

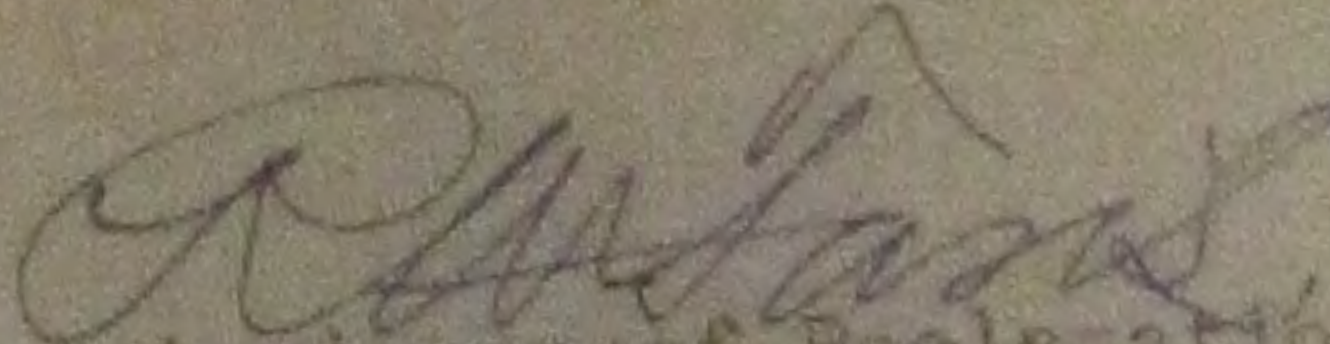
STATE OF IDAHO)
 (ss
COUNTY OF ADA)

I, R. W. FARIS, do hereby certify that I am the duly appointed, acting, and qualified Commissioner of Reclamation of the State of Idaho, and that as such Commissioner I am the legal custodian of the records of the said Department of Reclamation of the State of Idaho; and I FURTHER CERTIFY, That the foregoing is a full, true, and correct copy of:

REPORT ON WATER DISTRIBUTION AND HYDROMETRIC
WORK, DISTRICT No. 36, 1927, by G. CLYDE
BALDWIN, DEPUTY

as the same appears of record in the Department of Reclamation of the State of Idaho.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Department of Reclamation of the State of Idaho at Boise-Idaho, this 27th day of January, 1932.


Commissioner of Reclamation

State of Idaho

H. C. BALDRIDGE, GOVERNOR

DEPARTMENT OF RECLAMATION

GEORGE N. CARTER, COMMISSIONER

BOISE

April 12, 1928

HONORABLE H. C. BALDRIDGE
Governor of Idaho
Boise, Idaho

SIR:

It is my pleasure to transmit herewith the Ninth annual report of G. Clyde Baldwin, the watermaster and special deputy for Water District No. 36, Snake River. The report is similar in form and contains parallel data when referred to the eight previous annual reports of this district.

The continuity of the work of distributing the waters of Snake River in conformity to the decrees of the court and laws of the State, as carried on by Mr. Baldwin, is in itself very substantial proof of the efficacy of the methods and organization employed for this purpose. Great credit is due those who in 1919 conceived the plan and put into effect the policies for management and regulation of the Snake River, which have remained for nine years and promise to continue much longer.

There was nothing of an unusual nature in connection with the 1927 distribution. It was a year of plentiful water supply. The American Falls reservoir was filled to capacity and only a small part of the the storage thus impounded was needed.

There is one matter in this report to which I would direct your attention, that of the menace of Snake River to property in the district affected by last year's flood, which was caused by the breaking of the Gros Ventre river landslide dam in Wyoming. Such a condition created, and existing by reason of an act of nature, seems to warrant the State's aid in protecting the property of its citizens.

May I again take occasion to commend the work of Mr. Baldwin and his organization and express my appreciation on behalf of the State of this invaluable service.

Yours very respectfully,

GEO. N. CARTER
Commissioner of Reclamation



BALDRIDGE, GOVERNOR

STATE OF IDAHO
DEPARTMENT OF RECLAMATION
GEORGE N. CARTER, COMMISSIONER
G. CLYDE BALDWIN, DEPUTY

WATER DISTRICT NO. 36

April 5, 1928.

IDAHO FALLS, IDAHO

Mr. George N. Carter,
Commissioner of Reclamation,
Boise, Idaho.

Dear Sir:

Herewith I take pleasure in submitting the technical report covering all regular water distribution and hydrometric operations in Water District No. 36 for the irrigation season of 1927.

From the standpoint of water supply the year was one of the best of record. Normal stream flow sufficed to fill all requirements until the latter part of July and the amount of stored water needed thereafter was much less than usual. Consequently the season closed with large amounts of hold-over storage remaining in all reservoirs.

Crops were generally good and aside from the damage occasioned by the Gros Ventre Flood the season was a very satisfactory one for the water users. No unusual disputes arose and river administration proceeded in a spirit of harmony seldom experienced in the drier years.

U. S. Geological Survey methods have been used throughout as a standard for the collection and compilation of the hydrometric data which are presented in this report. In this, in the recomputation of records since the close of the irrigation season and in other respects the report is consistent with those which have been issued for the eight preceding years.

The so-called Normal Flow Fund was continued as a means of financing that portion of the work eventually paid for under the annual Water Master Bill. This fund was maintained during the past year through the advance of money by the Water Users Protector Association of the North Fork of Snake River and Tributaries, the Upper Snake River Water Users Protective Union, the Twin Falls Canal Company and the North Side Canal Company, Ltd.

Special acknowledgments are due to the North Fork Reservoir Company, the Utah Power and Light Company, the Idaho and Snake River Valley Irrigation Districts and the Aberdeen-Springfield Canal Company for gage readings and to the U. S. Bureau of Reclamation, the Twin Falls Canal Company and the North Side Canal Company, Ltd. for gage readings, results of current meter measurements and other data which were furnished without charge.

Work in the American Falls Reservoir basin was facilitated and duplication of effort avoided by reason of the careful planning of Thomas R. Newell.

Appreciation should again be accorded to you and to the members of the Water Users Committee of Nine of District No. 36 for continued cooperation and for advice and assistance which were freely given whenever required.

The conscientious service of the hydrographers, deputy water masters and other members of the regular organization must also be recognized and full credit be given for their part in the success of the year's operations.

C. A. McClelland, Mans H. Coffin, H. S. Kollenborn and Miss Helen George assisted materially in the preparation of this report and their work in this connection is gratefully acknowledged.

Respectfully yours,

G. Clyde Baldwin
Deputy.

WATER DISTRIBUTION AND HYDROMETRIC WORK

In District No. 36

1927

by G. Clyde Baldwin

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INTRODUCTION

The annual meeting and election of Water District No. 36 was held at Idaho Falls, Idaho on March 7, 1927. At this time G. Clyde Baldwin was reelected to the position of Water Master and the old members of the Committee of Nine, viz., F. A. Miller, Eph Peterson, John W. Hart, W. O. Cotton, John E. Kelley, L. C. Walker, E. B. Darlington, C. J. Miller and R. E. Shepherd were all continued in office.

After an amendment designed to provide for the determination of the storage transmission loss between Blackfoot and Neeley had been voted down, this meeting finally adopted, by the record vote of 84,507 to 48,985, the following majority report of the resolutions committee as the program or plan for 1927 river operation:

"Your committee have to recommend for the year 1927, water administration of Snake River, Water District No. 36, be had as follows:

I.

That from Jackson Lake (Moran) to Heise storage water shall be charged a transmission loss of $2\frac{1}{2}\%$, and in an attempt to establish conditions at Heise as nearly as practicable to pre-reservoir times, that storage water shall be charged a reasonable amount to cover lag and other causes of loss in return flow. Said amount to be repaid and returned to storage water interests before the close of the irrigation season, or before the storage water interests shall have exhausted their rights. It is understood that when a decreed right shall have been cut under river regulations that right shall not be reinstated until such time as its proportion of this amount shall have been repaid.

II.

That from Heise to Lorenzo bridge a minimum 3% channel transmission loss be charged to stored water, and when it shall be shown by a "two day mean method" that there is an additional loss in excess of said 3% the natural or direct flow users must be credited with the additional amount. It being understood that a measuring station will be maintained at or near Lorenzo.

III.

That from Lorenzo to Woodville a loss of 0.5% be charged storage water.

IV.

That from Woodville to Blackfoot a loss of 6% be charged to storage water.

V.

As to temporary exchanges and temporary transfers this question shall be left to the Committee of Nine to formulate and determine upon a plan at a later date.

VI.

That the salary of the Water Master for the year 1927 be fixed in the same amount paid him for the year 1926, and that said Water Master shall select such assistants and in the same manner as practiced during 1926, and that the total expenditure for river administration be kept within the total expended for like services and administration as that of 1926. That the Water Master's bond be fixed at \$500.00 and his bond as treasurer of the Normal Flow fund be fixed at \$4,500.00.

VII.

As to further investigation of conditions on Snake River your committee feel that it should be empowered to take such action as in its judgment may be warranted and incur the necessary expense.

(Signed) F. A. Miller
(Signed) W. O. Cotton
(Signed) J. E. Kelley
(Signed) R. E. Shepherd

Members of Committee"

Part of the opposition indicated, was directed exclusively against Paragraph V of the report and immediately after the announcement of the vote the following protest was presented by G. R. Davis who asked that it be incorporated in the minutes of the meeting:

"In behalf of the Fall River Irrigation Company, Twin Groves Canal and Irrigation Company and Wilford Irrigation Company we protest against any transfer or exchange of water in any manner, shape or form or the actions of any committee that will in any way change the natural flow of any stream in District No. 36 other than along the lines of decree."

A resolution endorsing and recommending favorable action by Congress on legislation which would permit the creation of the so-called Bachelor or Fall River Meadows Reservoir was again unanimously adopted in substantially the same form as at the previous annual meeting.

The so-called Boise River plan of financing water district operations which is provided for under Senate Bill No. 36 enacted by the 1927 legislature was presented and explained. Since the advantages to be gained through its adoption did not appear to outweigh the objectionable features, the meeting voted to continue the operation of District No. 36 affairs under the same financial plan which was effective during the preceding year.

On March 30, 1927 the Committee of Nine met at Idaho Falls, considered the annual Water Master budget and approved same in the amount of \$13,891.80 as the estimated cost of all regular work properly chargeable against normal flow water users.

Action taken upon other matters of importance is outlined in the following quotations from the minutes of this meeting:

"Moved by E. B. Darlington and seconded by J. B. Stocking that the committee postpone taking action relative to the matter of temporary transfers and exchanges of normal flow for storage as applied to 1927 water distribution. After considerable discussion the motion was carried.

Moved by C. J. Miller and seconded by L. C. Walker that a committee of three be appointed by the chair and authorized to arrange for carrying on an investigation during 1927 to determine the effect which the American Falls Reservoir and its operation will have upon river administration in District No. 56, the cost of said investigation not to exceed \$5000.00 and to be paid by the American Falls Reservoir interests. Vote on this motion showed all committee members favorable except J. B. Stocking. Motion declared carried.

Chairman Hart appointed C. J. Miller, J. B. Stocking and W. O. Cotton as members of this committee.

Moved by J. B. Stocking and seconded by L. C. Walker that the 1927 operation costs be prorated between stored water and normal flow users on the former 40%-60% basis except those made necessary by the construction and operation of the American Falls Reservoir which should be charged in their entirety against the said reservoir interests.

Motion carried.

Informal discussion of the necessity for 1927 regulation of small canals in the Springfield-Sterling section resulted in a general understanding to the effect that such regulation would not be warranted so long as the injunction granted by Judge Adair of the Sixth Judicial District remains valid.

It was also informally decided to continue the operation of the Robertson Station on Snake River by District No. 36 for another season before deciding upon its final disposition.

In connection with the discussion of the first item of the budget C. J. Miller outlined the unanimous action which was taken at the meeting of the American Falls Reservoir Advisory Board on March 8, 1927, authorizing a \$50.00 per month increase in Mr. Baldwin's salary in recognition of the extra work and responsibility devolving upon him on account of the operation of this new reservoir.

Mr. Baldwin then asked for an expression of opinion from the committee as to whether it would be proper for him to accept this salary increase.

Moved by C. J. Miller and seconded by L. C. Walker that the committee endorse the action taken by the American Falls Reservoir Board in the matter of Mr. Baldwin's salary and approve of his accepting extra compensation from that source to the extent of \$50.00 per month.

Motion carried.

Mr. Baldwin then asked to have the minutes show a pledge on his part to present the whole matter to the Water Users of District No. 36 at their annual meeting in March 1928 and promised to refund all money paid to him in excess of his regular salary of \$4800.00 if the Water Users then decided that he should not have accepted the extra amount.

Moved by W. O. Cotton and seconded by Eph Peterson that the bills of J. H. Peterson for \$100.00 and F. A. Miller for \$75.00 on account of legal services be approved and ordered included in the 1927 Water Master statement as a special charge against upper valley canals.

Carried."

Shortly after this meeting the special committee, after due consideration of the various problems to be encountered, arranged with Thomas R. Newell to conduct the desired investigation in the American Falls Reservoir basin. This work has now been summarized in a separate report and in consequence will only be referred to herein to the extent necessary to adequately explain the 1927 water segregation and distribution.

The same general cooperative plan which has been described in detail in preceding reports* again formed the basis for the administration of water distribution and also, with the single modification introduced by Mr. Newell's investigations, of hydrometric work conducted within the district in 1927. Funds for securing hydrometric data of a wide-spread interest character were provided by the State of Idaho and the U. S. Geological Survey while operations conducted primarily in connection with water distribution were sustained at the expense of normal flow and stored water users of the district.

Beginning in 1923 the offices of Water Master and Special Deputy were consolidated, but aside from this the organization and division of work has changed but little since the central office at Idaho Falls was first established on a permanent basis in May 1919.

Actual water deliveries, storage transmission via natural stream channels and other phases of river operation have been conducted each year in accordance with certain regulations and schedules usually adopted by the water users at the annual March election meeting.

*Water Distribution and Hydrometric Work in District No. 36, 1919; 1920; 1921; 1922; 1923; 1924; 1925 and 1926 by G. Clyde Baldwin.

These regulations cover points on which the statutes and decrees are not sufficiently definite or concerning which available data are too incomplete to afford satisfactory basis for a single fixed method of procedure. Occasionally also, when unanimous consent has been secured, certain departures from statutory methods prescribed for water distribution have been authorized. The former reports of the Deputy State Commissioner of Reclamation, already referred to, should be consulted for further details or information concerning the changes in these regulations which were in force during former years.

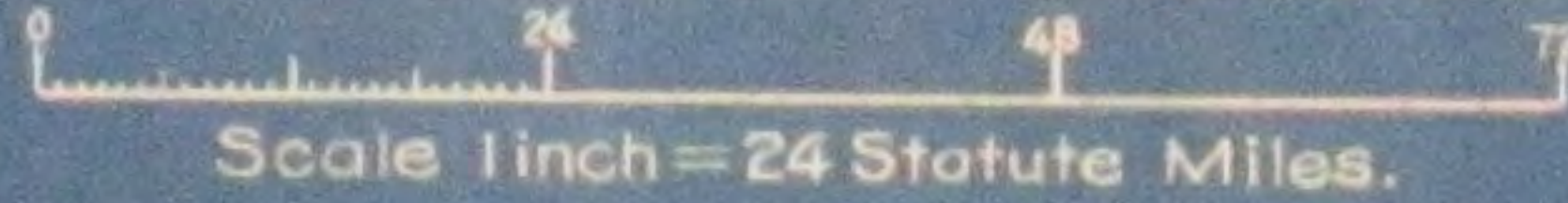
Because of the generally very favorable water supply conditions, regular river riders and deputy water masters were not required to begin their work for the season until June 1, but the hydrographers were engaged for some time prior to this in the re-establishment of gaging stations on both canals and natural streams, the making of necessary minor repairs and in securing measurements for the purpose of defining changes in rating which had occurred since the last previous records were secured.

PERSONNEL

The personnel engaged in the work of distribution during the season of 1927 was as follows:

G. Clyde Baldwin	Deputy State Commissioner of Reclamation, Special Deputy in charge of Jackson Lake, Market Lake and American Falls Stored Water Delivery and Water Master of District No. 36.
Thos. R. Newell	Engineer, American Falls Reservoir investigation.
C. A. McClelland	Hydrographer
Mans H. Coffin	Hydrographer and Deputy Water Master in charge of branch office at St. Anthony, Idaho.
Leo K. Homer	Hydrographer
Leelie Bowen	Hydrographer
C. T. Judah	Hydrographer, American Falls Reservoir Basin
Helen George	Clerk and office assistant, Idaho Falls office
Mrs. Snow Coffin	" " " " St. Anthony "

MAP OF WATER DISTRICT No. 36 SHOWING PRINCIPAL STREAMS AND GAGING STATIONS

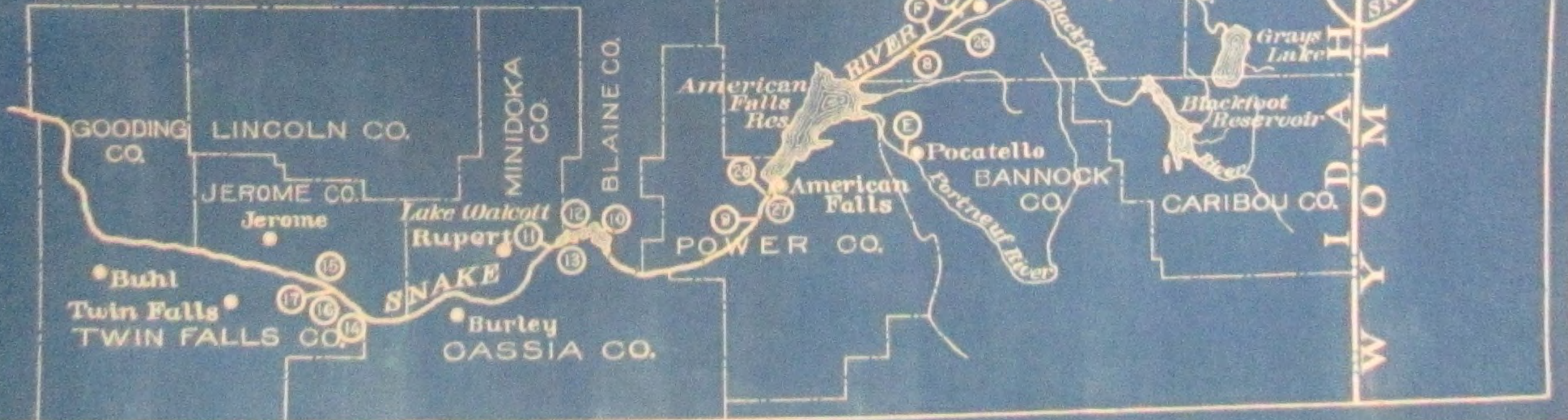


NO. REGULAR STATIONS

- 1 Jackson Lake at Moran Wyo.
- 2 Snake River near Moran Wyo.
- 3 Snake River near Heise Ida.
- 4 Great Feeder Canal near Ririe Ida.
- 5 Snake River at Lorenzo Ida.
- 6 Snake River near Shelley Ida.
- 7 Snake River near Blackfoot Ida. (Blackfoot Bridge)
- 8 Snake River at Clough's Ranch (formerly listed as near Blackfoot)
- 9 Snake River at Neeley Ida.
- 10 Lake Walcott near Minidoka Ida.
- 11 Snake River near Minidoka Ida.
- 12 North Side Minidoka Canal near Minidoka Ida.
- 13 South Side Minidoka Canal near Minidoka Ida.
- 14 Lake Milner at Milner Ida.
- 15 North Side Twin Falls Canal at Milner Ida.
- 16 South Side Twin Falls Canal at Milner Ida.
- 17 Snake River at Milner Ida.
- 18 Henrys Lake Reservoir near Lake Ida.
- 19 Henrys Fork near Lake Ida.
- 20 Henrys Fork near Ashton Ida.
- 21 Henrys Fork at St. Anthony Ida.
- 22 Henrys Fork near Rexburg Ida.
- 23 Fall River near Squirrel Ida.
- 24 Fall River near Chester Ida.
- 25 Teton River near St. Anthony Ida.
- 26 Blackfoot River near Blackfoot
- 27 American Falls Reservoir at American Falls Ida.
- 28 Snake River at American Falls Ida.

AUXILIARY STATIONS

- A Snake River at South Boundary Yellowstone Park.
- B Henrys Fork at Warm River Ida.
- C Warm River at Warm River Ida.
- D Robinson Creek at Warm River Ida.
- E Portneuf River at Pocatello Ida.
- F Snake River at Robertson Ranch.



Bruno Albert	Deputy Water Master,	Upper Fall River division
T. W. Luetjen	" " "	St. Anthony division
David I. Gardner	" " "	and hydrographer Teton River division.
Wm. Burton	" " "	Swan Valley canals
W. J. Kremer	" " "	Heise division
Wm. Sauer	" " "	Rigby division
J. W. Ensign	" " "	Idaho Falls division
Delbert Taylor	" " "	Blackfoot division
T. E. Culley	" " "	Minidoka Dam
W. N. McConnel	" " "	and hydrographer, Milner Dam
J. M. McGinn	Gate Tender,	Henry's Lake Dam
Joseph Markham	Superintendent,	Jackson Lake Dam
Frances W. Herre	Forwarding Agent,	Ashton, Idaho.

Mrs. J. L. Carter, Harold Fuqua, Mrs. Irvin Siepert, W. H. Kremer, W. H. Davis, J. A. Clough, A. J. Ayers and H. B. McConnel, Gage Readers.

DESCRIPTIVE OUTLINE OF 1927 DISTRIBUTION

The monthly surveys of the snow accumulated on the area tributary to Jackson Lake, which have been made by Joseph Markham each winter beginning with 1920, early in 1927 indicated that the summer water supply would probably be above normal. Reservoir inflow was retarded somewhat by the unusually cool weather which was generally noted throughout April and May but this same condition was no doubt responsible to a considerable degree for the very well sustained character of the normal stream flow later in the season.

Both Jackson Lake and American Falls Reservoirs were practically empty at the close of the 1926 season but in spite of the fact that they were so operated as to reduce the peak discharges at lower river points, each was filled to capacity several days before there was any need for the release of stored water. This flood prevention value of Jackson Lake Reservoir, in particular, should perhaps be emphasized for the reason that it is so frequently overlooked

at times when the river still reaches a sufficiently high stage to cause damage to adjacent lands. For example, had no water been impounded during June the maximum discharge for the month at points between the dam and the mouth of Henrys Fork would have occurred about the middle of the month and would have been more than 6500 second-feet greater than the peak which was actually noted on June 28.

The normal stream flow sufficed to fill the demands for water until July 19 when all canals were ordered cut to record rights. A small amount of stored water was released on the preceding day but deliveries did not begin until July 20, the latest date for initial storage use which has been noted since 1918.

Diversions under permit and license rights as well as under some of the youngest decrees ceased on July 21.

Thereafter decreed rights were regulated in accordance with the following schedule:

July 29	Cut off rights having a priority date subsequent to	Mar.26, 1903
Aug. 9	" " " " " " " " " " " "	Oct.11, 1900
" 16	Reinstated rights having a priority date earlier than	Mar.26, 1903
" 17	" " " " " " " " " " " "	June 7, 1905
" 26	Cut off rights having a priority date subsequent to	Mar.26, 1903
" 30	" " " " " " " " " " " "	Oct.11, 1900
Sept. 1	General regulation terminated for the season.	

Attention should be called to the fact that both cuts and reinstatements, as listed above, apply particularly to upper valley canals. These, as a rule, were regulated slightly later than canals below American Falls, due largely to the attempt which was made to make some allowance for the so-called lag as provided in paragraph I of the 1927 river operation program (See page 1).

The following letter which was forwarded by Mr. Baldwin under date of August 30 to each of the members of the Committee of Nine,

describes conditions existing at that time and outlines the procedure adopted for river operation during the balance of the season:

"Throughout the entire summer of 1927 up to date, the normal flow of Snake River and its tributaries has been sufficient in amount to supply decreed rights with a priority earlier than October 11, 1900 and for most of the time it has been great enough to fill all rights having a priority earlier than March 26, 1903.

The situation at this time is very similar to that of 1925 except for the materially larger quantities of storage still available for use this year.

It would appear to be unwise to close the gates at the outlet of Jackson Lake until the hold-over storage has been reduced to about 500,000 acre-feet, which condition will not be reached at the present rate of draft much before September 15. Very little of this stored water is being used in the upper valley, however, and with the further material decrease in demand by the canals which may be expected hereafter it seems hardly necessary to attempt to maintain regulation in this section after the end of the present month.

Therefore, if there is no serious objection on your part, I propose to follow the precedent established in other years of favorable water supply and discontinue the services of most of the deputy water masters as well as two of the hydrographers effective August 31, 1927.

Under this program the remaining hydrographers will be able to secure occasional gage readings and measurements at each of the canal stations throughout September to an extent which will make approximate discharge computations possible by interpolation for missing dates.

While the data thus secured will of course be less accurate it is believed the material saving in expense accomplished will warrant the changed procedure, especially since continuous records will be maintained at the river stations.

This plan has been discussed with Chairman Hart and with one or two other members of your committee who all felt that it should be carried out and that conditions did not warrant the calling of a special meeting for the purpose of ratification.

I hope that those of your number whom it has not been practicable for me to see in person will advise immediately if they have any objections and that you will all continue to feel free to offer comments and suggestions at any time concerning the work."

While regulation would doubtless have been continued until nearly the middle of September, had there been no surplus storage available, the actual removal of restrictions on the earlier date did not result in any material increase in the amount diverted. In fact, with the arrival of cooler weather following the heavy rains noted about September 9th, there was a pronounced decrease in the water used and in consequence a considerable amount of stored water was purposely wasted past Milner Dam.

Draft upon Jackson Lake Reservoir ceased on September 19 and with hold-over storage amounting to 503,320 acre-feet, or the largest of record since the construction of the dam, the gates were closed to begin storage for the next season.

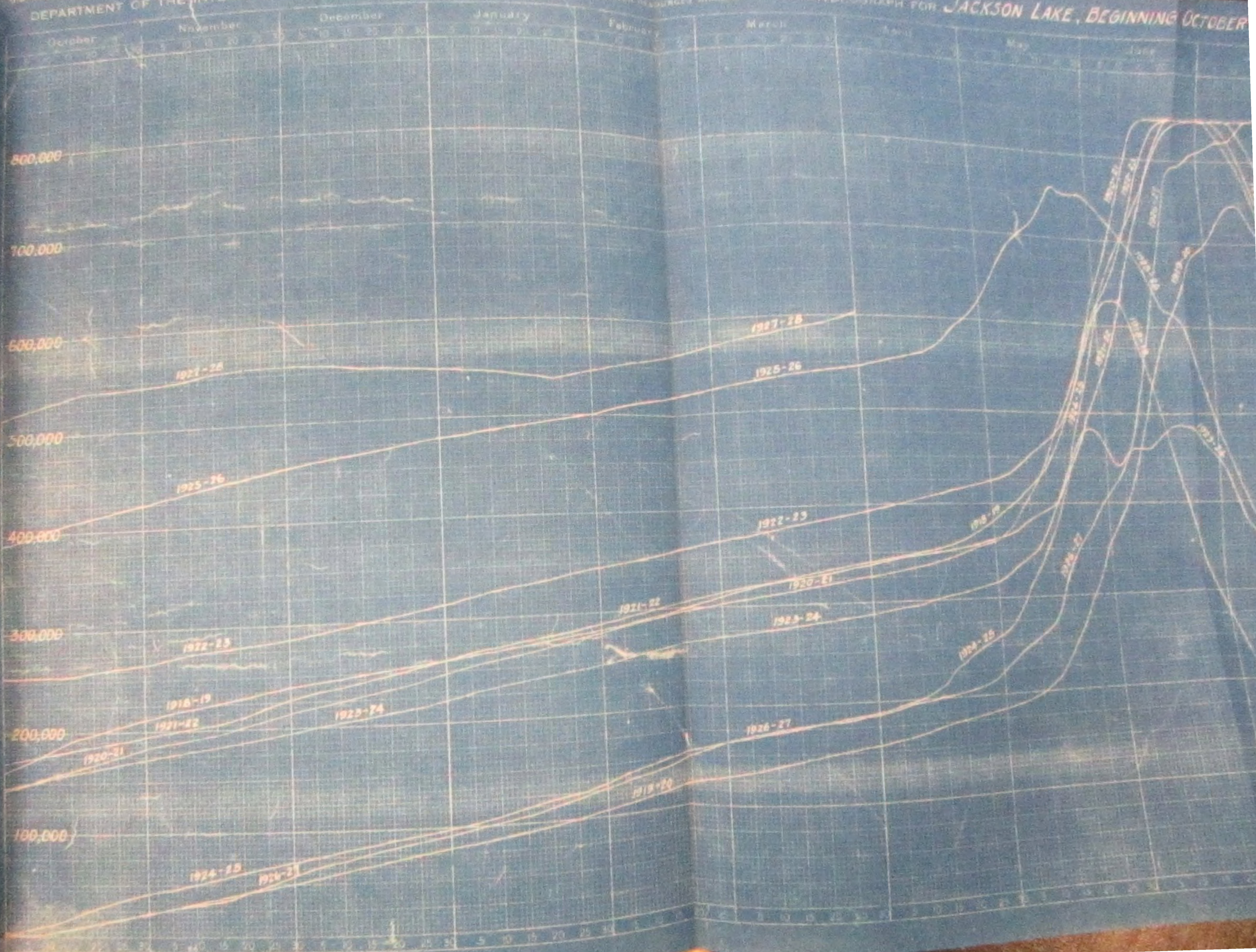
In December 1927 and January 1928, when it appeared that the filling of the reservoir would be certain without impounding all available flow, some additional water was released.

Plate II illustrates graphically the manner in which Jackson Lake was filled and drawn down during the period from October 1, 1918 to March 31, 1928. All graphs are plotted on the basis of 1919 capacity tables. (See 1925 report for similar graphs covering the period from November 15, 1914 to September 30, 1918).

WATER SUPPLY

If the comparison of annual run-off at the Moran and Neeley gaging stations which has been included in the seven preceding reports, is extended to include the year ending September 30, 1927 the data may be summarized as follows:

STORAGE IN ACRE-FEET



HYDROGRAPH FOR JACKSON LAKE, BEGINNING OCTOBER 1, 1918. PLATE II

Station No. _____
Elev. _____



Station	Mean annual run-off for 24 years ending September 30, 1927	Run-off for year ending September 30, 1927	% of Mean
Moran	1,107,000	1,417,000	128.0
Neeley	6,522,000	6,470,000	99.2

In this tabulation all Moran records beginning with the year 1910 have been corrected to take account of the storage in Jackson Lake which has been held over from one climatic year to another. Neeley records, on the other hand, represent actual totals measured at the gaging station except during the last two years of the period when adjustments have been made to take into account the American Falls Reservoir hold-overs. Variations in the amount diverted for irrigation, as well as in the quantity of inflow entering between the two stations, also affect the Neeley comparisons. If dependable corrections could be computed to cover all these different factors, their application to the Neeley data would undoubtedly make the records at the latter station more consistent with those at Moran. This has not been attempted because the development of such corrections from the data available would be difficult, if not almost impossible, and for the further reason that total annual run-off is often not a true measure of summer water supply.

Additional information concerning the latter together with comparisons showing the relative normal flow supply and use by months will be found further on in the text of this report and in the tables on Plate XVIII.

This total annual run-off from the drainage area above the Moran station was the largest for any year since the one ending September 30, 1913 while the Neeley records, without attempting detailed analysis of the intervening factors, indicate the largest total for any year since the one ending September 30, 1918.

STORAGE VERSUS FLOOD WATER DIVERSIONS

Because of the fact that both Jackson Lake and American Falls Reservoirs were filled to capacity some time before the regulation of normal flow diversions began, no conflict as to the right to store water under state permits as opposed to direct flow use under prescriptive or non-record rights existed during the 1927 season.

A small unauthorized increase in the Henry's Lake storage attributable to inattention on the part of the local gate-tender was adjusted before the end of the regulation period.

DOMESTIC WATER

The practice first inaugurated in 1920 of making no allowance of water for domestic or culinary use to canals whose entire rights had become invalidated, was again continued.

Ample stored water was available to make up all deficiencies and, in the very few instances where ownership rights were inadequate, this was purchasable for 1927 use upon very reasonable terms. One sale of 2,000 acre-feet at \$0.35 per acre-foot and a few of smaller amounts at unknown prices constituted the total of such transactions for the season.

TEMPORARY TRANSFERS AND EXCHANGES

In view of the protest filed at the annual water master election of March 7, 1927 by the Fall River Irrigation Company and others (see page 2) a request was made by the water master for a departmental ruling as to whether or not temporary transfers or exchanges of normal flow for storage would be permissible during 1927.

The following paragraphs quoted from a letter dated March 12, 1927 and signed by Geo. N. Carter, Commissioner of Reclamation are self-explanatory:

"Especial reference is made to the matter contained in the second paragraph of your letter; namely, request for a statement from me as to the position which will be taken upon the question of temporary transfer of water and exchange of normal flow for storage, as this matter has been before the waterusers of District 36 in the preceding years and particularly the year 1926.

So far as I am aware at this time, I am quite fully convinced that the position taken upon this question by W. G. Swendsen, former Commissioner of Reclamation, is sound, and I do not expect to deviate therefrom, as same is quite fully set out in his letter of March 17, 1926, addressed to you as watermaster of Water District 36.*

In accordance with the foregoing, it is my understanding that unless and until the protest voiced by the Fall River Irrigation Company and others, at the regular annual meeting, is removed, there is no authority for you, as watermaster, to allow the temporary transfer of water, or the exchange of normal flow for storage."

No attempt was made therefore to utilize either of these practices at any time during the season.

Under the authority conferred by Section 5560 of the Idaho Compiled Statutes normal flow of Fall River was substituted for storage released from Jackson Lake Reservoir in order to make delivery of the letter to the Enterprise Irrigation District, all in accordance with the procedure adopted in previous years.

*See pages 5 and 6 of 1926 report on Water Distribution and Hydrometric Work in District No. 36.

LITIGATION

In April 1927 the Twin Falls Canal Company started a suit in the District Court of the Eleventh Judicial District against George N. Carter as Commissioner of Reclamation and G. Clyde Baldwin as both Deputy Commissioner of Reclamation and Water Master of District No. 36, for the purpose of abrogating or changing the interpretation heretofore given to the so-called Foster Decree in which the principal water rights of all lower valley canals are fixed.

Since the proposed changes would chiefly affect the rights of the Minidoka Project of the U. S. Bureau of Reclamation, a motion was filed asking that the Secretary of the Interior be made a party defendant in the action. After a hearing before Judge Wm. A. Babcock at Twin Falls, Idaho, on June 1, 1927, this motion was granted. Shortly thereafter, upon motion by attorneys representing the interests of the Government, the case was removed from the State to the Federal District court. It is now understood that a demurrer has been filed by the plaintiffs for the purpose of having the case remanded to the jurisdiction of the State courts but no date for a hearing or argument on this demurrer had been set at the time this resume was written.

The status of all other pending litigation pertaining to the administration of Water District No. 36 remains practically as outlined on pages 17 to 19 of the 1926 report, although some progress is understood to have been made during the past year toward the settlement, by stipulated agreement, of the Woodville or "High Water Decree" case.

GROS VENTRE FLOOD

At about 10 A. M. on May 18, 1927 the large landslide which on June 23, 1925 blocked the channel of Gros Ventre River at a point about two miles above Kelly, Wyoming, suddenly gave way and released some sixty thousand acre-feet of impounded water. The resultant flood caused the death of six persons, practically wiped out the small settlement of Kelly, carried away several important bridges and caused extensive damage to farm lands, irrigation structures and highways within its path.

The flood peak reached the Heise gaging station at 10:50 A. M. May 19 and is estimated to have been equivalent to a discharge of about 60,000 second-feet (uncertainty as to the time when portions of the controlling Anderson Dam washed out makes exact discharge determination impossible). Below this point, in the more open valley, the river overflowed considerable areas of farm land and thus flattened out or spread the short duration maximum to such an extent that little damage resulted at points below Rigby and Lorenzo. In fact the flood peak reached at the Woodville gaging station below Idaho Falls was by no means abnormal and was later exceeded during the ordinary June high water period.

Much of the large amount of drift brought down at this time grounded upon bars in the river channel between Heise and Lorenzo. The net result seems to have been the direction of the main river current more to the southward with consequent increased danger of developing a new channel across the country toward Rigby.

Had the extreme high discharge been continued over a much longer period of time something of this kind would almost assuredly have occurred.

Even now the upper valley is still menaced by this southward trend of the river which, aside from the actual damage at the time, represents the most serious result of the flood.

The lake created by the original slide is now so reduced in size and capacity as to offer little potential danger for the future unless it should be enlarged as a result of new slides - a contingency by no means unlikely if the unstable appearance of the adjacent terrain affords any criterion.

CANAL DELIVERIES

The amount of water diverted daily through each canal heading in Snake River* during the period from June 1 to September 30, 1927 is shown on Plates III, IV, V and VI.

Following the practice inaugurated in the 1919 report, except for a few of the smaller canals where estimates were used, all data were recomputed prior to their presentation herein. This practice affords opportunity to more thoroughly analyze the records at each station than is possible in the limited time available during the field season. Wherever changes in rating have been noted, either because of the growth of vegetation, variation of checks or for any other reason, all meter measurements, notes and other information have been carefully reviewed to the end that the final computed data

*By a decision of the Board of Geographic Names the stream known locally as South Fork of Snake River is considered to be the upper portion of the main stream and given no other designation than Snake River.

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM SNAKE RIVER FOR SEPTEMBER 1927.

Table with columns for canal names and days 1-30, plus a Total column. Rows include various canal names like 'MAY & WILSON CREEK', 'HARRISON', 'CONSOLIDATED FEEDER', 'RESERVATION', 'SMITH MAYWELL', 'NORTH SIDE MINIDOKA', 'PALATRAL', 'NORTH SIDE TWIN FALLS', and 'TOTAL TWIN FALLS CANALS'.

may represent the most reasonable interpretation of these changes, particularly as regards time. On days when more than one stage has been observed mean discharges have been recorded. Daily summaries showing the total diversions between river gaging stations have also been included.

River riders were employed continuously from June 1 to August 31 and for this period records are based upon daily gage readings at each station. September discharges depend upon less regular and generally less frequent readings with data for intervening dates supplied through interpolation or by estimates.

Following the practice of preceding years, the small river channel from which the Morgan and Rostan canals divert, was completely dammed off on July 19. Thereafter no attempt was made to either regulate or record the flow through these ditches.

Laterals which divert from several of the canals above the main gaging stations are, in these tables, in each case included with the flow in the main canal.

The canals are listed by divisions, each of which represents the territory covered by a deputy water master or river rider. The canals of each division in general are shown in down stream order.

RIVER DATA

The extensive tables found on Plates VII and VIII summarize data in regard to total flow, normal and stored water segregation, diversions, losses and gains for each section of the river between Jackson Lake and Milner.

These tables are prepared upon the following time interval basis:

Time from Jackson Lake In Hours	Gaging Station	Period used for comparable daily means.
0	Jackson Lake and Moran	Day ending at 4 a. m.
24	Heise	Day ending at 4 a. m.
28	Lorenzo and Rexburg	1st day following Day ending at 8 a. m.
42	Woodville	1st day following Day ending at 10 p. m.
50	Blackfoot Bridge	1st day following Day ending at 6 a. m.
53	Blackfoot (Robertson)	2nd day following Day ending at 9 a. m.
54	Blackfoot (Cloughs)	2nd day following Day ending at 10 a. m.
66 $\frac{1}{2}$	American Falls	2nd day following Day ending at 10:30 p. m.
68	Neeley	2nd day following Day ending at 12 midnight
92	Minidoka	2nd day following Day ending at 12 midnight
116	Milner	3rd day following Day ending at 12 midnight 4th day following.

This schedule is the same as the one adopted for the eight preceding years except that for American Falls the time from Jackson Lake has been lengthened from 66 to 66 $\frac{1}{2}$ hours to make the results coincide with those presented in the special investigation report of T. R. Newell. While not exactly correct for all stages of the river, the intervals listed are believed to be fairly representative of average conditions and in consequence have been used throughout the entire period of record.

The dates given on these two plates are those which agree most nearly with the midday hour on this schedule, but the discharges for all river stations have been computed from recording gage records

and agree exactly with the schedule. The summaries of diversions or canal totals are for the dates indicated on the tables.

Only stored water quantities are tabulated for the Lorenzo station. Complete segregation of flow would, in this case, involve consideration of all water by-passed through the Great Feeder and this could hardly be shown satisfactorily without the addition of complicated tables to the already voluminous summary herein presented. Losses and gains between the Heise and Lorenzo stations were computed to determine the amounts deducted throughout the season as storage transmission loss and will be discussed further on in this report.

No attempt was made to deliver stored water from the small Emma Matilda and Two Ocean Lake Reservoirs of the Utah-Idaho Sugar Company although, during the latter part of the season, some water was released as a precautionary measure. For this reason the Twin Lakes column shown in the similar tables contained in previous reports has been omitted.

The outlet from the so-called Market Lake Springs was affected by back water from the river during a portion of the season but a sufficiently dependable record was secured to make certain that the inflow from this source was enough to supply the storage requirements of the Sheppard canal. No attempt has been made to include this record in the general tabulations both for the above reason and also because of the very small quantity of water involved (usually not in excess of 5 second-feet).

Hydrometric conditions at the Robertson station on Snake River were decidedly unfavorable during 1927 and little record of value was secured prior to August 1. Likewise, because of the overflow and by-pass of water during the high-water period, part of the data for Blackfoot Bridge are also considered unreliable. All of the records for the former station and a portion of those for the latter have therefore been omitted from these tables but most of the information available for both during August and September will be given in another part of this report (See Plates XIV and XV). Because of these facts columns have been inserted to show gains and losses from Woodville through to Cloughs as well as for the shorter sections introduced by using Blackfoot Bridge as an intermediate station.

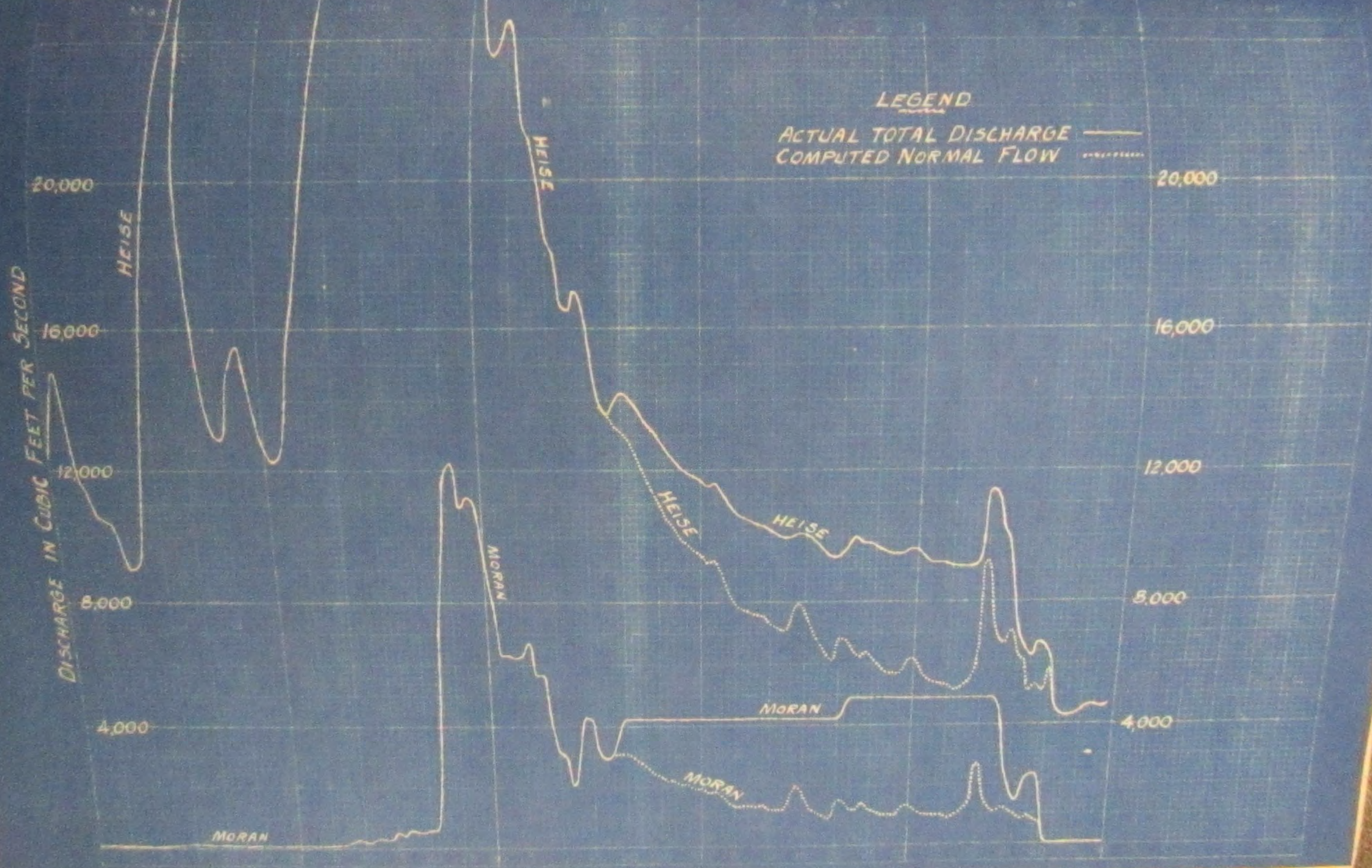
The American Falls Reservoir data, the measured and computed inflow between the Clough and Neeley gaging stations are all identical with these quantities as listed in the special report of T. R. Newell, to which reference has previously been made, and will be discussed in more detail in connection with the storage deliveries to lower valley canals.

In most other respects the river data presented herein conform and are consistent with the similar tables contained in former reports.

SEGREGATION OF FLOW

Plate IX shows graphically both the total discharge and the computed normal flow past the Moran and Heise gaging stations during the season of 1927. The difference between the total and normal flow graphs on any date, of course, indicates storage.

HYDROGRAPHS SHOWING TOTAL AND NORMAL FLOW AT THE MORAN AND HEISE STATIONS
1927 DISTRIBUTION WATER DISTRICT NO. 36 PLATE IX



These graphs are plotted from the special day discharges with the time interval adjusted to make them coincide with the nearest regular day at Heise. For example, the Heise data shown for July 20 really represent mean quantities for the 24 hour period ending at 4 a.m. on July 21, while the indicated Moran data for July 20 are means for the 24 hour period ending at 4 a.m. on July 20.

While these diagrams are merely a graphical representation of some of the numerical quantities contained in the tables of Plates VII and VIII, they will be of interest and perhaps of assistance in connection with the explanations and discussions which have preceded as well as those which follow.

The very uniform summer discharge past the Moran Station is indicative of what may be reasonably expected during future years of favorable water supply when most of the more exact regulation can be made at the outlet of the American Falls Reservoir.

While the pronounced peak shown on both the Heise total and normal flow and on the Moran normal flow graph for September 10 is due almost entirely to heavy rains, some of the later irregularities in the Heise normal are doubtless attributable to the failure of a single time interval to remain strictly applicable at all stages of river flow. (See page 24 of the 1926 report for more complete discussion).

The Gros Ventre flood is clearly shown at the Heise Station on May 19 although the mean discharge for that day (36,400 second-feet) extends beyond the edge of the sheet.

UPPER VALLEY STORAGE DELIVERIES

The amount of stored water released each day from Jackson Lake was determined from the reservoir capacity tables by noting the quantity corresponding to the daily decrease in stage indicated by the lake gage readings. Occasional irregularities in the latter, attributable to wind effect, were largely eliminated by short period interpolations or adjustments.

This method of determining the proportion of the total daily flow passing the dam and the Moran gaging station, which is stored water, has been in use for several years. Its use assumes a certain balancing of comparatively unknown factors. Normal flow rights should obtain the benefit of such natural storage as would have been created in the old lake during flood periods and they should not be required to stand the extra evaporation loss attributable to the larger flooded area of the present reservoir. On the other hand the storage owners should be credited with all the additional ground or bank storage which results from the increased elevation of the water surface in the lake.

The primary object of the investigations conducted during 1924 by Thomas R. Newell and for several years previous by employees of the U. S. Bureau of Reclamation was to secure a more accurate segregation between stored water and normal flow at the outlet of the reservoir. The data thus secured indicate that the method just described is not strictly applicable under all conditions of river flow and reservoir operation, but hardly suffice as yet to warrant the preparation and adoption of any more equitable plan of division.

The storage transmission loss schedule agreed upon for 1927 (which is the same as that used in 1924, 1925 and 1926) provided for flat deductions of 2.5 per cent between Moran and Heise, 0.5 per cent between Lorenzo and Woodville and 6.0 per cent between Woodville and Blackfoot Bridge, but after fixing a minimum of 3.0 per cent left the actual amount to be deducted for the section from Heise to Lorenzo to be determined by what is called the "two day mean method". Under this method the percentage loss actually applied each day is the mean of the computed losses for the two preceding days as these are evolved from the following equation:

$$\text{Percentage loss} = \frac{\text{Actual daily loss}}{\text{Approximate average flow in section}} = \frac{U + T - D - L}{\frac{1}{2}(U + T + L)}$$

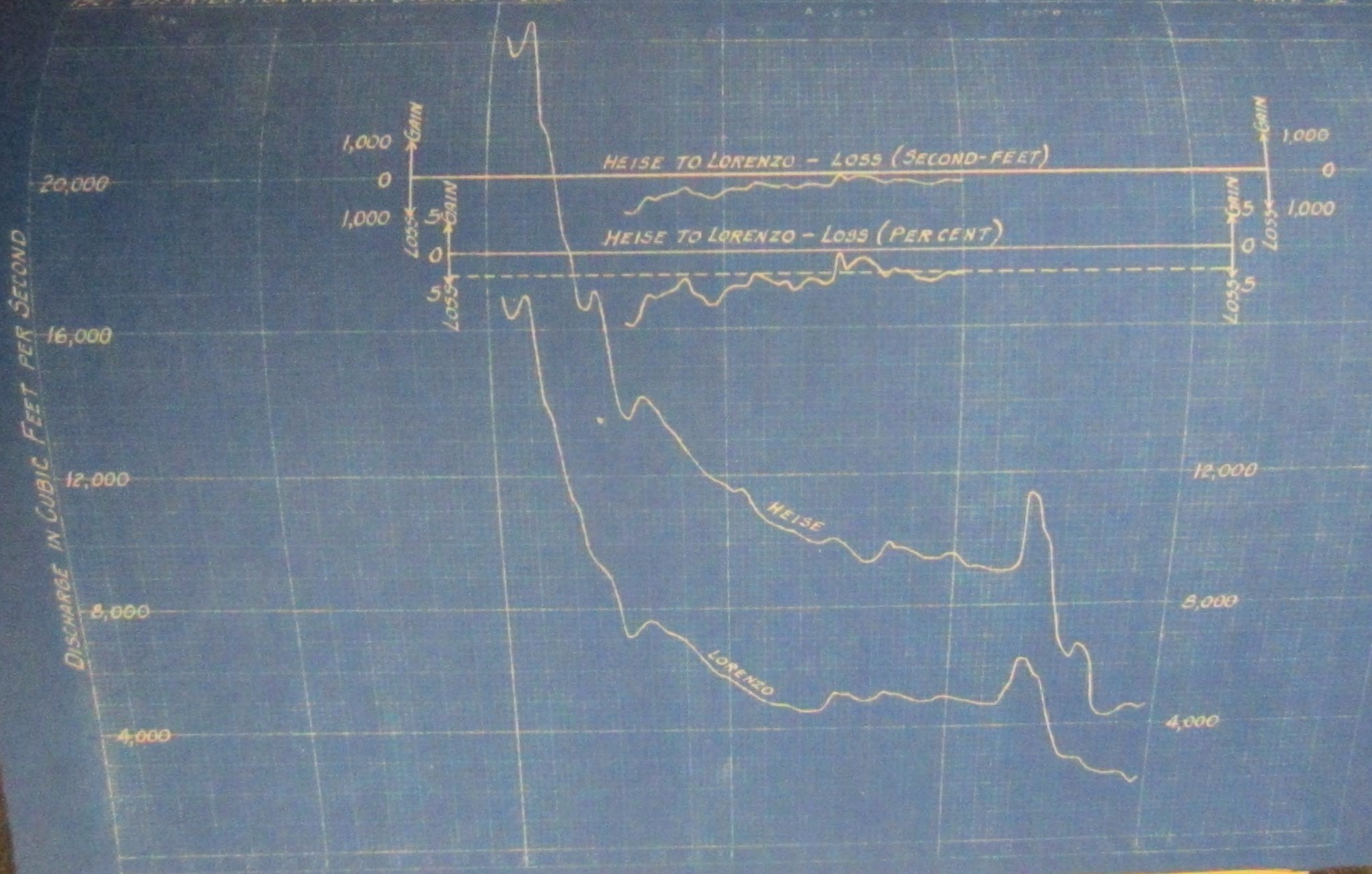
- Where U equals total flow at upper river station (Heise in this case)
- T " inflow from tributary streams entering within section
- D " total diversions throughout section
- L " total flow at lower river station (Lorenzo)

3.0 per cent, however, was always applied on days for which the mean loss, thus derived, was less than this amount.

Plate X contains hydrographs for both the Heise and Lorenzo stations together with curves, which exhibit the computed daily losses and gains between the two points, not only in percentage, but also in second-feet. These diagrams have all been adjusted to make them correspond to the nearest Heise dates.

Because of high water conditions dependable discharge data for Lowder and Bannock Jim Sloughs could not be obtained during the early part of the season with existing station equipment, while during September the employment of special gage readers to secure these readings was not deemed warranted. For these reasons the loss graphs cover only the principal stored water delivery period.

HYDROGRAPHS ILLUSTRATING NET LOSSES AND GAINS BETWEEN THE HEISE AND LORENZO STATIONS
1927 DISTRIBUTION WATER DISTRICT NO. 36 PLATE 7



The average loss applied prior to that month was used for September storage calculations. In percentage this amounted to 4.2610 in comparison with 3.9507 in 1926, 4.1763 in 1925 and 5.2424 in 1924. When the variations in water supply and in other factors involved in loss determinations are taken into consideration the close agreement of these different season averages is somewhat surprising and indicates that for the purpose of simplifying river operation the future use of 4.4076 per cent or the mean of these four years might well be agreed upon.

Transmission deductions for all storage delivered to canals diverting above the Blackfoot Bridge gaging station were computed upon the basis of losses to Woodville, as specified in the purchase contracts. Obviously it would be impracticable to calculate losses to the heading of each individual canal and this group method was doubtless originally adopted to avoid the necessity for such procedure. Since more than half the Jackson Lake storage owned in the upper valley is diverted above the Woodville station and the balance within a distance of about twelve miles below that point, this plan would seem to be at least reasonably fair to all concerned. 1927 computations show that upon the basis of the final seasonal loss these canals should have received at their headgates 92.87915 per cent of the stored water turned out for them at Moran.

The Minidoka and Twin Falls canals were charged with pro-rata transmission losses to the Blackfoot Bridge station and on the basis of season deliveries were entitled to receive at their headgates 87.3064 per cent of the amounts released for them at the Jackson Lake outlet gates.

No losses were charged against the inflow from Market Lake Springs because this water was supplied to the Sheppard Canal and diverted immediately below its point of entrance into the river.

Plate XI shows 1927 daily and total storage deliveries together with summaries of the season allocation of both Jackson Lake and American Falls storage.

Attention is directed to the fact that no minus quantities appear in this table or in any of the stored water diversion columns on Plates VII and VIII. Exchange of normal flow for storage was not permitted and in consequence it was unnecessary to indicate any credits for underdraft. In the daily reports prepared during the summer, plus and minus storage items were still used to some extent to simplify the bookkeeping but it now seems possible that even this practice may be largely, if not entirely, eliminated under similar conditions in the future.

Equitable segregation of stored water deliveries to lower valley canals as between the three principal reservoir sources of supply has become almost impossible and has not been attempted in this summary. So long as the distinction between normal flow and storage is maintained and the relative values of those items are known, it does not appear to be vital whether the Twin Falls Canal Company, for instance, is supplied with stored water from Jackson Lake, American Falls or even Lake Walcott, provided their use during any period in question is limited to their total storage rights.

In order to afford comparison between season use and storage available, all upper valley totals have been shown upon a

	JULY	20	21	22	23	24	25	26	27	28	29	30	31	AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
POPLAR IRRIGATION DIST.																														
PROGRESSIVE IRRIG DIST.																														
FARMERS FRIEND CAN. CO.	99	139	138	127	158	192	181	171	141	159	157	165	157	157	163	155	197	182	163	151	76	66	60	51	50	45	32			
ENTERPRISE CANAL CO.				19	25	3	39	23	3		48	35	29	29	57	65	51	53	23	7	68	60	62	60	62	55	15			
HARRISON CAN. & IRRIG CO.		13	30	21	32	23	19	19	10	12	30	29	26	35	31	25	24	23	21	21	17	3	2	2	2	2				
IDAHO IRRIG. DIST. (BOONER & IDAHO)	37	33	56	8	62	58	37	59	60	74	71	58	56	69	69	62	59	59	59	56	53	53	50	37	19					
RUDY CANAL CO.	36	81	112	127	134	117	130	105	107	117	119	104	109	102	98	91	63	98												
BURGESS CAN. & IRRIG CO.		11	6	8	25	35	32	19	37	60	75	73	73	68	64	69	66	66	42	7										
LOWDER CANAL CO.	58	102	122	146	114	114	106	90	82	118	122	122	126	146	118	86	82	78	82	94	90	78	58	98	30					
SUNNYDELL IRRIG DIST.																														
LENROOT CANAL CO.																														
REID CANAL CO.																														
ENTERPRISE IRRIG DIST.														4												55	55	54	42	47
DILTS CANAL CO.																														
BUTTE & MARKET LAKE CAN. CO.															60	101	100	101	100	100	102	101	103	102	103	103	103	103	103	
SHEPPARD & CO.																														
UTAH-IDAHO SUGAR CO.																														
J.D. KENNEDY																														
K.M. NANDORFF (BEAR ISL.)																														
G.D. SMITH		1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
NEW SWEDEN IRRIG. DIST.		127	161	158	153	151	147	145	139	136	141	135	132	127	124	124	120	119	114	107	99	87	84	74	68	50	31			
MARTIN CANAL CO.		13	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	20	20	20	20	
WOODVILLE CANAL CO.																														
SNAKE RIVER VALLEY IRR. DIS.	15	27	32	48	36	23	48	52	50	103	154	13			36	55	71	73	43	41	37	13								
TOTAL DIVERS. HEISE-WOOD.	245	547	702	694	743	791	766	710	659	810	948	765	744	861	894	889	848	830	648	596	561	565	513	524	410	312	25			
BLACKFOOT IRRIG. CO.																														
PEOPLES CANAL & IRRIG. CO.	10	97	63	10	49	7								5	3	3	1	10	20	18										
ABERDEEN-SPRING CAN. CO.																														
CORBETT SLOUGH DITCH CO.																														
TREGO DITCH CO.																														
TOTAL DIV. WOOD-BLACK.	10	97	63	10	49	7								5	3	3	1	10	20	18										
MINIDOKA PROJECT CANALS	679	904	914	914	914	904	904	904	1012	1554	1921	2040	2074	1940	1407	1369	1375	1534	2122	2460	2410	2310	2270	2260	2300	2275	15			
NORTH SIDE CANAL CO.	16	112	200	362	459	1001	1669	1902	2261	2724	2700	2746	2719	2661	2671	2673	2684	2672	2649	2682	2684	2708	2686	2599	2661	2674				
TWIN FALLS CANAL CO.	74	630	681	651	563	533	641	613	574	631	631	711	661	641	641	641	641	631	611	631	665	747	620	633	706	780				
MILNER LOW LIFT IRRIG. DIS.	101	101	93	88	95	97	97	81	96	99	101	103	95	101	98	84	94	94	78	94	94	97	97	92	94	96				
TOTAL LOWER VALLEY CANALS	870	1747	1888	2015	2031	2535	3311	3500	3943	5008	5353	5600	5549	5343	4817	4767	4794	4991	5460	5867	5853	5862	5673	5584	5761	5823				

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
224	108	103													
1	1	2	1	1	1										
	1	1	1	1											

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
225	110	106	2	2	1										

1723	1121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2323	2194	2014	9	9	9	9	9	9	9	426	536	580	10	10	84	139	61
14	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	12	12
84	82	83	0	0	0	0	0	0	0	78	79	82	0	0	84	86	86
										516	657	674	22	22	184	237	159

27	28	29	30	Oct 1	2	3	TOTAL SEC. FT.	TOTAL AC. FT.	J. LAKE EQUIV. AC. FT.	JACKSON LAKE FT. AC. FT.	J. LAKE AM. FT. AC. FT.	TOTAL SEC. FT.	TOTAL AC. FT.
							196	389	419	1200	700	196	389
							4150	8231	8862		14615	4150	8231
							908	1801	1939	2000	2000	908	1801
							544	1079	1162	6100	9800	544	1079
							1379	2735	2945	5000	11200	1379	2735
							1854	3677	3959		25200	1854	3677
							873	1732	1865	2000	2000	873	1732
							2462	4883	5257	5120	7000	2462	4883
							0	0	0	1040		0	0
							349	692	745	4000		349	692
							4	8	9	3000		4	8
							0	0	0			0	0
							1894	3757	4045		2000	1894	3757
							0	0	0		2000	0	0
							0	0	0		500	0	0
							61	121	130		2800	61	121
							0	0	0		14000	0	0
							0	0	0		365	0	0
							0	0	0		210	0	0
							24	48	52		70	24	48
							3335	6615	7122	5000	25200	3335	6615
							973	1930	2078	1500	2100	973	1930
							0	0	0		8400	0	0
							969	1922	2069	15000	28000	969	1922
							19914	39499	42528		14000	19914	39499
							296	587	632	3000	21000	296	587
										42685	36949		
											560		
											1400		
							296	587	632			296	587
							0	0	0	0	0	0	0
							86602	171773			88622	86602	171773
							139	61	10	10	10	139	61
							12	12	12	12	12	12	12
							5731	11367			5731	5731	11367
							86	86	0	0	0	86	86
							22	22	22	22	22	22	22

EXTRA WASTE 17237 34229
 UNALLOTTED
 UNITED STATES
 IDAHO POWER CO.
 TOTALS

PLA
 -NOTES-
 140% OF ORIGINAL PURCHASE
 ADDED TO COVER REPAIR
 ALLOWANCE.
 2000 ACRE FEET ADDITION
 PURCHASED FOR USE DURING
 THE BLACKFOOT IRRIGATION
 PERMANENT RIGHTS ACQUIRED
 CLOSE OF THE IRRIGATION
 INCLUDED.
 SEE SHEPPARD STORAGE OF
 TOTALS

1927	AMERICAN FALLS	TOTAL 1927
AMER. FALLS EQUIV. AC. FT.	RIGHTS EQUIV. AC. FT.	AMER. FALLS EQUIV. AC. FT.
88622	77372	285188
5731	281624	263949
19359	85000	141107
		28000
		631
		936125
		45000
		45000
		170000

	20	21	22	23	24	25	26	27	28	29	30	OCT. 1	2	3	TOTAL SEC. FT.	TOTAL AC. FT.	1 LAKE EQUIV. AC. FT.	JACKSON LAKE FT. AC. FT.	AMER. FALLS AC. FT.	TOTAL SEC. FT.	TOTAL AC. FT.		
															196	389	419	1200	700	1900	14000		
															4150	8231	8862			14000	14000		
															908	1801	1939	2000		2000	15900		
															544	1079	1162	6100		9800	16200		
															1379	2735	2945	5000		11200	25200		
															1854	3677	3959			25200	25200		
															873	1732	1865	2000		2000	2000		
															2462	4883	5257	5120		7000	12120		
															0	0	0	1040		1040	4000		
															349	692	745	4000		4000	4000		
															4	8	9	3000		4200	7200		
															0	0	0			2800	2800		
															1894	3757	4045			2000	2000		
															0	0	0			980	980		
															0	0	0			2800	2800		
															61	121	130						
															0	0	0			14000	14000		
															0	0	0				355		
															0	0	0			210	210		
															24	48	52			70	70		
															3335	6615	7122	5000		25264	30264		
															973	1930	2078	1500		2100	3600		
															0	0	0			8400	8400		
															969	1922	2069	15000		28000	43000		
															19914	39499	42528						
																				14000	14000		
															296	587	632	8000		21000	29000		
																		42685		36464	79149		
																				5600	5600		
																				1400	1400		
															296	587	632						
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86602	171773			88622	77372	285188	362560	
9	9	426	536	580	10	10	84	139	61	10	10	10	10	10	128068	254019			322571	281624	263949	545573	
1	11	12	42	12	12	12	12	12	12	12	12	12	12	12	30507	60510			97359	85000	141107	226107	
0	0	78	79	82	0	0	84	86	86	0	0	0	0	0	5731	11367					28000	28000	
0	20	516	657	674	22	22	180	287	159	22	22	22	22	22									
															EXTRA WASTE	17257	34229					631	631
															UNALLOTTED							936125	936125
															UNITED STATES							45000	45000
															IDAHO POWER CO.								
															TOTALS							1700000	

PLATE NO XI

NOTES

- 140% OF ORIGINAL PURCHASE. EXTRA 40% ADDED TO COVER REBATE STORAGE ALLOWANCE.
- 2000 ACRE FEET ADDITIONAL WATER PURCHASED FOR USE DURING 1927 FROM THE BLACKFOOT IRRIGATION CO. - ADDITIONAL PERMANENT RIGHTS ACQUIRED AFTER THE CLOSE OF THE IRRIGATION SEASON NOT INCLUDED.
- SEE ↓
- SHEPPARD STORAGE OMITTED FROM TOTALS

1927 AMER. FALLS EQUIPMENT AC. FT.	AMERICAN FALLS RIGHT AC. FT.	TOTAL 1927 AMER. FALLS EQUIPMENT AC. FT.
88622	77372	285188
322571	281624	263949
97359	85000	141107
	28000	28000
	631	631
	936125	936125
	45000	45000
	1700000	

887740

Jackson Lake basis while these of the lower valley have all been reduced to American Falls equivalents.

In the case of only three canals did the actual draft come within 10 per cent of the right available for use while the average stored water diversions (Government and Power Company rights excluded) amounted to but little more than a third of the supply which might have been drawn had the need for the water existed.

19,099 second-feet of stored water was wasted past Milner Dam during the season of which only 1635 second-feet can be classed as ordinary or unavoidable waste and 207 second-feet as loss due to maintaining Lake Milner at above normal stages to permit continued heavy draft by the North Side Canal Company. The balance of 17,257 second-feet together with 6,354 second-feet of normal flow may be considered as intentional waste which could easily have been avoided had there been any need for larger reservoir carry-overs.

The ordinary Milner waste was again prorated 5/11 against the North Side Canal Company and 6/11 against the Twin Falls Canal Company while the special 207 second-feet was all charged against the former. These items have been included in the individual daily deliveries as listed on Plate XI and account for the differences noted in comparison with the stored water diversions as shown on Plates VII and VIII.

Plate XII contains a supplemental summary or accounting for all lower valley storage and is largely self-explanatory.

The American Falls equivalent of the Sheppard & Company storage is set up to compensate for the fact that on Plates VII and VIII this item was erroneously included with the Jackson Lake

SUMMARY OF LOWER VALLEY STORAGE OR EQUIVALENT RIGHTS

CHARACTER OF RIGHT	MINIDOKA PROJECT	NORTH SIDE TWIN FALLS CANAL CO.	MILNER LOW LIFT IRR. CO.	OTHER INTERESTS	TOTAL SECOND FEET	TOTAL ACRE FEET
JACKSON LAKE	39009	141985	42854		223848	443995
AMERICAN FALLS	143782	133074	71141	14117	494969	857083
LAKE WALKOTT	5082					10080
NET GAIN NEELEY-MIL.	49448					98080
	9691					19221
TOTAL	247012	275059	113996	14117	494969	1145152

1927 UTILIZATION OF LOWER VALLEY STORAGE OR EQUIVALENT RIGHTS

AMERICAN FALLS EQUIVALENT SHEPPARD & CO. STORAGE	57	113
AMERICAN FALLS EQUIV. UNUSED JACKSON L. RIGHTS	91244	180980
OVERALL LOSS IN AMERICAN FALLS RESERVOIR	29582	58675
STORAGE USED BY LOWER VALLEY CANALS	250908	497669
HOLDOVER AMER. FALLS RES. END OF SEASON	70474	1397780
HOLDOVER AT LAKE WALKOTT END OF SEASON	51390	101930
EXTRAORDINARY WASTE PAST MILNER DAM	17257	34229
TOTAL	1145152	2271376

ERRONEOUSLY TREATED AS JACKSON LAKE STORAGE ON PLATES VII & VIII. SEE TEXT FOR FURTHER EXPLANATION.

INCLUDES 1635 SECOND FEET CONSIDERED ORDINARY WASTE PAST MILNER DAM AND PRORATED,
 892 SECOND FEET AGAINST TWIN FALLS CANAL CO.
 743 SECOND FEET AGAINST NORTH SIDE CANAL CO.
 AND 207 SECOND FEET SPECIAL WASTE DUE TO HIGH STAGE MAINTAINED IN LAKE MILNER. ALL CHARGED AGAINST NORTH SIDE CANAL CO. LTD.

NOTE
 ALL QUANTITIES IN ABOVE TABLES LISTED UPON A NEELEY OR HEADGATE DELIVERY BASIS.

diversions instead of being omitted altogether in the manner adopted for the corresponding inflow from Market Lake Springs. Correct segregation would increase the stored water passing the Clough Station, decrease the normal flow at Neeley and consequently increase the indicated lower valley stored water diversions all by the amount of 57 second-feet or an amount considered too small to justify the numerous revisions required.

The capacity tables indicated 1,710,080 acre-feet of storage to be available at American Falls when draft upon that reservoir began, while, at the same time, only 98,080 acre-feet were impounded at Lake Walcott. The latter has therefore been credited with the 10,080 acre-feet excess from the former in the interest both of equity and simplicity of records.

Under the interpretation which has been placed upon the Foster decree, normal flow to which all lower valley canals are entitled is measured at the Neeley gaging station while storage deliveries are computed, after due allowance for time interval, as the difference between total draft and normal flow.

Great importance is therefore attached to the equitable determination of the normal flow at Neeley. Although in former years this was a comparatively simple matter it has now, due to the American Falls Reservoir, become a very complex problem.

In anticipation of this difficulty, gaging stations were established at points above the reservoir flow line and the measurement of surface inflow to the basin was initiated by U. S. Bureau of Reclamation hydrographers in 1924. This work was continued during the two succeeding years and was supplemented in the last of

these (1926) by measurements and other data secured by employees of District No. 36 and of the Twin Falls Canal Company.

Analysis of the first two season's records indicated that about 53 per cent of the total inflow between the Clough and Neeley gaging stations was actually measured in 27 separate streams. Difficulty was experienced in attempting to use this coefficient for 1926 river operation and eventually it became apparent that only about 50% of the inflow was actually measured at the same stations during that year.

During 1927 arrangements were made, as previously described, for the continuation of this work under the supervision of Thos. R. Newell with assistance from C. T. Judah of the regular District No. 36 organization.

For operation use during the regulation period, the summation of measured inflow at these 27 stations was furnished daily by Mr. Newell but it was still necessary to rely upon the work of former years for a basis upon which to convert this quantity into total inflow. Further study showed that as the amount of the measured inflow decreased, so also did its proportional relationship to the total. Coefficients ranging from 55.2% with a measured inflow of about 1680 second-feet down to 51.5% with a measured quantity of about 1320 second-feet were thereafter applied according to the judgment of the Water Master.

In his report on the segregation of Water Resources in the American Falls Basin Newell develops the following formula as apparently applicable to 1927 conditions:

Total tributary inflow Clough's to Neeley = $4/3$ (measured gain Clough's to Neeley) + 840 second-feet.

This method therefore, rather than the more indefinite one previously described, has been used in the computations contained herein, so the two reports are entirely consistent.

Additional comment upon this subject together with a comparison of results obtained by the two methods will be included in connection with the discussion of Plate XVI.

The actual normal flow at the Neeley station is of course the sum of the corresponding quantity passing the Clough station and the total inflow or gain between the two points.

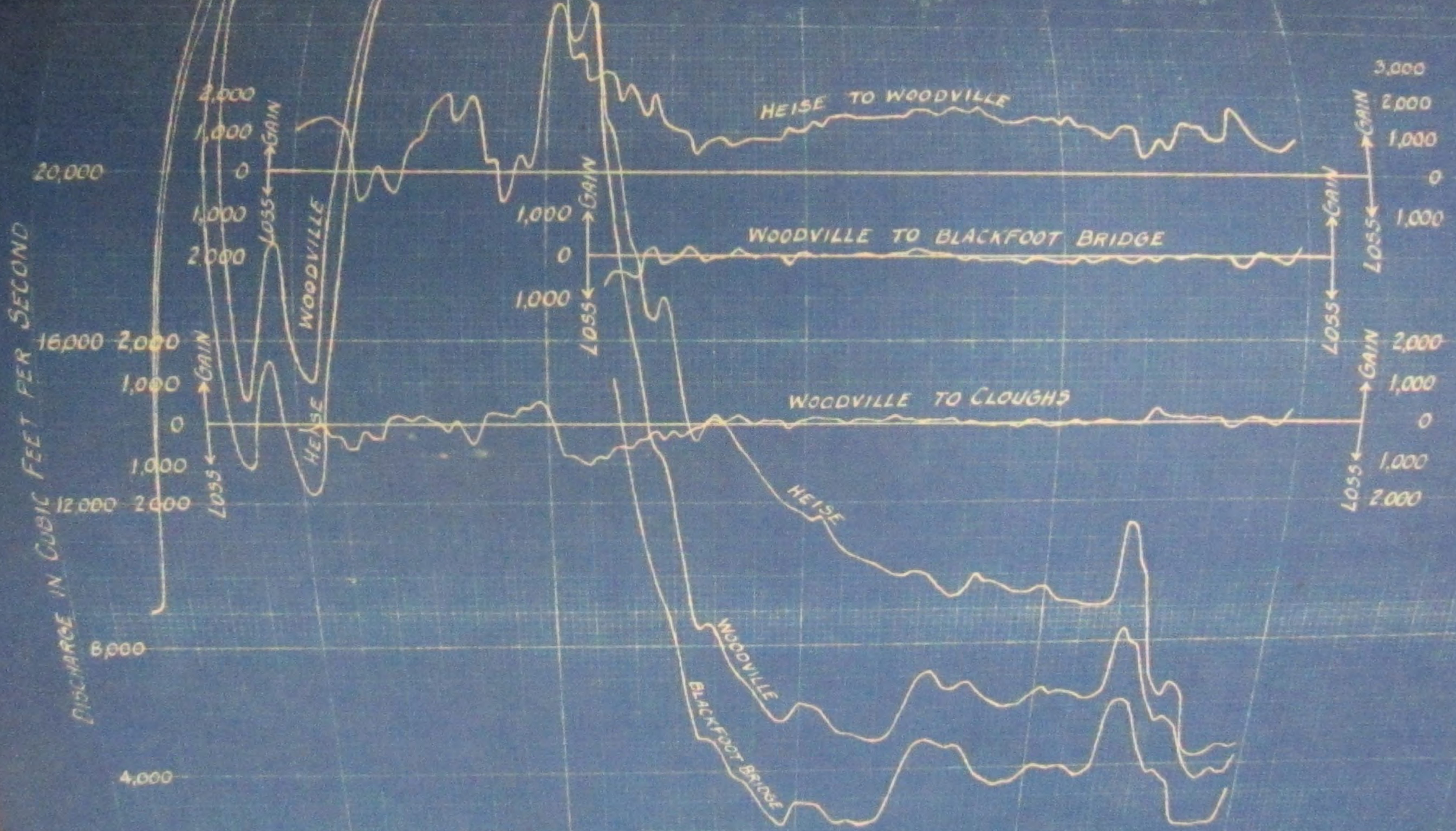
RIVER LOSSES AND GAINS

Losses and gains throughout different sections of Snake River are included in the data contained on Plates VII and VIII but the changes in the quantities and the relation which these changes have to the discharge of the river at different points are much more readily noted when indicated graphically.

Plate XIII contains hydrographs of the total flow passing the Heise, Woodville and Blackfoot Bridge gaging stations, together with graphs showing the net losses and gains in the two intervening sections and also in the section from Woodville to Clough's. The latter has been added because of the incompleteness of the Blackfoot Bridge record. All are plotted to the same scale and with a time interval allowance to make them coincide with Heise dates.

The general characteristics of these curves are not materially different from those of former years. The gain and loss curves are most irregular during periods of high discharge and rapid

HYDROGRAPHS ILLUSTRATING NET LOSSES AND GAINS BETWEEN THE HEISE AND CLOUGH GAGING STATIONS
 1927 DISTRIBUTION WATER DISTRICT NO. 36
 PLATE XIII



change of stage, with the previously noted trend toward a decrease in the gain or an increase in the loss accompanying a rapid rise in river stage and the reverse condition attendant upon a rapid drop, still in evidence. The extremely large gain noted between Heise and Woodville July 1-4 is probably attributable in part to errors in river station ratings, although at this particular time large increase in the waste from adjacent canal systems as well as in the ground water return seems reasonable.

Larger mid-season gains and correspondingly smaller losses than those of the preceding year are consistent with the more abundant water supply which was available throughout 1927.

At different times during the years 1921 to 1926 ten separate sets of measurements have been obtained covering surface waste and return flow entering Snake River between the Woodville and Clough gaging stations, all of which have been summarized and discussed in previous reports.

The following tabulation makes available the results of one more such investigation conducted during the 1927 season:

<u>Right Bank River</u>			<u>Left Bank River</u>		
<u>Name</u>	<u>Date</u>	<u>Amt.</u>	<u>Name</u>	<u>Date</u>	<u>Amt.</u>
Fugal Gulch	8/10	0.00			
Roadside	"	0.00			
Woodville Bridge					
#1	8/10	0.00	#1 (Snake River Valley)	8/10	0.80
#2	"	0.00	#2	"	0.30
#3	"	0.20	#2a	"	0.30
#4	"	0.10			
#5	"	0.00			
#6 (Woodville waste)	"	3.00			
#6a	"	0.00			
#6b	"	0.30			
#6c	"	0.50			

Right Bank River

Left Bank River

Name	Date	Amt.	Name	Date	Amt.
	8/10	4.00			
#7	"	0.50			
#7a (New Sweden)	"	0.10			
#7b	"	3.00			
#7c (New Sweden regular)		53.40			
#8					

Lower Shelley Bridge

#10	8/10	0.80	#3 (Snake River Valley)		
#11	"	2.00	#3a " " "	8/10	0.20
#12	"	0.60	#3b " " "	"	0.20
#13	"	0.10	#4 " " "	"	0.30
#14-25	"	0.30	#5-10	"	23.20
				"	0.00

Firth Bridge

#25a	8/10	0.90	#11	8/10	0.30
#25b	"	0.00	#12-15	"	0.00
#26 (New Sweden)	"	42.20	#16 (Nielsen-Hansen)	"	0.40
#27-29	"	1.70	#17-19	"	0.00
#30 (New Lava Side)	"	9.18	#20	"	1.00
#31 (Riverside)	"	1.00	#21	"	0.00
#32	"	0.00			

Porterville Bridge

#33-43	8/11	0.60	#22	8/11	2.65
#44 (Danskin)	"	16.80	#23	"	0.00
#45	"	0.20	#24 (Blackfoot Waste)	"	31.30
			#24a " "	"	3.50
			#24b " "	"	0.40
			#25 " Sewer)	"	0.60

Blackfoot Bridge

#46	8/11	0.20	#26	8/11	2.50
#47-51	"	0.40	#27	"	1.00
#52 (Trego)	"	18.67	#28	"	0.70
#52a (Thorsen)	"	0.00	#29	"	0.20
#53 (Parsons)	"	0.20	#30	"	1.00
#54 (Watson)	"	0.80	#31	"	0.30
#55 (Combined wasteway)	"	60.48	#32	"	2.00
#55a	"	0.60			
#56 (Peoples)	"	1.60			
#57	"	0.40			
#58	"	1.50			

Blackfoot Gaging Station (Cloughs) on Snake River ----- 73.35

Total Right Bank 226.33 Total Left Bank

These special return flow measurements have been made for the purpose of affording additional information concerning the reasonableness of the 6 per cent which has, for several years, been charged against stored water as transmission loss through this section of the river. The results obtained, however, can hardly be considered as in any sense conclusive because of the effect of preceding river conditions and, when reduced to percentage, of the marked variations introduced by the different amounts of total flow pertaining at the time of the particular investigation. For example; analysis shows actual net differences ranging in amount from an indicated net gain of 43 second-feet up to an average loss of 510 second-feet or from an apparent gain of 1.28 per cent up to a loss of 24.4 per cent. It should be noted also that the largest actual loss which was shown for the first test represents only 6 per cent because the average river flow in the section at that time amounted to about 8500 second-feet while the 24.4 per cent loss which is the result of the 1926 series of measurements corresponds to an actual loss of only 264 second-feet since the average total discharge of the river was then slightly less than 1100 second-feet.

If the 299.7 second-feet of surface waste measured or estimated during the 1927 test is added as measured inflow an apparent net gain in this section of 89.5 second-feet is changed to a net loss of 210.2 second-feet or 5.4 per cent of the approximate mean river discharge.

To arrive at really dependable average percentage losses would require carrying on these special measurements continuously (with recording gage records on all important wasteways) for a period of several years. However, the short time tests afford some additional

information and, if the 1924 and 1926 series which were made at extremely low river stages (under conditions which do not pertain when any appreciable quantity of storage is being run past Blackfoot) are excluded, indicate that the 6 per cent loss which has been charged is probably not seriously in error.

Plates XIV and XV afford a study of the gains and losses in the river sections immediately above and below the Robertson station and have been inserted as much to show the doubtful character of the 1927 record at this point as for any real value to be derived from the data.

Both the information on Plate XIV and the graphs on Plate XV correspond with the nearest calendar dates for the three stations involved. The Clough hydrograph has been added to the latter to facilitate the determination of the effect of changing river stage upon the gains and losses.

Examination of these plates shows immediately a very pronounced tendency toward increased gains between Robertson and Clough's as the losses become greater between Blackfoot Bridge and Robertson. This is particularly noticeable when the discharge at Clough's is in excess of about 3500 second-feet. At the same time the gain and loss graph from Blackfoot Bridge through to Clough's remains fairly uniform. The natural conclusion to be derived from these conditions is that too little water is shown by the Robertson record.

Possibly this situation may be due entirely to poor definition of the Robertson rating at higher stages but it might also be explained by some undiscovered by-pass of water which is non-existent when the river discharge is less.

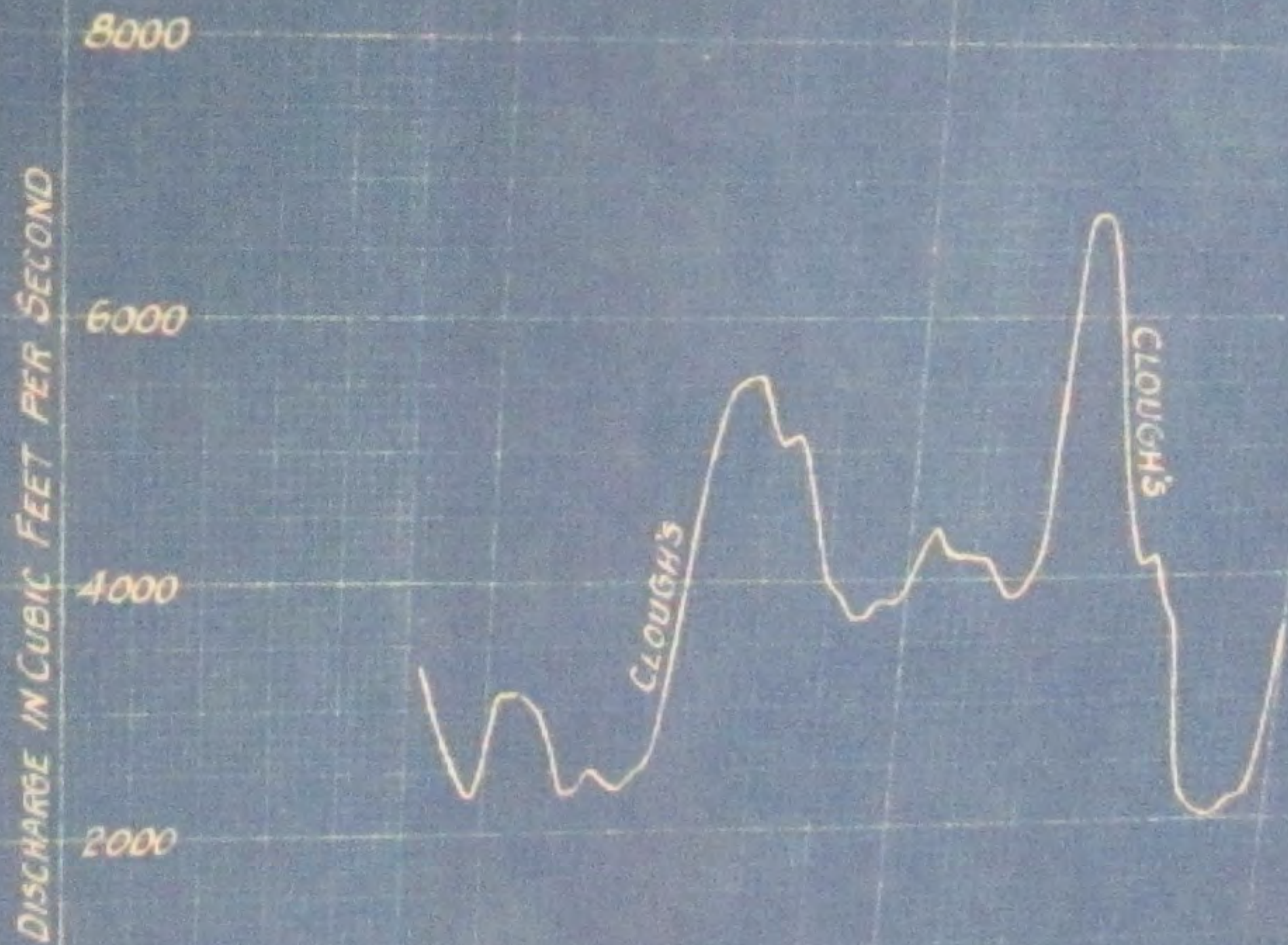
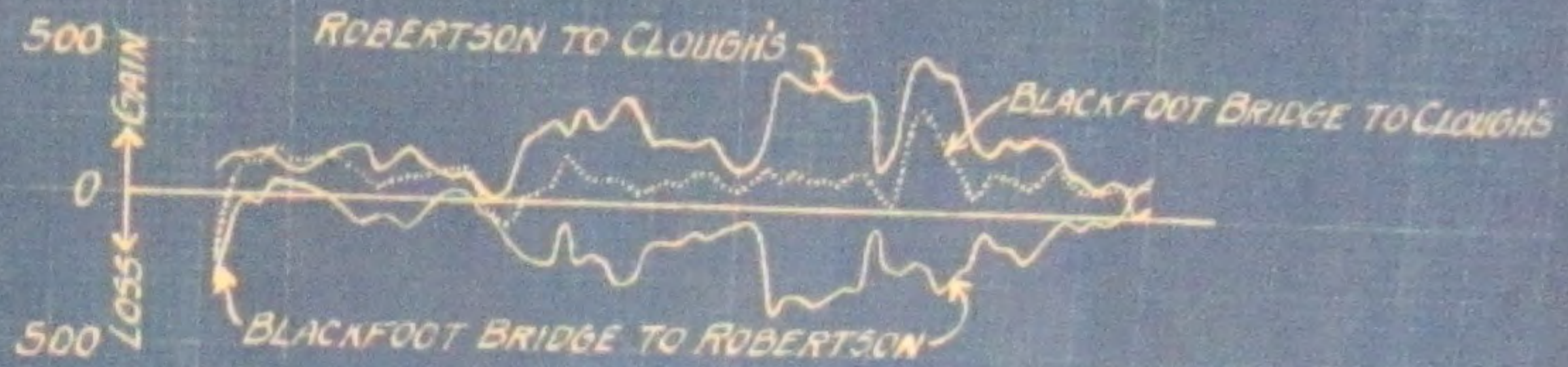
DEPARTMENT OF THE INTERIOR
 UNITED STATES GEOLOGICAL SURVEY
 WATER RESOURCES BRANCH

DISTRIBUTION WATER DISTRICT NO. 36
 GAINS AND LOSSES ABOVE AND BELOW ROBERTSON GAGING STATION

File (Washington
 Number (District

DATE	AUGUST						SEPTEMBER					
	BL. BR. MINUS S.M.CAN.	ROBERTSON LOSS	ROBERTSON PLUS BL. RIVER	CLOUGH'S GAIN	BL. BR. MINUS S.M.CAN.	ROBERTSON LOSS	ROBERTSON PLUS BL. RIVER	CLOUGH'S GAIN				
1	2885	2910	- 25	3025	3110	85	3864	3810	54	4109	4250	141
2	2856	2860	- 4	3004	3120	116	4036	3900	136	4113	4380	267
3	2820	2810	10	2919	3070	151	3985	3620	365	3737	4190	453
4	2758	2700	58	2790	2950	160	3952	3650	302	3748	4170	422
5	2490	2400	90	2484	2650	166	3979	3670	309	3769	4170	401
6	2232	2170	62	2230	2320	90	3979	3650	329	3709	4130	421
7	2207	2140	67	2236	2360	124	3824	3520	304	3556	3940	384
8	2238	2140	98	2339	2500	161	3679	3410	269	3458	3840	382
9	2160	2100	60	2283	2410	127	3753	3480	273	3571	3960	389
10	2134	2130	4	2245	2340	95	4012	3940	72	4080	4210	130
11	2212	2240	- 28	2368	2440	72	5406	5210	196	5449	5660	211
12	2260	2280	- 20	2456	2540	84	6099	5890	209	6289	6760	471
13	2683	2640	43	2865	2920	55	6139	5960	179	6238	6760	522
14	3358	3300	58	3662	3670	8	6009	5810	199	5995	6460	465
15	4040	3900	140	4449	4500	51	5403	5130	273	5300	5760	460
16	4543	4360	183	4904	5100	196	4627	4410	217	4586	4940	354
17	4867	4660	207	5236	5470	234	4138	3950	188	4168	4400	232
18	4931	4720	211	5279	5540	261	3740	3670	70	3912	4110	198
19	4864	4790	74	5342	5570	228	3760	3640	120	3906	4150	244
20	4747	4540	207	4934	5240	306	3536	3410	126	3606	3840	234
21	4684	4510	174	4804	5050	246	3350	3180	170	3350	3600	250
22	4739	4530	209	4810	5100	290	2454	2340	114	2466	2710	244
23	4602	4320	282	4523	4870	347	1938	1880	58	1974	2200	226
24	4197	3940	257	4110	4400	290	1890	1870	20	1951	2080	129
25	3810	3670	140	3794	3990	196	1874	1830	44	1915	2030	115
26	3665	3530	135	3648	3860	212	1877	1860	17	1958	2040	82
27	3496	3360	136	3490	3690	200	1948	1920	28	2058	2170	112
28	3426	3330	96	3506	3710	204	1928	1920	5	2107	2210	103
29	3490	3380	110	3624	3840	216	2153	2250	- 97	2642	2640	- 2
30	3496	3410	86	3666	3820	154	3102	3210	- 108	3596	3620	24
31	3665	3600	65	3849	3960	111						
TOTAL									4,441			8,064
			3,185			5,236						

HYDROGRAPHS ILLUSTRATING GAINS AND LOSSES IN SECTIONS ADJACENT TO ROBERTSON STATION
1927 DISTRIBUTION WATER DISTRICT NO 36.
May June



Measuring conditions are poor at nearly all stages and the known overflow or by-pass is so great as to make the station practically worthless during any really high discharge periods.

For these reasons it seems advisable not to place very much dependence upon the 1927 Robertson data.

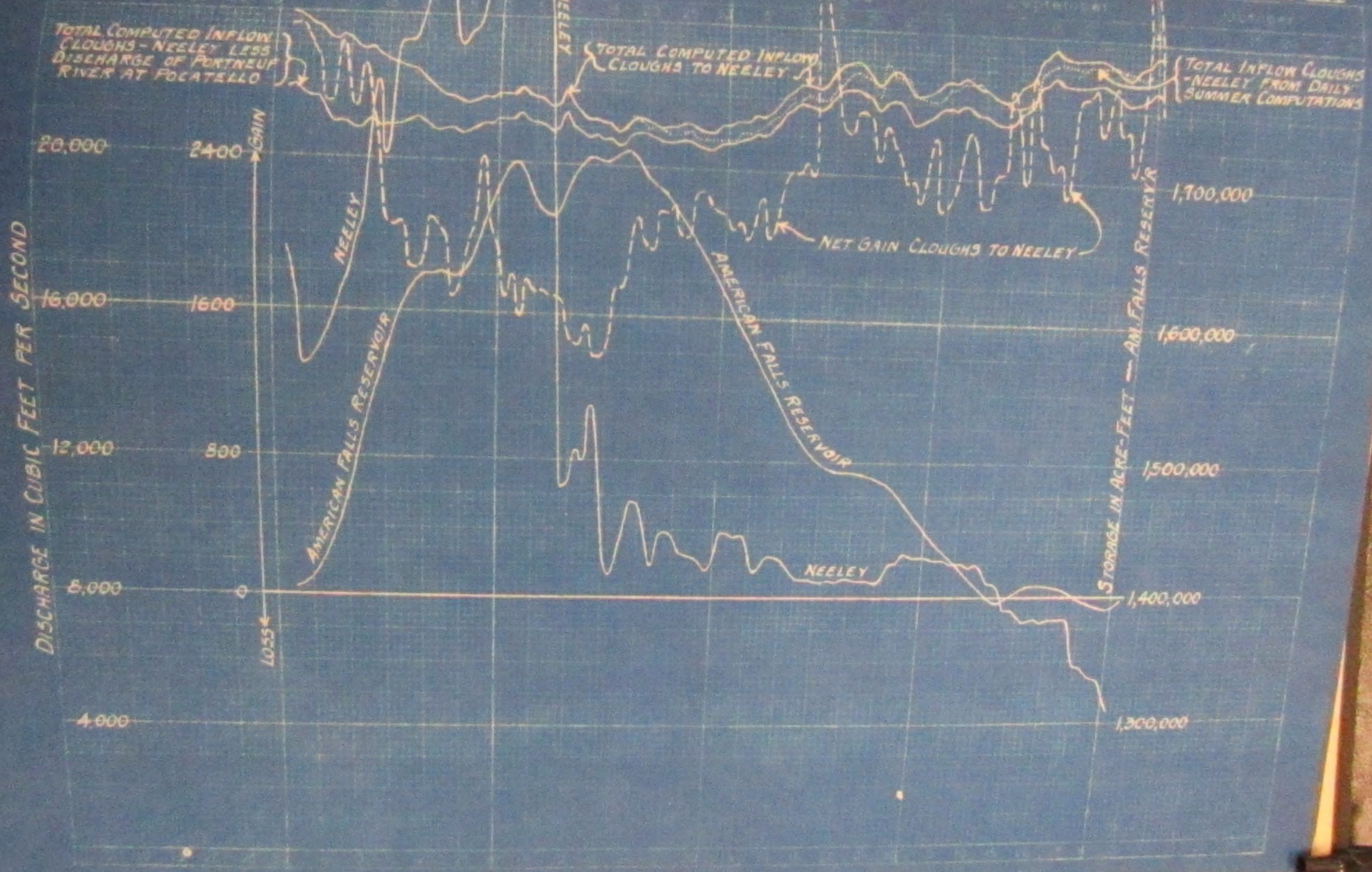
Plate XVI affords a graphical study of the inflow between the Clough and Neeley gaging stations and its relation to changes in the amount of storage impounded in the American Falls Reservoir. The Neeley total discharge hydrograph has been added for the convenience of those who may desire to make comparisons of reservoir inflow and outflow.

The dotted curve represents the total inflow as determined from day to day during the summer in accordance with the method described on page 28. While this curve crosses the one for the total computed inflow prepared from the Newell or final report data, the latter, in general, is slightly greater. For the period of comparative record this difference averages 42.8 second-feet or 1.5 per cent - a variation believed to be well within allowable range.

The graph showing the net gain between the Clough and Neeley stations introduces the reservoir factors and, as might be expected, is decidedly irregular. The difference between it and the total computed inflow represents the over-all or net loss through the reservoir, most of which is accounted for by the heavy evaporation. The fact that the losses are generally heavier on a rising than on a falling reservoir stage and are largest during mid-summer when the reservoir was practically full should be noted.

For more detailed study and discussion of the different factors affecting stream flow in this section of the river the reader

HYDROGRAPHS ILLUSTRATING COMPUTED AND NET GAINS BETWEEN CLOUGH AND NEELEY STATIONS
 1927 DISTRIBUTION WATER DISTRICT NO. 36
 PLATE XVI



is referred to the Nowell report issued during February 1928, to which reference has so frequently been made.

Before leaving this subject entirely, however, it may be well to repeat the table showing average June to September inflow in second-foot which was shown on page 40 of the 1926 report, with similar data for 1927 added:

Year	Gain	Year	Gain
1919	2340	1924	2279
1920	2435	1925	2495
1921	2529	1926	2456
1922	2564	1927	2693
1923	2701		

9 year average 2499

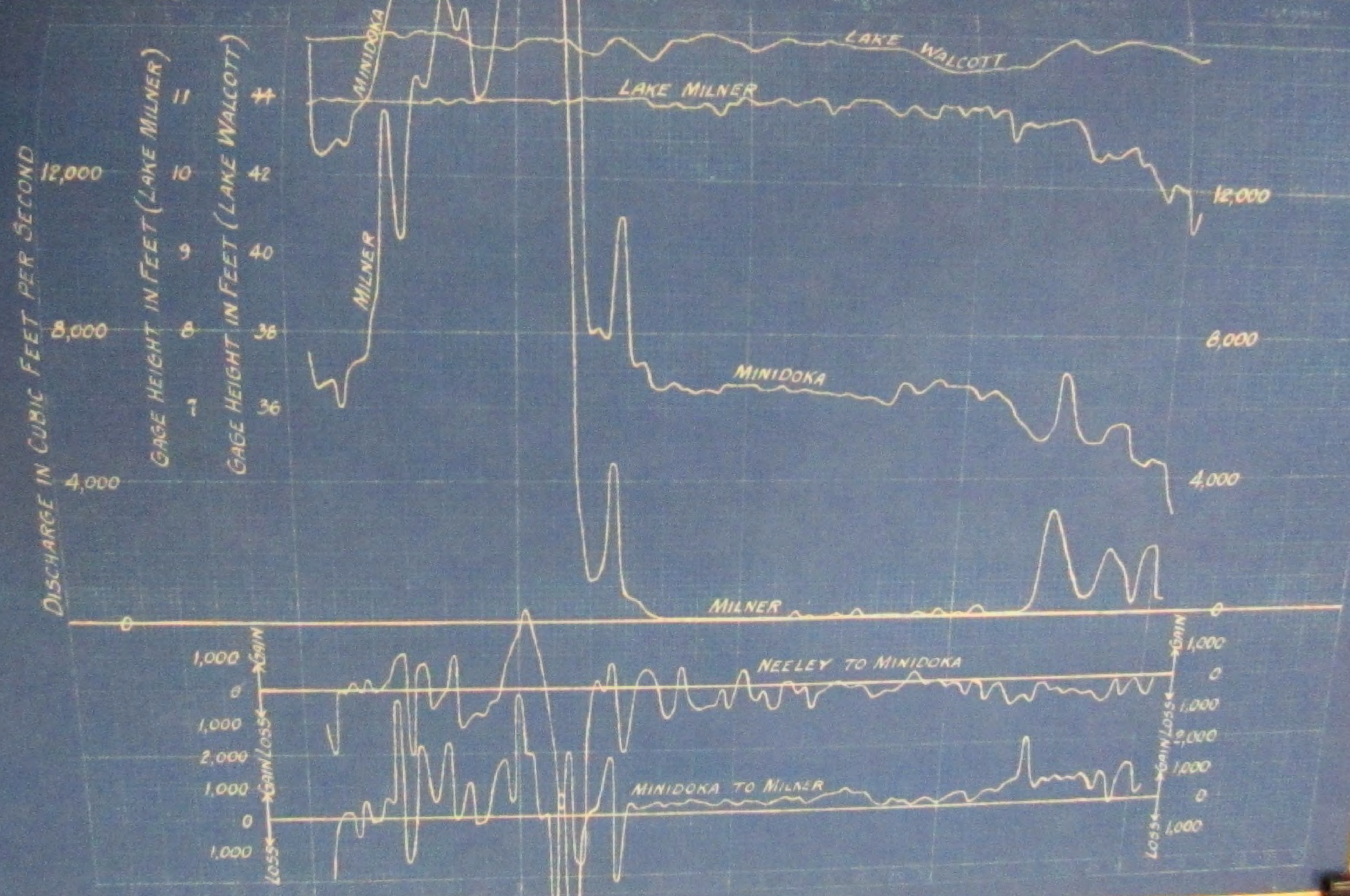
Note. Discharges in above table represent the total inflow between the Clough and Neeley stations (net gain for pre-reservoir years) less the flow of Portneuf River at Pocatello.

When the general water supply conditions during these years are taken into consideration, the 1927 data appear fairly reasonable and more consistent with the other records than 1923 which seems too large and 1925 which looks small.

Plate XVII shows net gain or loss graphs for the two sections between the Neeley and Minidoka and the Minidoka and Milner gaging stations respectively. It also includes curves showing the fluctuations in water surface elevation at both Lake Walcott and Lake Milner, together with hydrographs for the river stations below the Minidoka and Milner dams. All these are plotted to coincide with Lake Walcott or Minidoka dates.

The heavy September waste past Milner Dam has already been explained. (See pages 10 and 26).

HYDROGRAPHS ILLUSTRATING NET LOSSES AND GAINS BETWEEN THE NEELEY AND MILNER STATIONS
 1927 DISTRIBUTION WATER DISTRICT NO. 35
 PLATE XVII



Extreme irregularity of the gain and loss curves during the early part of the season is no doubt chiefly due to the fact that the time intervals used are too long for the high river discharges then experienced. With uniform stage changes of small magnitude a considerable error in time interval would have only a slight effect upon these graphs but when these variations are both sudden and large in amount the indicated gains and losses are bound to fluctuate over a much wider range.

The average net loss for the entire season for the section from Neeley to Minidoka amounted to 347 second-feet while for the corresponding period the average net gain recorded between Minidoka and Milner was 347.5 second-feet, making almost an exact balance for the combined section. The gain in the lower section is very consistent with that noted during 1925, the year which probably most closely resembles 1927 as regards water supply conditions, but the loss through the upper stretch is considerably larger than would be expected.

Possibly the unusually low stage in Lake Walcott (half capacity or less) which was maintained from October 1926 until the early part of February 1927, a condition which did not exist prior to the 1925 season, may have lowered the ground water table sufficiently to account in part for this heavier loss. At any rate these figures show no indication of the by-passing of water around the American Falls Dam.

During the 1927 storage delivery period (July 18 to October 1, Neeley dates), when the river station ratings were well defined and the gain or loss graphs more uniform, the records show an average daily

loss of 311 second-feet between Neeley and Minidoka and a mean daily gain of 438 second-feet between the latter station and Milner.

No very good opportunity existed to obtain data concerning the gain from bank storage which is to be expected when there is a material and rapid draft upon Lake Walcott.

NORMAL FLOW COMPARISON

The purpose of Plate XVIII is to afford a condensed comparison of the normal flow water supply available during the respective irrigation seasons 1919-1927 for the so-called Idaho Falls area. It consists of a table showing by months the principal component parts which make up the normal flow of Snake River and the extent to which water of this character is used in the territory between the Heise and Rexburg gaging stations at the upper end and the Blackfoot or Clough station at the lower end of this section.

The quantities listed are all summarized from the more extensive river data tables contained in District No. 36 Water Distribution Reports. Time intervals have been adjusted to correspond as nearly as practicable to Heise dates.*

The following brief explanation which is almost identical with that contained in the 1926 report is included for the convenience of the reader:

Columns 1-4 Sufficiently described by headings.

Column 5 Net gain in the section. To be complete it should probably have added to it the quantities contained in the same lines in Column 6.

*1922 and 1923 reports erroneously state that these records have been adjusted to correspond with actual canal diversion dates.

SUMMARY BY MONTHS OF NORMAL FLOW
 CONDITIONS BETWEEN THE HEISE-REXBURG
 AND BLACKFOOT GAGING STATIONS
 IRRIGATION SEASONS 1919-1927.

1927 DISTRIBUTION WATER DISTRICT NO. 36.

PLATE NO. XVIII

YEAR	HEISE NORMAL FLOW	REXBURG	BLACKFOOT RIVER	RETURN FLOW HEISE TO BLACKFOOT	NORMAL FLOW GAINS FROM STORED LOSS	TOTAL NORMAL FLOW SUPPLY	TOTAL DIVERSIONS	HEISE TO BLACKFOOT	STORED DIVERS.	HEISE TO BLACKFOOT	NORMAL FLOW DIVERS	HEISE TO BLACKFOOT	BALANCE AT BLACKFOOT STA.	NOR FLOW PASSING BLACKFOOT STA.
JUNE														
1919	241439	22477	400	-18994	16728	262050	264752	10493	254319	7731	7731			
1920	552010	84910	3205	-14579	0	625546	310026	0	310026	315520	315520			
1921	683677	153110	5039	-33854	0	807972	277462	0	277462	530510	530510			
1922	595489	113110	8190	-2304	0	714485	331545	0	331545	382940	382940			
1923	482579	90200	11597	23918	0	608294	262414	0	262414	345820	345820			
1924	303207	15476	201	10631	4577	334092	233547	-66484	300031	34061	34061			
1925	499874	123010	4830	25290	0	653004	314594	0	314594	338410	338410			
1926	273756	24483	78	12507	14003	324827	271980	-29310	301290	23537	23537			
1927	769629	222720	3547	22579	0	1018475	302135	0	302135	716340	716340			

JULY														
1919	121226	21652	14	-4693	12321	150520	180218	35521	144697	5823	5823			
1920	353997	31670	4810	8812	6048	405337	317285	7089	310196	95141	95141			
1921	308767	30480	3213	5651	7803	355914	323826	11031	312795	43119	43119			
1922	297375	31066	6471	25067	10796	370775	321988	4681	317307	53468	53468			
1923	365108	28661	5864	22459	10881	432973	328971	4020	324951	108022	108022			
1924	171278	17345	655	23098	9853	222229	255842	39689	216153	6076	6076			
1925	431518	82730	4470	38754	7175	564647	331306	3577	327729	236918	236918			
1926	161280	28155	54	18374	14360	222223	243236	24417	218819	3404	3404			
1927	500607	98850	3160	41057	2171	645845	357867	9368	348499	297346	297346			

AUGUST														
1919	98839	19894	78	3938	5123	127872	129054	2217	126837	1035	1035			
1920	177244	24553	5266	34866	6390	248319	259201	25851	233350	14969	14969			
1921	182975	35843	8209	29756	5620	262403	260670	10608	250062	12341	12341			
1922	192659	34222	6897	37086	7071	277935	252849	15156	237693	40242	40242			
1923	178904	28659	5979	35700	11008	260250	265384	23833	241551	18699	18699			
1924	101953	25686	16	13484	6060	147199	210169	67074	143095	4104	4104			
1925	213661	45400	5963	32383	15047	312454	281504	3753	277751	34703	34703			
1926	127966	28940	134	14822	5264	177126	198605	23454	175151	1975	1975			
1927	218894	43590	7688	45871	8748	324791	292973	10018	282955	41836	41836			

SEPTEMBER														
1919	87115	22501	345	2234	0	112195	107517	0	107517	4678	4678			
1920	66389	21130	2290	10585	521	100915	71638	0	71638	29277	29277			
1921	129235	50960	4525	26655	184	211559	149132	0	149132	62427	62427			
1922	133751	39758	1996	15950	0	191455	142769	0	142769	48686	48686			
1923	120623	30825	3798	23299	5571	184116	194718	22851	171867	12249	12249			
1924	87479	24983	503	15364	1890	130219	141596	15613	125983	4236	4236			
1925	142414	56000	9268	23884	2280	233846	150283	0	150283	83563	83563			
1926	95080	29468	1064	10731	2172	138515	142137	4869	137268	1247	1247			
1927	161014	53890	5027	30467	5566	255904	188009	885	187124	68780	68780			

NOTES: ALL DISCHARGE QUANTITIES LISTED IN SECOND FEET.
 * THEORETICAL; SEE TEXT FOR EXPLANATION.
 INCLUDES EMMA MATILDA AND TWO OCEAN LAKE STORAGE
 RECORDS FOR SEPTEMBER 1-15 (INCLUSIVE) ONLY.
 RECORDS FOR SEPTEMBER 1-28 (INCLUSIVE) ONLY.

- Column 6 If the storage transmission loss is correctly determined, any indicated normal flow gain from that source is really additional return flow. The quantities shown in this column reflect changes in transmission loss schedules which should be taken into account in comparing the data for different years.
- Column 7 The algebraic sum of the quantities listed in the five preceding columns.
- Columns 8-10 Headings afford sufficient explanation.
- Column 11 "Total Normal Flow Supply" less "Normal Flow Diversions Heise to Blackfoot."
- Column 12 Equivalent to column 11 on which it affords a check, as the results here given for all years except 1924, 1925, 1926 and 1927 were taken direct from the river data sheets. Because of the use of the Blackfoot Bridge instead of the older Blackfoot or Clough station as an adjustment point, theoretical rather than actual totals must be used for the latter point in these four years if a check on column 11 is to be secured.

The 1924 and 1925 segregations of diversions as between stored water and normal flow are complicated by the exchanges which were made. For example, the minus storage shown as being diverted during June of these years represents the excess of the normal flow accepted for exchange over actual storage diversions while the normal flow shown as diverted in the same month very evidently is a theoretical rather than an actual quantity.

The analysis of 1927 conditions to be derived from this summary emphasizes certain more or less pronounced peculiarities, some of which have already been mentioned.

(1) The total normal flow supply was consistently, throughout the entire summer, the largest of the nine years listed, although the excess over 1925 was very slight during August and September.

(2) The return flow entering between Heise and Blackfoot during July, August and September was the largest recorded for these months during the nine year period.

(3) More water was diverted between Heise and Blackfoot during July, August and September and during the whole four months than in any other year listed.

(4) With the single exception of 1925, the amount of stored water used in this section during the season was the smallest of record during the nine years.

(5) More normal flow passed Blackfoot during June, July and August and also during the entire four months period than in any other year since 1918, at least.

GROUND WATER

In connection with the Meeker investigation, records were maintained during the 1923 irrigation season on 134 wells distributed over what was designated as the Snake River Cone -- a triangular area extending in a general northwesterly direction from an apex at the Heise gaging station.

The ground water levels throughout this triangle are believed to have a material influence not only upon the river losses between the Heise and Lorenzo gaging stations, but also on the amount of return flow noted as entering between Lorenzo and Woodville. For this reason it seemed advisable to secure additional observations during subsequent seasons. Because of the more intensive regular work required during the water shortage year of 1924 only one set of measurements was then obtained but in 1925 records were secured once each month from May to September inclusive. In 1927, as in 1926, from three to five wells (27 in all) were selected in each of the following described six groups and were measured once each month from June to September.

Group No. 1.

Wells located on the south side of the Great Feeder Canal and east of the Yellowstone Branch of the O.S.L.R.R.

Group No. 2.

Wells located on the south side of the Great Feeder Canal and west of the Yellowstone Branch of the O.S.L.R.R.

Group No. 3.

Wells located on the north side of Snake River between Heise and the Yellowstone Branch of the O.S.L.R.R.

Group No. 4.

Wells located between Snake River and the Great Feeder Canal and east of the Yellowstone Branch of the O.S.L.R.R.

Group No. 5.

Wells located between Snake River and the Great Feeder Canal and west of the Yellowstone Branch of the O.S.L.R.R.

Group No. 6.

Wells located on the north side of Snake River and west of the Yellowstone Branch of the O.S.L.R.R.

This segregation corresponds to that described in all preceding reports but the diagrams shown on Plate XIX are consistent only with those contained in the 1926 summary.

With the smaller number of wells under observation during 1926 and 1927 it is still possible to show the general trend and characteristics of the ground water changes, although the data obtained are necessarily less comprehensive and consequently less dependable than the information secured during 1923 and 1925.

The progressive changes in elevation noted on Plate XIX indicate that 1927 conditions were quite similar to those of the years 1923 and 1925 and that August and September levels, in

particular, were much better sustained than during the less favorable water supply years of 1924 and 1926. Less use of water for irrigation during May probably accounts for the delayed ground water rise in comparison with other years and apparently had a much greater effect than did the overflow of some of this area at the time of the Gros Ventre flood.

WATER DISTRIBUTION AND HYDROMETRIC WORK
IN THE HENRYS FORK - FALL RIVER - TETON AREA

Mans R. Coffin filled the position of hydrographer and deputy water master in direct charge of hydrometric work and water distribution in the so-called North Fork section during 1927. All other deputies and assistants working in this area reported to and received their instructions from him, while he in turn worked under general orders issued from the office at Idaho Falls.

Through the courtesy of the Fremont County Commissioners the jury room at the Court House, St. Anthony, Idaho, was made available for use as summer headquarters.

The following abstract from a report prepared by Mr. Coffin affords a brief general summary of the work in this part of District No. 36:

Canal and river measurements, gage readings and minor repairs to station equipment as usual occupied the time of the available personnel during the early part of the season.

Beginning May 24, David I. Gardner assisted with this work, while from June 1 to August 31 he filled the combined position of hydrographer and deputy water master for the Teton River Division.

Regular daily gage readings and reports began June 1 and continued until the end of August. During this period Mrs. Coffin was employed upon a half time basis to act as clerk in the St. Anthony office while Bruno Albert and T. W. Luetjen served respectively as deputy water masters in the Upper Fall River and Henry's Fork sections. The latter was retained as general assistant and

hydrographer throughout the month of September when Mr. Gardner was transferred to other work in the vicinity of Idaho Falls.

The stream discharge was well sustained and at no time during the season did it become necessary to cut any rights in advance of the main river schedule.

Normal flow was sufficient to fill the necessary requirements of all canals except that of the Enterprise Irrigation District whose shortage was compensated by the purchase of Jackson Lake storage delivered under the substitution method.

No demand was made for the release of stored water from Henrys Lake Reservoir and in consequence nearly 49,000 acre-feet remained available as a carry-over at the end of the season.

The new dam at the forks of Teton River evidently functioned satisfactorily as no complaints were received. In fact no unusual difficulties were experienced in connection with the water distribution in any part of the district administered through the St. Anthony office.

Actual deliveries to the canals diverting from Henrys Fork, Fall and Teton Rivers are shown on Plates XX, XXI, XXII and XXIII. These are based upon daily gage readings except during September when, because of personnel depletion, the readings were obtained at less frequent intervals. Discharges for days when no observations were made have been supplied by interpolation or by estimates.

In the matter of recomputation of data, as well as in other respects, the records here presented correspond and are consistent with those contained on Plates III, IV, V and VI.

Plates XXIV and XXV summarize data in regard to the flow of the three principal streams, diversions therefrom, losses and gains throughout different sections, in so far as it is practicable to show all these facts in such tables.

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRYS FORK AND TRIBUTARIES FOR JUNE 1927

FALL RIVER CANALS

Table with 30 columns (days 1-30) and rows for various canals including Willowstone, Harrisfield, Marysville, Farmers Own, Almy, Enterprise, Bell, Fall River, McBee, Chester, Silky, Curr, White, and a total row for diversion from Squire to Chester.

HENRYS FORK CANALS

Table with 30 columns (days 1-30) and rows for various canals including Dewey, Last Chance, St Anthony Union, Farmers Friend, Twin Groves, Salem Union, and a total row for diversion from Ashton to St Anthony.

TETON RIVER CANALS

Table with 30 columns (days 1-30) and rows for various canals including Siddoway, Wilford, Teton Irrigation, Good Luck, Pioneer, Stewart, Pincock Byington, Pincock Garner, Teton Island Feeder, North Salem, Roxana, Island Ward, Woodhansfe Johnson, City of Rexburg, Rexburg Irrigation, and a total row for diversions.

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRYS FORK AND TRIBUTARIES FOR JULY 1927

FALL RIVER CANALS

Table with columns for days 1-31 and a TOTAL column. Rows include YELLOWSTONE, HARRISFIELD, MARTSVILLE, FARMERS OWN, ALMY, ENTERPRISE, BELL, FALL RIVER, M'BEE, CHESTER, SILKEY, CURR, WHITE, and TOTAL DIV ABOVE SQUIRREL.

HENRYS FORK CANALS

Table with columns for days 1-31 and a TOTAL column. Rows include DEWEY, LAST CHANCE, ST ANTHONY UNION, FARMERS FRIEND, TWIN GROVES, SALEM UNION, TOTAL DIV ASHTON TO STANTH, EGIN, STANTHONY UNION FEEDER, INDEPENDENT, CONSOLIDATED FARMERS, and TOTAL DIV STANTH TO HEBURG.

TETON RIVER CANALS

Table with columns for days 1-31 and a TOTAL column. Rows include SIDDOWAY, WILFORD, TETON IRRIGATION, GOOD LUCK, PIONEER, STEWART, PINCOCK BYINGTON, PINCOCK GARNER, TETON ISLAND FEEDER, NORTH SALEM, HAZANA, ISLAND WARD, WOODMANZEE JOHNSON, CITY OF HEBURG, HEBURG IRRIGATION, and TOTAL DIVERSIONS.

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRY'S FORK AND TRIBUTARIES FOR AUGUST 1927

FALL RIVER CANALS

Table with 31 columns (days 1-31) and 15 rows (locations: BELLEVILLE, SHERFIELD, MARYSVILLE, TOTAL DIV ARBNE SQUIRAEL, FARMERS OWN, ALMY, ENTERPRISE, BILL, FALL RIVER, MARLE, CHESTER, SILBEY, CURR, WHITE, TOTAL DIV SQUIR TO CHESTER). Each cell contains a numerical value representing discharge in second feet.

HENRY'S FORK CANALS

Table with 31 columns (days 1-31) and 10 rows (locations: DEWEY, LAST CHANCE, STANTHONY UNION, FARMERS FRIEND, TWIN GROVES, SALEM UNION, TOTAL DIV ASTON TO STANTH, FCIN, ST ANTHONY UNION FIEDER, INDEPENDENT, CONSOLIDATED FARMERS, TOTAL DIV STANTH TO HEBURG). Each cell contains a numerical value representing discharge in second feet.

TETON RIVER CANALS

Table with 31 columns (days 1-31) and 15 rows (locations: SIDOWAY, WILFORD, TETON IRRIGATION, GOODLUCK, PIONEER, STEWART, PHOENIX BYINGTON, FINGER GARNER, TETON ISLAND FIEDER, NORTH SALEM, HOKANA, ISLAND WARD, WOODMANSEE HANSON, CITY OF HEBURG, HEBURG IRRIGATION, TOTAL DIVERSIONS). Each cell contains a numerical value representing discharge in second feet.

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRYS FORK AND TRIBUTARIES FOR SEPTEMBER

FALL RIVER CANALS

Table with 30 columns (days 1-30) and 15 rows (canals: YELLOWSTONE, HARRISFIELD, MARYSVILLE, TOTAL DIV ABOVE SQUIRREL, FARMERS OWN, ALBY, ENTERPRISE, BELL, FALL RIVER, M-BEE, CHESTER, SILKEY, CURR, WHITE, TOTAL DIV SQUARR TO CHESTER). Includes handwritten 'B-Y' next to the FALL RIVER row.

HENRYS FORK CANALS

Table with 30 columns (days 1-30) and 10 rows (canals: DEWEY, LAST CHANCE, ST ANTHONY UNION, FARMERS FRIEND, TWIN GROVES, SALEM UNION, TOTAL DIV ASHTON TO STANTH, EQUIN, ST ANTHONY UNION FEEDER, INDEPENDENT, CONSOLIDATED FARMERS, TOTAL DIV STANTH TO REXBURG).

TETON RIVER CANALS

Table with 30 columns (days 1-30) and 15 rows (canals: BIDDOWAY, WILFORD, TETON IRRIGATION, GOOD LUCK, PIONEER, STEWART, PINCOCK BYINGTON, PINCOCK GARNER, TETON ISLAND FEEDER, NORTH SALT, HOKANA, ISLAND WARD, WOODMANSETT IRRIGATION, CITY OF REXBURG, REXBURG IRRIGATION, TOTAL DIVERSIONS).

The time interval basis used therein for the presentation of river records is as follows:

Time from Henrys Lake in hours	Gaging Station	Period used for comparable daily means
0	Henrys Lake Outlet near Lake	Day ending at 2 p.m.
40	Henrys Fork at Warm River	Day ending at 6 a.m. 2nd day following
50	Henrys Fork near Ashton	Day ending at 4 p.m. 2nd day following
	Fall River near Squirrel	*Day ending at 10 a.m. 2nd day following
	Fall River near Chester	Day ending at 5 p.m. 2nd day following
54	Henrys Fork at St. Anthony	Day ending at 8 p.m. 2nd day following
	Teton River near St. Anthony	Day ending at 6 p.m. 2nd day following
66	Henrys Fork near Rexburg	Day ending at 8 a.m. 3rd day following

This schedule is so arranged as to make the river records correspond as regards time with those on Plates VII and VIII. The dates indicated on the tables are for the nearest midnight to midnight or calendar days.

Water was passing the lowest diversion dams on both Henrys Fork and Teton River at all times during the season and in consequence no attempt was made to estimate or measure the flow at these points.

Fall River water delivered to the Enterprise Irrigation District as a substitute for equivalent Jackson Lake storage which was released for the use of Snake River normal flow users, is shown in these tabulations as stored water. No other storage deliveries were made to canals in this area during the entire season.

*Approximate means used. No recording gage records available.

DAILY SUMMARY OF DATA AT AND BETWEEN GAGING STATIONS ON HENRY'S FORK AND FALL RIVER

1927 HENRY'S LAKE RESERVOIR		HENRY'S FORK LAKE				WARM RIVER			ASHTON		SQUIRREL		CANALS ABOVE SQUIRREL		FALL RIVER DIVERSIONS		THEO BALAT		CHESTER		GAIN ABOVE CHESTER		ASHTON + DIVERS		THEO BALAT		HENRY'S FORK		
DATE	GAGE	CAPAC ACT	GAGE	DISCH	DATE	GAGE	DISCH	DATE	GAGE	DISCH	DATE	GAGE	DISCH	STATION	STATION	DATE	STORED	NORMAL	BALAT CHESTER	CHESTER GAGE	DISCH	CHESTER	CHESTER	ASHTON	DIVERS	THEO	BALAT	STANTIN	STANTIN
AUG 1				37	AUG 2	4.70	1110	AUG 3	1.05	1540	AUG 2	2.60	990	167	1157	AUG 3	100	688	369	2.41	402	3.3	1742	708	1234				
2				36	3	4.69	1110	4	1.05	1540	3	2.60	990	166	1158	4	101	687	370	2.38	384	1.4	1824	792	1132				
3				36	4	4.68	1100	5	1.05	1540	5	2.65	1040	170	1210	5	100	646	464	2.35	361	-103	1901	779	1122				
4	30.05	49262	1.10	35	5	4.67	1090	6	1.04	1530	6	2.55	942	166	1168	6	100	636	452	2.31	353	-19	1869	831	1032				
5	30.05	49262	1.10	34	6	4.69	1110	7	1.03	1510	7	2.68	914	167	1081	7	102	636	343	2.33	344	-1	1884	824	1030				
6	30.05	49262	1.10	33	8	4.67	1090	9	1.00	1450	8	2.52	914	157	1071	8	101	631	339	2.31	328	-11	1778	832	946				
7	30.05	49262	1.10	33	10	4.65	1080	10	0.99	1430	9	2.48	877	155	1030	9	103	630	317	2.29	317	0	1747	831	916				
8	30.05	49262	1.10	33	11	4.63	1060	11	1.02	1480	10	2.47	868	155	1023	10	102	634	294	2.26	301	7	1731	809	922				
9	30.06	49321	1.11	33	12	4.62	1060	12	1.03	1490	11	2.52	914	155	1069	11	103	648	272	2.30	323	51	1803	802	1201				
10	30.05	49438	1.12	33	13	4.63	1060	13	1.04	1490	12	2.48	877	141	1018	12	103	595	371	2.32	333	-38	1823	811	1012				
11	30.05	49438	1.12	33	14	4.64	1070	14	1.03	1480	13	2.50	895	127	1022	13	103	585	350	2.34	344	14	1834	774	1012				
12	30.05	49438	1.12	33	15	4.68	1100	15	1.00	1430	14	2.50	895	125	1020	14	103	590	329	2.40	379	60	1857	796	1012				
13	30.05	49438	1.12	33	16	4.70	1110	16	1.03	1480	15	2.54	933	128	1061	15	101	575	321	2.42	390	69	1820	722	1012				
14	30.05	49438	1.42	55	17	4.65	1080	17	1.09	1580	16	2.50	895	115	1010	16	101	615	385	2.47	420	35	1900	550	1210				
15	30.08	49438	1.71	84	18	4.63	1060	18	1.02	1460	17	2.46	859	108	967	17	101	678	329	2.44	402	73	1862	479	1284				
16	30.08	49438	1.35	47	19	4.64	1070	19	1.02	1460	18	2.44	841	105	946	18	101	584	362	2.46	408	46	1868	531	1327				
17	30.08	49438	1.35	46	20	4.67	1090	20	1.05	1510	19	2.42	823	96	919	19	101	578	371	2.44	402	61	1912	528	1384				
18	30.08	49438	1.40	51	21	4.67	1080	21	0.98	1400	20	2.42	823	95	918	20	101	584	334	2.44	402	68	1892	534	1384				
19	30.08	49438	1.57	66	22	4.66	1080	22	1.03	1480	21	2.42	823	96	919	21	101	553	366	2.43	396	30	1796	540	1358				
20	30.08	49438	1.62	70	23	4.65	1060	23	1.05	1510	22	2.40	805	87	892	22	101	558	334	2.41	384	50	1864	537	1327				
21	30.08	49438	1.64	71	24	4.65	1060	24	1.04	1490	23	2.39	796	91	887	23	101	545	342	2.40	379	37	1889	535	1324				
22	30.10	49555	1.64	70	25	4.65	1060	25	1.04	1490	24	2.40	805	92	897	24	101	541	356	2.40	379	23	1869	505	1364				
23	30.08	49438	1.79	86	26	4.64	1050	26	1.01	1450	25	2.35	762	90	852	25	129	402	321	2.39	373	52	1823	500	1328				
24	30.10	49555	1.80	86	27	4.64	1050	27	0.98	1400	26	2.36	771	90	861	26	128	398	335	2.39	373	38	1773	497	1306				
25	30.10	49555	1.82	87	28	4.67	1070	28	0.99	1410	27	2.35	762	87	849	27	52	393	402	2.41	384	-18	1794	497	1327				
26	30.00	48970	1.90	94	29	4.71	1090	29	1.02	1460	28	2.35	762	88	850	28	52	385	465	2.52	452	-13	1912	351	1361				
27	29.97	48798	2.30	144	30	4.67	1060	30	1.08	1560	29	2.36	771	87	858	29	52	397	461	2.56	478	17	2038	619	1517				
28	29.91	48424	1.99	105	31	4.61	1020	31	1.04	1490	30	2.35	762	86	848	30	52	397	451	2.70	577	126	2067	590	1471				
29	29.90	48397	1.33	38	SEPT 1	4.63	1020	SEPT 1	0.99	1410	31	2.47	868	83	951	SEPT 1		456	495	2.63	526	31	1956	547	1389				
30	29.92	48511	1.34	40	2	4.66	1040	2	0.98	1400	SEPT 1	2.45	850	78	928	2		458	470	2.56	478	8	1878	507	1371				
SEPT 1			1.37	43	3	4.62	1010	3	1.02	1460	3	2.42	823	73	896	3		451	445	2.50	440	5	1900	501	1371				
2			1.38	44	4	4.62	1010	4	1.01	1450	4	2.38	788	68	856	4		446	410	2.46	414	4	1864	487	1371				
3			1.39	45	5	4.62	1010	5	1.03	1480	5	2.38	788	64	852	5		440	412	2.46	414	2	1894	472	1411				
4			1.40	46	6	4.63	1020	6	0.98	1400	6	2.37	780	59	839	6		432	407	2.46	414	7	1814	466	1384				
5			1.37	45	7	4.61	1000	7	1.00	1430	7	2.36	771	54	825	7		430	395	2.45	408	13	1838	455	1384				
6			1.09	23	8	4.58	983	8	0.97	1380	8	2.36	771	53	824	8		431	393	2.45	408	15	1768	444	1384				
7			1.09	24	9	4.58	983	9	0.97	1380	9	2.34	754	53	807	9		431	376	2.44	402	26	1782	404	1384				
8			1.11	25	10	4.60	1000	10	0.96	1370	10	2.34	754	53	807	10		411	396	2.55	533	137	1903	400	1384				
9			0.93	15	11	4.60	1010	11	1.00	1430	11	2.66	1050	53	1103	11		391	712	2.72	660	-52	2090	396	1384				
10			0.92	15	12	4.59	1020	12	1.00	1430	12	2.42	823	54	877	12		371	566	2.53	512	3	1949	391	1384				
11			0.92	15	13	4.59	1020	13	0.99	1410	13	2.40	805	54	859	13		350	509	2.50	479	-10	1907	386	1384				
12			0.89	13	14	4.63	1060	14	0.99	1410	14	2.40	805	54	859	14		350	509	2.65	606	37	2016	371	1384				
13			0.87	12	15	4.63	1060	15	1.01	1450	15	2.42	823	54	877	15		347	530	2.65	606	76	2056	356	1384				
14			0.88	12	16	4.60	1040	16	1.01	1480	16	2.38	788	53	841	16		346	495	2.58	584	59	2004	344	1384				
15			0.90	13	17	4.58	1030	17	1.00	1430	17	2.36	771	51	822	17		345	477	2.56	540	63	1970	342	1384				
16			0.92	15	18	4.57	1020	18	0.99	1410	18	2.34	754	51	805	18													

AT AND BETWEEN GAGING STATIONS ON HENRY'S FORK AND TRIBUTARIES

FALL RIVER

PLATE NO. XXV

MIRREL	GAGE	DISCH.	CANALS SQUIPP + CANALS				HENRY'S FORK					TETON RIVER					THEO BAL STANTH + TETON RIVER	HENRY'S FORK NEAR HENBURN	GAIN BELOW STANTH							
			ABOVE STATION	ABOVE	DIVERSIONS		THEO BAL AT CHESTER	CHESTER		GAIN ABOVE CHESTER	ASHTON + CHESTER	DIVERS ABOVE STANTH	THEO BAL AT STANTH	ST ANTHONY						THEO BAL BELOW						
					DATE	STORED		NORMAL	GAGE					DISCH.	GAGE	DISCH.					GAGE	DISCH.	DIVERS			
260	990	167	1157	AUG 3	100	688	369	2.41	4.02	33	1742	708	1234	3.57	1160	-	74	706	454	136	979	897	92	546	1420	874
260	990	165	1158	4	101	687	370	2.38	3.84	14	1824	792	1132	3.50	1060	-	72	706	354	150	944	842	102	456	1260	804
263	1040	170	1210	5	100	646	464	2.35	3.61	-103	1901	779	1122	3.50	1060	-	62	789	271	126	922	805	117	368	1130	742
255	942	166	1108	6	100	656	352	2.31	3.33	-19	1863	831	1092	3.49	1050	-	8	780	262	122	877	802	96	358	1020	662
252	914	167	1081	7	102	636	343	2.33	3.44	1	1854	824	1030	3.46	1020	-	10	803	217	120	888	780	108	323	971	656
252	914	157	1071	8	101	631	339	2.31	3.23	-11	1778	832	946	3.44	996	-	50	783	211	118	877	760	117	328	968	640
250	895	155	1050	9	103	630	317	2.29	3.17	0	1747	831	916	3.44	976	-	80	776	220	117	871	786	85	305	940	635
248	877	155	1030	10	102	634	294	2.26	3.01	7	1731	809	922	3.46	1020	-	98	782	238	114	855	786	89	307	923	616
247	868	155	1023	11	103	648	272	2.30	3.23	51	1803	802	1001	3.50	1070	-	69	789	281	115	860	799	61	342	951	609
232	914	155	1069	12	103	595	377	2.32	3.33	-58	1823	811	1012	3.49	1060	-	48	797	263	116	846	790	76	337	997	658
238	877	141	1018	13	103	585	330	2.34	3.44	14	1834	774	1060	3.53	1110	-	50	706	404	116	866	805	61	463	1070	605
250	895	127	1022	14	103	590	329	2.40	3.79	60	1859	796	1063	3.62	1240	-	177	661	479	126	822	861	58	437	1280	643
250	895	125	1020	15	102	597	321	2.42	3.90	69	1820	722	1098	3.65	1290	-	192	657	439	130	744	826	118	457	1500	743
254	933	128	1061	16	101	575	385	2.47	4.20	35	1900	550	1350	3.78	1490	-	140	621	467	130	744	822	122	797	1720	729
250	895	115	1010	17		615	395	2.49	4.33	38	2013	440	1573	3.87	1670	-	97	661	1009	122	699	785	114	1123	1860	737
246	859	108	967	18		638	329	2.44	4.02	73	1862	479	1383	3.77	1510	-	127	627	883	113	849	714	135	1018	1730	712
244	841	105	946	19		584	362	2.45	4.08	46	1868	531	1347	3.75	1480	-	143	626	854	111	838	698	140	994	1650	656
242	823	96	919	20		578	341	2.44	4.02	61	1912	528	1384	3.75	1480	-	96	638	842	110	828	679	129	971	1630	689
242	823	95	918	21		584	334	2.44	4.02	68	1892	534	1358	3.71	1410	-	52	658	752	113	844	705	139	891	1630	739
242	823	96	919	22		553	366	2.43	3.96	30	1796	540	1256	3.68	1360	-	104	650	710	110	828	709	119	827	1540	711
240	805	87	892	23		558	334	2.41	3.84	50	1864	537	1327	3.69	1380	-	53	676	704	107	811	734	77	781	1560	779
239	796	91	887	24		545	342	2.40	3.79	37	1869	535	1354	3.68	1360	-	6	553	607	109	817	738	77	886	1560	674
240	805	92	897	25		541	356	2.40	3.79	23	1869	505	1364	3.70	1400	-	36	566	834	107	806	700	106	940	1620	680
235	762	90	852	26	129	402	321	2.39	3.73	52	1823	500	1323	3.67	1350	-	27	567	783	103	785	677	108	897	1590	697
236	771	90	861	27	128	398	335	2.39	3.73	38	1773	497	1276	3.63	1290	-	14	555	735	98	733	668	85	820	1520	708
235	762	87	849	28	52	395	402	2.41	3.84	-18	1794	497	1297	3.64	1300	-	3	570	730	97	743	670	79	803	1500	697
235	762	88	850	29		385	465	2.52	4.52	-13	1912	551	1361	3.72	1430	-	69	557	813	97	717	666	51	924	1570	646
236	771	87	858	30		397	461	2.56	4.78	17	2038	619	1419	3.76	1470	-	71	559	731	99	711	658	73	1004	1640	636
235	762	86	848	31		397	451	2.70	5.77	126	2067	590	1477	3.81	1580	-	103	526	1034	90	711	641	70	1124	1730	688
247	868	83	951	SEP 1		456	495	2.63	5.26	31	1936	547	1389	3.72	1430	-	41	503	727	98	691	633	58	955	1680	695
245	850	78	928	2		458	470	2.56	4.78	8	1878	507	1371	3.72	1430	-	59	481	949	98	701	625	76	1025	1680	658
242	823	73	896	3		451	445	2.50	4.40	5	1900	501	1399	3.73	1440	-	41	486	984	98	701	618	83	1067	1680	613
238	788	68	856	4		446	410	2.46	4.14	4	1864	487	1377	3.73	1440	-	63	476	964	98	686	612	74	1038	1630	612
238	788	64	852	5		440	412	2.46	4.14	2	1894	472	1422	3.77	1510	-	88	495	1015	98	684	606	73	1090	1680	590
237	780	59	839	6		432	407	2.46	4.14	7	1814	466	1348	3.73	1440	-	92	486	1015	98	686	601	85	1039	1650	611
236	771	54	825	7		430	395	2.45	4.08	13	1838	455	1383	3.74	1460	-	77	478	982	98	681	578	83	1065	1610	545
236	771	53	824	8		431	393	2.45	4.08	15	1788	444	1344	3.74	1460	-	116	467	995	98	686	597	67	1060	1600	540
234	754	53	807	9		431	376	2.44	4.02	26	1782	404	1378	3.74	1460	-	82	456	1004	98	681	595	86	1090	1630	540
234	754	53	807	10		411	396	2.55	5.33	137	1903	400	1503	3.76	1490	-	13	441	1049	99	717	582	135	1184	1690	506
266	1050	53	1103	11		391	712	2.72	6.60	-52	2090	396	1674	3.87	1670	-	4	424	1266	110	828	582	246	1512	1870	578
242	823	54	877	12		371	506	2.53	5.19	3	1949	391	1558	3.81	1530	-	22	417	1147	98	762	575	194	1363	1910	547
240	805	54	859	13		350	509	2.50	4.99	-10	1909	386	1523	3.77	1510	-	13	406	1103	98	764	561	203	1307	1920	613
240	805	34	859	14		350	509	2.65	6.06	97	2016	371	1645	3.82	1600	-	43	396	1204	100	793	543	252	1486	1980	524
242	823	34	877	15		347	530	2.65	6.06	76	2056	356	1700	3.85	1650	-	50	384	1266	105	828	525	303	1569	2130	561
235	788	33	841	16		346	495	2.58	5.64	59	2004	344	1663	3.84	1630	-	33	375	1255	99	801	523	274	1533	2150	617
236	771	31	822	17		345	477	2.56	5.40	63	1970	342	1628	3.82	1600	-	28	373	1227	94	774	520	254	1481	2110	629
234	754	31	805	18		347	458	2.53	5.19	61	1929	344	1585	3.82	1600	-	15	369	1231	97	737	516	221	1452	2030	578
232	737	31	788	19		347	441	2.53	5.19	78	1869	348	1521	3.76	1490	-	31	367	1123	98	711	513	198	1321	1920	597
230	720	49	769	20		346	423	2.51	5.06	83	1866	353	1503	3.78	1530	-	27	367	1167	98	701	514	187	1350	1900	550
230	720	49	769	21		347	422	2.49	4.92	70	1832	363	1464	3.78	1530	-	66	366	1164	97	696	517	177	1341	1860	517
230	720	49	769	22		344	425	2.47	4.78	53	1818	382	1436	3.72	1430	-	6	364	1066	97	691	520	171	1237	1760	524
229	712	47	759	23		341	418	2.47	4.78	60	1828	353	1445	3.73	1440	-	5	364	1076	97	686	522	164	1240	1730	498
229	712	45	757	24		342	415	2.57	5.47	132	1977	388	1589	3.80	1560	-	29	363	1195	98	706	526	180	1375	1810	435
244	841	45	886	25		327	559	2.72	6.60	101	2110	379	1751	3.97	1760	-	29	364	1396	98	743	529	214	1610	1950	370
238	788	45																								

From the time regulation began until September 14 the entire normal stream flow should have been continuously allowed to pass the dam at the outlet of Henrys Lake. It will be noted, however, that about one thousand acre-feet of stored water was actually impounded during the latter part of July and the first three weeks of August but was released again prior to September 1. These irregularities were due to insufficient care and attention given to the adjustment of the reservoir outlet gates by the operator, Mr. McGinn. The resultant fluctuations in the normal flow were too small to be of any great importance in a year like 1927 but should nevertheless have been eliminated.

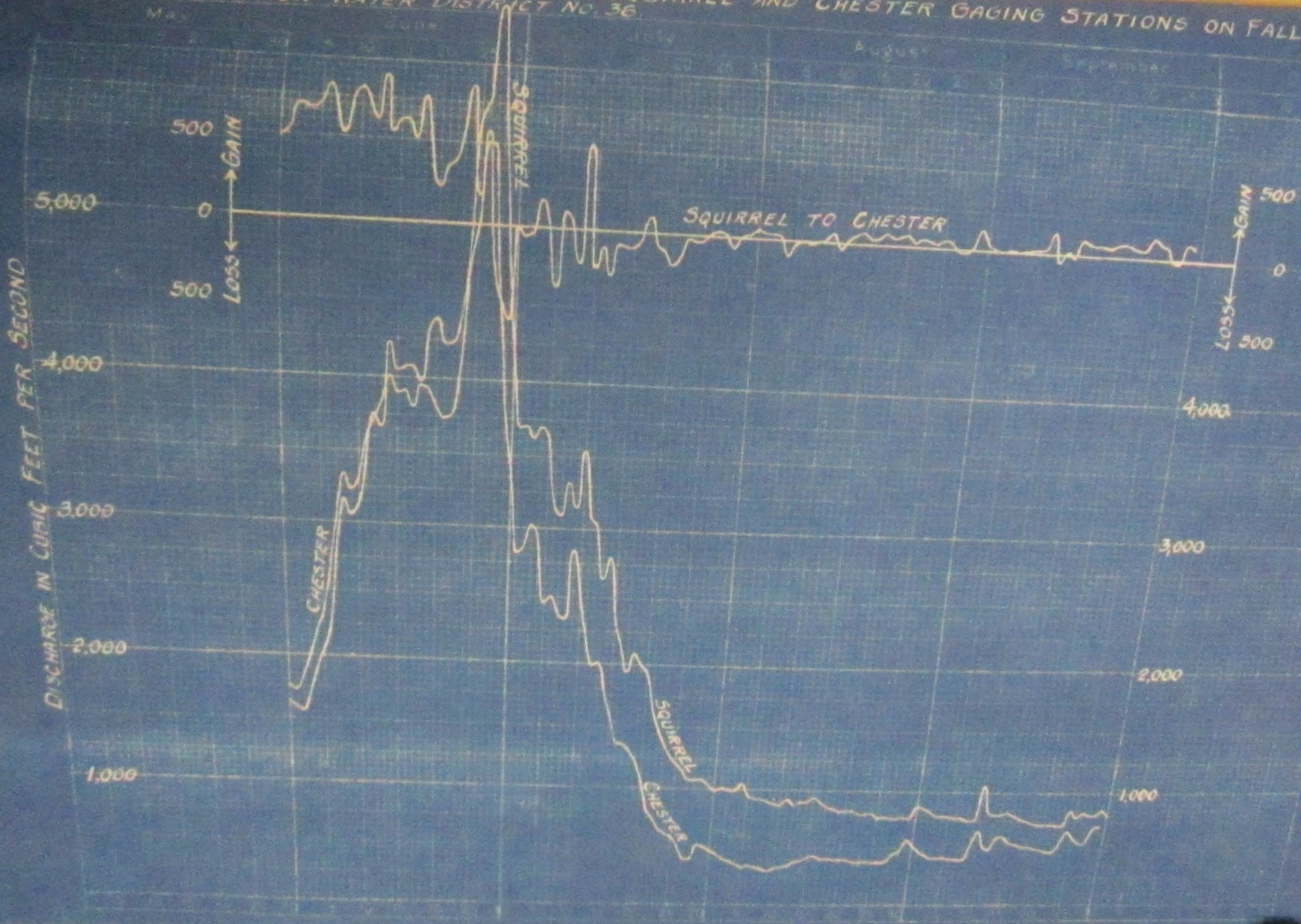
Plate XXVI contains hydrographs for the two gaging stations on Fall River and a graph showing indicated net gains or losses above the lower or Chester station. These are plotted to coincide with the dates at the upper station.

The heavy gains noted during June are probably due to the unmeasured tributary inflow (chiefly from Squirrel Creek) while the irregularities in the gain or loss curve are doubtless largely attributable to the inaccurate daily mean discharges computed for the Squirrel Station at which only staff gage readings were secured.

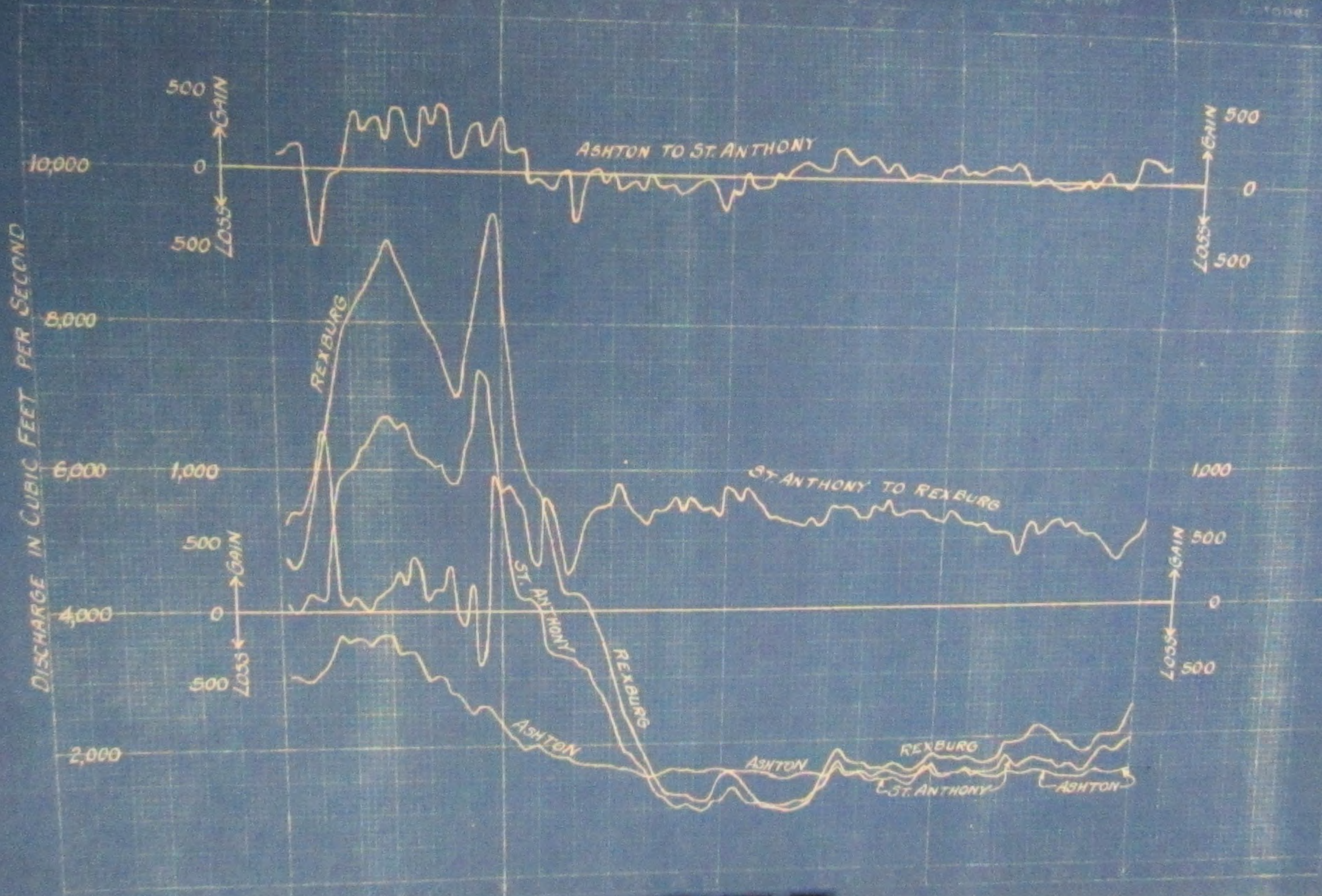
Hydrographs for the Ashton, St. Anthony and Rexburg gaging stations on Henrys Fork together with curves showing gains or losses in the intermediate sections are included on Plate XXVII. All are plotted to agree with the Rexburg dates.

Attention is directed to the fact that the gain or loss graphs are plotted to a different scale from that used for the hydrographs. Differences in the shape of the latter result from the

NET LOSSES AND GAINS BETWEEN THE SQUIRREL AND CHESTER GAGING STATIONS ON FALL RIVER
1927 DISTRIBUTION WATER DISTRICT NO. 36
May June August September
PLATE XX



NET LOSSES AND GAINS BETWEEN THE ASHTON AND ST ANTHONY GAGING STATIONS ON HENRY'S FORK
 1921 DISTRIBUTION WATER DISTRICT NO. 36
 May June July August September October
 PLATE XXVII



relatively large tributary contributions from Fall and Teton Rivers and from variations in the total amount of intervening canal diversions.

The small gain noted between St. Anthony and Roxburg during June may be attributed in part to ground water losses during this period, occasioned by overflow of adjacent lowlands, and partially to possible errors in the high stage river ratings. With this exception the gain or loss graphs exhibit no marked peculiarities which are not readily explainable by climatic or seasonal differences to which attention has already been called.

DISTRIBUTION IN SWAN VALLEY

Wm. Burton was again appointed as deputy water master for the Swan Valley section but his salary and other expenses incident to the work were paid directly by the local water users, in accordance with the custom followed during preceding years. Copies of all instructions regarding cuts and reinstatements were forwarded to him by mail and he was directed to regulate all diversions in accordance with these orders. Aside from the slight delay resulting from the method of communication, regulation in this section was therefore consistent with that in other portions of the district.

No unusual difficulties or controversies with the respective users in this territory were reported.

DISTRIBUTION ON SAND CREEK, FREMONT COUNTY

Water distribution on Sand Creek in Fremont County in 1927 was handled strictly as a local problem. No request for the appointment of a deputy water master was made and since this stream is really not a surface tributary of Henrys Fork during the ordinary regulation period, it was entirely neglected as a part of District No. 36 work.

CLIMATOLOGICAL DATA

Study of the U. S. Weather Bureau monthly and annual climatological summaries covering the twelve months ending September 30, 1927 affords much information of interest and serves to explain certain phases of the year's water supply which might otherwise be difficult to understand.

The following notes from the Idaho and Wyoming section reports describe the principal monthly peculiarities:

- | | | |
|-----------|------|---|
| October | 1926 | Temperature considerably above but precipitation below normal. Good harvest weather. |
| November | 1926 | Precipitation extremely heavy - in Idaho, the greatest recorded for this month since 1909 and in Wyoming, 200% of normal. Temperature much higher than usual. |
| December | 1926 | Average temperature but slight deficiency in precipitation. |
| January | 1927 | Both temperature and precipitation about normal. |
| February | 1927 | Slightly warmer than usual. Precipitation in excess of the normal amount. |
| March | 1927 | An average month with respect to temperature but subnormal as regards precipitation. |
| April | 1927 | Idaho Stations reported no material departure from ordinary weather conditions. Colder than usual in Wyoming. |
| May | 1927 | Another cold month with above normal precipitation in Wyoming. Idaho conditions nearly average. |
| June | 1927 | No very unusual weather reported in the upper Snake area. Slight deficiency in rainfall. |
| July | 1927 | Nearly normal temperature. Precipitation a little below the average amount. |
| August | 1927 | Slightly colder than usual but otherwise a normal month. |
| September | 1927 | Weather generally cool with much more than the ordinary amount of rainfall. |

Early crop development was somewhat retarded but normal growth was experienced throughout the summer and since little damage from early fall frosts was noted, the season was generally considered to have been a good one from the standpoint of weather conditions as well as water supply.

The amount and distribution of precipitation at the principal observation points throughout District No. 36 territory is shown graphically for the irrigation season on Plates XXVIII and XXIX.

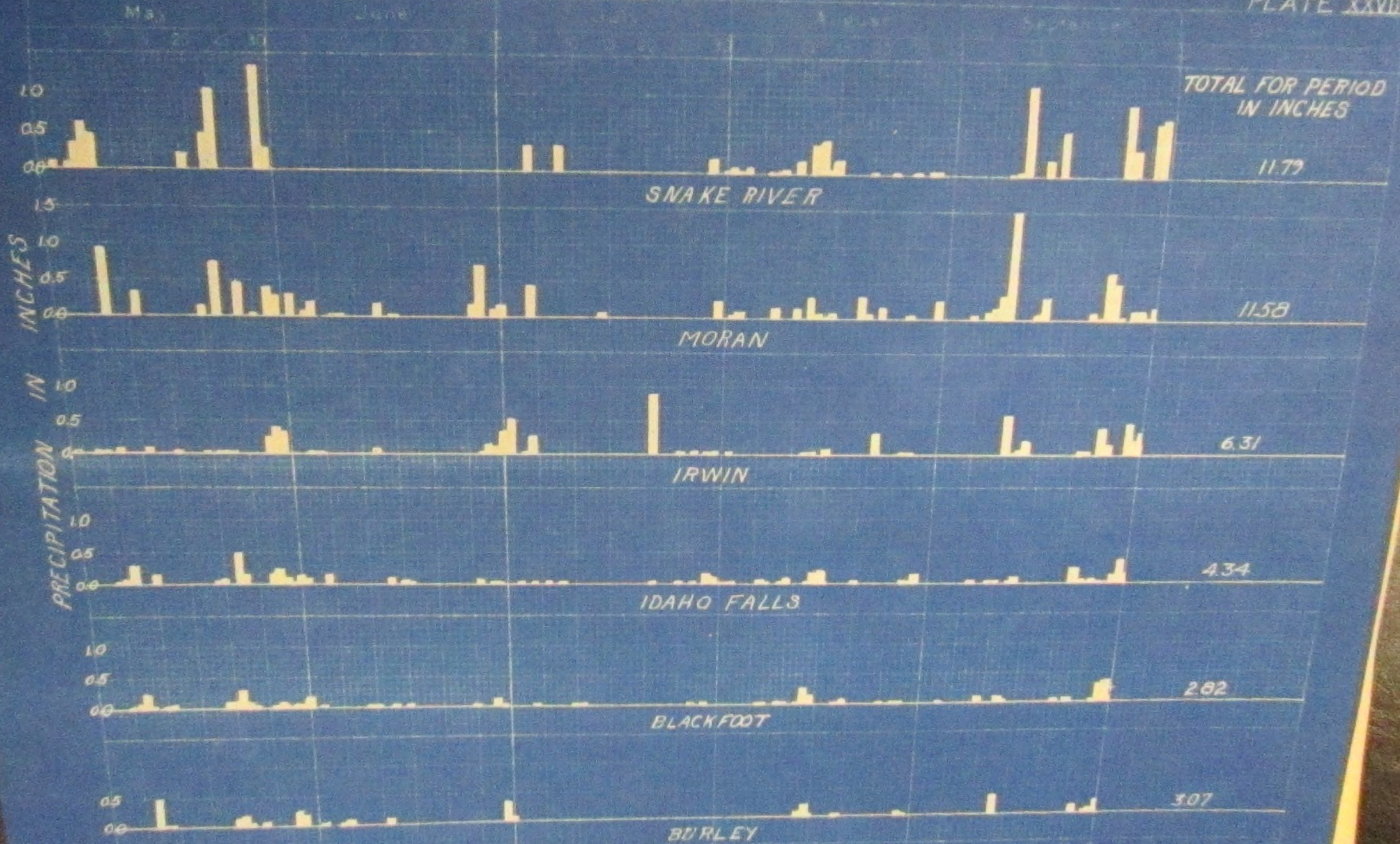
The record at Riverside near the west entrance to Yellowstone National Park is not altogether consistent with those for the other stations but has been included because of its proximity to Henrys Lake.

The following table summarizes precipitation data for Snake River, Moran, Irwin, Ashton, Idaho Falls, Blackfoot, Pocatello and Twin Falls by months for the year ending September 30, 1927:

Month	Total Number of Stations	Number Above Normal	Number Below Normal	Monthly Aver. Precip. in Inches for All years of Record	Average Precip. in Inches for Specific Month	Mean Departure from Average Amount in Inches.
1926						
October	8	0	8	1.349	0.680	-0.669
November	8	6	2	1.251	2.614	+1.363
December	8	2	6	1.434	1.291	-0.143
1927						
January	8	3	5	1.839	1.788	-0.051
February	8	7	1	1.386	2.005	+0.619
March	8	0	8	1.580	0.769	-0.811
April	8	2	6	1.555	1.231	-0.124
May	8	5	3	1.839	2.579	+0.740
June	8	2	6	1.275	1.022	-0.253
July	8	2	6	0.925	0.540	-0.385
August	8	2	6	0.779	0.708	-0.071
September	8	1	7	1.140	2.290	+1.150
		7	1			
				16.152	17.517	+1.365
		Total				

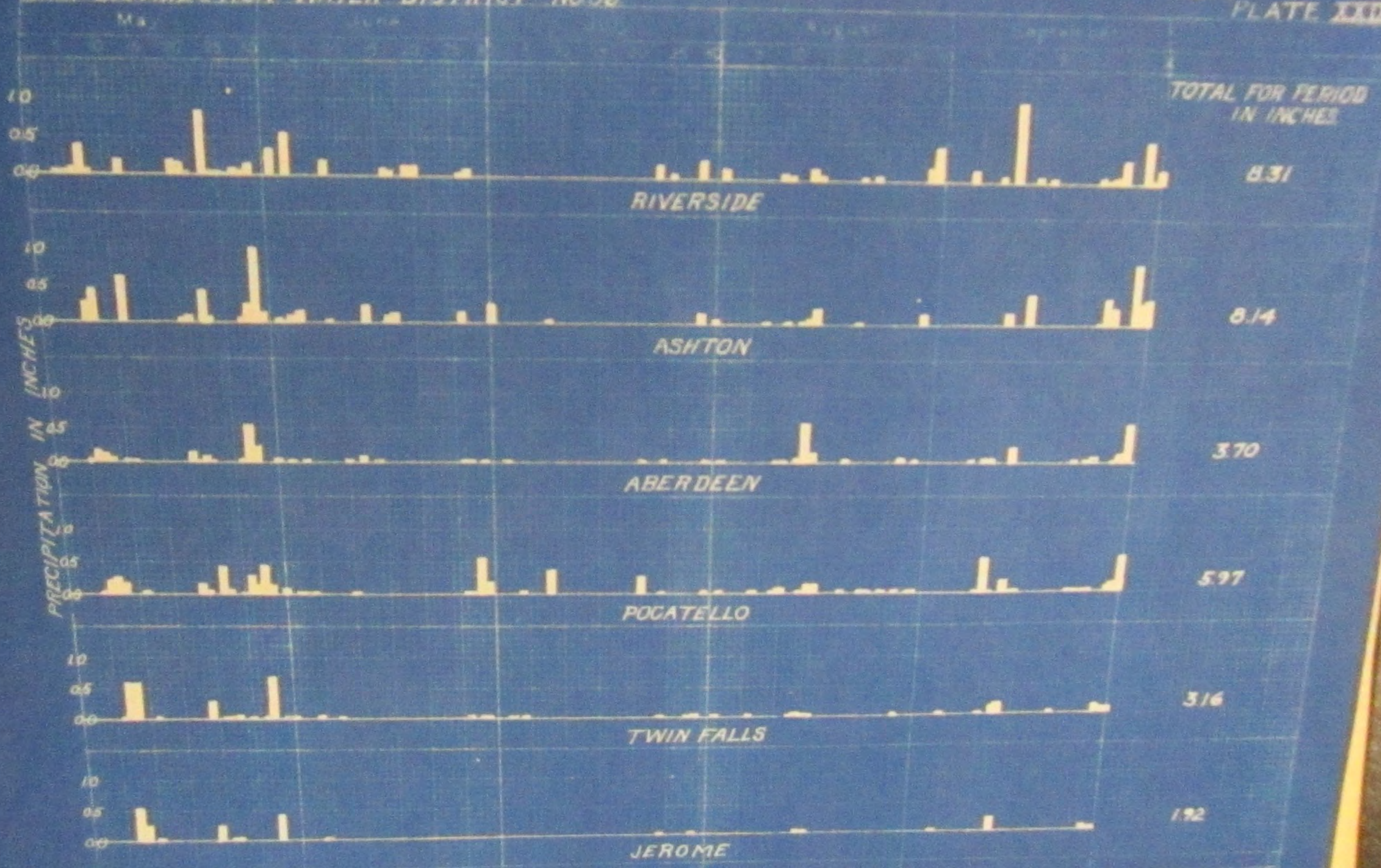
1927 DAILY PRECIPITATION DIAGRAM - SNAKE RIVER AREA
 1927 DISTRIBUTION WATER DISTRICT NO. 36

PLATE XXVIII



1927 DAILY PRECIPITATION DIAGRAM - SNAKE RIVER AREA
1927 DISTRIBUTION WATER DISTRICT NO. 36

PLATE XXXIX



This summary corresponds with the one contained in the 1926 report with respect to stations included, but is not quite so dependable because it was necessary to estimate data for the Snake River station during the months of April and June of 1927.

Records at the respective eight observation points cover periods ranging from 17 to 33 years and for this reason, as well as because of their general distribution throughout the upper Snake drainage area, the combined data may be expected to be fairly representative in character when applied to District No. 36. The group totals show that precipitation for the entire twelve months amounted to 108.5 per cent of the average while actual run-off for the same time, as determined from records secured at Moran, Wyoming, (see page 11) represented 128.0 per cent of a 24 year mean.

Just why so large a spread should be noted between these percentages is not immediately apparent. If the two Wyoming stations are considered separately, however, the data for the year ending September 30, 1927 represent 127 per cent of the mean of all available precipitation records -- a figure very consistent with the Moran run-off. This seems to indicate that the 1927 precipitation was unequally distributed and was relatively much greater at the higher altitudes than over the lower portions of the drainage area. Some further substantiation of this theory is afforded by the fact that, even with reasonable corrections for storage and other factors, the 1927 run-off at Neeley represents a considerably lower percentage of the 24 year average than that shown for the Moran station.

EVAPORATION

For data concerning evaporation at southern Idaho points during the 1927 season the reader is referred to the previously mentioned report of Thos. R. Newell which contains records for both a land and water pan located near Sterling, Idaho and to the publications of the U. S. Weather Bureau which list records for stations located at Milner and Arrowrock Dams and at Jerome.

NEW CONSTRUCTION AND REPAIRS

Staff gages on Bannock Jim and Lowder Sloughs and the stay line at the Heise river station were washed out at the time of the Gros Ventre Flood. These were all replaced and in addition several days work by two men and a team were required to strengthen the north river bank at the main channel Lorenzo cable. Appreciable expenditures were also necessary in the construction of bridges and repair of roads near the upper end of the American Falls Reservoir.

With these exceptions work of this character was limited to minor repairs to gaging station equipment.

EXPENDITURES

A complete summary of expenditures covering the year ending March 31, 1928 follows. This statement includes all general charge items which appeared in the annual water master's bill for the season of 1927, as well as everything pertaining to the work of the Idaho Falls office. No attempt has been made, however, to segregate expense for strictly hydrometric work from that for water distribution, as in many respects these phases are too closely related to warrant more than an arbitrary separation.

Salaries and expenses of Upper Valley members of the Committee of Nine together with a few other small items, which were not charged against the whole district, have been omitted.

Certain expenses (indicated by foot-notes) were, through pre-season agreement, paid in their entirety by the American Falls Reservoir interests. All other general water users charges were prorated on the basis of 60 per cent against normal flow and 40 per cent against stored water. The latter were in turn segregated between the principal reservoirs. The 1926 capacity ratio was used for this purpose during April and May but throughout the balance of the year all storage expenditures were assessed against the Jackson Lake - American Falls users except for monthly "stand-by" charges of \$25.00 and \$2.50 which were paid respectively by the North Fork Reservoir Company and the Utah-Idaho Sugar Company.

EXPENDITURES FOR WATER DISTRIBUTION AND HYDROMETRIC WORK

April 1, 1927 to March 31, 1928.

Water Master, Special Deputy and Deputy

G. Clyde Baldwin,	Salary (a) Apr. 1-May 31, Oct. 9-15, 17-22 & 29-31, 2 13/30 mo. @ \$400	\$ 975.33
	June 1-Oct. 6, Oct. 14-16 & 23-26, Nov. 1-Mar. 31, 9 17/30 mo. @ \$450	4305.00
	Expenses Apr. 1-Mar. 31	412.97
	Auto hire do	117.65

Hydrographers

C. A. McClelland,	Salary Apr. 1-June 30, 3 mo. @ \$225.00	675.00
	July 1-Mar. 31, 9 mo. @ \$233.33 1/3	2100.00
	Expenses Apr. 1-Mar. 31	129.82
	Auto hire do	931.71

(a) \$478.33 of this item paid direct by American Falls Reservoir interests.

Hydrographers

Mans H. Coffin,	Salary Apr. 1-Dec. 31, 9 mo. @ \$200.00	\$1800.00
	Jan. 1-Mar. 31, 3 mo. @ \$208.33 1/3	625.00
	Expenses Apr. 1-Mar. 31	40.80
	Auto hire do	884.13
Leo. K. Homer,	Salary May 14 & 18-31, June 1-July 29, July 31, Aug. 2-19 & 20-25, Sept. 10-11 3 10/30 mo. @ \$150.00	500.00
	Expenses do	17.38
	Auto hire do	638.04
Leslie Bowen,	Salary May 23-Aug. 15 & Aug. 20-27, 3 1/30 mo. @ \$150.00	455.00
	Expenses do	16.15
	Auto hire do	560.69
C. T. Judah,	Salary Apr. 13-May 20 & May 29-Oct. 22, 6 2/30 mo. @ \$150.00	910.00(b)
	Expenses do	19.70(b)
	Auto hire do	996.06(b)
D. I. Gardner,	Salary May 16-Aug. 31, 3 1/2 mo. @ \$135.00	472.50
	Sept. 1-30, 1 mo. @ \$140.00	140.00
	Expenses May 16-Sept. 30	28.05
	Auto hire do	857.61
H. S. Kollenborn	Salary Mar. 26-31, 5/30 mo. @ \$200.00	33.33
	Expenses do	5.60

Deputy Water Masters

Bruno Albert,	Salary June 1-Aug. 31, 3 mo. @ \$50.00	150.00
	Auto hire do @ \$50.00	150.00
T. W. Luetjen,	Salary May 1-3 & 16, June 1-Sept. 30, 126 days @ \$4.00	504.00
	Auto hire June 1-Aug. 31, 92 days @ \$3.25	299.00
	Sept. 1-30	85.28
W. J. Kremer,	Salary June 1-Aug. 31, 92 days @ \$4.00	368.00
	Sept. 1-17, 17 days @ \$2.30	39.10
	Auto hire June 1-Aug. 31, 92 days @ \$4.00	368.00
Wm. Sauer,	Salary June 1-Aug. 31, 92 days @ \$4.00	368.00
	Auto hire do \$5.75	345.00
J. W. Ensign,	Salary June 1-Aug. 31, 92 days @ \$4.00	368.00
	Auto hire do \$3.50	322.00
D. C. Taylor,	Salary June 1-Aug. 31, 92 days @ \$4.00	368.00
	Auto hire do \$3.25	299.00
W. N. McConnel,	Salary June 1-Sept. 30, 4 mo. @ \$50.00	200.00

(b) Paid direct by American Falls Reservoir interests.

Stenographers

Helen George,
Snow Coffin,

Salary Apr. 1-Mar. 31, 1 year @ \$1500.00
Salary June 1-Aug. 31, 3 mo. @ \$40.00

\$1500.00
120.00

Gate Readers

Mrs. J. L. Carter,
Mrs. John Keppner,
Walter Lenz,

Salary Apr. 1-Dec. 31, 9 mo. @ \$15.00
Salary Jan. 1-Mar. 31, 3 mo. @ \$15.00
Salary Apr. 1-May 31 & Sept. 1-Mar. 31,
9 mo. @ \$9.00

135.00
45.00

Harold Fuqua,

Salary Apr. 1-May 31 & Sept. 1-30,
3 mo. @ \$5.00

81.00

June 1-Aug. 31, 3 mo. @ \$12.00

15.00

Oct. 1-Dec. 31, 3 mo. @ \$6.00

36.00

Jan. 1-Mar. 31, 3 mo. @ \$8.33 1/3

16.00

Mrs. Irvin Siepert, Salary Apr. 6-May 31, 1 25/30 mo. @ \$5.00

25.00

June 1-Sept. 17, 109 days @ \$1.00

9.17

Sept. 18-30, 13/30 mo. @ \$8.00

109.00

Oct. 1-25, 7 trips @ \$1.00

3.47

B. F. Smith,

Salary Apr. 1-May 31 & Oct. 1-Dec. 7,
30 trips @ \$1.00

7.00

Dec. 8-Mar. 18, 102 days @ 0.60

30.00

Mar. 19-31, 2 trips @ \$1.00

61.20

W. H. Kremer,

Salary July 19-Aug. 31, 44 days @ \$1.00

2.00

Mrs. A. M. Anderson,

Salary Apr. 1-May 31 & Sept. 1-30, 3 mo. @ \$5.00

44.00

W. H. Davis,

Salary June 1-July 19, 49 days @ 0.50

15.00

July 20-Sept. 30, 72 days @ \$1.00

24.50

J. A. Clough,

Salary Apr. 1-May 31 & Oct. 1-Mar. 31,
6 mo. @ \$10.00

72.00

June 1-Sept. 30, 122 days @ \$1.00

80.00

A. J. Ayers, (a)

Salary Oct. 1-May 31, 8 mo. @ \$8.00

122.00

June 1-Sept. 30, 4 mo. @ \$50.00

64.00

H. B. McConnel,

Salary June 1-Sept. 30, 4 mo. @ \$10.00

200.00

Secretary, Water Users Committee of Nine

John Lee, (b)

Salary Nov. 10 & 22, Jan. 4-7, Mar. 7-8 & 30,
Sept. 26 & Oct. 1, 11 days @ \$5.00

55.00

Expenses do

47.98

Auto hire do

17.94

Miscellaneous

Materials, labor and equipment for gaging stations

104.25

Field and office equipment (instruments, etc.)

521.61

Telephone and telegraph

358.85

Field and office supplies

315.89

Premiums on official bonds

18.25

Interest on borrowed money

137.66

Employees compensation insurance

80.97

American Falls Reservoir Bridge & Road work

426.05

Upper Snake River Flood Prevention Survey

13.00

\$27626.87

Total

(a) Computed for year ending September 30, 1927.

(b) Computed for 366 day period ending October 1, 1927.

SOURCES OF REVENUE

Normal Flow Fund	
Normal Flow Users (Direct assessment in 1927 District No. 36 water master bill)	\$12,219.96
Jackson Lake and American Falls Stored Water Users (through State)	230.95
Jackson Lake and American Falls Stored Water Users (credit in 1927 District No. 36 Water Master bill)	10,650.46
North Fork Reservoir Company (through State)	153.97
Utah-Idaho Sugar Company (through State)	307.07
Sheppard & Company (through State)	29.40
U. S. Geological Survey	31.51
State of Idaho (Cooperative Stream Measurement Fund)	1,249.43
Utah Power & Light Co.	2,729.12
	25.00
Total	\$27,626.87

*FUNDS AVAILABLE APRIL 1, 1928

Normal Flow Fund (a)	1,379.04
Jackson Lake Stored Water Users (a)	12.82
North Fork Reservoir Company (b)	50.00
Sheppard & Company (b)	16.83
U. S. Geological Survey (c)	152.60
State of Idaho, Cooperative Stream Measurement Fund (d)	614.88
	614.88
Total	\$2,226.17

* Amounts given in this table represent funds in bank or definitely known to be available after all accounts (except a few outstanding claims which had not yet been presented) were settled and adjusted to and including March 31, 1928.

- (a) Additional funds probably available on or before June 1, 1928.
- (b) Represents unexpended portion of money advanced.
- (c) Represents amount available for expenditure prior to July 1, 1928.
- (d) Amount allotted for expenditure prior to July 1, 1928
(Subject to slight change).

Two important items are not included in these summaries for the reason that their exact value is not definitely known.

These are:

- (1) The rent equivalent of the office quarters and furniture in the Federal Building at Idaho Falls. Because of the cooperation with the U. S. Geological Survey this very desirable office space and equipment is made available without charge.

(2) The cost of securing the necessary prints for and the binding of 55 copies of the 1926 report which was paid direct by the State Commissioner of Reclamation.

The total annual expenditure of \$27,626.87 does not include the \$5,000.00 cost of Mr. Newell's investigation. If the other expense directly attributable to the American Falls Reservoir were likewise omitted the total for regular work would be reduced below that of any year since 1923 although the margin under 1925 would be very small. These costs normally reflect the water supply conditions noted in the respective seasons and, except for special investigations or other unusual work, expenditures may be expected to decrease whenever the necessary regulation period is shortened.

WATER RIGHTS

No permanent changes of material consequence were recorded during the past year in the decreed rights of District No. 36 water users, hence the diagrams which were presented under this heading in previous reports have in this instance been omitted.

Final American Falls Reservoir storage rights cannot be determined until the amount of rebate water, acquired by reason of the decrease in actual construction cost with respect to the original estimate, is announced. Upper Valley Jackson Lake rights will be increased and those of the Minidoka Project will be correspondingly decreased as the result of exchanges (either seasonal or permanent) for water in the larger reservoir.

RECOMMENDATIONS

The present southward trend of Snake River in the vicinity of the head of Lowder Slough has already been mentioned. Should this situation lead to the formation of a new and more direct main river channel, immense damage would result. Steps have already been taken to initiate some plan for river control in this section but the problem is of such magnitude that State and, if at all possible, Federal aid will undoubtedly be needed to effect permanent relief.

Water distribution throughout District No. 36 has been conducted under substantially the same plan for a number of years and, although no claim can be made that the procedure has been perfected, it has proved workable in actual operation. Hence, if no material change in conditions occurs, it should continue to function satisfactorily in the future without further legislation. Minor improvements and adjustments will doubtless be made from time to time, however, through the medium of the Committee of Nine which has now attained a well recognized and important place in the administration of the affairs of this District.