.8	47.3	47.3	47.3	47.7
31	52.5	.....	51.9	.....	49.8	.....	49.4	48.6	.....	48.8	.....	49.7
	50.8	.....	50.3	.....	48.5	.....	47.7	47.7	.....	47.3	.....	47.7

Relation between Gauge Reading and Datum:—791.83 = Zero of Gauge to W.P.S. datum.

Ry.

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Tail Race for 1914.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	49.4	49.8	51.2	51.0	48.5	48.9	49.1	49.4	49.1	48.7	48.6	48.6
2...	47.8	47.6	49.1	49.1	46.4	47.5	48.1	47.8	47.3	47.0	48.8	48.6
3...	49.3	50.2	51.9	51.1	48.3	48.9	49.5	48.7	49.1	48.6	48.3	48.6
4...	48.0	48.4	49.7	49.0	46.5	47.3	48.1	47.4	47.3	47.0	48.7	48.6
5...	49.7	50.3	51.7	51.1	47.7	49.4	49.5	49.5	49.0	48.7	48.8	48.6
6...	47.0	48.3	49.5	49.0	46.5	48.1	48.1	48.0	47.2	47.0	47.1	48.0
7...	49.3	50.4	51.6	51.0	48.5	49.3	49.5	49.4	49.1	48.3	48.5	48.6
8...	47.9	48.4	49.5	49.0	47.0	47.9	48.1	47.7	47.2	47.0	48.7	48.6
9...	49.9	50.4	51.7	50.2	48.3	49.3	48.8	49.3	48.9	49.0	48.7	48.6
10...	48.5	48.3	49.4	49.0	46.6	47.8	48.0	47.8	47.2	47.3	46.6	48.6
11...	50.0	50.5	51.6	51.2	48.5	49.2	49.2	49.2	48.5	48.6	48.4	48.0
12...	48.2	48.2	49.2	49.4	46.0	47.8	48.1	47.9	47.2	47.0	47.0	48.8
13...	49.5	50.8	51.5	51.2	48.7	48.7	49.6	49.2	49.2	48.5	48.5	48.8
14...	47.8	48.5	49.2	49.2	46.7	47.8	48.1	48.1	48.1	48.1	48.1	48.8
15...	49.3	50.6	51.1	50.9	48.0	49.4	49.6	49.6	49.6	49.6	49.6	49.9
16...	47.3	48.3	49.2	49.0	46.6	48.0	48.0	48.0	48.0	48.0	48.0	49.0
17...	49.4	51.2	51.1	50.9	48.6	49.4	49.4	49.4	49.4	49.4	49.4	48.6
18...	47.3	49.3	49.6	49.0	46.5	47.8	48.1	48.1	48.1	48.1	48.1	49.1
19...	49.4	51.2	51.5	50.5	48.0	49.4	49.4	49.4	49.4	49.4	49.4	48.6
20...	47.4	49.2	49.3	49.0	46.5	47.8	48.1	48.1	48.1	48.1	48.1	47.1
21...	49.2	51.4	51.5	51.5	48.9	49.2	49.2	49.2	49.2	49.2	49.2	49.2
22...	47.6	49.3	49.3	49.1	47.0	47.8	48.1	48.1	48.1	48.1	48.1	49.2
23...	49.6	51.4	51.5	50.4	48.8	49.4	49.4	49.4	49.4	49.4	49.4	47.2
24...	48.0	49.6	49.6	49.2	48.8	48.7	48.7	48.7	48.7	48.7	48.7	49.2
25...	49.4	51.4	51.4	51.1	48.8	49.4	49.4	49.4	49.4	49.4	49.4	49.2
26...	47.6	49.6	49.6	49.1	46.7	47.7	47.7	47.7	47.7	47.7	47.7	49.5
27...	49.4	51.3	51.3	50.4	48.8	49.4	49.4	49.4	49.4	49.4	49.4	49.0
28...	47.5	49.2	49.2	49.1	46.8	47.8	48.0	48.0	48.0	48.0	48.0	49.7
29...	49.7	51.1	50.8	50.3	48.8	49.5	49.5	49.5	49.5	49.5	49.5	48.6
30...	47.8	49.2	49.1	48.2	46.7	47.7	48.2	48.2	48.2	48.2	48.2	49.7
31...	49.9	51.5	51.4	50.3	48.7	49.4	49.4	49.4	49.4	49.4	49.4	48.2
32...	48.3	49.3	49.5	48.2	47.8	47.8	48.6	48.6	48.6	48.6	48.6	48.2
33...	49.3	51.4	51.2	49.3	48.0	49.4	49.5	49.5	49.5	49.5	49.5	49.7
34...	48.3	49.6	49.1	47.1	46.7	47.8	48.0	48.0	48.0	48.0	48.0	49.5
35...	49.7	51.4	51.4	51.1	48.8	49.4	49.4	49.4	49.4	49.4	49.4	49.7
36...	47.6	49.6	49.6	49.2	47.3	48.0	48.0	48.0	48.0	48.0	48.0	49.7
37...	49.8	51.6	51.2	48.1	48.0	49.5	49.5	49.5	49.5	49.5	49.5	49.5
38...	48.4	49.2	49.1	47.1	46.8	47.7	48.0	48.0	48.0	48.0	48.0	49.5
39...	49.6	51.4	51.4	49.0	48.0	49.3	49.6	49.6	49.6	49.6	49.6	49.7
40...	47.6	49.4	49.2	47.3	46.8	47.9	48.2	48.2	48.2	48.2	48.2	49.1
41...	49.9	51.5	51.4	50.3	48.7	49.4	49.4	49.4	49.4	49.4	49.4	49.7
42...	48.3	49.3	49.5	48.2	47.8	47.8	48.6	48.6	48.6	48.6	48.6	49.7
43...	49.3	51.4	51.2	49.3	48.0	49.4	49.5	49.5	49.5	49.5	49.5	49.7
44...	48.3	49.6	49.1	47.1	46.7	47.8	48.0	48.0	48.0	48.0	48.0	49.5
45...	49.7	51.4	51.2	49.1	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.7
46...	47.6	49.6	49.2	47.3	46.8	47.7	48.0	48.0	48.0	48.0	48.0	49.5
47...	49.4	51.3	51.3	50.4	48.8	49.4	49.4	49.4	49.4	49.4	49.4	49.7
48...	47.5	49.2	49.2	49.1	46.8	47.8	48.0	48.0	48.0	48.0	48.0	49.5
49...	49.7	51.1	50.8	50.3	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.5
50...	47.8	49.2	49.1	48.2	46.7	47.7	48.2	48.2	48.2	48.2	48.2	49.1
51...	49.9	51.5	51.4	50.3	48.7	49.4	49.4	49.4	49.4	49.4	49.4	49.7
52...	48.3	49.3	49.5	48.2	47.8	47.8	48.6	48.6	48.6	48.6	48.6	49.7
53...	49.3	51.4	51.2	49.3	48.0	49.4	49.5	49.5	49.5	49.5	49.5	49.7
54...	48.3	49.6	49.1	47.1	46.7	47.8	48.0	48.0	48.0	48.0	48.0	49.5
55...	49.7	51.4	51.2	49.1	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.7
56...	47.6	49.6	49.2	47.3	46.8	47.7	48.0	48.0	48.0	48.0	48.0	49.5
57...	49.4	51.3	51.3	50.4	48.8	49.4	49.4	49.4	49.4	49.4	49.4	49.7
58...	47.5	49.2	49.2	49.1	46.8	47.8	48.0	48.0	48.0	48.0	48.0	49.5
59...	49.7	51.1	50.8	50.3	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.5
60...	47.8	49.2	49.1	48.2	46.7	47.7	48.2	48.2	48.2	48.2	48.2	49.1
61...	49.9	51.5	51.4	50.3	48.7	49.4	49.4	49.4	49.4	49.4	49.4	49.7
62...	48.3	49.3	49.5	48.2	47.8	47.8	48.6	48.6	48.6	48.6	48.6	49.7
63...	49.3	51.4	51.2	49.3	48.0	49.4	49.5	49.5	49.5	49.5	49.5	49.7
64...	48.3	49.6	49.1	47.1	46.7	47.8	48.0	48.0	48.0	48.0	48.0	49.5
65...	49.7	51.4	51.2	49.1	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.7
66...	47.6	49.6	49.2	47.3	46.8	47.7	48.0	48.0	48.0	48.0	48.0	49.5
67...	49.4	51.3	51.3	50.4	48.8	49.4	49.4	49.4	49.4	49.4	49.4	49.7
68...	47.5	49.2	49.2	49.1	46.8	47.8	48.0	48.0	48.0	48.0	48.0	49.5
69...	49.7	51.1	50.8	50.3	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.5
70...	47.8	49.2	49.1	48.2	46.7	47.7	48.2	48.2	48.2	48.2	48.2	49.1
71...	49.9	51.5	51.4	50.3	48.7	49.4	49.4	49.4	49.4	49.4	49.4	49.7
72...	48.3	49.3	49.5	48.2	47.8	47.8	48.6	48.6	48.6	48.6	48.6	49.7
73...	49.3	51.4	51.2	49.3	48.0	49.4	49.5	49.5	49.5	49.5	49.5	49.7
74...	48.3	49.6	49.1	47.1	46.7	47.8	48.0	48.0	48.0	48.0	48.0	49.5
75...	49.7	51.4	51.2	49.1	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.7
76...	47.6	49.6	49.2	47.3	46.8	47.7	48.0	48.0	48.0	48.0	48.0	49.5
77...	49.4	51.3	51.3	50.4	48.8	49.4	49.4	49.4	49.4	49.4	49.4	49.7
78...	47.5	49.2	49.2	49.1	46.8	47.8	48.0	48.0	48.0	48.0	48.0	49.5
79...	49.7	51.1	50.8	50.3	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.5
80...	47.8	49.2	49.1	48.2	46.7	47.7	48.2	48.2	48.2	48.2	48.2	49.1
81...	49.9	51.5	51.4	50.3	48.7	49.4	49.4	49.4	49.4	49.4	49.4	49.7
82...	48.3	49.3	49.5	48.2	47.8	47.8	48.6	48.6	48.6	48.6	48.6	49.7
83...	49.3	51.4	51.2	49.3	48.0	49.4	49.5	49.5	49.5	49.5	49.5	49.7
84...	48.3	49.6	49.1	47.1	46.7	47.8	48.0	48.0	48.0	48.0	48.0	49.5
85...	49.7	51.4	51.2	49.1	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.7
86...	47.6	49.6	49.2	47.3	46.8	47.7	48.0	48.0	48.0	48.0	48.0	49.5
87...	49.4	51.3	51.3	50.4	48.8	49.4	49.4	49.4	49.4	49.4	49.4	49.7
88...	47.5	49.2	49.2	49.1	46.8	47.8	48.0	48.0	48.0	48.0	48.0	49.5
89...	49.7	51.1	50.8	50.3	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.5
90...	47.8	49.2	49.1	48.2	46.7	47.7	48.2	48.2	48.2	48.2	48.2	49.1
91...	49.9	51.5	51.4	50.3	48.7	49.4	49.4	49.4	49.4	49.4	49.4	49.7
92...	48.3	49.3	49.5	48.2	47.8	47.8	48.6	48.6	48.6	48.6	48.6	49.7
93...	49.3	51.4	51.2	49.3	48.0	49.4	49.5	49.5	49.5	49.5	49.5	49.7
94...	48.3	49.6	49.1	47.1	46.7	47.8	48.0	48.0	48.0	48.0	48.0	49.5
95...	49.7	51.4	51.2	49.1	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.7
96...	47.6	49.6	49.2	47.3	46.8	47.7	48.0	48.0	48.0	48.0	48.0	49.5
97...	49.4	51.3	51.3	50.4	48.8	49.4	49.4	49.4	49.4	49.4	49.4	49.7
98...	47.5	49.2	49.2	49.1	46.8	47.8	48.0	48.0	48.0	48.0	48.0	49.5
99...	49.7	51.1	50.8	50.3	48.8	49.5	49.5	49.5	49.5	49.5	49.5	49.5
100...	47.8	49.2	49.1	48.2	46.7	47.7	48.2	48.2	48.2	48.2	48.2	49.1

*Maximum and Minimum Daily Gauge Height, in Feet, of Pinawa W. E. Ry.
Power Plant at Tail Race for 1915.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	50.3	51.9	50.9	49.9	48.3	48.8	48.5	48.6	48.5	48.2	48.1	48.4
2...	48.7	50.8	49.5	48.2	46.9	47.7	47.6	47.5	47.0	46.5	46.4	46.4
3...	50.3	51.9	50.7	49.7	47.9	48.9	48.7	49.0	48.5	48.3	48.1	48.7
4...	48.9	50.3	48.6	48.1	47.0	47.7	47.7	47.9	47.0	46.5	46.0	46.6
5...	50.5	52.0	50.7	49.7	48.4	48.9	48.8	49.0	48.4	47.9	48.1	48.6
6...	48.8	50.4	48.7	48.8	47.3	47.8	47.6	47.6	47.0	46.6	46.1	46.5
7...	51.1	52.1	50.7	49.4	48.3	48.9	48.4	48.9	48.3	48.3	48.1	48.4
8...	49.8	50.5	48.8	47.9	46.9	47.7	47.6	47.6	46.9	46.5	46.1	46.4
9...	51.1	51.9	50.7	50.0	48.4	48.7	49.0	48.9	47.9	48.2	48.2	47.7
10...	49.4	50.4	48.7	47.8	46.9	47.6	47.8	47.7	46.9	46.5	46.0	46.3
11...	50.7	51.8	50.4	48.9	48.4	48.4	48.9	48.9	48.0	48.3	48.1	48.6
12...	49.0	50.2	48.9	47.2	47.0	47.6	47.6	47.6	47.1	46.5	46.0	46.6
13...	51.0	51.6	50.1	48.3	48.5	49.1	48.9	48.8	48.3	48.2	47.7	48.4
14...	49.3	50.3	48.7	47.0	47.0	47.8	47.7	47.5	46.9	46.5	46.2	46.2
15...	50.9	52.1	50.6	48.2	48.4	48.9	48.9	48.4	48.3	48.1	48.6	48.5
16...	49.1	50.7	49.0	46.4	47.1	47.6	47.6	47.6	46.8	46.5	46.3	46.1
17...	51.0	51.9	50.5	48.0	47.9	48.9	48.9	48.7	48.3	48.1	48.2	48.3
18...	49.4	50.4	48.5	46.4	47.0	47.5	47.6	47.8	46.8	46.5	46.5	46.3
19...	50.7	51.8	50.8	48.0	48.7	48.9	48.8	48.9	48.3	47.8	48.4	48.5
20...	49.0	50.4	48.9	46.2	47.3	47.5	47.7	47.6	46.8	46.5	46.3	46.4
21...	51.1	51.7	50.9	47.5	48.5	48.9	48.4	49.0	48.2	47.8	48.3	48.6
22...	49.0	50.2	48.7	46.3	47.1	47.6	47.7	47.0	46.7	46.7	46.3	46.5
23...	51.0	51.6	50.9	48.3	48.5	48.8	48.9	48.9	47.7	48.1	48.3	48.5
24...	49.4	50.1	48.8	46.5	47.1	47.6	47.9	47.6	46.8	46.6	46.0	46.7
25...	51.0	51.1	50.1	48.0	48.5	49.0	48.9	48.9	48.3	48.2	47.7	48.9
26...	49.1	50.0	49.7	46.2	47.2	47.8	47.7	47.5	46.5	46.3	46.1	47.2
27...	51.1	51.6	50.7	48.0	48.5	48.9	48.9	48.5	48.3	48.1	48.4	48.9
28...	49.3	50.1	49.3	46.3	47.2	47.6	47.7	47.5	46.6	46.2	46.4	47.2
29...	51.0	51.5	50.7	48.0	48.0	49.0	48.9	49.1	48.2	48.1	48.4	49.0
30...	49.4	49.7	48.9	46.4	47.4	47.6	47.7	47.7	46.8	46.2	46.2	47.1
31...	51.2	51.4	50.6	47.7	48.7	49.0	48.4	48.9	48.1	48.2	48.3	48.9
32...	49.9	49.7	48.7	46.5	47.2	47.6	47.7	47.4	46.7	46.5	46.2	47.2
33...	51.2	51.7	50.7	48.2	48.6	48.8	49.0	48.9	47.7	48.2	48.3	48.5
34...	49.4	49.5	48.5	46.3	47.3	47.6	48.0	47.5	46.4	46.2	46.2	47.3
35...	51.2	51.2	50.4	48.1	48.6	48.3	49.0	48.8	48.4	48.1	48.3	48.9
36...	49.5	49.5	48.4	46.5	47.2	47.5	47.7	47.4	46.8	46.0	46.1	47.6
37...	51.1	50.7	49.8	48.2	48.6	48.8	49.0	48.8	48.2	48.1	47.8	49.0
38...	49.3	49.3	48.5	46.5	47.3	47.7	47.7	47.4	46.4	46.0	46.0	47.1
39...	51.3	51.0	50.3	48.2	48.6	48.8	48.9	48.3	48.2	48.2	48.4	49.0
40...	49.5	49.7	48.8	46.6	47.4	47.6	47.8	47.4	46.4	46.0	46.5	47.5
41...	51.3	50.9	50.2	48.3	48.3	48.8	48.9	49.0	48.2	48.2	48.4	49.2
42...	49.6	49.1	48.6	46.5	47.6	47.6	47.7	47.6	46.5	46.1	46.4	47.6
43...	51.0	51.0	50.2	48.2	48.5	48.8	48.9	48.8	48.2	47.8	48.4	49.2
44...	49.5	49.0	48.5	46.6	47.7	47.5	47.7	47.4	46.4	46.1	46.4	47.8
45...	51.5	50.9	50.1	47.9	49.0	48.8	48.4	48.8	48.2	48.3	48.4	49.1
46...	50.2	49.0	48.2	46.6	47.6	47.6	47.6	47.4	46.3	46.5	46.3	48.1
47...	51.6	50.9	49.9	48.3	48.9	48.7	49.0	48.8	47.7	48.1	48.4	48.8
48...	49.8	49.0	48.0	47.0	47.6	47.7	47.6	47.3	46.4	46.0	46.3	48.2
49...	51.6	50.9	49.9	48.3	48.9	48.3	48.9	48.6	48.3	48.0	48.4	49.2
50...	50.0	49.2	48.2	46.8	47.7	47.5	47.7	47.1	46.8	45.9	46.2	47.8
51...	51.8	50.3	49.3	48.4	48.9	48.9	48.9	48.6	48.3	48.1	47.8	49.5
52...	49.8	49.1	48.1	46.9	47.7	47.7	47.7	47.1	46.5	45.8	46.2	48.3
53...	51.8	.....	48.3	46.8	48.9	48.9	48.9	48.1	48.3	48.1	48.5	49.3
54...	50.0	.....	48.3	46.8	47.7	47.7	47.5	47.1	46.5	46.0	46.4	48.2
55...	51.8	.....	49.8	48.3	48.5	48.8	48.9	48.6	48.3	48.2	48.6	49.3
56...	50.0	.....	48.1	46.9	47.7	47.6	47.5	47.3	46.5	46.0	46.3	48.1
57...	51.7	.....	49.9	.....	49.0	.....	48.8	48.5	.....	47.7	.....	49.1
58...	50.0	.....	48.2	.....	47.9	.....	47.7	47.1	.....	46.1	.....	47.7

Relation between Gauge Reading and Datum: -791.83 = Zero of Gauge to W.P.S. datum.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26

Maximum and Minimum Daily Gauge Height, in Feet, of Pisuwa W. E. Ry. Power Plant at Tail Race for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1...	49.1	51.1	51.6	50.9	48.5	48.9	47.1	47.6	47.2	46.8	47.2	48.6
2...	48.0	51.0	51.6	50.3	48.6	48.5	46.9	47.6	47.4	47.4	44.5	46.2
3...	48.1	49.1	50.0	49.0	47.0	47.0	46.0	45.5	45.1	45.1	47.2	48.6
4...	49.2	51.0	51.6	50.7	48.5	48.0	47.8	47.5	46.5	47.3	47.2	46.3
5...	49.3	51.0	51.7	50.9	48.6	47.5	47.7	47.6	47.1	47.1	47.2	48.0
6...	47.9	49.0	50.0	49.1	47.1	46.5	46.0	45.2	45.2	44.5	44.4	46.2
7...	49.3	51.1	51.4	50.7	48.6	48.3	47.7	47.5	47.6	47.0	46.9	48.4
8...	48.0	48.9	50.2	49.0	47.2	46.5	45.8	45.2	44.8	44.5	44.6	45.2
9...	49.4	51.0	52.0	50.8	48.6	48.2	47.6	46.9	47.5	47.3	47.7	48.4
10...	48.0	49.1	50.5	49.0	47.2	46.5	45.8	45.6	44.8	44.6	45.2	46.0
11...	49.6	51.1	51.6	50.7	48.9	47.4	47.7	47.6	47.5	47.5	47.3	48.4
12...	48.1	48.8	50.1	49.0	47.4	46.6	46.0	45.1	44.7	44.5	44.5	47.2
13...	49.9	51.3	51.1	50.5	48.8	48.1	47.7	47.4	47.4	47.4	47.4	49.1
14...	48.0	49.1	49.9	48.9	47.4	46.4	46.0	44.9	44.5	44.6	45.6	46.8
15...	50.3	50.8	51.7	50.4	48.8	48.0	47.6	46.8	47.4	47.4	48.0	48.8
16...	48.4	49.2	50.1	49.0	47.4	46.4	46.0	45.6	44.9	44.5	46.2	46.9
17...	50.4	51.6	51.5	50.5	48.3	48.1	47.7	47.6	47.2	47.3	48.0	49.0
18...	48.5	49.2	49.8	49.1	47.5	46.3	46.0	45.4	44.2	44.6	45.5	46.6
19...	50.2	51.3	51.4	50.7	49.1	48.1	47.7	47.5	47.3	46.8	47.9	48.8
20...	48.7	49.7	49.7	49.2	47.5	46.0	46.0	45.0	44.6	44.5	45.4	46.3
21...	50.3	51.6	51.4	49.7	49.0	48.1	46.9	47.6	47.4	47.0	47.9	48.8
22...	48.9	49.8	49.6	48.7	47.5	46.9	46.8	45.2	44.6	45.8	45.5	46.4
23...	50.6	51.5	51.5	49.5	48.9	47.7	47.7	47.4	46.6	47.3	48.0	48.4
24...	49.2	50.0	49.6	48.3	47.5	46.0	46.0	45.4	44.7	44.5	45.4	46.2
25...	50.9	51.2	51.3	49.0	48.9	47.0	47.9	47.4	47.7	47.4	48.1	49.0
26...	49.1	49.8	49.7	47.3	47.6	46.0	46.0	45.5	45.6	44.7	45.4	46.9
27...	50.8	51.3	50.8	48.7	48.9	47.7	47.6	47.5	47.3	47.4	47.7	48.9
28...	48.9	49.8	49.3	47.1	47.5	46.0	45.6	45.6	44.6	45.0	45.5	46.4
29...	51.1	51.1	51.4	48.6	48.9	47.7	47.7	46.9	47.4	47.3	48.3	49.0
30...	49.3	49.9	49.8	47.0	47.5	46.0	45.6	45.6	44.5	44.6	45.9	46.3
31...	51.4	51.5	51.2	48.1	48.3	47.8	47.7	47.7	47.3	47.3	48.0	48.8
32...	49.7	50.3	49.5	47.0	47.5	46.0	45.6	45.0	44.5	44.6	45.5	46.6
33...	51.5	51.6	51.1	48.4	49.0	47.6	47.7	47.5	47.2	47.2	47.9	48.7
34...	49.9	50.0	49.4	47.0	47.7	46.0	45.8	45.0	44.5	44.8	45.5	46.3
35...	50.8	51.4	51.1	47.8	49.1	47.8	46.9	47.5	47.1	47.8	48.4	49.4
36...	49.3	50.0	49.5	47.0	47.6	45.6	45.6	45.0	44.4	45.7	45.5	46.2
37...	51.3	51.4	51.1	48.5	48.4	47.7	47.9	47.5	46.7	47.1	48.1	48.9
38...	49.9	50.0	49.3	47.0	47.5	45.7	45.4	45.0	44.5	44.8	45.5	46.0
39...	51.1	51.4	51.0	48.6	49.2	47.0	47.6	47.5	47.5	47.4	48.1	48.6
40...	49.3	49.9	49.2	47.0	47.6	46.0	45.4	45.0	45.1	44.6	46.0	46.3
41...	51.1	51.5	50.4	48.4	49.1	47.9	47.7	47.4	47.1	47.3	47.9	49.0
42...	49.4	49.9	49.3	47.0	47.6	46.0	45.5	44.8	44.6	44.4	46.0	46.3
43...	51.1	51.3	50.9	48.4	49.0	47.8	47.6	46.8	47.1	47.3	48.4	49.0
44...	49.3	49.6	49.3	47.0	47.5	46.0	45.5	45.3	44.4	44.5	46.1	46.3
45...	51.1	51.7	50.9	48.5	48.3	47.8	47.6	47.7	47.1	47.2	48.3	49.4
46...	49.5	50.2	49.2	47.0	47.5	45.8	45.6	45.0	44.3	44.7	45.8	46.2
47...	51.3	51.5	51.0	48.5	49.1	47.8	47.7	47.4	47.2	47.0	48.3	49.5
48...	49.5	49.9	49.1	47.0	47.4	45.7	45.6	45.0	44.3	44.6	46.1	46.5
49...	50.9	50.7	50.7	48.0	48.8	47.8	47.0	47.4	47.1	47.6	48.4	49.5
50...	49.6	49.0	49.0	47.0	47.4	45.7	45.7	44.6	44.3	45.4	46.1	46.4
51...	51.2	50.8	48.9	47.0	47.8	45.7	47.7	47.5	47.2	47.2	48.3	49.3
52...	49.5	48.9	48.9	47.0	47.8	45.1	45.1	44.7	44.5	44.5	47.1	47.1

Relation between Gauge Reading and

—791.83 = Zero of Gauge to W.P.S. datum.

BELOW MAIN DIVERSION DAM TO LAC DU BONNET.

In the section of the river from below the Winnipeg Electric Railway Main Diversion Dam to Lac du Bonnet, a number of gauges have been set and read at various times by officers of the Manitoba Hydrometric Survey. They are as follows:—

Below Twin falls (Sharkey's channel).
 Head of Seven Sisters falls.
 Between 1st and 2nd falls, Seven Sisters.
 Between 2nd and 3rd falls, Seven Sisters.
 Foot of 3rd falls, Seven Sisters.
 Foot of 4th falls, Seven Sisters.
 Above the Mouth of the Whitemouth river.
 At the Mouth of the Whitemouth river.
 Foot of Seven Sisters falls.
 Above Rapids, B.M. No. 161.
 Below Rapids, B.M. No. 161.
 At Gustafson's farm.

WINNIPEG RIVER AT RAPIDS BELOW TWIN FALLS (GAUGING STATION).

History.—The station was established by S. C. O'Grady on July 1, 1913.

Location.—The gauge is located in a bay at the westerly extremity of the large island between the two diversion dams of the Winnipeg Electric Railway Company, at the head of the Pinawa channel. This bay is opposite Porcupine Island and is on the main channel just above the junction of the two channels below Twin falls on Sec. 3, Tp. 14, R. 12, E.P.M.

Records Available.—A continuous record of daily gauge height is available from July 1 to August 2, 1913. These gauge-heights are given below, reduced to Water Power Survey Datum.

JULY												AUGUST	
Day	Gauge-Height.	Day	Gauge-Height.	Day	Gauge-Height.	Day	Gauge-Height.	Day	Gauge-Height.	Day	Gauge-Height.	Day	Gauge-Height.
1	888.58	6	888.38	11	888.12	16	887.80	21	887.23	26	886.90	31	886.95
2	888.56	7	888.26	12	888.10	17	887.65	22	887.19	27	886.86		
3	888.55	8	888.21	13	888.10	18	887.55	23	887.11	28	886.82		
4	888.49	9	888.17	14	888.01	19	887.40	24	887.02	29	886.85		
5	888.36	10	888.14	15	887.93	20	887.29	25	886.94	30	886.93		

WINNIPEG RIVER—HEAD OF SEVEN SISTERS FALLS (GAUGING STATION).

History.—The station was established by S. C. O'Grady on May 17, 1913.

Location.—A vertical staff gauge is located near the left bank of the river in a small bay, one thousand feet south of the head of the Seven Sisters falls in the N.W. $\frac{1}{4}$ Sec. 30, Tp. 13, R. 12, E.P.M.

Records Available.—Intermittent records of daily gauge height are available over periods from April 17 to August 1, 1913; from May 27 to August 6, 1914, and from June 9 to November 28, 1916.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 25e

Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Seven Sisters Falls for 1913, 1914 and 1916.

Day.	1913								1914			
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	May.	June.	July.	Aug.
1							885.92	884.53				
2							885.84					
3												
4												
5							885.77					
6												
7												
8							885.68				885.73	
9							885.61					
10												
11							885.72					
12												
13												
14						885.87	885.62					
15						886.06	885.53					
						886.04						
16												
17						885.95						
18					885.04	885.95						
19						885.92						
20						885.94						
						885.93						
21												
22						885.93						
23						885.93						
24						885.92	884.81					
25						885.92						
						885.91						
26											885.18	
27						885.89					886.18	
28						885.89	884.46		883.58			
29					885.65	885.87	884.51					
30						885.87	884.51					
31						885.87	884.54					
									883.68		885.98	

1916

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								890.63	889.53			
2												
3										888.13	886.73	
4							890.23	890.53				
5									889.63			
6												
7							890.23			888.03		
8							890.26	890.33	889.43		886.23	
9												
10						889.18	890.23			889.03		
11												
12						889.33	890.23	890.33				
13						889.43		889.13			885.83	
14							890.23	890.23		888.23		
15							890.23					
								890.13	888.93		885.73	
16												
17						889.53	890.23					
18										887.93	885.73	
19						889.53	890.43	890.13				
20							890.43	890.13				
						889.63			888.53	887.83		
21												
22							890.43	890.13			885.93	
23								888.43				
24						889.73				887.63	885.83	
25							890.73	890.23				
26												
27						889.93			888.23			
28						890.03				887.53		
29						890.03	890.53				885.83	
30						890.13		889.53	888.23			
31										887.33		

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—BETWEEN 1ST AND 2ND FALLS—SEVEN SISTERS.
GAUGING STATION.

History.—The station was established by S. C. O'Grady on June 13, 1913.

Location.—A vertical staff gauge is located near the left bank of the river midway between the first and second falls of the Seven Sisters in the S. E. $\frac{1}{4}$ Sec. 36, Tp. 13, R. 11, E.P.M.

Records Available.—Intermittent records of daily gauge height are available over periods from June 13 to August 1, 1913, May 27 to August 6, 1914, and from June 7 to November 30, 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River between 1st and 2nd Falls, Seven Sisters, for 1913, 1914 and 1916.

Day.	1913			1914			1916					
	June	July	Aug.	May.	July	Aug.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		876-66	875-71						880-43	879-83		
2												
3											878-23	876-83
4								879-33	880-33			
5		876-55								879-73		
6						876-40					878-13	
7							878-83	879-83				876-63
8							878-83	879-85	880-33	879-73		
9							878-93					
10											878-03	876-53
11								879-83	880-23			
12										879-63		876-43
13	876-76						879-13				877-93	
14								879-83				876-33
15									880-03	879-43		
16	876-81						879-23				877-83	
17	876-77								879-83	878-43	877-73	876-13
18	876-76							880-03				
19	876-66									878-23		
20							879-23				877-63	
21								880-23				876-03
22									879-73			
23		876-46					879-33					
24											877-43	875-93
25	876-76						879-63	880-43	879-83			
26	876-76									878-03		
27		875-66		874-50			879-73				877-23	
28	876-76							880-43				875-83
29									879-83	877-83		
30	876-70						879-83			877-83		875-83
31				874-80	876-50						877-03	

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—BETWEEN 2ND AND 3RD FALLS—SEVEN SISTERS.
GAUGING STATION.

History.—The station was established by S. C. O'Grady on June 13, 1913.

Location.—A vertical staff gauge was located on the left bank of the river about four hundred feet south of the second fall of the Seven Sisters and in approximately the center of the S.E. $\frac{1}{4}$ Sec. 36, Tp. 13, R. 11, E.P.M.

Records Available.—An intermittent record of daily gauge height is available over periods from June 13 to August 1, 1913, from June 4 to December 6, 1914, and from June 7 to November 30, 1916.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 25a

Mean Daily Gauge Height, in Feet, of Winnipeg River between 2nd and 3rd Falls, Seven Sisters, for 1913, 1914, and 1916.

1913

1914

Day.	June.	July.	Aug.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		867.08	865.58			867.02				864.62	
2						867.32					
3						867.42					
4					866.02	867.42					
5		866.94				867.42			865.07		
6					866.12	867.42	866.72	865.52			864.82
7		866.71			866.22	867.32					
8		866.74					866.67				
9					866.72	867.32				864.42	
10											
11		866.75									
12					866.82	867.32			865.72		
13	867.10	866.77									
14		866.68						865.32			
15										864.20	
16	867.13				866.82						
17	867.09					867.47	866.42				
18	867.07				866.92				865.42		
19					866.92			865.04			
20					866.92			865.12			
21					866.92						
22					866.92	867.32					
23	867.00	866.00			866.92		866.32			864.32	
24	866.99				866.92	867.32					
25					866.92	867.27					
26	866.90				866.92						
27	866.89	865.60		864.37	866.92			865.17	864.82		
28					866.92	867.12					
29					867.02					964.32	
30				864.62	867.02		866.12				
31						867.02					

1916

1							871.18	870.98			
2											
3											
4											
5						871.58	871.18	870.98	869.28	868.28	
6											
7									869.18	868.18	
8					870.48	871.58		870.48		868.18	
9					870.43	871.55	871.08				
10					870.58			870.53			
11						871.58	871.08		869.08	867.98	
12						871.58		870.43		867.78	
13					870.68				868.08		
14						871.58				867.68	
15							870.88	870.23			
16											
17					870.78				868.98		
18								869.58	868.88	867.58	
19						871.78	870.58		868.88	867.58	
20					870.88			869.68	868.78	867.58	
21						871.98					
22							870.58			867.48	
23					871.08						
24						871.78			868.58	867.28	
25							870.58				
26								869.28			
27					871.28				868.58		
28						871.58					
29							870.78	869.18		867.18	
30					871.48						
31										867.18	

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—FOOT OF 3RD FALLS—SEVEN SISTERS. (GAUGING STATION).

History.—The station was established by D. L. McLean on July 7, 1911.

Location.—A vertical staff gauge was secured near the left bank of the river about three thousand feet below the third fall of the Seven Sisters in the N.E. $\frac{1}{4}$ Sec. 26, Tp. 13, R. 11, E.P.M.

Records Available.—Practically continuous records of daily gauge height are available over the following periods:—From July 7 to October 30, 1911; from May 20 to September 16, 1913; from May 25 to August 6, 1914, and from June 7 to November 30, 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of 3rd Falls, Seven Sisters, for 1911 and 1913.

1911							1913					
Day.				July.	Aug.	Sept.	Oct.	May.	June.	July	Aug.	Sept.
1					857.93	857.93	857.73		859.24	859.33	857.64	
2					858.03	857.93	857.73		859.24	859.32	857.59	
3					858.03	857.83	857.83		859.29	859.29	857.69	857.59
4					858.03	857.83	857.83		859.29	859.30	857.79	
5					858.13	857.93	857.83		859.29	860.20	857.89	
6					858.03	857.93	858.03		859.39	859.14	857.84	857.54
7				858.53	858.13	857.73	858.03		859.39	859.11	857.99	
8				858.83	858.13	857.63	858.03		859.39	859.12	857.99	
9				857.13	858.13	857.53	858.03		859.39	859.09	857.94	
10				857.13	858.13	857.53	858.03		859.39	859.09	857.89	857.89
11				857.33	858.13	857.43	858.03		859.39	859.14	858.04	858.04
12					858.13	857.43	858.13		859.39	858.89	858.04	858.04
13					858.18	857.33	858.13		859.49	859.04	858.04	858.04
14					858.13	857.32	858.13		859.69	858.99	857.99	857.99
15				857.43	858.03	857.33	858.23		859.69	858.79	858.39	858.39
16				857.53	858.03	857.43	858.23		859.49	858.69	858.29	858.29
17				857.63	858.03	857.53	858.33		859.49	858.54	858.19	
18				857.63	858.13	857.53	858.33		859.49	858.42	858.19	
19				857.73	858.03	857.63	858.33		859.49	858.24	858.19	
20				857.73	857.93	857.63	858.33	858.59	859.39	858.14	858.24	
21				857.78	857.93	857.73	858.33	858.54	859.39	858.09	858.19	
22				857.83	857.93	857.83	858.33	858.64	859.39	858.04	858.19	
23				857.93	857.93	857.73	858.33	858.69	859.39	857.89	858.09	
24				858.03	857.93	857.63	858.43	858.84	859.29	857.84	858.04	
25				858.03	857.93	857.63	858.43	858.89	859.29	857.79	857.99	
26				858.13	857.93	857.63	858.43	858.99	859.29	857.74	857.89	
27				857.93	857.93	857.63	858.38	859.09	859.39	857.69	857.89	
28				857.93	857.73	858.33	859.09	859.09	859.29	857.69	857.89	
29				857.93	857.73	858.33	859.19	859.29	859.29	857.64	857.89	
30				857.93	857.73	858.33	859.19	859.39	859.39	857.69	857.79	
31				858.03	857.93		858.33	859.19		857.64	857.69	

Levels reduced to Water Power Survey datum.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of 3rd Falls, Seven Sisters, for 1914 and 1916.

		1914				1916					
Day.		May.	June	July	Aug.	June.	July.	Aug.	Sept.	Oct.	Nov.
1			856.85	859.70				865.30	863.90	862.70	861.20
2			857.10	859.80				865.30	864.00	862.60	861.10
3			858.30	859.90				865.20	864.10	862.50	861.00
4			858.30	860.00				865.20	864.10	862.40	860.90
5			858.40	860.00				865.10	864.10	862.30	860.80
6			858.50	859.90	859.75			865.10	864.20	862.20	860.70
7			858.60	859.90		863.60		865.10	864.30	862.10	860.60
8			858.70	859.90		863.70	865.04	865.00	864.20	862.10	860.50
9			859.10	859.90		863.80	864.99	865.00	864.20	862.00	860.30
10			859.20	859.90		863.80	864.99	865.00	864.10	861.90	860.30
11			859.30	859.90		863.90	864.99	865.00	864.10	861.80	860.20
12			859.30			863.90	864.99	864.99	864.00	861.80	860.20
13			859.30			863.90	864.99	864.99	863.90	861.70	860.10
14			859.30			863.90	864.99	864.80	863.80	861.70	860.10
15			859.30			864.00	864.99	864.80	863.70	861.60	860.00
16			859.30			864.10	864.99	864.80	863.50	861.50	860.00
17			859.30			864.10	864.99	864.70	863.00	861.40	859.50
18			859.30			864.10	865.10	864.70	863.00	861.40	859.50
19			859.30			864.10	865.20	864.70	862.90	861.40	859.70
20			859.30			864.10	865.20	864.60	862.90	861.40	859.70
21			859.30			864.20	865.30	864.60	862.80	861.30	859.70
22			859.30			864.20	865.30	864.50	862.80	861.30	859.60
23			859.30			864.30	865.40	864.40	862.70	861.30	859.60
24			859.40			864.30	865.40	864.30	862.60	861.30	859.60
25		856.10	859.40			864.40	865.40	864.20	862.60	861.20	859.60
26		856.20	859.40	860.20			865.40	864.10	862.50	861.20	859.50
27		856.40	859.40	860.20			865.40	864.00	862.50	861.20	859.50
28		856.50	859.50	860.20			865.40	864.00	862.40	861.10	859.50
29		856.60	859.50	860.20			865.30	864.00	862.40	861.10	859.50
30		856.70	859.60	860.20			865.30	864.00	862.30	861.10	859.40
31		856.80		860.00			865.30	863.90		861.10	

Levels reduced to Water Power Survey datum.

NOTE.—Water over Gauge from June 26 to July 7, 1916 (inclusive).

WINNIPEG RIVER—FOOT OF FOURTH FALLS—SEVEN SISTERS. GAUGING STATION.

History.—The station was established by S. C. O'Grady on April 13, 1913.

Location.—A vertical staff gauge is located near the left bank of the river, three quarters of a mile below the fourth fall of the Seven Sisters near the mouth of a small creek in the N.E. $\frac{1}{4}$ Sec. 27, Tp. 13, R. 11, E.P.M.

Records Available.—An intermittent record of daily gauge height is available over periods from April 22 to July 14, 1913, from May 27 to August 6, 1914, and from June 8 to November 28, 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of 4th Falls, Seven Sisters, for 1913 and 1914.

1913					1914							
Day.					April.	May.	June.	July.	May.	June.	July.	Aug.
1						849.57	851.89	851.99		850.01	852.41	
2						849.64					852.51	
3						849.64					852.61	
4						849.99		851.95		851.11	852.71	
5						850.04					852.71	
6						850.29						
7						850.46					852.61	851.88
8						850.87					852.61	
9						850.85		851.63			852.61	
10						850.73				851.91	852.61	
										852.01	852.61	
11						850.78				852.01	852.61	
12						850.83				852.01		
13						850.90				852.01		
14						850.97		851.81		852.01	852.61	
15						851.03		851.71		852.01	852.61	
										852.01		
16						851.07				852.01		
17						851.12				852.01		
18						851.13				852.01		
19						851.19	852.06			852.01		
20						851.20				852.01		
21						851.22	851.89			852.01		
22						848.74	851.44			852.01		
23						848.77	851.50	851.89		852.01		
24						848.82	851.55	851.89		852.01		
25						848.91	851.61			852.11		
26						848.97	851.69	851.79		852.11		
27						849.00	851.76	851.84	849.66	852.11	852.21	
28						849.04	851.83					
29						849.22	851.87					
30						849.48	851.88	852.00	849.81			
31						851.89						

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of 4th Falls, Seven Sisters, for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							855.91	856.26	855.21			
2									855.16		852.76	
3							855.96	856.21				
4									855.41	854.06	852.56	
5												
6								856.21				
7							855.96					
8						854.96	855.96	856.11		853.96	852.36	
9							855.96					
10									855.11	853.96	852.16	
11						855.08	855.96	856.01				
12									854.86		851.86	
13						855.16		855.91		853.96		
14							856.01				851.76	
15								855.86	854.61	853.81		
16						855.21	856.01					
17										853.81	851.76	
18						855.31	856.16			853.81		
19								855.76			851.81	
20						855.36		855.66		853.71		
21							856.16					
22								855.66		853.71	851.91	
23						855.51	856.36					
24												
25						855.86		855.61		853.86	851.96	
26												
27						855.76	856.31	855.41		853.81		
28							856.31				851.96	
29								855.31		853.41		
30						855.86	856.31					
31										853.21		

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—ABOVE THE MOUTH OF THE WHITEMOUTH RIVER.
GAUGING STATION.

History.—The station was established by S. C. O'Grady on April 23, 1913, and was continued in operation while the survey party under his direction were in this vicinity.

Location.—A vertical staff gauge was located on the left bank of the Winnipeg river, eight hundred feet above the point of junction of the Winnipeg and Whitemouth rivers in S.E. $\frac{1}{4}$ Sec. 23, Tp. 13, R. 11, E.P.M.

Records Available.—An intermittent record of daily gauge height is available over a period from April 23 to July 13, 1913.

Mean Daily Gauge Height, in Feet, of Winnipeg River above Whitemouth River for 1913.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							842.11					
2												
3							842.09					
4												
5												
6					841.30							
7							842.02					
8												
9												
10												
11												
12							841.99					
13												
14												
15												
16												
17												
18												
19												
20												
21					841.77							
22					841.87							
23				840.26	841.89	842.05						
24				840.26	841.92	842.01						
25												
26				840.35		842.01						
27						842.04						
28				840.42	841.94							
29					841.99							
30				840.64		842.11						
31												

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER AT THE MOUTH OF THE WHITEMOUTH RIVER. GAUGING STATION.

History.—The station was established by S. C. O'Grady on April 22, 1913, and was continued in operation while the survey party under his direction was in this vicinity.

Location.—A vertical staff gauge was located on the westerly side of the point at which the right bank of the Whitemouth river and the left bank of the Winnipeg river join in the S.E. $\frac{1}{4}$ Sec. 33, Tp. 13, R. 11, E.P.M.

Records Available.—An intermittent record of daily gauge height is available over a period from April 22 to July 8, 1913.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Mouth of Whitemouth River for 1913.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							836.06					
2												
3												
4							835.82					
5												
6					834.97							
7												
8							835.95					
9												
10												
11												
12												
13												
14					835.59							
15												
16					835.62							
17												
18												
19												
20					835.74							
21					835.74	835.89						
22				834.44								
23				834.42		835.90						
24					835.79	835.88						
25												
26				834.45	835.89	835.82						
27						835.83						
28				834.29	835.97							
29					835.04							
30				834.39		835.79						
31												

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER AT FOOT OF SEVEN SISTERS FALLS (GAUGING STATION).

History.—The station was established by S. C. O'Grady on May 19, 1913.

Location.—A vertical staff gauge was located on the left bank of the river in a bay just below the Seven Sisters falls and downstream from the mouth of the Whitemouth river, in the north westerly part of the S.E. $\frac{1}{4}$ Sec. 33, Tp. 13, R. 11, E.P.M.

Records Available.—Continuous records of daily gauge height are available from May 21 to September 7, 1913, and from May 11 to October 14, 1915. An intermittent record of gauge height is also available over a period from June 9 to November 29, 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of Seven Sisters Falls for 1913 and 1914.

Day.	1913					1914					
	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	Oct.
1		834.74	834.74	833.44	833.80		833.25	835.10	835.05	834.35	833.25
2		834.74	834.69	833.65	833.80		833.35	835.25	834.95	834.30	833.25
3		834.84	834.64	833.90	833.80		834.20	835.25	834.95	834.20	833.25
4		834.74	834.64	833.91	833.80		834.70	835.25	834.95	834.15	833.25
5		834.74	834.64	833.91	833.70		834.00	835.15	834.95	834.00	833.25
6		834.84	834.40	833.80	833.70		834.00	835.20	834.80	833.85	833.30
7		834.84	834.64	833.80	833.70		834.65	835.20	834.70	833.80	833.25
8		834.84	834.40	833.91			834.78	835.15	834.70	833.65	833.25
9		834.84	834.44	833.90			835.05	834.15	834.70	833.60	833.25
10		834.84	834.34	833.91			835.30	834.10	834.75	833.55	833.35
11		834.84	834.44	833.90		832.03	835.25	835.05	834.70	833.45	833.70
12		834.84	834.50	833.90		832.15	835.25	835.35	834.70	833.45	833.60
13		834.84	834.50	833.90		832.15	835.30	835.70	834.65	833.40	833.75
14		834.90	834.40	833.90		832.15	835.15	835.65	834.65	833.40	833.75
15		834.94	834.44	834.31		832.15	835.15	835.70	834.55	833.40	833.85
16		834.84	834.34	834.41		832.15	835.10	835.75	834.55	833.40	
17		834.79	834.29	834.31		832.15	835.05	835.70	834.55	833.35	
18		834.74	834.09	834.25		832.15	835.15	835.65	834.55	833.35	
19		834.74	833.94	834.25		832.40	835.05	835.65	834.45	833.35	
20		834.74	833.84	834.25		832.45	835.05	835.55	834.45	833.30	
21	834.24	834.64	833.70	834.25		832.50	835.05	835.45	834.45	833.35	
22	834.24	834.54	833.74	834.21		832.55	835.10	835.50	834.45	833.45	
23	834.34	834.64	833.69	834.15		832.60	835.15	835.35	834.45	833.35	
24	834.44	834.64	833.59	834.15		832.85	835.15	835.35	834.45	833.25	
25	834.44	834.64	833.54	834.00		832.85	835.10	835.25	834.45	833.45	
26	834.54	834.64	833.44	834.01		832.65	835.05	835.25	834.45	833.35	
27	834.64	834.74	833.44	833.90		832.95	835.15	835.25	834.45	833.35	
28	834.64	834.74	833.39	834.00		832.95	835.05	834.15	834.35	833.25	
29	834.74	834.74	833.44	833.90		833.10	835.10	834.15	834.35	833.35	
30	834.74	834.84	833.64	833.90		833.15	835.15	834.15	834.35	833.30	
31	834.74		833.44	833.86		833.25		834.05	834.35		

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of Seven Sisters Falls for 1916.

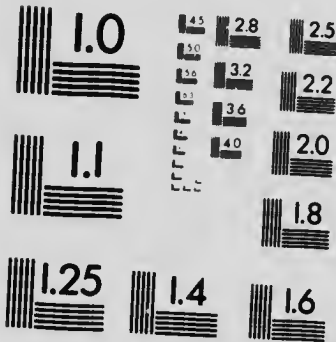
Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							839.61	840.11	838.81	837.51	836.51	
2									838.71		836.41	
3								840.01		837.41		
4							839.61				836.31	
5												
6								839.91	838.61	837.31		
7							839.61			837.21	836.21	
8						838.61	839.61	839.81			836.11	
9									838.61			
10												
11						838.71		839.71		837.11		
12							839.61				836.01	
13								839.61	838.51	837.11		
14						838.81	839.61					
15									838.51	837.11	835.91	
16						838.91	839.61	839.51				
17									838.51		835.91	
18						838.90	839.91	839.41		837.01		
19								839.31	838.21	836.91	835.81	
20												
21						839.11	840.21					
22									837.81	836.81	835.51	
23						839.21	840.21	839.16				
24								839.01		836.81		
25						839.31						
26							840.21				835.41	
27								838.91	837.61	836.71		
28						839.41	840.21			836.61	835.31	
29								838.81	837.41			
30						839.51	840.21					
31												

Levels reduced to Water Power Survey datum.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



WINNIPEG RIVER—ABOVE RAPIDS AT B.M. NO. 161
(GAUGING STATION).

History.—The station was established by E. B. Patterson on August 6, 1914.

Location.—A vertical staff gauge was located on the left bank of the Winnipeg river near the east boundary of the S.E. $\frac{1}{4}$ Sec. 5, Tp. 14, R. 11, E.P.M.

Records Available.—An intermittent record is available during the year 1914, from August 6 to November 22.

Mean Daily Gauge Height, in Feet, of Winnipeg River above Rapids at B. M. No. 161, $\frac{3}{4}$ Mile Below Whitemouth River, for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1											831·97	
2												
3												
4										832·27		
5												
6								833·92				
7									832·77			
8											831·77	
9												
10												
11								833·87				
12										832·87		
13												
14									832·57			
15											831·57	
16												
17								832·67		832·77		
18												
19									832·37			
20												
21												
22											831·67	
23								833·57				
24												
25										832·27		
26												
27									832·37			
28												
29												
30								833·47				
31												

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—BELOW RAPIDS AT B.M. NO. 161 (GAUGING STATION)

History.—The station was established by E. B. Patterson on August 6, 1914.

Location.—A vertical staff gauge was located on the left bank of the river in a small bay two hundred feet north of the north boundary of the S.E. $\frac{1}{4}$ Sec. 5, Tp. 14, R. 11, E.P.M.

Records Available.—An intermittent record of daily gauge height is available during the year 1914, from August 6 to December 6.

*Mean Daily Gauge Height, in Feet, of Winnipeg River below Rapids at B. M.
No. 161, $\frac{3}{4}$ Mile Below Whitemouth River, for 1914.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3									831.60		830.20	829.80
4												
5										830.50	830.00	
6												
7								832.30				830.10
8									831.10	830.40		
9											830.00	
10									830.90			
11												
12								832.15			829.85	
13								832.20		831.10		
14												
15									830.80	831.10		
16											829.85	
17									830.70			
18												
19								831.90		831.00	829.60	
20								831.95				
21									830.60			
22										830.70		
23											830.00	
24								831.90	830.65			
25										830.50	829.50	
26												
27								831.80				
28												
29										830.30		
30								831.80	830.50		829.00	
31												

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER AT GUSTAFSON'S FARM (GAUGING STATION).

History.—The station was established by E. B. Patterson on August 7, 1914, and was discontinued on December 5 of the same year.

Location.—The gauge was located on the left bank of the river at the N.E. $\frac{1}{4}$ Sec. 18, Tp. 14, R. 11, E.P.M.

Records Available.—A continuous record of daily gauge height is available from August 7 to December 5, 1914.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Rapids at Gustafson's Farm below Seven Sisters Falls, above B. M. No. 157, for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1									825.94	825.09	824.84	824.59
2									825.80	825.08	824.79	824.79
3									825.79	825.08	824.79	824.99
4									825.09	825.09	824.79	824.99
5									825.64	825.09	824.74	824.99
6									825.59	825.09	824.69	
7								826.39	825.49	825.09	824.69	
8									825.39	825.09	824.69	
9								826.39	825.32	825.09	824.64	
10								826.39	825.29	825.14	824.64	
11								826.29	825.29	825.44	824.64	
12								826.29	825.24	825.49	824.59	
13								826.29	825.24	825.49	824.54	
14								826.29	825.19	825.54	824.59	
15								826.29	825.19	825.54	824.59	
16								826.24	825.19	825.51	824.54	
17								826.24	825.19	825.49	824.49	
18								826.19	825.14	824.44	824.49	
19								826.14	825.14	824.39	824.49	
20								826.09	825.14	824.39	824.49	
21								826.09	825.19	825.34	824.49	
22								826.04	825.19	825.29	824.49	
23								826.04	825.19	825.29	824.44	
24								826.04	825.19	825.19	825.44	
25								826.09	825.19	825.19	825.44	
26								826.09	825.19	825.09	824.44	
27								826.09	825.19	824.99	824.49	
28								826.09	825.14	824.99	824.89	
29								826.09	825.14	824.99	824.44	
30								826.04	825.14	824.94	824.44	
31								825.99		824.89		

Levels reduced to Water Power Survey datum.

LAC DU BONNET TO LAKE WINNIPEG.

The gauges placed in this section of the river were practically all established during the operation of the Winnipeg River Power Survey, 1911, and have been operated since that date.

They are as follows:—

City Tramway Bridge.

Foot of First McArthur falls.

Below Second McArthur falls.

Head of Grand du Bonnet falls.

Head of Little du Bonnet falls.

Foot of Little du Bonnet falls.

Head of Whitemud falls.

Head of Silver falls.

Foot of Silver falls.

Head of Pine falls.

Foot of Pine falls.

Fort Alexander (Lake Winnipeg level).

SESSIONAL PAPER No. 25a

WINNIPEG RIVER—CITY TRAMWAY BRIDGE (GAUGING STATION).

History.—The station was established by the city of Winnipeg. Records were first obtained by this survey in January of 1912.

Location.—A vertical staff gauge was bolted to the rock at a point about two hundred feet above the west end of the tramway bridge of the city of Winnipeg which crosses the Winnipeg river three miles downstream from the town of Lac du Bonnet. In the spring of 1916, this gauge was destroyed and readings have been obtained since that time on a staff gauge secured to the upstream side of the bridge near the west end of same.

Records Available.—An intermittent record of daily gauge height is available over a period from January 6, 1912 to September 24, 1915. A continuous record of daily gauge height is available from October 10 to December 31, 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Winnipeg City Tramway Bridge, Lac-du-Bonnet, for 1912.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1										822 11		
2												
3						822 20						
4											822 34	
5								821 20			822 31	
6	818 30					821 92		821 20				
7										822 80		
8						821 80	820 75			822 05		
9	818 20								822 00			
10									821 95			
11							820 80				822 12	
12	818 50						820 78	821 17	821 64		822 10	
13						821 68		821 16				
14										822 42		
15							820 82			822 47		
16							820 88					
17						821 54			821 80			
18								821 80			821 90	
19	818 48							821 05	821 80	822 66	821 87	
20						821 40		821 05				
21										822 75		
22							820 95	821 02		822 75		
23							820 96		822 10			
24						821 20						
25											821 70	
26												
27	818 40					821 17						
28										822 54		
29								821 20			821 62	
30								821 23	822 21	822 42		
31												

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Heights, in Feet, of Winnipeg River at Winnipeg City Tramway
Bridge, Lac-du-Bonnet, for 1913 and 1914.*

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								820.80	820.82			
2						822.12						
3										819.80	818.80	
4		820.35				822.26	822.11	820.78				
5												
6						822.28				819.71		
7	820.61						822.02					
8								820.85				
9					820.75	822.30						
10										819.50		
11		820.31						820.90				
12					821.05				820.60			
13						822.30				819.28		
14	820.53						821.72					
15				819.65				821.14	820.51			
16					821.25							
17			818.84	819.52						819.14		
18		820.47					821.54	821.22				
19					821.23				820.40			
20						822.28				818.80		
21	820.42						821.31		820.33			
22								821.17				
23					821.60	822.21						
24				819.40						818.71		
25							821.10	821.11				
26			818.50		821.80							
27		819.85			821.90	822.05				818.62		
28	820.40			819.30			820.90					
29								820.95	820.05			
30					822.06	822.06						
31			818.30									

1914

1						820.31						
2										820.46		
3			817.05					822.21			820.01	
4		817.35							821.36			
5					818.54				821.01	820.33	819.93	
6						820.78	822.51					
7				817.86					821.01			
8		816.61				821.71						
9								822.11		820.31		
10										819.76		
11			817.26		818.71		822.59		820.86			
12						822.51				820.71	819.71	
13				817.91				821.85				
14							822.71	821.82	820.71			
15	817.64				819.01	822.60				820.95		
16												
17			817.39				822.91	821.76			819.63	
18					819.06				820.60			
19											819.59	
20	817.58			818.21		822.54	822.81					
21									820.59	820.86		
22					819.46			821.71				
23										820.85		
24			817.63					821.66				
25									820.53			
26					819.51					820.51	819.51	
27							822.59					
28	817.51			818.46				821.61	820.46			
29						822.51				820.26		
30												
31			817.81					821.60				

Levels reduced to Water Power Survey datum.

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Mean Daily Gauge Height, in Feet, of Winnipeg River at Winnipeg City Tramway Bridge, Lac-du-Bonnet, for 1915 and 1916.

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1											819-16	819-63
2											819-18	819-66
3								822-41			819-18	819-66
4											819-21	819-66
5							822-01				819-21	819-68
6												
7						821-71					819-23	819-69
8									820-31		819-26	819-68
9											819-31	819-71
10										819-51	819-36	819-71
11								822-35			819-38	819-71
12										819-46	819-43	819-71
13										819-43	819-53	819-71
14						821-86				819-29	819-61	819-71
15							822-29			819-37	819-61	819-76
16										819-36	819-66	819-73
17									819-89			
18										819-31	819-66	819-71
19										819-25	819-71	819-71
20										819-18	819-71	819-68
21										819-16	819-71	819-68
22										819-16	819-71	819-66
23												
24										819-13	819-68	819-66
25										819-11	819-68	819-63
26										819-11	819-66	819-61
27										819-11	819-66	819-61
28										819-71	819-63	819-61
29										819-13	819-63	819-61
30										819-16	819-61	819-61
31								820-84		819-16		

1916

1	819-56	819-51	820-31	820-26	822-70	825-00	826-60	827-00	825-40	823-90	823-20	821-80
2	819-58	819-51	820-34	820-26	822-78	825-00	826-60	826-90	825-30	823-90	823-10	821-80
3	819-56	819-51	820-36	820-24	822-65	825-00	826-70	826-80	825-60	826-90	823-00	821-80
4	819-51	819-51	820-38	820-21	823-20	825-00	826-70	826-70	825-40	823-90	822-90	821-90
5	819-48	819-51	820-41	820-16	823-11	825-10	826-60	826-70	825-40	823-90	822-80	821-90
6	819-48	819-51	820-41	820-16	823-36	825-10	826-60	826-60	825-40	823-90	822-70	821-90
7	819-46	819-54	820-41	821-11	823-45	825-20	826-60	826-60	825-30	823-90	822-60	821-90
8	819-46	819-56	820-44	820-11	823-53	825-20	826-60	826-60	825-30	823-90	822-50	821-90
9	819-46	819-56	820-46	820-16	823-61	825-20	826-70	826-50	825-30	823-80	822-40	822-00
10	819-46	819-58	820-48	820-16	823-70	825-30	826-70	826-50	825-20	823-80	822-30	822-00
11	819-48	819-61	820-48	820-21	823-78	825-40	826-60	826-40	825-10	823-80	822-10	822-00
12	819-48	819-61	820-36	820-31	823-86	825-40	826-60	826-40	825-00	823-80	822-10	821-90
13	819-51	819-66	820-36	820-31	823-95	825-50	826-60	826-30	824-90	823-80	822-00	821-90
14	819-51	891-71	820-31	820-36	824-03	825-50	826-60	826-30	824-80	823-70	822-00	821-90
15	819-51	819-76	820-31	820-41	824-16	825-60	826-50	826-20	824-70	823-70	821-90	821-80
16	819-51	819-76	820-48	820-51	824-18	825-60	826-50	826-20	824-60	823-70	821-90	821-80
17	819-51	819-81	820-48	820-71	824-26	825-70	826-50	826-10	824-50	823-70	821-90	821-80
18	819-51	819-84	820-48	821-01	824-26	825-80	826-60	826-10	824-40	823-70	821-90	821-70
19	819-51	819-86	820-48	821-31	824-41	825-80	826-80	826-00	824-30	823-70	821-90	821-70
20	819-51	819-91	820-48	821-86	824-46	825-90	827-00	826-00	824-20	823-60	821-80	821-70
21	819-51	819-94	820-44	821-94	824-46	825-90	827-10	825-90	824-10	823-60	821-80	821-70
22	819-51	819-96	820-41	823-21	824-49	825-90	827-10	825-90	824-10	823-60	821-80	821-60
23	891-51	820-01	820-41	822-47	824-51	826-00	827-10	825-80	824-00	823-50	821-70	821-60
24	819-51	820-11	820-41	822-49	824-56	826-00	827-10	825-80	824-00	823-50	821-70	821-60
25	819-51	820-16	820-36	822-53	824-59	826-10	827-20	825-70	824-00	823-50	821-70	821-50
26	819-51	820-24	820-36	822-56	824-61	826-20	827-20	825-70	824-00	823-40	821-60	821-50
27	819-51	820-26	820-31	822-61	824-61	826-30	827-20	825-60	823-90	823-40	821-60	821-40
28	819-51	820-28	820-31	822-66	824-60	826-40	827-20	825-60	823-90	823-30	821-70	821-40
29	819-51	820-31	820-31	822-68	824-70	826-50	827-20	825-50	823-90	823-30	821-70	821-30
30	819-51	820-31	820-31	822-70	824-80	826-60	827-20	825-50	823-90	823-30	821-80	821-30
31	819-51	820-26			824-90		827-10	825-40		823-20		821-30

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER FOOT OF FIRST MCARTHUR FALLS (GAUGING STATION).

History.—The station was established by D. L. McLean on June 22, 1911, and has been in operation since that date.

Location.—A vertical staff gauge is located near the left bank on the West channel of the river just below First McArthur falls, in the N.W. $\frac{1}{4}$ Sec. 26, Tp. 16, R. 11, E.P.M.

Records Available.—Intermittent records of daily gauge height are available during the years 1911 to 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of 1st McArthur Falls for 1911 and 1912.

Day.	1911						1912					
	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.
1							812.00					
2					812.50	812.70			811.25	810.95		
3												812.30
4				812.60								
5												
6												
7			812.70									
8							812.05			810.80		
9					813.05	812.51			811.10			
10												812.60
11				812.40								
12								811.50				
13					813.04							
14			812.70									
15										810.71		
16									811.03			
17		812.60										812.80
18				812.40								
19					812.95			811.43				
20												
21			812.60									
22												
23									811.00	810.66		
24		812.60										
25				812.50								
26												
27					812.80							
28			812.60					811.32				
29										810.50		
30		812.70										
31		812.70										

Limits reduced to Water Power Survey datum.

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Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of 1st McArthur Falls for 1913 and 1914.

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								812.77	812.76			
2						813.64						
3						813.60	813.70	812.72		812.39	811.19	
4												
5												
6						813.83				812.21		
7							813.63					
8								812.82				
9						813.84						
10										812.04		
11							812.42	812.92				
12									812.62			
13						813.82				811.79		
14												
15								813.06	812.51			
16					813.22							
17										811.00		
18							813.40	813.12				
19					813.27				812.40			
20						813.67				811.49		
21							813.12		812.39			
22								813.02				
23					813.38	813.62						
24										811.37		
25							812.92	812.97				
26					813.52							
27						813.62				811.29		
28							812.82					
29					813.56			812.87	812.29			
30					813.62	813.62						
31												

1914

1						812.42						
2		810.52	810.32							812.43		
3						812.72		813.82			812.33	
4					811.27							
5										812.38		
6				810.85		813.22	814.12				812.28	
7									812.92			
8					811.42	813.82						
9		810.50	810.43						812.83	812.38		
10											812.23	
11					811.62		814.02		812.73			
12						814.17				812.63		
13				810.78	811.57			813.42				
14							814.12	813.52	812.63			
15					811.62	814.22				812.73		
16		810.45	810.54									
17							814.22	813.52			812.13	
18					811.72				812.53			
19	810.64											
20				811.02		814.22	814.12			812.73		
21												
22					811.87			813.32				
23			810.62						812.53	812.63		
24								813.42				
25					811.97		814.02					
26	810.56									812.53		
27				811.19	812.12		813.92				812.03	
28								813.32	812.43			
29					812.22	814.22						
30			810.82							812.43		
31								813.22				

Levels reduced to Water Power Survey datum.

**Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of 1st McArthur Falls
for 1915 and 1916.**

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1												Completely frozen river.
2						813.23		813.78			811.28	
3												
4												
5												
6							813.83					
7												811.33
8						813.33			812.78	812.08		
9											811.41	
10												
11								813.68				
12										811.44		
13												
14												811.41
15							813.73					
16									812.18		811.52	
17						813.48						
18												
19								813.13		811.31		
20												
21												811.52
22							813.93					
23											811.61	
24						813.43						
25												
26										811.25		
27					814.23							811.46
28												
29							813.83					
30						813.48					811.38	
31								812.58				

1916

1		806.10				815.50					814.68	813.80
2					806.10							
3												
4	806.00			806.73				816.90				
5										814.95		
6												
7			806.80				816.60					
8		806.05						816.12				813.75
9					806.81	815.96						
10								816.80		814.96	813.81	
11	806.10			806.67								
12												
13							816.56					
14		806.16	806.80					815.64				
15						816.27						
16					809.13							
17								816.72		814.83	813.52	813.30
18	806.20											
19												
20							816.97					
21			806.83						815.05			
22		806.55		807.70		816.45						
23											813.58	813.20
24								816.24				
25				807.77						814.74		
26	806.30											
27							817.04					
28			806.84					814.94				
29		806.60				816.83						813.95
30												
31								816.01				

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—BELOW SECOND MCARTHUR FALLS (GAUGING STATION).

History.—The station was established by M. S. Madden on December 8, 1914, and has been in operation since April of the following year.

Location.—A vertical staff gauge is located near the left bank of the river, in a small bay, about one hundred yards north of the north boundary of N.W. $\frac{1}{4}$ Sec. 34, Tp. 16, R.11, E.P.M.

Records Available.—An intermittent record of daily gauge height is available from April 15, 1915 to December 31, 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of 2nd McArthur Falls for 1915.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2						807.51					805.87	
3								807.94				
4					806.07							
5												
6							807.37					
7												806.30
8						807.26			806.46			
9											806.16	
10												
11					806.15			807.89				
12										806.10		
13												
14												806.41
15				804.87			807.74					
16									805.87		806.25	
17						807.33						
18												
19								807.38		805.95		
20					806.34							
21												806.20
22				805.28			808.04					
23											806.34	
24						807.29						
25												
26										806.06		
27				805.63								
28												806.20
29				806.05			808.00					
30						807.34					806.30	
31								806.80				

Levels reduced to Water Power Survey datum.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of 2nd McArthur Falls for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		806-26				810-30					806-82	807-37
2												
3								811-86				
4	806-61			806-24								
5										809-21		
6							811-60					
7			806-37						810-83			807-33
8		806-32										
9						810-65					807-62	
10								811-74		809-20		
11	806-63			806-18								
12												
13							811-58					
14			806-42						810-68			
15		806-26				811-00						
16												
17										808-19	807-32	807-47
18	806-70							811-62				
19							811-97					
20												
21			806-44						809-76			
22		806-22				810-09						
23											807-34	807-15
24								811-02				
25										808-88		
26	806-75											
27							812-03					
28			806-16						809-10			
29		806-32				811-37						807-57
30												
31								810-84				

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—HEAD OF GRAND DU BONNET FALLS (GAUGING STATION).

History.—The station was established by D. L. McLean on June 22, 1911, and has been in operation since that date.

Location.—A vertical staff gauge is located on the right bank at the head of the portage above Grand du Bonnet falls in the S.W. $\frac{1}{4}$ Sec. 23, Tp. 17, R. 11, E.P.M.

Records Available.—Intermittent records of daily gauge height are available during the years 1911 to 1916.

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Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Grand du Bonnet Falls for 1911, 1912, 1913 and 1914.

1911

1912

Day	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1				805.83	805.95	805.11	805.06	804.23	803.86
2				805.86	805.89	805.10	805.11	804.22	803.86
3				805.91	805.88	805.09	805.16	804.21	803.86
4			805.93	805.91	805.84	805.08	805.20	804.21	803.86
5				805.11	805.82	805.07	805.25	804.16	803.81
6									
7				805.11	805.80	805.06	805.20	804.11	803.81
8		805.93		805.24	805.74	805.05	805.34	804.11	803.81
9				805.31	805.73	805.04	805.30	804.11	803.76
10				805.32	805.71	805.03	805.34	804.11	803.66
11				805.32	805.64	805.02	805.30	804.11	803.66
12			805.83	805.32	805.73	805.01	805.37	804.11	
13				805.30	805.63	805.00	805.34	804.11	
14				805.26	805.63	804.98		804.11	
15		805.93		805.25	805.61	804.96	804.99		
16				805.24	805.59	804.94	805.01	804.11	
17	805.83			805.23	805.57	804.92	804.89	804.11	
18	805.83			805.20	805.55	804.90	804.83	804.11	
19			805.54	805.17	805.51	804.88	804.78	804.11	
20				805.15	805.51	804.85	804.72	804.01	
21				805.14	805.49	804.85	804.67	804.01	
22		805.93		805.13	805.47	804.85	804.51	804.01	
23				805.13	805.45	804.85	804.46	804.01	
24	805.83			805.13	805.43	804.87	804.39	803.96	
25			805.83	805.13	805.41	804.87	804.39	803.96	
26				805.13	805.39	804.84	804.39	803.96	
27				805.12	805.37	805.02	804.38	803.96	
28			805.83	805.07	805.30	805.06	804.38	803.91	
29	805.93	805.83	805.83	805.05	805.27	805.07	804.32	803.91	
30			805.83	805.04	805.15	805.08	804.32	803.91	
31	805.93	805.80	805.83	805.02	805.12	805.07	804.34		
				805.00		805.07	804.24		

Levels reduced to Water Power Survey datum.

1913

1914

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	May.	June.	July.	Aug.	Sept.
1				805.98	806.11				805.56			
2		807.04										
3						805.40	804.24		805.94			
4		807.08	807.09	805.98								
5												
6		807.19				805.19			806.11	807.26		
7			806.90									
8			806.09						806.20			
9		807.13									806.04	
10						805.09						
11			806.81	806.14						807.31		
12					805.90				806.81			
13		807.13				804.89						
14								804.72		807.56		
15				806.21	805.81			804.67	807.36			
16	806.39											
17						804.79				807.71		
18				806.36				804.76				
19	806.49				805.74							
20		807.09				804.09			807.31	807.64		
21			806.54		805.64							
22				806.31				804.86				
23	806.68	807.04										
24						804.54						
25			806.17	806.26				805.01		807.46		
26	806.81											
27	806.89	806.99				804.47		805.26				
28	806.97		805.99									
29				805.19	805.51			805.54	807.26			
30	806.99	807.02										
31												

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Grand du Bonnet
Falls for 1915 and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1											804.92	Completely frozen over
2												
3												
4						806.62		807.36				
5												
6							807.03			805.27		
7									805.77			
8						806.59	807.07			805.24		805.08
9											805.02	
10												
11												
12								807.29		805.07		
13												
14												805.12
15						806.83						
16												
17						806.87	807.45				805.23	
18												
19								806.69		804.93		
20												
21												805.00
22						806.84	807.46					
23											805.25	
24												
25												
26										804.87		
27												
28							807.41		805.35			804.99
29						806.98						
30											805.11	
31								806.18				

1916

1		804.97				809.41					808.24	806.80
2												
3								810.85				
4	804.89			805.18						808.59		
5												
6							810.59					
7			805.37						810.01			806.94
8		804.90										
9						809.79					807.24	
10								810.74		808.58		
11	804.90			805.14								
12												
13							810.58					
14			805.43						809.60			
15		804.86				810.16						
16											806.97	806.78
17								810.65		808.40		
18	805.27											
19							810.94					
20												
21			805.44						808.91			
22		805.05				810.04						
23											807.01	806.66
24								810.13				
25					809.20					808.24		
26	805.37											
27							811.00					
28			805.43						808.73			
29		805.07				810.48						806.88
30												
31								809.92				

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—HEAD OF LITTLE DU BONNET FALLS (GAUGING STATION).

History.—The station was established by D. L. McLean on June 22, 1911.

Location.—The gauge is located on the right bank of the river, a short distance upstream from the head of Little du Bonnet Falls in the S.W. $\frac{1}{4}$ Sec. 27, Tp. 17, R. 11, E.P.M.

Records Available.—Intermittent records of daily gauge height are available during the years 1913, 1914, 1915 and 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Little du Bonnet Falls for 1913 and 1914.

Day.	1913							1914				
	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	May.	June.	July.	Aug.	Sept.
1				771.05	771.31				770.62			
2		772.24										
3						770.26	768.84		770.92			
4		772.34	772.37	771.04								
5												
6		772.35				770.14			772.02	772.57		
7			772.24									
8				771.14					772.14			
9		772.38										771.19
10						770.06						
11			772.06	771.19						772.61		
12					770.94				772.47			
13		772.39				769.79						
14								769.57		772.92		
15				771.41	770.84			769.62	772.72			
16	771.57											
17						769.64				773.22		
18				771.54				769.68				
19	771.59				770.74							
20		772.39				769.45			772.67	773.13		
21			771.62		770.64							
22				771.46				769.92				
23	771.83	772.27										
24						769.34						
25			771.29	771.42				770.07		772.84		
26	772.09											
27		772.29				769.14						
28			771.08									
29				771.35	770.44			770.32	772.60			
30	772.14	772.30										
31												

Levels reduced to Water Power Survey datum.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Little du Bonnet Falls for 1915 and 1916.

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							772.99				770.57	Completely frozen over
2												
3												
4						772.60		773.46				
5												
6										770.94		
7									771.59			
8							773.06			770.94		770.96
9						772.67	773.19				770.60	
10												
11								773.39		770.79		
12												
13												770.99
14						772.89						
15												
16									771.09		771.09	
17							773.54					
18												
19								772.79		770.59		
20												
21												771.83
22						772.85	773.55					
23											771.09	
24												
25												
26										770.49		
27												
28							773.51		771.01			771.54
29						772.89						
30											771.02	
31								772.29				

1916

1		771.49				774.95					773.68	772.17
2												
3								776.35				
4	771.69			771.04								
5										773.95		
6							776.33					
7			771.74						775.65			771.80
8		771.49									772.40	
9						775.35						
10								776.26		773.97		
11	771.89			771.61								
12												
13							776.27					
14			771.89						775.22			
15		771.44				775.65						
16											772.16	771.15
17	772.19							776.17		773.77		
18												
19												
20							776.65					
21			771.93						774.44			
22		771.71				776.67					772.19	771.19
23												
24								775.77				
25					774.77					773.68		
26	771.99											
27							777.05					
28			771.93						773.82			
29		771.72				776.06						771.15
30												
31								775.56				

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—FOOT OF LITTLE DU BONNET FALLS (GAUGING STATION).

History.—The station was established by M. S. Madden on December 8, 1914 and has been in operation since that date.

Location.—A vertical staff gauge was located in a small bay on the left bank of the river, 400 feet below the large island at the foot of Little du Bonnet falls. On February 9, 1915 the gauge was moved upstream about 400 feet and located opposite the southerly end of the above island. This location is in S.W. $\frac{1}{4}$ Sec. 27, Tp. 17, R. 11, E.P.M.

Records Available.—Intermittent records are available during December of 1914, and throughout the years 1915 and 1916. Gauge heights (to W.P.S. datum) available for December 1914 are as follows.

DECEMBER 1914

Day	11	14	18	21	26	31
Gauge Height.....	761.88	761.66	761.45	761.45	761.47	761.50

Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of Little du Bonnet Falls for 1915 and 1916.

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			761.67				763.70					
2	761.50	761.50		761.26			763.74	764.02			761.97	
3				761.23	762.58	763.54			762.97			
4	761.50					763.54			762.87			
5							763.71					
6					762.65		763.73	764.04	762.72			762.10
7	761.50		761.67	761.26		763.62	763.77	764.06	762.67			
8							763.67		762.62	763.22		
9		761.55 ¹										
10		761.95 ¹		761.31		763.53	763.84	764.02			762.04	
11	761.50				762.94	763.56			762.62			
12		761.96		761.39			763.92	764.02		762.13		
13			761.62		763.13			763.97	762.42			
14	761.50			761.40	763.18	763.67		764.00				762.29
15						763.62						
16		761.94				763.62	764.12	764.00	762.32		762.27	
17					763.23	763.67	764.13		762.30			
18					763.23	763.68						
19				761.54			764.10			761.97		
20	761.54	761.88	761.56		763.22			763.87	762.22			
21						763.57						762.23
22							764.14					
23				761.84	763.14		764.13	763.61			762.32	
24					763.21				762.20			
25	761.67	761.83				763.62						
26												
27			761.36	762.24	763.32		764.15			761.92		
28				762.34				763.62				762.20
29				762.39	763.40	763.70			762.24			
30	761.54		761.31			763.67					762.14	
31				762.54	763.50	763.70	764.12	763.32				

1916

1		762.69				765.84					764.79	763.51
2												
3								767.11				
4	762.22			763.20								
5										765.06		
6							766.86					763.45
7			763.07						766.38			
8		762.77									763.94	
9						766.06						
10								767.04		765.16		
11	762.23			763.16								
12							766.66					
13												
14			762.97						766.02			
15		762.69				766.31						
16												
17								766.93		764.90		763.48
18	762.57											
19							767.14					
20												
21			762.97						765.34			
22		762.60				766.39					763.72	763.28
23												
24								766.46		764.79		
25					765.56							
26	762.67											
27							767.16					
28			763.17						765.13			
29		762.97				766.75						763.38
30												
31								766.27				

¹Location of Gauge changed February 9.
Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—HEAD OF WHITEMUD FALLS (GAUGING STATION).

History.—The station was established by D. L. McLean on June 22, 1911, and has been in operation since that date.

Location.—A vertical staff gauge is located near the right bank of the river at the head of the portage at Whitemud falls, in the S.W. $\frac{1}{4}$ Sec. 32, Tp.17, R. 11, E.P.M.

Records Available.—An intermittent record of daily gauge height is available during the years 1911, 1913, 1914, 1915 and 1916.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Whitemud Falls for 1911 and 1913.

1911						1913						
Day.	July.	Aug.	Sept.	Oct.	Nov.	April.	May.	June.	July.	Aug.	Sept.	Oct.
1												
2				762.38	762.40		761.99	763.31		762.50	762.54	
3												
4			762.38					763.34	763.30	762.49		761.73
5							762.12					
6												
7		762.48						763.37				761.61
8									763.21			
9					762.26		762.39	763.39		762.57		
10												761.44
11			762.18		762.20		762.52		763.11	762.61		
12							762.58				762.38	
13				762.71				763.34				761.36
14		762.48										
15										762.70	762.29	
16	762.38						762.75					
17	762.38											
18			762.08									761.27
19				762.59			762.79			762.79		
20								763.31			762.27	761.18
21		762.38				761.69						
22									762.95		762.22	
23										762.72		
24	762.38						762.87	763.27				
25			762.38						762.70	762.64		761.10
26												
27				762.88			763.04					
28		762.38						763.25				761.06
29	762.43					761.79			762.49			
30	762.47									762.61		
31	762.38	762.38					763.25	763.27			761.83	

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Whitemud Falls
for 1914 and 1915.*

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						762 17				762 25	762 02	
2								763 35				
3								762 83				
4									762 22			
5												
6						762 89	762 54		762 64		761 97	
7						763 10		763 19	762 54	762 22	761 82	
8								763 14				
9												
10									762 47			
11						763 39	763 59			762 49		
12											761 82	
13							763 64	763 12	762 35			
14					761 52	763 62						
15										762 53		
16							763 85	763 04				
17					761 57				762 32	762 50		
18												
19						763 59	763 76					
20												
21					761 74			763 03	762 27			
22										762 42		
23							763 70	763 02	762 30			
24					761 81							
25										762 30		
26												
27							763 65	762 99	762 25			
28					761 99	763 56				762 17		
29								762 94				
30												
31												

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Remarks
1							763 27	763 56			761 65		Completely frozen out
2									762 65				
3					762 23	763 14			762 52				
4					762 26		763 36		762 45				
5													
6					763 27	763 04	763 38	763 55	762 36				
7								763 56		761 92		761 94	
8								763 55		761 90			
9						763 07	763 47	763 55			761 77		
10					763 47	763 16			762 22				
11						763 16							
12							763 46			761 82			
13					763 67			763 57	762 07				
14					763 76	763 15		763 51				761 97	
15						763 16							
16				761 27			763 58	763 49			761 89		
17					763 78				761 99				
18					763 85	763 18	763 67			761 76			
19				761 30			763 59						
20					763 73			763 47	761 94				
21						763 17						761 87	
22					761 56	763 77	763 66	763 37			761 90		
23						763 77			761 93				
24						763 19							
25													
26				761 92			763 63			761 65			
27								763 17	761 90				
28						763 20						761 97	
29													
30				762 22			763 58	762 86			761 87		
31													

Levels reduced to Water Power Survey datum.

Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Whitemud Falls for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		761 93				765 09					763 99	763 13
2					763 34							
3								766 81				
4	761 95			762 47								
5									765 32	764 44		
6							766 04					
7			762 42									763 01
8		761 93										
9					764 05	765 39					763 39	
10								767 22		764 34		
11	761 98			762 44								
12												
13							766 01					
14			762 59						765 74			
15		761 95				765 52						
16					761 39						763 09	763 11
17								767 11		764 31		
18	762 14											
19							766 29					
20												
21			762 60	763 07					764 92			
22		762 17				765 59						
23											763 14	762 79
24								766 41				
25				763 27	764 91					763 85		
26	762 07											
27							766 34					
28			762 61						764 60			
29		762 40				765 08						762 84
30												
31								766 21				

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—HEAD OF SILVER FALLS (GAUGING STATION).

History.—The station was established by D. L. McLean on June 22, 1911, and has been in operation since that date.

Location.—A vertical staff gauge is located on the right bank of the Winnipeg river, one mile and a quarter above the head of Silver falls, in the N.W. ¼ Sec. 36, Tp. 17, R. 10, E.P.M.

Records Available.—Intermittent records of daily gauge height are available during the years 1911, 1912, 1913 and 1914. A continuous record of daily gauge height is available from May 29, 1915 to December 31, 1916.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Silver Falls
for 1911, 1912 and 1913.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							748-31	749-11	749-01	749-01	749-11	748-75
2							748-31	749-11	749-01	749-01	749-01	748-76
3							748-21	749-11	749-01	749-11	749-01	748-78
4							748-21	749-11	749-11	749-11	749-01	748-77
5							748-21	749-11	749-11	749-21	749-01	748-77
6							748-21	749-11	749-01	749-31	749-01	748-77
7							748-31	749-21	749-01	749-41	748-91	748-77
8							748-31	749-11	748-91	749-41	748-91	748-78
9							748-61	749-21	748-91	749-51	748-91	748-78
10							748-61	749-21	748-81	749-51	748-91	748-78
11							748-81	749-21	748-81	749-51	748-86	748-77
12							748-91	749-21	748-81	749-51	748-83	748-78
13							749-01	749-21	748-81	749-51	748-68	748-78
14							749-01	749-21	748-71	749-41	748-73	748-78
15							749-11	749-21	748-71	749-41	748-74	748-78
16							749-11	749-21	748-71	749-41	748-74	748-78
17							749-01	749-21	748-71	749-41	748-74	748-78
18							749-01	749-21	748-71	749-31	748-75	748-78
19							749-01	749-11	748-81	749-31	748-74	748-78
20							749-01	749-11	748-91	749-31	748-74	748-78
21							749-01	749-21	748-91	749-31	748-74	748-78
22						748-11	749-01	749-11	749-01	749-31	748-74	748-78
23						748-21	748-11	749-11	749-01	749-31	748-74	748-78
24						748-21	749-11	749-11	749-01	749-31	748-74	748-78
25						748-21	749-01	749-11	749-01	749-31	748-75	748-78
26						748-21	749-01	749-11	749-01	749-31	748-75	748-78
27						748-21	749-11	749-11	749-01	749-31	748-76	748-78
28						748-21	749-11	749-01	749-01	749-21	748-75	748-78
29						748-21	749-11	748-01	749-01	749-21	748-74	748-78
30						748-21	749-11	749-01	749-01	749-21	748-74	748-78
31							749-11	749-01		749-21		

1912

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.
1						750-36	750-11	750-21	749-11	749-21
2						750-39	750-11	750-21	749-11	749-21
3						750-49	750-11	750-21	749-11	749-21
4						750-59	750-11	750-21	749-11	749-21
5						750-69	750-16	750-21	749-11	749-21
6						750-77	750-21	750-21	749-11	749-21
7						750-82	750-21	750-11	749-11	749-21
8						750-83	750-21	750-11	749-21	749-11
9							750-21	750-11	749-21	749-11
10							750-21	750-01	749-21	749-11
11							750-21	750-01	749-21	749-11
12						749-34	750-21	750-11	749-21	749-01
13						749-39	750-26	750-11	749-21	749-01
14						749-44	749-41	750-11	749-31	749-01
15						749-53	749-41	750-42	749-41	749-01
16						749-64	749-41	750-36	750-01	749-01
17						749-71	749-51	750-31	749-96	749-51
18						748-76	749-51	750-31	749-91	749-51
19						749-82	749-51	750-26	749-81	749-51
20						749-86	749-61	750-21	749-71	749-51
21						749-91	749-61	750-21	749-61	749-51
22						749-95	749-71	750-21	749-56	749-51
23						749-99	749-71	750-21	749-51	749-51
24						750-05	749-81	750-11	749-41	749-46
25						750-08	749-81	750-11	749-31	749-41
26						750-12	749-81	750-11	749-31	749-41
27						750-13	749-91	750-11	749-21	749-41
28						750-16	750-01	750-11	749-21	749-41
29						750-19	750-01	750-11	749-16	749-41
30						750-28	750-01	750-11	749-11	749-31
31						750-34	750-11		749-11	749-31

Levels reduced to Water Power Survey datum.

SESSIONAL PAPER No. 25e

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Silver Falls
for 1914 and 1915.*

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				747 06	747 26	748 76	750 41	750 35	749 76	748 68	748 69	748 32
2					747 26	748 81	750 45	750 31	749 71	748 67	748 66	748 35
3					747 26	749 05	750 48	750 27	749 66	748 67	748 51	748 37
4		746 86	748 96		747 26	749 51	750 50	750 26	749 51	748 66	748 58	748 37
5					747 26	749 75	750 51	750 28	749 53	748 66	748 58	748 47
6					747 36	749 93	750 51	750 18	749 46	748 67	748 57	748 50
7	746 76				747 46	750 01	750 49	750 10	749 37	748 67	748 56	748 49
8				747 06	747 56	750 06	750 49	750 09	749 34	748 67	748 53	748 49
9					747 66	750 08	750 48	750 06	749 27	748 67	748 49	
10					747 76	750 26	750 44	750 04	749 25	748 67	748 47	
11		746 86	746 96		747 76	750 43	750 42	750 03	749 19	749 02	748 47	
12					747 86	750 54	750 41	749 98	749 15	749 12	748 46	
13					747 96	750 54	750 48	749 97	749 12	749 15	748 45	
14	746 76				747 96	750 56	750 66	749 97	749 07	749 18	748 41	
15				747 06	747 96	750 56	750 74	749 96	749 02	749 22	748 39	
16					747 98	750 54	750 76	749 95	749 07	749 27	748 35	
17					747 99	750 52	750 86	749 94	749 02	749 29	748 32	
18		746 86	746 96		747 99	750 47	750 85	749 94	748 98	749 28	748 31	
19				747 06	748 06	750 46	750 80	749 91	748 97	749 26	748 30	
20				746 96	748 16	750 16	750 76	749 86	748 96	749 23	748 30	
21	746 86			746 96	748 18	750 14	750 74	749 85	748 95	749 21	748 27	
22					746 96	748 24	750 44	750 76	749 85	748 97	749 18	748 27
23					747 06	748 26	750 42	750 76	749 86	748 97	749 13	748 27
24				747 06	748 26	750 41	750 67	749 86	748 97	749 10	748 28	
25		746 96	746 96	747 16	748 31	750 41	750 61	749 85	748 97	749 03	748 27	
26					747 16	748 37	750 44	750 58	749 85	748 96	748 95	748 28
27					747 26	748 45	750 44	750 56	749 84	748 96	748 90	748 29
28	746 86				747 26	748 51	750 44	750 53	749 83	748 93	748 87	748 29
29					747 26	748 56	750 42	750 47	749 83	748 91	748 83	748 29
30					747 26	748 66	750 11	750 45	749 80	748 89	748 79	748 29
31					748 72		750 35	749 77		748 75		

1915

1					749 96	750 12	750 46	749 50	748 53	748 11	Prozenover
2					749 95	750 10	750 46	749 40	748 55	748 11	748 28
3					749 94	750 12	750 46	749 49	748 53	748 13	748 30
4					749 95	750 12	750 47	749 20	748 49	748 14	748 31
5					749 95	750 13	750 47	749 10	748 49	748 14	748 32
6					749 94	750 13	750 49	749 00	748 50	748 14	748 31
7					749 94	750 15	750 49	749 05	748 48	748 14	748 32
8					749 93	750 17	750 46	748 98	748 48	748 20	748 31
9					749 94	750 22	750 46	748 92	748 42	748 21	748 33
10					749 95	750 21	750 47	748 89	748 39	748 27	748 31
11					749 99	750 28	750 47	748 80	748 36	748 30	748 32
12					750 00	750 33	750 47	748 72	748 31	748 34	748 34
13					750 01	750 40	750 45	748 65	748 30	748 36	748 39
14					750 02	750 41	750 44	748 61	748 27	748 43	748 47
15					750 03	750 50	750 41	748 61	748 25	748 43	748 50
16					750 03	750 53	750 37	748 59	748 23	748 42	748 52
17					750 02	750 53	750 35	748 53	748 21	748 42	748 54
18					750 05	750 55	750 31	748 85	748 17	748 42	748 54
19					750 05	750 57	750 30	748 84	748 15	748 43	748 53
20					750 02	750 57	750 28	748 51	748 12	748 43	748 53
21					750 01	750 58	750 25	748 49	748 12	748 45	748 52
22					750 01	750 58	750 20	748 45	748 12	748 30	748 52
23					750 02	750 58	750 19	748 45	748 11	748 28	748 53
24					750 02	750 54	750 17	748 45	748 10	748 30	748 53
25					750 03	750 52	750 12	748 53	748 10	748 29	748 53
26					750 03	750 51	750 08	748 52	748 10	748 29	748 54
27					750 04	750 51	750 07	748 51	748 11	748 30	748 55
28					750 07	750 51	749 91	748 50	748 11	748 30	748 57
29					749 82	750 50	749 83	748 50	748 11	748 30	748 58
30					749 86	750 11	750 50	749 70	748 53	748 12	748 59
31					749 90		750 49	749 62		748 12	748 50

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Silver Falls
for 1916.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	748.50	749.41	749.39	749.35	750.37	752.37	753.42	753.77	752.77	751.60	751.00	750.10
2	748.54	749.40	749.39	749.33	750.45	752.44	753.43	753.69	752.75	751.66	751.01	750.11
3	748.56	749.40	749.38	749.32	750.50	752.45	753.44	753.69	752.69	751.69	750.80	750.12
4	748.57	749.41	749.39	749.32	750.70	752.47	753.45	753.69	752.72	751.68	750.76	750.11
5	748.58	749.40	749.38	749.30	750.71	752.54	753.46	753.68	752.76	751.69	750.66	750.09
6	748.59	749.39	749.40	749.30	750.91	752.50	753.45	753.69	752.83	751.71	750.57	750.08
7	748.59	749.38	749.39	749.29	750.92	752.51	753.44	753.61	752.89	751.64	750.34	750.09
8	748.59	749.37	749.38	749.29	750.87	752.63	753.42	753.68	752.84	751.63	750.36	750.11
9	748.59	749.38	749.39	749.25	751.15	752.63	753.38	753.58	752.77	751.62	750.39	750.11
10	748.60	749.38	749.40	749.23	751.21	752.69	753.40	753.54	752.71	751.62	750.34	750.11
11	748.61	749.39	749.40	749.21	751.37	752.74	753.43	753.62	752.61	751.64	750.29	750.09
12	748.63	749.38	749.40	749.17	751.52	752.79	753.49	753.49	752.57	751.63	750.22	750.10
13	748.67	749.37	749.41	749.12	751.67	752.83	753.45	753.41	752.54	751.62	750.09	750.12
14	748.73	749.36	749.41	749.07	751.63	752.84	753.39	753.30	752.46	751.61	750.06	750.12
15	748.77	749.35	749.40	749.01	751.65	752.86	753.42	753.37	752.40	751.59	750.04	750.10
16	748.79	749.32	749.39	749.07	751.68	752.87	753.42	753.36	752.31	751.55	750.04	750.11
17	748.81	749.33	749.39	749.23	751.74	752.89	753.42	753.41	752.23	751.54	750.02	750.10
18	748.91	749.35	749.40	749.41	751.82	752.87	753.60	753.34	752.00	751.52	750.01	750.10
19	748.94	749.37	749.39	749.50	751.87	752.87	753.64	753.27	752.00	751.49	749.99	750.09
20	749.01	749.37	749.39	749.79	751.92	752.89	753.67	753.23	752.01	751.48	749.96	750.09
21	749.03	749.36	749.40	750.24	751.93	752.91	753.74	753.16	751.90	751.43	749.98	750.09
22	749.05	749.35	749.40	750.10	751.99	752.92	753.81	753.12	751.89	751.39	749.96	750.08
23	749.16	749.36	749.39	750.05	752.06	753.02	753.76	753.09	751.80	751.35	749.98	750.08
24	749.28	749.37	749.39	750.12	752.10	753.03	753.82	753.02	751.84	751.35	750.02	750.07
25	749.31	749.38	749.39	750.06	752.14	753.04	753.84	753.00	751.83	751.34	750.09	750.07
26	749.36	749.37	749.40	750.09	752.19	753.10	753.81	752.86	751.79	751.34	750.10	750.08
27	749.36	749.39	749.39	750.10	752.22	753.24	753.82	752.85	751.76	751.34	750.09	750.11
28	749.35	749.37	749.39	750.10	752.24	753.30	753.80	752.84	751.74	751.27	750.09	750.11
29	749.34	749.38	749.39	750.25	752.27	753.36	753.80	752.84	751.69	751.20	750.10	750.11
30	749.36	.....	749.37	750.28	752.30	753.40	753.80	752.82	751.62	751.16	750.10	750.11
31	749.39	.....	749.36	.....	752.33	.....	753.79	752.78	.....	751.14	.....	750.13

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—FOOT OF SILVER FALLS (GAUGING STATION).

History.—The station was established by D. L. McLean on June 21, 1911, and has been in operation since that date.

Location.—A vertical staff gauge is secured to the upstream side of a dock located on Lot 7, S.W. ¼ Sec. 10, Tp. 18, R. 10, E.P.M., about one mile and one-half below the foot of Silver falls.

Records Available.—Intermittent records of daily gauge height are available during the years 1911, 1913, 1914, 1915 and 1916.

SESSIONAL PAPER No. 26a

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of Silver Falls
for 1911 and 1913.*

1911

Day.	Jan.	Feb.	Mar.	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							726.30	727.00	726.90	726.80	727.00	726.50
2							726.30	727.00	726.90	726.80	727.00	726.50
3							726.30	727.00	726.90	726.80	726.00	726.50
4							726.30	727.00	726.90	726.80	726.00	726.50
5							726.30	727.00	726.90	727.00	726.00	726.50
6							726.30	727.00	726.90	727.10	726.00	726.50
7							726.30	727.00	726.90	727.10	726.00	726.50
8							726.30	727.00	726.90	727.20	726.00	726.50
9							726.30	727.00	726.90	727.20	726.00	726.50
10							726.60	727.00	726.80	727.30	726.70	726.60
11							726.70	727.00	726.80	727.30	726.70	726.60
12							726.90	727.00	726.90	727.30	726.70	726.60
13							727.00	727.00	726.70	727.30	726.60	726.60
14							727.10	727.00	726.70	727.30	726.60	726.50
15							727.10	727.00	726.70	727.30	726.60	726.50
16							727.10	727.00	726.70	727.30	726.60	726.50
17							727.00	727.00	726.70	727.30	726.60	726.50
18							727.00	727.00	726.70	727.30	726.60	726.50
19							726.90	727.00	726.70	727.30	726.50	726.50
20							726.90	727.00	726.70	727.30	726.50	726.50
21							726.90	727.00	726.70	727.30	726.50	726.50
22							727.00	727.00	726.70	727.30	726.50	726.50
23							727.00	727.00	726.80	727.30	726.50	726.50
24							727.00	727.00	726.80	727.30	726.50	726.50
25							727.00	727.00	726.80	727.30	726.50	726.50
26							727.00	726.90	726.80	727.30	726.50	726.50
27							727.00	726.90	726.80	727.30	726.50	726.50
28							727.00	726.90	726.80	727.30	726.50	726.50
29							727.00	726.90	726.80	727.30	726.50	726.50
30							727.00	726.90	726.80	727.30	726.50	726.50
31							727.00	726.90	726.80	727.30	726.50	726.50

1913

1						727.08	727.08	726.93		726.55	725.05	.....
2						727.08	728.18	726.88		726.45	725.05	.....
3						727.08	727.78	726.88		726.45	725.05	.....
4						728.18	728.18	726.88		726.45	725.05	.....
5						728.18	727.08	726.88		726.45	725.05	.....
6						728.18	727.08	726.88		726.35	725.05	.....
7						727.78	727.08	726.93		726.25	725.55	.....
8						727.78	727.08	726.93		726.15	725.55	.....
9						727.78	727.08	726.98		726.15	725.55	.....
10						727.78	727.08	726.98		726.15	725.55	.....
11						727.78	727.08	726.93		726.05	725.55	.....
12						727.78	727.08	726.98		726.05	725.55	.....
13						727.78	727.08	727.03		726.05	725.55	.....
14						727.83	727.08	727.08		726.05	725.55	.....
15					727.13	727.83	727.58	727.08		726.05	725.55	.....
16					727.15	727.83	727.58	727.18		726.05	725.55	.....
17					727.21	727.88	726.93	727.18		725.95	725.55	.....
18					727.23	727.88	726.88	727.18		725.95	725.55	.....
19					727.23	727.88	727.38	727.18		725.95	725.55	.....
20					726.95	727.81	727.38	727.18		725.95	725.55	.....
21					727.36	727.93	727.28	727.18		725.85	725.55	.....
22					727.38	727.98	727.18	727.18		725.85	725.55	.....
23					727.38	727.98	727.13	727.18		725.85	725.55	.....
24					727.38	727.98	727.08	727.08		725.85	725.55	.....
25					727.46	727.93	727.08	727.08		725.75	725.55	.....
26					726.93	727.58	727.01	727.08		725.75	725.55	.....
27					727.58	727.63	726.98	727.03		725.75	725.55	.....
28					727.55	727.63	726.98	727.03		725.75	725.55	.....
29					727.63	727.63	726.98	727.03	726.55	725.75	725.55	.....
30					727.68	727.63	726.98	727.03	726.55	725.75	725.55	.....
31					727.68	727.63	726.98	727.03	726.55	725.75	725.55	.....

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet. of Winnipeg River at Foot of Silver Falls
for 1914 and 1915.*

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						726.44	727.94	727.84	727.34	726.54	726.44	726.04
2						726.54	727.94	727.74	727.34	726.54	726.44	726.04
3						726.74	727.94	727.74	727.34	726.54	726.44	726.04
4						727.14	727.94	727.74	727.34	726.54	726.44	726.04
5		724.55				727.34	727.94	727.64	727.54	726.54	726.44	726.04
6						727.54	727.94	727.64	727.34	726.54	726.34	
7						727.54	727.94	727.54	727.14	726.54	726.24	
8						727.74	727.94	727.54	727.04	726.54	726.24	
9						727.79	727.94	727.54	726.94	726.54	726.24	
10						728.84	727.94	727.54	726.84	726.54	726.24	
11						727.84	727.94	727.54	726.84	726.54	726.14	
12						727.04	727.94	727.44	726.74	726.54	726.14	
13						728.04	728.04	727.44	726.64	726.74	726.14	
14						728.04	728.14	727.44	726.64	726.74	726.14	
15					725.84	728.04	728.24	727.44	726.64	726.74	726.14	
16					725.84	728.04	728.24	727.44	726.64	726.84	726.14	
17					725.84	728.04	728.24	727.44	726.64	726.84	726.14	
18					725.84	728.04	728.24	727.44	726.64	726.84	726.14	
19					725.94	727.94	728.24	727.34	726.64	726.84	726.14	
20					726.04	727.94	728.14	727.34	726.64	726.84	726.04	
21					726.04	727.94	728.14	727.34	726.64	726.84	726.04	
22					726.04	727.94	728.14	727.34	726.64	726.74	726.04	
23					726.04	727.94	728.14	727.34	726.64	726.74	726.04	
24					726.04	727.94	728.04	727.34	726.64	726.74	726.04	
25					726.04	727.94	728.04	727.34	726.64	726.64	726.04	
26					726.04	727.94	728.04	727.34	726.64	726.64	726.04	
27					726.14	727.94	727.94	727.34	725.64	726.54	726.04	
28					726.24	727.94	727.94	727.34	726.54	726.54	726.04	
29	726.56				726.34	727.94	727.94	727.34	726.54	726.54	726.04	
30					726.34	727.94	727.94	727.34	726.54	726.44	726.04	
31					726.44		727.84	727.34		726.44		

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Frozen over
1						727.60	727.80	728.10	727.40	726.40	726.10		726.40
2						727.60	727.80	728.10	727.30	726.40	726.10		726.40
3						727.60	727.80	728.10	727.10	726.40	726.10		726.40
4						727.60	727.80	728.10	727.00	726.40	726.10		726.40
5						727.60	727.80	728.10	727.00	726.40	726.10		726.40
6						727.60	727.80	728.10	726.90	726.40	726.10		726.40
7						727.60	727.80	728.10	726.90	726.40	726.10		726.40
8						727.60	727.80	728.10	726.80	726.40	726.10		726.40
9						727.60	727.80	728.10	726.70	726.40	726.10		726.40
10						727.60	727.80	728.10	726.70	726.30	726.20		726.40
11						727.60	727.90	728.10	726.60	726.30	726.20		726.40
12						727.70	727.90	728.10	726.50	726.30	726.20		726.40
13						727.70	728.00	728.10	726.50	726.30	726.20		726.40
14						727.70	728.00	728.10	726.50	726.30	726.20		726.40
15						727.70	728.00	728.10	726.50	726.20	726.20		726.40
16						727.70	728.10	728.10	726.50	726.20	726.20		726.40
17						727.70	728.20	728.00	726.40	726.20	726.30		726.40
18						727.70	728.20	728.00	726.40	726.20	726.30		726.40
19						727.70	728.20	728.00	726.40	726.20	726.30		726.40
20						727.70	728.20	728.00	726.40	726.10	726.40		726.40
21						727.70	728.20	727.90	726.40	726.10	726.40		726.40
22						727.70	728.20	727.90	726.40	726.10	726.40		726.40
23						727.70	728.20	727.90	726.40	726.10	726.40		726.40
24						727.70	728.20	727.80	726.40	726.10	726.40		726.40
25						727.70	728.20	727.80	726.40	726.10	726.40		726.40
26						727.70	728.10	727.70	726.40	726.10	726.40		726.40
27						727.80	728.10	727.70	726.40	726.10	726.40		726.40
28						727.60	727.80	728.10	727.60	726.40	726.10		726.40
29						727.60	727.80	728.10	727.60	726.10	726.40		726.40
30						727.60	727.80	728.10	727.50	726.10	726.40		726.40
31						727.60		727.50		726.10			726.40

Levels reduced to Water Power Survey datum.

**Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of Silver Falls
for 1916.**

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						729 96	731 36	731 86	730 66	729 86	728 86	
2						730 06	731 36	731 86	730 86	729 86	728 86	
3			728 60			730 16	731 36	731 86	730 86	729 86	728 86	
4		728 40				730 26	731 36	731 76	730 46	729 36	728 46	
5						730 26	731 36	731 76	730 46	729 36	728 36	
6				728 90		730 36	731 36	731 76	730 46	729 36	728 36	
7						730 36	731 36	731 76	730 46	729 36	728 16	
8						730 36	731 36	731 66	730 46	729 36	728 06	
9		728 50	728 90			730 46	731 36	731 66	730 46	729 36	728 06	
10						730 46	731 36	731 66	730 36	729 36	727 96	
11						730 46	731 36	731 86	730 36	729 36	727 96	
12	728 50					730 46	731 36	731 66	730 26	729 36	727 86	
13				728 70		730 56	731 36	731 46	730 26	729 36	727 86	
14						730 56	731 36	731 36	730 16	729 36	727 86	
15						730 56	731 36	731 26	730 16	729 36	727 76	
16			728 60			730 66	731 36	731 16	730 06	729 36	727 76	
17		728 50				730 66	731 36	731 16	730 06	729 36	727 66	
18						730 66	731 36	731 16	729 96	729 36	727 66	
19						730 66	731 46	731 16	729 96	729 36	727 66	
20	728 50			728 70		730 66	731 66	731 06	729 86	729 36	727 66	
21						730 76	731 66	731 06	729 86	729 36	727 66	
22						730 76	731 76	730 96	729 76	729 36	727 66	
23			728 60		729 66	730 76	731 86	730 96	729 66	729 36	727 66	
24					729 76	730 86	731 86	730 86	729 56	729 16		
25		728			729 86	730 86	731 86	730 86	729 46	729 06		
26					729 86	730 96	731 86	730 76	729 46	728 96		
27					729 86	731 06	731 86	730 76	729 46	728 86		
28	728 50				729 86	731 16	731 86	730 76	729 36	728 76		
29					729 86	731 26	731 86	730 76	729 36	728 76		
30					729 96	731 26	731 86	730 66	729 36	728 66		
31			728 90		729 96	731 26	731 86	730 66	729 36	728 66		

Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—HEAD OF PINE FALLS (GAUGING STATION).

History.—The station was established by D. L. McLean on June 21, 1911, and has been in operation since that date.

Location.—The gauge is located on the left bank of the Winnipeg river close to the head of Pine falls, in the S.W. $\frac{1}{4}$ Sec. 29, Tp. 18, R. 10, E.P.M.

Records Available.—Intermittent records of daily gauge height are available for the years 1911, 1913, 1914, 1915, and 1916.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Pine Falls
for 1911 and 1913.*

1911

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1										722 23	722 23	721 38
2												
3									722 23			
4												
5												
6								722 33				
7												
8											722 00	721 28
9												
10												
11									721 93		722 01	
12												
13								722 33		722 77		
14												
15												
16							722 23					
17												
18									721 83			
19										722 62		
20												
21								722 33				
22												
23							722 13		722 23			
24												
25												
26												
27								722 23		722 52		
28							722 23					
29												
30							722 33	722 15				
31												

1913

1								722 25	722 45			
2					721 60	723 50						
3										721 51	720 25	
4								722 25				
5					721 75		723 65					
6												
7						723 58	723 48			721 39		
8								722 33				
9					722 25	723 58						
10										721 26		
11					722 45			722 39				
12					722 48		723 25		722 14			
13						723 56				721 01		
14												
15								722 47	722 07			
16					722 73							
17										720 76		
18								722 64				
19					722 75							
20						723 55			721 95	720 65		
21							722 85		721 83			
22								722 60				
23					723 07	723 50						
24							722 55	722 55		720 45		
25												
26					723 22							
27						723 44				720 42		
28							722 31					
29								722 50	721 67			
30					723 45	723 45						
31												

Levels reduced to Water Power Survey datum.

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*Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Pine Falls
for 1914 and 1915.*

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						721 69						
2										721 84	721 64	
3								723 52				
4									722 69			
5										721 79		
6						723 24	723 79				721 49	
7									722 49			
8						723 36						
9								723 44		721 79	721 14	
10								723 42				
11							723 74		722 24			
12						723 55				722 04		
13											721 26	
14							723 94	723 44	722 00			
15					720 79	723 89						
16					720 84						721 19	
17								723 05	722 01	722 34		
18					720 84		721 24					
19										722 36		
20						723 84	721 12					
21									721 94		721 14	
22					721 17			723 04				
23								723 03		722 44		
24							721 01		721 94			
25					721 24							
26										721 99		
27												
28							721 01	723 01	721 79		721 09	
29					721 54	723 71						
30										721 74		
31								722 99				

1915

1										721 54	721 04	721 54
2								723 76		721 54	721 04	721 54
3					722 99		723 43		722 44	721 54	721 04	721 54
4						723 24			722 29	721 54	721 04	721 54
5					723 04		723 44			721 54	721 06	721 49
6												
7						723 19		723 74	722 14	721 19	721 07	721 44
8								723 76		721 19	721 07	721 44
9							723 51			721 44	721 09	721 44
10									721 84	721 39	721 12	721 44
11										721 39	721 14	721 44
12						723 24				721 34	721 14	721 44
13							723 64			721 31	721 14	721 44
14									721 64	721 29	721 14	721 21
15					723 74	723 34		723 74		721 29	721 14	721 21
16										721 29	721 12	721 71
17							723 89	723 69		721 24	721 09	721 74
18					723 79		723 89		721 49	721 24	721 09	722 24
19					723 81	723 34	723 94			721 19	721 14	722 29
20					720 44		723 92			721 19	721 14	722 34
21					723 74			723 62	721 44	721 19	721 09	722 39
22						723 24				721 19	721 24	722 39
23										721 14	721 29	722 44
24					720 94	723 73		723 57		721 14	721 29	722 34
25						723 76			721 44	721 09	721 29	722 31
26						723 33				721 09	721 34	722 29
27					721 19		723 84			721 04	721 34	722 29
28								723 24	721 44	721 02	721 44	722 29
29						723 35			721 54	721 04	721 44	722 29
30										721 06	721 49	722 28
31					722 89		723 89	722 99		721 04		722 29

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Head of Pine Falls
for 1916.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	722.29	722.24	.....	.....	.....	726.36	727.66	728.01	726.71	725.36	724.56	723.51
2	722.34	722.24	.....	.....	723.94	726.39	727.71	728.01	726.66	725.34	724.46	723.51
3	722.34	722.24	722.59	.....	.....	726.39	727.76	727.99	726.66	725.31	724.41	723.51
4	722.34	722.24	.....	722.19	.....	726.41	727.81	727.96	726.71	725.31	724.36	723.51
5	722.39	722.24	.....	.....	724.34	726.46	727.84	727.96	726.71	725.36	724.26	723.51
6	722.39	722.24	.....	.....	.....	726.46	727.86	727.96	726.76	725.41	724.16	723.51
7	722.39	722.24	722.64	721.96	.....	726.51	727.86	727.86	726.81	725.36	723.96	723.56
8	722.44	722.24	.....	.....	.....	726.55	727.86	727.76	726.76	725.31	723.81	723.61
9	722.44	722.24	.....	.....	724.84	726.64	727.84	727.71	726.71	725.31	723.71	723.66
10	722.44	722.24	722.64	.....	.....	726.66	727.84	727.66	726.64	725.36	723.66	723.71
11	722.44	722.29	.....	722.02	.....	726.74	727.81	727.61	726.53	725.36	723.61	723.76
12	722.44	722.29	.....	.....	725.29	726.76	727.79	727.56	726.46	725.34	723.56	723.66
13	722.54	722.29	.....	.....	.....	726.79	727.78	727.56	726.41	725.31	723.51	723.71
14	722.64	722.29	722.57	721.84	.....	726.84	727.76	727.56	726.34	725.29	723.44	723.76
15	722.69	722.29	.....	.....	.....	726.89	727.76	727.51	726.26	725.26	723.41	723.86
16	722.74	722.34	.....	.....	725.59	726.91	727.71	727.51	726.06	725.24	723.36	723.96
17	722.74	722.34	.....	.....	.....	726.91	727.71	727.46	725.96	725.21	723.34	724.11
18	722.74	722.34	722.49	722.82	.....	726.89	727.71	727.41	725.91	725.19	723.31	724.16
19	722.74	722.34	.....	.....	725.74	726.89	727.84	727.36	725.86	725.18	723.26	724.26
20	722.74	722.34	.....	.....	.....	726.89	727.91	727.26	725.81	725.16	723.26	724.36
21	722.74	722.34	722.37	723.64	.....	726.91	727.91	727.21	725.76	725.14	723.36	724.36
22	722.74	722.34	.....	.....	.....	726.91	727.91	727.16	725.74	725.11	723.36	724.26
23	722.64	722.34	.....	.....	725.96	726.94	727.96	727.11	725.72	725.09	723.36	724.26
24	722.54	722.44	722.34	.....	726.06	726.96	728.01	727.03	725.71	725.01	723.46	724.21
25	722.54	722.44	.....	723.74	726.01	727.06	728.06	726.99	725.61	724.96	723.61	724.26
26	722.49	722.44	.....	.....	725.76	727.16	728.11	726.91	725.56	724.91	723.59 ¹	724.46
27	722.44	722.44	.....	.....	726.06	727.26	728.06	726.86	725.51	724.88	723.56 ¹	724.56
28	722.39	722.52	722.26	723.77	726.11	727.36	728.04	726.84	725.48	724.84	723.54 ¹	724.66
29	722.39	722.53	.....	.....	726.16	727.46	728.01	726.84	725.46	724.79	723.51	724.76
30	722.34	.....	.....	.....	726.18	727.56	728.01	726.81	725.41	724.76	723.51	724.76
31	722.29	.....	722.26	.....	726.41	.....	728.01	726.76	.....	724.66	.....	724.56

Marked thus (¹) interpolated.
Levels reduced to Water Power Survey datum.

WINNIPEG RIVER—FOOT OF PINE FALLS (GAUGING STATION).

History.—The station was established by D. L. McLean on June 21, 1911, and has been in operation since that date.

Location.—A vertical staff gauge is secured to a post driven into the bed of the river near the left bank, in a small bay fifteen hundred feet below Pine falls in the S.W. ¼ Sec. 29, Tp. 18, R. 10, E.P.M.

Records Available.—Intermittent records of daily gauge height are available during the years 1911 and 1913. Continuous records of daily gauge height are available over periods from April 16 to December 9, 1914, and from May 30, 1915 to December 31, 1916.

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*Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of Pine Falls
for 1911 and 1913.*

1911

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								714.32	714.32	714.62	715.42	
2								714.22	714.52	714.22	714.52	715.10
3								714.42	714.02	714.62	713.02	
4								714.72	714.62	715.42	714.22	
5								715.12	714.82	714.22	714.52	714.15
6								714.42	714.92	714.62	714.62	
7								714.62	714.32	714.72	715.12	
8							713.52	714.72	714.32	714.82	714.22	
9							713.82	715.32	714.12	714.22		714.50
10							713.62	714.42	714.22	714.62	715.02	
11							715.52	714.02	714.62	714.72	714.98	
12							714.32	713.92	714.22	714.32	715.38	714.40
13							713.72	714.12	713.62	714.52	715.58	
14							713.92	714.62	713.92	714.62	714.78	
15							715.92	714.62	714.12	714.32	714.68	
16							715.02	714.92	713.92	714.72	714.38	714.70
17							714.82	714.82	714.02	715.12	714.58	
18							714.52	714.62	716.12	715.02		
19							714.32	714.52	714.92	715.12		715.20
20							714.92	713.92	714.62	715.02		
21							714.2	716.02	714.52	714.72	714.30	
22							714	715.52	714.82	714.32		
23							714	714.52	715.02	714.92		
24							715.92	714.32		715.32	715.10	
25							714.62	714.72	714.52	715.12		
26							713.72	71	713.92	714.82		715.20
27							713.92	71	714.82	714.82		
28							714.42	71	713.82	714.62	715.20	
29								714.12	714.12	715.82		
30							713.72	713.72	713.62	715.52		
31							714.42	714.42		715.32		

1913

1						715.54	715.14	715.74	714.54	714.74	713.54	
2						715.64	715.24	715.64	715.74	714.24	714.44	
3						715.64	716.14	715.34	715.54	714.64	715.74	
4						715.44	715.64	714.94	714.64	714.74	713.74	
5						716.54	715.94	715.44	714.54	715.14	713.34	
6						715.54	716.34	715.54	715.34	714.24	713.94	715.34
7						715.54	716.04	714.84	715.64	713.74	714.74	
8						715.44	716.34	714.54	714.34	714.34	714.24	
9						715.14	715.74	715.64	713.54	714.54	713.84	
10						714.94	715.14	714.74	713.44	714.84	713.34	
11						715.04	714.84	714.84	715.84	715.14	713.14	
12						715.74	715.64	715.64	715.24	714.84	713.64	
13						715.64	715.94	714.94	714.74	713.94	714.84	713.64
14						715.64	715.54	715.74	714.44	714.64	713.94	
15					714.94	715.74	715.74	715.64	715.34	715.24	713.34	
16						715.04	716.44	715.74	715.34	714.64		
17						715.54	715.64	715.84	715.74	714.84		
18						715.41	715.94	715.94	715.24	714.04		
19						715.14	715.94	716.14	714.84	715.44		
20						714.94	715.74	715.64	715.54	717.34	714.84	713.44
21						715.14	714.84	715.74	715.74	715.04	713.84	
22						715.04	715.24	716.44	715.31	714.34	713.34	
23						715.14	715.54	715.84	715.94	714.84	713.64	
24						715.34	715.04	715.14	715.44	715.04	714.54	
25						714.04	715.54	715.04	715.64	715.44	714.64	
26						715.34	716.04	714.84	716.04	715.44	713.94	
27						715.24	715.31	716.34	715.24	714.24	713.64	713.34
28						715.31	715.44	714.64	715.84	714.84	713.54	
29						715.44	715.44	714.64	715.44	714.54	715.54	
30						715.64	715.64	715.34	715.74	714.54	713.84	
31						715.54		714.94		713.54		

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of Pine Falls
for 1914 and 1915.*

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					713 16	713 86	715 06	715 61	714 56	713 58	713 66	713 71
2					713 26	714 16	714 86	715 21	715 71	713 80	714 06	713 66
3					713 26	714 40	715 19	715 06	715 96	713 46	714 46	713 86
4					713 26	714 21	715 11	715 06	715 66	714 06	714 26	713 91
5					713 16	714 41	714 96	715 38	714 56	713 86	714 06	713 76
6					713 46	714 66	715 06	715 87	714 51	713 66	713 56	
7					713 46	714 68	715 36	715 26	714 36	713 46	713 36	
8					713 36	714 81	714 76	714 96	714 36	713 26	713 46	
9					713 76	714 96	715 11	715 39	714 41	713 86	713 56	
10					713 76	715 01	715 16	715 19	713 86	714 06	713 51	
11					713 66	715 31	715 09	714 76	713 96	714 06	713 46	
12					713 36	715 36	714 96	711 48	713 66	714 26	713 96	
13					713 36	715 18	715 26	715 46	713 46	713 96	713 76	
14					714 06	715 26	715 26	715 41	713 41	713 46	713 66	
15					713 46	715 16	715 16	714 51	713 61	713 76	714 06	
16				713 26	713 35	715 21	716 06	714 56	714 56	713 36	715 26	
17				713 36	713 38	715 23	715 06	714 84	713 71	714 16	714 91	
18				713 16	713 30	715 51	715 36	715 06	713 96	711 16	714 56	
19				712 86	713 74	715 09	715 26	714 68	713 66	714 21	713 76	
20				712 86	713 71	714 86	715 11	714 56	714 36	713 96	713 56	
21				712 86	714 18	715 11	715 91	714 76	715 16	714 6	714 21	
22				712 86	713 91	715 16	715 38	714 81	714 86	714 71	714 16	
23				713 06	713 76	715 06	715 16	715 21	714 26	714 86	714 21	
24				713 16	713 65	715 73	715 36	714 71	714 41	714 46	714 36	
25				713 16	713 66	715 46	715 26	714 66	713 86	715 26	714 96	
26				713 26	714 16	715 21	715 00	714 61	713 86	714 56	714 86	
27				713 36	714 14	715 16	715 46	714 56	713 76	714 56	714 56	
28				713 06	713 36	714 96	715 21	714 54	713 96	713 86	711 06	
29				713 16	714 21	715 06	715 41	714 58	714 06	713 66	713 66	
30				713 16	713 86	715 16	714 86	714 76	713 96	713 46	713 56	
31				713 49	.....	.....	715 18	711 71	.....	713 86	.....	

1915

1						714 37	714 72	714 72	714 12	713 62	713 42	713 42
2						714 42	714 52	714 72	713 82	714 02	713 32	713 32
3						714 32	714 42	714 82	714 32	714 12	713 12	713 12
4						714 27	714 52	714 72	714 22	714 02	713 42	713 52
5						714 22	711 42	714 72	714 17	713 42	713 02	713 42
6						714 72	714 22	715 12	713 92	714 42	713 22	713 32
7						714 72	714 32	715 02	714 02	714 42	713 42	713 52
8						714 52	714 22	714 82	711 92	714 02	715 02	713 52
9						711 42	714 32	711 82	714 12	713 12	713 62	713 12
10						714 32	711 42	714 72	711 42	713 57	713 72	713 62
11						714 27	714 22	714 82	714 32	713 62	714 02	713 52
12						714 37	714 72	714 82	711 12	713 52	715 32	713 52
13						714 32	715 02	714 92	713 92	713 72	714 72	713 62
14						714 52	715 03	715 02	714 02	713 52	714 12	713 62
15						711 42	714 62	714 82	713 82	713 62	713 82	713 42
16						714 42	715 02	714 72	713 82	713 32	713 42	713 52
17						714 12	715 12	714 62	713 32	713 42	713 32	713 62
18						711 42	715 02	714 52	714 32	713 32	713 42	713 62
19						711 32	715 02	714 62	713 62	713 42	713 62	713 62
20						714 22	715 12	714 62	713 92	714 12	713 82	713 72
21						714 22	715 22	711 72	713 32	714 52	713 62	713 62
22						714 52	715 02	715 12	711 12	713 32	714 02	714 52
23						714 72	714 92	714 92	714 32	713 22	713 42	713 62
24						714 42	715 02	715 02	713 42	713 62	713 42	713 62
25						714 12	714 72	715 12	713 52	714 42	713 52	713 72
26						714 22	714 62	714 52	713 52	714 52	713 52	713 62
27						714 22	714 82	714 22	713 42	713 22	713 42	713 72
28						714 42	714 62	715 82	713 32	713 52	713 72	713 72
29						714 52	714 82	715 62	713 22	713 42	713 62	713 62
30					714 32	714 12	714 72	714 22	713 42	713 62	713 82	713 62
31					714 37	.....	.....	714 12	.....	713 72	.....	713 62

Levels reduced to Water Power Survey datum.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Foot of Pine Falls
for 1916.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	713 72	713 62	711 15	714 10	714 67	717 07	718 12	718 12	718 32	717 52	716 62	716 12
2	713 72	713 62	711 15	711 11	714 74	716 92	717 92	718 32	717 92	717 32	717 02	716 07
3	713 62	713 62	711 15	714 14	714 82	716 92	717 92	718 52	717 82	717 02	716 02	716 02
4	713 62	713 62	711 12	714 19	715 12	717 12	717 97	718 72	717 02	717 12	715 82	716 12
5	713 62	713 62	714 12	711 14	715 17	717 47	718 07	718 72	717 02	717 02	715 62	716 17
6	713 72	713 62	714 20	714 12	714 82	716 82	718 12	718 62	718 02	716 92	715 22	716 02
7	713 72	713 62	714 32	714 10	715 32	717 02	718 17	718 52	717 82	717 12	716 92	716 12
8	713 62	713 72	714 22	714 07	716 02	717 22	718 12	718 32	717 62	717 02	716 22	716 02
9	713 62	713 72	714 25	714 12	715 62	717 22	718 22	718 62	717 32	716 97	716 32	715 92
10	713 52	713 72	714 27	714 14	715 82	717 22	718 32	718 92	717 22	716 82	715 92	715 82
11	713 62	713 72	714 27	711 11	716 22	717 12	718 22	719 02	717 32	717 02	716 52	715 72
12	713 62	713 72	714 25	713 94	715 97	717 22	718 27	718 52	717 52	717 52	716 92	716 12
13	713 62	713 72	714 27	713 85	716 02	717 12	718 47	718 72	717 62	717 32	716 32	716 32
14	713 62	713 72	714 25	713 72	715 87	717 42	718 12	718 62	718 22	717 02	716 22	716 22
15	713 72	713 72	714 27	713 57	716 07	717 72	718 12	718 42	718 32	716 82	715 92	716 32
16	713 72	713 82	714 25	713 82	716 52	717 62	718 17	718 32	717 72	717 32	716 22	716 52
17	713 62	713 82	714 24	713 97	716 52	717 52	718 17	718 32	717 62	717 12	716 02	716 62
18	713 62	713 82	714 21	711 17	716 32	717 62	718 22	718 22	717 12	717 22	716 12	716 32
19	713 72	713 82	714 25	714 32	716 32	717 62	718 37	718 32	717 22	717 12	716 42	716 12
20	713 72	713 82	714 17	711 57	716 12	717 52	718 42	718 12	717 72	716 92	716 02	716 02
21	713 72	713 82	714 15	711 52	716 07	717 57	718 12	718 22	719 32	716 82	715 72	716 22
22	713 72	713 82	714 22	714 55	716 12	717 52	718 52	718 22	718 02	716 62	715 92	716 02
23	713 62	713 82	714 22	711 57	716 72	717 72	718 72	718 12	717 12	716 32	716 62	716 22
24	713 62	713 62	714 24	714 60	716 62	718 12	718 52	718 42	716 92	716 12	716 42	716 32
25	713 62	713 92	714 22	711 64	716 72	718 17	718 62	718 52	716 82	717 82	716 02	716 22
26	713 62	713 92	714 17	714 62	716 62	718 22	718 72	718 12	717 02	717 42	716 32	716 52
27	713 62	713 92	714 10	714 62	716 62	717 92	718 82	718 12	717 52	717 22	716 22	716 62
28	713 72	714 16	714 05	714 61	716 72	718 02	718 87	718 32	717 32	716 92	716 02	716 42
29	713 72	713 15	714 14	715 47	716 87	717 92	718 72	718 42	718 02	716 32	716 42	716 52
30	713 72		714 07	714 72	716 92	718 02	718 67	718 12	717 12	715 72	716 22	716 32
31	713 72		711 10		716 67		718 72	718 32		716 12		716 42

NOTE. (b) Interpolated.
Levels reduced to Water Power Survey datum.

WINNIPEG RIVER AT FORT ALEXANDER (GAUGING STATION).

History.—The station was established by D. L. McLean on June 21, 1911, and has been in operation since that time. It records Lake Winnipeg levels.

Location.—A vertical staff gauge is secured to the downstream side of the wharf of the Hudson's Bay Company on the Winnipeg river at Fort Alexander.

Records Available.—Practically continuous records of daily gauge height are available for periods from May 14 to November 30, 1913; May 16 to November 16, 1914, and from May 30, 1915 to December 31, 1916.

*Mean Daily Gauge Height, in Feet, of Winnipeg River at Fort Alexander for
1913 and 1914.*

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						714.70		714.90	713.70	714.60	713.49	
2						715.20		715.20	715.10	713.62	713.39	
3						714.87		715.00	714.17	714.17	714.87	
4						714.35	713.95	714.15	713.80	714.42	713.24	
5						714.10	714.90	714.65	713.65	714.24	712.72	
6						714.75	714.75	714.52	714.70	714.07	713.52	
7						714.87	714.25	713.70	714.95	713.27	714.37	
8						714.40	714.60	714.30	714.47	714.02	713.64	
9						714.05	715.25	715.30	712.25	714.19	713.87	
10						714.10	713.85	714.12	713.88	714.42	713.07	
11						713.90	712.80	714.00	715.18	715.69	712.74	
12						713.75	714.40	714.60	714.70	715.80	713.89	
13						713.70	715.30	714.10	714.13	713.65	714.47	
14						713.70	713.77	714.40	714.62	712.70	714.25	713.67
15						713.85	713.45	714.70	715.70	715.32	713.17	
16						714.10	714.45	714.55	714.52	714.25	713.62	712.84
17						714.65	715.25	714.70	715.62	714.05	712.42	713.77
18						714.65	715.20	715.02	714.62	713.33	714.07	713.87
19						714.35	714.35	715.05	714.35	715.05	715.02	714.07
20						714.05	714.50	715.15	714.55	716.95	714.07	713.62
21						714.10	714.45	715.40	715.40	715.60	713.57	712.97
22						714.10	713.90	715.25	714.75	713.80	713.42	713.42
23						714.47	713.65	715.00	715.40	714.25	714.47	713.12
24						714.20	714.00	714.37	714.30	714.65	713.67	713.97
25						714.00	714.15	714.20	714.65	714.22	714.20	713.72
26						714.10	713.90	714.15	715.52	714.75	713.77	713.47
27						714.35	714.95	715.85	713.75	713.69	713.44	712.79
28						713.77		714.67	715.60	714.22	715.22	712.54
29						714.12		713.95	714.95	713.85	713.72	712.62
30						714.35		714.90	714.45	713.99	714.29	712.99
31						714.55		714.85	711.13		713.77	

1914

1						712.79	713.24	713.36	713.01	711.99	712.89	
2						712.44	712.69	713.24	714.49	712.69	711.04	
3						712.94	713.12	713.51	714.76	712.39	713.09	
4						712.64	712.60	713.31	712.94	712.66	714.04	
5						712.09	712.56	713.64	712.86	711.96	712.59	
6						712.62	713.16	714.70	713.09	712.66	712.24	
7						712.04	713.59	712.94	713.19	712.54	713.64	
8						712.04	712.19	712.64	712.69	712.36	712.19	
9						713.31	713.19	714.06	711.87	712.89	711.99	
10						712.54	712.96	714.06	712.14	713.54	713.34	
11						713.36	713.21	713.09	712.51	713.89	713.19	
12						712.94	713.69	712.16	711.94	712.86	712.14	
13						712.86	713.09	714.41		712.56	712.59	
14						713.34	713.11	713.89		711.64	712.19	
15						713.26	713.11	712.64		712.69	713.54	
16						712.54	712.81	713.91	713.34	713.14	711.84	714.94
17						712.59	712.89	714.11	713.44	712.54	712.54	
18						712.79	713.71	713.29	713.29		711.54	
19						712.89	712.74	713.21	713.49	712.22	712.84	
20						712.34	712.46	713.16	713.29	712.74	712.19	
21						713.34	712.56	712.84	713.64	714.39	712.91	
22						713.44	712.92	713.29	713.29	714.10	712.29	
23						712.64	712.74	713.21	713.54	712.51	713.59	
24						712.24	714.04	713.26	713.44	713.46	712.49	
25						712.64	713.34	713.36	713.39		713.44	
26						713.26	713.06	713.14	713.09	712.56	713.64	
27						712.59	713.34	713.16	714.59	711.94	712.54	
28						712.22	712.94	713.64	711.87	712.51	713.14	
29						713.06	713.12	712.69	712.72	712.81	712.14	
30						713.16	713.24	713.64	712.84	711.74	711.84	
31						713.01		713.36	712.89		712.64	

Levels reduced to Water Power Survey datum.

SESSIONAL PAPER No. 266

Mean Daily Gauge Height, in Feet, of Winnipeg River at Fort Alexander for
1915 and 1916.

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						711 53	712 28	712 73	712 93	712 33	714 23	712 28
2						711 73	712 38	712 13	712 53	713 03	712 78	712 33
3						711 88	712 23	712 23	712 98	713 00	712 03	712 33
4						711 33	712 93	712 15	712 33	713 28	712 33	712 33
5						711 43	712 33	712 33	712 20	711 88	711 08	712 33
6						713 03	712 13	713 13	712 58	714 08	712 33	712 03
7						712 38	712 08	712 80	712 90	713 68	712 18	712 23
8						712 58	711 98	712 53	713 23	712 93	715 03	712 23
9						711 78	711 68	712 43	713 03	710 60	712 98	712 23
10						711 78	711 58	712 08	713 53	712 25	711 28	712 13
11						711 93	711 88	712 20	713 63	712 68	712 48	712 23
12						712 48	712 13	712 48	712 23	711 48	714 48	712 23
13						711 88	712 48	712 48	712 73	712 28	714 38	712 23
14						711 43	712 48	712 68	713 08	712 23	712 88	712 13
15						712 58	711 93	712 65	711 73	712 43	713 43	712 23
16						712 38	711 83	712 58	712 48	712 33	712 33	712 23
17						711 38	712 73	712 18	711 78	712 33	711 98	712 23
18						712 18	712 58	712 15	713 40	712 38	711 83	712 23
19						712 08	712 58	712 33	712 13	712 20	712 98	712 23
20						711 43	712 58	713 00	713 53	713 60	712 43	712 23
21						712 03	712 48	712 68	712 88	713 08	713 23	712 23
22						712 38	712 73	712 33	712 03	712 38	712 23	712 23
23						712 23	712 93	713 81	713 18	712 18	712 33	712 23
24						711 93	712 58	712 73	712 48	711 83	712 18	712 23
25						711 48	712 18	714 15	712 65	713 63	712 33	712 18
26						711 48	712 13	711 83	712 75	714 13	712 03	712 23
27						711 73	712 38	711 30	711 78	711 63	712 23	712 03
28						712 53	712 15	712 63	712 28	712 78	712 23	712 13
29						711 78	712 75	712 88	712 58	712 33	712 23	712 43
30					711 88	711 88	712 73	712 53	712 38	712 33	712 23	712 13
31					711 63		712 70	712 15		712 23		712 23

1916

1	712 23	712 23	711 93	712 13	712 18	714 86	714 41	714 26	716 16	715 11	714 76	711 76
2	712 24	712 03	711 93	712 08	712 63	713 59	714 36	715 31	715 06	716 11	715 46	714 76
3	712 03	712 03	712 03	712 13	712 38	714 06	714 31	715 11	714 46	715 16	714 36	714 66
4	712 23	712 08	712 03	712 13	712 93	714 14	715 66	715 46	714 51	715 26	713 36	714 66
5	712 23	712 03	712 03	712 13	712 73	713 16	714 61	715 01	714 29	715 46	713 46	714 76
6	712 23	712 03	711 93	712 03	712 60	713 36	714 26	715 26	714 81	714 81	713 54	714 76
7	712 13	711 93	711 93	712 08	712 48	713 46	714 76	715 01	714 86	715 61	715 71	714 96
8	712 13	712 03	712 08	712 03	713 73	714 06	714 41	714 76	714 76	715 51	715 01	714 86
9	712 23	712 03	712 23	712 03	712 53	713 91	714 36	711 81	714 26	715 31	715 41	714 66
10	712 43	712 03	712 03	711 73	714 33	713 81	714 76	716 31	714 24	714 81	717 31	714 76
11	712 43	712 03	712 18	711 83	714 23	713 86	714 76	716 29	714 66	714 66	716 36	714 86
12	712 13	711 93	712 13	711 93	712 03	713 51	714 71	715 56	715 21	715 66	715 51	714 86
13	712 03	711 93	712 13	711 93	712 83	713 81	714 36	715 01	715 06	715 31	715 06	714 86
14	712 08	711 98	712 03	712 08	712 88	714 11	711 51	714 66	717 90	715 36	715 36	711 76
15	712 23	711 98	712 03	711 83	713 73	714 86	714 96	715 14	717 16	715 86	714 71	714 76
16	712 13	712 03	712 03	711 93	714 08	714 61	714 86	714 89	716 16	716 21	715 41	714 86
17	712 23	712 23	711 83	712 03	713 58	714 56	714 56	715 16	715 91	715 26	714 86	714 86
18	712 13	712 03	712 03	712 13	713 68	714 54	714 46	714 81	714 51	715 61	714 86	714 86
19	712 18	712 13	711 98	712 23	713 13	714 16	714 56	714 96	714 84	715 46	714 86	714 71
20	712 18	712 03	711 93	712 23	712 93	711 26	714 76	715 31	716 06	715 06	714 96	711 71
21	712 18	712 03	712 03	712 23	712 98	714 06	714 81	715 01	717 71	715 26	714 56	714 46
22	712 23	712 03	712 03	712 23	713 03	714 11	714 83	715 06	715 91	715 81	714 06	714 46
23	712 13	711 93	711 93	712 23	713 43	714 41	715 01	715 71	71 96	714 91	716 06	714 56
24	712 13	712 13	712 03	712 43	713 66	715 31	714 99	716 31	716 16	713 26	715 06	714 56
25	712 03	711 93	712 03	712 43	713 46	714 36	714 86	715 76	715 01	716 96	714 86	714 56
26	712 18	712 13	712 03	712 23	713 01	714 61	714 91	715 81	715 76	714 76	714 96	714 86
27	712 33	712 03	712 03	712 23	713 01	714 21	714 96	715 56	715 96	715 26	714 86	714 96
28	712 23	712 13	711 98	712 23	713 06	714 41	715 41	715 96	716 66	715 06	714 86	714 66
29	712 43	712 03	712 03	713 03	713 66	714 16	715 31	715 86	715 11	715 11	715 06	714 51
30	712 13	.....	712 03	712 48	713 31	713 56	715 31	716 01	714 01	713 26	714 86	714 56
31	712 03	.....	712 03	.....	712 71	.....	715 01	716 31	.....	714 56	.....	714 56

Levels reduced to Water Power Survey datum.

RED RIVER GAUGING STATIONS.

Several gauges have been placed at points along the Red river and records of the river stage obtained. They are as follows:—

Below Emerson (2½ miles below bridge).

Morris.

St. Agathe.

Agricultural College.

Elm Park Bridge.

Redwood Bridge.

RED RIVER BELOW EMERSON BRIDGE (GAUGING STATION).

History.—The station was established by G. H. Burnham on June 13, 1912. It was intended as a metering station; but as a more suitable location was obtained in the vicinity, this station was abandoned on April 12, 1913.

Location.—A vertical staff gauge was secured to a pile driven into the bed of the river about sixty feet from the right bank at the farm of Thomas Clarke, two and one-half miles below the C.N. Ry. bridge at Emerson.

Records Available.—Continuous records of daily gauge height are available over periods from June 17 to November 23, 1912, and from March 1 to May 12, 1913. Intermittent gauge readings are also available over the period from November 23, 1912 to March 1, 1913.

Mean Daily Gauge Height, in Feet, of Red River at 2½ Miles Below Emerson for 1912 and 1913.

1912										1913		
Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.
1			750.32	751.32	749.65	753.34	751.18				753.42	752.92
2			750.17	750.95	749.57	753.94	751.07				753.22	753.02
3			750.02	750.62	749.49	754.37	750.79				753.12	752.92
4			749.82	750.32	749.32	754.58	751.08	751.49			743.07	752.92
5			749.87	750.12	749.37	754.47	751.19				753.22	753.02
6			749.82	750.11	749.59	754.32	751.02		750.32	750.33	753.02	752.97
7			749.75	750.17	749.56	754.18	751.09		750.32		753.12	752.92
8			749.62	749.96	749.72	753.87	750.92		750.32		753.42	753.22
9			749.79	749.82	749.57	753.87	751.08				752.92	753.02
10			749.90	749.64	749.38	753.19	750.97				752.92	752.92
11			749.82	749.56	749.42	752.72	751.09			750.33	753.22	753.02
12			749.72	749.65	749.47	752.79	751.10		750.33		753.22	753.12
13			749.82	749.57	749.40	752.37	750.92	750.32			753.02	
14			749.77	749.52	749.24	752.45	751.09				753.22	
15			749.72	749.44	749.34	752.39	750.97				753.02	
16			749.72	749.46	749.44	752.14	750.96				753.92	
17		750.57	749.67	749.39	749.54	752.04	750.95			750.33	753.22	
18		750.53	749.78	749.32	749.72	752.02	751.17	750.32			753.07	
19		750.54	749.82	749.34	749.92	751.77	750.42				753.02	
20		750.57	749.77	749.62	749.98	751.67	751.32		750.33		753.22	
21		750.57	749.82	749.88	750.04	751.54	751.42				753.92	
22		750.59	749.92	749.67	749.20	751.38	750.94				753.27	
23		750.56	750.32	749.55	749.16	751.32	750.12				753.12	
24		750.57	750.14	749.59	749.28	751.24				750.56	753.92	
25		750.59	750.17	749.54	749.57	751.19					753.02	
26		750.72	750.12	749.52	750.77	751.02					753.22	
27		750.82	750.32	749.70	750.82	751.07		750.32			753.02	
28		750.92	750.34	749.52	750.92	751.02			750.33		752.92	
29		750.87	750.27	749.42	751.73	751.22					753.02	
30		750.60	750.16	749.50	752.55	751.47						
31			751.60	749.57		751.37						

Marked thus (†) interpolated.

Levels reduced to M.H. S. datum (approximate sea level).

RED RIVER AT MORRIS (GAUGING STATION).

History.—The station was established by A. Pirie on May 1, 1914, and has been in operation since that date.

Location.—A vertical staff gauge is secured to a post driven into the bed of the river close to the left bank at a point near the pump house of the C.P. Ry.

Records Available.—A continuous record of daily gauge height is available for the following periods:—From May 2 to August 31, 1914; from January 1 to November 21, 1915, and from April 9 to December 14, 1916.

Mean Daily Gauge Height, in Feet, of Red River at Morris for 1914 and 1915.

1914

Day.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						743 55	744 70	742 00				
2					744 13	743 51	744 59	741 81				
3					744 10	743 37	744 69	741 66				
4					743 31	743 27	745 19	741 73				
5					741 03	743 30	745 05	741 54				
6					744 70	743 29	746 28	741 25				
7					745 51	743 33	746 05	741 28				
8					740 01	743 30	746 15	741 10				
9					746 23	743 15	746 59	740 43				
10					746 36	743 15	746 44	740 94				
11					746 29	743 25	746 05	740 75				
12					745 93	743 59	745 88	740 83				
13					745 70	744 04	745 56	740 79				
14					745 46	744 60	745 10	740 74				
15					745 15	745 83	744 75	740 55				
16					744 75	746 93	744 42	740 60				
17					744 53	747 94	744 17	740 45				
18					744 15	.....	743 87	740 47				
19					744 03	.....	743 66	740 35				
20					743 77	749 03	743 40	740 40				
21					743 51	748 85	743 32	740 25				
22					743 23	748 65	743 17	740 29				
23					743 05	748 20	742 95	740 29				
24					743 02	747 74	743 00	740 23				
25					743 01	747 14	742 89	740 15				
26					742 95	746 59	742 80	740 24				
27					743 15	745 95	742 60	740 15				
28					743 43	745 65	742 58	740 27				
29					743 60	745 27	742 35	740 29				
30					743 74	745 00	742 11	740 15				
31					743 65	.....	742 05	740 20				

1915

1	740 61	740 69	740 62	741 38	743 24	744 72	751 37	746 00	741 46	740 83	740 91
2	740 56	740 69	740 55	741 35	743 34	744 58	753 07	745 65	741 47	740 83	740 91
3	740 73	740 66	740 66	741 45	740 44	744 36	754 97	745 34	741 46	740 83	740 91
4	740 76	740 66	740 55	741 64	740 20	744 08	756 03	745 03	741 34	740 86	740 90
5	740 82	740 68	740 66	741 73	743 44	743 95	756 67	744 75	741 24	740 87	740 81
6	740 75	740 67	740 68	741 86	743 46	743 67	757 27	744 60	741 19	740 95	740 81
7	740 86	740 66	740 71	742 06	743 51	743 46	757 72	744 47	741 15	740 95	740 81
8	740 86	740 55	740 65	742 45	743 51	743 35	758 06	744 20	741 15	740 90	740 81
9	740 84	740 64	740 80	743 20	743 49	743 17	758 26	744 00	741 14	740 89	740 85
10	740 83	740 64	740 83	747 60	743 59	742 97	758 57	743 81	741 07	741 01	740 92
11	740 83	740 64	740 90	749 40	743 74	742 94	758 46	743 65	741 04	741 02	740 90
12	740 84	740 63	740 93	749 60	743 72	742 83	758 07	743 49	740 96	740 92	740 71
13	740 84	740 60	740 94	749 70	743 82	742 82	757 46	743 30	740 89	740 95	740 89
14	740 75	740 63	740 85	749 80	743 99	742 81	756 72	743 14	740 82	741 01	740 75
15	740 74	740 55	740 96	749 80	744 29	742 98	755 66	742 93	740 68	741 06	740 84
16	740 79	740 67	740 98	749 20	744 59	743 27	754 68	742 79	740 72	741 11	740 87
17	740 79	740 69	740 99	748 40	744 84	743 55	753 61	742 57	740 72	741 11	740 91
18	740 81	740 68	741 00	747 50	744 99	744 22	752 96	742 41	740 73	741 10	740 87
19	740 84	740 67	741 00	746 70	745 09	745 27	752 26	724 26	740 75	741 08	740 81
20	740 86	740 66	741 00	745 90	745 24	746 47	751 81	742 15	740 76	741 05	740 80
21	740 87	740 66	741 00	744 90	745 54	747 52	751 40	742 10	740 74	741 09	740 76
22	740 87	740 68	741 02	744 40	746 03	748 32	750 98	742 00	740 83	741 11	.....
23	740 85	740 70	741 04	743 90	746 31	748 84	750 55	741 98	740 97	741 12	.....
24	740 85	740 72	741 06	743 60	746 50	749 12	750 06	741 86	741 04	741 11	.....
25	740 84	740 71	741 06	743 40	746 57	749 27	749 51	741 76	741 07	740 92	.....
26	780 84	740 71	741 07	743 20	747 28	749 32	749 35	741 72	741 04	741 02	.....
27	740 83	740 66	741 09	743 10	745 98	749 22	747 86	741 69	740 96	741 09	.....
28	740 79	740 55	741 13	743 05	745 74	748 13	747 48	741 59	740 96	741 06	.....
29	740 76	.....	741 16	743 32	745 53	749 22	747 05	741 48	740 93	741 02	.....
30	740 74	.....	741 20	743 28	745 29	751 17	746 64	741 44	740 91	741 01	.....
31	740 70	.....	741 29	.....	745 07	.....	746 21	741 45	.....	740 85	.....

Levels reduced to M.H.S. datum (approximate sea level).

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26

Mean Daily Gauge Height, in Feet, of Red River at Morris for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					772.49	751.72	747.11	749.16	748.04	744.38	743.09	743.24
2					771.98	751.89	747.46	748.66	748.08	744.32	743.06	743.19
3					771.83	751.81	747.87	748.18	748.98	744.17	743.12	743.16
4					771.13	751.39	748.38	747.71	748.81	744.02	743.16	743.07
5					770.49	751.04	749.16	747.32	748.48	743.88	743.10	743.06
6					769.93	750.90	749.66	747.11	748.09	743.79	743.34	742.97
7					769.04	750.86	750.67	746.71	744.74	743.77	743.16	742.78
8					768.38	750.88	751.26	746.45	744.40	743.76	743.25	742.71
9				768.98	767.58	750.98	751.67	746.15	744.16	743.75	743.31	742.73
10				768.19	766.59	751.10	752.22	745.98	744.06	743.66	743.36	742.70
11				757.59	765.43	751.03	752.60	745.71	743.69	743.65	743.36	742.80
12				758.78	764.58	750.78	752.86	745.56	743.64	743.60	743.18	743.01
13				759.70	762.78	750.66	753.16	748.41	743.67	743.52	743.11	743.07
14				760.78	761.30	750.47	753.46	748.25	743.82	743.42	743.16	743.07
15				763.77	759.76	750.98	753.64	748.08	743.86	743.37	743.16	
16				770.08	758.55	749.68	753.76	745.03	744.16	743.34	743.12	
17				772.33	757.58	749.43	754.02	744.98	744.49	743.28	743.05	
18				774.08	756.09	749.08	754.06	745.06	744.76	743.25	742.92	
19				774.53	755.58	748.92	754.03	745.16	743.15	743.14	742.78	
20				774.63	753.90	748.38	753.95	745.22	743.31	743.08	742.70	
21				774.43	752.61	748.12	753.72	745.28	743.34	743.07	742.68	
22				774.28	752.00	747.87	753.16	745.34	743.37	743.05	742.72	
23				774.32	752.58	747.72	752.86	745.44	743.35	743.02	742.92	
24				774.32	752.49	747.28	752.40	745.56	743.28	742.96	742.96	
25				774.28	752.38	747.10	752.07	745.60	743.18	742.96	743.07	
26				774.08	752.33	747.06	751.74	745.56	744.97	742.94	743.15	
27				773.91	752.16	746.87	751.44	745.44	744.86	742.88	743.11	
28				773.49	751.98	746.83	751.05	745.38	744.67	742.87	743.14	
29				773.18	751.81	746.66	750.72	745.44	744.56	742.90	743.18	
30				772.88	751.78	746.84	750.16	745.64	744.47	742.88	743.22	
31				751.74			749.71	745.86		742.94		

Levels reduced to M.H.S. datum (approximate sea level).

RED RIVER AT ST. AGATHE (GAUGING STATION).

History.—This station was established by G. H. Burnham on November 6, 1912, at the time the Red River Survey was being carried on. From that time records have been obtained at this station covering various periods.

Location.—A vertical staff gauge is secured to a post driven into the bed of the river near the left bank and two hundred feet downstream from the ferry crossing the river at the town of St. Agathe.

Records Available.—Continuous records of daily gauge height are available for the following periods:—From November 7, 1912, to April 5, 1913; from May 1 to December 3, 1914; from January 1 to November 12, 1915, with the exception of from April 3 to May 9, and from July 1 to July 20 of that year, and from April 9 to November 12, 1916, with the exception of the period from April 21 to 23, and from July 4 to August 4.

Mean Daily Gauge Height, in Feet, of Red River at St. Agathe for 1912, 1913 and 1914.

Day.								Nov.	Dec.	Jan.	Feb.	Mar.	April.
1									737 71	736 03	736 04	736 06	736 74
2									737 71	736 00	736 04	736 04	737 93
3									737 61	736 12	736 04	736 93	736 33
4									737 48	736 16	736 12	736 84	740 31
5									737 39	736 17	736 13	736 04	740 31
6									737 18	736 21	736 10	736 09	
7								737 48	737 09	736 24	736 03	736 06	
8								737 43	737 00	736 20	736 01	736 01	
9								737 38	736 99	736 27	736 01	736 01	
10								737 38	736 91	736 31	736 05	736 04	
11								737 38	736 82	736 33	736 10	736 08	
12								737 4	736 73	736 34	736 11	736 01	
13								737 36	736 68	736 35	736 12	736 05	
14								737 33	736 62	736 37	736 13	736 01	
15								737 31	736 58	736 37	736 10	736 06	
16								737 16	736 50	736 36	736 07	736 06	
17								737 21	736 40	736 28	736 03	736 08	
18								737 05	736 31	736 28	736 12	736 09	
19								737 01	736 28	736 28	736 14	736 05	
20								736 98	736 20	736 29	736 15	736 03	
21								737 09	736 11	736 29	736 18	736 08	
22								737 02	736 08	736 18	736 21	736 03	
23								736 87	736 06	736 18	736 25	736 08	
24								737 33	736 04	736 17	736 21	736 13	
25								737 40	736 01	736 16	736 21	736 13	
26								737 55	735 98	736 16	736 20	736 18	
27								737 37	735 95	736 18	736 15	736 28	
28								737 61	735 92	736 18	736 11	736 28	
29								737 61	735 92	736 18		736 38	
30								737 68	735 97	736 17		736 44	
31									735 99	736 14		736 45	

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					739 31	739 21	739 91	737 76	736 71	736 84	736 76	736 31
2					739 21	739 06	739 61	737 72	736 61	737 01	736 74	736 31
3					739 11	739 07	739 61	737 64	736 71	736 91	736 75	736 31
4					739 01	739 01	739 93	737 64	736 71	736 71	736 81	736 31
5					739 01	738 83	740 31	737 61	736 71	736 91	736 81	
6					739 66	738 81	740 71	737 56	736 76	736 84	736 79	
7					740 41	738 96	740 62	737 41	737 81	737 01	736 81	
8					740 81	738 89	740 91	737 11	737 01	737 81	736 77	
9					741 46	738 83	741 06	737 11	736 96	736 99	736 80	
10					741 21	738 74	741 01	737 06	736 91	736 87	736 81	
11					741 11	738 74	740 91	737 11	736 86	736 91	736 82	
12					740 21	738 93	741 11	737 21	736 81	736 86	736 81	
13					740 71	739 26	740 91	737 11	736 76	736 81	736 71	
14					740 56	739 61	740 91	737 06	736 71	736 79	736 81	
15					740 31	740 81	739 61	737 06	736 76	736 82	736 81	
16					740 01	741 31	739 81	736 91	736 74	736 86	736 51	
17					739 61	742 11	739 21	736 86	736 73	736 91	736 41	
18					739 58	742 81	739 11	737 01	736 81	736 89	736 51	
19					739 49	742 83	738 91	736 91	736 71	736 80	736 50	
20					739 39	742 91	739 01	736 86	736 73	736 94	736 50	
21					739 21	743 11	738 81	736 81	736 73	737 11	736 50	
22					739 11	743 21	738 91	736 71	736 73	737 31	736 51	
23					739 01	742 41	738 81	736 61	736 71	737 01	736 51	
24					739 01	742 21	738 91	736 71	736 74	736 96	736 31	
25					738 81	741 01	738 61	736 76	736 71	736 93	736 30	
26					738 76	741 21	738 21	736 76	736 73	736 91	736 23	
27					735 52	740 91	738 11	736 74	736 73	736 86	736 23	
28					738 91	740 91	738 21	736 81	736 96	736 86	736 24	
29					739 02	740 21	738 01	736 81	737 31	736 81	736 25	
30					739 09	739 91	737 91	736 91	736 86	736 76	736 31	
31					739 21		737 81	736 93		736 71		

Levels reduced to M.H.S. datum (approximate sea level).

SESSIONAL PAPER No. 26a

*Mean Daily Gauge Height, in Feet, of Red River at St. Agatha for 1915
and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	736 51	737 11	737 23	738 14	739 07	740 47	737 70	737 45	736 80	736 79	736 79	736 79
2	736 51	737 11	737 23	738 14	739 07	740 47	737 70	737 45	736 80	736 79	736 79	736 79
3	736 51	737 11	737 23	738 14	739 07	740 47	737 70	737 45	736 80	736 79	736 79	736 79
4	736 51	737 11	737 23	738 14	739 07	740 47	737 70	737 45	736 80	736 79	736 79	736 79
5	736 51	737 11	737 23	738 14	739 07	740 47	737 70	737 45	736 80	736 79	736 79	736 79
6	737 01	737 21	737 41	738 14	739 07	740 47	737 70	737 45	736 80	736 79	736 79	736 79
7	737 01	737 21	737 41	738 14	739 07	740 47	737 70	737 45	736 80	736 79	736 79	736 79
8	737 01	737 21	737 41	738 14	739 07	740 47	737 70	737 45	736 80	736 79	736 79	736 79
9	736 08	737 11	737 40	738 14	739 07	740 47	737 70	737 45	736 80	736 79	736 79	736 79
10	737 01	737 11	737 51	738 15	739 52	740 19	737 58	737 40	736 74	736 74	736 74	736 74
11	737 01	737 21	737 51	738 16	739 51	740 11	737 39	737 48	736 78	736 78	736 78	736 78
12	737 01	737 21	737 61	738 18	739 52	740 11	737 31	737 44	736 60	736 60	736 60	736 60
13	737 06	737 21	737 70	738 21	739 52	740 11	737 27	737 41	736 59	736 59	736 59	736 59
14	737 06	737 21	737 70	738 24	739 62	740 11	737 30	737 43	736 72	736 72	736 72	736 72
15	737 07	737 21	737 71	738 50	739 67	740 11	737 31	737 42	736 72	736 72	736 72	736 72
16	737 03	737 21	737 72	738 50	739 80	740 11	737 30	737 41	736 71	736 71	736 71	736 71
17	737 01	737 29	737 79	739 06	739 80	740 11	737 30	737 47	736 71	736 71	736 71	736 71
18	737 01	737 29	737 80	740 16	739 20	740 11	737 29	737 50	736 71	736 71	736 71	736 71
19	737 09	737 29	737 81	740 24	739 08	740 11	737 29	737 50	736 71	736 71	736 71	736 71
20	737 11	737 29	737 82	740 25	740 87	740 11	737 30	737 51	736 71	736 71	736 71	736 71
21	737 09	737 31	737 82	740 44	741 77	744 08	738 21	737 30	737 53	737 53	737 53	737 53
22	737 11	737 31	737 82	740 66	742 37	744 06	738 09	737 29	737 53	737 53	737 53	737 53
23	737 34	737 31	737 83	741 06	742 65	744 04	738 04	737 38	737 53	737 53	737 53	737 53
24	737 34	737 31	737 89	741 10	743 17	743 88	738 04	737 50	737 52	737 52	737 52	737 52
25	737 21	737 33	737 91	741 31	743 32	743 18	737 04	737 59	737 51	737 51	737 51	737 51
26	737 21	737 34	737 93	741 11	744 57	742 88	738 04	737 60	737 51	737 51	737 51	737 51
27	737 16	737 31	737 93	740 56	744 42	742 46	738 10	737 58	737 51	737 51	737 51	737 51
28	737 21	737 26	737 97	740 66	744 32	741 68	738 29	737 52	737 10	737 10	737 10	737 10
29	737 11	737 26	738 03	740 51	743 31	741 38	737 29	737 50	736 99	736 99	736 99	736 99
30	737 11	737 26	738 09	740 36	743 77	741 28	737 18	737 18	736 88	736 88	736 88	736 88
31	737 11	737 26	738 09	740 16	743 16	741 08	737 18	737 18	736 85	736 85	736 85	736 85

1916

1	741 84	745 00	741 78	740 88	739 60	738 26	737 00	736 08	735 30	735 25	735 18	735 18
2	741 73	745 00	741 08	740 88	739 48	738 00	737 00	736 08	735 30	735 25	735 18	735 18
3	741 23	745 00	741 48	740 88	739 51	738 08	737 00	736 08	735 30	735 25	735 18	735 18
4	741 10	745 08	741 08	740 78	739 48	738 08	737 00	736 08	735 30	735 25	735 18	735 18
5	741 50	745 00	741 78	740 56	739 47	738 25	737 00	736 08	735 30	735 25	735 18	735 18
6	742 80	745 28	742 53	740 67	739 21	738 18	737 00	736 08	735 30	735 25	735 18	735 18
7	742 00	745 18	742 33	740 58	739 20	738 18	737 00	736 08	735 30	735 25	735 18	735 18
8	741 00	745 23	741 98	740 68	739 19	738 18	737 00	736 08	735 30	735 25	735 18	735 18
9	740 45	745 23	741 58	740 60	739 18	738 21	737 00	736 08	735 30	735 25	735 18	735 18
10	740 61	745 38	740 78	740 48	739 10	738 25	737 00	736 08	735 30	735 25	735 18	735 18
11	751 51	745 36	740 58	740 10	739 02	738 28	737 00	736 08	735 30	735 25	735 18	735 18
12	754 17	745 10	740 48	740 13	739 08	738 21	737 00	736 08	735 30	735 25	735 18	735 18
13	757 44	745 12	740 55	740 16	739 05	738 25	737 00	736 08	735 30	735 25	735 18	735 18
14	750 80	744 88	740 28	740 28	739 26	738 88	737 00	736 08	735 30	735 25	735 18	735 18
15	764 31	744 58	740 18	740 18	739 46	738 86	737 00	736 08	735 30	735 25	735 18	735 18
16	766 07	744 28	740 08	740 08	739 47	738 80	737 00	736 08	735 30	735 25	735 18	735 18
17	766 77	744 98	740 08	740 08	739 68	738 84	737 00	736 08	735 30	735 25	735 18	735 18
18	766 85	743 60	740 18	740 18	739 84	738 58	737 00	736 08	735 30	735 25	735 18	735 18
19	767 00	743 18	740 18	740 18	740 18	738 78	737 00	736 08	735 30	735 25	735 18	735 18
20	769 00	742 98	740 28	740 28	740 28	738 68	737 00	736 08	735 30	735 25	735 18	735 18
21	746 68	742 70	740 28	740 40	738 68	738 68	737 00	736 08	735 30	735 25	735 18	735 18
22	746 58	742 41	740 30	740 38	738 67	738 67	737 00	736 08	735 30	735 25	735 18	735 18
23	746 58	742 32	740 38	740 33	738 64	738 64	737 00	736 08	735 30	735 25	735 18	735 18
24	766 73	742 30	740 50	740 28	738 58	738 58	737 00	736 08	735 30	735 25	735 18	735 18
25	766 71	741 98	740 58	740 21	738 58	738 58	737 00	736 08	735 30	735 25	735 18	735 18
26	766 61	741 79	740 57	740 08	738 58	738 58	737 00	736 08	735 30	735 25	735 18	735 18
27	766 48	741 58	740 48	740 08	738 58	738 58	737 00	736 08	735 30	735 25	735 18	735 18
28	766 32	741 58	740 40	740 08	738 58	738 58	737 00	736 08	735 30	735 25	735 18	735 18
29	766 08	741 62	740 28	740 08	738 58	738 58	737 00	736 08	735 30	735 25	735 18	735 18
30	765 43	741 58	740 48	740 08	738 58	738 58	737 00	736 08	735 30	735 25	735 18	735 18
31	765 43	741 58	740 48	740 08	738 58	738 58	737 00	736 08	735 30	735 25	735 18	735 18

Levels reduced to M.H.S. datum (approximate sea level).

RED RIVER AT AGRICULTURAL COLLEGE (GAUGING STATION).

History.—The station was established by A. Pirie on October 15, 1914, and discontinued on December 6 of same year.

Location.—A vertical staff gauge was secured to a pile at the outer end of the Arctic Ice Co.'s dock on the Red River at their ice house just above the power house of the Agricultural College at St. Vital, about three miles south of Winnipeg.

Records Available.—A continuous record of daily gauge height is available from October 15 to December 6, 1914, with the exception of from October 17 to October 21.

Mean Daily Gauge Height, in Feet, of Red River at Agricultural College, Winnipeg, for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1											730.75	730.03
2											730.70	730.01
3											730.17	730.06
4											730.33	730.17
5											730.28	730.15
6											730.23	730.17
7											730.29	
8											730.21	
9											730.18	
10											730.20	
11											730.19	
12											730.15	
13											730.10	
14											730.24	
15										735.90	730.44	
16										735.68	730.37	
17											730.06	
18											729.75	
19											729.89	
20											729.79	
21											729.89	
22										735.88	729.98	
23										735.19	730.01	
24										734.59	730.01	
25										734.58	729.13	
26										734.36	729.88	
27										733.20	729.84	
28										732.44	729.84	
29										731.82	729.88	
30										731.34	729.98	
31										730.93		

Levels reduced to M.H.S. datum (approximate sea level).

RED RIVER AT ELM PARK.

History.—This station was established on August 19, 1914 by M. S. Madden and has been in continuous operation since that time.

Location of Section.—The meter section is situated on the downstream side of Elm Park traffic bridge, located at the southerly limits of the city of Winnipeg and four and one-half miles by the river above the junction of the Red and Assiniboine rivers.

Drainage Area.—The drainage area of the river above the station is 41,060 square miles.

Channel.—The bed of the channel is clay and of a fairly permanent nature. The banks are high and confine the discharge at the section during all stages of the river.

Gauge.—When the station was established, a nine-foot vertical staff gauge was secured to the wooden ice breaker immediately above the bridge. This was replaced on November 6, 1914 by a vertical staff gauge secured to the central concrete pier of the bridge.

A chain gauge was placed on the bridge on April 8, 1916, as owing to the high stage of the river at that time the staff gauge had become submerged. All of these gauges are referred to Red River Survey datum.

Discharge Measurements.—Discharge measurements have been made from time to time since the establishment of the station, but as the discharge of the river at this point is controlled by the St. Andrew's dam, the operation of same has a material effect on the results obtained.

Records Available.—From August 19, 1914 to December 31, 1916 a continuous record of daily gauge height has been obtained at this station.

Owing to the effect of the St. Andrew's dam on the river stage at this section, no attempt has been made to deduce any estimates of discharge from the information obtained.

*Mean Daily Gauge Height, in Feet, of Red River at Elm Park Bridge for
1914 and 1915.*

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1									736-23	736-12	730-81	729-65
2									736-25	736-02	730-47	729-65
3									736-22	735-88	730-25	729-65
4									736-23	735-76	730-09	729-65
5									736-27	735-77	729-98	729-70
6									736-36	735-83	729-87	729-80
7									736-21	735-98	729-92	729-85
8									736-01	736-19	729-90	729-95
9									735-96	736-31	729-87	730-05
10									736-02	736-34	729-87	730-15
11									736-04	736-35	729-83	730-20
12									736-03	736-31	729-73	730-25
13									735-95	736-23	729-75	730-35
14									735-92	736-16	729-80	730-40
15									735-85	736-01	729-80	730-30
16									735-86	735-74	729-80	730-20
17									735-83	735-66	729-80	730-15
18									735-85	735-74	729-80	730-05
19								736-09	735-98	735-90	729-80	730-00
20								736-08	736-06	736-05	729-80	729-90
21								736-06	736-27	736-14	729-80	729-90
22								736-98	736-32	735-92	.....	729-80
23								736-88	736-10	735-12	.....	729-80
24								736-85	735-98	734-55	.....	729-80
25								736-01	735-92	734-50	.....	729-75
26								736-22	736-03	734-27	.....	729-70
27								736-26	736-20	733-19	.....	729-70
28								736-15	736-32	732-37	.....	729-60
29								735-95	736-27	731-63	729-50	729-55
30								735-88	736-17	731-25	.....	729-55
31								736-04	.....	730-70	.....	729-55

1915

1	729-54	730-04	730-09	730-54	734-74	735-99	737-74	734-55	735-94	735-86	729-99	729-89
2	729-49	730-04	730-04	730-54	735-04	735-96	738-11	734-29	735-86	735-76	729-79	729-89
3	729-49	729-99	730-04	730-64	735-29	735-89	738-49	733-79	735-79	735-74	729-59	729-89
4	729-59	730-04	729-99	730-89	734-89	735-86	738-96	733-49	735-76	735-69	729-59	729-89
5	729-64	730-04	729-99	731-09	736-54	735-81	739-44	733-11	735-79	735-69	729-69	729-99
6	729-60	730-04	729-99	731-14	736-14	735-79	739-71	732-79	735-79	735-71	729-59	729-79
7	729-79	730-09	729-99	731-24	736-06	735-69	740-06	732-34	735-74	735-69	729-49	729-69
8	729-79	730-09	730-04	731-49	736-34	735-56	740-31	732-29	735-74	735-71	729-69	729-69
9	729-84	730-09	730-04	731-99	736-24	735-44	740-41	733-79	735-76	735-69	729-69	729-74
10	729-84	730-09	730-09	733-19	736-09	735-56	740-54	735-79	735-72	735-74	729-69	729-79
11	729-84	730-09	730-14	735-29	736-06	735-94	740-71	736-31	735-69	735-71	729-59	729-89
12	729-85	730-04	730-19	735-09	736-01	736-02	740-43	736-16	735-69	735-76	729-39	729-99
13	729-89	730-09	730-19	735-89	736-04	736-04	740-21	735-94	735-64	735-82	729-19	729-99
14	729-89	730-09	730-24	735-99	736-19	735-96	739-79	735-81	735-69	735-87	729-19	729-89
15	729-94	730-09	730-24	735-89	736-46	736-07	739-29	735-79	735-71	735-81	729-19	729-99
16	729-89	730-09	730-24	735-59	736-61	735-96	738-64	735-69	735-64	735-92	729-39	729-99
17	729-94	730-09	730-14	735-09	736-61	735-94	738-14	735-67	735-66	735-94	729-39	729-99
18	729-94	730-09	730-14	734-79	736-46	735-99	737-69	735-57	735-66	735-96	729-49	729-99
19	729-94	730-09	730-14	734-44	736-36	736-24	737-37	735-54	735-64	735-89	729-59	729-99
20	729-94	730-09	730-19	733-84	736-29	736-46	737-19	735-92	735-71	735-87	729-59	729-99
21	729-99	730-09	730-24	733-49	736-36	736-79	737-20	736-12	735-81	735-82	729-59	730-09
22	729-99	730-09	730-24	733-16	736-49	736-94	737-41	736-01	735-89	735-86	729-59	730-19
23	729-99	730-09	730-29	733-06	736-54	736-86	737-34	735-96	735-86	735-81	729-49	730-24
24	730-04	730-09	730-34	732-76	736-64	736-99	737-04	735-99	735-94	735-76	729-49	730-29
25	729-99	730-09	730-39	732-64	736-71	736-99	736-74	735-96	736-01	735-76	729-49	730-34
26	729-99	730-09	730-49	732-44	736-59	737-06	736-39	735-91	736-11	735-81	729-54	730-39
27	729-99	730-09	730-49	732-41	736-44	737-06	736-16	735-89	736-09	734-99	729-59	730-39
28	729-99	730-09	730-49	732-36	736-46	736-94	735-94	735-94	736-04	733-39	729-69	730-29
29	729-99	.....	730-49	732-34	736-36	736-86	735-71	735-99	735-99	732-54	729-79	730-34
30	729-99	.....	730-44	732-99	736-11	737-07	735-49	735-94	735-96	731-59	729-89	730-14
31	729-99	.....	730-49	.....	736-04	.....	735-04	735-96	.....	730-74	.....	730-09

Levels reduced to M.H.S. datum (approximate sea level).

SESSIONAL PAPER No. 26a

Mean Daily Gauge Height, in Feet, of Red River at Elm Park Bridge for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	729.99	729.69	729.69	730.39	752.98	739.60	737.11	737.48	736.81	736.48	730.98	730.98
2	729.99	729.69	729.69	730.59	752.43	739.73	737.13	737.36	736.83	736.51	730.88	730.98
3	729.99	729.69	729.69	730.74	751.88	739.66	737.31	737.26	736.86	736.58	730.88	730.98
4	729.99	729.69	729.69	731.19	751.38	739.53	737.61	737.01	736.88	736.56	730.93	730.88
5	729.99	729.69	729.79	732.39	750.88	739.56	737.71	736.93	736.78	736.53	730.98	730.78
6	729.99	729.69	729.79	734.39	750.36	739.36	737.98	736.88	736.51	736.56	731.03	730.73
7	729.99	729.69	729.84	736.29	749.83	739.33	738.36	736.71	736.36	736.51	731.08	730.73
8	729.99	729.69	729.80	737.69	749.25	739.43	738.63	736.43	736.28	736.48	731.08	730.73
9	729.99	729.69	729.89	738.52	748.83	739.63	739.70	736.26	736.31	736.41	731.13	730.68
10	729.99	729.69	729.94	739.19	748.28	739.61	738.86	736.38	736.28	736.33	731.13	730.58
11	729.99	729.69	729.99	739.84	747.53	739.56	738.98	736.53	736.18	736.18	731.03	730.68
12	729.99	729.69	729.99	740.49	746.72	739.53	739.18	736.66	736.33	736.11	730.78	730.73
13	729.99	729.69	730.09	741.34	745.93	739.41	739.28	736.68	736.41	736.08	730.38	730.73
14	729.94	729.69	730.09	742.49	745.13	739.31	739.23	736.56	736.43	736.03	730.38	730.78
15	729.94	729.69	730.09	743.89	744.16	739.23	739.11	763.33	736.51	736.08	730.48	730.78
16	729.89	729.69	730.09	747.59	743.23	739.06	738.93	736.58	736.58	736.13	730.53	730.88
17	729.89	729.69	730.09	750.94	742.16	738.83	72.91	736.88	736.66	736.11	730.38	730.88
18	729.89	729.64	730.09	752.42	741.28	738.58	739.01	736.86	736.81	736.28	730.38	730.88
19	729.89	729.64	730.19	753.10	740.53	738.33	739.01	736.81	737.06	736.32	730.38	730.83
20	729.89	729.64	730.29	752.90	739.88	738.13	738.86	736.78	736.93	736.28	730.28	730.78
21	729.84	729.59	730.29	753.45	739.43	737.58	738.78	736.81	736.78	736.21	730.33	730.78
22	729.84	729.59	730.29	754.53	739.33	737.26	738.61	736.78	736.78	736.18	730.38	730.71
23	729.84	729.59	730.34	754.83	739.56	737.38	738.31	736.86	736.71	736.06	730.38	730.68
24	729.79	729.64	730.34	754.98	740.26	737.28	738.01	736.96	736.68	736.03	730.48	730.63
25	729.79	729.64	730.29	754.93	740.41	737.13	737.66	736.98	736.61	736.01	730.58	730.58
26	729.79	729.69	730.29	754.88	740.18	737.06	737.51	736.83	736.53	735.83	730.78	730.68
27	729.79	729.69	730.29	754.68	740.31	736.98	737.48	736.71	736.66	735.26	730.83	730.68
28	729.79	729.39	730.34	754.28	740.08	737.13	737.76	736.66	736.73	734.38	730.88	730.68
29	729.79	729.69	730.34	753.91	740.01	737.13	737.91	736.56	736.61	733.51	730.88	730.63
30	729.79	729.39	730.39	753.48	739.88	737.18	737.58	736.53	736.53	732.56	730.98	730.58
31	729.74	729.39	730.39	753.76	739.76	737.38	737.38	736.60	736.60	731.28	730.98	730.54

Levels reduced to M.H.S. datum (approximate sea level).

RED RIVER AT REDWOOD BRIDGE, WINNIPEG (GAUGING STATION).

History.—A gauge was set on the Red river at the Redwood bridge in the city of Winnipeg on August 21, 1912, by G. H. Burnham, in connection with the work of the Red River Survey, and from that time intermittent gauge readings have been obtained at this point.

Location.—The Redwood bridge crosses the Red river on Redwood avenue in the city of Winnipeg about three miles downstream from the junction of the Red and Assiniboine rivers.

The gauge is an eighteen foot vertical staff gauge located inside the ice breaker and facing the upstream side of the bridge, and is referenced to a B.M. set to M.H.S. datum, on the top of the bridge pier adjacent to the gauge.

Records Available.—Intermittent gauge readings have been obtained on this gauge from the time of installation to the end of the year 1916.

*Mean Daily Gauge Height, in Feet, of Red r at Redwood Bridge for
1912 and 1913.*

1912

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1									735 66	736 59		
2									735 85	736 66		
3									735 79	736 87		
4									736 11	736 79	731 17	
5									735 84	736 93	731 44	
6									735 82	737 06	731 53	
7									735 68	736 72	731 43	
8									736 10	736 82	731 33	
9									736 08	736 83	731 23	
10									735 76	736 77	731 18	
11									736 02	736 49	731 13	
12									735 77	736 55	731 10	
13									735 97	736 50	731 08	
14									736 30	736 36	731 08	
15									736 28	736 44	731 08	
16									736 00	736 43	731 38	
17									735 89	736 33	730 62	
18									736 14	736 16	730 50	
19									736 15	736 25	730 57	
20									736 21	736 22	730 53	
21								735 73	736 39	736 20	730 61	
22								735 75	736 22	736 24	730 67	
23								735 98	736 21	736 19	730 69	729 92
24								735 98	736 27	736 03	730 32	
25								735 50	736 35	736 04	730 29	
26								735 73	736 37	730 04	730 22	
27								735 93	736 38	736 34	730 20	
28								735 83	736 49	736 03	730 21	
29								735 83	736 41		730 20	
30								735 58	736 12		729 80	729 52
31								735 94				

1913

1				730 32	739 37		736 87		737 12	737 32	736 22	
2					739 52		737 32		737 22	737 22		
3					739 62		737 32		737 22	737 12	735 52	
4		729 42	729 67				737 42		737 32	737 12		
5					739 72		737 32		737 32			
6					739 92				737 32	737 12		
7	729 52				739 82		737 32			737 22		
8				745 27	740 02		737 22		737 22	736 92		
9				743 42	740 02	737 02	737 27		737 02	736 72		
10				745 02	740 07	737 12	737 32		737 12	736 02		
11		729 52	729 52	744 72		736 82	737 32	737 32	737 12	736 62		
12				744 02	739 62	736 52	737 42	737 72	737 22			
13					739 47	736 27		737 42	737 32	736 92		
14	729 57			744 72	739 42	736 12	737 72	737 22		737 12		
15				745 32	739 27		737 52	737 72	737 02	737 12		
16				745 02	739 12	735 92	737 67	737 32	737 12	737 02		
17				744 52	739 02	737 62	737 72	737 32	737 22	737 22		
18		729 62		743 72		737 52	737 52	737 32	737 32	737 42		
19			729 62	743 02	739 07	737 32	737 62	737 42	737 42			
20					738 90	737 32		737 42	737 62	737 52		
21				742 32	738 77	737 27	737 72	737 32		737 72		
22				741 72	738 62		737 57	737 32	737 52	737 72		
23	729 52			740 52		737 32	737 42	737 22	737 32	737 72		
24				740 32		737 32	737 32		737 22	737 92		
25			729 72	739 62		737 47	737 32		737 12	737 92		
26		729 62		739 72		737 32	737 37		737 22			730 02
27						737 32			737 12	737 72		
28	729 42			739 52		737 12	737 67			737 72		
29				739 12			737 62		737 32	737 52		
30				738 57		737 02	737 42		737 22	737 42		
31							737 32			737 22		

Levels reduced to M.H.S. datum (approximate sea level).

SESSIONAL PAPER No. 256

Mean Daily Gauge Height, in Feet, of Red River at Redwood Bridge for 1914

and 1915.

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						736.43	735.93	736.13	736.33	736.13	730.33 ¹	728.93
2	729.92			731.92		736.43	736.13	736.08 ¹	736.43	736.03	730.13	728.93
3						736.53	736.33	736.03	736.53	735.93	729.83	729.03
4					734.53	736.33	736.43	735.93	736.43	735.88 ¹	729.53	729.13
5		730.42			736.73	736.23	736.43 ¹	736.03	736.23	735.83	729.33	729.23
6			730.52		736.53	736.23	736.43	736.13	736.13 ¹	735.73	729.33	729.23 ¹
7					736.33	736.13 ¹	736.53	735.83	736.03	735.93	729.23	729.23
8					736.73	736.03	736.63	736.03	736.03	736.03	729.18 ¹	729.13
9	729.72				736.93	736.03	736.73	736.03 ¹	736.13	736.03	729.13	729.23
10					736.73 ¹	736.03	736.43	736.03	735.93	736.23	729.13	729.13
11					736.53	736.13	736.43	736.03	735.83	736.28 ¹	729.13	729.33
12		730.52			736.43	736.23	736.34 ¹	735.93	736.03	736.33	729.13	729.33
13					736.33	736.23	736.33	736.03	736.03 ¹	736.13	729.03	729.43 ¹
14			730.62		736.33	736.38 ¹	736.23	735.83	736.03	736.23	729.03	729.53
15					736.23	736.53	736.23	735.83	735.93	736.03		729.73
16	729.92				736.23	736.73	736.03	735.93 ¹	736.03	735.83		729.63
17					736.13 ¹	736.93	735.93	736.03	736.13	735.73		729.53
18					736.03	737.03	735.83	735.83	736.13	735.88 ¹		729.53
19					736.43	737.03	735.83 ¹	735.73	736.23	736.03		729.43
20		730.62	730.72		736.53	737.13	735.83	735.83	736.13 ¹	736.13		729.43 ¹
21					736.73	736.83 ¹	736.03	736.03	736.03	736.33	728.93	729.43
22					736.53	736.53	736.33	736.03	735.93	736.03	728.88 ¹	729.43
23	730.02				736.33	736.33	736.13	736.13 ¹	735.93		728.83	729.53
24					736.38 ¹	736.23	736.04	736.23	736.13		728.83	729.33
25					736.43	736.03	736.03	736.33	736.03		728.93	729.33
26					736.33	736.03	736.03 ¹	736.33	735.93	734.13	728.93	729.38
27		730.62	731.72		736.33	736.13	736.03	736.43	736.03 ¹	733.03	728.83	729.38 ¹
28					736.23	736.08 ¹	736.13	736.23	736.13	732.23	728.93	729.43
29	730.12				736.23	736.03	736.23	736.13	736.13	731.43	728.88 ¹	729.43
30					736.33	735.93	736.03	736.13 ¹	736.23	730.83	728.83	729.53
31					736.38 ¹		735.93	736.13		730.53		729.43

1915

1	729.33	729.63	729.63	730.23	735.13	736.03	737.03	733.93	735.83	736.03	729.83	729.03
2	729.23	729.63	729.53	730.23	735.03 ¹	735.83	737.43	733.53	735.93	735.93	729.33	729.13
3	729.15 ¹	729.53	729.63	730.33	734.93	735.83	737.63	733.03	735.93	735.93 ¹	729.13	729.33
4	729.13	729.43	729.53	730.48 ¹	736.13	735.73	737.83 ¹	732.73	735.83	735.93	728.83	729.53
5	729.13	729.43	729.53	730.63	736.43	735.73	738.63	732.43	735.83 ¹	735.93	728.73	729.58 ¹
6	729.23	729.53	729.73	730.73	736.13	735.73 ¹	738.33	731.93	735.83	735.93	728.53	729.63
7	729.33	729.58 ¹	729.68 ¹	730.93	736.13	735.73	738.63	731.33	735.83	735.83	728.68 ¹	729.73
8	729.43	729.63	729.63	731.13	736.23	735.43	738.73	732.98 ¹	735.93	735.83	728.83	729.63
9	729.43	729.53	729.53	731.13	736.18 ¹	735.43	738.93	734.63	736.03	735.73	728.73	729.63
10	729.43 ¹	729.53	729.53	731.13	736.13	735.73	739.13	736.03	735.93	735.78 ¹	728.73	729.53
11	729.43	729.53	729.63	732.73 ¹	736.03	735.93	738.93 ¹	736.33	735.83	735.83	728.83	729.63 ¹
12	729.33	729.43	729.73	734.33	736.23	735.93	738.73	736.63	735.88 ¹	735.83	728.63	729.68 ¹
13	729.33	729.53	729.73	734.63	736.03	735.93 ¹	738.53	735.83	735.93	735.83	728.63	729.73
14	729.33	729.58 ¹	729.78 ¹	734.63	736.13	735.93	738.23	735.63	735.83	735.93	728.58 ¹	729.63
15	729.43	729.63	729.83	734.53	736.53	735.93	737.63	735.63 ¹	735.83	735.93	728.53	729.63
16	729.43	729.73	729.93	734.33	736.48 ¹	735.93	737.13	735.63	735.73	735.93	728.53	729.83
17	729.38 ¹	729.73	730.03	733.93	736.43	735.93	736.83	735.63	735.73	735.93 ¹	728.73	729.73
18	729.33	729.73	730.03	733.58 ¹	736.43	736.03	736.53 ¹	735.63	735.63	735.93	728.83	729.63
19	729.43	729.63	730.13	733.23	736.33	736.23	736.23	735.83	735.68 ¹	735.93	728.93	729.63 ¹
20	729.53	729.63	730.13	732.63	736.23	736.33 ¹	735.93	736.13	735.73	735.93	728.93	729.63
21	729.53	729.63 ¹	730.13 ¹	732.33	736.33	736.43	739.63	736.03	735.73	735.93	728.98 ¹	729.63
22	729.63	729.63	730.13	732.13	736.33	736.33	736.83	736.03 ¹	735.83	735.93	729.03	729.73
23	729.63	729.53	730.13	731.93	736.38 ¹	736.43	736.53	736.03	735.93	735.83	729.13	729.63
24	729.63 ¹	729.73	730.13	731.73	736.43	736.43	736.03	736.03	736.03	735.83	729.03	729.73
25	729.63	729.73	730.03 ¹		736.43	736.63	735.93 ¹	736.03	736.03	735.83	728.93	729.73
26	729.53	729.63	730.13	731.73	736.33	736.63	735.83	735.93	736.08 ¹	735.73	728.93	729.73 ¹
27	729.53	729.73	730.13	731.73	736.33	736.53 ¹	735.53	735.93	736.13	734.73	728.93	729.73
28	729.63	729.68 ¹	730.13 ¹	731.93	736.23	736.43	735.23	735.53	736.13	734.53	728.88 ¹	729.73
29	729.43		730.13	731.73	736.13	736.43	734.93	735.83 ¹	736.13	734.53	728.83	729.83
30	729.53		730.13	733.13	736.08 ¹	736.63	734.63	735.83	736.03	730.53	738.83	729.83
31			730.13		736.03		734.33	735.83		730.68 ¹		729.93

Levels reduced to M.H.S. datum (approximate sea level).

Marked thus (1) interpolated.

Mean Daily Gauge Height, in Feet, of Red River at Redwood Bridge for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	729.93	729.43	729.43	730.43	750.93	738.23	736.53	736.73	736.63	736.53 ¹	731.13	730.63
2	729.93 ¹	729.43	729.43	730.53 ¹	749.83	738.13	736.78 ¹	736.83	736.73	736.63	730.43	730.63
3	730.03	729.33	729.43	730.63	749.23	738.03	737.03	736.53	736.68 ¹	736.63	730.43	730.63 ¹
4	730.13	729.43	729.33	731.53	748.63	738.03 ¹	737.23	736.73	736.63	736.73	730.43	730.63
5	730.13	729.33	729.33 ¹	732.13	747.93	738.03	737.03	736.93	736.53	736.63	730.39 ¹	730.53
6	729.93	729.33 ¹	729.33	733.33	747.63	737.93	737.33	736.73 ¹	736.43	736.53	730.33	730.53
7	729.83	729.33	729.33	735.13	747.33 ¹	737.93	737.63	736.53	736.33	736.43 ¹	730.53	730.53
8	729.63	729.33	729.43	736.33	747.03	737.93	737.73	736.13	736.23	736.43 ¹	730.53	730.63
9	729.68 ¹	729.43	729.43	737.13 ¹	746.93	738.03	737.73 ¹	736.03	736.33	736.33	730.63	730.53
10	729.73	729.43	729.43	737.93	745.23	738.13	737.73	736.13	736.28 ¹	736.33	730.63	730.63 ¹
11	729.73	729.53	729.53	738.53	744.73	738.13 ¹	737.83	736.43	736.23	736.33	730.43	730.53
12	729.83	729.43	729.53 ¹	739.33	743.73	738.13	737.93	736.53	736.43	736.23	730.43 ¹	730.53
13	729.73	729.43 ¹	728.53	740.03	743.13	738.03	737.93	736.43 ¹	736.53	736.13	730.43	730.63
14	729.63	729.43	729.53	741.03	742.23 ¹	737.93	737.83	736.33	736.53	736.03	730.43	730.73
15	729.73	729.43	729.53	741.63 ¹	741.33	737.73	737.73	736.13	736.63	736.03 ¹	730.53	730.73
16	729.73 ¹	729.53	729.43	.....	740.53	737.53	737.68 ¹	736.33	736.73	736.03	730.53	730.73
17	729.73	729.53	729.43	.....	739.73	737.33	737.63	736.53	736.78 ¹	736.03	730.43	730.73 ¹
18	729.73	729.63	729.53	.....	739.03	737.13 ¹	737.53	736.83	736.83	736.33	730.43	730.73
19	729.63	729.63	729.53 ¹	.....	738.43	736.93	737.43	736.73	737.03	736.33	730.33 ¹	730.63
20	729.53	729.63 ¹	729.53	.....	737.83	736.73	737.33	736.73 ¹	736.83	736.33	730.33	730.63
21	729.53	729.63	729.53	752.63	737.58	736.53	737.23	736.73	736.83	730.23	736.33	730.53
22	729.53	729.53	729.53	753.43	737.33	736.83	737.13	736.73	736.73	736.18 ¹	730.23	730.43
23	729.58 ¹	729.53	729.53	753.08 ¹	738.43	736.93	736.88	736.73	736.63	736.13	730.33	730.43
24	729.63	729.48	729.63	752.73	738.73	736.83	736.63	736.73	736.63 ¹	736.13	730.33	730.43 ¹
25	729.63	729.43	729.63	752.53	738.93	736.68 ¹	736.43	736.83	736.63	736.03	730.43	730.43
26	729.53	729.53	729.63 ¹	752.33	738.73	736.53	736.03	736.83	736.53	735.73	730.43 ¹	730.43
27	729.53	729.53 ¹	729.63	752.13	738.63	736.73	736.23	736.68 ¹	736.63	735.33	730.43	730.43
28	729.53	729.53	729.63	751.83	738.53 ¹	736.83	736.53	736.53	736.73	734.53	730.43	730.33
29	729.53	729.53	729.83	751.43	738.43	736.73	737.03	736.43	736.53	733.63 ¹	730.53	730.33
30	729.48 ¹	.....	729.93	751.18 ¹	738.33	736.03	736.88 ¹	736.53	736.43	732.73	730.63	730.23
31	729.43	.....	730.13.	.....	738.23	.....	736.73	736.53	.....	732.13	.....	730.23

Levels reduced to M.H.S. datum (approximate sea level).
Marked thus (1) interpolated.

ASSINIBOINE RIVER AND TRIBUTARIES.

The following gauging stations have been operated on the Assiniboine river and its tributaries.

Assiniboine river at Currie's Landing.

Qu'Appelle river at De Corby's Farm.

Qu'Appelle river at Welby, Sask.

Minnedosa river. (Plate 5.).

Kirkham Traffic Bridge.

McKellar Bridge.

Minnedosa.

Otter Creek near Scandinavia.

Also on the following lakes which are drained by tributaries of the Minnedosa (Plate 6):—

Otter lake.

Round lake.

Boggy lake.

Wolf lake.

Clear lake.

Audy lake.

ASSINIBOINE RIVER AT CURRIE'S LANDING (GAUGING STATION).

History.—The gauge at this point was established by members of the Manitoba Hydrometric Survey party on the Assiniboine river under the direction of G. H. Burnham on May 14, 1913, and was continued in operation for about two months.

Location.—The gauge was secured to a pier of the Canadian Northern Railway bridge, crossing the Assiniboine river three miles above Currie's Landing and six miles downstream from the city of Brandon.

Records Available.—Records of daily gauge height are available at this point from May 14 to July 5, 1913.

Mean Daily Gauge Height, in Feet, of Assiniboine River at Currie's Landing, Brandon for 1913.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						1131.03	1128.98					
2						1130.98	1129.00					
3						1130.90	1128.05					
4						1130.80	1128.93					
5						1130.68	1128.95					
6						1130.68						
7						1130.63						
8						1130.58						
9						1130.55						
10						1130.50						
11						1130.45						
12						1130.33						
13						1130.25						
14					1133.18	1130.20						
15					1133.08	1130.00						
16					1132.93	1130.20 ¹						
17					1132.83	1130.40						
18					1132.73	1129.70						
19					1132.63	1129.58						
20					1132.53	1129.50						
21					1132.40	1129.43						
22					1132.30	1129.30						
23					1132.08	1129.18						
24					1131.85	1129.10						
25					1131.73	1129.03						
26					1131.58	1128.98						
27					1131.43	1129.03						
28					1131.35	1129.00						
29					1131.28	1128.95						
30					1131.20	1129.03						
31					1131.10							

NOTE.—⁽¹⁾ Interpolated.

Levels reduced to M.H.S. datum (approximate sea level).

QU'APPELLE RIVER AT DE CORBY'S FARM (GAUGING STATION).

History.—This station was established by T. H. Boyd on September 6, 1915.

Location.—The gauge is located about fifty feet upstream from a ferry on the farm of J. De Corby, three quarters of a mile east of the station of Victor on the Grand Trunk Pacific railway.

Records Available.—A continuous record of daily gauge height is available during the year 1915 from September 6 to November 10.

*Mean Daily Gauge Height, in Feet, of Qu'Appelle River at De Corby's Farm,
Near St. Lazare for 1915.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1										92.15	92.15	
2										92.15	92.15	
3										92.15	92.15	
4										92.15	92.20	
5										92.05	92.15	
6									91.65	92.05	92.20	
7									91.65	92.05	92.25	
8									91.95	92.05	92.25	
9									91.95	92.05	92.25	
10									91.95	92.05	92.20	
11									91.95	92.05		
12									91.95	92.05		
13									92.00	92.05		
14									91.95	92.05		
15									91.95	92.15		
16									91.95	92.15		
17									91.95	92.15		
18									91.95	92.15		
19									91.95	92.15		
20									92.05	92.15		
21									91.95	92.15		
22									91.95	92.15		
23									91.95	92.05		
24									92.05	92.05		
25									92.05	92.05		
26									91.95	92.05		
27									91.95	92.15		
28									91.95	92.15		
29									91.95	92.10		
30									92.05	92.05		
31										92.05		

Levels reduced to M.H.S. Station datum (assumed).

QU'APPELLE RIVER NEAR WELBY, SASK. (GAUGING STATION).

History.—The station was established by C. O. Allen on June 1, 1915.

Location.—A vertical staff gauge was secured to a post driven into the bed of the stream about twenty feet upstream from a steel traffic bridge across the Qu'Appelle river, two and one-half miles south of Welby, Sask.

Records Available.—A continuous record of daily gauge height is available in the year 1915 over a period from May 30 to September 15.

Mean Daily Gauge Height, in Feet, of Qu'Appelle River at Welby, Sask. for 1915.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						81.10	81.22	80.00	80.20			
2						81.10	81.00	80.00	80.20			
3						81.24	81.22	80.80	80.20			
4						81.00	80.90	80.80	80.20			
5						81.10	80.90	81.21	80.20			
6						81.10	80.90	80.70	80.20			
7						81.20	80.90	80.70	80.40			
8						81.20	80.80	80.70	80.50			
9						81.25	80.80	80.60	80.50			
10						81.25	80.80	80.60	80.40			
11						81.25	80.80	80.60	80.40			
12						81.20	80.90	80.50	80.40			
13						81.20	80.90	80.60	80.50			
14						81.10	81.00	80.60	80.50			
15						81.10	81.60	80.50	80.50			
16						81.10	81.50	80.50				
17						81.10	81.40	80.50				
18						81.10	81.30	80.40				
19						81.24	81.30	80.40				
20						81.10	81.30	80.40				
21						81.10	81.30	80.40				
22						81.10	81.20	80.40				
23						81.10	81.20	80.40				
24						81.24	81.20	80.40				
25						81.10	81.10	80.40				
26						81.10	81.10	80.40				
27						81.23	81.10	80.40				
28						81.02	81.23	80.30				
29						81.00	81.00	80.30				
30					81.25	81.22	81.00	80.30				
31					81.20		81.00	80.20				

Levels reduced to M.H.S. Station datum (assumed).

MINNEDOSA RIVER AT KIRKHAM TRAFFIC BRIDGE (GAUGING STATION).

History.—The station was established by T. J. Moore on May 29, 1913.

Location.—A point was located on the lower chord of the traffic bridge across the Minnedosa situated about four hundred feet south of the boundary between Secs. 9 and 16 in Tp. 12, R. 21, W.P.M. Records of river stage were obtained by measuring from this point to water surface.

Records Available.—Continuous records of daily gauge height are available over periods from June 6 to November 9, 1913, and from March 5 to May 27, 1914. Intermittent records are also available over the period from November 9, 1913, to March 5, 1914.

Mean Daily Gauge Height, in Feet, of Minnedosa River at Kirkham Traffic Bridge, Carnegie for 1913 and 1914.

1913

1914

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.
1	.....	1199 12	1198 87	1198 37	1197 87	1198 04	.....	.....	.....	.....	1201 12	1199 45
2	.....	1199 37	1198 87	1198 37	1197 95	1198 20	.....	.....	.....	.....	1201 29	1199 37
3	.....	1199 29	1198 87	1198 37	1197 95	1198 20	1198 45	.....	.....	.....	1201 45	1199 21
4	.....	1199 29	1198 79	1198 70	1197 95	1198 37	.....	.....	1199 54	.....	1201 29	1199 21
5	.....	1199 20	1198 79	1198 62	1198 04	1198 37	.....	.....	.....	1200 37	1201 21	1199 45
6	1199 37	1199 20	1198 79	1198 62	1198 20	1198 29	.....	.....	.....	1200 54	1201 21	1199 79
7	1198 87	1199 20	1198 87	1198 20	1198 20	1198 37	.....	1198 54	.....	1200 54	1201 12	1199 87
8	1199 12	1199 20	1198 70	1198 04	1198 04	1198 12	.....	.....	.....	1200 54	1201 12	1199 87
9	1199 12	1199 20	1198 70	1198 37	1198 04	1198 12	.....	.....	.....	1200 87	1200 87	1200 12
10	1199 12	1199 29	1199 04	1198 37	1197 95	.....	.....	.....	.....	1200 87	1200 87	1200 12
11	1198 87	1199 20	1199 04	1198 29	1197 95	.....	1198 87	.....	.....	1200 79	1200 87	1200 12
12	1198 70	1199 70	1198 87	1198 12	1198 12	1198 54	.....	.....	.....	1200 79	1200 87	1200 21
13	1199 04	1199 37	1198 70	1198 04	1198 24	.....	.....	1198 37	.....	1200 79	1200 87	1200 21
14	1199 04	1199 37	1198 37	1198 12	1198 24	.....	.....	.....	.....	1200 79	1200 87	1200 21
15	1198 95	1198 37	1198 79	1198 04	1198 12	.....	.....	.....	.....	1200 87	1200 87	1200 12
16	1198 79	1199 37	1198 79	1197 87	1197 95	.....	.....	.....	.....	1200 95	1200 87	1200 12
17	1199 20	1199 37	1198 70	1197 87	1197 95	.....	1199 12	.....	.....	1201 04	1201 12	1200 12
18	1198 95	1199 45	1198 87	1197 95	1198 04	.....	.....	.....	.....	1201 04	1201 12	1200 12
19	1198 79	1199 45	1198 79	1197 79	1198 04	1198 54	.....	.....	.....	1200 95	1200 87	1200 12
20	1198 95	1199 20	1198 62	1197 70	1198 20	.....	.....	.....	.....	1200 95	1199 12	1199 87
21	1198 95	1199 37	1198 62	1197 70	1198 20	.....	.....	1198 87	.....	1200 95	1199 12	1199 87
22	1198 79	1199 45	1198 70	1197 70	1198 12	.....	.....	.....	.....	1200 95	1199 21	1199 87
23	1198 87	1199 37	1198 70	1197 79	1198 20	.....	.....	.....	.....	1200 95	1199 87	1199 79
24	1198 79	1199 29	1198 79	1197 95	1198 12	.....	1198 95	.....	.....	1200 95	1199 54	1199 79
25	1199 04	1199 20	1198 87	1198 04	1197 87	.....	.....	.....	.....	1200 95	1200 79	1199 79
26	1199 04	1199 12	1198 62	1197 87	1197 87	1198 62	.....	.....	.....	1200 70	1200 54	1199 70
27	1199 20	1199 12	1198 37	1198 04	1197 87	.....	.....	.....	.....	1200 70	1200 12	1199 70
28	1199 37	1199 04	1198 20	1197 70	1197 95	.....	.....	1199 12	.....	1200 70	1199 87	.....
29	1199 29	1199 04	1197 95	1197 87	1197 87	.....	.....	.....	.....	1200 70	1199 79	.....
30	1199 29	1199 04	1198 20	1197 87	1197 95	.....	.....	.....	.....	1200 87	1199 70	.....
31	.....	1198 95	1198 29	.....	1198 04	.....	.....	.....	.....	1200 87	.....	.....

Levels reduced to M.H.S. datum (approximate sea level).

**MINNEDOSA RIVER AT MCKELLAR'S TRAFFIC BRIDGE
(GAUGING STATION).**

History.—The station was established by M. S. Madden on June 11, 1913.

Location.—The station was established at the traffic bridge which crosses the Minnedosa river three miles upstream from the town of Rivers. Records of water level were obtained by measurements made from a fixed point on the bridge to water surface, the elevation of the measuring point being known.

Records Available.—Continuous records of daily gauge height are available from June 11 to November 30, 1913, with the exception of the period from November 22 to 28.

Mean Daily Gauge Height, in Feet, of Minnedosa River at McKellar's Traffic Bridge, for 1913.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							69 33	68 03	68 33	68 23	68 53	
2							69 03	68 43	68 43	68 33	68 13	
3							69 13	68 73	68 43	68 33	68 43	
4							69 03	68 73	68 43	68 13	68 43	
5							69 03	68 73	68 53	68 03	68 21	
6							69 13	68 73	68 23	68 43	68 33	
7							69 23	68 73	68 13	68 33	68 43	
8							69 13	68 63	68 53	68 23	68 43	
9							69 53	68 63	68 53	68 43	68 03	
10							69 23	68 81	68 33	68 23	68 33	
11						70 58	69 23	68 63	68 33	68 23	68 43	
12						69 23	68 23	68 63	68 33	68 03	68 33	
13						68 83	69 23	68 43	68 33	68 33	68 33	
14						68 88	69 23		68 13	68 23	68 43	
15						68 83	69 43	68 53	68 33	68 43	68 23	
16						69 03	69 43	68 53	68 53	68 23	68 13	
17						68 68	69 53	68 53	68 43	68 23	68 23	
18						68 83	69 53	68 53	68 33	68 43	68 43	
19						69 23	69 63	68 53	67 03	68 03	68 43	
20						68 83	69 43	68 63	68 13	68 23	68 33	
21						68 63	69 43	68 63	68 03	68 43	68 43	
22						68 73	69 13	68 63	68 23	68 13		
23						68 83	69 23	68 63	68 23	68 33		
24						69 23	69 13	68 53	68 33	68 13		
25						68 83	69 21	68 43	68 33	68 23		
26						69 13	69 13	68 53	68 33	68 13		
27						69 13	69 03	68 13	68 13	68 43		
28						69 23	69 03	68 13	68 13	68 63		
29						69 13	68 73	68 33	68 13	68 63	68 63	
30						69 23	68 93	68 43	68 23	68 53	68 23	
31							68 73	68 43		68 53		

Zero of Gauge = 1,400 00 M.H.S. datum (approximate sea level).

MINNEDOSA RIVER AT MINNEDOSA (GAUGING STATION).

History.—The station was established by W. G. Worden on October 12, 1912, as a metering station, but on account of interference to flow by the power house of the Minnedosa Power Company, was discontinued on November 2 of the same year.

Location.—A vertical staff gauge was secured to the downstream side of the traffic bridge across the Minnedosa on the main street of the town of Minnedosa.

Records Available.—A record of daily gauge height is available over a period from October 12 to November 2, 1912. Levels are reduced to M.H.S. datum and are given below.

OCTOBER										NOVEMBER	
Day	Gauge Height.	Day	Gauge Height.	Day	Gauge Height.	Day	Gauge Height.	Day	Gauge Height.	Day	Gauge Height.
.....	.....	16	1625.68	21	1626.17	26	1625.87	31	1624.67	1	1624.67
.....	.....	17	1626.37	22	1626.17	27	1624.77	.....	.....	2	1624.67
.....	.....	18	1626.37	23	1626.07	28	1624.77	.....	.....	.....	.....
14	1625.75	19	1626.27	24	1625.97	29	1624.77	.....	.....	.....	.....
15	1625.72	20	1626.27	25	1625.87	30	1624.77	.....	.....	.....	.....

OTTER CREEK NEAR SCANDINAVIA (GAUGING STATION).

History.—The station was established by E. B. Patterson on May 22, 1915, and has been in operation during open water seasons since that time.

Location.—A vertical staff gauge is secured to a pile of the traffic bridge crossing the stream on the north boundary of Sec. 12, Tp. 18, R. 18, W.P.M.

Records Available.—From May 23 to November 7, 1915, and from April 1 to November 11, 1916, continuous records of daily gauge height are available.

MANITOBA HYDROMETRIC SURVEY

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Mean Daily Gauge Height, in Feet, of Otter Creek (from Otter Lake), near Scandinavia, for 1915 and 1916.

1915

Day.	Jan.	Feb.	Mar.	April.	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						87 71	88 21	88 13	88 11	88 88	88 71	
2						87 71	88 13	88 14	88 12	88 91	88 71	
3						87 71	88 21	88 01	88 12	88 93	88 61	
4						87 71	88 16	88 11	88 11	88 91	88 61	
5						87 70	88 11	88 01	88 11	88 93	88 61	
6						87 90	88 11	88 01	88 21	88 93	88 61	
7						88 16	88 43	88 06	88 21	88 80	88 61	
8						88 61	88 60	88 06	88 21	88 80		
9						88 71	88 73	88 01	88 51	88 93		
10						88 81	88 40	88 06	88 41	88 93		
11						88 86	88 35	88 11	88 41	88 66		
12						88 66	88 51	88 14	88 40	88 66		
13						88 71	88 28	88 16	88 61	88 71		
14						88 81	87 96	88 16	88 71	88 71		
15						88 86	88 18	88 11	88 71	88 71		
16						88 86	88 56	88 16	88 69	88 71		
17						88 81	88 81	88 17	88 61	88 71		
18						88 81	88 81	88 21	88 51	88 69		
19						88 76	88 76	88 21	88 51	88 61		
20						88 71	88 61	88 21	88 61	88 61		
21						88 75	88 41	88 21	88 84	88 51		
22						88 74	88 20	88 21	88 61	88 61		
23					87 91	88 61	88 13	88 25	88 61	88 61		
24						88 62	88 11	88 21	88 61	88 71		
25					88 01	88 97	87 93	88 21	88 62	88 71		
26					88 01	89 01	87 83	88 21	88 71	88 71		
27					87 91	89 09	87 81	88 21	88 71	88 61		
28					87 71	88 81	87 71	88 21	88 71	88 61		
29					87 71	88 63	87 71	88 21	88 81	88 70		
30					87 71	88 11	87 71	88 21	88 91	88 81		
31					87 71		87 81	88 21				

Frozen over November 7.

1916

1					90 36	90 01	91 01	89 91	89 01	88 71	89 61	
2					90 26	89 96	92 91	89 81	88 91	88 71	89 61	
3					90 11	89 91	91 61	89 81	88 81	88 71	89 61	
4					90 01	89 91	91 71	89 71	89 01	89 61	89 61	
5					89 91	89 76	91 66	89 71	89 31	89 61	89 61	
6					89 86	89 84	91 51	89 61	89 21	89 61	89 51	
7					89 81	89 91	91 41	89 61	89 11	89 61	89 51	
8					89 86	90 01	91 31	89 61	89 11	89 61	89 51	
9					89 70	90 01	91 21	89 41	89 11	89 61	89 51	
10					89 64	89 89	91 14	89 31	89 11	89 61	89 51	
11				88 81	89 61	89 76	91 01	89 31	89 21	89 51	89 51	
12				88 81	89 63	89 61	90 91	89 31	89 21	89 51		
13				88 81	89 61	89 51	90 81	89 31	89 31	89 51		
14				90 71	89 61	89 41	90 74	89 21	89 41	89 51		
15				90 71	89 51	89 51	90 61	89 21	89 51	89 51		
16					92 61	89 41	89 61	89 21	89 51	89 51		
17					92 69	89 41	89 74	89 11	89 51	89 51		
18					91 96	89 11	89 81	90 31	89 11	89 61	89 51	
19					91 26	89 31	89 71	90 31	89 11	89 61	89 51	
20					90 86	89 31	89 71	90 21	89 11	89 61	89 51	
21					90 81	89 31	89 81	90 11	89 01	89 61	89 51	
22					90 46	89 39	89 91	90 01	89 01	89 71	89 41	
23					90 36	89 44	90 01	90 01	89 01	89 71	89 41	
24					90 41	89 54	90 16	90 01	88 91	89 61	89 41	
25					89 49	89 71	90 86	89 91	88 91	89 41	89 41	
26					90 59	90 06	91 86	89 91	88 51	89 31	89 51	
27					90 61	90 19	93 01	89 91	88 81	89 21	89 51	
28					90 17	90 31	93 01	89 91	88 91	89 01	89 51	
29					90 36	90 21	93 11	90 01	89 01	88 91	89 61	
30					90 41	90 14	93 01	90 01	89 11	88 81	89 61	
31					90 04			89 91	89 11		89 61	

Levels reduced to M.H.S. Station datum (assumed).
Break-up April 10. Freeze-up November 11.

OTTER LAKE NEAR ERICKSON (GAUGING STATION).

History.—The station was established by E. B. Patterson on May 14, 1915, but was discontinued in October of the same year.

Location.—A vertical staff gauge was secured to a post driven into the bed of the lake about three hundred yards from the house of J. Hafdahl on Sec. 1, Tp. 18, R. 18, W.P.M.

Records Available.—A continuous record of daily gauge height is available from May 14 to October 20, 1915.

Mean Daily Gauge Height, in Feet, of Otter Lake, near Erickson, for 1915.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						91.13	91.12	91.01	90.66	90.71		
2						91.12	91.11	90.99	90.66	90.70		
3						91.11	91.11	90.97	90.65	90.69		
4						91.10	91.13	90.95	90.65	90.69		
5						91.13	91.12	90.94	90.64	90.71		
6						91.13	91.10	90.94	90.64	90.72		
7						91.13	91.08	90.93	90.63	90.72		
8						91.14	91.05	90.91	90.63	90.74		
9						91.14	91.04	90.89	90.65	90.75		
10						91.13	91.06	90.88	90.66	90.77		
11						91.12	91.05	90.88	90.68	90.76		
12						91.11	91.06	90.86	90.69	90.75		
13						91.11	91.06	90.85	90.71	90.73 ¹		
14					91.31	91.10	91.07	90.84	90.73	90.71 ¹		
15					91.35	91.10	91.08	90.83	90.73	90.70 ¹		
16					91.32	91.10	91.08	90.82	90.71	90.69		
17					91.30	91.09	91.07	90.82	90.71	90.69		
18					91.29	91.09	91.06	90.80	90.70	90.68		
19					91.29	91.08	91.06	90.79	90.69	90.68		
20					91.26	91.10	91.05	90.79	90.69	90.69		
21					91.25	91.11	91.04	90.77	90.70			
22					91.25	91.11	91.04	90.75	90.72			
23					91.24	91.11	91.03	90.63	90.72			
24					91.23	91.12	91.02	90.72	90.73			
25					91.21	91.13	91.01	90.70	90.73			
26					91.18	91.18	91.00	90.70	90.74			
27					91.18	91.17	91.00	90.68	90.75			
28					91.18	91.15	90.99	90.67	90.73			
29					91.18	91.14	90.99	90.66	90.72			
30					91.16	91.13	90.98	90.66	90.72			
31					91.14		91.00	90.67				

Levels reduced to M.H.S. Station datum (assumed).
Marked thus (1) interpolated.

ROUND LAKE NEAR ERICKSON (GAUGING STATION).

History.—The station was established by E. B. Patterson on May 22, 1915, and was discontinued on October 2 of the same year.

Location.—A vertical staff gauge was secured to a post driven into the bed of the lake in Sec. 14, Tp. 18, R. 19, W.P.M.

Records Available.—An intermittent record of daily gauge height is available over a period from May 22 to October 2, 1915.

Mean Daily Gauge Height, in Feet, of Round Lake, near Erickson, for 1915.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						95.75	95.79					
2									95.45	95.47		
3						95.73	95.77	95.69				
4									95.42			
5						95.71		95.66				
6							95.78					
7								95.63	95.44			
8						95.75	95.77					
9									95.46			
10						95.75	95.77	95.60				
11									95.47			
12						95.75		95.58				
13							95.73					
14								95.56	95.48			
15						95.77	95.74					
16									95.47			
17						95.77	95.74	95.54				
18									95.48			
19						95.78		95.54				
20							95.74					
21								95.53	95.47			
22					95.89	95.78	95.74					
23									95.45			
24						95.79	95.73	95.51				
25					95.86				95.46			
26						95.80		95.50				
27					95.82		95.71					
28								95.48	95.48			
29					95.80	95.79	95.70					
30									95.47			
31							95.69	95.47				

Levels reduced to M.H.S. Station datum (assumed).

BOGGY LAKE AT OUTLET (GAUGING STATION).

History.—This station was established by W. J. Ireland on July 3, 1915.

Location.—A vertical staff gauge was placed on the upstream side of a temporary storage dam placed at the outlet of Boggy lake.

Records Available.—Owing to the inaccessibility of this location, no permanent gauge reader could be found and only a few isolated gauge readings in 1915 and 1916 have been obtained.

Mean Daily Gauge Height, in Feet, of Boggy Lake, at the Outlet of Whirlpool Creek, for 1915 and 1916.

Day.	1915					1916						
	July.	Aug.	Sept.	Oct.	Nov.	April.	May.					
1												
2												
3	94.56											
4					92.34 ¹							
5												
6												
7												
8												
9												
10												
11												
12						94.84						
13												
14												
15												
16												
17												
18												
19						95.34						
20												
21												
22	94.94											
23												
24												
25												
26												
27												
28												
29												
30												
31												

Levels reduced to M.H.S. Station datum (assumed).
Marked thus (1) Estimated; (2) Read at 5.00 p.m.; (3) Read at 8.00 a.m.

WOLFE LAKE, NEAR ELPHINSTONE (GAUGING STATION).

History.—The station was established by E. B. Patterson on June 1, 1915, and has been in operation since that date.

Location.—A vertical staff gauge was secured to a post driven into the bed of the lake near the shore in Sec. 24, Tp. 17, R. 21, W.P.M.

Records Available.—Continuous records of daily gauge height are available for periods from June 1 to November 8, 1915, and April 17 to November 6, 1916.

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*Mean Daily Gauge Height, in Feet, of Wolfe Lake, near Elphinstone, for 1915
and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						95.61	95.61	95.48	95.11	95.28	95.25	
2						95.58	95.63	95.45	95.15	95.28	95.23	
3						95.55	95.61	95.43	95.15	95.28	95.21	
4						95.58	95.58	95.41	95.13	95.28	95.21	
5						95.61	95.58	95.41	95.13	95.31	95.21	
6						95.55	95.58	95.41	95.18	95.31	95.21	
7						95.58	95.58	95.38	95.23	95.28	95.25	
8						95.58	95.58	95.38	95.28	95.25	95.25	
9						95.58	95.55	95.35	95.28	95.25		
10						95.58	95.58	95.33	95.28	95.25		
11						95.55	95.58	95.33	95.25	95.25		
12						95.55	95.55	95.38	95.25	95.23		
13						95.58	95.53	95.38	95.28	95.23		
14						95.55	95.53	95.38	95.28	95.23		
15						95.58	95.58	95.35	95.28	95.23		
16						95.55	95.58	95.33	95.28	95.21		
17						95.53	95.58	95.33	95.31	95.21		
18						95.53	95.58	95.31	95.28	95.21		
19						95.51	95.58	95.31	95.31	95.25		
20						95.55	95.55	95.31	95.28	95.21		
21						95.58	95.53	95.28	95.28	95.21		
22						95.58	95.53	95.28	95.28	95.21		
23						95.5	95.53	95.25	95.25	95.21		
24						95.58	95.51	95.23	95.28	95.21		
25						95.58	95.51	95.21	95.25	95.25		
26						95.65	95.51	95.18	95.25	95.25		
27						95.65	95.48	95.18	95.25	95.25		
28						95.65	95.48	95.15	95.28	95.25		
29						95.63	95.48	95.13	95.28	95.23		
30						95.61	95.45	95.13	95.28	95.23		
31							95.48	95.11		95.23		

1916

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					95.73	95.88	96.11	95.81	95.51	95.45	95.48	
2					95.73	95.88	96.08	95.78	95.48	95.45	95.48	
3					95.71	95.88	96.05	95.81	95.45	95.51	95.48	
4					95.71	95.88	96.08	95.78	95.58	95.51	95.51	
5					95.73	95.91	96.05	95.81	95.55	95.48	95.51	
6					95.75	95.91	96.11	95.81	95.58	95.49	95.51	
7					95.75	95.91	96.08	95.78	95.53	95.49		
8					95.75	95.91	96.05	95.78	95.51	95.48		
9					95.75	95.88	96.05	95.78	95.51	95.48		
10					95.78	95.88	96.03	95.78	95.53	95.48		
11					95.75	95.91	96.08	95.75	95.51	95.48		
12					95.75	95.88	96.08	95.75	95.51	95.48		
13					95.75	95.88	96.05	95.73	95.51	95.45		
14					95.75	95.88	96.03	95.71	95.51	95.45		
15					95.78	95.85	96.01	95.71	95.48	95.45		
16					95.78	95.85	95.98	95.68	95.48	95.48		
17					95.58	95.78	95.95	95.68	95.48	95.48		
18					95.61	95.78	95.83	95.98	95.65	95.48		
19					95.53	95.78	95.83	95.95	95.65	95.45		
20					95.75	95.83	95.91	95.65	95.48	95.51		
21					95.68	95.75	95.83	95.88	95.63	95.48		
22					95.68	95.78	95.85	95.91	95.63	95.48		
23					95.68	95.81	95.95	95.88	95.61	95.45		
24					95.71	95.81	96.05	95.88	95.58	95.43		
25					95.73	95.83	96.08	95.85	95.58	95.43		
26					95.73	95.78	96.08	95.83	95.55	95.48		
27					95.73	95.81	96.08	95.83	95.55	95.48		
28					95.75	95.81	96.05	95.88	95.53	95.45		
29					95.73	95.81	96.05	95.88	95.53	95.45		
30					95.73	95.83	96.13	95.85	95.53	95.48		
31					95.88		95.83	95.51				

Levels reduced to M.H. S. Station datum (assumed).

CLEAR LAKE (GAUGING STATION).

History.—The station was established by W. J. Ireland on April 26, 1914.

Location.—A vertical staff gauge was secured to the upstream side of a small storage dam placed at the outlet of Clear lake in the Riding Mountain Forest Reserve.

Records Available.—Owing to the impossibility of obtaining a gauge reader at this point, the only records available are isolated gauge readings (lake level) obtained during the years 1914, 1915, and 1916.

Mean Daily Gauge Height, in Feet, of Clear Lake at Clear Creek Dam for 1914, 1915 and 1916.

Day.	1914			1915					1916			
	April.	May.	June.	May.	June.	July.	August.	Sept.	Oct.	Nov.	March.	June.
1			95 03									
2												
3												
4												
5										94 31		
6				95 22								
7												
8					95 29							
9												
10		94 92										
11									95 36			
12												
13												
14												
15												
16												
17												
18												
19					95 26							
20												
21							95 43					
22						95 55						
23		95 10										
24												
25												
26	94 66											
27												
28					95 35						94 94	
29												
30		95 00										96 12
31												

Levels reduced to M.H.S. Station datum (assumed).

LAKE AUDY (GAUGING STATION).

History.—The station was established by E. B. Patterson on May 10, 1915.

Location.—A vertical staff gauge is located above the dam at the outlet of lake Audy in the N.E. 1/4 Sec. 29, Tp. 20, R. 20, W.P.M.

Records Available.—Owing to the impossibility of obtaining a gauge reader at this point, isolated readings in May and June of 1915 alone are available. These are given below and are reduced to M.H.S. datum (assumed).

Day	May			June
	10	17	29	3
Gauge Height	91 14	91 37	91 28	91 32

SASKATCHEWAN RIVER.

The following gauges have been operated on the Saskatchewan river:—

Grand Rapids, at outlet of Overflow Channel.

Grand Rapids, Morrison's Dock.

Grand Rapids, at mouth of river (Lake Winnipeg level).

Gauge records at Pas will be found with the discharge data at that point in Part II. of this report.

SASKATCHEWAN RIVER GRAND RAPIDS OUTLET OF OVERFLOW CHANNEL,
(GAUGING STATION).

History.—The station was established by E. B. Patterson on July 29, 1912.

Location.—A vertical staff gauge was secured to a post driven into the bed of the stream on the upstream side of the outlet of the overflow channel and about two miles above the mouth of the Saskatchewan river.

Records Available.—Intermittent records of daily gauge height were obtained on this gauge over periods from July 29 to October 16, 1912, and from July 2 to December 27, 1913.



Saskatchewan River—Grand Rapids.
Canoes rigged as Catamaran for Metering.

*Mean Daily Gauge Height, in Feet, of Saskatchewan River at Grand Rapids,
Outlet of Overflow Channel for 1912 and 1913.*

1912

1913

Day.			July.	August	Sept.	Oct.	July.	August.	Sept.	Oct.	Nov.	Dec.
1				713.77				714.45	714.18	713.68		713.12
2				713.76			714.41	714.48	714.18	713.78		713.09
3				713.81			714.38	714.46	714.38	713.68		713.14
4				713.88			714.38	714.45	714.48	713.68		713.05
5				713.99			714.33	714.45	714.48	713.68		713.02
6				713.89			714.32	714.47	714.18	714.12		713.07
7				713.92			714.33	714.45	714.08	714.10	714.69	713.12
8				713.97			714.43	714.45	714.68	714.07	714.67	714.17
9				714.03			714.41	714.44	713.38	714.03	714.86	713.75
10				714.09			714.42	714.44	713.28	713.72	714.56	713.32
11				714.14			714.41	714.45	713.38	713.42	714.57	713.58
12				714.20			714.41	714.44	713.98	713.22	713.62	713.17
13				714.23			714.41	714.45	714.08	712.92	713.67	713.35
14				714.19		714.34	714.43	714.44	713.98	712.92	713.56	713.21
15				714.25			714.42	714.45	714.08	712.92	713.39	713.25
16				714.30		714.43	714.43	714.47	713.98	712.82	713.37	713.23
17				714.29			714.45	714.46	713.88	712.82	713.42	713.29
18				714.30			714.43	714.45	714.18	712.72	713.65	714.32
19				714.29			714.41	714.44	714.06	712.72	713.25	713.95
20				714.32			714.41	714.45	713.28	712.62	713.23	714.25
21				714.32			714.44	713.67	713.98		713.17	714.17
22				714.31			714.45	713.67	713.88		713.15	714.35
23				714.49			714.42	713.67	713.88		713.18	714.26
24				714.37			714.41	713.65	713.98		713.21	714.31
25				714.36			714.44	713.62	713.68		713.19	715.12
26				714.28			714.45	714.28	714.28		713.92	714.56
27				714.36			714.42	713.78	713.88		713.25	714.68
28				714.45	715.40		714.46	713.98	713.98		713.17	
29			713.74	714.44			714.47	714.28	714.18		713.15	
30			713.74				714.48	714.06	713.88		713.19	
31			713.74				714.47	714.18				

Levels reduced to M.H.S. datum (approximate sea level).

**SASKATCHEWAN RIVER—GRAND RAPIDS, MORRISON'S DOCK.
(GAUGING STATION).**

History.—The station was established by S. C. O'Grady on August 28, 1912.

Location.—A vertical staff gauge was secured to the downstream side of Morrison's Dock, located on the left bank about one mile and one-half upstream from the mouth of the Saskatchewan river.

Records Available.—A record of daily gauge height is available over periods from August 28 to November 29, 1912, and from July 2 to September 6, 1913.

*Mean Daily Gauge Height, in Feet, of Saskatchewan River at Grand Rapids,
on Morrison's Dock for 1912 and 1913.*

1912						1913					
Day.					Aug.	Sept.	Oct.	Nov.	July.	Aug. *	Sept.
1						713.40	713.57	712.87		713.89	
2						713.07	713.32	713.07	713.85	713.92	
3						713.77	713.27	713.17	713.72	713.90	
4						713.07	713.67	712.67	713.82	713.89	
5						713.32	713.47	712.72	713.77	713.89	
6						713.37	713.27	712.77	713.76	713.91	713.62
7						713.07	712.97	712.72	713.77		
8						713.57	713.27	712.87	713.87		
9						713.47	713.07	713.67	713.85		
10						713.17	713.07	712.77	713.86		
11						713.32	713.47	712.87	713.85		
12						713.37	713.07	712.82	713.85		
13						713.32	713.37	712.97	713.85		
14						713.37	713.32	713.07	713.87		
15						713.34	713.37	712.47	713.86		
16						713.27	713.47	712.52	713.87		
17						713.32	713.42	712.47	713.89		
18						713.37	713.32	712.52	713.87		
19						713.82	713.32	712.67	713.85		
20						713.62	713.37	712.77	713.85		
21						713.52	713.32	712.87	713.88		
22						713.22	713.42	712.67	713.89		
23						713.07	713.47	712.47	713.86		
24						713.37	713.87	712.77	713.85		
25						713.37	713.12	712.87	713.88		
26						713.37	713.12	712.57	713.89		
27						713.37	713.57	712.67	713.86		
28					713.36	713.47	713.47	715.57	713.90		
29					713.57	713.37	712.15	716.12	713.91		
30					713.32	713.47	712.82		713.92		
31					713.42		712.77		713.91		

Levels reduced to M.H.S. datum (approximate sea level).

SASKATCHEWAN RIVER AT MOUTH (GAUGING STATION).

History.—The station was established by S. C. O'Grady on July 30, 1912, and was in operation during the years 1912, 1913 and 1914.

Location.—The gauge was secured to a post driven into the bed of the river in a small bay, on the left bank of the river, just inside the bar across the mouth of the river. This gauge records Winnipeg lake level.

Records Available.—An intermittent record of daily gauge height is available over the following periods:—From July 30 to October 13, 1912, and from September 6, 1913, to December 4, 1914.

Mean Daily Gauge Height, in Feet, of Saskatchewan River near Grand Rapids (Mouth of River) for 1912 and 1913.

Day.	1912				1913						
	July.	Aug.	Sept.	Oct.	Sept.	Oct.	Nov.	Dec.			
1			711-93	712-23		711-99					
2		712-03	711-78	712-18		712-09					
3			712-13	711-73		711-99					
4			711-78	712-82		711-89					
5			712-78	712-63		711-99				711-72	
6			712-33	711-83	712-37	712-39					
7			711-63	711-61	712-39	712-39	712-13				
8			712-23	711-93	713-17	712-29					
9			711-93	711-98	713-84	712-39					
10			711-88	712-03	711-59	711-99					
11			712-03	712-43	711-69	711-69					
12		711-89	712-03	711-84	712-29	711-49				712-37	
13			712-13	711-78	712-39	711-19					
14		711-84	712-23		712-29	711-19	712-17				
15		711-94	712-03		712-39	711-19					
16		711-94	712-08		712-29	711-09					
17		712-04	712-03		712-19	711-09					
18		711-94	712-15		712-49	710-89					
19		711-84	712-58		712-39	710-89				712-37	
20		711-94	712-38		711-49	710-79					
21		711-84	712-26		712-29		711-87				
22		712-14	712-18		712-19						
23		712-38	712-03		712-19						
24		711-95	712-13		712-29						
25		711-98	712-13		711-99						
26		711-73	711-93		711-99					712-22	
27		711-93	712-03		712-19						
28		712-21	712-09		712-29		711-87				
29		712-18	712-23		712-49						
30		712-11	712-18	712-28	712-19						
31			712-03								

Levels reduced to M.H.S. datum (approximate sea level).

SEASONAL PAPER No. 25a

*Mean Daily Gauge Height, in Feet, of Saskatchewan River at Grand Rapids
(Mouth of River) for 1914.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					712 27							
2	712 24											
3				712 35			711 27					
4									711 27			711 07
5						711 87						
6		712 35	712 35					711 07			711 17	
7					712 24							
8	712 32									711 27		
9				712 36			711 47					
10									711 07			
11						712 07						
12		712 36	712 37					710 97			711 07	
13					712 25							
14												
15	712 27									711 17		
16				712 37			711 57					
17									711 17			
18						711 27						
19		712 38	712 38									
20								711 27				
21					711 97							
22	712 27									711 17		
23				712 33			711 67					
24									710 97			
25												
26						711 27						
27		712 37	712 36								711 07	
28								711 47				
29	712 38				711 89					711 27		
30												
31							710 97					

Levels reduced to M.H.S. datum (approximate sea level).

BERENS RIVER.

The Berens river enters lake Winnipeg from the east, about one hundred and forty miles north of Fort Alexander. It is the most important tributary of the lake entering from the east, with the exception of the Winnipeg river. It has a drainage area estimated to be 7,800 square miles and a length of approximately 300 miles. The headwaters lie near the height of land which forms the south and west limits of the Severn and Albany drainage basins. Many lakes are to be found in the district, though their areas are not well defined as they are in unsurveyed territory.

The country drained is typical of the Laurentian formation, abounding in muskegs and swamps with frequent rock outcrops. These rock outcrops form barriers across the river and are the reason for the numerous falls and rapids. Some fifty-two falls and rapids occur between the first fall, which is five miles from the mouth and Family lake, and these vary in height or drop between three and forty feet.

Family lake also forms the source of the Pigeon River, which parallels the course of the Berens and empties into Lake Winnipeg a few miles south of the mouth of the former river.

The Berens river was examined by a party sent out by the Manitoba Hydro-metric Survey to determine its power possibilities. This survey revealed the fact that there are a number of feasible sites on the river.

The country is not heavily timbered but is covered with a growth of small spruce, poplar, birch and scrub oak. There is little merchantable timber to be found along the river.

BERENS RIVER (GAUGING STATION).

History.—The station was established by A. Pirie on October 1, 1913, and has been in operation since that date.

Location.—The gauge is secured to the Hudson's Bay Company's dock at the mouth of the river and registers lake Winnipeg levels.

Records Available.—In the year 1914 continuous records of gauge height during the open water seasons and intermittent gauge readings during the winter months are available. From January 1, 1915 to September 30, 1916 a continuous record of daily gauge height is available.

Mean Daily Gauge Height, in Feet, of Berens River at Berens River (Lake Winnipeg Levels) for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					712 72	713 05	713 38	713 60	713 05		712 85	
2					712 72	712 03	713 30	713 60	713 05		712 85	
3	714 53				712 73	712 05	713 30	713 70	712 95		713 15	
4				712 70	712 85	712 05	713 40	713 55	712 95	712 75	712 75	
5		713 04			712 95	712 07	713 41	713 57	713 05	712 65	712 65	712 65
6					712 92	713 15	713 43	713 50	713 15	712 95	712 65	
7			712 82		712 92	713 17	713 43	713 45	713 05	712 85	712 65	
8					712 93	713 15	713 43	713 55	713 05	712 85	712 75	
9					712 95	713 25	713 43	713 50	(712 65) 711 71	712 95	712 70	
10	713 22				713 03	713 20	713 43	713 60	713 05	712 85	712 65	
11				712 09	712 95	713 22	713 44	713 65	713 00	712 90	712 50	
12		712 95		712 68	712 90	713 27	713 45	714 15	713 05	712 95	712 65	712 55
13				712 67	712 88	713 33	713 50	714 85	712 95	712 85	712 85	
14			712 90	712 69	712 91	713 28	713 47	714 46	713 05	713 15	712 85	
15				712 69	712 93	713 31	713 47	714 35	713 05	712 85		
16				712 71	712 95	713 35	713 48	713 55	713 25	712 95		
17	713 15			712 73	713 05	713 35	713 47	713 45	712 90	711 73		712 55
18				712 73	713 05	713 36	713 45	713 45	713 05	712 66		712 55
19		712 70		712 74	713 00	713 36	713 47	713 45	712 65	713 15		712 55
20				712 74	713 10	713 35	713 49	713 55	713 30	712 85		712 75
21			712 70	712 74	713 05	713 37	713 49	713 45	712 95	712 65	712 68	712 65
22				712 74	713 05	713 35	713 50	713 35	713 05	712 73		712 55
23				712 70	713 00	713 36	713 47	713 36	713 05	712 85		712 55
24	713 12			712 72	713 05	713 34	713 50	713 15	712 95	712 85		712 55
25				712 73	713 05	713 33	713 50	713 05	713 05	713 15		712 55
26				712 85	713 10	713 35	713 51	712 95	712 65	713 00		712 45
27				712 85	713 15	713 36	713 55	712 85	712 45	713 15		712 45
28		712 95	712 70	712 85	713 10	713 36	713 54	713 05	712 85	712 75	712 65	712 4
29				712 85	713 05	713 37	713 55	713 05	712 95	712 90		712 45
30	713 08			712 85	713 15	713 37	713 55	713 15	713 05	712 45		712 4
31					713 12		713 64	713 05		712 05		712 4

Marked thus (5) interpolated.
Levels reduced to M.H.S. datum (approximate sea level).

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26a

Mean Daily Gauge Height, in Feet, of Berens River at Berens River (Lake Winnipeg Levels) for 1915 and 1916.

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	712.31	712.21	712.00	711.87	711.91	712.10	712.49	712.60	712.60	712.79	713.20	712.59
2	712.21	712.21	712.00	711.88	712.11	712.20	712.49	712.60	712.64	712.84	713.04	712.64
3	712.20	712.21	712.00	711.71	712.21	712.20	712.50	712.64	712.60	712.80	713.00	712.50
4	712.31	712.21	712.00	711.71	712.11	712.30	712.30	712.60	712.74	712.94	713.14	712.64
5	712.31	712.21	712.00	711.71	712.11	712.35	712.30	712.64	712.89	713.04	713.29	712.54
6	712.31	712.21	712.00	712.04	712.11	712.20	712.35	712.64	712.89	713.09	713.29	712.59
7	712.31	712.21	712.00	711.94	712.11	712.20	712.30	712.65	712.79	712.99	713.19	712.59
8	712.31	712.21	712.00	711.94	711.91	712.20	712.49	712.64	712.89	713.09	713.29	712.59
9	712.31	712.21	712.00	711.91	711.91	712.10	712.30	712.64	712.89	713.19	713.39	712.59
10	712.21	712.10	712.00	711.91	711.91	712.19	712.30	712.79	713.39	712.89	711.67	712.79
11	712.31	712.10	712.00	711.81	712.31	712.20	712.45	712.99	713.09	713.49	712.99	712.89
12	712.31	712.10	712.00	711.81	712.11	712.10	712.60	712.79	712.89	712.99	713.09	712.89
13	712.31	712.10	711.98	711.86	712.21	712.20	712.70	712.79	712.89	712.89	713.49	712.89
14	712.31	712.10	711.98	711.91	712.01	712.40	712.50	712.64	712.69	712.89	712.89	712.84
15	712.31	712.11	711.98	711.90	711.91	712.50	712.35	712.89	712.99	713.09	711.68	712.49
16	712.31	712.11	711.98	711.86	712.01	712.15	712.40	712.89	712.89	712.89	711.68	712.59
17	712.31	712.11	711.98	711.86	711.91	712.10	712.48	712.79	712.89	712.89	711.68	712.49
18	712.31	712.11	711.98	711.88	711.91	712.10	712.60	712.67	712.99	712.89	712.39	712.59
19	712.31	712.11	711.98	712.01	712.01	712.20	712.69	712.79	712.59	713.39	711.39	712.59
20	712.31	712.11	711.91	712.01	712.11	712.10	712.70	712.89	712.79	713.04	711.39	712.54
21	712.31	712.11	711.91	712.01	712.11	712.40	712.67	712.79	713.19	713.19	712.39	712.54
22	712.31	712.11	711.89	712.11	712.11	712.30	712.69	712.79	712.79	712.49	712.39	712.40
23	712.11	712.11	711.89	712.11	712.11	712.30	712.65	712.99	713.09	712.59	712.29	712.40
24	712.31	712.11	711.88	712.11	711.91	712.30	712.65	712.79	711.68	712.89	712.39	712.40
25	712.31	712.11	711.87	712.11	712.01	712.30	712.67	711.68	712.89	712.99	712.39	712.49
26	712.31	712.11	711.86	712.11	712.18	712.30	712.65	712.74	712.64	712.89	712.37	712.19
27	712.31	712.11	711.85	712.11	712.16	712.20	712.65	712.79	712.69	712.74	712.80	712.40
28	712.21	712.06	711.85	712.11	712.16	712.25	712.69	712.79	713.00	712.84	713.09	712.40
29	712.21	711.81	711.81	712.11	712.16	712.30	712.69	712.69	712.79	712.79	712.59	712.59
30	712.21	711.81	711.81	712.11	712.21	712.30	712.65	712.69	712.91	712.89	712.59	712.49
31	712.21	711.80	711.80	712.11	712.11	712.30	712.60	712.79	712.79	712.79	712.49	712.49

May 7, Lake ice gone.

1916

1	712.48	712.38	712.20	712.18	712.58	713.58	714.48	714.98	715.68			
2	712.48	712.38	712.21	712.18	712.53	713.83	714.18	715.28	715.61			
3	712.48	712.38	712.21	712.15	712.53	713.78	714.45	714.98	715.43			
4	712.48	712.38	712.22	712.15	712.88	713.68	714.53	714.98	715.51			
5	712.18	712.33	712.22	712.13	712.63	713.88	714.33	715.18	715.73			
6	712.48	712.33	712.22	712.13	712.68	713.78	714.38	714.88	715.68			
7	712.48	712.33	712.23	712.13	712.68	713.78	714.53	715.18	715.76			
8	712.48	712.33	712.23	712.12	712.88	713.85	714.53	715.08	715.58			
9	712.48	712.33	712.28	712.12	712.83	713.93	714.48	715.08	715.78			
10	712.38	712.33	712.23	712.11	712.89	713.98	714.58	715.38	715.83			
11	712.38	712.33	712.23	712.11	713.08	713.98	714.78	715.68	716.28			
12	712.38	712.33	712.23	712.10	713.08	713.98	714.83	715.68	715.88			
13	712.38	712.28	712.24	712.08	713.08	714.03	714.73	714.88	715.53			
14	712.38	712.28	712.24	712.08	713.10	714.08	714.78	714.98	715.23			
15	712.38	712.28	712.24	712.13	712.98	714.08	714.83	715.18	715.28			
16	712.38	712.28	712.25	712.15	713.13	714.08	714.78	715.08	715.23			
17	712.38	712.28	712.25	712.17	713.13	714.08	714.83	715.08	714.88			
18	712.38	712.28	712.28	712.18	713.18	714.18	714.88	714.98	715.18			
19	712.38	712.18	712.25	712.23	713.28	714.18	715.08	715.18	715.31			
20	712.38	712.28	712.25	712.29	713.18	714.18	714.68	714.88	715.43			
21	712.38	712.28	712.25	712.50	713.28	714.18	714.88	714.98	715.33			
22	712.38	712.26	712.25	712.33	713.28	714.23	714.78	715.08	715.58			
23	712.38	712.26	712.25	712.35	713.38	714.13	716.53	715.18	715.23			
24	712.38	712.26	712.25	712.43	713.43	714.28	714.08	715.28	715.28			
25	712.38	712.23	712.25	712.48	713.33	714.28	711.98	715.33	715.28			
26	712.38	712.23	712.25	712.43	713.38	714.38	714.93	715.18	715.63			
27	712.38	712.23	712.25	712.43	713.43	714.33	714.93	715.08	714.88			
28	712.38	712.23	712.23	712.45	713.78	714.28	714.88	714.88	714.88			
29	712.38	712.21	712.08	712.48	713.38	714.33	714.88	714.78	714.78			
30	712.38	712.17	712.53	713.48	714.38	714.98	714.98	715.36	715.36			
31	712.38	712.18	712.18	713.48	714.48	714.98	714.98	714.98	714.98			

Levels reduced to M.H.S. datum (approximate sea level).
Free of ice April 23. Frozen over November 9.

BERENS RIVER ABOVE LITTLE GRAND RAPIDS (GAUGING STATION)

History.—The station was established by D. B. Gow on August 28, 1914, and has been in continuous operation since that date.

Location.—The gauge is located in a bay about two hundred and fifty feet above the head of Little Grand rapids.

Records Available.—A continuous record of daily gauge height is available from August 29, 1914 to March 19, 1916, with the exception of a period from July 13 to July 18, 1915. From March 20 to December 31, 1916 an intermittent record of gauge height is available.

Mean Daily Gauge Height, in Feet, of Berens River above Little Grand Rapids, for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1									94 45	93 54	93 63	94 52
2									94 45	93 54	93 61	94 52
3									94 35	93 54	93 73	94 52
4									94 35	93 54	93 73	94 52
5									94 28	93 44	93 73	94 52
6									94 15	93 44	93 83	94 52
7									94 15	93 44	93 83	94 52
8									94 15	93 44	93 93	94 52
9									94 05	93 44	93 93	94 52
10									94 05	93 44	93 93	94 52
11									94 05	93 44	94 03	94 52
12									93 95	93 44	94 03	94 52
13									93 95	93 44	94 13	94 52
14									93 95	93 44	94 13	94 52
15									93 95	93 39	94 13	94 52
16									93 85	93 44	94 23	94 52
17									93 85	93 44	94 23	94 52
18									93 85	93 44	94 23	94 52
19									93 75	93 44	94 23	94 52
20									93 85	93 44	94 33	94 52
21									93 85	93 44	94 33	94 52
22									93 75	93 44	94 33	94 52
23									93 75	93 44	94 33	94 52
24									93 75	93 44	94 33	94 52
25									93 75	93 44	94 43	94 52
26									93 65	93 44	94 43	94 52
27									93 65	93 44	94 43	94 52
28									93 65	93 54	94 43	94 52
29									93 65	93 54	94 53	94 52
30								94 45	93 65	93 54	94 53	94 52
31								94 45		93 64		94 52

Levels reduced to M.H.S. Station datum (assumed).

SESSIONAL PAPER No. 26a

*Mean Daily Gauge Height, in Feet, of Berens River above Little Grand Rapids
for 1915 and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	94 31	93 80	93 49	93 08	93 37	96 56		91 51	93 78	93 32	93 11	93 45
2	94 21	93 80	93 39	93 08	93 47	96 56		94 49	93 73	93 12	93 11	93 45
3	94 21	93 80	93 39	93 08	93 47	96 66		94 49	93 73	93 32	93 11	93 45
4	94 21	93 80	93 39	93 08	93 47	96 66		94 39	93 73	93 32	93 11	93 50 ^a
5	94 21	93 80	93 39	93 08	93 47	96 66		94 39	93 68	93 32	93 11	93 55
6	94 21	93 79	93 39	93 08	93 57	96 66		94 34	93 63	93 32	93 11	93 60
7	94 21	93 79	93 38	93 08	93 57	96 66		94 34	93 63	93 27	93 11	93 60
8	94 21	93 79	93 39	93 08	93 67	96 66		94 34	93 68	93 27	93 11	93 65
9	94 21	93 79	93 39	93 08	93 67	96 56		94 29	93 63	93 27	93 11	93 65
10	94 21	93 79	93 29	93 08	93 77	96 56		91 29	93 58	93 27	93 01	93 79
11	94 21	93 78	93 29	93 08	93 87	96 56		94 24	93 58	93 27	93 01	93 79
12	94 21	93 79	93 29	93 08	93 97	96 56		94 24	93 53	93 22	93 06	93 79
13	94 11	93 60	93 29	93 08	94 17			94 19	93 53	93 22	93 09	93 79
14	91 11	93 60	93 29	93 08	94 37			91 14	93 53	93 22	93 06	93 79
15	91 11	93 60	93 29	93 08	94 17			94 19	93 53	93 22	93 06	93 79
16	94 11	93 60	93 29	93 08	94 07			94 14	93 53	93 22	93 11	93 79
17	94 01	93 60	93 19	93 18	94 87			94 09	93 48	93 22	93 11	93 79
18	94 01	93 60	93 19	93 18	95 07			94 09	93 48	93 17	93 11	93 75
19	94 01	93 60	93 19	93 18	95 27	94 95	94 04	94 04	93 48	93 17	93 16	93 75
20	94 01	93 50	93 19	93 18	95 47	94 90	94 04	94 04	93 48	93 17	93 16	93 75
21	91 01	93 50	93 19	93 28	95 87	94 85	94 09	93 48	93 17	93 21	93 75	
22	94 01	93 50	93 19	93 28	95 67	94 85	94 04	93 43	93 17	93 21	93 75	
23	91 01	93 50	93 19	93 28	95 77	94 80	93 99	93 43	93 17	93 21	93 75	
24	94 01	93 50	93 19	93 28	95 87	94 75	93 99	93 43	93 17	93 26	93 75	
25	93 91	93 50	93 09	93 28	95 97	94 75	93 91	93 43	93 17	93 26	93 75	
26	93 91	93 50	93 09	93 28	96 07	94 65	93 91	93 43	93 17	93 31	93 75	
27	93 91	93 50	93 09	93 28	96 17	94 65	93 91	93 43	93 17	93 31	93 75	
28	93 91	93 50	93 09	93 28	96 27	94 65	93 91	93 43	93 17	93 31	93 75	
29	93 91	93 50	93 09	93 28	96 37	94 60	93 84	93 38	93 12	93 41	93 80	
30	93 91	93 50	93 09	93 28	96 47	94 60	93 84	93 38	93 12	93 41	93 80	
31	93 91	93 50	93 09	93 28	96 47	94 55	93 79	93 38	93 12	93 41	93 80	

1916

1	93 80	93 65	93 49	93 11	94 32	96 58						
2	93 80	93 65	93 45		94 32							
3	93 80	93 65	93 45			96 55	96 50	95 98			91 09	91 19
4	93 80	93 60	93 45									
5	93 80	93 60	93 45	93 11								
6	93 80	93 60	93 45									
7	93 80	93 60	93 44		94 65			91 91				
8	93 80	93 55	93 44						94 24			
9	93 80	93 55	93 40							94 10		
10	93 80	93 55	93 40			96 58		94 81			94 20	
11	93 80	93 55	93 40						94 17			
12	93 80	93 55	93 40	94 08				95 87				
13	93 80	93 55	93 40		91 25					94 10		
14	93 80	93 50	93 40					91 73			94 18	
15	93 80	93 50	93 28									94 18
16	93 80	93 50	93 25	93 15				95 78		94 44		
17	93 80	93 50	93 22			96 80						
18	93 80	93 50	93 22									
19	93 80	93 45	93 20		94 78					91 12		
20	93 80	93 15								94 16	94 15	
21	93 80	93 45						95 45				
22	93 80	93 45										
23	93 75	93 45		93 30						94 19		
24	93 75	93 15										
25	93 70	93 45	93 22		95 16	96 77		95 39				94 11
26	93 79	93 40					96 08			91 24		
27	93 79	93 40		93 45								
28	93 79	93 40	93 16							94 18		
29	93 79	93 40										
30	93 65					96 05	95 24		94 08			
31	93 65							94 39				94 04

Marked thus (i) interpolated.
Levels reduced to M.H.S. Station datum (assumed).
Free of ice April 12.

FAMILY LAKE (GAUGING STATION).

History.—The station was established by C. O. Allen on March 7, 1916.

Location.—A vertical staff gauge is located approximately 1,500 feet below Little Grand rapids on Family lake and 1,000 feet from the Hudson's Bay Company's post.

Records Available.—From March 7 to December 31, 1916 continuous records of daily gauge height have been obtained, with the exception of periods from March 8 to 13; July 9 to 25; and September 14 to 30.

Mean Daily Gauge Height, in Feet, of Family Lake near H. B. Post, Little Grand Rapids for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				981 85	982 24	984 30	985 43	984 85	984 00	983 35	982 73	982 71
2				981 84	982 26	984 37	985 42	984 84	984 06	983 33	982 72	982 71
3				981 84	982 29	984 47	985 40	984 84	984 03	983 29	982 71	982 75
4				981 82	982 30	984 55	985 40	984 82	984 00	983 28	982 70	982 75
5				980 81	982 34	981 64	985 39	984 81	983 97	983 26	982 72	982 75
6				981 85	982 41	984 70	985 37	984 78	983 93	983 25	982 73	982 75
7			982 20	981 84	982 47	984 79	985 35	984 77	983 89	983 12	982 73	982 76
8				981 84	982 52	984 86	985 33	984 76	983 86	983 05	982 74	982 76
9				981 82	982 58	984 94		984 74	983 83	983 04	982 73	982 77
10				981 78	982 67	985 03		984 73	983 82	983 03	982 72	982 77
11				981 76	982 75	985 18		984 71	983 81	983 01	982 72	982 77
12				981 73	982 80	985 25		984 70	983 77	982 95	982 71	982 77
13				981 72	982 94	985 30		984 68	983 75	982 95	982 71	982 77
14			982 10	981 78	982 97	985 34		984 67		982 90	982 70	982 78
15			982 10	981 80	983 03	985 38		984 65		982 89	982 71	982 78
16			982 08	981 81	983 08	985 41		984 62		982 88	982 70	982 78
17			982 07	981 84	983 14	985 45		984 58		982 88	982 70	982 78
18			982 05	981 86	983 20	985 47		984 54		982 85	982 69	982 79
19			982 04	981 89	983 27	985 48		984 50		982 84	982 70	982 79
20			982 02	981 91	983 36	985 50		984 47		982 81	982 70	982 79
21			982 02	981 96	983 44	985 53		984 44		982 79	982 70	982 79
22			982 00	981 99	983 50	985 56		984 41		982 78	982 70	982 78
23			981 99	982 03	983 55	985 59		984 38		982 77	982 70	982 78
24			981 96	982 06	983 57	985 62		984 36		982 75	982 70	982 77
25			982 04	982 10	983 66	985 60		984 31		982 73	982 71	982 77
26			981 99	982 12	983 75	985 60	984 94	984 30		982 74	982 70	982 77
27			981 95	982 15	983 82	985 59	984 93	984 25		982 76	982 71	982 77
28			981 96	982 16	983 93	985 59	984 90	984 22		982 76	982 72	982 77
29			981 93	982 19	984 03	985 58	984 88	984 20		982 76	982 73	982 77
30			981 90	982 22	984 14	985 57	984 87	984 16		982 75	982 74	982 77
31			981 88		984 21		984 85	984 13		982 74		982 77

Levels reduced to M.H.S. datum (approximate sea level).
Free of ice April 16; Frozen over November 9.

NELSON RIVER GAUGING STATIONS.

A number of gauging stations have been operated by the survey at various points along the river. Generally they were established by members of the survey, but in some cases advantage was taken of the presence of engineers of the Hudson's Bay Railway and gauge readings were obtained through their co-operation.

The gauges from which records were obtained were located at the following points, in order from the outlet of lake Winnipeg down stream:—

Warren's Landing (also lake Winnipeg level).

Norway House (Playgreen lake.)

McMillan's Landing (above Shell rapids).

Manitou Rapids (at the H.B. Ry. crossing).

Kettle Rapids (at the H.B. Ry. crossing).

NELSON RIVER AT WARREN'S LANDING (GAUGING STATION).

History.—The station was established by A. Pirie on September 29, 1913, and from that date to October 13, 1915 was in practically continuous operation. records at this point are water levels of lake Winnipeg.

Location of Section.—A vertical staff gauge is secured to the warehouse of the Northern Fish Company at Warren's Landing.

Records Available.—From September 29, 1913 to February 8, 1914 and from March 3, 1914 to October 13, 1915 continuous records of daily gauge height are available.

Mean Daily Gauge Height, in Feet, of Nelson River at Warren's Landing (Lake Winnipeg Levels) for 1913 and 1914.

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1										93 22	93 17	92 92
2										93 32	93 04	92 92
3										93 62	92 82	93 02
4										93 42	93 42	92 92
5										93 17	93 47	92 82
6										93 37	92 97	91 92
7										93 62	92 92	92 82
8										93 47	93 17	92 86
9										93 45	92 97	92 87
10										92 82	93 52	92 92
11										93 02	93 22	92 77
12										93 02	92 92	92 77
13										93 32	92 77	92 37
14										93 72	93 12	92 82
15										93 22	93 25	92 72
16										93 42	93 26	92 77
17										93 82	92 82	92 72
18										93 02	92 92	92 80
19										92 82	92 92	92 72
20										93 27	93 14	92 77
21										93 82	92 72	92 67
22										93 22	93 12	92 62
23										93 42	93 02	92 62
24										93 42	93 10	92 62
25										93 02	92 82	92 67
26										93 04	93 14	92 62
27										92 62	93 02	92 62
28										92 84	93 22	92 72
29									93 72	93 44	92 57	92 62
30									93 55	93 07	93 17	92 62
31										93 02		92 72

1914

1	92 56	92 36	.....	92 11	92 41	92 51	92 71	92 71	92 63	92 53	92 06	91 86
2	92 61	92 26	.....	92 21	92 41	92 61	92 81	92 98	91 81	91 83	92 41	92 91
3	92 61	92 31	92 21	92 21	92 36	92 61	92 72	92 91	92 06	92 06	91 51	91 81
4	92 71	92 36	92 21	92 21	92 31	92 61	92 81	93 01	92 53	91 63	91 51	91 86
5	92 76	92 41	92 21	92 21	92 21	92 71	92 91	93 01	92 16	92 16	92 01	91 81
6	92 51	92 31	92 21	92 11	92 31	92 51	92 86	92 46	92 40	92 18	92 01	91 91
7	92 44	92 31	92 21	92 15	92 41	92 51	92 71	92 81	92 38	92 16	91 71	91 91
8	92 46	92 31	92 21	92 16	92 46	92 61	92 86	92 91	92 48	92 23	92 11	91 91
9	92 51	.....	92 21	92 21	92 21	92 61	92 86	92 41	92 99	92 11	92 81	92 91
10	92 51	.....	92 21	92 11	92 41	92 71	92 88	92 51	92 81	91 78	91 41	91 91
11	92 51	.....	92 21	92 21	92 41	92 16	92 73	92 86	92 71	91 63	91 81	91 91
12	92 51	.....	92 19	92 11	92 51	92 61	92 58	93 01	92 83	92 11	92 01	91 91
13	92 51	.....	92 11	92 17	92 41	92 61	92 81	92 26	93 26	92 51	91 96	91 81
14	92 41	.....	92 21	92 16	92 51	92 56	92 81	92 46	93 16	92 06	91 61	91 81
15	92 41	.....	92 16	92 21	92 51	92 61	93 01	92 81	92 93	92 36	91 51	91 81
16	92 44	.....	92 21	92 21	92 51	92 61	92 36	92 74	92 58	92 06	90 81	91 91
17	92 51	.....	92 21	92 16	92 51	92 41	92 06	92 61	92 84	92 13	92 01	91 81
18	92 41	.....	92 21	92 11	92 41	92 16	92 81	92 66	92 88	92 61	92 01	91 81
19	92 31	.....	92 21	92 21	92 41	92 71	92 86	92 81	92 73	92 11	92 41	91 81
20	92 41	.....	92 16	92 21	92 31	92 46	92 88	92 56	92 41	92 21	92 16	91 81
21	92 41	.....	92 21	92 16	92 41	92 61	93 01	92 59	92 01	92 11	91 81	91 81
22	92 46	.....	92 19	92 31	92 41	92 66	92 88	92 46	92 93	92 31	92 01	91 91
23	92 41	.....	92 21	92 26	92 51	92 51	92 81	92 41	92 06	91 81	92 11	91 81
24	92 46	.....	92 16	92 21	92 61	92 51	92 86	92 58	92 13	92 71	92 01	91 91
25	92 41	.....	92 11	92 31	92 31	92 61	92 71	92 61	92 38	91 61	91 91	91 81
26	92 31	.....	92 21	92 41	92 41	92 61	92 81	92 66	92 26	92 11	91 91	91 81
27	92 31	.....	92 19	92 26	92 51	92 61	92 81	92 83	92 46	92 11	92 01	91 81
28	92 31	.....	92 21	92 26	92 51	92 66	93 21	92 93	92 28	91 61	92 06	91 81
29	92 41	.....	92 19	92 31	92 61	92 61	92 91	92 76	92 11	91 71	92 11	91 81
30	92 31	.....	92 19	92 41	92 51	92 66	92 96	92 68	92 43	92 11	91 91	91 81
31	92 31	.....	92 21	.....	92 51	.....	92 91	92 76	.....	92 01	.....	91 91

Levels reduced to M.H.S. Station datum (assumed).

SESSIONAL PAPER No. 25e

Mean Daily Gauge Height, in Feet, of Nelson River at Warren's Landing (Lake Winnipeg Levels) for 1915.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	91.81	91.71	91.71	91.61	91.31	91.29	91.29	91.91	92.04	92.41		
2	91.92	91.76	91.71	91.71	91.41	91.26	91.34	92.09	92.09	92.24		
3	91.81	91.76	91.71	91.61	91.41	91.19	91.19	92.14	91.99	91.99		
4	91.81	91.71	91.71	91.61	91.01	91.31	91.14	92.19	92.19	91.89		
5	91.81	91.71	91.66	91.61	91.11	90.91	91.44	92.16	92.24	91.99		
6	91.81	91.71	91.66	91.61	91.41	91.04	91.49	91.91	92.19	91.99		
7	91.86	91.71	91.71	91.61	91.01	91.04	91.54	91.94	92.19	91.99		
8	91.81	91.71	91.71	91.61	91.41	91.04	91.59	92.04	91.69	92.09		
9	91.71	91.71	91.71	91.61	91.51	91.29	91.69	92.19	92.19	92.39		
10	91.71	91.66	91.71	91.61	91.41	91.24	91.64	92.26	91.94	91.89		
11	91.71	91.71	91.71	91.61	91.41	91.06	91.64	92.16	91.94	91.94		
12	91.71	91.71	91.71	91.61	91.51	91.29	91.54	92.09	92.24	92.04		
13	91.66	91.71	91.61	91.66	91.51	91.29	91.26	92.14	92.04	91.99		
14	91.76	91.71	91.61	91.71	91.51	91.09	91.24	92.14	92.14			
15	91.81	91.71	91.66	91.71	91.31	91.19	91.44	92.04	92.29			
16	91.81	91.71	91.71	91.71	91.26	91.39	91.49	92.09	92.29			
17	91.76	91.71	91.61	91.61	91.41	91.09	91.61	92.19	92.29			
18	91.76	91.71	91.61	91.61	91.51	91.14	91.71	92.21	92.19			
19	91.76	91.71	91.61	91.61	91.51	91.29	91.74	92.22	92.14			
20	91.81	91.71	91.69	91.61	91.56	91.49	91.79	92.09	91.99			
21	91.81	91.71	91.69	91.51	91.51	91.14	91.96	92.19	92.04			
22	91.81	91.71	91.69	91.41	91.51	91.39	91.69	92.19	92.49			
23	91.81	91.71	91.61	91.51	91.51	91.21	91.79	91.74	91.79			
24	91.81	91.66	91.61	91.51	91.51	91.39	91.99	92.29	92.29			
25	91.81	91.66	91.61	91.71	91.51	91.39	92.09	91.74	92.14			
26	91.81	91.71	91.71	91.71	91.51	91.34	92.19	92.54	92.24			
27	91.81	91.71	91.71	91.71	91.71	91.39	92.19	92.39	92.44			
28	91.71	91.71	91.71	91.51	91.71	91.39	92.14	91.64	92.26			
29	91.71		91.71	91.51	91.71	91.51	92.04	91.99	92.24			
30	91.71		91.71	91.41	91.71	91.39	91.99	91.79	92.29			
31	91.71		91.61		91.61		91.99	92.04				

Levels reduced to M.I.S. Station datum (assumed).
May 6, lake ice gone.

NELSON RIVER AT NORWAY HOUSE (GAUGING STATION).

History.—The station was established by A. Pirie on September 13, 1913, and has been in practically continuous operation since that time.

Location of Section.—A vertical staff gauge is bolted to the rock opposite the end of the dock of the Hudson's Bay Company's post at Norway House, twenty miles downstream from Warren's Landing at the head of the river.

Records Available.—From September 13, 1913 to December 31, 1916, practically continuous records of daily gauge height during the open water seasons and intermittent gauge readings throughout the winter seasons are available.

*Mean Daily Gauge Height, in Feet, of Nelson River at Norway House for 1913
and 1914.*

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1										91-58	90-77	
2										91-57		90-75
3										91-58		90-76
4										91-38		90-75
5										91-20		
6										91-18		90-68
7										91-54		
8										91-37	90-69	90-56
9										91-38	90-62	90-58
10										91-27	90-79	
11										91-04	90-99	90-58
12										90-54	90-96	90-58
13									91-58	90-54	90-75	90-58
14									92-06	91-26	90-80	90-50
15										90-90	90-85	90-52
16									91-74	91-13	90-98	
17									91-63	91-39	90-90	90-18
18									91-86	91-48	90-75	90-50
19									91-68	90-88		
20									90-75		90-77	90-18
21									90-86		90-78	
22									90-95		90-78	
23									91-41		90-76	
24									91-36			
25									91-50	90-82	90-68	
26									91-45			
27									91-60			
28									91-44		90-78	90-10
29									91-16			
30									91-58			
31												

1914

1						90-48		90-78		90-12	
2						90-55		90-78		90-08	
3						90-46		90-55	89-96	90-05	
4						90-45	90-86	91-13	90-04	89-97	
5						90-61	90-90	90-36	89-82	89-96	
6					90-26	90-66		90-28	90-06	89-87	
7		90-01			90-32	90-60		90-71	90-25	89-86	
8					90-42	90-66			90-70	89-89	
9					90-44	90-70			90-74	89-93	
10	90-32				90-47	90-69			90-78	89-87	
11					90-57		90-60	90-45	90-75	89-79	
12					90-61	90-58	90-71	90-71	90-87	89-77	
13					90-66	90-68	90-58	90-38	90-08	89-86	
14		89-96			90-68	90-58	90-80	90-25	91-68	90-25	
15					90-75	90-61	90-88	90-38	91-28	90-17	
16					90-78	90-68	90-60	90-58	90-98	90-05	
17	90-25				90-84	90-53	90-43	90-58	90-65	89-95	
18					90-68	90-58	90-56	90-73		89-95	
19					90-56	90-69	90-64	90-56		89-93	
20					90-58		90-84	90-48	91-50	89-94	
21		89-88			90-58	90-59	91-00	90-49	91-06	89-94	
22					90-58	90-77	91-08	90-51	91-02	89-95	
23					90-68	90-60	90-97	90-34	90-16	89-87	
24	90-17				90-55	90-58	90-79	90-35	90-17	89-87	
25					90-44			90-36	90-12		
26					90-46			90-58	90-15		
27					90-54			90-67	90-10		
28					90-55	90-60	90-78	90-65	90-26		
29					90-71		90-87	90-71	90-17		
30					90-65	90-68	90-95	90-68	90-11		
31	90-10				90-46			90-58			

Levels reduced to M.H.S. Station datum (assumed).

Mean Daily Gauge Height, in Feet, of Nelson River at Norway House for 1915 and 1916.

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				89 10	89 27		89 53	89 87	89 87	90 26	89 88	
2				89 10	89 18		89 54	89 84	89 88	90 20	89 02	
3		89 26		89 10	89 14		89 64	89 93	89 92	90 16	89 85	
4			89 09	89 10	89 15		89 42	89 99	89 88	90 03	90 03	
5	89 37			89 11	89 18		89 44	90 04	89 97	89 90	90 14	
6				89 13	89 13		89 51	89 93	90 00	89 86	90 22	88 08
7				89 20	89 14		89 55	89 88	90 07	89 82	90 08	
8				89 26	89 18		89 88	89 95	89 95	89 85	89 78	
9				89 32	89 18		90 08	89 95	89 88	90 20	89 50	88 67
10		89 23		89 38	89 13		89 63	90 03	89 88	90 27	89 59	
11			89 08	89 38	89 03		89 76	90 04	89 77	90 14	90 08	
12	89 36			89 51	89 02		89 82	89 99	89 77	90 38	88 72	
13				89 56	89 03		89 60	90 03	89 90	90 26		
14				89 58	89 06		89 44	89 92	89 88	90 24		88 73
15				89 66	89 13		89 56	89 93	89 98	90 31		
16				89 65	89 20		89 38	89 98	90 06	90 28		
17		89 17		89 67	89 26		89 40		90 08	90 23		
18			89 11	89 58	89 30		89 59	90 05	90 11	90 22		88 78
19	89 31			89 59	89 33		89 67	90 08	90 05	90 28	88 86	
20				89 66	89 39		89 71	90 01	89 97	89 97		
21				89 70	89 40		89 81	90 05	89 98	89 81		
22				89 70	89 37		89 76		90 08	89 64		
23				89 07	89 35		89 70	89 55	89 93	89 73		88 80
24		89 11		89 70	89 35		89 81	89 85	89 83	89 88		
25			89 10	89 72	89 39		90 02	89 38	89 96	89 81		
26	89 30			89 82	89 40		89 87	89 71	89 99	89 58	88 63	
27				89 87	89 42			89 93	90 12	89 81		
28				89 70	89 45			89 76	90 18	89 78		88 74
29				89 56	89 41			89 70	90 16	89 98		
30				89 29	89 48	89 58	89 92	89 72	90 17	89 91		
31					89 49		89 86	89 70		90 08		

Frozen over November 13, 1915.

1916

1					90 05	90 76	91 75	92 21	91 68	92 28	92 93	
2					90 07	90 83	91 68	92 18	91 73	92 36	92 53	
3					90 12	90 87	91 68	92 18	91 88	92 43	92 63	
4					90 17	90 90	91 73	92 14	91 78	92 38	92 58	
5		88 85			90 18	90 98	91 88	92 12	92 32	92 43	92 73	
6					90 25	91 22	91 68	92 18	92 33	92 33	92 84	91 98
7	88 78				90 23	91 30	91 66	92 19	92 30	92 33	92 73	
8					90 31	91 34	91 68	92 26	92 28	92 33	92 48	
9					90 36	91 38	91 72	92 20	92 26	92 33	92 43	
10					90 18	91 36	91 76	92 07	92 54	92 38		
11					89 93	91 45	91 87	91 93	92 70	92 48		
12					90 22	91 51	91 76	91 88	92 57	92 43		91 98
13		88 80			90 36	91 53	91 82	92 08	92 08	92 28		
14					90 43	91 53	91 77	92 23	91 38	92 38		
15		88 88			90 33	91 35	91 88	92 23	91 14	92 41	91 78	
16					90 13	91 34	91 88	92 22	91 54	92 41		
17					90 25	91 27	91 95	92 22	91 58	92 33		
18		88 96			90 28	91 28	91 97	92 20	91 68	92 38		
19					90 37	91 26	92 41	92 53	92 26	92 41		92 03
20					90 47	91 38	92 21	92 76	92 34	92 33		
21	88 88				90 48	91 31	92 06	92 25	91 76	92 33		
22					90 23	91 38	91 97	92 33	91 58	92 28	91 88	
23				89 48	90 40	91 22	91 86	92 38	92 02	92 53		
24		89 18		89 58	90 36	91 32	91 83	91 86	92 15	92 68		
25				89 64	90 54	91 43	91 90	91 88	92 28	92 43		
26				89 63	90 28	91 36	91 90	91 90	92 32	92 38		91 88
27				89 83	90 86	91 41	91 97	92 05	92 18	92 43		
28	88 82			89 94	90 88	91 54	92 02	91 93	91 88	92 58		
29			89 76	89 80	90 88	91 54	92 15	91 88	91 98	92 68	91 98	
30				89 89	90 86	91 72	91 98	91 96	92 28	92 88		
31					91 01		92 04	91 88		92 93		

Levels reduced to M.H.S. Station datum (assumed).
Break-up April; Frozen up November 10.

NELSON RIVER—McMILLAN'S LANDING (GAUGING STATION).

History.—The station was established by G. J. Lamb on September 7, 1914, and has been in operation during various periods since that date.

Location of Section.—A vertical staff gauge is located at the northwest corner of the dock at McMillan's warehouse on the Nelson river above Shell rapids.

Records Available.—Continuous records of daily gauge height are available over the following periods:—From February 7 to April 8, 1915; from June 24, 1915 to February 5, 1916, and from July 24 to August 9, 1916.

*Mean Daily Gauge Height, in Feet, of Nelson River at McMillan's Landing
for 1915 and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			562.74	560.21			561.76	562.26	562.68	562.74	563.24	562.16
2			562.72	560.18			561.67	562.41	562.65	562.79	563.26	562.36
3			562.70	560.02			561.61	562.41	562.71	562.81	563.27	562.36
4			562.68	559.90			561.80	562.32	562.77	562.83	563.27	562.36
5			562.47	559.78			561.93	562.37	562.77	562.85	563.26	562.16
6			562.36	559.57			561.96	562.30	562.04	562.86	563.26	562.16
7		562.94	562.34	559.56			561.96	562.34	562.08	562.89	563.24	561.90
8		562.93	562.22	559.53			561.97	562.38	562.71	562.91	563.24	561.70
9		562.93	562.11				561.96	562.40	562.80	562.93	563.25	561.56
10		562.93	561.92				561.88	562.41	562.71	562.91	563.26	561.36
11		562.92	561.90				561.86	562.41	562.73	562.94	561.56	561.36
12		562.92	561.74				561.91	562.42	562.66	562.94	561.56	561.36
13		562.90	561.69				561.96	562.43	562.59	562.91	561.56	561.36
14		562.83	561.64				562.14	562.30	562.56	562.91	561.56	561.36
15		562.90	561.49				562.21	562.41	562.59	562.93	561.96	561.16
16		562.90	561.34				562.06	562.54	562.56	562.93	561.96	561.36
17		562.87	561.18				562.21	562.64	562.56	562.92	562.16	561.16
18		562.88	561.13				562.36	562.67	562.58	562.94	562.16	561.16
19		562.87	561.18				562.37	562.67	562.57	562.94	561.96	561.16
20		562.87	561.04				562.38	562.66	562.61	562.97	561.96	561.16
21		562.81	560.90				562.36	562.76	562.65	563.01	561.96	561.16
22		562.81	560.76				562.26	562.62	562.57	563.03	561.96	561.16
23		562.80	560.61				562.31	562.51	562.56	563.05	561.96	561.16
24		562.04	560.66			561.74	562.35	562.73	562.59	563.06	561.96	561.16
25		562.78	560.61			561.56	562.39	562.73	562.54	563.07	561.96	561.16
26		562.78	560.58				561.67	562.33	562.84	562.62	563.12	562.16
27		562.77	560.56				561.66	562.41	562.78	562.64	563.16	562.16
28		562.75	560.60				561.76	562.36	562.73	562.67	563.17	562.16
29			560.50				561.67	562.35	562.75	562.68	563.22	562.16
30			560.35				561.76	562.36	562.74	562.71	563.25	562.16
31			560.34					562.28	562.64		563.26	561.96

1916

1	561.06	561.06					567.01					
2	561.06	561.06					567.05					
3	561.06	561.06					567.09					
4	561.06	561.06					567.17					
5	561.06	561.06					567.24					
6	561.06						567.23					
7	561.06						567.22					
8	561.06						567.22					
9	561.06						567.21					
10	561.06											
11	561.06											
12	561.06											
13	561.06											
14	561.06											
15	561.06											
16	561.06											
17	561.06											
18	561.06											
19	561.06											
20	561.06											
21	561.06											
22	561.06											
23	561.06											
24	561.06						566.77					
25	561.06						566.77					
26	561.06						566.79					
27	561.06						566.81					
28	561.06						566.84					
29	561.06						567.01					
30	561.06						567.00					
31	561.06						567.00					

Levels reduced to H.B.Rly. datum. Zero M.H.S. assumed datum = 172.83 H.B.Rly. datum.
Zero of H.B. Rly. datum = 26.6 approximate mean sea level datum.

NELSON RIVER AT MANITOU BRIDGE CROSSING (GAUGING STATION).

History.—The station was established by M. S. Madden on June 26, 1915, and has been in practically continuous operation to the present date.

Location of Section.—A vertical staff gauge was installed on the left bank of the river, one thousand feet above the bridge crossing the Nelson river at the Manitou rapids. On July 24, 1916 a new gauge was installed one thousand feet below the bridge. Readings were obtained on both these gauges over a period of three months when the upper gauge was discontinued.

Records Available.—Continuous records of daily gauge height are available on the upper gauge for the following periods:—From June 26 to November 6, 1915, and from January 23 to October 28, 1916. On the lower gauge records are available from July 24 to November 11, and from December 20 to December 31, 1916.

Mean Daily Gauge Height, in Feet, of Nelson River at Manitou Bridge Crossing for 1915.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							555 90	556 43	556 09	557 01	557 41	
2								556 55	556 85	557 03	557 41	
3								556 56	556 85	557 03	557 51	
4							555 95	556 55	556 88	557 02	557 41	
5							556 00	556 45	556 91	556 97	557 36	
6							556 08	556 47	556 82	556 93	557 36	
7							556 06	556 51	556 80	557 05		
8							556 02	556 55	556 85	557 14		
9							556 06	556 66	556 98	557 12		
10							556 05	556 70	556 98	557 11		
11							555 99	556 66	556 86	557 06		
12							555 97	556 66	556 72	557 06		
13							556 03	556 73	556 77	557 01		
14							556 19	556 70	556 74	557 01		
15							556 23	556 62	556 78	557 21		
16							556 12	556 70	556 77	557 21		
17							556 33	556 83	556 73	557 26		
18							556 42	556 87	556 75	557 28		
19							556 46	556 86	556 74	557 26		
20							556 48	556 82	556 75	557 51		
21							556 51	556 90	556 80	557 51		
22							556 34	556 77	556 76	557 41		
23							556 39	556 69	556 72	557 21		
24							556 44	556 88	556 77	557 16		
25							556 50	556 96	556 96	557 11		
26						555 78	556 44	557 03	556 84	557 31		
27						555 78	556 50	557 03	556 92	557 36		
28						555 85	556 46	556 80	556 91	557 38		
29						555 84	556 43	556 87	556 91	557 53		
30						555 79	556 49	556 86	556 98	557 51		
31							556 46	556 72		557 46		

Levels reduced to H.B. Rly. datum. Zero M.H.S. assumed datum = 472 83 H.B. Rly. datum.
Zero of H.B. Rly. datum = 26 6 approximate mean sea level datum.
From July 4 to October 9 readings by Automatic Water Stage register.

SESSIONAL PAPER No. 266

**Mean Daily Gauge Height, in Feet, of Nelson River at Manitou Bridge Crossing
for 1916.**

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		561.03	562.18	560.33	560.13	557.28	561.03	561.63	562.73	562.63		
2		561.93	562.17	560.23	560.18	557.83	561.03	561.73	562.63	562.83		
3		561.90	562.17	560.23	560.13	557.72	561.93	561.83	562.53	562.73		
4		561.88	562.18	560.13	560.03	557.53	561.13	561.93	562.33	562.53		
5		561.91	562.18	560.03	559.93	557.83	561.13	561.93	562.23	562.83		
6		561.90	562.13	559.88	559.63	557.83	561.03	561.83	562.43	562.93		
7		561.93	562.03	559.73	559.28	558.33	561.03	561.83	562.43	562.83		
8		561.93	561.93	559.53	558.78	558.83	561.03	561.93	562.33	562.73		
9		561.88	561.88	559.33	557.08	558.83	561.03	561.73	562.23	562.93		
10		561.80	561.83	559.13	557.38	559.03	561.13	561.93	562.23	562.93		
11		561.86	561.83	558.98	558.93	559.03	561.23	562.23	562.63	562.83		
12		561.88	561.73	558.83	558.53	559.43	561.03	562.33	562.73	563.03		
13		561.86	561.68	558.73	558.43	559.83	561.13	562.53	562.63	563.03		
14		561.87	561.63	558.63	558.23	560.03	561.23	562.53	562.63	562.83		
15		561.88	561.58	558.58	558.08	560.03	561.13	562.43	562.73	563.13		
16		561.86	561.55	558.53	558.08	560.13	561.13	562.43	562.83	563.13		
17		561.83	561.53	558.48	558.08	560.13	561.13	562.43	562.93	563.13		
18		561.83	561.46	558.53	558.08	560.33	561.13	562.53	562.93	563.23		
19		561.85	561.38	558.58	558.13	560.33	561.43	562.63	562.93	563.23		
20		561.88	561.28	558.68	558.08	560.03	561.43	562.83	562.93	563.23		
21		561.93	561.18	558.73	558.08	560.73	561.13	562.73	562.83	563.13		
22		561.98	561.13	558.78	555.93	560.73	561.13	562.63	562.83	563.13		
23	561.08	562.08	561.03	558.83	555.93	560.73	561.13	562.73	563.03	563.33		
24	561.93	562.13	560.03	558.03	556.13	560.83	561.53	562.73	562.83	563.33		
25	561.88	562.18	560.88	559.05	556.38	560.93	561.43	562.73	562.83	563.23		
26	561.93	562.25	560.85	559.16	556.28	560.93	561.33	562.63	562.93	563.33		
27	561.88	562.23	560.83	559.43	556.58	561.13	561.43	562.63	562.83	563.43		
28	561.98	562.23	560.98	559.78	558.91	560.93	561.53	562.73	562.83	563.43		
29	561.93	562.23	560.58	560.03	557.03	561.03	561.03	562.71	562.83			
30	561.98		560.43	560.08	557.23	561.03	561.03	562.73	562.73			
31	561.93		560.38		557.03		561.03	562.73				

Levels reduced to H.B. Ry. datum. Zero M.H.S. assumed datum = 472.83 H.B. Ry. datum.
Break up May 1. Zero of H.B. Ry. datum = 26.6 approximate mean sea level datum.

**Mean Daily Gauge Height, in Feet, of Nelson River 1,000 Feet Below Manitou
Bridge Crossing for 1916.**

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								565.55	566.40	566.60	567.50	
2								565.75	566.30	566.70	567.40	
3								565.58	566.30	566.70	567.30	
4								565.52	566.20	566.60	567.30	
5								565.77	566.20	566.70	567.40	
6								565.87	566.40	566.80	567.40	
7								565.75	566.40	566.79	567.50	
8								565.96	566.10	566.70	567.50	
9								565.89	566.30	566.70	567.60	
10								565.94	566.19	566.80	567.60	
11								566.18	566.40	566.80	567.79	
12								565.96	566.60	566.76		
13								565.98	566.50	566.80		
14								565.97	566.50	566.80		
15								565.99	566.50	567.00		
16								565.96	566.70	566.90		
17								565.98	566.50	567.00		
18								566.00	566.60	567.00		
19								566.12	566.70	567.10		
20								567.00	566.70	567.10		566.10
21								566.80	566.60	567.00		566.10
22								567.00	566.60	567.00		566.00
23								565.99	566.70	567.30		565.90
24							565.32	567.00	566.70	567.20		565.80
25							565.42	565.99	566.70	567.10		565.90
26							565.38	565.97	566.60	567.20		565.80
27							565.48	566.40	566.60	567.40		565.70
28							565.64	566.40	566.60	567.30		565.80
29							565.68	566.50	566.50	567.30		565.60
30							565.62	566.58	566.60	567.50		565.70
31							565.57	566.56		567.60		565.70

Levels reduced to H.B. Ry. datum. Zero M.H.S. assumed datum = 472.83 H.B. Ry. datum.
Zero of H.B. Ry. datum = 26.6 approximate mean sea level datum.

NELSON RIVER AT KETTLE BRIDGE CROSSING (GAUGING STATION).

History.—The station was established on November 26, 1916 by T. B. Campbell, Bridge Engineer, Hudson's Bay Railway.

Location of Section.—The records at this station consist of water levels taken at the point where the Hudson's Bay Railway crosses the Nelson river at Kettle rapids.

Records Available.—A continuous record of daily gauge height is available from October 23 to December 31, 1916.

Mean Daily Gauge Height, in Feet, of Nelson River at Kettle Bridge Crossing (Below Kettle Rapids) for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1											318 70	317 70
2											318 90	317 60
3											319 00	317 70
4											319 00	317 80
5											318 90	317 90
6											318 70	318 00
7											318 70	317 90
8											318 50	318 00
9											318 50	318 00
10											318 50	317 90
11											318 00	318 00
12											318 70	318 00
13											318 80	318 10
14											318 70	318 10
15											318 70	318 00
16											318 70	317 90
17											318 60	317 90
18											318 00	318 00
19											318 00	318 00
20											318 00	317 90
21											318 50	317 90
22											318 50	317 80
23										317 90	318 40	317 80
24										318 00	318 40	317 90
25										318 00	318 50	317 80
26										318 10	318 40	317 70
27										318 10	318 30	317 60
28										318 30	318 20	317 60
29										318 40	318 00	317 70
30										318 40	317 90	317 60
31										318 00	.....	317 60

Levels reduced to H. B. Ry. datum. Zero M. H. S. assumed datum = 472.84 H. B. Ry. datum.
Zero of H. B. Ry. datum = 26.6 approximate mean sea level datum.

MISCELLANEOUS GAUGING STATIONS.

Gauge records have been obtained on the following rivers at the points named:

Boyne river, Carman.
Cypress river, Cypress River.
Fairford river, Fairford.
La Salle river, Sanford.
Morris river, Rosemort.
Mossy river, Cameron's Bridge.
Pembina river, Killarney.
Pembina river, La Riviere.
Pipestone creek, Cromer.
Squirrel creek, Austin.
Whitemouth river, above falls at the Mouth.
Whitemud river, Holmfild.
Whitemud river, Westbourne.

BOYNE RIVER AT CARMAN (GAUGING STATION).

History.— This station was established by M. S. Madden on April 30, 1915.

Location.— A vertical staff gauge is located on a timber pile at the downstream side of a highway bridge across the Boyne river two miles east of the town of Carman.

Records Available.— From April 30 to November 13, 1915, and from April 7 to June 30, 1916, with the exception of from May 15 to 19, continuous records of daily gauge height are available.

Mean Daily Gauge Height, in Feet, of Boyne River near Carman for 1915 and 1916.

Day.	1915								1916		
	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	April	May	June
1		84.02	83.17	83.15	82.72	81.89	83.08	84.18		88.58	85.42
2		83.01	83.15	83.11	82.67	81.87	83.07	84.36		87.78	85.41
3		83.85	83.15	83.10	82.65	81.86	83.22	84.36		87.23	85.41
4		83.75	83.09	83.05	82.61	81.84	82.95	84.35		86.79	85.41
5		83.00	83.09	83.05	82.60	81.86	83.02	84.33		86.48	85.41
6		83.65	83.09	83.02	82.58	81.70	83.24	84.32		85.90	85.41
7		83.64	82.10	83.00	82.55	81.53	83.26	84.34		85.98	85.41
8		83.59	83.12	82.95	82.45	81.55	83.31	84.38	85.5	86.16	85.42
9		83.46	83.18	82.94	82.45	81.56	83.34	84.24	85.12	86.34	85.42
10		83.51	83.15	82.96	82.46	81.57	83.34	84.36	85.01	85.52	85.42
11		83.48	83.15	82.95	82.47	81.65	83.38	84.60		85.61	85.41
12		83.48	83.18	82.88	82.44	81.68	83.37	84.62	85.6	85.40	85.41
13		83.48	83.24	82.87	83.20	81.65	83.18	84.62	85.6	85.98	85.41
14		83.41	83.36	83.02	82.74	82.26	83.25		85.51	85.07	84.37
15		83.39	83.37	82.95	82.64	82.31	83.05			85.16	83.70
16		83.49	83.35	82.80	82.57	82.16	83.13			85.16	83.70
17		83.42	83.26	82.85	82.54	82.16	83.27			85.25	83.79
18		83.41	83.22	82.83	82.45	82.29	83.23			85.34	83.79
19		83.45	83.18	82.83	82.38	82.27	83.18			85.43	83.79
20		83.64	83.21	82.79	82.35	82.43	83.17		86.04	85.43	83.79
21		83.62	83.24	82.75	82.31	82.67	83.16		86.68	85.43	83.88
22		83.51	83.20	82.74	82.27	82.36	83.39		86.68	85.43	83.88
23		83.48	83.24	82.66	82.23	82.33	83.48		86.68	85.43	83.88
24		83.44	83.22	82.83	82.20	82.32	83.58		86.68	85.42	83.88
25		83.39	83.18	82.88	81.98	82.38	83.68		86.68	85.42	83.79
26		83.35	83.18	82.85	81.97	82.67	83.73		86.68	85.42	83.70
27		83.29	83.21	82.85	81.95	82.33	83.81		86.68	85.42	83.41
28		83.28	83.18	82.84	81.94	82.18	83.88		86.68	85.43	85.33
29		83.25	83.15	82.84	81.93	83.13	84.01		86.68	85.43	85.25
30	84.04	83.19	83.12	82.79	81.92	83.08	84.05		86.68	85.42	86.41
31		83.19		82.75	81.89		84.18			85.42	

Levels reduced to M.H.S. Station datum (assumed).
Frozen over November 12, 1915. Free of ice April 20, 1916.

CYPRESS RIVER AT CYPRESS RIVER (GAUGING STATION).

History.—The station was originally established by G. J. Lamb on October 27, 1912 at the traffic bridge. Subsequently in 1915 some meterings were taken at a section 75 feet below the bridge.

Location.—A vertical staff gauge is secured to a pile on the downstream side of the bridge, one-half mile south and east of the town of Cypress River.

Records Available.—Records of daily gauge height are available for a period from October 27 to December 31, 1912; and from January 9 to 11, 1913. The gauge zero for this period was assumed to be 100.00. On April 19, 1915, the gauge was again replaced and tied in, but to a different assumed elevation, and a record to July 31 was obtained. These two data have not been co-related.

*Mean Daily Gauge Height, in Feet, of Cypress River at Cypress River
for 1912, 1913 and 1915.*

Day	1912			1913		1915				
	Oct.	Nov.	Dec.	Jan.	April.	May.	June	July		
1		101.50	101.40			92.54	92.54	92.72		
2		101.45	101.40			92.53	92.54	92.71		
3		101.45	101.60			92.53	92.53	92.71		
4		101.40	101.30			92.52	92.53	92.69		
5		191.40	101.40			92.60	92.56	92.67		
6		101.31	101.20			92.59	92.56	92.64		
7		101.15	101.70			92.50	92.61	92.63		
8		101.00	101.60			92.58	92.60	92.64		
9		191.00	101.50	105.30		92.58	92.59	92.64		
10		101.00	101.40	105.30		92.58	92.62	92.62		
11		101.00	191.30	105.30		92.57	92.61	92.60		
12		101.00	101.20			92.56	92.61	92.57		
13		101.00	101.10			92.56	92.61	92.54		
14		101.00	101.00			92.53	92.62	92.58		
15		101.20	101.00			92.58	92.62	92.62		
16		101.30	100.90			92.58	92.61	92.53		
17		101.30	100.90			92.57	92.61	92.51		
18		101.30	100.80			92.57	92.61	92.48		
19		101.30	100.80		92.57	92.58	92.60	92.41		
20		101.20	100.70		92.57	92.59	92.68	92.45		
21		101.30	100.70		92.56	92.59	92.67	92.41		
22		101.30	101.70		92.58	92.60	92.66	92.41		
23		101.40	101.80		92.61	92.60	92.64	92.42		
24		101.40	101.80		92.63	92.59	92.61	92.40		
25		101.40	101.90		92.66	92.59	92.64	92.39		
26		101.40	101.90		92.63	92.58	92.77	92.40		
27	101.18	101.40	102.00		92.60	92.57	92.76	92.41		
28	101.19	101.40	102.00		92.58	92.57	92.74	92.40		
29	101.67	101.40	102.10		92.56	92.56	92.73	92.41		
30	191.60	101.50	102.20		92.56	92.56	92.72	92.41		
31	101.51		102.25			92.56		92.42		

Levels reduced to M.H.S. Station datum (assumed).

FAIRFORD RIVER AT FAIRFORD.

History.—The station was established by G. H. Burnham on June 27, 1912, and has been in continuous operation since that date.

Location of Section.—The metering section is located on the downstream side of the Canadian Northern Railway bridge which crosses the Fairford river at Fairford, two and one-half miles below lake Manitoba.

Drainage Area.—The drainage area of the river above the station is 31,900 square miles.

Channel.—The section is located in a straight stretch of the river, nine hundred feet long. The channel was originally divided by fifteen piers of the bridge, but in 1914 the old bridge was replaced by a steel structure resting on piers which divide the channel into four sections. The old piling was entirely removed.

The bed of the channel is uneven and liable to shift.

The full discharge of the river is confined within the limits of the section at all stages.

Gauge.—A vertical staff gauge is secured to the first bridge pier from the left bank. Records from this gauge to the end of 1914 are referred to C.N.R. datum. Following a reconnaissance survey of the river by this Survey in 1913, this gauge was tied in to M.H.S. datum and all records following the end of the year 1914 are referred to the latter datum.

Discharge Measurements.—Since this station was established, discharge measurements have been obtained over a range in stage of 2.48 feet, corresponding to a range in discharge of from 2,700 to 8,000 c.f.s.

Records Available.—A continuous record of daily gauge height is available from June 28, 1912 to December 31, 1916. No record of daily discharge is available at this point, as on account of the change in slope due to wind effect on lake Manitoba, it has not been possible to define a discharge curve for the station.

*Mean Daily Gauge Height, in Feet, of Fairford River at Fairford for 1912
and 1913.*

1912

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1							347 89	347 49	347 69	347 69	347 41	349 21
2							348 19	347 43	347 61	347 69	347 51	349 81
3							346 03	347 59	347 61	347 61	347 61	349 21
4							347 50	347 60	347 41	347 61	347 51	349 21
5							347 39	347 89	347 51	347 67	347 51	349 21
6							347 50	347 79	348 11	347 51	347 61	349 21
7							347 51	347 69	347 71	347 21	347 71	349 21
8							347 49	347 50	347 51	347 81	347 41	349 25
9							347 33	347 50	347 61	347 07	347 51	349 23
10							347 59	347 69	347 51	347 81	347 65	349 47
11							346 09	347 69	347 61	347 57	347 51	350 03
12							347 55	347 85	347 55	347 41	347 41	350 81
13							347 69	346 79	347 21	347 59	347 11	350 61
14							347 33	347 49	346 01	347 31	348 61	349 41
15							347 75	347 69	347 11	347 57	347 61	348 51
16							347 93	347 73	347 31	347 67	347 91	347 61
17							347 44	347 69	347 51	347 61	348 01	347 41
18							347 09	347 75	347 57	347 61	347 91	347 41
19							347 69	347 49	347 71	347 31	347 71	347 41
20							347 49	347 49	347 47	347 41	347 69	347 41
21							347 49	347 63	347 61	347 41	347 61	347 51
22							347 31	347 19	347 61	347 51	347 59	347 51
23							347 49	347 09	347 41	347 81	347 21	347 51
24							347 47	347 09	347 21	347 91	348 61	347 51
25							347 49	347 59	347 27	347 81	349 41	347 51
26							347 59	347 69	347 27	347 61	349 61	347 51
27							347 63	347 59	347 47	347 71	349 62	347 41
28						347 84	347 69	347 49	347 31	347 41	349 61	347 21
29						347 65	347 79	347 99	347 69	347 81	349 63	347 21
30						347 59	347 59	348 29	347 41	347 31	349 63	347 21
31							347 49	347 99		347 11		347 21

1913

1	347 21				347 11	347 51	347 51	347 91	347 69	347 43	347 12	347 32
2	347 35				347 21	347 51	347 81	347 81	347 71	347 46	347 42	347 39
3	347 25			347 06	347 31	347 41	347 61	347 71	347 57	347 41	347 36	347 32
4	347 21				347 41	347 61	347 71	347 81	347 76	347 26	347 32	347 32
5	347 27				347 41	347 51	347 71	347 71	347 91	346 91	347 42	347 32
6	347 21	346 11	346 21	347 31	347 41	347 31	347 81	347 71	347 86	347 11	347 37	347 51
7	347 21			347 31	347 37	347 11	347 81	347 91	347 81	347 61	347 12	347 72
8	347 21			347 31	347 31	347 61	348 01	347 91	347 76	347 36	347 92	347 79
9	347 21			347 31	347 31	347 99	347 61	347 51	348 36	347 33	347 02	347 72
10	347 21			347 31	347 41	348 11	347 71	347 51	348 05	346 81	347 52	347 79
11	347 21			347 31	347 61	348 01	348 11	347 81	348 01	347 31	347 86	347 57
12	347 21	346 11		347 31	347 57	347 81	347 91	347 71	347 66	347 16	347 32	347 59
13			346 21	347 31	347 31	347 61	348 01	347 81	347 61	347 27	347 98	347 11
14				347 31	347 41	347 71	347 91	347 61	347 91	347 61	348 02	347 38
15				347 41	347 61	347 71	348 01	347 81	347 76	347 36	347 88	347 22
16				347 41	347 61	347 61	348 11	347 81	347 66	347 31	347 72	347 22
17	347 61			347 41	347 41	347 11	348 01	347 55	347 69	347 41	347 47	347 29
18				347 11	347 21	347 61	347 91	347 51	347 85	347 45	347 32	347 29
19				347 11	347 41	347 51	347 71	347 73	347 31	347 06	347 17	347 49
20		346 21	346 21	347 41	347 51	347 51	347 81	347 87	347 21	346 91	347 42	347 62
21				347 41	347 51	347 61	347 81	347 75	347 61	347 11	347 40	348 59
22	347 47			347 41	347 41	347 71	347 81	347 71	347 25	347 36	347 42	348 12
23				347 41	347 41	347 71	347 61	347 57	347 36	347 47	347 42	348 06
24				347 31	347 31	347 91	347 81	347 61	347 41	347 39	347 42	348 06
25				347 31	347 61	347 81	347 91	347 73	347 43	347 41	347 37	348 49
26				347 31	347 61	347 51	347 71	347 61	347 21	347 21	347 10	348 49
27		346 21	346 21	347 31	347 61	347 51	347 61	347 76	347 55	347 21	347 48	348 49
28				347 35	347 51	347 51	347 91	347 81	347 46	347 41	347 40	348 49
29	347 49			347 41	347 61	347 71	348 01	347 57	347 76	348 06	347 34	348 49
30				347 21	347 61	347 81	348 01	347 51	347 41	347 46	347 32	348 49
31					347 61		348 01	347 55		347 49		348 49

Levels reduced to C.N.R. datum.

344.00 C. N. R. datum = 800.15 approximate sea level datum.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 26

Mean Daily Gauge Height, in Feet, of Fairford River at Fairford for 1914 and 1915.

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	348.44	347.64	347.67	347.17	347.06	347.16	347.12	347.26	346.84	346.81	346.12	346.36
2	348.44	347.64	347.70	347.18	347.02	347.34	347.22	347.12	346.32	346.32	346.62	346.32
3	348.42	347.64	347.72	347.18	347.02	347.16	347.20	347.10	346.02	345.85	346.48	346.32
4	348.42	347.62	347.60	347.16	347.02	347.14	347.12	347.02	346.26	346.12	346.12	346.32
5	348.42	347.62	347.59	347.12	347.02	347.46	347.32	347.22	346.28	346.26	346.08	346.34
6	347.52	347.62	347.52	347.06	347.08	347.60	347.52	346.82	346.31	346.42	346.22	346.32
7	347.52	347.62	347.48	347.06	347.12	347.52	347.12	346.79	346.28	346.38	346.02	346.32
8	347.62	347.64	347.44	347.04	347.12	347.45	347.08	347.10	346.37	346.44	346.22	346.26
9	347.82	347.64	347.45	347.04	347.14	347.42	347.30	346.91	346.72	346.48	346.32	346.51
10	347.74	347.62	347.46	347.06	347.02	347.48	347.22	346.62	346.88	346.32	346.41	346.47
11	348.44	347.62	347.46	347.08	347.02	347.26	347.12	346.72	346.72	346.02	346.02	346.36
12	347.62	347.62	347.40	347.07	347.12	347.04	347.32	346.91	346.76	346.12	346.09	346.36
13	347.62	347.63	347.36	347.02	347.02	347.20	347.12	346.98	346.92	346.30	346.26	346.38
14	347.36	347.63	347.36	346.92	347.02	347.16	347.26	346.72	347.37	346.52	346.62	346.36
15	347.62	347.62	347.36	346.92	347.22	347.12	347.32	346.46	347.26	346.72	346.52	346.36
16	347.62	347.62	347.36	346.92	347.27	347.32	347.42	346.72	347.02	346.78	352.52	346.34
17	347.62	347.62	347.36	347.02	347.28	347.30	346.92	346.67	346.72	346.37	352.66	346.32
18	347.62	347.62	347.36	347.02	347.23	346.02	347.12	346.61	346.88	346.51	352.68	346.32
19	347.62	347.62	347.35	346.92	347.16	347.12	347.18	346.62	346.92	346.48	352.68	346.51
20	347.68	347.62	347.36	347.02	348.02	347.22	347.02	346.71	346.70	346.52	349.62	346.51
21	347.64	347.64	347.38	347.02	347.06	317.02	347.22	346.52	346.46	346.50	349.42	346.52
22	347.62	347.64	347.38	347.06	346.92	347.22	347.32	346.48	346.28	346.48	347.22	346.52
23	347.62	347.64	347.22	347.02	347.12	347.32	347.12	346.36	346.31	346.42	347.22	346.52
24	347.68	347.62	347.24	347.02	347.27	347.02	347.12	346.42	346.18	346.54	347.22	346.52
25	347.64	347.62	347.28	347.04	347.32	347.06	347.22	346.56	346.36	346.12	346.64	346.56
26	347.64	347.62	347.26	347.06	347.28	347.02	347.26	346.52	346.42	346.42	346.62	346.56
27	347.64	347.62	347.26	347.02	347.22	347.11	347.22	346.60	346.66	346.38	346.62	346.54
28	347.62	347.65	347.22	347.02	347.26	347.02	347.07	346.64	346.56	346.11	346.57	346.54
29	347.67	.....	347.22	347.08	347.42	347.12	347.44	346.78	346.44	346.26	346.52	346.54
30	347.62	.....	347.18	347.02	347.32	347.14	347.21	346.72	346.52	346.28	346.42	346.54
31	347.68	.....	347.17	.....	347.28	.....	347.30	346.78	.....	346.36	.....	346.54

Levels reduced to C.N.R. datum.

344.00 C.N.R. datum = 800.15 approximate sea level datum.

1915

1	802.68	802.48	802.08	801.84	801.63	801.75	801.93	801.37	801.00	801.25	800.55	801.63
2	802.68	802.47	802.08	801.87	801.61	801.92	801.55	801.45	800.95	801.19	800.91	801.63
3	802.66	802.46	802.08	801.79	801.65	801.77	801.45	801.67	800.85	801.00	800.97	801.63
4	802.68	802.46	802.08	801.79	801.67	801.83	801.35	801.65	801.05	800.85	801.01	801.63
5	802.68	802.46	802.08	801.79	801.65	801.97	801.51	801.77	801.17	801.05	801.25	801.61
6	802.68	802.47	802.04	801.75	801.41	801.25	801.55	801.65	801.15	800.31	801.15	801.61
7	802.70	802.48	802.03	801.75	801.35	801.43	801.71	801.45	801.17	800.65	801.05	801.57
8	802.69	802.48	802.03	801.79	800.75	801.31	801.79	801.47	800.75	800.71	800.65	801.55
9	802.50	802.47	801.99	801.81	801.35	801.65	801.87	801.49	800.19	801.73	800.39	801.45
10	802.46	802.48	801.99	801.81	801.49	801.65	801.75	801.61	801.21	801.09	801.03	801.51
11	802.46	802.47	801.99	801.73	801.65	801.75	801.94	801.69	801.23	801.25	800.95	801.57
12	802.44	802.46	801.99	801.75	801.45	801.69	801.95	801.51	800.95	801.35	801.75	801.57
13	802.45	802.46	802.03	801.77	801.55	801.61	801.79	801.49	800.99	801.05	801.45	801.85
14	802.50	802.38	801.99	801.84	801.45	801.82	801.45	801.45	800.83	801.13	801.49	802.15
15	802.50	802.38	801.95	801.84	801.15	801.80	801.45	801.59	801.43	801.15	801.85	802.55
16	802.46	802.28	801.95	801.77	801.15	801.55	801.55	801.55	800.17	801.17	801.85	802.75
17	802.36	802.27	801.95	801.79	800.85	801.71	801.45	801.47	801.15	801.19	801.83	802.81
18	802.37	801.95	801.81	801.51	801.73	801.53	801.57	801.57	801.05	801.17	801.83	802.85
19	802.37	801.95	801.81	801.65	801.82	801.57	801.65	801.65	801.06	801.29	801.83	802.85
20	802.46	801.95	801.73	801.74	801.85	801.66	801.61	800.61	801.35	801.35	801.79	802.55
21	802.48	801.91	801.75	801.67	801.84	801.65	801.41	800.85	800.95	801.75	802.35	802.35
22	802.47	802.16	801.91	801.65	801.85	801.71	801.45	801.45	800.85	801.75	802.15	802.15
23	802.46	802.16	801.91	801.65	801.57	801.57	801.45	800.25	800.87	801.00	801.77	801.95
24	802.48	802.16	801.91	801.65	801.79	801.55	801.45	800.25	800.79	801.05	801.75	801.75
25	802.46	802.16	801.91	801.69	801.55	801.84	801.75	800.75	801.05	800.53	801.67	801.75
26	802.47	802.16	801.91	801.75	801.75	801.85	801.81	801.05	800.91	800.75	801.65	801.75
27	802.49	802.03	801.91	801.85	801.95	801.83	801.25	801.05	801.05	801.35	801.65	802.35
28	802.50	802.03	801.91	801.61	801.99	801.79	801.84	801.75	800.11	800.85	801.66	802.45
29	802.50	801.91	801.69	801.85	802.03	801.49	800.21	801.06	801.07	801.65	801.63	802.35
30	802.49	801.91	801.45	801.77	801.84	801.41	800.21	801.09	800.95	801.63	802.15	802.15
31	802.48	801.91	801.71	801.56	801.56	801.56	801.05	801.05	801.53	801.53	801.63	802.65

Levels reduced to mean sea level datum (approximate).

Mean Daily Gauge Height, in Feet, of Fairford River at Fairford for 1916.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	802.35	802.15	801.51	800.97	801.05	800.99	801.89	801.96	801.15	801.57	801.65	801.59
2	802.35	802.15	801.51	800.95	801.05	801.15	801.75	801.85	801.11	800.67	801.51	801.55
3	802.31	802.25	801.55	800.97	801.04	801.23	801.85	801.93	800.95	800.55	801.75	801.55
4	802.25	802.25	801.55	800.97	800.95	800.24	801.95	801.75	801.07	801.09	801.49	801.56
5	802.23	802.25	801.53	800.95	800.97	801.19	802.15	801.71	801.65	801.24	801.71	801.49
6	802.25	802.15	801.45	800.75	801.01	801.45	801.85	801.55	801.57	801.45	801.70	801.51
7	802.25	802.15	801.45	800.77	801.03	801.40	801.57	801.67	801.35	800.85	801.69	801.49
8	802.25	802.15	801.45	800.79	800.79	801.55	801.75	801.75	801.27	801.21	801.85	801.47
9	802.25	802.05	801.65	800.81	801.05	801.45	801.83	801.95	801.31	801.17	801.59	801.61
10	802.27	802.05	801.65	800.77	800.25	801.36	801.75	801.51	801.35	801.49	801.05	801.61
11	802.35	802.05	801.45	800.75	800.69	801.55	801.85	801.77	802.05	801.43	801.13	801.99
12	802.45	802.05	801.45	800.75	800.91	801.63	801.79	801.61	801.59	801.20	801.99	801.81
13	802.35	802.02	801.45	800.76	800.95	801.65	801.75	801.69	800.15	801.25	801.73	802.55
14	802.35	802.03	801.45	800.85	801.15	801.35	801.93	801.67	799.65	801.05	801.79	802.95
15	802.45	801.94	801.51	800.85	800.85	801.15	801.95	801.65	800.55	801.35	801.83	802.86
16	802.45	801.83	801.49	800.86	800.45	800.95	801.77	801.83	800.67	801.36	801.75	802.41
17	802.35	801.75	801.45	800.85	800.73	801.15	801.85	801.59	800.95	801.23	801.75	802.35
18	802.35	801.65	801.45	800.86	800.61	801.05	801.97	801.57	801.01	801.05	801.79	802.33
19	802.31	801.61	801.45	800.86	800.89	801.01	802.45	801.85	801.09	800.15	801.65	802.45
20	802.31	801.65	801.41	800.85	801.05	801.07	801.95	802.01	800.79	801.29	801.53	802.35
21	802.15	801.61	801.45	800.85	801.05	801.25	801.85	801.55	800.47	801.25	801.55	802.33
22	802.15	801.45	801.47	800.95	801.21	801.15	801.75	801.61	800.71	800.87	801.56	801.95
23	802.05	801.45	801.47	800.95	801.15	800.55	802.36	801.45	800.93	801.41	801.45	802.33
24	802.05	801.61	801.47	801.01	801.05	801.19	801.83	801.27	800.95	801.46	801.79	802.15
25	802.15	801.45	801.49	800.97	800.97	801.45	801.79	800.95	801.04	801.35	801.83	802.05
26	802.15	801.45	801.49	800.99	801.05	801.39	801.63	801.05	800.95	801.43	801.71	801.25
27	802.05	801.47	801.45	800.95	801.49	801.35	801.65	801.25	800.89	801.09	801.65	801.39
28	801.95	802.05	801.15	800.97	801.41	801.55	801.83	801.39	800.85	801.31	801.67	802.59
29	801.95	802.05	801.15	800.95	801.11	801.64	801.75	800.91	801.11	801.61	801.66	802.05
30	801.97	.....	800.95	800.95	801.15	802.05	801.77	801.25	801.25	801.85	801.61	802.05
31	802.15	.....	800.95	.....	801.39	.....	801.65	800.51	.....	801.65	.....	802.05

Levels reduced to mean sea level datum (approximate).

LA SALLE RIVER AT SANFORD (GAUGING STATION).

History.—The station was established by A. Pirie on May 3, 1915.

Location.—A vertical staff gauge is secured to a pile on the upstream side of the traffic bridge across the La Salle river, one-quarter of a mile east of the town of Sanford, Manitoba.

Records Available.—Continuous records of daily gauge height are available for the following periods:—From May 3 to November 3, 1915, and from April 10 to December 9, 1916.

MANITOBA HYDROMETRIC SURVEY

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SESSIONAL PAPER No. 25a

Mean Daily Gauge Height, in Feet, of La Salle River Near Sanford for 1915 and 1916.

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						89.23	89.10	88.83	88.37	88.19	88.32	
2						89.24	89.08	88.82	88.33	88.19	88.35	
3					89.21	89.25	89.06	88.79	88.28	88.18	88.38	
4						89.28	89.06	88.77	88.23	88.17		
5					89.39	89.30	89.05	88.75	88.18	88.15		
6					89.34	89.32	89.04	88.78	88.17	88.14		
7					89.33	89.34	89.05	88.78	88.16	88.12		
8					89.27	89.34	89.06	88.77	88.15	88.11		
9					89.24	89.30	89.06	88.78	88.14	88.10		
10					89.19	89.25	89.06	88.79	88.14	88.10		
11					89.18	89.23	89.05	88.79	88.04	88.10		
12					89.24	89.24	89.04	88.78	88.04	88.09		
13					89.22	89.24	89.04	88.77	88.05	88.09		
14					89.22	89.24	89.04	88.77	88.06	88.09		
15					89.24	89.21	89.23	88.76	88.07	88.09		
16					89.26	89.19	89.23	88.72	88.07	88.08		
17					89.23	89.15	89.01	88.69	88.08	88.08		
18					89.22	89.17	89.02	88.65	88.09	88.08		
19					89.21	89.20	88.99	88.61	88.10	88.08		
20					89.20	89.22	88.98	88.56	88.12	88.08		
21					89.20	89.23	88.94	88.58	88.14	88.07		
22					89.19	89.21	88.92	88.59	88.15	88.07		
23					89.19	89.19	88.95	88.58	88.16	88.07		
24					89.18	89.18	88.94	88.56	88.17	88.07		
25					89.18	89.18	88.93	88.52	88.18	88.07		
26					89.17	89.18	88.92	88.51	88.18	88.08		
27					89.18	89.17	88.91	88.51	88.18	88.10		
28					89.19	89.15	88.89	88.50	88.19	88.12		
29					89.20	89.13	88.88	88.50	88.19	88.25		
30					89.21	89.12	88.86	88.46	88.19	88.26		
31					89.23		88.84	88.42		88.29		

1916

1					98.92	90.07	90.87	90.57	89.77	89.07	88.97	89.07
2					98.35	90.07	91.27	90.57	89.67	89.07	88.97	89.07
3					97.64	89.97	91.37	90.47	89.67	89.07	88.87	89.07
4					96.81	89.97	91.52	90.47	89.67	89.07	88.87	89.07
5					95.87	89.87	91.57	90.37	89.57	89.07	88.87	89.07
6					95.87	89.87	91.67	90.27	89.57	89.07	88.87	89.07
7					94.37	89.87	92.02	90.27	89.57	89.07	88.97	89.07
8					93.97	89.87	92.02	90.27	89.57	89.07	88.97	89.07
9					93.32	89.77	91.82	90.17	89.57	89.17	88.97	89.07
10				90.52	93.12	89.77	91.72	90.17	89.57	89.17	89.07	
11				90.47	92.87	89.77	91.57	90.17	89.57	89.17	89.17	
12				90.32	92.42	89.77	91.47	90.17	89.47	89.17	89.17	
13				90.57	92.07	89.77	91.37	90.07	89.47	89.17	89.27	
14				92.87	91.57	89.77	91.32	90.07	89.47	89.27	89.37	
15				95.93	91.47	89.67	91.32	90.07	89.47	89.27	89.37	
16				98.19	91.72	89.67	91.32	90.07	89.47	89.37	89.37	
17				99.19	91.02	89.67	91.17	90.07	89.37	89.37	89.37	
18				99.59	90.82	89.77	91.17	89.97	89.37	89.37	89.37	
19				99.19	90.57	89.77	91.07	89.97	89.37	89.47	89.27	
20				99.93	90.47	89.67	91.07	89.97	89.37	89.47	89.27	
21				100.67	90.37	89.67	91.07	89.97	89.37	89.47	89.27	
22				101.11	90.37	89.67	91.17	89.97	89.37	89.47	89.17	
23				101.35	90.32	89.87	90.97	89.97	89.27	89.57	89.17	
24				101.54	90.27	89.87	90.87	89.97	89.29	89.47	89.17	
25				101.62	90.27	89.87	90.87	89.87	89.29	89.47	89.17	
26				101.48	90.27	89.97	90.87	89.87	89.29	89.37	89.07	
27				101.23	90.22	90.07	90.77	89.77	89.29	89.37	89.07	
28				100.70	90.17	90.27	90.77	89.77	89.28	89.17	89.07	
29				100.22	90.17	90.47	90.77	89.77	89.28	89.07	89.07	
30				99.42	90.12	90.57	90.67	89.77	89.28	89.07	89.07	
31				90.07			90.67	89.77		89.07		

Level reduced to M.H.S. Station datum (assumed).
Free of ice April 17. Frozen over November 10.

MORRIS RIVER AT ROSENORT (GAUGING STATION).

History.—The station was established by A. Pirie on May 13, 1915, and has been in operation during the open water seasons since that date.

Location.—A vertical staff gauge is secured to a pile of the traffic bridge at Rosenort, nine miles northwest of Morris.

Records Available.—From May 13 to November 12, 1915, and from April 9 to November 9, 1916, continuous records of daily gauge height are available.

*Mean Daily Gauge Height, in Feet, of Morris River at Rosenort for 1915
and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						84 62	88 46	88 29	87 79	87 72	88 44	
2						84 54	88 48	88 28	87 79	87 72	88 44	
3						84 52	88 51	88 27	87 78	87 72	88 45	
4						84 49	88 61	88 26	87 77	87 71	88 46	
5						84 68	88 61	88 25	87 76	87 71	88 45	
6						84 69	88 62	88 22	87 73	87 71	88 44	
7						84 51	88 61	88 21	87 72	87 71	88 46	
8						84 61	88 60	88 20	87 70	87 71	88 50	
9						84 62	88 60	88 18	87 69	87 71	88 58	
10						85 14	88 66	88 15	87 67	87 71	88 59	
11						1 43	88 66	88 14	87 66	87 70	88 57	
12						84 85	88 64	88 14	87 63	87 70	88 55	
13					85 39	86 22	88 63	88 13	87 63	87 69		
14					85 38	86 53	88 61	88 12	87 63	87 68		
15					85 37	86 83	88 59	88 10	87 63	87 66		
16					85 36	87 12	88 55	88 10	87 62	87 65		
17					85 36	87 38	88 54	88 07	87 62	87 65		
18					85 46	87 64	88 55	88 05	87 61	87 65		
19					85 46	88 04	88 58	88 02	87 59	87 65		
20					85 46	88 15	88 59	88 01	87 55	87 65		
21					85 81	88 56	88 57	88 00	87 55	87 66		
22					85 56	88 63	88 54	87 99	87 54	87 69		
23					85 48	88 66	88 55	87 96	87 54	87 69		
24					85 13	88 68	88 53	87 91	87 56	87 78		
25					85 11	89 08	88 49	87 89	87 63	87 88		
26					85 10	88 69	88 16	87 87	87 68	88 03		
27					81 00	88 69	88 14	87 85	87 70	88 15		
28					81 82	88 68	88 11	87 84	87 71	88 26		
29					81 65	88 68	88 39	87 82	87 71	88 38		
30					84 61	88 49	88 36	87 81	87 72	88 43		
31					81 64		88 31	87 80		88 44		

1916

1					102 73	86 16	86 74	88 07	88 24	88 12	88 61	
2					102 27	86 12	86 76	88 01	88 24	88 11	88 60	
3					101 85	86 08	86 00	88 06	88 25	88 10	88 61	
4					101 27	86 05	87 46	88 05	88 32	88 11	88 77	
5					100 80	86 06	87 74	88 02	88 42	88 10	88 78	
6					100 34	86 12	87 58	88 05	88 47	88 10		
7					99 68	86 08	87 54	88 88	88 52	88 09	88 74	
8					98 66	86 03	87 32	88 65	88 55	88 08	88 67	
9					88 92	86 05	86 00	87 06	88 56	88 53	88 62	
10					88 92	96 59	86 03	86 87	88 48	88 57	88 58	
11					80 00	91 82	86 21	86 83	88 51	88 55		
12					80 22	94 12	86 24	86 70	88 63	88 56		
13					90 79	92 77	86 21	86 59	88 74	88 54		
14					91 76	91 18	86 16	86 42	89 02	88 42		
15					97 92	90 02	86 11	86 34	89 50	88 33		
16					103 97	88 06	86 10	86 27	89 05	88 28		
17					106 07	87 42	86 11	86 23	88 87	88 24		
18					106 67	87 08	86 09	86 14	88 80	88 48		
19					106 41	86 63	86 08	86 11	88 77	88 76		
20					106 07	86 41	86 08	86 13	88 70	88 53		
21					105 67	86 25	86 11	86 11	88 67	88 33		
22					105 22	86 24	86 11	86 06	88 65	88 31		
23					104 75	86 24	86 25	85 98	88 62	88 28		
24					104 32	86 18	86 18	85 93	88 57	88 26		
25					103 94	86 14	86 16	86 07	88 55	88 31		
26					103 80	86 21	86 15	86 83	88 43	88 24		
27					103 60	86 32	86 23	87 87	88 34	88 21		
28					103 32	86 23	86 03	88 69	88 27	88 19		
29					102 92	86 17	86 72	89 07	88 25	88 17		
30					102 58	86 14	86 83	89 11	88 25	88 14		
31					86 26		89 10	89 21		88 64		

Levels reduced to M.H.S. Station datum (assumed).
Free of ice April 9. Frozen over November 10.

MOSSY RIVER, CAMERON BRIDGE (GAUGING STATION).

History.—The station was established by E. Bankson on May 21, 1913, with the intention of operating it as a metering station. A more favorable section was shortly afterwards located on the river and this station was discontinued.

Location.—A vertical staff gauge was secured to a pile on the traffic bridge at Cameron's farm about three miles southeast of the town of Fork river.

Records Available.—Gauge readings were obtained at this station between May 22 and 31 of 1913. These are given below, reduced to M.H.S. datum (assumed).

Day	22	24	25	26	27	29	30	31
Gauge Height.....	95 44	95 44	95 44	95 34	95 44	95 14	95 34	95 24

PEMBINA RIVER NEAR KILLARNEY (GAUGING STATION).

History.—The station was established by M. S. Madden on April 26, 1915.

Location.—A vertical staff gauge was located on the downstream side of a traffic bridge at Sec. 34, Tp.3, R. 17, W.P.M., three miles north of the town of Killarney.

Records Available.—From April 26 to November 13, 1915, and from May 1 to June 24, 1916, continuous records of daily gauge height are available.

Mean Daily Gauge Height, in Feet, of Pembina River Near Killarney for 1915 and 1916.

and 1910.
1916

1915												1916
Day.			April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	May.	June.
1				89 77	89 56	89 53	89 59	89 44	89 61	89 60	91 31	89 93
2				89 75	89 56	89 52	89 58	89 43	89 60	89 59	91 25	89 91
3				89 73	89 55	89 52	89 56	89 43	89 60	89 59	90 97	89 88
4				89 69	89 55	89 55	89 54	89 42	89 59	89 58	90 80	89 85
5				89 68	89 56	89 53	89 52	89 42	89 59	89 57	90 76	89 79
6				89 67	89 56	89 52	89 49	89 51	89 60	89 56	90 73	89 79
7				89 66	89 55	89 50	89 46	89 53	89 61	89 56	90 71	89 76
8				89 66	89 56	89 49	89 46	89 58	89 62	89 58	90 67	89 75
9				89 66	89 58	89 49	89 45	89 57	89 61	89 59	90 61	89 71
10				89 65	89 59	89 49	89 47	89 57	89 60	89 60	90 57	89 68
11				89 65	89 60	89 50	89 44	89 56	89 60	89 60	90 53	89 68
12				89 65	89 58	89 50	89 55	89 56	89 59	89 60	90 50	89 67
13				89 64	89 57	89 49	89 53	89 57	89 59	89 60	90 47	89 67
14				89 64	89 57	89 48	89 52	89 58	89 58		90 45	89 67
15				89 64	89 56	89 47	89 51	89 57	89 58		90 36	89 66
16				89 75	89 56	89 46	89 50	89 57	89 57		90 27	89 64
17				89 73	89 57	89 47	89 49	89 56	89 57		89 96	89 61
18				89 72	89 56	89 48	89 48	89 56	89 58		89 93	89 60
19				89 81	89 55	89 49	89 48	89 56	89 59		89 89	89 59
20				89 84	89 57	89 48	89 47	89 58	89 60		89 87	89 58
21				89 81	89 56	89 47	89 47	89 58	89 60		89 85	89 58
22				89 77	89 56	89 46	89 47	89 57	89 60		89 87	89 61
23				89 72	89 53	89 45	89 47	89 57	89 59		89 89	89 63
24				89 70	89 56	89 48	89 47	89 58	89 59		89 91	89 64
25				89 66	89 57	89 47	89 46	89 59	89 60		89 94	
26			89 83	89 65	89 58	89 47	89 46	89 60	89 61		89 97	
27			89 84	89 65	89 60	89 46	89 45	89 61	89 62		89 99	
28			89 84	89 65	89 56	89 46	89 45	89 62	89 63		90 00	
29			89 83	89 65	89 55	89 45	89 45	89 63	89 62		90 01	
30			89 79	89 61	89 54	89 65	89 44	89 62	89 61		89 99	
31				89 58		89 61	89 44		89 61		89 96	

Levels reduced to M.H.S. Station datum (assumed).

PEMBINA RIVER AT LA RIVIERE (GAUGING STATION).

History.—A station was established at this point by W. G. Worden on October 3, 1912, but was discontinued in March of the following year. On April 28, 1915 another station was established by M. S. Madden. This station was in operation throughout the open water season of 1915.

Location.—The original station was located at a traffic bridge across the river in the town of La Riviere.

The latter station was established further downstream and a vertical staff gauge was secured to the downstream side of a dam built by the Canadian Pacific Railway Company in the town.

Records Available.—At the original station gauge readings were obtained covering short periods during the winter of 1912 and 1913.

After the latter station was established, a continuous record of daily gauge height was obtained from April 28 to November 21, 1915. A different elevation was assumed for the gauge zero for these records. No co-relation has been obtained between the datum used in 1912-13 and that used in 1915.

*Mean Daily Gauge Height, in Feet, of Pembina River at La Riviere
for 1912 and 1913 and 1915.*

	1912			1913			1915					
Day.	Oct.	Nov.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
June.	1	101.00		102.70		91.90	91.29	91.38	91.28	91.40	91.41	91.44
	2	100.90				91.67	91.27	91.26	91.24	91.40	91.41	91.48
89.93	3	101.10				91.54	91.24	91.25	91.26	91.40	91.43	91.50
89.91	4	101.10				91.70	91.24	91.24	91.29	91.40	91.45	91.50
89.88	5	101.18				91.45	91.23	91.23	91.29	91.39	91.45	91.66
89.85	6	101.16				91.60	91.24	91.24	91.28	91.39	91.46	91.68
89.79	7	101.16				91.61	91.24	91.23	91.28	91.39	91.47	91.69
	8	101.16				91.61	91.29	91.23	91.29	91.39	91.47	91.71
89.79	9	101.16				91.65	91.31	91.23	91.33	91.39	91.48	91.72
89.76	10	101.15				91.66	91.47	91.24	91.33	91.39	91.48	91.73
89.75												
89.71	11	101.15				91.64	91.51	91.24	91.39	91.40	91.49	91.73
89.68	12					91.65	91.51	91.25	91.40	91.40	91.49	91.74
89.68	13					91.31	91.51	91.26	91.40	91.40	91.49	91.75
89.67	14					91.56	91.50	91.26	91.39	91.40	91.49	91.75
89.67	15					91.58	91.50	91.28	91.39	91.39	91.49	91.76
89.66	16											
89.64	17					91.61	91.50	91.30	91.39	91.39	91.48	91.76
89.61	18					91.43	91.49	91.30	91.40	91.39	91.48	91.76
89.61	19					91.70	91.49	91.29	91.40	91.39	91.48	91.77
89.60	20				103.09	91.63	91.49	91.29	91.40	91.39	91.48	91.77
89.59						91.39	91.48	91.29	91.39	91.39	91.47	91.77
89.58	21											
	22				103.17	91.43	91.49	91.26	91.39	91.39	91.47	91.77
89.58	23				103.19	91.43	91.48	91.25	91.41	91.39	91.44	
89.61	24				103.17	91.45	91.49	91.24	91.41	91.39	91.44	
89.63	25				102.34	91.44	91.48	91.24	91.41	91.40	91.45	
89.61					102.72	91.45	91.41	91.24	91.40	91.40	91.45	
	26				103.01	91.43	91.40	91.23	91.40	91.40	91.45	
	27				103.18	91.41	91.40	91.23	91.40	91.41	91.44	
	28	101.15			103.20	91.41	91.41	91.24	91.40	91.41	91.44	
	29	101.15			103.21	91.36	91.36	91.26	91.40	91.41	91.44	
	30	101.10			91.83	91.35	91.41	91.26	91.40	91.41	91.44	
	31	101.09				91.33		91.29	91.40		91.44	

Levels reduced to M.H.S. Station datum (assumed).
Marked thus (b) interpolated.
Gates of dam closed July 2, 1915.

PIPESTONE CREEK AT CROMER (GAUGING STATION).

History.—The station was established by A. Pirie on August 24, 1912.

Location.—A vertical staff gauge is secured to a pile of the Canadian Northern Railway bridge a quarter of a mile east of the station at the town of Cromer.

Records Available.—During the year 1912, a continuous record of daily gauge height over a period from August 25 to October 26, is available.

Mean Daily Gauge Height, in Feet, of Pipestone Creek at Cromer for 1912.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1									101.56	101.79		
2									101.56	101.83		
3									101.57	101.88		
4									101.58	101.92		
5									101.58	101.93		
6									101.57	101.95		
7									101.56	101.94		
8									101.55	101.94		
9									101.54	101.93		
10									101.54	101.93		
11									101.53	101.93		
12									101.58	101.93		
13									101.62	101.89		
14									101.60	101.87		
15									101.58	101.85		
16									101.57	101.83		
17									101.55	101.82		
18									101.54	101.79		
19									101.56	101.78		
20									101.58	101.77		
21									101.62	101.75		
22									101.65	101.73		
23									101.68	101.73		
24									101.71	101.72		
25								101.51	101.74	101.72		
26								101.51	101.75	101.72		
27								101.51	101.74			
28								101.51	101.74			
29								101.55	101.75			
30								101.57	101.75			
31								101.56				

Levels reduced to M.H.S. Station datum (assumed).

SQUIRREL CREEK AT AUSTIN (GAUGING STATION).

History.—The station was established by A. Pirie on June 21, 1913, and was discontinued on August 18, 1914.

Location.—A vertical staff gauge was secured to a pile near the upstream side of the Canadian Pacific Railway bridge over Squirrel creek, two miles west of the town of Austin.

Records Available.—Continuous records of daily gauge height are available from June 21 to November 8, 1913, and from April 5 to August 9, 1914.

Mean Daily Gauge Height, in Feet, of Squirrel Creek near C.P.R. Bridge, Austin, for 1913 and 1914.

Day.	1913						1914					
	June.	July.	Aug.	Sept.	Oct.	Nov.	April.	May.	June.	July.	Aug.	
1		85.46	85.11	85.14	85.19	86.33		86.94	86.31	86.23	86.19	
2		85.43	85.09	85.14	85.17	86.33		86.80	86.24	86.23	86.23	
3		85.30	85.07	85.04	85.15	86.33		86.80	86.30	86.19	86.10	
4		85.39	85.07	85.04	85.14	86.33		86.84	86.30	86.19	86.18	
5		85.36	85.08	85.15	85.14	86.31	87.89	86.79	86.43	86.19	86.14	
6		85.34	85.11	85.15	85.15	86.31	87.91	86.79	86.44	86.19	86.14	
7		85.33	85.13	85.14	85.16	86.29	87.91	86.74	86.49	86.19	86.14	
8		85.32	85.14	85.04	85.19	86.29	87.94	86.73	86.49	86.19	86.19	
9		85.30	85.14	85.04	85.21		87.99	86.69	86.44	86.19	86.18	
10		85.29	85.14	85.04	85.23		88.03	86.69	86.43	86.14		
11		85.27	85.14	85.04	85.29		88.17	86.64	86.39	86.14		
12		85.24	85.16	85.13	85.33		88.19	86.63	86.34	86.14		
13		85.24	85.16	85.11	86.39		88.23	86.54	86.34	86.14		
14		85.24	85.16	85.11	86.41		88.24	86.53	86.34	86.14		
15		85.24	85.39	85.11	86.41		88.29	86.49	86.34	86.14		
16		85.24	85.43	85.11	86.39		88.31	86.49	86.34	86.23		
17		85.25	85.45	85.11	86.43		88.31	86.49	86.34	86.23		
18		85.26	85.47	85.11	86.41		88.34	86.44	86.29	86.19		
19		85.27	85.49	85.11	86.41		88.39	86.44	86.24	86.14		
20		85.27	85.46	85.11	86.41		88.41	86.44	86.24	86.14		
21	85.23	85.25	85.44	85.11	86.41		88.34	86.43	86.24	86.14		
22	85.19	85.24	85.41	85.13	86.43		88.32	86.39	86.23	86.14		
23	85.19	85.23	85.39	85.13	86.43		88.29	86.39	86.19	86.19		
24	85.19	85.21	85.34	85.14	86.43		88.24	86.39	86.19	86.20		
25	85.19	85.21	85.31	85.16	86.43		88.23	86.34	86.19	86.21		
26	85.19	85.19	85.29	85.17	86.43		88.19	86.34	86.14	86.19		
27	85.19	85.18	85.24	85.17	86.43		88.14	86.34	86.14	86.18		
28	85.21	85.17	85.14	85.19	86.43		88.04	86.34	86.14	86.14		
29	85.79	85.17	85.14	85.19	86.40		87.04	86.34	86.14	86.14		
30	85.79	85.14	85.14	85.19	86.39		87.03	86.34	86.14	86.14		
31		85.13	85.14		86.35			86.34		86.14		

Levels reduced to M.H.S. Station datum (assumed).

WHITEMOUTH RIVER—HEAD OF FIRST FALLS (GAUGING STATION).

History.—The station was established on May 11, 1913, by S. C. O'Grady, during the course of operations on the Winnipeg River Power Surveys, and observations were carried on during the years 1913 and 1914.

Location.—A vertical staff gauge was secured to a post driven into the bed of the river on the left bank at a point a short distance above the first falls and about one-half mile above the point of junction between the Whitemouth and Winnipeg rivers.

Records Available.—Continuous records of daily gauge readings are available over periods from May 24 to October 30, 1913, and from May 12 to December 5, 1914.

Mean Daily Gauge Height, in Feet, of Whitemouth River at Head of First Falls for 1913.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						850.38	850.78	849.60	850.18	849.78		
2						850.38	850.63	849.63	850.06	849.78		
3						850.38	850.43	849.60	849.98	849.78		
4						850.38	850.33	849.40	849.88	849.78		
5						850.38	850.18	849.40	849.88	849.78		
6						850.38	850.18	849.28	849.78	849.88		
7						850.58	850.10	849.23	849.83	849.88		
8						850.68	850.00	849.18	849.88	849.88		
9						850.58	850.00	849.18	849.83	849.98		
10						850.58	849.90	849.18	849.73	849.98		
11						850.58	849.90	849.18	849.78	849.98		
12						850.58	850.40	849.28	849.78	849.98		
13						850.28	851.03	849.28	849.78	849.98	River frozen over Nov. 4	
14						850.28	851.18	849.40	849.78	850.08		
15						850.18	851.08	850.48	849.88	850.08		
16						850.18	850.98	851.18	849.88	849.98		
17						850.18	850.78	850.98	849.98	849.98		
18						850.08	850.68	850.78	849.98	849.98		
19						850.00	850.48	850.58	849.98	849.98		
20						849.90	850.38	850.48	850.08	849.98		
21					850.58	849.80	850.28	850.38	850.08	849.88		
22					850.58	849.70	850.28	850.68	850.08	849.88		
23					850.58	849.70	850.18	850.78	850.10	849.88		
24					850.58	849.60	850.18	850.58	850.13	849.78		
25					850.58	849.50	850.08	850.48	849.98	849.78		
26					850.48	849.50	850.00	850.38	849.98	849.78		
27					850.48	849.70	850.00	850.28	849.78	849.88		
28					850.48	849.70	849.88	850.28	849.78	849.98		
29					850.48	850.10	849.78	850.38	849.78	850.08		
30					850.48	850.48	849.73	850.38	849.78	850.08		
31					850.48		849.68	850.33		850.08		

Levels reduced to Water Power Survey datum.

WHITEMUD RIVER AT HOLMFIELD (GAUGING STATION).

History.—The station was established by M. S. Madden on April 26, 1915, and has been in operation since that date.

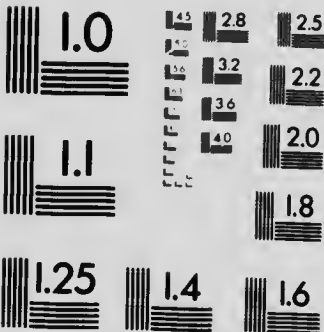
Location.—The gauge is secured to the downstream side of the north end of the traffic bridge which spans the Whitemud west of Sec. 22, Tp. 2, R. 16, W.P.M., and three miles west of the town of Holmfield.

Records Available.—Continuous records of daily gauge height are available for periods from April 26 to November 7, 1915, and from April 10 to November 11, 1916.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482-3300 Phone
(716) 288-5989 Fax

*Mean Daily Gauge Height, in Feet, of Whitemud River Near Holmfeld for 1915
and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					86.39	86.39	86.32	86.33	86.27	86.41	86.33	
2					86.39	86.39	86.33	86.33	86.36	86.41	86.32	
3					86.38	86.35	86.32	86.33	86.36	86.39	86.32	
4					86.38	86.36	86.30	86.32	86.36	86.37	86.31	
5					86.39	86.35	86.30	86.30	86.37	86.37	86.30	
6					86.34	86.36	86.30	86.29	86.29	86.38	86.29	
7					86.38	86.36	86.30	86.29	86.29	86.38	86.38	
8					86.38	86.36	86.29	86.29	86.42	86.38		
9					86.38	86.36	86.33	86.29	86.42	86.37		
10					86.37	86.36	86.35	86.28	86.42	86.36		
11					86.37	86.38	86.35	86.27	86.39	86.36		
12					86.37	86.37	86.32	86.29	86.38	86.36		
13					86.37	86.36	86.32	86.29	86.39	86.36		
14					86.36	86.35	86.32	86.29	86.40	86.35		
15					86.39	86.35	86.31	86.30	86.38	86.35		
16					86.49	86.36	86.31	86.30	86.38	86.34		
17					86.41	86.34	86.30	86.30	86.36	86.33		
18					86.43	86.34	86.33	86.30	86.36	86.33		
19					86.45	86.34	86.33	86.29	86.35	86.34		
20					86.44	86.36	86.32	86.30	86.35	86.34		
21					86.44	86.35	86.34	86.31	86.35	86.33		
22					86.46	86.36	86.35	86.30	86.34	86.33		
23					86.47	86.35	86.37	86.30	86.34	86.33		
24					86.46	86.34	86.36	86.30	86.41	86.35		
25					86.46	86.33	86.35	86.31	86.40	86.36		
26				86.47	86.43	86.36	86.36	86.30	86.31	86.35		
27				86.43	86.43	86.36	86.35	86.29	86.31	86.36		
28				86.43	86.43	86.35	86.34	86.29	86.33	86.36		
29				86.40	86.40	86.34	86.33	86.29	86.32	86.35		
30				86.39	86.39	86.33	86.33	86.29	86.31	86.34		
31					86.39		86.33	86.28		86.33		

1916

1					89.90	87.09	87.05	86.94	86.44	86.43	86.48	
2						87.10	87.06	86.80	86.43	86.44	86.48	
3					88.78	87.08	86.70	86.80	86.41	86.44	86.48	
4					88.75	87.05	86.68	86.85	86.41	86.46	86.48	
5					88.76	87.01	86.48	86.70	86.55	86.47	86.48	
6					88.80	87.03	86.48	86.70	86.71	86.45	86.48	
7					88.47	87.05	86.58	86.68	86.41	86.44	86.49	
8					88.25	87.05	86.68	86.62	86.42	86.43	86.49	
9					88.01	87.05	87.57	86.72	86.42	86.44	86.50	
10				93.18	87.82	87.05	87.56	86.68	86.42	86.44	86.51	
11				94.98	87.85	87.05	87.55	86.68	86.42	86.45		
12				95.03	87.56	87.05	87.54	86.69	86.42	86.45		
13				94.13	87.48	87.05	87.48	86.80	86.42	86.44		
14				94.63	87.37	87.05	87.38	86.80	86.42	86.45		
15				94.33	87.33	87.02	87.48	86.76	86.42	86.44		
16				94.08	86.50	87.00	87.58	86.73	86.42	86.46		
17				93.58	86.48	86.88	87.55	86.68	86.43	86.47		
18				93.18	87.25	86.85	87.56	86.63	86.42	86.46		
19				92.78	87.20	86.75	87.54	86.65	86.42	86.45		
20				92.28	87.18	86.71	87.52	86.60	86.43	86.44		
21				91.83	87.28	86.69	87.23	86.54	86.42	86.43		
22				91.38	87.26	86.68	87.23	86.51	86.41	86.43		
23				91.44	87.25	86.85	87.23	86.53	86.43	86.43		
24				91.43	87.28	87.02	87.18	86.50	86.43	86.44		
25				91.38	87.26	87.01	87.15	86.47	86.43	86.44		
26				91.18	87.28	87.00	87.15	86.47	86.43	86.45		
27				90.89	87.28	87.00	87.11	86.45	86.47	86.45		
28				89.90	87.27	87.08	87.08	86.45	86.46	86.48		
29				89.90	87.25	87.05	86.98	86.44	86.49	86.48		
30					87.20	87.04	86.94	86.45	86.45	86.48		
31					87.16		86.94	86.45		86.48		

Levels reduced to M.H.S. Station datum (assumed).
NOTE.—(1) Interpolated.

History.—The station was established by W. G. Worden on October 15, 1912, and was discontinued on November 10 of the same year.

Records Available.—A continuous record of daily gauge height is available from October 15 to November 10, 1912. This record is given below. Levels are reduced to M.H.S. datum (assumed).

OCTOBER.										NOVEMBER.			
Day	Gauge Height.	Day	Gauge Height.	Day	Gauge Height.	Day	Gauge Height.	Day	Gauge Height.	Day	Gauge Height.	Day	Gauge Height.
.....		16	101.48	21	101.56	26	101.56	31	102.55	1	101.84	6	101.77
.....		17	101.72	22	101.55	27	101.66	.....	.....	2	101.55	7	101.69
.....		18	102.34	23	101.31	28	102.50	.....	.....	3	101.55	8	101.96
.....		19	101.90	24	101.41	29	103.31	.....	.....	4	101.93	9	101.65
15	101.66	20	101.44	25	101.57	30	101.93	.....	.....	5	101.64	10	102.22

LAKE GAUGING STATIONS.

Gauging stations have been maintained on all of the important lakes, and in some cases a gauge has been placed at several points so that the records of mean lake level may be obtained. The names of the lakes with the localities of the gauges on each are as follows:—

Lake of the Woods (see Lake of Woods Outlets).
Ontario D.P.W. Lake gauge, Keewatin.
Automatic gauge, Kenora.

Lake Winnipeg.
Winnipeg Beach.
Fort Alexander (see Winnipeg river).
Berens river (see Berens river).
Grand Rapids (see Saskatchewan river).
Warren's Landing (see Nelson river).

Lake Manitoba.
Delta.
Oak Point.
Meadow Portage.

Lake Dauphin.
Mossy river (Outlet of lake Dauphin).

Lake Winnipegosis.
Winnipegosis.

Red Deer lake.
Barrows.

Family lake (see Berens river).
Little Grand Rapids.

Lac Seul.
Hudson's Bay Co. Post.

LAKE WINNIPEG AT WINNIPEG BEACH (GAUGING STATION).

History.—The station was established by G. H. Burnham on May 1, 1913, and has been in practically continuous operation since that date.

Location.—The gauge is secured to the planking near the outer end of the Canadian Pacific Railway dock at Winnipeg Beach.

Records Available.—Continuous records of daily gauge height are available over periods from May 1 to October 31, 1913, and from April 6, 1914 to December 31, 1916. Intermittent records of gauge height are also available over a period from November 1, 1913 to March 5, 1914.

SESSIONAL PAPER No. 26a

*Mean Daily Gauge Height, in Feet, of Lake Winnipeg at Winnipeg Beach for 1913
and 1914.*

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					714.06	714.19	714.78	714.69	713.89	714.49		
2					713.99	714.29	713.98	715.29	713.79	713.51		
3					713.89	714.14	715.29	714.74	713.69	713.69		713.14
4					713.86	714.64	714.40	714.89	713.89	715.19		
5					714.40	714.69	715.34	714.14	713.99	714.69		
6					713.71	715.29	714.24	713.89	715.19	714.29	714.14	
7					714.59	713.98	714.30	713.69	714.69	713.31	715.09	
8					714.17	714.15	715.29	714.79	714.19	713.40	714.92	
9					713.95	713.40	714.68	715.29	711.59	713.60		
10					713.71	713.17	713.09	714.09	714.01	714.41		
11					713.73	713.74	713.59	714.79	715.71	715.49		
12					714.94	715.04	714.49	714.19	714.79	715.99		
13					714.19	714.49	714.89	714.19	714.49	713.49		
14					713.92	714.34	714.39	715.69	712.89	714.81		
15					714.04	714.14	714.44	714.09	714.52	713.29		
16					714.27	715.39	714.69	713.89	713.40	712.80		713.29
17					714.73	714.09	714.64	715.24	713.29	714.99		
18					714.50	714.59	715.19	714.41	712.40			
19					713.81	714.49	715.49	714.07	715.59	715.49		713.64
20					713.89	714.69	714.04	714.39	716.49	714.49		
21					714.41	714.18	715.16	715.89	714.94	714.29		
22					713.94	713.99	715.69	714.29	712.79	714.39		713.54
23					714.79	714.29	714.89	713.99	714.49	714.44		
24					713.99	713.72	714.20	715.19	714.54	714.20		
25					713.51	714.19	714.04	714.97	714.29	714.01		
26					714.29	715.09	713.94	713.37	713.60	712.80		713.24
27					714.17	714.08	715.49	713.19	713.30	714.54		
28					714.19	713.84	713.49	715.84	714.49	714.34		
29					714.49	714.14	713.99	714.64	714.09	713.99		
30					714.00	715.19	714.99	714.49	714.39	713.79		713.24
31					714.59		714.69	713.29		714.19		

1914

1					712.98	713.01	713.58	713.58	713.78	711.98	712.88	712.68
2	713.38				712.88	712.98	712.86	713.48	714.08	712.98	711.38	712.58
3		713.18	712.88		712.68	712.78	713.08	713.48	712.98	713.38	712.28	712.38
4					712.68	712.98	713.18	713.21	713.53	713.18	712.98	714.18
5						712.98	712.78	712.93	713.58	713.78	712.13	712.78
6	713.28	712.98	712.98		712.88	713.08	712.88	712.28	715.38	713.58	712.88	712.38
7					712.98	713.18	713.12	714.28	713.48	713.15	712.77	713.88
8					712.88	713.08	712.98	712.78	712.26	712.18	712.63	712.28
9	713.28				712.68	712.98	713.28	713.33	713.56	711.78	713.18	712.48
10		712.98	712.98		712.98	712.98	712.93	713.38	714.58	712.82	712.88	712.78
11					712.68	713.26	713.48	713.48	713.38	712.38	714.18	714.18
12					712.88	715.06	713.48	713.88	713.38	711.98	713.08	712.48
13	712.98		712.68		712.58	712.98	713.37	713.48	714.68	709.78	712.83	713.78
14					712.88	713.38	713.33	713.38	713.98	711.38	710.85	711.58
15					712.78	713.28	713.43	712.80	712.98	711.58	713.02	712.48
16	713.38	712.98			712.68	712.88	712.92	713.58	713.48	713.38	711.38	714.98
17			712.98		712.78	712.86	713.08	714.78	713.78	713.04	713.12	713.48
18		712.98			713.08	712.80	714.08	713.23	713.58	712.28	711.68	713.48
19					712.78	713.17	713.28	713.28	713.38	712.38	712.96	712.60
20	713.28	712.88	712.78		712.78	713.17	712.63	713.68	713.58	713.23	711.58	712.38
21					712.88	712.90	713.58	712.58	713.48	713.98	713.22	713.48
22					712.68	713.38	712.83	713.58	713.68	715.38	712.53	712.69
23	713.28				712.78	713.40	712.86	712.96	713.49	712.66	712.68	712.00
24		712.88	712.98		712.78	713.17	713.78	713.67	712.98	713.88	712.88	712.38
25					712.88	712.78	713.68	713.28	713.38	711.68	713.43	712.58
26					712.78	712.58	713.48	713.53	713.38	712.88	712.41	712.98
27	713.28	712.68	712.68		712.98	713.36	713.58	713.38	712.98	712.28	712.93	712.46
28					713.08	713.07	713.36	713.28	712.18	712.48	713.23	712.36
29					712.98	712.68	713.38	712.98	713.28	711.98	711.98	712.46
30	713.08				712.88	713.10	713.16	713.58	712.98	711.68	711.58	712.58
31			712.68			712.98		713.88	713.38		712.76	

Levels reduced to Mean Sea Level datum, New York, N.Y., U.S.A.

*Mean Daily Gauge Height, in Feet, of Lake Winnipeg at Winnipeg Beach for 1915
and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	712.48	712.28	712.26	712.08	712.38	712.03	712.78	713.18	712.08	712.68	713.88	712.68
2	712.18	712.08	712.15	711.98	712.38	712.03	712.58	712.88	712.88	713.08	713.38	712.58
3	712.28	712.18	712.08	711.97	712.38	712.38	713.38	712.63	713.88	713.78	712.88	712.38
4	712.28	712.48	712.20	712.08	712.28	711.83	713.38	712.58	712.78	713.98	711.48	712.68
5	712.18	712.38	712.20	712.08	713.98	712.18	712.28	712.38	712.18	712.38	712.68	712.58
6	712.28	712.21	712.25	711.98	712.78	712.08	712.63	712.58	713.18	714.68	713.78	712.68
7	712.38	712.18	712.15	711.98	712.78	713.38	712.18	713.08	712.91	714.38	713.78	712.78
8	712.38	712.24	712.15	711.98	713.78	712.48	712.18	712.78	713.78	713.78	715.38	712.68
9	712.38	712.08	712.20	711.88	711.98	711.98	711.98	712.78	712.92	711.38	713.88	712.58
10	712.20	712.28	712.18	712.10	712.18	711.88	711.88	712.58	713.78	712.68	711.98	712.68
11	712.23	712.35	712.08	712.18	712.18	711.98	712.08	712.58	713.08	713.18	712.58	712.08
12	712.38	712.16	712.06	712.18	712.78	713.18	712.38	712.58	712.68	712.58	713.58	712.58
13	712.48	712.18	712.18	711.92	712.28	712.38	713.58	712.78	713.28	712.98	714.48	712.68
14	712.28	712.47	712.18	711.93	712.48	713.58	713.38	712.93	713.78	712.98	712.98	712.48
15	712.38	712.28	712.18	712.18	712.48	713.78	712.18	712.58	712.48	712.18	712.68	712.58
16	712.18	712.18	712.08	711.88	713.38	712.28	713.58	713.28	713.38	712.48	712.88	712.58
17	712.28	712.08	712.20	711.88	712.68	711.68	712.28	712.38	712.38	712.78	711.88	712.58
18	712.23	712.18	712.28	712.06	712.28	712.78	712.58	712.38	713.38	712.88	711.68	712.62
19	712.38	712.31	712.18	712.08	712.23	711.03	712.98	712.58	714.03	711.38	713.48	712.58
20	712.38	712.08	712.20	712.08	712.18	711.58	712.88	713.38	713.78	712.38	712.98	712.58
21	712.28	712.22	712.03	712.08	712.28	712.98	712.48	712.78	713.48	713.38	713.38	712.58
22	712.28	712.28	712.08	712.58	711.88	712.08	713.38	712.78	712.38	712.68	712.48	712.58
23	712.28	712.17	711.88	712.28	712.28	712.88	712.98	714.43	713.98	712.48	712.68	712.58
24	712.18	712.18	712.18	712.38	712.68	711.98	712.88	713.38	712.78	712.58	712.88	712.58
25	712.23	712.28	712.08	712.38	712.38	712.48	712.68	714.98	712.58	714.08	712.88	712.60
26	712.28	712.23	711.88	712.08	711.98	711.78	712.58	712.38	713.38	714.48	712.58	712.58
27	712.18	712.18	712.18	712.07	711.83	712.08	712.48	711.68	712.38	711.68	712.68	712.58
28	712.28	712.08	712.18	712.68	711.93	712.78	712.63	714.18	713.08	713.68	712.88	712.66
29	712.28	712.08	712.08	712.08	712.58	712.28	711.98	713.38	712.78	712.28	713.18	712.64
30	712.18	712.08	712.08	712.58	712.08	711.58	713.38	712.38	712.68	712.88	712.68	712.62
31	712.38	712.08	712.12	712.08	712.08	712.08	712.68	712.78	712.78	711.88	712.68	712.58

1916

1	712.58	712.10	712.18	712.28	712.58	715.18	711.38	714.38	716.08	715.88	714.38	715.08
2	712.54	712.14	712.13	712.18	713.18	713.48	714.48	715.98	714.98	717.58	714.68	715.18
3	712.53	712.14	712.13	712.28	712.38	714.88	714.38	714.98	714.98	715.98	714.28	715.08
4	712.52	712.15	712.12	712.28	712.78	714.18	714.28	715.48	715.08	715.38	714.08	714.98
5	712.51	712.18	712.14	712.18	712.58	713.18	714.08	714.98	713.88	715.08	714.18	714.88
6	712.51	712.24	712.18	712.18	712.78	713.78	714.68	715.58	714.88	715.18	713.88	714.98
7	712.50	712.36	712.21	711.98	713.38	713.38	714.98	715.18	715.08	716.58	715.28	715.98
8	712.50	712.35	712.28	711.98	713.08	714.18	714.18	714.98	715.28	715.28	715.28	715.18
9	712.51	712.33	712.31	712.18	712.88	713.68	714.58	714.38	714.78	715.58	715.68	715.08
10	712.52	712.33	712.32	712.28	712.98	714.68	713.88	714.58	716.38	714.18	714.98	715.08
11	712.31	712.33	712.33	712.18	713.38	713.98	714.68	716.58	713.98	714.98	716.18	715.18
12	712.28	712.33	712.33	712.18	712.88	713.58	714.38	715.68	714.88	717.18	715.58	715.28
13	712.28	712.32	712.33	712.38	713.18	714.38	714.68	714.98	715.08	715.38	714.98	715.08
14	712.28	712.32	712.31	712.38	713.18	714.18	714.58	715.38	717.98	716.98	715.38	714.98
15	712.26	712.31	712.28	712.28	714.38	715.38	715.28	715.68	716.68	715.38	714.68	715.08
16	712.27	712.31	712.28	712.28	714.18	714.58	714.58	715.18	716.98	715.08	715.68	715.08
17	712.26	712.32	712.18	712.28	713.28	714.98	714.38	715.18	716.08	715.08	715.28	715.03
18	712.26	712.32	712.23	712.38	713.78	714.78	714.58	715.18	714.68	716.38	714.38	714.98
19	712.26	712.34	712.18	712.38	713.08	714.58	714.58	715.08	714.58	715.48	714.98	714.98
20	712.26	712.35	712.14	712.48	713.18	714.28	714.38	715.38	715.68	715.28	715.28	714.98
21	712.26	712.35	712.12	712.48	713.38	714.48	715.58	715.58	717.88	715.48	714.68	714.93
22	712.26	712.38	712.08	712.48	713.68	714.68	714.68	715.28	716.88	715.18	714.78	714.94
23	712.25	712.38	712.13	712.38	713.68	714.38	713.78	716.08	715.08	715.08	716.58	714.88
24	712.24	712.28	712.12	712.58	714.38	715.58	714.58	716.78	715.98	714.48	715.58	714.88
25	712.24	712.26	712.12	712.68	713.98	714.68	715.18	716.38	715.38	716.48	715.08	714.81
26	712.22	712.23	712.13	712.58	713.08	715.08	714.78	715.78	715.88	716.08	715.18	714.88
27	712.23	712.23	712.12	712.38	712.88	714.38	714.78	715.48	717.58	715.48	714.58	714.98
28	712.18	712.21	712.08	712.38	713.88	714.58	714.68	715.98	716.58	715.18	714.88	714.98
29	712.14	712.18	712.10	713.28	714.18	714.18	714.28	715.98	716.58	715.08	716.18	714.88
30	712.11	712.16	712.08	713.78	714.28	715.08	715.08	716.08	714.98	714.88	715.38	714.88
31	712.11	712.18	712.18	713.38	713.38	714.88	714.88	716.58	714.38	714.38	714.38	714.78

Levels reduced to mean sea level datum, New York, N.Y., U.S.A.
Lake clear of ice at this point April 28.

LAKE MANITOBA—DELTA (GAUGING STATION).

History.—The station was established by C. O. Allen on July 9, 1914, and has been in practically continuous operation since that date.

Location.—A vertical staff gauge is secured to a pile of the breakwater a short distance south of the bridge across the canal at Delta.

Records Available.—From July 12 to November 4, 1914, and from December 7, 1914 to December 31, 1916 continuous records of daily gauge height are available.

Mean Daily Gauge Height, in Feet, of Lake Manitoba at Delta for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								96 74	96 44	96 04	96 14	
2								96 64	97 24	96 34	96 24	
3								96 84	96 74	96 24	96 44	
4								96 54	96 44	96 24	96 34	
5								97 14	96 54	96 24	96 24	
6								96 54	96 44	96 34	96 34	
7								96 24	96 24	96 44	96 34	96 27
8								96 04	96 14	96 44	96 24	96 27
9								97 34	96 14	96 54	96 24	96 27
10								96 64	96 14	97 34	96 34	96 27
11								96 24	96 04	97 04	96 24	96 27
12							97 44	96 74	95 84	96 64	96 44	96 27
13							97 04	96 94	95 64	96 44	95 44	96 27
14							96 84	96 54	95 34	96 34	96 34	96 27
15							96 94	96 44	95 24	96 24		96 27
16							97 74	96 44	95 94	96 14		96 27
17							96 84	96 64	95 84	96 04		96 17
18							97 14	96 74	95 94	96 14		96 27
19							97 04	96 44	96 04	96 14		96 27
20							96 84	96 54	96 34	96 14		96 17
21							96 74	96 44	96 94	96 44		96 27
22							96 74	96 04	96 54	96 74		96 27
23							96 84	96 74	97 04	96 34		96 17
24							96 64	96 84	96 34	96 14		96 27
25							96 64	96 74	96 24	97 34		96 17
26							96 84	96 44	96 14	96 44		96 27
27							96 54	96 14	96 04	96 44		96 17
28							96 54	97 24	96 14	96 34		96 17
29							96 44	96 24	95 94	96 24		96 27
30							96 74	97 11	96 04	96 14		96 27
31							96 34	96 24		96 34		96 17

Levels reduced to M.H.S. Station datum (assumed).

*Mean Daily Gauge Height, in Feet, of Lake Manitoba at Delta for 1915
and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	96.27	96.09	96.02	95.87	96.07	95.67	95.76	95.72	95.47	95.57	95.53	95.36
2	96.17	96.08	95.97	95.82	96.07	95.67	95.77	95.77	95.67	95.56	95.47	95.37
3	96.27	96.08	95.97	95.82	96.07	95.72	96.41	95.76	95.57	95.72	95.39	95.36
4	96.27	96.11	95.97	95.82	96.07	95.67	96.42	95.82	95.41	95.57	95.46	95.35
5	96.17	96.11	95.97	95.87	96.27	96.47	96.05	95.87	95.57	95.67	95.37	95.35
6	96.17	96.08	95.97	95.87	96.27	96.57	95.86	95.92	95.47	96.51	95.32	95.35
7	96.17	96.08	95.97	95.87	96.27	96.67	95.77	95.77	95.57	96.57	97.37	95.37
8	96.17	96.09	95.92	95.87	96.47	96.07	95.72	95.67	95.67	96.02	96.07	96.37
9	96.17	96.09	95.92	95.87	96.27	95.97	95.62	95.67	95.67	95.87	95.87	95.35
10	96.17	96.11	95.92	95.87	96.07	95.97	95.66	95.57	95.62	95.97	95.51	95.37
11	96.17	96.07	95.92	95.87	96.27	95.97	95.67	95.56	95.72	95.47	95.97	95.36
12	96.17	96.07	95.92	95.77	96.02	96.17	96.02	95.71	95.67	95.62	95.42	95.37
13	96.17	96.07	95.97	95.77	96.22	95.87	95.76	95.41	95.67	95.47	95.82	95.37
14	96.17	96.11	95.97	95.77	96.17	96.07	95.77	95.67	95.67	95.42	95.81	95.37
15	96.17	96.07	95.92	95.87	96.27	96.37	95.82	95.67	95.57	95.37	95.71	95.37
16	96.17	96.02	95.87	95.82	96.47	96.06	96.82	95.67	95.47	95.27	95.67	95.37
17	96.17	96.02	95.97	95.92	96.17	95.97	95.82	95.62	95.57	95.27	95.67	95.38
18	96.17	96.07	95.97	95.92	96.12	96.02	95.77	95.42	95.47	95.22	95.97	95.37
19	96.17	96.07	96.02	95.92	96.02	95.87	95.62	95.37	95.67	95.37	95.87	95.37
20	96.17	96.02	95.97	95.87	95.92	95.72	95.47	95.57	95.76	95.32	95.97	95.37
21	96.17	96.02	95.92	95.87	95.87	96.02	95.42	95.77	95.72	95.37	95.87	95.38
22	96.17	96.02	95.92	96.07	95.82	95.91	96.17	95.47	95.67	95.42	95.62	95.37
23	96.17	96.02	95.92	96.07	95.97	95.87	96.02	96.77	95.77	95.37	95.37	95.37
24	96.17	95.97	95.97	96.07	96.37	95.77	95.91	96.62	95.61	95.39	95.41	95.35
25	96.17	95.97	95.92	95.87	96.07	95.87	95.77	95.77	95.87	97.02	95.37	95.40
26	96.07	95.97	95.87	95.87	95.77	95.67	95.72	95.62	95.67	95.37	95.36	95.38
27	96.07	95.97	95.87	95.87	95.57	95.77	95.76	95.47	95.72	95.42	95.39	95.38
28	96.11	95.97	95.87	96.07	95.57	95.76	95.77	95.77	95.47	95.47	95.42	95.41
29	96.10	.....	95.87	96.07	95.72	95.67	95.82	95.57	95.62	95.51	95.37	95.42
30	96.09	.....	95.87	96.07	95.77	96.12	95.76	95.47	95.47	95.56	95.37	95.38
31	96.11	.....	95.87	.....	95.77	.....	95.87	95.47	.....	95.42	.....	95.39

1916

1	95.38	95.37	95.37	95.30	95.33	95.77	95.17	95.57	95.37	95.61	95.29	95.49
2	95.37	95.37	95.37	95.30	95.37	95.47	95.29	95.56	95.47	96.01	95.37	95.57
3	95.37	95.37	95.37	95.30	95.31	95.57	95.37	96.33	95.49	95.92	95.45	95.57
4	95.41	95.37	95.37	95.28	95.42	96.92	95.32	95.72	95.37	95.98	95.27	95.55
5	95.38	95.37	95.30	95.29	95.43	95.82	95.27	95.77	95.32	95.37	95.97	95.54
6	95.39	95.37	95.39	95.27	95.45	95.51	95.73	96.97	95.27	95.17	95.27	95.51
7	95.41	95.36	95.37	95.27	96.57	95.27	95.46	95.62	95.25	95.84	95.21	95.65
8	95.37	95.37	95.37	95.24	95.35	95.46	95.32	95.70	95.23	95.87	95.13	95.55
9	95.41	95.37	95.37	95.27	95.39	95.17	95.27	95.67	95.06	95.39	96.07	95.57
10	95.41	95.37	95.36	95.27	95.39	95.27	95.09	95.61	94.87	95.33	95.77	95.62
11	95.41	95.39	95.37	95.26	95.83	95.42	95.16	95.66	95.21	95.37	95.72	95.65
12	95.41	95.37	95.37	95.22	95.07	95.37	95.17	95.50	95.27	95.28	95.86	95.66
13	95.39	95.36	95.37	95.29	95.65	95.43	95.06	95.66	96.17	95.15	95.85	95.61
14	95.37	95.37	95.36	95.30	95.57	95.55	95.23	95.55	96.57	95.17	95.82	95.57
15	95.37	95.36	95.36	95.37	95.87	95.39	95.17	95.67	96.43	95.26	95.67	95.45
16	95.37	95.37	95.36	95.39	96.02	95.36	95.27	95.06	96.29	95.17	95.69	95.55
17	95.37	95.37	95.34	95.42	96.22	95.61	95.21	95.64	95.51	95.29	95.62	95.58
18	95.36	95.37	95.36	95.51	95.77	95.57	95.34	95.90	95.43	95.06	95.53	95.59
19	95.36	95.37	95.36	95.52	95.57	95.17	95.66	95.51	95.37	95.77	95.57	95.57
20	95.37	95.37	95.32	95.49	95.87	95.39	95.50	95.70	95.87	95.47	95.55	95.55
21	95.37	95.37	95.36	95.57	96.37	95.31	95.42	95.49	97.39	95.73	95.53	95.57
22	95.35	95.37	95.32	95.45	96.41	95.37	95.36	95.37	95.99	96.17	95.62	95.47
23	95.37	95.39	95.33	95.41	96.73	96.37	96.70	95.53	95.06	95.07	95.99	95.51
24	95.37	95.37	95.37	95.49	96.62	95.32	95.87	95.62	95.71	95.83	95.57	95.57
25	95.37	95.39	95.36	95.37	96.56	95.23	95.69	95.76	95.49	95.49	95.47	95.55
26	95.42	95.37	95.32	95.27	96.22	95.42	95.37	95.64	95.54	94.99	95.62	95.58
27	95.39	95.37	95.29	95.34	96.26	95.31	95.39	95.34	95.86	94.30	95.53	95.56
28	95.37	95.37	95.32	95.41	96.67	95.23	96.23	96.13	95.67	94.57	95.51	95.61
29	95.37	95.37	95.32	95.39	96.59	95.27	95.73	95.94	95.54	94.31	95.55	95.57
30	95.39	.....	95.31	95.37	96.53	95.22	95.35	95.41	94.56	94.35	95.51	95.56
31	95.37	.....	95.27	.....	96.57	.....	95.39	95.57	.....	94.17	.....	95.57

Free of ice April 22.
Levels reduced to M.H.S. Station datum (assumed).

SESSIONAL PAPER No. 256

LAKE MANITOBA—OAK POINT (GAUGING STATION).

History.—The station was established by C. O. Allen on August 13, 1913, and was discontinued on April 25, 1914.

Location.—A vertical staff gauge was located six hundred feet southwest of the Canadian Northern station at Oak Point.

Records Available.—Continuous records of daily gauge height from August 19 to October 25, 1913, and from April 2 to April 25, 1914 are available.

Mean Daily Gauge Height, in Feet, of Lake Manitoba at Oak Point for 1913 and 1914.

1913 .									1914			
Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	April.	May.
1									97.17	97.27		
2									97.07	97.27	96.87	
3									96.97	97.07	96.87	
4									97.02	96.97	96.87	
5									97.07	97.17	95.87	
6									97.07	97.27	96.87	
7									96.97	97.27	96.87	
8									97.17	97.24	96.87	
9									97.17	96.97	96.87	
10									97.27	97.07	96.87	
11									97.27	97.17	96.87	
12									97.27	97.07	95.87	
13								96.97	97.07	96.77	96.87	
14								96.87	97.22	96.97	96.87	
15								97.02	96.67	96.97	96.77	
16								97.07	97.07	97.12	96.87	
17								96.97	97.17	97.32	96.87	
18								96.97	97.17	97.17	96.17	
19								96.90	96.97	97.07	96.07	
20								97.27	97.07	96.97	96.07	
21								97.07	97.07	96.97	96.07	
22								97.12	97.12	96.87	95.97	
23								97.07	97.07	96.97	95.77	
24								97.17	96.97	96.97	95.77	
25								97.12	96.97	96.87	95.87	
26								97.17	96.77			
27								97.07	96.87			
28								97.17	96.67			
29								97.02	96.97			
30								97.07	96.92			
31								97.17				

Levels reduced to M.H.S. Station datum (assumed).

LAKE MANITOHA. MEADOW PORTAGE. (GAUGING STATION).

History.—The station was established by T. J. Moore on August 27, 1913, but owing to difficulty in obtaining a gauge reader, few records have been obtained.

Location.—The gauge is located on N.W. ¼ Sec. 31, Tp. 31, R. 15, W.P.M.

Records Available.—Records of daily gauge height were obtained on this gauge from August 27 to September 27, 1913, on October 5 and 6 of the same year.

Mean Daily Gauge Height, in Feet, of Lake Manitoba at Meadow Portage for 1913.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1									812 08			
2									812 28			
3									812 48			
4									812 48			
5									811 93	811 58		
6									811 91	811 68		
7									812 88			
8									812 08			
9									812 18			
10									812 28			
11									811 78			
12									812 08			
13									812 18			
14									812 78			
15									812 18			
16									812 98			
17									811 98			
18									812 28			
19									811 78			
20									811 18			
21									811 28			
22									812 08			
23									811 98			
24									811 78			
25									811 68			
26									811 78			
27								811 90	811 78			
28								810 95				
29								811 88				
30								812 08				
31								812 08				

Levels reduced to M.H.S. datum (approximate sea level).

LAKE WINNIPEGOSIS AT WINNIPEGOSIS (GAUGING STATION).

History.—The station was established by E. Bankson on May 22, 1913, and has been in operation since that date.

Location.—A vertical staff gauge is secured to a pile thirty feet north of Standard Lumber Company's wharf on lake Winnipegosis at the town of Winnipegosis.

Records Available.—From May 22, 1913 to November 30, 1916 practically continuous records of daily gauge height for open water seasons are available, together with occasional gauge readings during the winter seasons.

SESSIONAL PAPER No. 26

*Mean Daily Gauge Height, in Feet, of Lake Winnipegosis at Winnipegosis for 1913
and 1914.*

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						831 05	830 57	831 29	831 09	830 76		830 09
2						831 08	830 55	831 45	831 02	830 86		
3						830 97	831 48	830 80	830 32	830 72	830 39	
4						830 98	831 05	831 41	830 84	831 07	829 85	
5						831 04	831 06	831 08	830 90	830 95	830 10	
6						830 90	831 07	830 67	831 03	830 25	830 45	
7						830 80	830 33	830 95	830 95	830 05	830 10	
8						830 60	832 00	831 17	830 15	830 31	830 10	830 13
9						830 44	830 78	831 21	830 24	830 46		
10						830 34	830 28	830 95	830 63	831 06	830 11	
11						830 90	830 88	831 28	831 40	831 27		
12						831 25	831 17	830 94	831 04	830 55		
13						831 03	830 81	831 00	829 65	830 37		
14						831 09	830 80	831 11	830 78	830 70		
15						831 03	831 08	830 93	830 67	830 39		830 05
16						830 00	831 21	831 30	830 87	829 45		
17						830 49	831 39	831 12	830 29	830 46	830 32	
18						831 05	831 53	830 99	830 50	831 21		
19						831 02	831 36	830 90	831 09	830 90		
20						830 87	831 27	830 68	831 20			
21						830 71	831 60	831 61	830 64			
22					830 80	830 74	832 25	831 08	829 96	829 79		
23					831 41	830 77	831 02	831 05	830 98	830 44		
24					830 02	830 95	830 89	830 67	831 15	830 20	830 12	
25					830 87	832 02	830 97	831 02	830 59	831 30		
26					830 89	831 01	832 18	830 91	830 34	829 95		
27					831 17	830 89	830 69	830 80	830 47	832 58		
28					830 85	830 79	830 67	831 48	830 66			
29					831 20	830 99	830 96	830 86	830 37			
30					830 79	832 06	831 06	831 27	830 58			
31					831 01		831 39	831 16				

1914

1					829 56	829 81	829 26	829 44	829 26	828 34	827 61	
2					829 57	829 87	829 24	829 07	829 86	828 76	828 12	
3					829 53	829 76	829 51	829 18	828 71	829 11	828 71	
4					829 54	829 58	829 00	828 81	828 66	829 31	828 06	
5					829 85	829 01	828 75	829 87	829 28	828 31	828 07	
6					829 86	829 84	830 81	829 25	828 95	828 47	828 30	
7					829 76	829 63	828 86	827 86	828 76	828 31	828 27	
8					829 71	829 58	829 11	828 96	828 59	828 46	828 24	
9					830 01	829 57	829 56	829 26	827 86	828 90	828 26	
10					829 87	829 87	829 57	828 87	828 47	829 26	829 26	
11					829 84	829 37	829 56	828 81	828 51	829 38	828 08	
12					829 79	829 78	829 37	829 25	828 48	828 88	828 04	
13					829 89	829 66	829 46	829 87	827 76	827 86	829 46	
14					829 78	830 01	828 87	829 06	827 84	828 21	829 30	
15					829 71	829 38	829 18	828 95	828 32	828 17	829 28	
16					829 48	829 41	829 60	830 87	828 96	828 43	828 16	
17					829 54	829 66	830 41	828 98	829 26	827 90	827 86	
18					829 58	829 87	830 48	829 66	829 96	828 51	828 19	
19					829 57	829 94	828 71	829 55	828 74	828 36	828 26	
20					829 58	830 24	830 15	828 76	829 24	828 31	828 16	
21					829 56	830 01	829 47	829 31	828 76	829 19	828 68	
22					829 54	830 16	829 41	828 86	828 96	828 16	828 51	
23					829 03	829 71	829 45	829 22	829 26	829 01	828 51	
24					829 65	829 49	830 06	829 15	828 95	828 11	828 39	
25					829 64	830 36	829 81	829 46	828 90	828 40	828 81	
26					829 76	829 88	830 07	829 25	828 81	828 21	828 24	
27					829 72	829 74	829 51	829 23	827 91	828 18	828 46	
28					829 70	829 76	829 44	828 76	827 94	828 46	828 41	
29					829 64	829 89	829 49	828 96	828 71	828 11	828 34	
30					829 57	829 77	829 64	829 35	828 75	828 29	828 26	
31					829 75		829 21	828 76		828 74		

Levels reduced to M.H.S. datum (approximate sea level).

*Mean Daily Gauge Height, in Feet, of Lake Winnipegosis at Winnipegosis for 1915
and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1						827 02	828 02	827 88	827 16	827 04	827 31	
2						827 78	827 93	827 34	828 12	827 33	828 08	
3						828 03	828 63	827 31	827 37	827 31	828 03	
4						828 06	827 98	828 09	827 28	827 04	828 54	
5						829 63	827 63	817 91	827 36	827 75	828 77	
6						828 33	827 70	827 83	827 08	827 95	828 84	
7						828 27	827 54	827 79	827 88	827 66	827 23	
8						827 90	827 48	827 43	827 05	828 63	827 93	
9						827 62	827 53	827 32	827 47	828 73	828 65	
10						828 00	827 54	827 43	827 78	827 57	828 80	
11						828 18	827 86	827 74	827 33	828 74	827 08	
12						828 01	827 70	827 79	828 88	827 03	827 44	
13						827 71	827 65	827 73	827 58	827 12	827 38	
14						828 10	827 84	827 53	827 36	828 78	827 06	
15						827 91	828 08	828 04	827 43	827 13	828 88	
16						827 58	828 53	827 45	827 01	828 74		
17						828 01	828 04	827 31	827 29	828 78		
18					828 06	827 65	827 67	827 43	827 38	827 12		
19					828 03	827 71	827 83	827 48	827 98	827 53		
20					827 04	827 53	827 81	827 85	827 45	827 21		
21					828 08	828 54	827 71	827 37	827 15	827 25		
22					828 11	827 81	828 13	827 43	827 11	828 88		
23					828 21	827 61	828 02	828 26	827 56	828 80		
24					828 43	827 55	827 75	828 45	828 73	828 53		
25					828 12	827 91	827 48	827 43	827 93	827 28		
26					827 63	827 99	827 59	828 33	827 48	827 05		
27					827 68	828 06	827 60	827 46	828 98	828 73		
28					827 74	827 58	827 73	828 37	827 28	827 16		
29					827 92	827 95	827 91	827 01	827 34	828 73		
30					828 03	827 58	828 00	827 24	827 03	828 88		
31					828 01		827 83	827 22		827 20		

1916

1					826 98	827 65	828 24	827 93	828 23	828 61	828 01	
2					826 94	827 12	828 30	828 23	827 98	828 33	827 83	
3					826 90	828 21	827 43	828 38	827 85	828 63	827 83	
4					826 93	827 51	827 48	828 26	827 38	828 78	827 38	
5					826 98	827 43	828 32	828 01	827 43	828 13	827 52	
6					826 93	827 98	828 45	828 23	827 93	828 03	828 15	
7					826 94	827 72	828 31	828 20	827 92	828 33	828 30	
8					827 01	827 63	828 21	827 81	827 83	828 25	827 73	
9					827 06	827 68	828 48	828 01	827 70	827 73	828 73	
10					828 30	827 28	828 38	828 70	827 78	827 88	828 98	
11				826 68	827 15	827 53	828 47	828 55	827 93	827 33	827 83	
12				826 80	827 12	827 34	828 44	828 33	828 08	827 93	827 78	
13				826 78	827 05	827 75	827 93	827 92	829 38	827 28	827 83	
14				826 77	827 04	827 94	828 36	828 05	829 83	828 28	827 78	
15				826 87	827 26	828 73	828 43	828 08	828 48	827 13	827 78	
16				826 88	827 65	827 77	828 23	828 43	828 71	828 83	827 73	
17				826 37	827 68	827 96	828 21	828 21	827 88	827 83	827 83	
18				826 87	827 53	828 18	827 88	827 70	827 96	828 03	827 83	
19				826 94	827 45	828 15	827 48	827 93	827 93	827 93	827 88	
20				826 92	827 23	827 91	828 23	827 78	828 63	827 93	827 73	
21				826 84	826 74	828 01	828 59	828 01	830 03	828 58	827 83	
22				826 87	827 28	828 15	828 22	828 00	827 75	827 93		
23				826 88	827 73	829 57	829 13	828 61	828 63	827 13		
24				826 95	827 35	828 28	828 06	828 26	827 93	828 23		
25				826 93	827 28	828 33	828 28	828 63	828 95	827 93	827 78	
26				826 83	827 33	828 11	828 26	827 93	828 23	828 63	827 83	
27				826 83	827 38	828 15	828 21	827 94	829 00	827 28		
28				826 83	827 51	828 31	828 33	828 58	827 95	828 05		
29				827 01	827 61	827 75	828 41	828 63	827 63	827 28		
30				826 86	827 18	828 12	828 13	828 13	827 83	827 63	827 76	
31					827 13		827 92	828 18		827 38		

Levels reduced to M.H.S. datum (approximate sea level).

MOSSY RIVER NEAR LAKE DAUPHIN (GAUGING STATION).

History.—The station was established by E. Banks on May 20, 1913, and was discontinued on September 30, 1915.

Location.—A vertical staff gauge was secured to a timber driven into the bed of the river and braced to a crib on Clendenning's bridge across the Mossy river, 150 feet below the outlet of lake Dauphin.

Records Available.—From May 24, 1913 to September 30, 1915 a practically continuous record of daily gauge height is available.

*Mean Daily Gauge Height, in Feet, of Mossy River at Clendenning's Bridge,
Lake Dauphin, for 1913.*

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						91 67	91 10	91 70	91 40	90 60	90 00	90 00
2						90 52	91 00	91 80	91 30	90 70	90 30	90 00
3						91 49	91 25	91 90	91 20	90 80	90 40	90 00
4						91 65	91 30	91 80	91 20	90 70	90 30	90 00
5						90 90	91 40	91 79	91 30	91 00	90 20	90 00
6						90 60	91 40	92 00	91 20	90 80	90 20	90 00
7						91 75	91 45	91 60	90 90	90 90	90 20	90 00
8						91 80	90 70	91 50	91 50	90 80	90 00	90 00
9						91 70	91 50	91 50	91 50	90 70	90 10	90 00
10						91 60	91 50	91 70	91 50	90 60	90 10	89 90
11						91 50	91 80	91 40	91 20	90 70	90 10	90 00
12						91 30	91 90	91 49	91 40	90 60	90 00	90 00
13						91 25	91 85	91 30	91 40	90 50	90 10	89 90
14						91 58	91 05	91 40	91 20	90 60	90 10	89 90
15						91 47	92 05	91 79	91 10	90 60	90 00	89 90
16						91 35	92 00	91 49	91 00	90 40	90 10	89 90
17						91 40	91 90	91 50	91 20	90 50	90 10	89 90
18						91 20	91 80	91 49	90 90	90 40	90 10	89 90
19						91 45	92 10	91 50	90 90	90 50	90 10	89 90
20						91 40	92 10	91 60	90 80	90 40	90 00	89 90
21												
22						91 65	91 30	92 10	91 40	90 80	90 60	90 00
23						91 80	91 20	91 80	91 40	90 80	90 40	90 00
24						91 30	91 10	92 00	91 50	90 70	90 60	90 00
25						91 70	91 00	92 19	91 30	90 80	90 40	90 00
26						91 80	91 19	92 10	91 20	90 79	90 50	90 00
27						91 90	90 90	92 10	91 49	90 70	90 50	90 00
28						91 75	91 20	92 00	91 40	90 60	89 00	89 80
29						91 85	91 30	92 10	91 40	90 60	89 00	89 80
30						91 60	91 20	92 20	91 40	91 00	90 30	89 79
31						91 65	91 19	91 70	91 50	90 49	90 40	89 80
						91 50	91 50	91 40		90 40		89 81

Levels reduced to M.H.S. Station datum (assumed).

*Mean Daily Gauge Height, in Feet, of Mossy River at Clendenning's Bridge,
Lake Dauphin, for 1914 and 1915.*

1914

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	89 73	89 53	89 33	89 23	89 73	90 13	89 83	89 23	88 83	88 23	88 53	88 33
2	89 73	89 53	89 33	89 23	89 78	90 13	89 83	89 23	88 43	88 23	88 43	88 33
3	89 63	89 53	89 33	89 23	89 83	90 13	89 93	89 23	88 83	88 23	88 53	88 33
4	89 63	89 53	89 33	89 23	89 83	90 13	89 78	88 25	88 73	88 33	88 53	88 33
5	89 63	89 53	89 33	89 23	89 93	90 93	89 73	89 23	88 83	88 33	88 43	88 23
6	89 63	89 53	89 33	89 23	89 98	90 13	89 53	88 23	88 73	88 33	88 53	88 23
7	89 63	89 53	89 33	89 23	90 02	90 03	89 73	89 23	88 73	88 23	88 53	88 23
8	89 63	89 43	89 33	89 23	90 03	90 03	89 68	89 23	88 63	88 23	88 53	88 23
9	89 63	89 43	89 33	89 23	90 07	89 98	89 73	89 23	88 13	88 43	88 53	88 23
10	89 63	89 43	89 33	89 23	90 93	90 93	89 63	89 23	88 33	88 43	88 53	88 23
11	89 63	89 43	89 33	89 23	90 08	89 98	89 63	88 23	88 23	88 43	88 53	88 23
12	89 63	89 43	89 33	89 23	90 03	89 93	89 63	89 03	88 63	88 33	88 53	88 23
13	89 63	89 43	89 33	89 23	90 06	89 93	89 63	89 03	88 63	88 43	88 53	88 23
14	89 63	89 43	89 33	89 23	90 08	89 88	89 53	88 93	88 73	88 43	88 53	88 23
15	89 63	89 43	89 33	89 23	90 10	89 88	89 58	88 93	88 63	88 53	88 43	88 23
16	89 63	89 43	89 23	89 23	.....	89 83	88 33	88 88	88 53	88 43	88 43	88 23
17	89 63	89 33	89 23	89 23	.....	89 83	89 53	88 83	88 53	88 43	88 43	88 23
18	89 53	89 33	89 23	89 23	.....	89 83	89 35	88 83	88 53	88 43	88 43	88 23
19	89 53	89 33	89 23	89 25	.....	90 93	89 43	88 53	88 63	88 53	88 43	88 23
20	89 53	89 33	89 23	89 25	90 03	89 93	89 48	88 83	88 53	88 43	88 43	88 23
21	89 53	89 33	89 23	89 26	89 93	89 93	89 48	88 93	88 83	88 43	88 43	88 23
22	89 53	89 33	89 23	89 26	89 93	89 83	89 43	88 83	88 63	88 53	88 43	88 23
23	89 53	89 33	89 23	89 27	90 03	89 83	89 33	88 23	88 53	88 43	88 43	88 23
24	89 53	89 33	89 23	89 28	91 03	89 88	89 33	88 83	88 53	88 33	88 43	88 23
25	89 53	89 33	89 23	89 29	89 98	89 83	89 23	88 83	88 43	87 43	88 43	88 23
26	89 53	89 33	89 23	89 31	90 03	89 78	89 33	88 93	88 23	88 53	88 43	88 23
27	89 53	89 33	89 23	89 33	90 08	89 73	89 43	88 83	88 13	88 53	88 43	88 23
28	89 53	89 33	89 23	89 35	89 33	89 73	89 33	88 73	88 23	88 43	88 43	88 23
29	89 53	.....	89 23	89 37	90 03	89 73	89 34	88 53	88 23	88 53	88 43	88 23
30	89 53	.....	89 23	89 38	90 13	89 78	89 35	88 83	88 23	88 53	88 43	88 23
31	89 53	.....	89 23	.....	.....	.....	89 33	88 83	.....	.....	.....	88 23

1915

1	88 23	88 13	89 03	88 93	88 43	88 03	87 73	87 73	87 53	.....	.....	.....
2	88 23	88 13	89 03	88 93	88 43	87 93	87 53	87 73	87 63	.....	.....	.....
3	88 23	88 13	89 03	88 93	88 43	87 93	87 83	87 83	87 53	.....	.....	.....
4	88 23	88 13	89 03	88 83	87 93	88 33	87 93	87 83	87 43	.....	.....	.....
5	88 23	88 13	89 03	88 93	87 83	.....	87 93	87 83	87 33	.....	.....	.....
6	88 23	88 13	89 03	88 93	87 63	87 93	87 83	87 73	87 33	.....	.....	.....
7	88 23	88 13	89 03	88 83	87 83	87 93	87 73	87 73	87 43	.....	.....	.....
8	88 23	88 13	89 03	88 83	87 93	87 93	87 83	87 63	87 43	.....	.....	.....
9	88 23	88 13	88 93	88 83	88 13	88 23	87 83	87 63	87 33	.....	.....	.....
10	88 23	88 13	89 03	88 83	88 63	87 83	87 83	87 73	87 33	.....	.....	.....
11	88 23	88 13	88 93	88 93	87 93	88 03	88 93	87 73	87 23	.....	.....	.....
12	88 23	88 13	88 93	88 93	87 93	87 93	87 93	87 83	87 33	.....	.....	.....
13	88 13	88 13	88 93	88 93	88 03	87 93	87 93	87 73	87 33	.....	.....	.....
14	88 13	89 03	88 93	88 83	87 73	87 23	87 83	87 73	87 23	.....	.....	.....
15	88 13	89 03	88 93	88 83	87 88	87 53	88 23	87 83	87 13	.....	.....	.....
16	88 13	89 03	88 93	88 83	87 93	87 63	.....	87 73	87 33	.....	.....	.....
17	88 13	89 03	88 83	88 93	88 13	88 03	87 93	87 83	87 33	.....	.....	.....
18	88 13	89 03	88 93	88 83	88 03	87 63	87 93	87 73	87 23	.....	.....	.....
19	88 13	89 03	88 93	88 83	88 13	87 83	87 83	87 73	87 33	.....	.....	.....
20	88 13	89 03	88 93	88 83	88 13	88 03	87 93	87 63	87 43	.....	.....	.....
21	88 13	89 03	88 93	88 73	87 93	88 03	87 93	87 63	87 43	.....	.....	.....
22	88 13	89 03	88 93	88 63	88 03	87 93	88 03	87 83	87 33	.....	.....	.....
23	88 13	89 03	88 93	88 63	87 93	87 93	87 93	87 73	87 23	.....	.....	.....
24	88 13	89 03	88 83	88 73	87 93	88 03	87 93	87 73	87 13	.....	.....	.....
25	88 13	89 03	88 93	88 73	88 13	87 93	87 83	87 63	87 33	.....	.....	.....
26	88 13	89 03	88 93	88 63	88 43	87 93	87 83	87 63	87 23	.....	.....	.....
27	88 13	89 03	88 93	88 63	88 23	88 23	87 93	87 53	87 33	.....	.....	.....
28	88 13	89 03	88 93	88 53	88 23	88 03	87 83	87 63	87 43	.....	.....	.....
29	88 13	.....	88 93	88 53	87 93	87 93	87 83	87 53	87 33	.....	.....	.....
30	88 13	.....	88 93	88 53	87 93	87 93	87 83	87 63	87 13	.....	.....	.....
31	88 13	.....	88 93	.....	87 93	.....	87 83	87 53	.....	.....	.....	.....

Levels reduced to M.H.S. Station datum (assumed).

NOTE.—Readings marked thus— are below Gauge Height 87.13.

SESSIONAL PAPER No. 25e

RED DEER LAKE AT BARROWS (GAUGING STATION).

History.—The station was established by E. Bankson on May 23, 1913, and was discontinued on December 5, 1914.

Location.—A vertical staff gauge was secured to a pile on the west side of the wharf of the Red Deer Lumber Company on Red Deer lake, one-half mile west of Barrows P.O.

Records Available.—Continuous records of daily gauge height are available during periods from May 24 to November 29, 1913, and from April 19 to December 5, 1914.

*Mean Daily Gauge Height, in Feet, of Red Deer Lake near Barrows for 1913
and 1914.*

1913

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						93-37	92-67	92-97	91-77			
2						93-37	92-67	92-97	91-77		90-27	
3						93-27	92-87	92-97	91-87		00-27	
4						93-27	92-67	92-87	91-87		90-27	
5						93-57	92-67	92-87	91-77	90-67	90-27	
6						93-17	92-67	92-87	91-67	90-67	90-27	
7						93-17	92-52	92-87	91-77	90-67	90-27	
8						93-17	92-57	92-77	91-67	90-57	90-27	
9						93-12	92-67	92-97	91-47	90-57	90-27	
10						93-07	92-67	92-67	91-17	90-47	00-27	
11						93-07	92-67	92-57	91-27	90-07	90-27	
12						93-07	92-87	92-57	91-47	90-27	90-27	
13						93-17	92-67	92-47	91-47	90-37	90-27	
14						92-97	92-87	92-57	91-47	89-67	90-27	
15						92-62	92-67	92-37	91-17	90-07	90-27	
16						92-87	92-87	92-27	91-17	90-37	90-27	
17						92-87	92-87	92-57	91-07	90-37	90-27	
18						92-77	92-87	92-47	91-17	90-27	90-27	
19						92-77	92-97	92-37	91-17	90-27	90-27	
20						92-77	93-07	92-27	90-97	90-27	90-27	
21						92-67	93-17	92-27	91-07	90-07	90-27	
22						92-57	93-17	92-27	91-07	90-07	90-27	
23						92-57	93-27	92-37	90-97	90-07	90-27	
24					93-57	92-47	93-07	92-27	90-97	90-07	90-27	
25					93-57	92-97	93-17	92-07	90-77	90-07	90-27	
26					93-57	92-67	93-27	92-17	90-87	90-07	90-27	
27					93-57	92-67	93-07	92-07	90-87	90-07	90-27	
28					93-67	92-67	92-97	91-87	90-87	90-07	90-27	
29					93-47	92-77	93-17	91-97	90-77	90-07	90-27	
30					93-47	92-67	92-97	91-87	90-67	90-27		
31					93-47		92-97	91-97		90-27		

1914

1					89-97	91-97	90-77	89-67	88-64	89-10	89-00	89-00
2					89-97	91-97	90-77	89-67	88-97	89-20	89-10	89-00
3					90-07	92-07	90-67	89-57	88-97	89-00	88-90	89-00
4					90-17	92-17	90-67	89-22	88-97	89-10	89-00	89-00
5					90-27	91-97	90-77	88-47	89-14	89-10	88-90	89-00
6					90-37	91-87	90-67	89-14	89-14	89-10	89-00	
7					90-47	91-87	90-57	89-47	89-14	89-20	89-10	
8					90-67	91-77	90-57	88-47	88-97	89-20	89-00	
9					90-77	91-67	90-47	89-47	88-97	89-10	88-90	
10					90-77	91-47	90-47	89-14	88-47	89-10	88-90	
11					90-97	91-67	91-37	89-14	89-10	89-10	89-10	
12					90-97	91-57	91-27	88-97	89-20	89-10	89-00	
13					91-17	91-47	91-27	88-97	89-20	89-00	89-00	
14					91-27	91-67	91-27	89-14	89-00	89-00	89-00	
15					91-37	91-47	91-27	89-22	89-10	89-00	89-00	
16					91-37	91-37	90-97	89-14	89-10	89-10	89-00	
17					91-37	91-37	91-17	89-14	89-10	89-20	89-00	
18					91-47	91-37	90-97	89-05	89-00	89-00	89-00	
19				89-47	91-47	91-27	89-97	89-14	89-10	89-10	89-00	
20				89-47	91-57	91-17	90-17	89-14	89-00	88-90	89-00	
21				89-47	91-57	91-17	89-77	89-14	89-20	89-00	89-00	
22				89-47	91-67	90-77	89-77	89-22	89-10	89-10	89-00	
23				89-47	91-67	91-07	89-07	89-14	89-10	88-90	89-00	
24				89-47	91-87	91-07	89-87	89-14	89-10	88-90	89-00	
25				89-47	91-97	90-97	89-87	88-97	89-00	89-00	89-00	
26				89-57	91-97	90-97	89-87	88-97	89-00	88-80	89-00	
27				89-77	92-07	90-87	89-77	88-80	89-10	88-80	89-00	
28				89-87	91-97	90-87	89-87	88-97	89-10	88-90	89-00	
29				89-87	91-87	90-77	89-77	88-97	89-10	88-80	89-00	
30				89-97	91-87	90-77	89-67	88-97	89-10	89-00	89-00	
31					91-97		89-67	88-47		88-90		

Levels reduced to M.H.S. Station datum (assumed).

LAC SEUL AT HUDSON'S BAY POST (GAUGING STATION).

History.—The station was established by the officers of the Ontario Hydro-Electric Commission in the summer of 1914, and since September 11 of that year the station has been operated jointly by the Ontario Hydro-Electric Commission and the Manitoba Hydrometric Survey.

Location.—A vertical staff gauge is secured to the west side of the dock at the Hudson's Bay post, located on the north side of Lac Seul, eighteen miles north of the station of Hudson on the Grand Trunk Pacific Railway.

Records Available.—A continuous record of daily gauge height is available from September 11, 1914 to December 31, 1916.

Mean Daily Gauge Height, in Feet, of Lac Seul at Hudson's Bay Co's Post for 1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1										105.08	104.88	104.58
2										105.08	104.88	104.58
3										105.08	104.92	104.54
4										105.08	104.92	104.54
5										105.04	104.83	104.54
6										105.04	104.83	104.50
7										105.02	104.83	104.50
8										105.02	104.83	104.50
9										105.00	104.83	104.46
10										105.00	104.83	104.46
11									105.06	105.00	104.79	104.46
12									105.08	105.02	104.75	104.44
13									105.08	105.04	104.75	104.42
14									105.08	105.04	104.75	104.42
15									105.08	105.04	104.79	104.42
16									105.08	105.04	104.79	104.40
17									105.08	105.00	104.71	104.40
18									105.08	105.00	104.71	104.40
19									105.08	105.00	104.67	104.40
20									105.04	104.92	104.67	104.33
21									105.08	104.92	104.67	104.33
22									105.08	104.92	104.63	104.33
23									105.13	105.00	104.63	104.33
24									105.17	105.00	104.63	104.33
25									105.17	105.00	104.60	104.33
26									105.17	105.00	104.60	104.33
27									105.17	105.00	104.58	104.31
28									105.08	104.92	104.58	104.31
29									105.17	104.92	104.58	104.31
30									105.08	104.92	104.58	104.29
31										104.83		104.29

Zero of Gauge = 1.054 05 W.P.S. datum.

*Mean Daily Gauge Height, in Feet, of Lac Seul at Hudson's Bay Co.'s Post for 1915
and 1916.*

1915

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	104 29	103 92	103 75	103 50	103 85	105 25	105 60	105 67	105 02	104 77	105 27	105 73
2	104 29	103 92	103 75	103 46	103 94	105 25	105 60	105 65	105 02	104 81	105 27	105 73
3	104 25	103 92	103 71	103 46	104 02	105 27	105 60	105 65	104 98	104 81	105 27	105 77
4	104 25	103 92	103 71	103 46	104 11	105 32	105 60	105 63	104 98	104 85	105 27	105 77
5	104 23	103 92	103 71	103 46	104 27	105 37	105 60	105 60	104 94	104 94	105 27	105 77
6	104 23	103 92	103 67	103 44	104 31	105 40	105 65	105 56	104 94	104 88	105 31	105 77
7	104 23	103 90	103 67	103 44	104 27	105 42	105 65	105 54	104 85	105 00	105 33	105 81
8	104 21	103 90	103 67	103 42	104 40	105 40	105 60	105 54	104 85	105 02	105 43	105 81
9	104 21	103 86	103 67	103 42	104 52	105 37	105 60	105 54	104 85	105 02	105 43	105 81
10	104 21	103 86	103 67	103 42	104 52	105 42	105 60	105 48	104 85	105 02	105 43	105 81
11	104 17	103 86	103 64	103 42	104 52	105 42	105 60	105 48	104 85	105 02	105 43	105 85
12	104 17	103 86	103 64	103 42	104 52	105 45	105 60	105 48	104 77	105 02	105 43	105 85
13	104 17	103 83	103 62	103 42	104 56	105 53	105 60	105 40	104 75	105 02	105 52	105 85
14	104 17	103 83	103 62	103 46	104 73	105 50	105 60	105 46	104 73	105 02	105 52	105 85
15	104 17	103 83	103 62	103 46	104 73	105 48	105 65	105 44	104 73	105 02	105 52	105 85
16	104 17	103 83	103 58	103 46	104 77	105 53	105 60	105 42	104 69	105 08	105 52	105 85
17	104 17	103 83	103 58	103 31	104 77	105 50	105 77	105 42	104 69	105 10	105 56	105 85
18	104 12	103 83	103 58	103 31	104 81	105 50	105 77	105 27	104 69	105 15	105 56	105 85
19	104 12	103 83	103 54	103 31	104 85	105 52	105 75	105 27	104 69	105 15	105 56	105 85
20	104 12	103 83	103 54	103 31	104 94	105 53	105 77	105 25	104 67	105 15	105 60	105 85
21	104 08	103 83	103 54	103 31	104 94	105 53	105 77	105 23	104 67	105 17	105 60	105 77
22	104 08	103 83	103 52	103 31	104 94	105 53	105 73	105 23	104 69	105 17	105 65	105 77
23	104 08	103 83	103 52	103 40	104 08	105 53	105 75	105 23	104 69	105 17	105 65	105 77
24	104 08	103 83	103 60	103 52	105 02	105 60	105 75	105 19	104 73	105 19	105 66	105 77
25	104 00	103 83	103 58	103 56	105 02	105 58	105 71	105 19	104 73	105 19	105 66	105 77
26	104 00	103 83	103 58	103 62	105 06	105 60	105 60	105 15	104 75	105 23	105 66	105 77
27	104 00	103 83	103 58	103 60	105 14	105 62	105 65	105 10	104 75	105 23	105 68	105 77
28	104 00	103 75	103 58	103 60	105 14	105 70	105 65	105 10	104 77	105 25	105 68	105 77
29	104 00	103 75	103 58	103 81	105 31	105 73	105 65	105 10	104 77	105 25	105 68	105 77
30	104 00	103 75	103 58	103 85	105 27	105 73	105 60	105 06	104 77	105 27	105 68	105 77
31	104 00	103 75	103 58	103 85	105 27	105 73	105 60	105 06	104 77	105 27	105 68	105 77

1916

1	105 77	105 44	105 10	104 83	105 38	108 32	109 38	110 11	108 51	107 30	106 43	105 78
2	105 77	105 44	105 10	104 83	105 44	108 40	109 38	110 06	108 43	107 27	106 40	105 76
3	105 77	105 44	105 02	104 77	105 51	108 49	109 38	109 96	108 39	107 20	106 38	105 76
4	105 77	105 44	105 02	104 77	105 53	108 61	109 38	109 91	108 35	107 28	106 37	105 73
5	105 73	105 44	105 02	104 75	105 61	108 65	109 90	109 89	108 31	107 31	106 33	105 73
6	105 73	105 35	105 02	104 75	105 67	108 74	109 86	109 81	108 26	107 19	106 31	105 73
7	105 73	105 35	105 02	104 73	105 69	108 86	109 88	109 83	108 21	107 13	106 30	105 73
8	105 73	105 35	105 02	104 69	105 86	108 90	109 86	108 76	108 16	107 03	106 31	105 73
9	105 69	105 35	105 02	104 69	105 88	108 90	109 86	109 71	108 11	107 03	106 29	105 81
10	105 69	105 35	105 02	104 69	106 28	109 11	109 99	109 66	108 06	107 01	106 21	105 73
11	105 69	105 35	105 02	104 65	106 49	109 15	110 13	109 76	108 01	106 99	106 21	105 71
12	105 65	105 35	105 02	104 69	106 49	109 21	110 15	109 66	107 96	106 94	106 21	105 71
13	105 65	105 35	105 02	104 71	106 53	109 28	110 13	109 56	107 91	106 91	106 19	105 63
14	105 65	105 35	105 02	104 73	106 53	109 36	110 13	109 44	107 91	106 91	106 16	105 63
15	105 62	105 35	104 94	104 69	106 53	109 40	110 15	109 36	107 86	106 86	106 17	105 70
16	105 62	105 35	104 91	104 71	106 53	109 49	110 13	109 28	107 81	106 86	106 11	105 66
17	105 60	105 27	104 02	104 77	106 53	109 57	110 13	109 28	107 71	106 83	106 13	105 62
18	105 52	105 27	104 94	104 81	106 88	109 69	110 10	109 26	107 66	106 71	106 05	105 63
19	105 52	105 27	104 96	104 83	106 94	109 71	110 28	109 10	107 61	106 71	106 11	105 61
20	105 52	105 19	104 85	104 85	107 03	109 71	110 32	109 17	107 56	106 71	106 01	105 56
21	105 52	105 19	104 85	104 94	107 05	109 74	110 17	109 11	107 81	106 71	106 01	105 58
22	105 52	105 19	104 85	105 00	107 09	109 74	110 19	109 06	107 71	106 65	105 91	105 56
23	105 52	105 19	104 79	105 00	107 19	109 74	110 17	108 96	107 64	106 61	105 91	105 53
24	105 52	105 27	104 77	105 02	107 44	109 86	110 19	108 96	107 61	106 57	105 90	105 53
25	105 52	105 19	104 77	105 02	107 57	109 82	110 09	108 88	107 58	106 63	105 88	105 51
26	105 52	105 10	104 85	105 17	107 65	109 84	110 11	108 86	107 55	106 53	105 87	105 51
27	105 52	105 10	104 85	105 23	107 78	109 86	110 03	108 76	107 49	106 46	105 87	105 51
28	105 52	105 10	104 83	105 23	107 90	109 86	110 03	108 73	107 46	106 41	105 81	105 51
29	105 52	105 10	104 85	105 38	107 96	109 86	110 03	108 69	107 41	106 38	105 83	105 51
30	105 52	105 10	104 85	105 33	108 03	109 82	110 02	108 61	107 38	106 41	105 81	105 51
31	105 52	105 10	104 83	105 33	108 11	109 82	110 02	108 54	107 38	106 41	105 81	105 51

Zero of Gauge = 1054.05 W.P.S. datum.

PROGRESS REPORT
OF THE
MANITOBA HYDROMETRIC SURVEY
FOR
THE CALENDAR YEAR 1916
PART IV.
METEOROLOGICAL DATA

PART IV.

METEOROLOGICAL STATIONS.

Meteorological stations have been maintained at the following points:—

Keewatin.

Pinawa.

Evaporation records are also obtained at these two points.

METEOROLOGICAL STATION, KEEWATIN.

In the spring of 1913 a meteorological station was established at Keewatin on the Lake of the Woods, and from the month of May of that year continuous records have been obtained at this station.

In addition to the meteorological equipment, apparatus for observing evaporation has been installed. This consists of a tank equipped with a measuring point. The tank is floated on a raft which is moored in the bay at Keewatin. The records therefore indicate evaporation from water surface.

Meteorological Data of M.H.S. Station, Keewatin, Ont., for January 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1			+ 7	+ 8	2 6	N.	28 25				C
2			+ 8	+11	6 0	NW.	28 48				C
3			0		5 7	S.					R
3	33		+ 7	+ 5	3 8	SE.	28 50		0 03		R
4			+ 8		4 3	N.					S
4			+ 5	+ 6	8 3	NW.	28 00		0 15		P
5			+16		5 8	NW.					P
5	33		+10	-15	8 3	W.	28 30				P
6			-33		4 1	S.					P
6			-17	-21	0 9	N.	28 55				P
7			-20		1 7	SE.					S
7	33		-2	-0	8 3	S.	28 74				R
8			+ 5	+ 9	0 4	W.					R
8			+ 9		2 6	S.	28 43		0 05		R
9			+13	+13	3 7	N.					S
9			+ 2		8 3	N.	28 05				S
10			- 1	0	5 0	N.	28 28		1 30		S
11			-15		0 3	SE.					Q
11			3	- 9			28 61				S
12			-27								P
12	33		-26	-27			28 75		0 20		P
13			-40								P
13			-23	-32			28 86				P
14			-20								P
14			-12	-20			28 72				P
15			-24								P
15	33		-11	-18			28 46				P
16			-20								Q
16			-20	-20			28 44				S
17			- 3								S
17	33		- 3	- 3			28 28				S
18			- 7								S
18			+ 6	0			28 30		0 08		S
19			+ 7								S
19	33		+ 8	+ 8			28 21				S
20			+17								S
20			+18	+17			28 06		0 22		S
21			+21	+22							S
21			+22				28 04				S
22	44		- 7	- 9							P
22			-10				28 43		0 02		P
23			0	0							P
23			0				28 37				P
24			+16								R
24	33		- 2	+ 9			28 30				R
25			-11								Q
25			- 7	- 9			28 84				S
26			-14								S
26	33		- 7	- 7			28 90				S
27			- 2								S
27			0	- 4			28 78				S
28			6								S
28	33		+ 6	0			28 93		0 35		S
29			+15								S
29			+20	+ 9			28 45				S
30			-12	-14							P
30			-26				28 48		0 55		P
31			- 7	-15							P
31	33		- 7				28 35		0 02		Q

Average time of observation 7.45 a.m. and 5 p.m. Wind Gauge gone for repairs Jan 12.

P—Clear, no clouds.

Q—Small fleecy clouds.

R—Cumuli.

S—Heavy, overcast, threatening.

Meteorological Data of M.H.S. Station, Keewatin, Ont., for February, 1916.

Day	Temperature				Velocity of Wind Miles per hour	Direction of Wind	Barometer Inches	Evaporation Inches	Rain Inches	Humidity %	General
	Lake	Tank	Air	Day							
1	33		-20	0			28.00				P
2	33		-8	-14			28.00				P
3	33		-21	-16			28.50				P
4	33		-3	-15			28.50				P
5	33		-22	-13			28.50				P
6	33		-13	-7			28.58				P
7	33		1	-15			28.57				P
8	33		18	-17			28.40				P
9	33		-4	-17			28.54				P
10	33		7	-10			28.30		0.05		P
11	33		-2	-11			28.57				P
12	33		-14	-11			28.57				P
13	33		-28	-14			28.00				P
14	33		-0	-14			28.00				P
15	33		-18	-9			28.78				P
16	33		-4	-11			28.04				P
17	33		-14	-10	3.5	S.	28.00				P
18	33		-22	-10	6.3	SW.	28.00				P
19	33		+8	+8	3.5	W.	28.55				P
20	33		+16	+8	4.6		28.55				P
21	33		+18	+19	4.5		28.42				P
22	33		+30	+19	4.5		28.42				P
23	33		+27	+27	4.6	S.	28.35				P
24	33		+38	+27	7.4	S.	28.35				P
25	33		+37	+23	7.1	NW.	28.42				P
26	33		+21	+23	20.5	W.	28.42				P
27	33		+2	+7	10.1	NW.	28.50				P
28	33		+17	+7	5.0	NW.	28.50				P
29	33		+16	+18	5.6	S.	28.24				P
30	33		+26	+18	2.6	S.	28.24				P
31	33		+13	+19	5.3	NW.	28.40				P
32	33		+17	+16	4.8		28.31				P
33	33		+7	+12	11.8	N.	28.31				P
34	33		+7	+12	6.9	SW.	28.41				P
35	33		+17	+12	4.3	SW.	28.41				P
36	33		+13	+20	3.5	N.	28.10				P
37	33		+33	+20	7.8	W.	28.10				P
38	33		+2	+8	12.3	S.	28.40		0.02		P
39	33		+11	+8	9.0	S.	28.40		0.02		P
40	33		+7	+7	5.8	N.	28.35				P
41	33		+16	+7	6.5	N.	28.35				P
42	33		0	+5	5.9	SE.	28.58		0.12		P
43	33		+13	+5	8.8	E.	28.58		0.12		P
44	33		-2	-3	6.0	N.	28.51				P
45	33		-6	0	3.3	NW.	28.51				P
46	33		+4	0	7.0	N.	28.33		0.03		P
47	33		-9	-11	6.3	N.	28.50				P
48	33		-2	-11	4.0	W.	28.50				P

Average time of observation 7.45 a.m. and 5 p.m. Wind Gauge gone for repairs Jan 12—Feb. 12.

P—Clear, no clouds.

Q—Small fleecy clouds.

R—Cumuli.

S—Heavy, overcast, threatening.

Meteorological Data of M.H.S. Station, Keewatin, Ont., for March, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	"	"	"	"	Miles per hour		Inches	Inches	Inches	%	
1	33		-22 +1	-10	3.5 4.6	W. W.	28.60				P P
2			-21 +4	-9	3.5 6.2	S. W.	28.50				P P
3	33		-10 +5	-3	8.7 10.1	W. W.	28.34				P P
4			+1 +12	-3	3.1 10.0	N. W.	28.29		0.08		P
5				+5	4.0	SE.	28.28				
6	33		+17 +23	+17	8.1 15.0	E. E.	28.95		1.00		S S
7			+14 +20	+14	13.4 11.9	NE. N.	28.28				S R
8	33		+3 +24	+0	11.9 6.3	S. S.E.	28.29				S R
9			+18 +12	+14	9.1	W.	28.04				R P
10	33		+2 +20	+11	12.4 4.1	NW. SW.	28.58				P
11			+16 +20	+18	4.7 4.1	S. E.	28.31		0.18		R
12				+21	6.5	NW.	28.28				R
13	33		+8 +15	+10	8.9 9.9	N. NE.	28.45				R C
14			0 +18	+5	5.3 2.4	S. S.	28.73				S
15	33		+8 +15	+6	4.1 8.3	N. N.	28.74				S
16			-5 +10	-1	5.6 2.1	N. S.	28.79				P
17	33		+6 +19	+7	5.6 12.4	S. S.	28.49				P P
18			+12 +19	13	7.3 14.5	NW. NW.	28.49				P
19			+19	15	5.2	S.	28.56				
20	34		+27 +34	28	6.7 2.8	S. S.	28.19		0.08		P
21			+24 +24	20	7.5 10.4	N. N.	28.32				S
22	33		+2 +19	7	8.3 2.6	NE. W.	28.48				C P
23			+17 +30	14	2.1 2.2	S. S.	28.30		0.20		P P
24	34		+34 +29	25	6.1 6.6	E. E.	28.10				C C
25			+30 +32	27	3.6 14.4	W. NW.	28.29				P
26			+21	26	3.5	N.W.	28.04				P
27	33		+24 +42	25	4.3 14.5	SE. SE.	28.52			77 91	S R
28			+37 +40	34	8.5 5.9	S. W.	28.40				P P
29	34		+38 +38	33	4.8 7.3	N. N.	28.66				P P
30			+37 +42	35	4.1 3.0	N. S.	28.71			91 85	P P
31	35		+38 +45	37	1.5 1.8	W. W.	28.41			65	P

Average time of observation 7.45 a.m. and 5 p.m.

P—Clear, no clouds.

O—Small fleecy clouds.

R—Cumuli.

S—Heavy, overcast, threatening

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Meteorological Data of M.H.S. Station, Keewatin, Ont., for April, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
					Miles per hour		Inches	Inches	Inches	%	
1			33		5.3	N.	28.40			80	O.
2			34	31	11.6	N.	28.40			81	P.
3	35		28	26	3.2	S.	28.50				S.
4			37	31	2.5	S.	28.31		0.08	91	R.
5			24	31	6.8	NW.	28.46				S.
6			20	27	9.4	W.	28.46			89	R.
7	34		24		8.9	N.	28.63				S.
8			20	16	9.1	N.	28.63				O.
9			14		4.1	S.					P.
10			16	19	5.1	SE.	28.60				P.
11	34		27		3.4	N.	28.67				R.
12			37	29	7.1	NW.	28.67			83	O.
13			30		2.7	W.	28.64				P.
14			39	31	7.8	SW.	28.64			76	P.
15	34		42	35	1.6	S.	28.27				P.
16			36		11.0	S.	28.08		0.04	85	S.
17			44	38	6.1	S.	28.08				P.
18	36		44		9.8	NW.	28.34			71	R.
19			52	44	5.8	S.	28.34			52	P.
20			46		4.4	SE.	28.30			86	R.
21			36	39	8.6	SE.	28.30				S.
22	36		38		10.3	N.	28.36		0.40	91	S.
23			41	39	13.1	N.	28.36		0.01	92	R.
24			42		5.1	S.	28.33				S.
25	36		52	44	7.0	S.	28.33			75	P.
26			52		6.2	SE.	28.17			75	P.
27			53	50	5.9	S.	28.17			70	S.
28			40		4.4	W.	28.10		0.39	92	N.
29			42	41	12.0	NW.	28.10				P.
30	36		50	42	14.6	W.	28.33		0.09	77	P.
31			40		3.1	NW.	28.38			56	P.
32			52	42	2.9	E.	28.38			96	P.
33	36		41		7.6	E.	28.28			52	P.
34			54	47	13.0	E.	28.28			77	R.
35			41		11.0	E.	28.30			70	S.
36			46	44	15.6	E.	28.30			84	S.
37	35		39		12.8	N.	28.27			79	S.
38				39	17.0	N.	28.27			76	S.
39			33		9.0	N.			0.07	90	S.
40				38	6.1	E.	28.32				P.
41	47		43		1.8	N.	28.44			78	P.
42	38		52	42	4.0	N.	28.44			63	P.
43	38		55		6.0	NE.	28.45			77	P.
44				47	8.5	N.	28.68				S.
45	47		46	42	13.5	N.	28.68		0.16	65	S.
46					7.4	N.					P.
47	38		51	46	7.0	N.	28.75			57	P.
48					2.8	S.	28.61				P.
49	39		59	46	8.8	W.	28.61			58	P.
50					6.1	NW.	28.07				S.
51	39		57	52	13.3	NW.	28.07			61	S.
52					13.7	S.	28.22				P.
53	38		34	33	11.4		28.59				P.
54				32	4.5		28.59				P.

Average time of observation 7.45 a.m. and 5 p.m.

P = Clear, no clouds.

Q = Small, fleecy clouds.

R = Cumuli.

S = Heavy, overcast, threatening.

Meteorological Data of M.H.S. Station, Keewatin, Ont., for May, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	"	"	"	"	Miles per hour		Inches	Inches	Inches	%	
1	38	40	41	35	5.4	N	28.47	0.15		62	C
					4.7	NW				82	
2	38	38	36	40	2.6	W.	28.43			76	P
	38	39	40		8.1	S.				64	
3	38	38	28	40	6.0	W.	28.19		0.02	54	P
	39	40	48		6.8	S.			0.24	61	
4	39	39	44	50	9.4	NW.	27.91			92	P
					16.0	NW.		0.03		70	
5	40	40	42	50	6.5	SE.	28.13	0.03			P
	44	45	64		6.0	N.				75	
6	40	40	44	53	5.0	S.	28.24	0.03		47	P
	42	46			4.3	S.					
7				52	7.6	SE.	28.01				P
									0.56	91	
8	42	42	38	42	10.4	W.	28.04			78	P
	41	42	43		19.4	NW.				84	
9	40	40	40	48	3.5	S.	28.10	0.02		43	P
	42	44	50		10.3	SE.					
10				42	11.5	S.	27.83				P
					22.7	W.					
11	40	39	37	40	20.7	NW.	28.34	0.04	0.16	63	P
	41	43	43		14.2	NW.		0.03		77	
12	41	41	41	44	5.3	NW.	28.08	0.03		56	P
	41	43	50		7.2	W.		0.03		85	
13	41	42	42	48	2.2	E.	28.00	0.03		15	P
	42	46	61		5.0	E.		0.02		50	
14	44	46	62	53	8.3	E.	28.54	0.03			P
									0.27	85	
15	43	42	42	40	16.5	NE.	28.17	0.03			P
					20.0	NE.					
16	42	42	35	39	16.9	S.	28.13	0.05	0.50	82	P
	42	44	41		16.4	S.		0.01	0.01	69	
17	41	40	37	47	12.1	NW.	28.23	0.03		66	P
	42	47	50		15.8	NW.		0.04		50	
18	42	43	45	48	6.0	N.	28.20	0.02		79	P
	42	46	53		8.4	S.		0.04		42	
19	44	44	42	47	3.0	N.	28.35	0.02		77	P
	43	47	54		5.3	SW.		0.03		44	
20	43	44	46	49	4.0	SE.	28.38	0.01		86	P
	45	50	61	52	5.8	S.		0.04		52	
21				57	5.0	S.	28.28	0.03		67	P
	45	49	58		9.8	E.		0.005	0.055	74	
22	44	46	49	49	3.3	E.	27.98	0.00	0.05	87	P
	44	46	48		4.0	W.		0.00	0.20		
23				52	11.8	SW.	27.99	0.01	0.01	62	P
	44	48	58		6.4	NW.		0.01	0.01	35	
24	45	49	56	53	6.5	E.	28.44	0.00		61	P
	45	50	64		11.0	E.		0.00		16	
25				56	10.2	SE.	28.43	0.03	0.14		P
	46	50	67		11.0	SE.				68	
26	47	50	61	56	8.5	S.	28.01	0.05	0.15		P
					13.8	SW.				51	
27				52	9.2	W.	28.05				P
	47	50	57	54	7.0	NW.	28.15	0.04		87	
28					14.4	N.	28.34	0.04		48	P
	47	48	51	54	5.5	S.		0.02		87	
29	47	52	59	55	3.4	SE.	28.48	0.02		40	P
	48	49	48		9.5	S.					
30	52	57	65		8.4	S.			0.31	84	P
				56							
31	49	51	59	56							

Average time of observation 7.45 a.m. and 5 p.m.

P = Clear, no clouds.

Q = Small fleecy clouds.

R = Cumuli.

S = Heavy, overcast, threatening.

MANITOBA HYDROMETRIC SURVEY

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Meteorological Data of M.H.S. Station, Keewatin, Ont., for June, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1.	40	34	62	50	6.9	NW.	28.25	0.03		37	O.
2.	49	40	44	44	9.7	N.				40	P.
3.	51	55	60	54	4.4	W.	28.24			20	P.
4.	50	53	61	58	2.9	NW.		0.04	0.01	50	S.
5.	50	54	64	54	7.7	S.	28.27	0.05		43	P.
6.	50	50	47	50	12.5	NW.		0.02		86	R.
7.	52	55	67	56	7.3	SE.	28.32	0.02		62	R.
8.	51	52	60		9.0	SE.		0.03		63	S.
9.	51	52	55	58	10.3	S.	28.17		0.30	88	P.
10.	54	56	64	61	7.9	SE.	28.24	0.02		32	R.
11.	52	52	58	61	3.9	SE.		0.02	0.01	77	S.
12.	52	53	61	50	4.1	N.	28.27			68	S.
13.	54	58	68	63	5.1	N.		0.01	0.14	67	P.
14.	53	54	56	63	6.3	E.	28.28	0.02		94	P.
15.	50	64	76	63	7.3	E.		0.02		45	P.
16.					3.5	S.	28.36	0.02			P.
17.	57	63	73	65	2.9	S.				54	P.
18.	55	58	61	65	5.4	S.	28.40	0.03	0.00	84	R.
19.	55	57	68	64	11.3	SW.	28.42	0.02		55	Q.
20.	55	55	59	64	7.9	S.		0.02		83	Q.
21.	57	59	68	62	5	S.	28.50	0.01	0.04	55	Q.
22.	55	56	58	62	0	W.		0.02		80	Q.
23.	56	59	65	62	1	NW.	28.15	0.03	0.06	40	R.
24.	55	56	54	58	3.1	S.		0.02		88	P.
25.					10.7	NW.	28.04				
26.	56	55	52	56	9.3	N.		0.04	0.20	81	S.
27.	56	50	62	55	7.1	NW.	28.24				
28.	58	62	61	55	8.6	N.	28.29	0.11	0.02	55	S.
29.	56	56	48	53	6.5	N.				70	P.
30.	57	56	48	53	7.6	N.	28.39			93	P.
31.	58	61	67	54	9.3	NE.	28.43	0.10			P.
32.	58	61	67	54	6.4	S.		0.11		38	Q.
33.	57	57	51	60	6.8	S.	28.48	0.06			P.
34.	62	65	70	60	0.9	S.		0.03		48	Q.
35.	58	58	64	62	3.3	S.	28.56	0.03			
36.	58	58	64	62	3.5	SE.				54	S.
37.	58	58	50	58	12.9	SE.	28.53	0.07			
38.	58	58	50	58	9.2	SE.			0.84	78	S.
39.	58	50	50	57	8.1	NW.	28.02				
40.	59	62	68	59	13.0	NW.	28.10	0.01	0.18	78	R.
41.					5.4	SE.		0.04		50	R.
42.	58	60	55		3.4	N.		0.02	0.27		P.
43.	58	62	67	61	17.6	N.	28.39	0.04		46	R.
44.	59	62	68	60	4.1	SE.					
45.	58	50	64		7.6	SE.	28.50	0.07	0.28	67	S.
46.	59	63	73	66	2.5	E.		0.01	0.13	80	S.
47.	59	60	64		5.4	E.	28.43	0.02	0.04	58	S.
48.	63	64	75	67	6.5	E.		0.02		80	P.
49.	61	63	66	67	6.6	SE.	28.44	0.02		50	P.
50.					10.3						
51.	61	63	66	67		SE.	28.37	0.18	0.36	85	S.

Average time of observation 7.45 a.m. and 5 p.m.

P = Clear, no clouds.

Q = Small, fleecy clouds.

R = Cumuli.

S = Heavy, overcast, threatening.

Meteorological Data of M.H.S. Station, Keewatin, Ont., for July, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
					Miles per hour		Inches	inches	Inches	%	
1			76	70	6.5	W.	28.33			67	Q
2	63				6.8	W.	28.36			56	Q
3	64		70	69	4.1	SE.	28.36			69	Q
4	67		79	71	5.7	SE.				54	Q
5	65		75		11.0	SW.					P
6				71	5.8	SW.				86	Q
7			72		4.6	S.	28.40			51	Q
8	66		85	77	8.6	SW.				95	P
9	68				5.3	S.			0.27	86	S
10			70	73	5.4	S.E.	28.47			95	S
11	66		69		3.4	N.	28.54			49	P
12	66		67	70	6.6	N.		0.03		95	P
13	66	66	65		5.1	S.	28.56	0.03		50	P
14	72	73	78	72	3.6	S.		0.05		78	Q
15	68	70	73		3.8	SE.	28.37				
16				73	2.3	S.			0.03	68	Q
17				79	16.4	S.	28.17	0.05	0.03		
18	68	71	70							86	P
19					6.6	NW.		0.03		45	P
20	68	68	71	79	8.5	W.	28.27	0.05		95	Q
21	69	69	69		5.3	W.		0.04		74	P
22	70	71	76	72	10.0	SW.	28.36	0.06			P
23	68	68	68		2.7	SE.		0.03			
24				74	2.1	S.	28.41			86	P
25			72		2.8	S.		0.06			
26	71	71		77	5.3	S.	28.36			86	S
27			73		3.9	S.			0.07	62	Q
28	71	71	82	78	5.3	W.	28.34	0.01	0.07		
29	72	74			5.4	NE.				43	Q
30				75	6.0	S.	28.47	0.13		73	Q
31	72	72	78		6.0	S.		0.07		79	Q
32	71	71	72		5.5	S.	28.35	0.02		91	Q
33	72	74	79	64	8.9	S.			3.20	73	P
34	72	74	74		9.9	S.	28.18	0.01	0.01	95	P
35	74	75	84	64	8.2	W.			1.09	52	P
36	72	71	64		14.9	W.	28.24	0.08			
37	72	73	77	69	9.1	W.				69	P
38				68	9.2	W.	28.35	0.16			
39	73	74	81							82	Q
40					3.6	S.		0.06		41	P
41	71	71	73		9.7	N.W.	28.34	0.07		79	P
42	71	72	79	74	5.2	SE.		0.05			
43	70	70	62		3.5	S.	28.34				
44				70				0.13	0.20		P
45					8.1	W.	28.29			50	P
46	71	72	73	68	9.5	W.		0.15		83	Q
47	70	69	57		5.4	NW.	28.52	0.06	0.01	66	Q
48	71	71	65	64	4.1	E.		0.06		84	Q
49	70	69	81		6.5	E.	28.50	0.06		58	Q
50	71	71	74	66							
51					5.0	SE.		0.07		82	P
52	70	70	66		7.0	NE.	28.46	0.04	0.02	90	Q
53	71	72	74	70	6.3	E.		0.03	0.06	72	P
54	71	71	71		4.6	N.	28.40			87	P
55	72	73	82	76	4.6	S.		0.03		70	P
56	72	72	76		5.8	S.	28.36	0.05			
57	73	76	83	80	6.9	SW.				68	Q
58				76	7.6	N.	28.41	0.02	0.03	70	P
59	72	74	79		3.2	W.		0.06	0.04		
60	73	73	74	73			28.50				P
61					5.5	N.		0.05		49	P
62	72	72			3.1	N.	28.73	0.07			
63	73	74	77								

NOTE.—Evaporation Tank carried away by log boom on 1st. Reset 7th. Mean of Air temperatures substituted for Day temperatures from the 8th to the 12th (inclusive).
 Average time of observation 7.45 a.m. and 5 p.m.
 P—Clear, no clouds.
 Q—Small fleecy clouds.
 R—Cumuli.
 S—Heavy, overcast, threatening.

SESSIONAL PAPER No. 25e

Meteorological Data of M.H.S. Station, Keewatin, Ont., for August, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	73	72	70		2.1	S.		0.07		77	P
	74	74	78	77	5.1	S.	28.57	0.07		62	O
2	73	73	72		5.4	S.		0.05	0.02	91	P
	73	74	81	76	6.8	N.	28.26	0.15		49	R
3	73	72	70		5.1	S.				90	P
	73	74	80	74	5.0	S.	28.26	0.02		54	P
4					7.1	W.					
	73	73	74	70	12.1	NW.	28.27		0.56	62	P
5	73	73	50		4.8	SE.		0.06			O
	74	76	76	65	2.0	S.	28.49	0.04		48	Q
6					6.2	N.					
	72	73	72	69			28.27		0.07	84	P
7	72	72	67		5.4	NW.		0.02		95	O
				66			28.36				
8	72	72	67		4.7	SW.		0.10		90	P
	73	73	78	70	4.5	S.	28.30	0.06		60	O
9	72	72	70		5.6	S.		0.03		77	P
	72	72	70	73	11.1	S.	28.09		0.03	86	R
10	72	71	69		9.0	S.			0.44	90	P
	72	71	64	68	12.6	NW.	28.19	0.07	0.02	75	S
11					9.2	NW.					
	71	72	61	55	16.0	NW.	28.67	0.25		54	R
12					5.1	NW.					
	72	71	66	55	14.2	NW.	28.63	0.19			R
13											
	72	71	66	60	3.5	NW.	28.60	0.03			O
14	69	68	63		8.2	SW.		0.34			R
	67	68	74	62	6.5	SW.	28.21	0.16		74	P
15	65	65	66		7.4	SW.		0.04		76	S
				64	7.8	SW.	28.15				
16					3.6	S.					
	67	67	77	66	7.1	S.	28.16	0.10		71	O
17	66	66	71		7.3	S.		0.04	0.04	77	R
	69	70	80	70	6.1	SE.	28.28			88	O
18	67	67	72		5.9	SE.		0.04		78	R
	68	71	84	74	9.4	SE.	28.16	0.01		73	O
19	68	68	74		8.7	SW.			0.16	74	R
	67	67	67	68	6.2	SW.	28.32	0.02	0.28	76	O
20	67	66	66		6.0	W.		0.10			R
				60			28.54			62	O
21					5.0	S.		0.15		84	R
	66	66	65	60	3.5	S.	28.47	0.01		62	O
22	66	66	58		3.3	W.		0.08		94	P
	67	67	72	66	3.8	W.	28.40	0.05		49	P
23	66	66	62		8.1	W.		0.07		79	R
	66	67	75	67	10.5	NW.	28.28	0.06		82	P
24	66	64	56		8.3	NW.		0.09		59	R
	64	65	63	61	10.7	NW.	28.30	0.09		65	O
25					6.8	NW.					
	64	64	57	58	9.6	N.	28.33	0.16	0.11	61	Q
26					7.6	W.		0.07		76	S
	64	64	54	53			28.42				
27	65	64	64		6.0	W.		0.18	0.23	66	R
				60			28.43				
28	64	63	60		6.9	SW.		0.14		78	O
	64	65	74		13.6	SW.	28.29	0.04		62	C
29	63	62	51		9.2	N.		0.09	0.15	81	O
	61	62	57		9.6	NW.	28.48	0.07		61	Q
30					4.5	N.					
	62	62	58		7.3	NW.	28.40	0.09	0.25	77	S
31					5.1	N.					
	61	61	57		11.1	NW.	28.39	0.14		61	Q

Average time of observation 7.45 a.m. and 5 p.m.

P—Clear, no clouds.

Q—Small fleecy clouds.

R—Cumuli.

S—Heavy, overcast, threatening.

Meteorological Data of M.H.S. Station, Keewatin, Ont., for September, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1.	64	63	48	54	5.1	W.	28.50	0.07	.....	75	P
	64	64	58		11.9	NW.		0.11	.....	47	Q
2.	62	63	46		5.0	NW.		0.07	.....	87	
	65	65	60	53	2.2	S.	28.66	0.05	.....	46	S
	64	63	57		6.8	E.		0.00	0.06	94	
3.				60			28.34				S
4.	63	62	59		5.1	SE.			1.08	89	
				58			28.26				
5.	63	63	60		14.4	S.		0.05	0.05	92	S
	64	65	70	61	7.5	W.	28.16	0.00		64	P
6.	63	62	54		5.6	W.		0.06		83	
	63	64	64	58	3.7	W.	28.26	0.01		84	Q
7.	62	62	54		3.5	W.		0.04		94	
	64	65	67	60	4.0	NW.	28.36	0.02		67	P
8.	63	62	55		3.0	E.		0.04		80	
	64	65	69	62	3.7	S.	28.43	0.02		60	P
9.	61	61	67		5.5	S.		0.03		76	
	64	65	72	66	16.0	F.	28.28	0.05		69	S
10.				62	15.6		28.07				
11.	62	61	59		16.8	W.		0.00	1.01	75	S
	63	64	66	62	13.6	SAW.	28.23	0.01		68	P
12.	63	61	57		4.1	W.		0.06		83	
	63	63	64	60	1.7	S.	28.30	0.02		77	S
13.	62	62	58		5.8	S.		0.04	0.02	39	
	63	63	59	59	8.3	W.	28.29	0.02		80	R
14.					5.6	NW.					
	60	60	41	57	28.6	NW.	28.40		0.07	76	S
15.				40	11.8	W.					
	60	58	43		4.1	W.	28.40	0.17		88	S
16.					7.1	W.					
	59	59	46	42	9.4	W.	28.35	0.21	0.05	71	R
17.	59	57	49		8.2	NW.		0.11		51	Q
18.				45			28.54				
	58	57	47		7.5	S.		0.17		57	R
	59	59	58	52	4.7	SW.	28.46	0.01	0.04	97	P
19.	58	57	49		3.8	S.		0.04			
	60	61	65	50	2.5	S.	28.22	0.00	0.12	68	P
20.	59	59	60		4.0	SE.		0.04		86	
	58	57	51	57	13.6	NW.	27.97	0.04	0.12	96	S
21.					17.4	NW.					
	57	56	50	49	18.9	N.	27.97	0.05	0.57	93	S
22.	56	56	46		15.3	N.		0.05		75	
	56	56	46	49	7.0	N.	28.30	0.06	0.01	89	S
23.											
	57	57	54	49	2.3	SE.	28.37	0.04		84	R
24.	58	58	58		2.8	N.		0.05	0.07	88	P
				54			28.41			71	
25.	56	55	54		6.4	S.		0.07		88	S
	57	58	62	57	14.4	W.	28.18	0.04	0.02	71	P
26.					10.0	SW.					
	57	57	52	53	12.9	W.	27.91	0.02		78	S
27.					6.7	N.					
	56	55	44	43	10.9	N.	28.12	0.10		60	Q
28.	55	56	32		11.1	NW.		0.08		82	
	55	54	44	39	11.6	NW.	28.49	0.07		39	P
29.	54	53	43		4.4	SW.		0.08		61	
	55	55	53	47	7.5	S.	28.38	0.02		66	S
30.					5.1	S.					
	55	55	60	55	10.0	S.	28.03	0.10		55	C

Average time of observation 7.45 a.m. and 5 p.m.

P—Clear, no clouds.

Q—Small fleecy clouds.

R—Cumuli.

S—Heavy, overcast, threatening.

SESSIONAL PAPER No. 25a

Meteorological Data of M.H.S. Station, Keewatin, Ont., for October, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Baro- meter	Evapor- ation	Rain	Humi- dity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	55.0	54.5	52	50	10.1	W.	28.23	.08		52	P
2	52.0		42		9.2	N.			.22		S
3	53.0	52.0	40	41	12.1	N.	28.33		.23	96	S
	53.0	52.0	42		8.0	E.		.08	.05		S
4	53.5	53.5	54	49	11.4	E.	28.22			94	S
					7.7	W.					
	52.5	52.0	47	49	10.2	SW.	28.24	.07		65	S
5	51.5	51.0	37		9.1	NW.		.12		79	S
	52.0	52.0	45	44	8.8	SW.	28.54	.04		57	P
6	52.0	51.0	44		7.2	SW.		.05		71	P
	52.5	53.0	60	52	12.5	W.	28.45	.05		45	P
7					5.6	NW.					
	52.0	51.0	43	46	10.4	NW.	28.41	.06		73	S
8	52.5	49.5	44		5.3	W.		.05		85	P
9	51.0	48.0	31	42	7.4	N.	28.65				
				37			28.87	.11		58	P
10	56	48.5	40		9.2	SW.		.11		61	Q
	59	50.5	55	48	12.0	SW.	28.07	.04		43	P
11	50.0	49.0	47		5.2	S.		.06		82	P
	50.5	51.0	59	53	5.5	S.	28.29			49	P
12	50.5	50.0			7.4	N.					
	50.0	49.0	49	49	11.0	NW.	28.23			51	S
13	50.0	50.0	38		6.2	N.		.06		84	P
	50.0	50.0	48	47	4.3	S.	28.40	.03		79	S
14					9.6	W.					
	50.0	50.5	48	52	16.4	N.	28.17		.02	63	S
15	51.0	49.5	42		6.3	SW.		.06			
				40			28.31				Q
16	49.0	47.0	36		7.0	N.					
	48.5	46.5	29	31	16.5	NW.	28.24	.04	.35	95	S
17					4.4	W.				72	S
	48.0	46.5	33	30	3.2	SE.	28.50	.08		95	S
18					8.7	NE.					
	47.0	45.5	34	34	10.2	N.	28.41	.05	.49	90	S
19					12.7	N.					
	46.0	45.0	31	31	13.0	N.	28.38	.07		74	P
20	45.0	44.0	22		8.3	N.		.08			P
	46.0	45.0	34	31	5.1	NW.	28.32	.03		67	P
21					2.4	S.					
	45.0	43.5	33	32	3.9	SE.	28.14	.13	.08	95	S
22	45.0	44.5	36		6.2	N.		.06		90	S
				33			28.52				
23	44.0	42.0	27		5.0	NW.		.04			
	44.5	43.5	32	33	6.6	S.	28.73	.02		85	P
24					7.1	S.					
	44.0	44.0	44	41	6.5	S.	28.35			74	P
25					11.2	NW.					
	44.0	42.5	33	35	18.1	NW.	28.22		.10	69	R
26					5.6	S.					
	42.5	41.0	34	34	13.2	E.	28.15		.36		S
27	41.0	42.0	30		5.7	N.		.02			Q
	43.0	42.0	36	34	3.3	S.	28.39	.04	.07	91	R
28					11.6	W.					
	43.0	41.5	36	36	8.6	NW.	28.31		.46	91	S
29	42.5	42.0	32		2.9	S.		.02		90	S
				35			28.49				
30	42.0	41.0	34		6.6	S.				90	S
	42.0	41.5	40	37	11.6	SE.	28.30			80	Q
31					2.1	N.					
	42.0	42.0	38	37	1.8	SW.	28.33	.07	.45	87	R

Average time of observation:—7.45 a.m. and 5 p.m.

P = Clear, no clouds.

Q = Small fleecy clouds.

R = Cumuli.

S = Heavy, overcast, threatening.

Meteorological Data of M.H.S. Station, Keewatin, Ont., for November, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1.	42.0	40.5	34	42	4.7	SW.	28.37	.03		35	P
	42.0	42.5	44		4.8	SW.					P
2.					5.9	W.				62	P
	41.5	42.0	42	39	7.0	NW.	28.52			75	P
3.	41.5	41.0	38		6.3	SE.		.05		62	P
	41.5	41.5	48	41	8.7	S.	28.25	.02			P
4.					7.3	N.				68	P
	41.5	41.0	40	39	2.4	S.	28.47	.04		64	P
5.	42.0	40.0	47		9.2	SE.		.02			
				44			28.33				
6.	42.0	42.0	49		20.9	SE.		.06		67	S
				48	17.9	SW.	27.77				
7.	J 0				24.1	W.				66	P
		40.0	39	38	17.1	W.	28.23	.06	.03		
8.					6.2	S.				63	R
	40.5	40.5	40	37	6.0	S.	28.22	.06			
9.					7.4	N.					
	40.0	39.0	31	34	7.5	NW.	28.07	.05	.03		
10.					10.4	N.				85	
	36.0	35.0	19	24	13.5	NW.	28.51				
11.					9.8	NW.					R
			17	16	20.4	W.	28.02				
12.					27.8	NW.					P
			14	14			28.90				P
13.			10		6.2	W.					P
	36.5		13	13	6.0	W.	28.64				P
14.			13		3.9	W.					P
	36.0		18	16	5.0	NW.	28.50		.05		P
15.			20		5.2	SW.				68	P
	36.0		24	24	8.0	SW.	28.42				
16.			28		3.6	W.				72	R
	35.5		28	27	10.3	N.	28.34				P
17.					8.1	SW.				72	P
	35.0		34	28	5.7	S.	28.33				P
18.			27		6.0	SW.				77	P
	35.5		39	34	4.8	S.	28.05				R
19.			29		5.9	N.					
20.			24	20	7.3	N.E.	28.34				P
	34.0		24	24	5.1	E.	28.77			64	
21.					2.6	W.				79	
	34.0		31	27	10.4	W.	28.62				P
22.			30		9.8	SW.				49	P
	34.0		39	34	10.3	S.	28.12				P
23.					7.3	NW.					P
	33.0		20	26	14.7	NW.	28.15		20	59	P
24.			9		13.9	NW.					P
	32.0		10	12	9.4	NW.	28.54				P
25.			10		4.4	N.					P
			13	10	4.9	SE.	28.48				P
26.			30		7.2	S.					P
	32.0			28			28.14				P
27.			19		7.5	NE.					P
	32.5		22	22	6.1	E.	28.29				P
28.			31		10.1	S.				25	P
			34	31	10.6	SE.	28.14				P
29.					8.7	NW.					P
	32.0		20	25	9.4	NW.	28.22				P
30.			18		6.7	NW.					P
			26	24	5.0	SE.	28.14		.05		P

Average time of observation 7.45 a.m. and 5 p.m.

P=Clear, no clouds.

Q=Small fleecy clouds.

R=Cumuli.

S=Heavy, overcast, threatening.

Meteorological Data of M.H.S. Station, Keewatin, Ont., for December, 1916.

Day	Temperature				Velocity of Wind	Direction of Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1.	32		32	27	7.4	S.	28.12			78	P
2.			23	30	5.0	S.	28.10				P
3.			37	33	7.3	SE.					S
4.					7.2	SE.	27.95				P
5.	32		34	33	6.4	S.					P
6.			36	33	5.7	S.	27.86			82	R
7.			36	31	8.3	W.	28.06				P
8.			10	23	4.7	S.					R
9.	32		30	23	2.7	NE.	28.32				R
10.			23	24	8.5	NE.					
11.			23	24	27.2	N.	28.12		90		
12.	32		16	16	13.9	NW.			20		S
13.			17	16	11.0	NW.	28.31				P
14.			6	2	5.2	NW.					P
15.			2	1	1.2	W.	28.37				P
16.	32		2	1			28.70				P
17.			6	3	2.5	NE.					P
18.	32		-10	3	3.5	N.	28.58				Q
19.			-6	-8	5.7	N.					
20.	32		-6	-8	4.6	N.	28.34				P
21.			-14	-12	4.1	W.					P
22.			-10	-12	4.9	W.	28.29				R
23.	32		-17	-11	4.2	S.			20		P
24.			-4	-11	2.4	S.	28.08				S
25.			-17	-13	5.9	SW.					P
26.			-9	-13	4.6	S.	27.98				R
27.	32		-15	-8	2.6	NW.					P
28.			-2	-8	6.1	NW.	27.97				P
29.			-10	-11	6.2	NW.					
30.			-29	-23	1.9	S.	28.36				P
31.	32		-18	-23	1.3	N.					P
32.			-28	-23	3.2	N.	28.37				P
33.			-18	-23	4.6	N.					P
34.	32		-13	-17	3.5	NW.	28.40				P
35.			-17	-17	2.9	W.	28.34				P
36.			-17	-13	2.9	S.					P
37.			-10	-13	5.0	S.	28.27				Q
38.			-14	-10	4.6	S.					R
39.	32		-6	-10	3.0	S.	28.14				P
40.			-12	-10	2.8	SW.					P
41.			-24	-16	1.1	NW.					C
42.	32		-25	-16	1.9	S.	28.47				P
43.			-25	-16			28.73				P
44.			+12	+14	8.0	E.					S
45.	32		+15	+14	16.7	E.	28.21		60		S
46.			+2	+13	12.8	S.					S
47.			+4	+13	1.7	NW.	27.95		30		S
48.			-6	-5	4.5	N.					S
49.	32		-3	-5	3.5	N.	28.55				P
50.			-27	-17	0.9	NW.					P
51.			-7	-17	1.7	S.	28.75				P
52.	32		-14	-17	2.6	S.					P
53.			+12	-17	4.7	S.	28.58				P
54.							28.17				P

Average time of observation 7.45 a.m. and 5 p.m.

P=Clear, no clouds.

Q=Small fleecy clouds.

R=Cumuli.

S=Heavy, overcast, threatening.

PINAWA CHANNEL—EVAPORATION STATION.

History.—The station was established by W. J. Ireland on May 14, 1915, and has been operated during the open water seasons since that date.

Location.—The evaporation tank is supported by a timber raft and anchored to the boom stretched across the forebay about one hundred yards above the racks of the Winnipeg Electric Railway Company's plant at Pinawa.

Records Available.—A continuous record of daily evaporation is available over periods from May 30 to November 2, 1915 and from May 1 to October 31, 1916.

Daily Evaporation in Inches at Pinawa Evaporation Station for 1915 and 1916

1915							1916					
Day.	May.	June.	July.	Aug.	Sept.	Oct.	May.	June.	July.	Aug.	Sept.	Oct.
1		0 070	0 110	0 160	0 090	0 030	0 020	0 086	0 120	0 130	0 080	
2		0 086	0 120	0 136	0 053	0 060	0 026	0 056	0 060	0 136	0 136	0 150
3		0 086	0 120	0 120	0 063	0 073	0 030	0 073	0 040	0 116	0 120	0 180
4		0 080	0 113	0 133	0 010	0 070	0 080	0 120	0 086	0 190	0 200	0 060
5		0 233	0 096	0 086	0 080	0 086	0 080	0 080	0 026	0 126	0 063	0 093
6		0 136	0 073	0 110	0 060	0 100	0 013	0 090	0 070	0 143	0 106	0 083
7		0 103	0 080	0 110	0 220	0 116	0 030	0 043	0 073	0 126	0 073	0 053
8		0 230	0 063	0 073	0 100	0 060	0 050	0 050	0 066	0 123	0 063	0 046
9		0 080	0 026	0 070	0 176	0 006	0 036	0 050	0 186	0 186	0 050	
10		0 120	0 010	0 106	0 143	0 020	0 073	0 020	0 203	0 080	0 080	
11		0 063	0 033	0 090	0 146	0 120	0 040	0 063	0 040	0 220	0 080	0 060
12		0 053	0 090	0 076	0 123	0 120	0 146	0 146	0 073	0 180	0 076	0 040
13		0 086	0 090	0 370	0 120	0 033	0 040	0 060	0 183	0 103	0 063	
14		0 080	0 076	0 066	0 170	0 053	0 053	0 090	0 060	0 200	0 163	0 030
15		0 110	0 066	0 090	0 130	0 030	0 066	0 080	0 076	0 113	0 220	0 060
16		0 183	0 106	0 143	0 100	0 020	0 110	0 073	0 103	0 076	0 100	0 013
17		0 130	0 100	0 123	0 096	0 013	0 060	0 070	0 083	0 093	0 123	0 100
18		0 086	0 086	0 110	0 183	0 033	0 140	0 080	0 116	0 043	0 120	0 153
19		0 080	0 100	0 130	0 146	0 060	0 060	0 123	0 196	0 066	0 080	0 060
20		0 060	0 110	0 100	0 130	0 060	0 060	0 126	0 253	0 130	0 056	0 060
21		0 070	0 100	0 076	0 090	0 070	0 053	0 116	0 130	0 203	0 110	0 063
22		0 103	0 093	0 260	0 050	0 080	0 063	0 080	0 093	0 123	0 093	0 033
23		0 086	0 150	0 123	0 100	0 090	0 043	0 280	0 210	0 133	0 066	0 043
24		0 080	0 126	0 166	0 150	0 090	0 073	0 063	0 043	0 173	0 073	0 070
25		0 073	0 106	0 200	0 033	0 053	0 026	0 086	0 113	0 193	0 086	0 053
26		0 103	0 186	0 056	0 040	0 073	0 123	0 123	0 200	0 043	0 033	
27		0 106	0 090	0 096	0 096	0 040	0 153	0 063	0 153	0 076	0 046	
28		0 100	0 120	0 180	0 080	0 046	0 050	0 036	0 146	0 110	0 090	
29		0 116	0 110	0 106	0 130	0 033	0 023	0 056	0 130	0 133	0 080	0 043
30	0 080	0 153	0 090	0 060	0 060	0 060	0 053	0 060	0 080	0 133	0 070	0 050
31	0 073	0 086	0 043	0 040	0 040	0 040	0 040	0 086	0 216	0 086	0 053	
Total	0 153	2 859	2 953	3 664	3 104	1 725	1 231	2 549	2 744	4 579	2 819	2 085

NOTE.—(1) Too windy for reading. Tank filled by spray.

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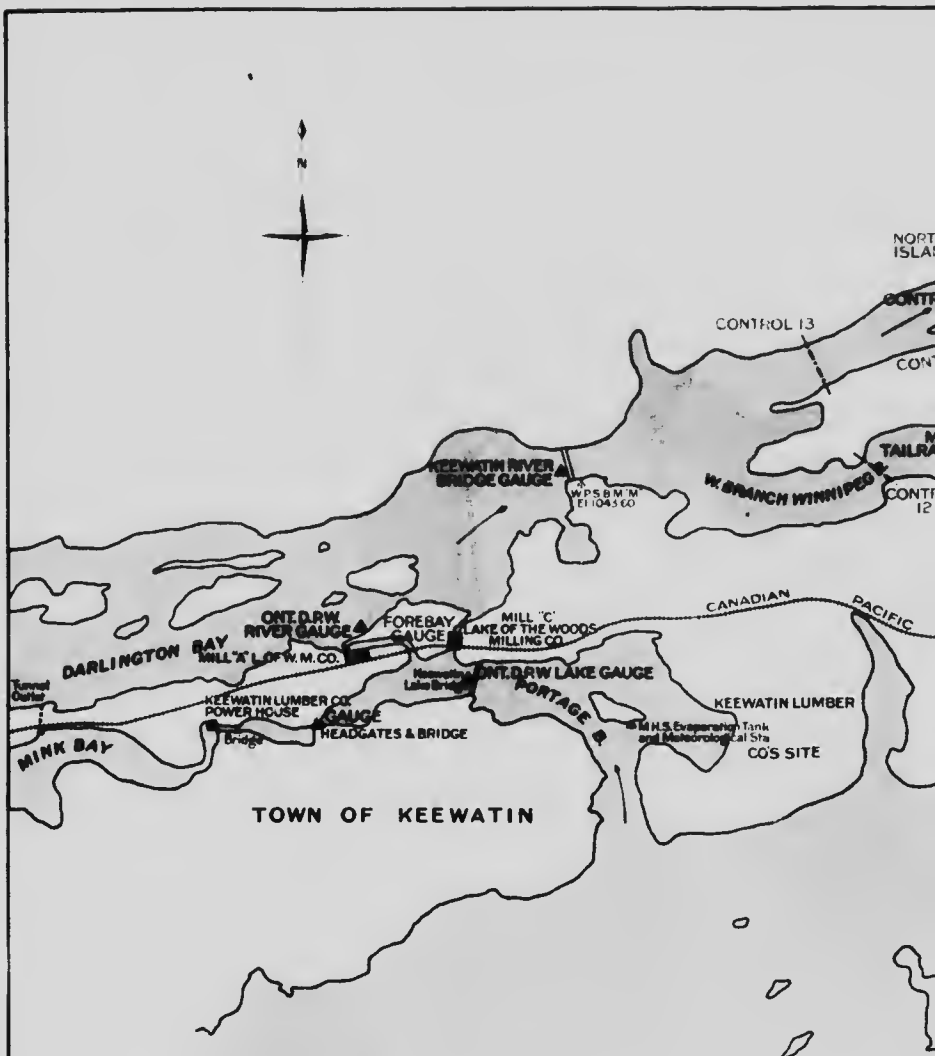
MANITOBA HYDROMETRIC SURVEY

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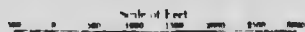


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 W. W. CORT, DEPUTY MINISTER
 Dominion Water Power Branch.
 J. B. CHALLIES, C.E., SUPERINTENDENT

MANITOBA HYDROMETRIC SURVEY PLAN OF OUTLETS of LAKE OF THE WOODS

SHOWING
 LOCATION OF GAUGES AND CONTROLS
 T. H. HARRISON, STREAM MEASUREMENT REPORT FOR 1910

LAKE

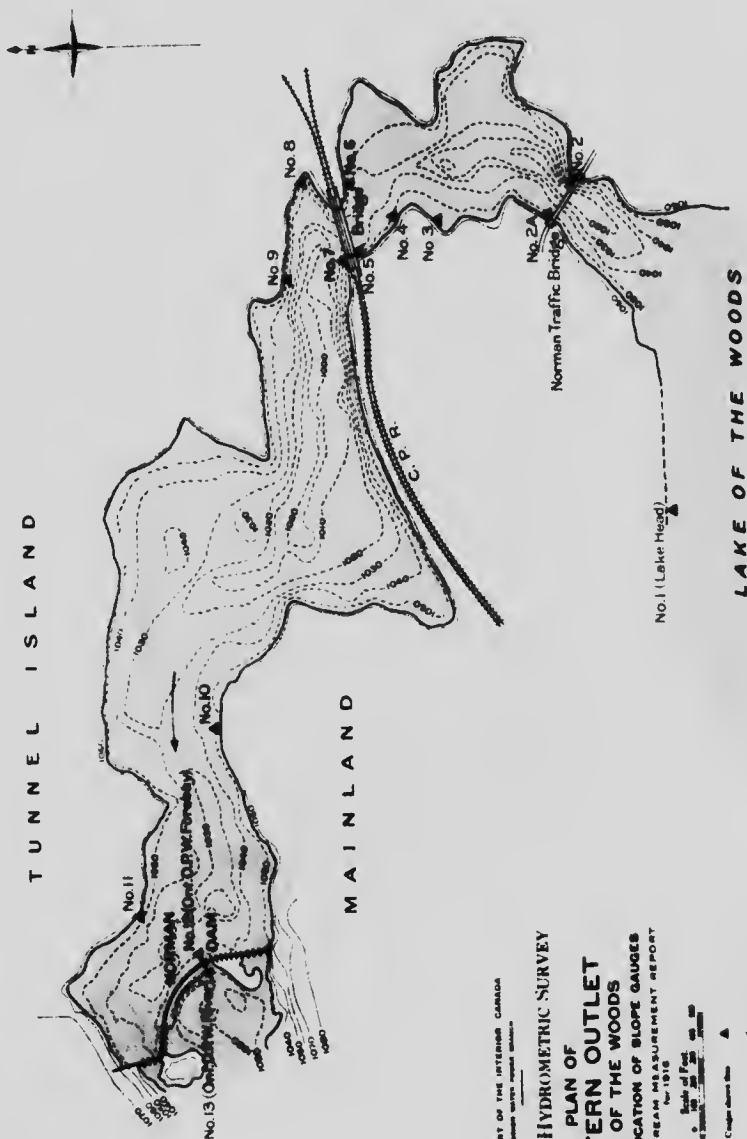


June 1912

M. L. Lundy Chief Engineer
 Manitoba Hydrometric Survey



OF THE WOODS



DEPARTMENT OF THE INTERIOR CANADA
MANITOBA HYDROMETRIC SURVEY
PLAN OF
WESTERN OUTLET
LAKE OF THE WOODS
SHOWING LOCATION OF SLOPE GAUGES
TO ACCOMPANY STREAM MEASUREMENT REPORT
FOR 1915

Scale of Feet
0 100 200 300 400 500 600 700 800 900 1000

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Manitoba Hydrographic Survey

June, 1917

W. J. Hinchey, Chief Draftsman
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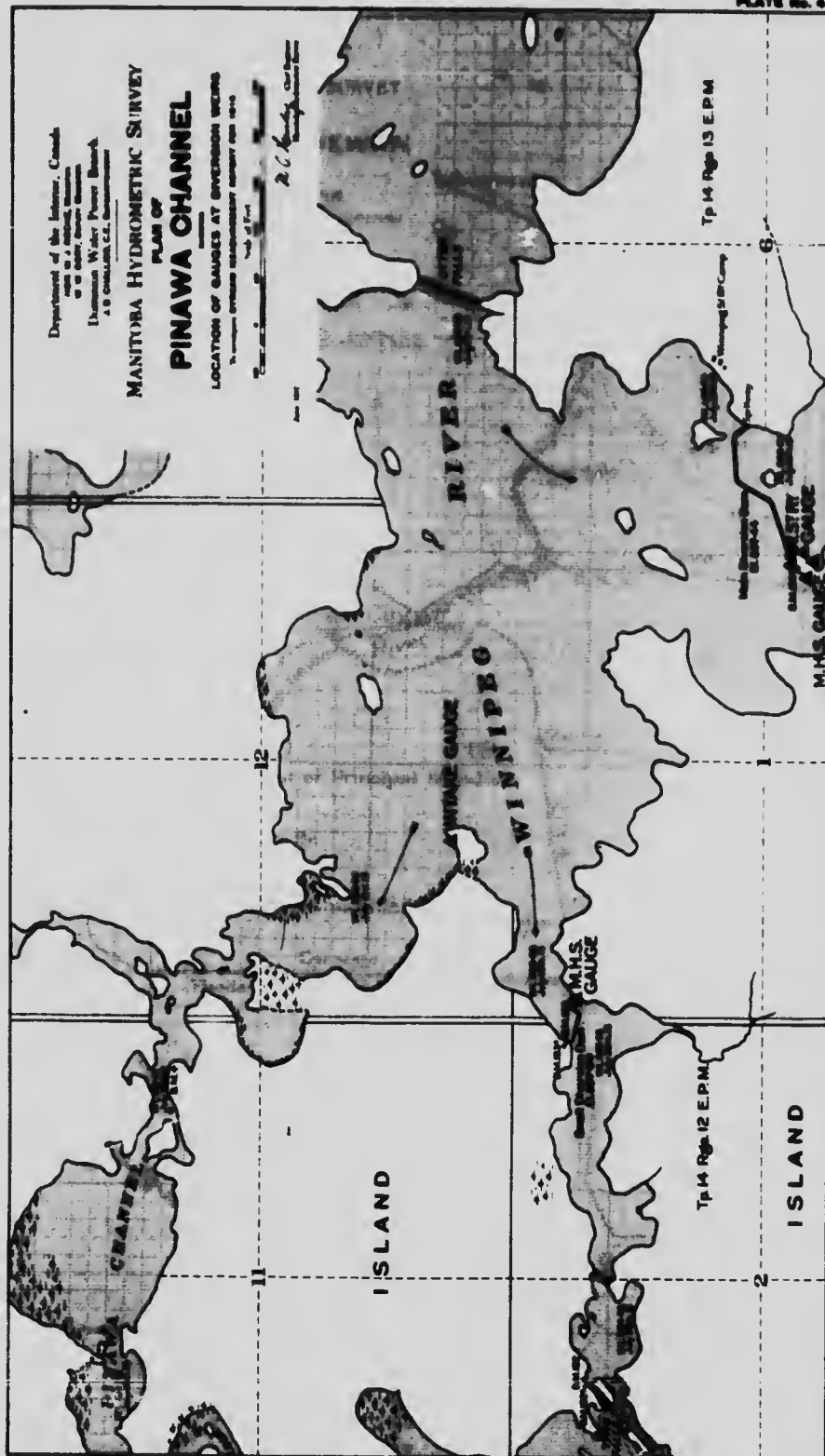
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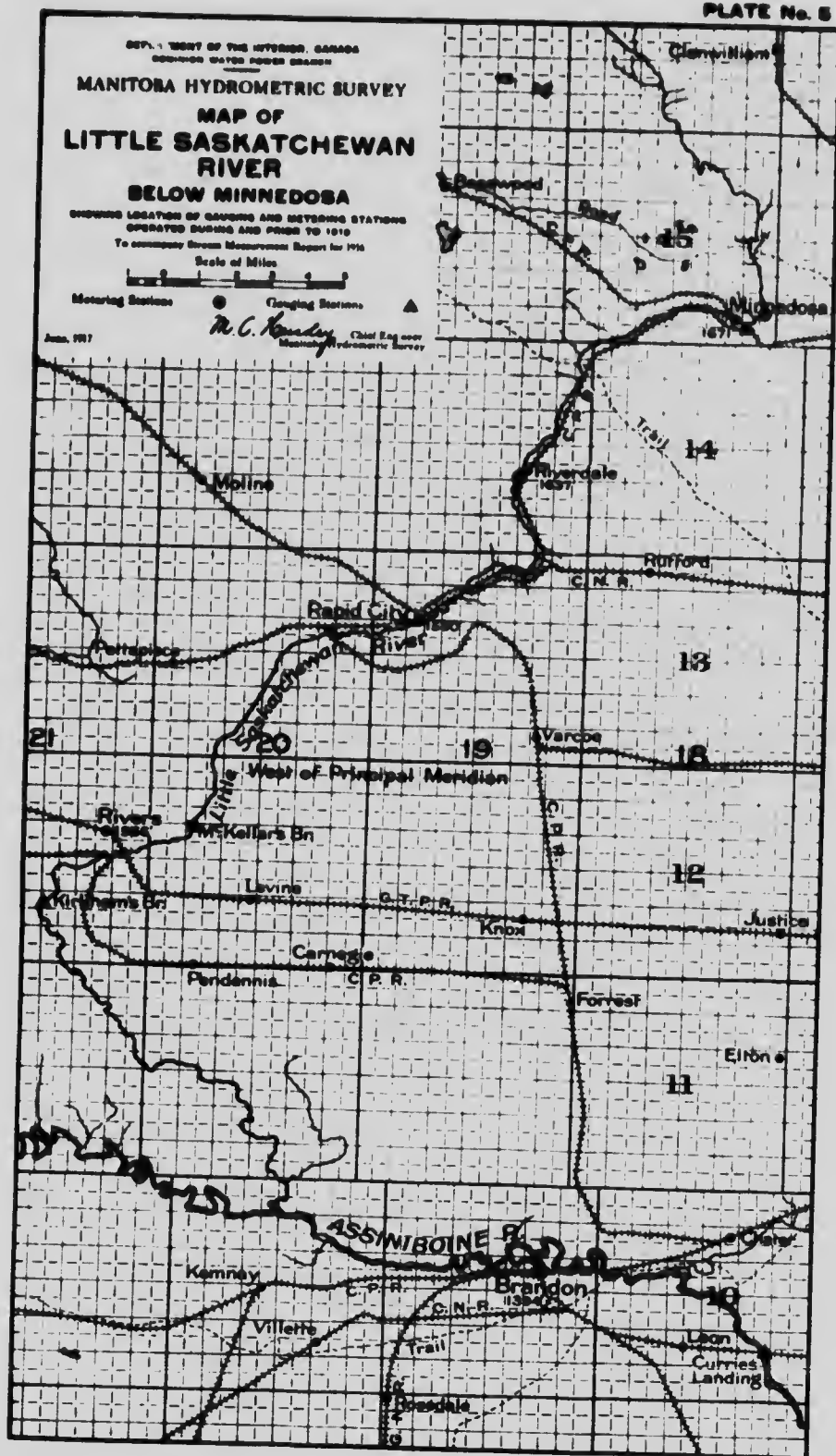
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MANITOBA HYDROMETRIC SURVEY

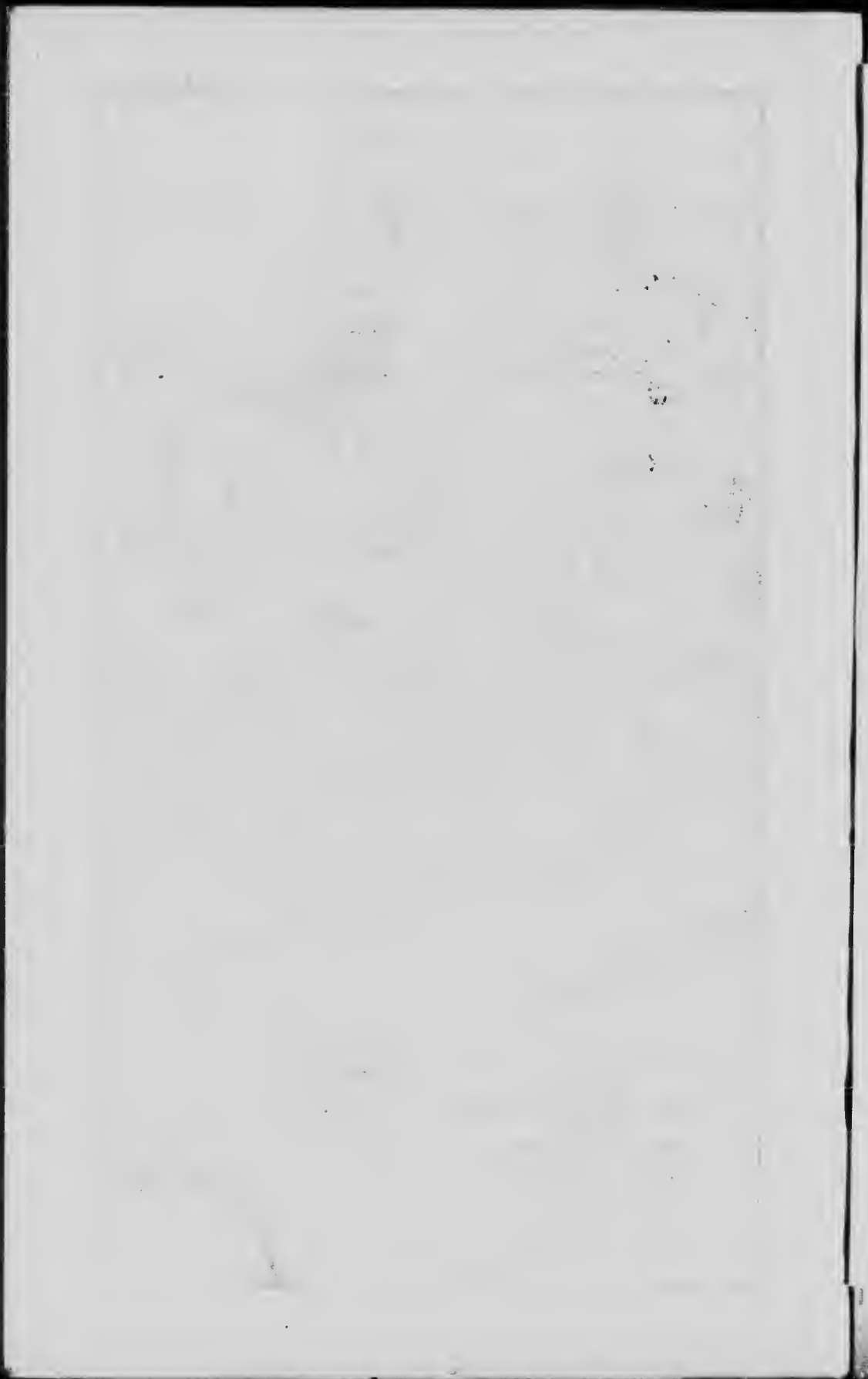
MANITOBA HYDROMETRIC SURVEY PINAWA CHANNEL

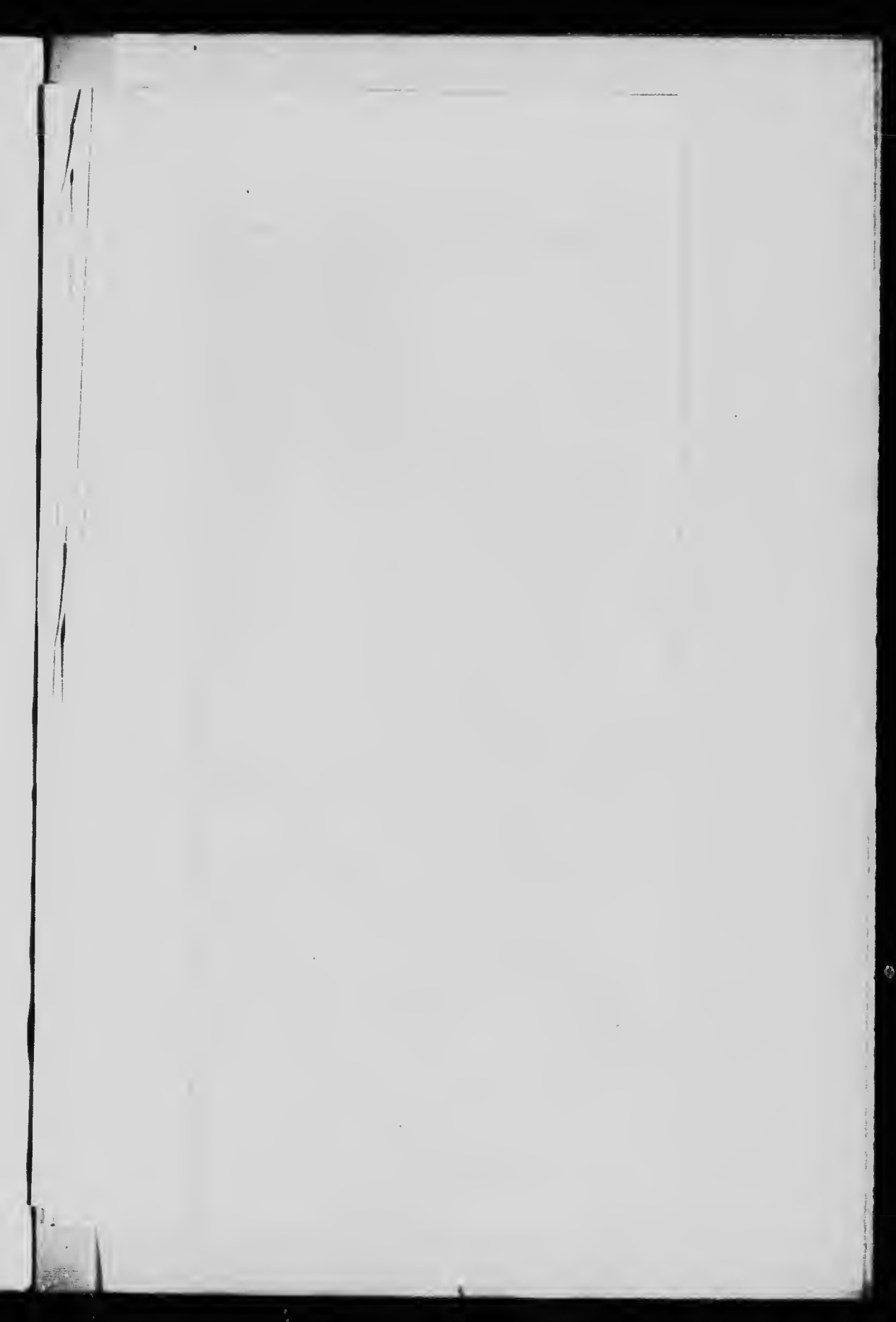
LOCATION OF GAUGES AT OVERSEASON WEIR

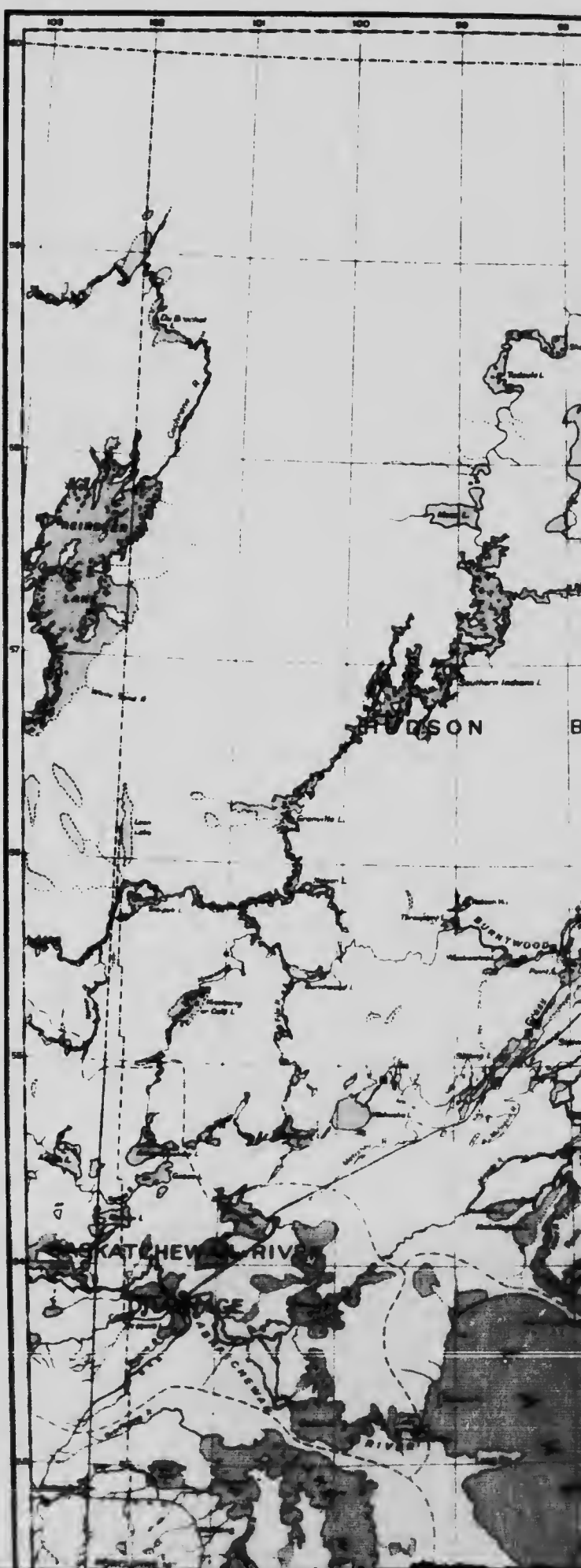














MANITOBA HYDROMETRIC SURVEY
MAP OF MANITOBA

Transmitted Annual Report for 1908
M. A. Hendry, B.A.Sc. Chief Engineer

Scale of Miles.



LEGEND

Rivers investigated by P.A.
Canadian Rivers
Manitoba River or
Canadian River
Manitoba River
Manitoba River
Manitoba River
Manitoba River
Manitoba River



LAKE WINNIPEG

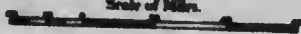


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Wm. M. J. ROBERT, Minister
W. W. GOSWAMY, Secretary
Division Water Power Branch
A. G. GOSWAMY, C.E., Commissioner

MANITOBA HYDROMETRIC SURVEY MAP OF MANITOBA

To accompany Annual Report for 1900
H. C. Mearns, B.A.Sc., Chief Engineer

Scale of Miles.



LEGEND

Stations Investigated in P.A.
Possible Power Sites
Measuring Stations
Gauging Stations
Hydrographic Stations
Water Survey P.A. stations in 1900
Limits of Drainage Area



PLATE No 7

