



D. W. DAVIS, GOVERNOR

STATE OF IDAHO
DEPARTMENT OF RECLAMATION
W. G. SWENDSEN, COMMISSIONER
BOISE

BUREAU OF WATER RESOURCES
WATER APPROPRIATIONS
CAREY ACT DEVELOPMENT

April 22, 1922

In Re: Water District No. 36

Honorable D. W. Davis,
Governor of Idaho,
Capitol Building,
Boise, Idaho

Dear Governor:

It is my pleasure to submit herewith for your consideration a report of this department covering the administration of the waters of Snake River and its distribution in Water District No. 36 for the year 1921.

This work was performed under the direction and supervision of Mr. G. Clyde Baldwin, acting as Special Deputy to distribute stored water and as Special Deputy Commissioner of Reclamation, representing this department in the said district. Mr. John Empey, the duly elected watermaster in District No. 36 served throughout the year under the direction of this department and the Special Deputy.

No effort has been made to embody in this report all of the vast detailed data collected during the year, but only such information and records as will likely be of value to the general public and the State in future years, are contained herein. This report is prepared in the same general form as the reports of 1919 and 1920 and because of the demonstrated value to the State and because of the useful reference made to these reports in various matters affecting water distribution and water rights, I am sure the time, effort and expense in compiling these data is well worth while.

On Page 15 under the heading "Permanent Transfers" this report calls attention to the tendency to barter decreed water rights in the same way as other commodities, and this matter is again referred to under the heading, "Recommendations" on page 40. Under the last mentioned heading you will find suggestions regarding desirable changes in our irrigation laws

to eliminate the evil growing out of the permanent transfers of decreed water rights and also regarding the almost absolute necessity for statutory amendments relating to the payment of watermasters and expense of distribution service.

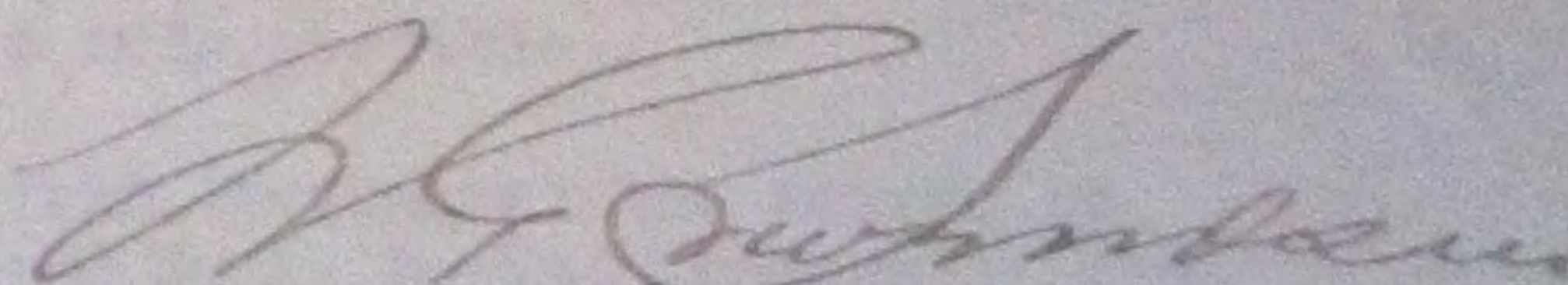
It is my purpose to more specifically outline these recommendations along with other legislation in the biennial report of this department.

It is not my purpose to specifically refer to the many individuals, associations, and companies to whom the department is indebted for assistance and cooperation in distributing the water in this very important district during the year, but it is a pleasure to express a keen appreciation of their splendid assistance.

Because of the numerous intricate problems involved in the water distribution of the Snake River, the highest standard of technical skill, ability and practical judgment is necessary and essential to a proper service, and the splendid results obtained is an evidence of the qualifications, untiring efforts and ability of Mr. Baldwin, the Deputy Commissioner.

I should be exceedingly ungrateful if I failed to recognize the splendid service rendered by Mr. John Empey, the water-master in this district, the other members of the distribution organization, and especially your valuable counsel and advice.

Very truly yours,



Commissioner of Reclamation



W. DAVIS, GOVERNOR

STATE OF IDAHO
DEPARTMENT OF RECLAMATION

W. G. SWENDSEN, COMMISSIONER
BOISE

Idaho Falls, Idaho,
April 15, 1922.

Mr. W. G. Swendsen,
Commissioner of Reclamation,
Boise, Idaho.

Dear Sir:-

There is submitted herewith the technical report covering water distribution and hydrometric operations in Water District No. 36 for the irrigation season of 1921.

U. S. Geological Survey methods have been used throughout as a standard for the collection and compilation of hydrometric data. Most of the latter which are contained herein have been recomputed since the close of the irrigation season, and in this, as well as in other respects, the report is similar to and consistent with reports for the two preceding years.

Special acknowledgments are due to the Idaho Irrigation District and the Utah Power & Light Company for gage readings and to the Aberdeen-Springfield Canal Company, Mr. D. G. Martin, the U. S. Reclamation Service, 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.

Money was again advanced by the Water Users' Protector Association of the North Fork of Snake River and Tributaries, the Farmers' Protective Irrigation Association, the Twin Falls Canal Company and the North Side Canal Company, Ltd., to create the so-called Normal Flow Fund, through which the prompt payment of all expenses incident to the distribution of normal flow was made possible.

The advice and assistance given throughout the season by Messrs. J. R. Thomson, D. H. Blosson and F. A. Banks, members of the water users' Advisory Committee, was very much appreciated.

Much credit should be given to Water Master John Empey, to each of the hydrographers and to the other members of the distribution personnel for the conscientious manner in which their duties were performed and for the willing assistance and hearty cooperation which they so freely rendered.

For valued assistance in the preparation of this report acknowledgment is accorded to Thomas R. Newell, to C. A. McClelland and to Mrs. Edith M. Cure.

Respectfully yours,

H. Clyde Baldwin
Special Deputy.

WATER DISTRIBUTION AND HYDROMETRIC WORK

In District No. 36

1921

By G. Clyde Baldwin

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PREFACE.

The primary purpose of this report is to present a complete record of the distribution of water within District No. 36 during the irrigation season of 1921. This has entailed the collection and preparation of many hydrometric records. Some of these are of especial value only because of their application to distribution problems, while a part are of more general interest.

Prior to 1919 much of the general hydrometric work, at river stations in particular, was performed by the U. S. Geological Survey. The data obtained in this way were of course available and were utilized by the distribution organization, which at that time was only in existence for a few months each summer. Under this system while duplication of work could be largely avoided, delay or lost motion and lack of coordination were inevitable.

Early in 1919 the distribution personnel was reorganized with provision made for a part to continue upon a permanent or all year basis. In this reorganization, which has since been effective, I was selected to fill the position of Special Deputy State Commissioner of Reclamation, while at the same time retaining my status as Hydraulic Engineer in the U. S. Geological Survey. In this way it became possible to handle all hydrometric work as well as water distribution with a single organization. A joint Geological Survey and State office was established in the Federal Building at Idaho Falls and has since been maintained as headquarters for both classes of work.

This arrangement eliminates the delay and expense of duplicating data and forwarding it from one office to another, permits field work to be planned and carried out to the best advantage, insures uniformity of methods and undoubtedly results in some reduction of total expenditures.

Care has of course been used in the segregation of all expenses, Federal and State Cooperative funds have been used for hydrometric work of general interest and value, while data which is chiefly of use in connection with distribution has been paid for by water users. Special hydrometric data have also been collected and compiled for and at the expense of the U. S. Indian Service.

A summary and segregation of expenditures is contained in the body of this report (pages 42-46), but it seems desirable to make this brief explanation in advance for the benefit of readers who may not be thoroughly familiar with the present procedure.

Acknowledgments are due to the U. S. Geological Survey and to the State of Idaho for financial and other assistance rendered in accordance with the above outlined plan.

G. Clyde Baldwin.

INTRODUCTION.

The general plan of operation under which water distribution and hydrometric work were carried on in Water District No. 36 during the season of 1921 was almost identical with that followed during 1920, which in turn differed but little from that adopted for 1919. Detailed explanation of this plan is contained in the report of the Special Deputy State Commissioner of Reclamation for the season of 1919*; while modifications which became effective during 1920 are described in the Special Deputy's report for that year**.

The contract between the stored water users and the State of Idaho which was executed on May 1, 1919, to define the portion of the total river expense which would be paid by the former, covered the two years ending April 30, 1921. Since a new contract would be necessary prior to the beginning of the 1921 distribution period the Special Deputy asked the directors of the Water Users' Protector Association of the North Fork of Snake River and Tributaries, the directors of the Farmers' Protective Irrigation Association and representatives of each of the large canal systems located below American Falls, Idaho, to meet at Idaho Falls on February 3, 1921, for the purpose of discussing a budget for future river operations and agreeing upon a basis for the negotiation of a new contract between the stored water users and the State.

The minutes of this meeting are as follows:

*Water Distribution and Hydrometric Work in District No. 36, 1919
by G. Clyde Baldwin.

**Water Distribution and Hydrometric Work in District No. 36, 1920
by G. Clyde Baldwin.

MINUTES OF MEETING HELD IN THE NEW COURT HOUSE
AT IDAHO FALLS, IDAHO, ON FEBRUARY 3, 1921.

"This meeting was presided over by F. A. Banks and John Lee was chosen secretary.

The following men were present:

J. C. Wheelon, Twin Falls; Eph Peterson, Rexburg; P. J. Davis, Idaho Falls; F. A. Banks, American Falls; John Pincock, Sugar City; George Pincock, Sugar City; John E. Kelley, Shelley; Chas. E. Anderson, Idaho Falls; John Wilcox, St. Anthony; Barry Dibble, American Falls; John Empey, Idaho Falls; Geo. Harrigfeld, Ashton; H. G. Fuller, Ashton; C. W. Foster, Heyburn; H. W. Hurlebaus, Jerome and John Lee, Idaho Falls.

Mr. Baldwin stated that the Executive Committee appointed by Mr. Swendsen to represent the various interests in the valley consisted of Mr. J. H. Thomson, Mr. D. H. Blossom and Mr. F. A. Banks.

It was stated by Mr. Baldwin that it was necessary to call a meeting at this time to decide upon a budget for the ensuing year and the organization for handling the distribution of water in District No. 36, on account of the fact that the agreement made with Mr. Swendsen would expire on April 30 of this year. Mr. Baldwin presented a statement of expenditures for water distribution and hydrometric work for the year ending March 31, 1921, and also a proposed budget for the ensuing year. This was discussed item by item at some length by Mr. Baldwin, the following facts being developed:

Some of the river riders travel from 45 to 65 miles per day, and are paid but \$8.00 per day for services and all transportation expenses. It was recommended that salaries be increased from \$8.00 per day to \$10.00 per day. The cost per acre-foot for distributing water in the Lost River and Wood River areas is ten to fifteen times as great as it is in District No. 36. There are four employees on an annual basis; the Special Deputy, two hydrographers and one clerk. No cars have been bought for the hydrographers, it being necessary for them to purchase their own cars, for which they are paid at a rate of ten cents per mile. It was recommended that this be increased to fifteen cents per mile. In support of this recommendation a statement was read of the expenses incurred by Mr. Howard for the season of 1920. On a motion by Mr. Wilcox, seconded by Mr. Fuller, it was voted to reimburse the hydrographers at the rate of fifteen cents per mile for the use of personally owned cars on official business in District No. 36. Carried. Upon motion by Mr. Wilcox and seconded by Mr. John Pincock, Mr. Baldwin's recommendation for an average of \$10.00 per day salary for river riders was approved. On motion by Mr. Harrigfeld and seconded by Mr. Geo. A. Pincock, Mr. Baldwin's recommendation for hydrographers was approved. On motion by Mr. Dibble and seconded by Mr. Geo. Pincock, Mr. Baldwin's recommendation for stenographers was approved. On motion by John Pincock and seconded by Chas. E. Ander-

son, it was voted that changes may be made in the budget as proposed by Mr. Baldwin, provided that the total amount of the budget was not exceeded. With reference to his own position Mr. Baldwin stated that a considerable amount of stored water had been sold during the past year for \$1.00 per acre-foot; that his organization had delivered during the season of 1920 about 6,000,000 acre-feet of water, and that while the value of the water handled by him might not be \$6,000,000.00, this statement was made as an indication of the responsibility imposed upon him as Special Deputy in handling its distribution. Mr. Baldwin stated that he could not handle the work for another year on a salary of \$3,600.00. A similar position on the Boise basin paid a salary of \$5,000.00 per annum; on Wood River, \$4,000.00 per annum, with a car furnished.

Mr. Baldwin then retired from the room and a discussion was had on the amount that should be offered Mr. Baldwin for the ensuing year. On motion by Mr. Harrigfeld, seconded by Mr. Chas. E. Anderson, it was voted to increase Mr. Baldwin's salary from \$300.00 per month to \$400.00 per month. Mr. Baldwin upon being informed of the offer that had been made, accepted the position and thanked the water users for their continued support. It was moved by Mr. Hurlebaus and seconded by Mr. John Pincock, that Mr. Swendsen be requested to appoint Mr. Baldwin as Special Deputy for District No. 36. Inasmuch as Mr. Howard had stated that he would not continue to serve as hydrographer on the North Fork at less than \$3,600.00 per annum, and Mr. Baldwin's budget called for \$2,400.00 per year for this position, the North Fork Association had been previously requested to take some action as to whether or not it desired to pay an additional \$100 per month to secure the services of Mr. Howard. It was stated at the meeting that the association had decided to leave to Mr. Baldwin the matter of filling the position of hydrographer on the North Fork. Upon a suggestion by Mr. Baldwin it was moved by Mr. Wheelon and seconded by John Pincock, that the two months' salary of hydrographer on the North Fork, previously paid by the North Fork water users, be in the future paid out of the general fund and not charged directly to the North Fork water users. Carried.

Mr. Dibble raised the question as to whether or not the water users on the North Fork desired to form themselves into a separate district. It was stated by Mr. John Pincock, Mr. Harrigfeld and Mr. Geo. Pincock that the water users on the North Fork had not decided to form, at this time, a separate unit.

Meeting adjourned."

Thereafter a new stored water contract was executed as of date May 1, 1921. This new agreement was similar to the old one except to the extent of providing higher maximum salary limitations, revising the method of making winter payments and other minor modifications which would make it consistent with the actions taken at the meeting of February 3, 1921, above referred to.

The same Advisory Committee which was originally appointed in 1919 by W. G. Swendsen, State Commissioner of Reclamation, to represent the water users of the three principal sections of the water district was elected to serve during the season of 1920 and re-elected for 1921.

These men, J. R. Thomson representing the North Fork area, D. H. Blossom representing the central section and F. A. Banks the lower or Minidoka-Twin Falls portion of the district, have been largely responsible for the general plan of river operation and have passed upon all principal changes or modifications of the original plan.

The following summary or minutes of the first meeting of this committee for the season will be self-explanatory:

SUMMARY OF PROCEEDINGS OF MEETING OF THE WATER USERS' ADVISORY COMMITTEE OF DISTRICT NO. 36, HELD AT IDAHO FALLS, IDAHO, MAY 3, 1921.

"Present, Messrs. D. H. Blossom, F. A. Banks and J. R. Thomson, members of Advisory Committee, and G. Clyde Baldwin, Special Deputy State Commissioner of Reclamation.

Consideration was first given to the financing of the normal flow portion of the 1921 water distribution. An itemized budget was presented by Mr. Baldwin which indicated that a total sum of \$12,000 will be required to finance this work until the end of the irrigation season. After some discussion the committee drafted and signed the following letter or statement:

"We, the Advisory Committee of the water users of District No. 36, State of Idaho, in session in Mr. Baldwin's office at Idaho Falls, Idaho, have given consideration to the decisions reached in the meeting of water users held in Idaho Falls on February 3, 1921, at which time the organization for the distribution of natural flow and stored water during the coming season was decided upon. In accordance with the decisions reached in this meeting, it is the opinion of this committee that it will be necessary to raise the sum of \$12,000 for the administration of the distribution of normal flow in this district during the coming season, and it is the recommendation of your committee that these funds be advanced as follows:

Water Users' Protector Assn. of the North Fork of Snake R.	\$2,500
Farmers' Protective Irrigation Association	4,500
North Side Canal Co. Ltd.	2,500
Twin Falls Canal Co.	2,500

On account of the necessity of having these funds available at an early date, it is respectfully requested that they be forwarded to Mr. Baldwin at Idaho Falls as soon as possible, and in any case, that he be advised as to when he may expect to receive the funds.'

The employment of river riders and deputy water masters beginning June 1, 1921, was approved.

The matter of properly crediting the summer inflow from Blackfoot River was discussed, together with plans for reducing this inflow and for taking surface waste into account in computing storage losses between the Woodville and Blackfoot gaging stations. The committee favored the continuation of the 1920 plan of operation under which the Blackfoot inflow was credited to the Upper Valley canals as available natural flow, and suggested that during the 1921 season the surface waste to the river between the Woodville and Blackfoot gaging stations be ascertained as nearly as practicable by occasional series of measurements.

With respect to domestic water the committee favored the continuation of the 1920 practice to grant no allowances for this purpose when it is possible for a canal to supply same by purchase or through transfer. It was also the consensus of opinion that a definite settlement of the municipal water rights of the cities of Idaho Falls and St. Anthony should be sought immediately.

The use of mean gage heights instead of single daily readings for operation purposes was advocated, at least to the extent of giving this plan a thorough trial.

Many other miscellaneous matters pertaining to the work of distribution were discussed during the meeting, but no important decisions were made involving any changes in present practice."

During the months of April and May many river and canal measurements were secured and in the North Fork area Stevens' 8 Day Recording Gages were installed at three of the more important river gaging stations. Regular records were also resumed at a number of the river stations which had been discontinued for the winter. As in the two preceding years however, daily records were not obtained at all of the river and canal stations until June 1, when the river riders and deputy water masters began their season's work.

PERSONNEL.

The personnel engaged in the work of distribution during the season of 1921 was as follows:

G. Clyde Baldwin,	Special Deputy State Commissioner of Reclamation
John Empey,	Water Master
Thomas R. Newell,	Hydrographer
C. A. McClelland,	Hydrographer and Deputy Water Master
Frank A. Backman,	Hydrographer
L. L. Bryan,	Hydrographer
Mrs. Edith M. Cure,	Clerk and Office Assistant, Idaho Falls office
Miss Phebe Arnold,	" " " " St. Anthony "
F. C. Braun,	Deputy Water Master, Upper Fall River division
Geo. A. Pincock,	" " " " Henrys Fork "
W. F. Dawson,	" " " " & Hydrographer, Teton River div.
W. J. Kremer,	" " " " Heise division
Albert Terry,	" " " " Rigby "
Chas. A. McCurdy,	" " " " Idaho Falls division
Antone Christensen,	" " " " Blackfoot "
Wm. Burton,	" " " " Swan Valley canals
Hyrum E. Bowman,	" " " " Sand Creek canals (Fremont Co.)
Harold F. Wallace,	" " " " Minidoka Dam
W. N. McConnel,	" " " " & Hydrographer, Milner Dam
Joseph Markhan,	Superintendent, Jackson Lake Dam
Miss Frances Woodburn,	Forwarding Agent, Ashton, Idaho.

Ernest Luetjen, Harold Fuqua, Mrs. J. F. Johnson, Mrs. Fred Monk, E. L. Jennings, James Thorne, Miss Lena Byington, Oliver L. Kofoed, J. A. Clough and H. R. Wallis, Gage Readers.

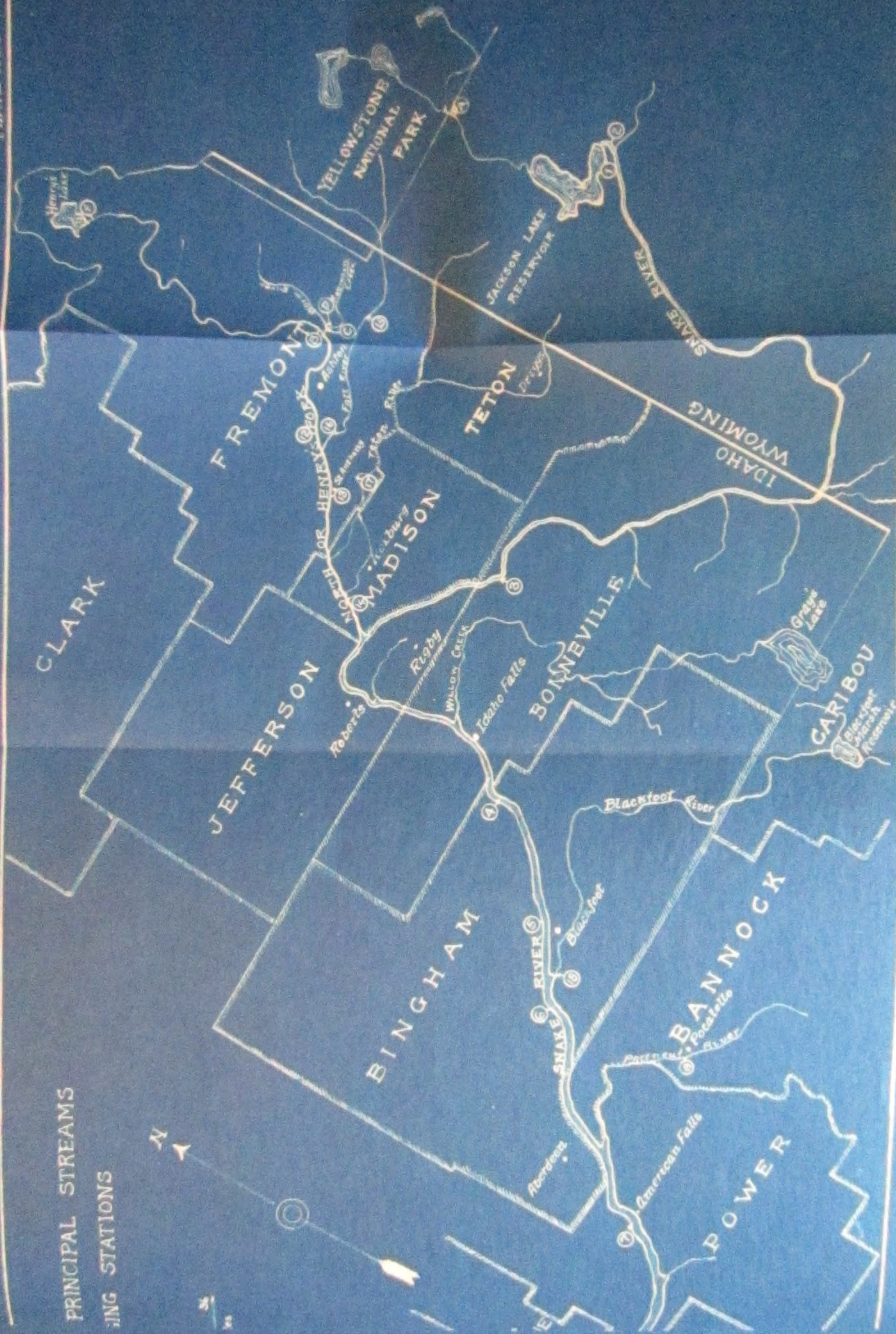
STATION

- 1 JACKSON LAKE AT MORAN, WYO.
- 2 SNAKE RIVER NEAR MORAN, WYO.
- 3 SNAKE RIVER NEAR HEISE, IDAHO
- 4 SNAKE RIVER NEAR SHELLEY, IDAHO
- 5 SNAKE RIVER AT PORTERVILLE BRIDGE, IDA.
- 6 SNAKE RIVER NEAR BLACKFOOT, IDA.
- 7 SNAKE RIVER AT NEELEY, IDAHO.
- 8 LAKE WALCOTT NR. MINIDOKA, IDA.
- 9 SNAKE RIVER NEAR MINIDOKA, IDA
- 10 LAKE MILNER AT MILNER, IDA.
- 11 SNAKE RIVER AT MILNER, IDA.
- 12 HENRY'S FORK NEAR ASHTON, IDA.
- 13 HENRY'S FORK AT ST ANTHONY, IDA.
- 14 HENRY'S FORK NEAR REXBURG, IDA.
- 15 FALL RIVER NEAR SQUIRREL, IDA
- 16 FALL RIVER NEAR CHESTER, IDA.
- 17 TETON RIVER NEAR ST ANTHONY, IDA.
- 18 BLACKFOOT RIVER NEAR BLACKFOOT, IDA.
- 19 PORTNEUF RIVER AT POCATELLO, IDA.
- 20 NORTH SIDE MINIDOKA CANAL NR. MINIDOKA, IDA.
- 21 SOUTH SIDE MINIDOKA CANAL NR. MINIDOKA, IDA.
- 22 SOUTH SIDE TWIN FALLS CANAL AT MILNER, IDA.
- 23 NORTH SIDE TWIN FALLS CANAL AT MILNER, IDA.

AUXILIARY STATIONS

- A SNAKE RIVER AT SOUTH BOUNDARY OF YELLOWSTONE NATIONAL PARK
- B HENRY'S FORK AT WARM RIVER, IDAHO
- C WARM RIVER AT WARM RIVER, IDAHO.
- D ROBINSON CREEK AT WARM RIVER, IDAHO
- E HENRY'S FORK AT LAKE, IDAHO.

MAP SHOWING PR
AND GAGING



DESCRIPTIVE OUTLINE OF 1921 DISTRIBUTION.

The winter of 1920-21 was considerably milder than that of 1919-20, but early reports, which were later substantiated, indicated that the snowfall in the upper Snake drainage area, particularly throughout the foothill region, was greater than that of the preceeding year.

The flow of practically all streams above Idaho Falls was slightly greater during the month of April than during the same period in 1920, but the variation was not such as to indicate any abnormal condition. This general comparison or relation continued throughout the greater part of the month of May, while during the first half of June the increase over corresponding dates of the preceeding year was more pronounced.

Jackson Lake Reservoir contained 126,120 acre-feet of unused storage when the outlet gates were closed on September 16, 1920. These gates remained closed until June 13, 1921, when, the filling of the reservoir to its capacity of 847,000 acre-feet being assured, water was again released in gradually increasing amounts for the purpose of securing measurements at different stages to define the rating at the Moran gaging station. From June 15 to June 30 the stage of the reservoir was maintained practically at capacity and the entire natural flow of the stream was allowed to pass the dam.

The flow of Snake River at the Heise gaging station reached its maximum for the year of 33,300 second-feet on June 15, following which date it dropped very rapidly to 18,400 second-feet on June 21 and 22. (These discharges are for regular days, from midnight to midnight.)

Another slight rise occurred June 23 to 25, only to be followed by a sudden drop of 3,100 second-feet in two days. The discharge was now approaching the critical stage when the available supply becomes insufficient to fill all demands without restrictions, and it appeared that regulation might be required as early as June 29. A break in the dike or dam at the outlet of the small Two Ocean Lake reservoir near Moran, Wyoming, on the morning of June 28 caused a slight temporary increase which served to defer regulation until July 1, when the canals were ordered cut to their record rights and the first storage was released from Jackson Lake Reservoir.

On July 6 all license and permit rights were cut off and most of the youngest 1908 decrees also became invalid. Unseasonable cold weather was experienced throughout the Upper Snake Valley during the early part of July and as a result the natural flow of the streams decreased more rapidly than usual. This condition made it necessary on July 10 to cut off all decreed rights having a priority date subsequent to March 26, 1903.

Thereafter decreed rights were ordered cut as follows:

July 17	Rights having a priority date subsequent to October 11, 1900						
21	"	"	"	"	"	"	" June 1, 1900
23	"	"	"	"	"	"	" May 31, 1899
24	"	"	"	"	"	"	" July 9, 1896
26	"	"	"	"	"	"	" March 22, 1895
27	"	"	"	"	"	"	" February 6, 1895
31	"	"	"	"	"	"	" August 8, 1894

Decreed rights were most affected for the season on August 1, when a part of the 400 second-feet right of the Peoples Canal dated August 18, 1894, was cut off. The demand for water began to decrease however, and this fact, together with slight increases in natural flow resulting from rains and the effect of the August 1 reduction in decreed rights on canals in the vicinity of St. Anthony made it possible to be-

gin the reinstatement of decreed rights on August 2.

About August 5 material increases were noted in the return flow entering between the Heise and Woodville gaging stations. These coincided with the rapid drop in river stage brought about by the reduction in the amount of stored water released from Jackson Lake from nearly 9,000 second-feet on August 2 to about 5,500 second-feet on August 6. These increases, together with the gain which resulted from the voluntary shutting of the Reservation Canal headgates on the afternoon of August 5, permitted this restoration to proceed sufficiently to include rights of June 1, 1895, on August 7. During most of the period from August 2 to August 15 however, the large right of the Aberdeen-Springfield Canal Company, dated February 6, 1895, served as a pivot to the extent that it was valid in part only.

Demands for water after the middle of August fell off rapidly and on August 19 the reinstatement of all rights having a priority date earlier than October 11, 1900, was ordered. Before the end of the month the necessity for regulation throughout the upper valley seemed to be at an end for the season.

A meeting of the Advisory Committee was held on August 31, at which arrangements for the termination of field work for the season were agreed upon as outlined in the following minutes:

SUMMARY OF PROCEEDINGS OF MEETING OF THE WATER USERS' ADVISORY COMMITTEE OF DISTRICT NO. 36, HELD AT IDAHO FALLS, IDAHO, AUGUST 31, 1921.

"Present, Messrs. D. H. Blossom, F. A. Banks and J. R. Thomson, members of Advisory Committee; John Elzey, Water Master and G. Clyde Baldwin, Special Deputy State Commissioner of Reclamation.

The general situation on Snake River existing at the present date was reviewed and discussed with special regard to natural and stored water diversions, probable demands of canals and available supplies. Comparisons with data for other years were also made. Thereafter it was unanimously agreed that the services of all the regular river riders might be terminated at the end of August, 1921, without serious detriment to any water users and since this action would result in a considerable reduction in the distribution expense, it was so ordered. The Water Master and all hydrographers, gage readers at the more important river stations and the Deputy Water Masters at Minidoka and Milner Dams are to be retained until the need for their services is no longer evident, which in the case of all except the regular winter organization, will probably be on or before September 30, 1921. It was also agreed that the Water Master and hydrographers should secure sufficient gage readings and measurements at the canal stations to afford reasonably reliable data concerning diversions during the month of September, but that daily readings on each canal could not be expected.

Informal discussion of the probable amount of attorney's fees in the case of the Enterprise Canal Company vs. the City of Idaho Falls followed, but it was deemed advisable to take no definite action in regard to recommendations for the payment of this claim until it was submitted in final form.

Mr. Baldwin stated that some investigations concerning the amount of surface return flow or waste which enters the river between the Woodville and Blackfoot gaging stations had already been made and others were in progress. He desired to postpone any recommendations regarding this and the Blackfoot River situation until more data had been secured and opportunity had been afforded for analysis.

Continuation of the policy adopted during 1920 of gradually installing permanent equipment at all the important river gaging stations was approved and the immediate installation of a reinforced concrete gage well and shelter at the Neeley gaging station was authorized."

No storage was released from Jackson Lake Reservoir after September 8 and on September 12 the outlet gates were closed for the season with 152,000 acre-feet of unused storage remaining in the reservoir.

Plate II illustrates graphically the rate at which Jackson Lake Reservoir was filled or drawn down during the period from November 15, 1914 to March 31, 1922 inclusive. All graphs are plotted on the basis of 1919 capacity tables.



Plotted by _____ Date _____
Checked by _____



WATER SUPPLY.

The 1920 report of the Special Deputy State Commissioner of Reclamation* contains a brief discussion and comparison of annual water supply as measured at the Moran and Neeley gaging stations.

Since this is something which is of interest to most water users the same comparison can now be extended to include the climatic year ending September 30, 1921, as follows:

Station	Mean annual run-off for 18 yrs. ending Sept. 30, 1921	run-off for year ending Sept. 30, 1921	% of mean
Moran	1,136,000	1,067,370	94.0
Neeley	6,858,000	6,770,000	98.7

In the preparation of this table, beginning with the year 1910 all Moran records have been corrected to take account of the storage in Jackson Lake which is held over from one climatic year to another. Neeley records, on the other hand, have not been subjected to any storage corrections but represent actual totals measured at the gaging station. 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. Attempts to harmonize the percentage relations at the two stations by applying approximate storage and diversion corrections to the Neeley data in the manner suggested in the preceding report, instead of bringing the percentages into closer agreement, will, in 1921, raise the Neeley quantity to slight-

*Water Distribution and Hydrometric Work in District No. 36,
by G. Clyde Baldwin.

ly more than 100 per cent of the 18 year average. This would seem to indicate that in this year, at least, the inflow between the two stations or the run-off from the lower drainage areas was proportionately greater in comparison with that of other years than was that from the high mountainous areas. This condition bears out the snowfall reports of the spring of 1921 which indicated an unusually large amount in the foot-hills but proportionately less in the higher altitudes. Six and seven year comparisons with Moran data which are available respectively at the stations on Henrys Fork at Warm River and Fall River near Squirrel show 1921 run-off as a higher percentage of the mean at the two latter stations than at Moran, thus affording additional confirmation or explanation of the Neeley results.

At any rate it seems evident that in considering the whole territory embraced in Water District No. 36, the year ending September 30, 1921, was one of very nearly average total run-off.

To determine its relation to other years as regards the water supply available for irrigation from natural flow would be a much more complicated problem because of the many varying factors which would have to be considered. There can be little doubt however, that from this standpoint it was the most favorable year since 1918.

STORAGE vs. FLOOD WATER DIVERSIONS.

Because Jackson Lake Reservoir was filled to capacity more than two weeks before any regulation in Idaho became necessary the right to store water did not conflict with the use of natural flow at any time during the season of 1921.

DOMESTIC WATER.

As noted in the minutes of the Advisory Committee meeting of May 3, 1921, the 1920 practice of granting no domestic water allowances when it was possible for a canal to obtain water either by purchase or transfer, was continued.

Surplus storage at Jackson Lake to the amount of about 50,000 acre-feet was again available and about 5,000 acre-feet were sold by the U. S. Reclamation Service at the rate of \$1.00 per acre-foot.

MUNICIPAL WATER RIGHTS.

The status of the water rights of the cities of Idaho Falls and St. Anthony remained practically unchanged in 1921 from that of 1920.

The Utah Power & Light Company, which furnishes the water for St. Anthony, had purchased stored water for that city during the latter part of 1920, and in July, 1921, they again purchased a sufficient amount of storage to cover low water period requirements.

In view of the failure, during 1920, of the officials of the City of Idaho Falls to provide water rights which would be valid after the expiration of their decree of April 20, 1900, arrangements were made to bring this matter to the early attention of the new city administration which took office during May, 1921. On June 20 the Water Master and Special Deputy outlined the situation briefly to Mayor Ralph A. Louis and at his request presented it a few days later at a meeting of the City Council. There then followed a number of confer-

ances and meetings at which this question was discussed, but on July 23, when orders were issued to cut decreed rights having a priority date subsequent to May 31, 1899, no arrangements had yet been made to provide a valid right for the city. Consequently the Water Master, in pursuance of his duty, attempted on that date to shut down the city pumps and thus cut off the supply to the mains. He was prevented from doing so by the refusal of members of the city police force to allow him to enter the building in which the pumps were housed.

Following this, on the same afternoon, papers were filed bringing suit in the name of the Enterprise Canal Company, one of the next appropriators in point of time under the Snake River Decree, against the City of Idaho Falls. A hearing on this case in the District Court of the Ninth Judicial District of Idaho was scheduled to be held at Idaho Falls on August 8. On that morning however, the City Attorney, on behalf of the City of Idaho Falls, agreed to purchase a sufficient amount of Jackson Lake storage to cover the use during that portion of 1921 when the decreed rights of the city were invalid, with the further proviso that before the beginning of the 1922 irrigation season the city would endeavor to provide a permanent right of adequate amount and priority. Upon this understanding the hearing on the case was indefinitely postponed.

Immediately thereafter the city purchased 350 acre-feet of storage and the rate of delivery was fixed, largely upon the showing of the city engineer, at $8\frac{1}{2}$ acre-feet per day.

TEMPORARY TRANSFERS.

Temporary transfers were recognized upon the same basis as during preceeding years, although the need for them, because of the better sustained natural flow, was less keenly felt.

The pooling system was again used to advantage in the North or Henrys Fork area and served to promote harmony amongst the water users of this section.

After the headgates of the Reservation Canal had been voluntarily closed on August 5 the water to which this canal was entitled was placed at the disposal of the Water Master and Special Deputy to be used as most needed to aid in the production of crops. This action was made possible by reason of the sufficient supply available from Blackfoot River for use on the Indian Service project lands and was taken upon the express understanding that it should in no way jeopardize the Snake River rights of the Reservation Canal. The use of this water was of material benefit to many canals which might otherwise have suffered from water shortage.

PERMANENT TRANSFERS.

The constantly increasing value of old decreed water rights seems to have resulted in an increased number of permanent transfers or changes in the points of diversion. Since water rights are only granted in Idaho upon a basis of beneficial use and are made appurtenant to specific lands, permanent transfers would ordinarily be expected only

under unusual circumstances. The frequency with which they have recently been effected therefore, gives rise to the question as to whether these water rights are not being bartered for gain in the same way as farm products and other commodities and contrary to the spirit if not the letter of our laws.

This is a matter which does not primarily come within the sphere of activity of the distribution organization, but it can do no harm to call attention to the possible misuse of a privilege which was undoubtedly only intended to cover the most exceptional cases.

EXCHANGE of NATURAL FLOW for STORAGE.

During July and August a number of prearranged trades of natural flow for storage were effected under the plan followed in 1920.

The canal desiring to participate in such an exchange sends in a written request for storage credit, stating the extent to which they propose to release natural water and the exact time when their gates will be shut down. If the arrangement is completed, the natural flow released by this canal is accepted and delivered in lieu of stored water and is later repaid as required from Jackson Lake Reservoir. A necessary condition which must first be agreed to is that storage credit will not be given in the event that unexpected changes in the flow of the river should make it impossible to complete the transaction without wastage of water or detriment to some other water user. Should such a situation arise however, the canal is notified and per-

mitted to resume their natural draft as promptly as possible.

All requests of this character which were made during the 1921 storage delivery period were granted, but each was handled separately and no general rule was adopted which would prevent the refusal of such exchanges should they become so numerous as to seriously complicate the distribution.

Stored water sold to canals in the Henrys Fork area was delivered under a modification of this plan whereby actual deliveries to the purchasing canals were from natural flow, while storage was given to canals farther down the river in place of the latter.

CANAL DELIVERIES.

The total amount diverted daily through each canal heading either in the South Fork or main river for the four months ending September 30, 1921, 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 re-computed 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 data have been carefully reviewed to the end that the final computed data may represent the most reason-

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERGING FROM SNAKE RIVER FOR JULY 1921

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				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able 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.

Since no river riders were employed during the month of September, data for this month are based upon the smaller number of gage readings which it was possible for the remainder of the organization to secure in connection with other work, and for this reason the September canal records are probably less reliable than those for the three preceding months. Discharges listed for days for which no gage readings are available have, with few exceptions, been interpolated.

Two canals which are somewhat isolated as regards location, viz. the Independent and the Smith-Maxwell, were measured and regulated for the first time during 1921. No June records are available for either and data for the later months are partially interpolated.

Beginning July 21 after a dike to exclude river water had been constructed across the slough from which the Morgan and Rostan canals divert, records of the flow through these canals were discontinued. Thereafter they were supplied from other adjacent canal systems.

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 downstream 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	Rexburg	1st day following Day ending at 8 a.m.
42	Woodville	1st day following Day ending at 10 p.m.
48	Porterville	1st day following Day ending at 4 a.m.
54	Blackfoot	2nd day following Day ending at 10 a.m.
68	Neeley	2nd day following Day ending at 12 midnight;
92	Minidoka	3rd day following Day ending at 12 midnight;
116	Milner	4th day following Day ending at 12 midnight;
		5th day following

This schedule for time of transmission is the same as the one adopted for the two preceeding years, and while not exactly correct for all stages of the river, it is believed to be fairly representative of average conditions, and on this account was used throughout the entire period from June 1 to September 30.

The dates given on these two plates are those which agree most nearly with the midday hour on this schedule, but the discharges for

2021 DISTRIBUTION WATER DISTRICT NO 36

[illegible]

DAILY SUMMARY OF DATA AT AND BETWEEN SHAKES

WHESE WOOD				WOODVILLE				HEISE-WOODVILLE				DIV WOOD-PORT				PORT				PORTERVILLE				WOOD-PORT				BLACK RIVER				P.B.		BLACK	
Sto	Doc	Nat	Th Bal	GAGE	Disch	STD	Nat	Total	Loss	Max	Min	Nat	Sto	Nat	Th Bal	GAGE	Disch	STD	Nat	For	Loss	Max	Min	Nat	Sto	Disc	*PORT	Div	Th Bal						
1	0	0	30827	1316	30320			1293							29027	942	28500			-527						244	28744	223	28521						
2	0	0	29438	1300	29620			1300							28320	928	28000			-320						276	28276	219	28057						
3	0	0	26657	1268	28250			1261							26389	907	26600			-369						322	26972	213	26709						
4	0	0	25300	1233	26750			1272							25458	884	24900			-518						336	25276	206	25070						
5	0	0	25480	1216	26000			1233							24767	873	24520			-247						176	24692	230	24466						
6	0	0	26687	1204	26300			1344							24996	877	24610			-386						129	24739	239	24500						
7	0	0	27787	1233	26900			1548							25392	886	25030			-362						154	25194	259	24925						
8	0	0	29076	1253	27590			1522							26068	896	25900			-568						114	25664	258	25356						
9	0	0	30247	1266	28150			1754							26396	904	25880			-516						69	25949	267	25692						
10	0	0	31178	1277	28620			1807							26813	910	26160			-653						39	26199	271	25928						
11	0	0	32565	1274	28490			1924							26466	904	25880			-686						8	25988	280	25608						
12	0	0	31078	1274	28490			2097							26399	903	25830			-569						0	25890	278	25552						
13	0	0	30387	1275	28520			2147							26393	901	25740			-653						0	25740	290	25450						
14	0	0	30216	1269	28280			2312							25963	893	25360			-608						39	25679	296	25388						
15	0	0	31913	1278	28660			2686							25964	899	25640			-324						18	25736	281	25453						
16	0	0	31432	1278	28660			2736							25924	897	25550			-394						302	24812	314	23898						
17	0	0	29028	1247	27330			2844							24516	873	23910			-406						184	22254	301	21993						
18	0	0	27426	1212	25830			2797							23033	845	22110			-923						190	19140	264	18876						
19	0	0	22258	1129	22320			2700							19630	786	18950			-680						54	15984	272	15712						
20	0	0	18518	1046	18920			2699							16221	727	15890			-331						219	13239	242	12997						
21	0	0	15498	973	16020			2722							13298	670	13020			-278						88	10738	318	10420						
22	0	0	12637	915	13770			2770							11000	622	10650			-350						520	9528	303	9225						
23	0	0	11946	823	12550			2917							9633	592	9490			-143						466	9528	294	8745						
24	0	0	11739	872	12140			2969							9171	580	9030			-141						412	9039	292	8745						
25	0	0	12253	873	12180			2994							9186	582	9110			-76						271	9381	292	9087						
26	0	0	12485	878	12370			3039							9331	587	9300			-31						366	9666	294	9372						
27	0	0	12464	871	12110			2924							9186	580	9030			-156						366	9396	304	9092						
28	0	0	10507	836	10810			2823							7987	548	7840			-147						382	8222	290	7932						
29	0	0	9481	813	9980			2859							7121	527	7070			-51						314	7384	268	7116						
30	0	0	9783	813	9980			2861							7119	527	7070			-49						325	7395	284	7117						
31	0	0	10476	807	9760			2800							6760	524	6960			0						319	7279	263	7016						
32	0	0	9867	805	9690			2734							6956	524	6960			4						247	7207	241	6889						
33	0	0	9114	803	9620			2698	11	0	517				6922	522	6890			-32						229	7113	224	6889						
34	0	0	10209	830	10590			2780	24	0	405				7810	547	7800			-10						244	8044	234	7810						
35	0	0	9186	821	10270			2683	16	0	500				7587	538	7470			-117						225	7765	240	7525						
36	0	0	7411	8123	779	8760		2628	13	0	650				6132	500	6110			-22						260	6432	206	6226						
37	0	0	7542	757	8000			2559	13	0	801				5441	430	5420			-21						260	6432	206	6226						
38	0	0	7864	765	8280			2667	19	0	435				5613	434	5560			-53						266	5826	197	5629						
39	0	0	8284	774	8590			2753	21	0	327				5837	439	5730			-107						230	5960	231	5729						
40	0	0	8148	775	8620			2739	20	0	492				5881	439	5690			-137						199	5829	232	5597						
41	0	0	8335	791	8240			2763	22	0	527				6077	495	5940			-191						28	6028	231	5797						
42	0	0	9530	806	9730			2851	26	0	226				6879	516	6680			-199						4	6684	249	6435						
43	0	0	10169	826	10450			2872	29	0	310				7578	533	7290			-288						28	7318	244	7074						
44	0	0	10767	840	10960			2823	33	0	226				8077	543	7840			-237						37	7877	229	7648						
45	0	0	10955	846	11180			2785	35	0	260				8395	554	8060			-335						48	8108	249	7859						
46	0	0	10220	828	10520			2731	33	0	333				7789	539	7500			-289						25	7525	245	7280						
47	0	0	9741	817	10120			2756	33	0	412				7364	529	7140			-224						23	7163	250	6913						
48	0	0	10176	828	10520			2833	37	0	381				7687	535	7360			-327						6	7366	252	7114						
49	0	0	10494	834	10740			2876	40	0	296				7864	540	7540			-324						9	7549	249	7300						
50	0	0	9811	820	10230			2826	36	0	455				7994	553	8020			-26						8	8028	246	7782						
51	0	0	9378	809	9830			2768	36	0	488				8215	551	7950			-265						12	7962	223	7739						
52	0	0	9203	806	9730			2751	37	0	564				7979	546	7760			-219						12	7788	223	7551						
53	0	0	9061	800	9510			2065	37	0	486				7445	532	7250			-195						36	7280	220	7060						
54	0	0	9241	807	9760			2567	37	0	556				7193	523	6930			-73						39	6969	231	6738						
55	0	0	9348	815	10050			2669	38	0	740				7381	530	7180			-201						50	7230	240	6990						
56	0	0	9344	815	10050			2768	38	0	744				7232	527	7070			-212						82	7152	237	6915						
57	0	0	9342	814	10010			2950	38	0	706				7060	519	6780			-231						82	7152	237	6915						
58	0	0	8611	798	9440			2893	39	0	868				6547	502	6180			-367						95	6275	234	6043						
59	0	0	8599	792	9220			2921	40	0	661				6299	496	5970			-286						95	6275	234	6043						
60	0	0	8544	792	9220			2933	41	0	717				6287	494	5900			-387						47	6017	230	5787						
61	0	0	8604	793	9260			2947	42	0	698				6313	497	6000			-313						42	5942	234	5708						
62	0	0	8944	801	9550			2604	44	0	650				6946	515	6640			-306						68	6708	243	6465						

NAKE RIVER GAGING STATIONS FROM JACKSON LAKE WYOMING TO MILNER IDAHO																																							
BLACKFOOT					PORT-BLACK					YUM CORR					NEELEY					LAKE WAICOTT					NS MINC					55 MINC					MIN				
GAUGE	DISCH	STD	NAT	TOTAL	DISCH	STD	NAT	TOTAL	DISCH	STD	NAT	TOTAL	DISCH	STD	NAT	TOTAL	DISCH	STD	NAT	TOTAL	DISCH	STD	NAT	TOTAL	DISCH	STD	NAT	TOTAL	DISCH	STD	NAT	TOTAL	DISCH	STD	NAT	TOTAL			
1149	28760			239	1098	32350			1921	JUN 3	399	102900	242	399	358	299	403			781				781	399	403			31531	1326				31531	1326				
1133	27940			-117	1090	31810					3810	101930	489	398	356	299	403			757				757	398	403			31540	1313				31540	1313				
1103	26430			-279	1072	30750					4120	100490	726	397	354	299	403			908				908	397	403			30719	1249				30719	1249				
1043	24630			-390	1046	29230					4550	99520	489	397	354	299	403			1053				1053	397	403			28811	1253				28811	1253				
1057	24140			-326	1025	28020					3880	98680	424	371	354	299	403			1228				1228	371	403			27389	1228				27389	1228				
1057	24140			-310	1025	27730					3540	98920	121	660	830	298	401	1231			1231				1231	298	401			26978	1231				26978	1231			
1057	24140			-245	1023	27930					3120	99280	181	726	971	321	401	1418			1418				1418	321	401			26301	1231				26301	1231			
1030	25280			-76	1033	28470					3120	99280	181	726	971	321	401	1418			1418				1418	321	401			26955	1242				26955	1242			
1030	25280			48	1039	28820					3080	99040	0	837	1230	405	638	1868			1868				1868	405	638			26955	1242				26955	1242			
1030	25280			2	1044	29110					3180	99440	302	893	1370	446	743	2113			2113				2113	446	743			26955	1242				26955	1242			
1030	25280			72	1044	28940					3240	99520	545	924	1450	512	924	2374			2374				2374	512	924			26955	1242				26955	1242			
1030	25280			178	1040	28880					3150	100730	610	925	1450	512	924	2374			2374				2374	512	924			26955	1242				26955	1242			
1030	25280			-20	1035	28590					3140	100010	363	923	1440	497	868	2308			2308				2308	497	868			26955	1242				26955	1242			
1063	24680			-383	1024	27960					3180	100370	181	925	1450	512	924	2374			2374				2374	512	924			26955	1242				26955	1242			
1079	25230			-153	1025	28020					2790	100850	242	925	1450	512	924	2374			2374				2374	512	924			26955	1242				26955	1242			
1072	25180			-275	1028	28190					3010	99880	489	926	1450	512	924	2374			2374				2374	512	924			26955	1242				26955	1242			
1048	23700			-198	1012	27270					3570	99760	60	924	1450	512	924	2374			2374				2374	512	924			26955	1242				26955	1242			
1012	21960			-33	981	25540					3580	99280	242	925	1450	512	924	2374			2374				2374	512	924			26955	1242				26955	1242			
942	18690			-186	920	22280					3590	99520	121	927	1450	512	924	2374			2374				2374	512	924			26955	1242				26955	1242			
869	15530			-182	850	18760					3230	101690	1094	926	1450	540	1000	2450			2450				2450	540	1000			26955	1242				26955	1242			
794	12580			-417	784	15680					3100	102410	363	926	1450	542	1010	2460			2460				2460	542	1010			26955	1242				26955	1242			
734	10460			40	732	13420					2960	104940	1276	927	1450	538	999	2449			2449				2449	538	999			26955	1242				26955	1242			
694	9160			-65	701	12150					2900	106030	550	929	1460	531	979	2439			2439				2439	531	979			26955	1242				26955	1242			
623	8830			85	690	11710					2880	106030	0	928	1460	528	970	2430			2430				2430	528	970												

MINIDOKA		N-M DATE		MIL		PALAT		NSTFCAN		PA + NSTFCAN		5.5 TF CANAL		MURTAUGH C		MIL		MILNER		M-M	
DISCH	STD	NAT	LOSS	1921	GAGE	GAGE	DISC	GAGE	DISCH	TOTAL	STD	NAT	GAGE	DISCH	STD	NAT	GAGE	DISCH	STD	NAT	GAIN
3240			-929	JUN 4	1090	198	53	650	2120	2173			678	1590			2869	2101	26380		2317
3160			-120	5	1089	176	41	751	2460	2501			692	1650			2750	2065	25210		2299
30010			709	6	1088	198	53	774	2580	2633			718	1770			2560	2023	23890		1717
28270			541	7	1090	194	51	H.D.	1940	1991			789	2110			24169	2008	23440		729
27330			59	8	1089	196	52	H.D.	863	913			810	2210			24209	2007	23710		-495
27330			-532	9	1090	201	53	830	2980	3038			892	2640			21235	1943	21690		455
26910			-249	10	1091	202	56	835	3000	3056			991	3210			20784	1931	21420		636
27030			-375	11	1089	207	59	835	3000	3059			1028	3430			20841	1934	21310		469
27330			-618	12	1091	208	59	840	3020	3079			1000	3260			21042	1906	20560		349
27370			-131	13	1091	206	58	846	3060	3118			1001	3270			19702	1954	19240		-482
27430			71	14	1092	206	58	844	3040	3098			1009	3320			19273	1902	20450		1177
26120			529	15	1090	206	58	848	3060	3118			1026	3420			20072	1863	19540		-492
25840			-75	16	1091	208	59	849	3070	3129			1035	3480			18952	1843	19290		131
26720			-205	17	1091	208	59	850	3080	3139			1036	3480			19131	1865	19500		369
25610			-429	18	1090	209	60	852	3080	3140			1036	3480			18851	1813	18270		-581
25790			533	19	1095	209	60	862	3140	3200			1041	3510			17321	1626	15510		-1811
25700			794	20	1100	209	60	866	3160	3220			1027	3430			13671	H.D.	11820		-1851
24090			2999	21	1092	210	60	863	3140	3200			1028	3430			9575	1199	7740		-1835
20340			3459	22	1100	208	59	865	3150	3209			1029	3440			5419	936	4270		-549
16260			3106	23	1100	208	59	866	3160	3219			1027	3430			3733	H.D.	3590		-703
12110			2487	24	1098	210	60	862	3160	3220			1035	3480			1320	550	1190		-130
10370			1645	25	1100	210	60	866	3160	3220			1040	3510			2206	763	3160		954
8050			1441	26	1100	208	59	866	3160	3219			1039	3500			2976	789	3370		994
7720			290	27	1100	211	61	867	3160	3221			1040	3510			2825	832	1870		-955
9740			-286	28	1100	211	61	865	3150	3211			1046	3540			995	470	682		-313
9610			440	29	1098	212	62	866	3160	3222			1043	3530			607	927	176		-431
7800			1308	30	1098	212	62	865	3150	3212			1028	3430			388	274	96		-292
7380			887	JUL 1	1089	211	61	860	3130	3191			1048	3560			577	439	625		48
6930			985	2	1060	212	62	834	3000	3062			1048	3560			257	432	498		241
7430			-402	3	1103	211	61	869	3180	3241			1048	3560			247	462	640		393
7120			100	4	1102	211	61	868	3190	3251			1048	3560			268	471	688		420
7120			125	5	1102	211	61	868	3200	3261			1048	3560			652	H.D.	1040		328
7140	379	6761	-489	6	1102	210	60	868	3200	3260	0	3260	1048	3560	0	52	390	216	41	0	-349
7510	1510	6000	732	7	1103	210	60	868	3200	3260	260	3000	1047	3550	550	0	390	216	41	0	304
7090	1796	5294	939	8	1092	210	60	842	3080	3140	846	2294	1043	3560	560	0	-280	187	24	0	203
6250	1643	4607	1098	9	1082	212	60	812	2940	3000	1393	1607	1044	3530	530	0	-180	186	23	0	322
6280	2454	3826	92	10	1078	212	60	799	2870	2930	2104	826	1044	3530	530	0	-299	186	23	0	289
6150	2750	3400	156	11	1078	212	59	796	2860	2919	2519	400	1044	3530	530	0	-268	186	23	0	261
6180	2780	3400	162	12	1079	211	58	796	2860	2918	2518	400	1043	3530	530	0	-367	187	24	0	291
6250	2850	3400	-80	13	1082	211	58	799	2880	2938	2538	400	1046	3540	540	0	-278	186	23	0	301
6280	2880	3400	-418	14	1084	210	58	799	2880	2938	2538	400	1048	3560	560	0	-357	183	22	0	360
6350	2950	3400	-401	15	1086	209	57	828	3030	3087	2687	400	1052	3580	580	0	-357	183	22	0	379
6480	3080	3400	-229	16	1084	211	58	829	3040	3098	2698	400	1054	3590	590	0	-278	186	23	0	299
6320	2920	3400	103	17	1076	211	58	815	2960	3018	2618	400	1054	3590	590	0	-318	177	19	0	337
6280	2880	3400	599	18	1076	209	57	810	2940	2997	2597	400	1054	3590	590	0	-258	174	17	0	275
6480	3146	3334	476	19	1078	211	58	815	2960	3018	2618	400	1054	3590	590	0	-219	174	17	0	236
6600	3879	2721	269	20	1083	211	58	840	3090	3148	2756	392	1055	3600	658	0	-249	176	18	0	267
6630	3950	2680	470	21	1087	211	58	854	3140	3198	2878	320	1056	3610	1209	0	-269	176	18	0	287
6550	3920	2630	-191	22	1084	212	59	856	3140	3199	2884	315	1055	3600	1235	0	-73	175	18	0	91
6550	3920	2630	258	23	1085	212	59	852	3100	3159	2850	309	1054	3590	590	0	-89	174	17	0	106
6700	3900	2650	616	24	1087	213	59	857	3100	3159	2847	312	1054	3590	590	0	-199	170	16	0	215
6680	4000	2700	669	25	1089	212	59	857	3080	3139	2821	318	1053	3590	590	0	-239	167	14	0	253
6600	4020	2660	653	26	1088	213	59	855	3060	3119	2806	313	1053	3590	590	0	-220	166	14	0	234
6650	4030	2670	140	27	1086	213	59	856	3100	3159	2845	314	1053	3590	590	0	-299	163	15	0	314
6600	4030	2620	371	28	1092	213	59	860	3180	3239	2931	308	1055	3600	1288	0	-370	163	15	0	385
6500	3900	2450	408	29	1092	213	59	859	3200	3259	2971	288	1041	3510	1348	0	-290	174	17	0	307
6450	3900	2600	756	30	1090	213	58	857	3200	3258	2952	306	1038	3490	1196	0	-166	168	15	0	181
6500	3810	2640	-117	31	1091	212	58	859	3200	3258	2947	311	1041	3510	1181	0	-399	166	14	0	413
6350	3830	2520	492	31	1091	212	58	856	3190	3248	2922	296	1038	3490	1266	0	-429	164	13	0	442
6150	3490	2660	67	32	1085	213	58	852	3060	3118	2865	296	1018	3370	1146	0	-429	164	13	0	442
6120	3480	2640	-235	33	1083	213	58	851	3120	3178	2865	313	1014	3350	1003	0	-429	164	13	0	442
				4	1070	213	58	838	3130	3188	2877	311	1013	3340	1011	0	-429	164	13	0	442

ALL DISCHARGE QUANTITIES ARE GIVEN IN SECOND FEET UNLESS OTHERWISE NOTED AT TOP OF COLUMN

1921 DISTRIBUTION WATER DISTRICT NO 36

JACKSON LAKE				MORAN				OSGOOD				RILEY				MURAN-HEISE				RILEY				1921		
DATE	Base	Cap Ac Ft	Don Fm Ft	Base	Disch	Std	Nat	Base	Disch	Std	Nat	Base	Disch	Std	05G	Nat	Tot Gain	Loss	Mass	Gain	Base	Disch	Base	Disch	1921	1921
1921	5292	453740	18310	871	10810	9231	1579	398	16280	16302	9000	0	7902	5492	231	0	5723	282	760	17062	1921	1921	1921	1921	1921	1921
10/31	5292	453740	18310	871	10810	9231	1654	397	16230	16251	8947	10	7294	5411	229	0	5640	296	847	17098	10/31	10/31	10/31	10/31	10/31	10/31
11/1	5212	440540	18200	872	10830	9176	1602	397	16230	15980	8656	26	7298	5473	222	1	5696	308	934	16914	11/1	11/1	11/1	11/1	11/1	11/1
2	5134	422930	17610	856	10480	8878	1602	397	15980	14160	6956	34	7170	5485	178	1	5664	313	968	15128	2	2	2	2	2	2
3	5071	403780	14150	771	8640	7134	1506	354	14160	12670	5938	36	6696	5103	152	1	5256	313	968	13638	3	3	3	3	3	3
4	5017	396700	12080	717	7530	6090	1440	321	12670	11964	5353	34	6577	5139	137	1	5277	306	934	12898	4	4	4	4	4	4
5	4968	385810	10890	679	6790	5490	1300	304	11950	11511	5225	34	6252	4916	134	1	5051	301	906	12417	5	5	5	5	5	5
6	4920	375180	10630	667	6540	5359	1201	293	11420	11461	5412	40	6009	4780	139	1	4920	305	934	12395	6	6	6	6	6	6
7	4870	364170	11010	671	6480	5551	1089	292	11420	11550	5496	38	6016	4831	141	1	4973	302	917	12467	7	7	7	7	7	7
8	4819	352990	11180	673	6480	5637	1043	294	11530	11546	5461	37	6048	4908	140	1	5049	307	951	12497	8	8	8	8	8	8
9	4768	341880	11110	669	6600	5601	999	294	11530	11211	5230	37	5944	4803	134	1	4938	306	951	12162	9	9	9	9	9	9
10	4719	331240	10640	657	6370	5364	1006	286	11200	11042	5191	37	5814	4684	133	1	4818	308	962	12004	10	10	10	10	10	10
11	4670	320680	10560	654	6320	5324	996	282	11030	11041	5167	34	5840	4686	132	1	4819	305	951	11992	11	11	11	11	11	11
12	4621	310170	10510	654	6320	5299	1021	282	11030	10961	5034	33	5894	4737	129	1	4867	315	1010	11971	12	12	12	12	12	12
13	4573	299930	10240	647	6190	5163	1027	280	10950	10961	5034	33	5894	4737	129	1	4867	315	1010	11971	13	13	13	13	13	13
14	4525	289750	10180	649	6220	5132	1088	283	11070	11081	5004	30	6047	4830	128	1	4959	333	1120	12201	14	14	14	14	14	14
15	4477	279630	10120	650	6240	5102	1138	284	1110	11121	4974	29	6118	4851	128	1	4980	356	1260	12381	15	15	15	15	15	15
16	4429	269580	10050	650	6240	5067	1173	280	10950	10961	4940	28	5993	4692	127	1	4820	371	1380	12341	16	16	16	16	16	16
17	4384	260200	9380	626	5810	4729	1081	266	10390	10400	4611	27	5762	4562	118	1	4681	374	1400	11800	17	17	17	17	17	17
18	4343	251720	8480	597	5290	4275	1015	247	9670	9678	4168	26	5494	4361	107	1	4469	373	1390	11068	18	18	18	18	18	18
19	4307	242280	7440	556	4600	3751	849	231	9070	9078	3657	26	5395	4451	94	1	4546	369	1360	10438	19	19	19	19	19	19
20	4271	236920	7360	547	4460	3711	739	228	8960	8968	3618	24	5326	4493	93	1	4587	369	1360	10328	20	20	20	20	20	20
21	4238	230190	6730	530	4180	3393	787	217	8560	8565	3308	20	5237	4364	85	1	4450	361	1300	9865	21	21	21	21	21	21
22	4204	223250	6940	537	4290	3499	791	217	8560	8565	3308	20	5237	4364	85	1	4450	361	1300	9865	22	22	22	22	22	22
23	4170	216400	6850	532	4210	3454	756	217	8560	8565	3308	20	5237	4364	85	1	4450	361	1300	9865	23	23	23	23	23	23
24	4138	209970	6430	528	4150	3242	908	217	8560	8565	3308	20	5237	4364	85	1	4450	361	1300	9865	24	24	24	24	24	24
25	4105	203340	6630	534	4240	3343	897	217	8560	8565	3308	20	5237	4364	85	1	4450	361	1300	9865	25	25	25	25	25	25
26	4072	196780	6560	530	4180	3307	873	212	8390	8394	3224	0	5170	4214	83	0	4297	371	1380	9944	26	26	26	26	26	26
27	4039	190250	6530	526	4120	3292	828	212	8390	8394	3210	0	5184	4274	82	0	4356	375	1400	9794	27	27	27	27	27	27
28	4009	184310	5940	504	3780	2995	785	204	8120	8122	2920	0	5202	4342	75	0	4417	373	1390	9974	28	28	28	28	28	28
29	3982	179020	5290	473	3330	2667	663	191	7680	7682	2600	0	5082	4352	67	0	4419	374	1400	9974	29	29	29	29	29	29
30	3959	174530	4490	442	2920	2264	656	175																		

MINICANS		MIN		MINIDOKA		N-M		DATE		MIL		PALAT		NSTFCAN		PA+NSTFCAN		55 TF		CANAL		MURTAUGH C		MIL		MILNER		M-M																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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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.

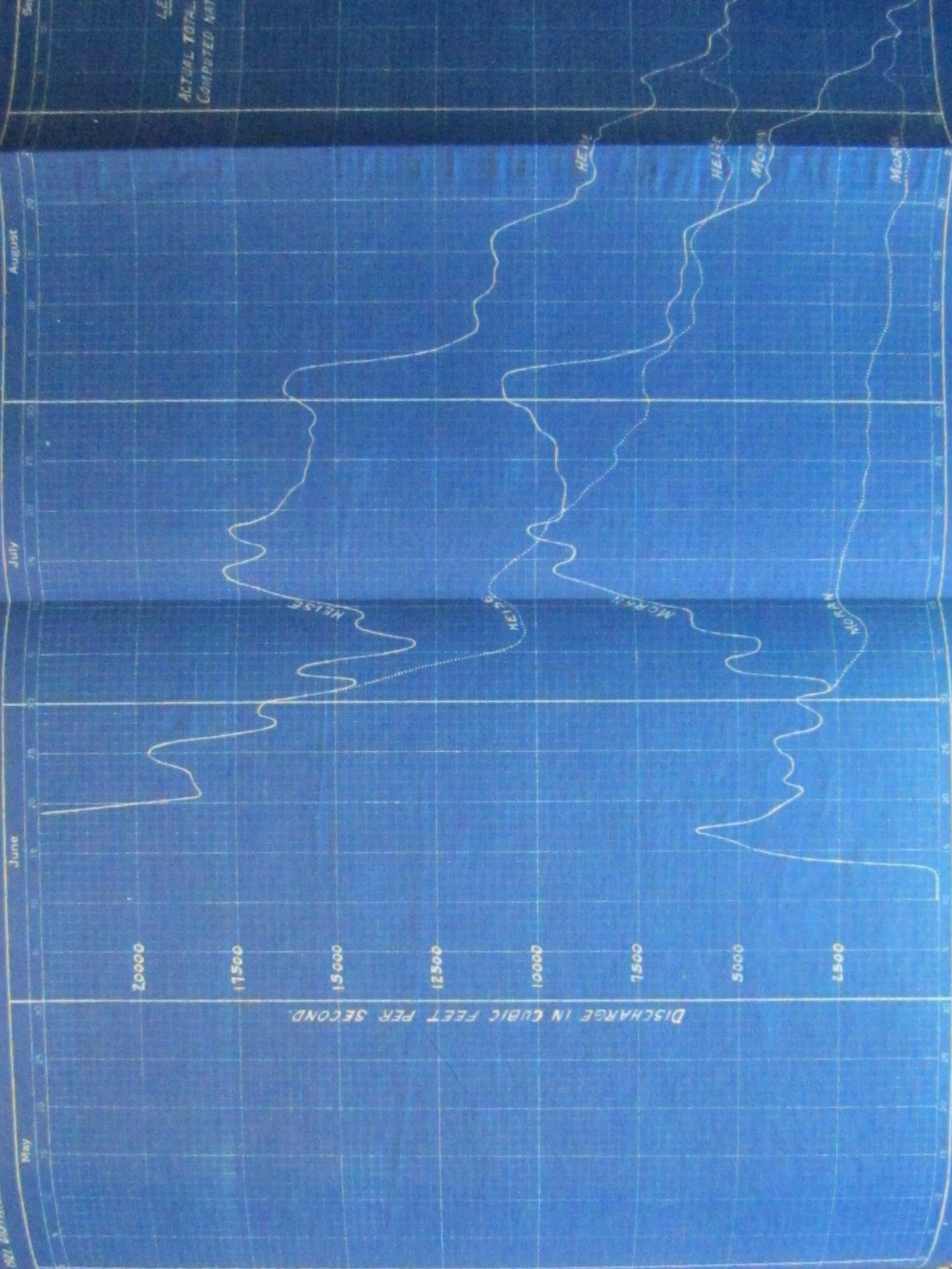
The river stations were maintained continuously during all four months but, as previously explained, records of the upper valley diversions were not secured every day in September; hence canal discharges for this month have been partially interpolated.

From August 1 to August 24 inclusive storage was released from the small Emma Matilda and Two Ocean Lake Reservoirs. This water was turned out for delivery to the Osgood Canal of the Utah-Idaho Sugar Company but, because anticipated transfers of a portion of the natural flow rights of this canal were never completed, the storage was not needed. Hence, in these final computations, it has been included with the natural water available at the Woodville river station but has not been added in the column showing gain in natural water between Heise and Woodville. At Heise and above it is shown separately as Two Ocean Lake storage.

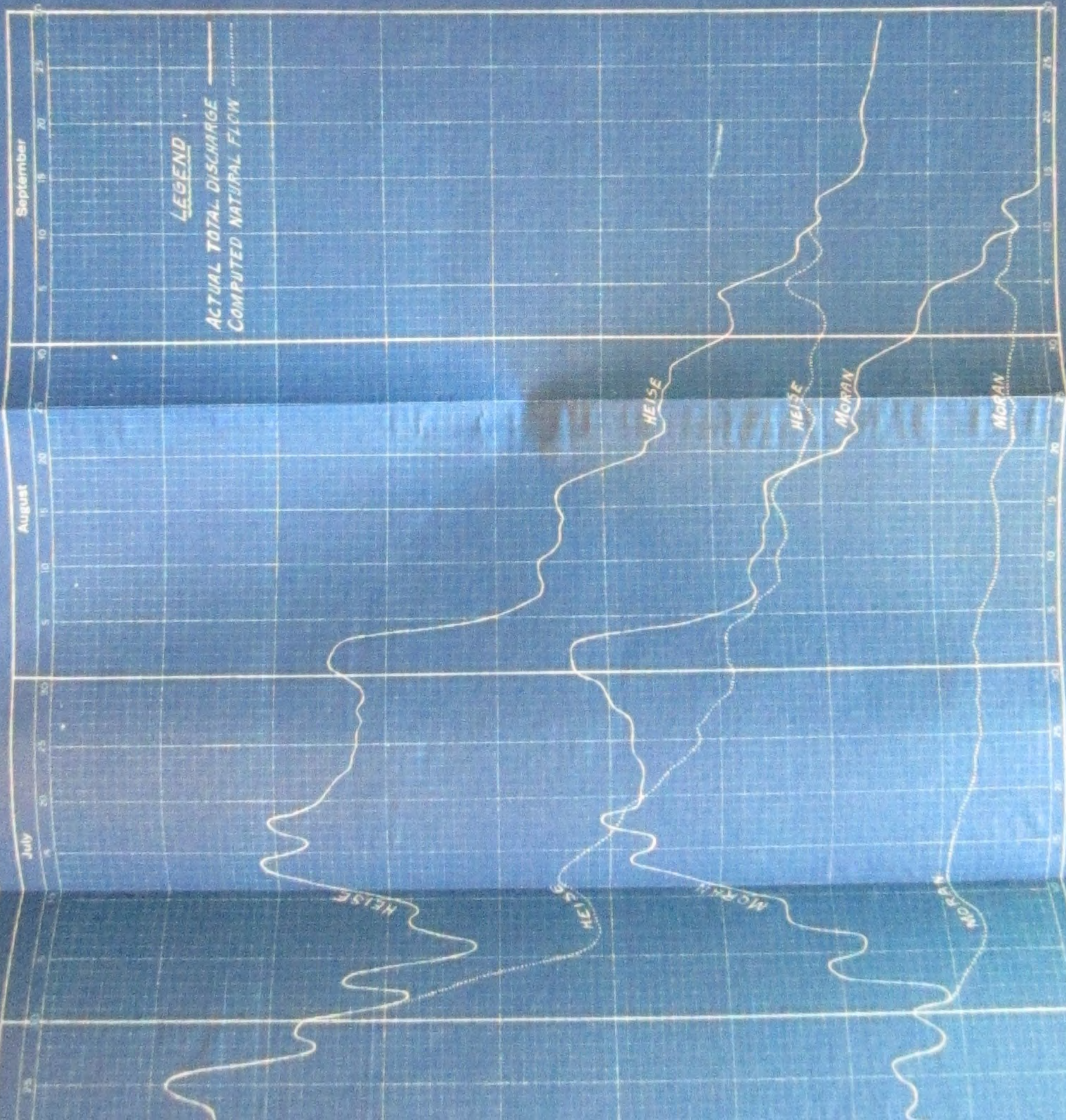
SEGREGATION OF FLOW.

Plate IX shows graphically both the actual total flow and the computed natural flow past the Moran and Heise gaging stations during the season of 1921. The difference between the total and natural flow graphs on any date of course indicates storage.

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 15 really represent mean quantities for the 24 hour period ending at 4 a.m. on



ACTUAL TOTAL
COMPUTED



July 16, while the indicated Moran data for July 15 are means for the 24 hour period ending at 4 a.m. on July 15.

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

JACKSON LAKE 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 unknown factors which may or may not be fair. Natural 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 obtain the benefit of all the additional ground or bank storage which results from the increased elevation of the water surface

in the lake. Without data upon which to base any equitable segregation of these several factors, however, the method heretofore followed appears to be the most practicable which can be devised.

Below the Moran gaging station stored water losses were determined and applied in exactly the same manner as during the two preceeding seasons^a, viz., $2\frac{1}{2}$ per cent between the Moran and Heise stations and computed losses based upon the average of the two preceeding days between the Heise and Woodville and between the Woodville and Blackfoot stations, with minimum loss in each of the two latter sections never less than one-half of one per cent.

Losses for all storage delivered to canals diverting above the Blackfoot gaging station were computed upon the basis of the losses to the Woodville station, 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 about 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 grouping of losses would seem to be at least a reasonably fair one. 1921 calculations show that these upper valley canals should have received at their headgates 97.0074 per cent of the storage turned out for them at Moran.

Storage released for the Minidoka and Twin Falls canals was charged with prorata losses to the Blackfoot gaging station which for the season

^aPages 27 and 28, Water Distribution and Hydrometric Work in District No. 36, 1919, by G. Clyde Baldwin.

averaged 6.6103 per cent; hence delivery to these canals should have been upon the basis of 93.3897 per cent of amounts released from Jackson Lake.

These computed losses differ but little from those of the preceeding year, although they are only about one-half of those noted for the season of 1919. This variation is accounted for chiefly by the larger return flow noted during the last two years between the Haise and Blackfoot gaging stations. The increased return flow is probably attributable in part to more favorable ground water conditions and partially to increased surface waste from canal systems of this section.

The advisability of attempting to keep daily records of the surface return or waste has several times been considered by the members of the water users' Advisory Committee, but the probable benefits to be derived have not been deemed sufficient to warrant the expense. Hence during 1920 and 1921, by agreement, the entire inflow from Blackfoot River was credited to the upper valley canals to offset any loss of water available to them resulting from inadequate storage loss computations. In order to obtain information which would assist in determining the justice of this compromise, two sets of measurements of the surface return between the Woodville and Blackfoot stations were obtained during the 1921 season and will be discussed later in this report. (Pages 27-31).

Plate X contains a summary of the daily and total deliveries of Jackson Lake storage to each company or canal owning rights therein. Deliveries are shown in second-feet for actual dates at the head of the

[illegible][illegible]

JACKSON LAKE STORAGE DELIVERIES

[illegible]

LAKE WALCOTT STORAGE DELIVER

[illegible]

14	15	16	17	ACT DELIV SEC FT	ADJUST MT SEC FT	ADJUSTED DELIVERY ACRE-FT	JL EQUIV ACRE-FT	JL RIGHT ACRE-FT
				475	0	475	971	1200
				963	0	963	1969	2000
				1869	0	1869	3821	6100
				241	0	241	493	5000
				894	0	894	1828	2000
				2599	0	2599	5314	5120
				0	0	0	0	1040
				929	0	929	1899	4000
				748	0	748	1530	3000
				1544	0	1544	3157	5000
				0	0	0	0	355
				616	0	616	1222	1500
				3792	0	3792	7521	15000
				-112	0	-112	-222	8000
				6837	0	6837	13561	42685
				46	0	46	94	100
				24	0	24	48	50
				24	0	24	48	50
				24	0	24	48	50
				112	0	112	222	350
				14	0	14	28	50
				13732	143	13875	262452	Q 321000
				108566	1132	109698	245103	2541
				1422	-209	1213	2406	97183
				41965	157	42122	83548	Q 323626
				138273	1442	139715	277121	151530
				2665	-2665	0	HOLDOVER 1922, 1921, AVAILABLE, 1921.	847000

a/ 325810 ACRE FEET JACKSON LAKE RIGHT LESS 4810 ACRE FEET SOLD FOR SEASONAL USE

b/ 322007 ACRE FEET JACKSON LAKE RIGHT PLUS 1357 ACFT FEET PURCHASED FROM USAS FOR SEASONAL USE BY HILLS-DALE IRRIGATION DISTRICT, 100 ACRE-FEET BY HANSTEN, AND 62 ACRE-FEET BY BODIN

14	15	16	17	ACT DELIV SEC FT	ADJUST MT SEC FT	ADJUSTED DELIVERY ACRE-FT	JL EQUIV ACRE-FT	JL RIGHT ACRE-FT
				30720	-13732	16988	33695	36080
				0	0	0	0	0
				0	0	0	0	0
113	120	236	158	627	0	627	1244	0
				INCREASE IN LAKE WALCOTT	JUL 5 SEPT 16, -1643		1332	
				EXCESS NATURAL AVAILABLE	JUL 6	425		
				TOTAL	16397			
				WELLY TO MILNER FOR PERIOD, SEE PLANS E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z	16397			

respective canals. In cases where storage rights were sold for delivery through other canals, both the parties owning the right and those receiving the water are indicated in the first column or by foot-notes.

Lake Walcott deliveries were limited to the Minidoka canals during the time when there was Jackson Lake storage in the river. This fact accounts for the small minus quantities which are shown on four different dates as stored in Lake Walcott. Storage delivered to the Twin Falls canals after September 13 was necessarily from Lake Walcott, but was authorized by the U. S. Reclamation Service officials in order to permit closing the outlet gates at Jackson Lake at an earlier date than would otherwise have been possible.

With the exceptions above noted all minus quantities in the body of the table represent credits for natural flow accepted in lieu of storage in accordance with the plan outlined on pages 16 and 17 of this report.

Because of the better sustained natural flow, especially during the latter part of August, less storage was used by upper valley canals than in 1920. The Farmers Friend, Rudy and Burgess were the only canals owning Jackson Lake rights which required the full amount to which they were entitled. Most of the other canals in this section had a substantial balance remaining to their credit at the close of the season, while the Peoples Canal had a small natural flow credit remaining in addition to their entire storage right. In a number of instances, due to revision of ratings, etc. the final computed totals differ slightly from those indicated by the summer or field computations, but in no case is the discrepancy of very great magnitude.

MINIDOKA AND MILNER ADJUSTMENTS.

As noted on Plate X water was wasted past Milner Dam to an amount in excess of the normal leakage through the dam on six different days during the period of Jackson Lake storage delivery. With the exception of a small amount of natural flow which passed this point on July 6, this extraordinary waste consisted of stored water. Hence, in order to balance all storage accounts, this wastage was charged or prorated against Jackson Lake rights.

Since no special agreement as to the manner in which these charges should be made was executed for the 1922 season, the general plan adopted for 1921 was again used. This provided essentially that waste due to faulty regulation should be prorated between the Minidoka and Milner canals in proportion to their respective seasonal diversions of stored water.

1922 extraordinary storage waste consisted of the 2,665 second-feet which actually passed Milner Dam and excess deliveries at times when the water must otherwise have been wasted totaling 224 second-feet to the Murtaugh Canal and 280 second-feet to the Twin Falls Canal Co. 3169 second-feet were therefore prorated as above outlined and the net charge against each canal is shown in the adjustment column. These latter quantities of course take account of the excess delivery credits given to the Murtaugh and Twin Falls Canal Co. rights.

Part of the waste during the period August 16 to 21 inclusive might be attributed to underdeliveries to the Minidoka canals amounting to 797 second-feet but, in order to simplify the final adjustments, this

was considered to be offset by the acceptance on the part of these canals during September of Jackson Lake storage in lieu of that from Lake Walcott. Likewise a slight overdelivery to the North Side Canal Co. during the same period has been considered as compensated by the failure of that company to accept all the storage ordered for September.

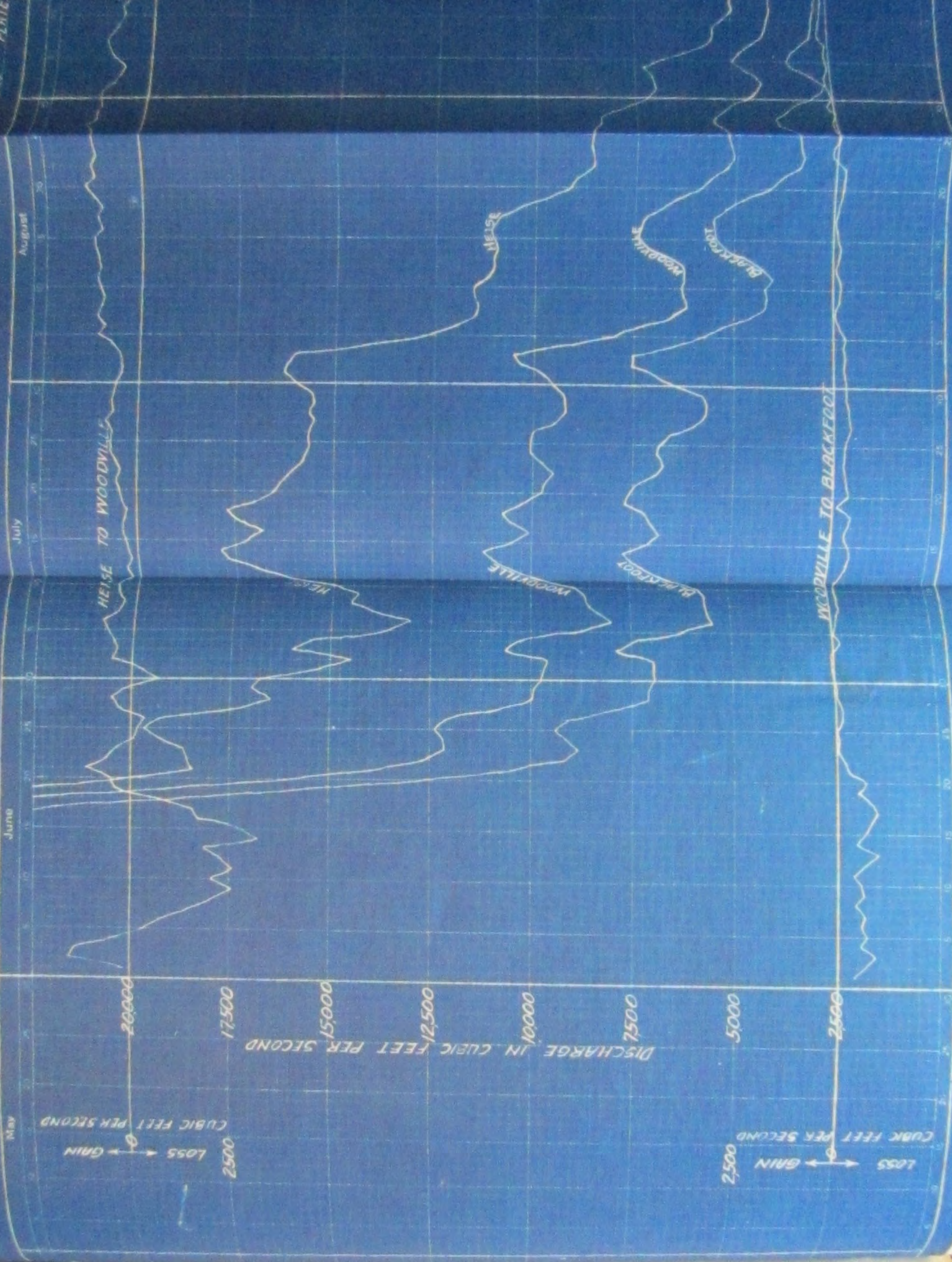
A more exact segregation of these charges might perhaps be warranted were it not for the material balance remaining to the credit of these storage rights at the end of the season.

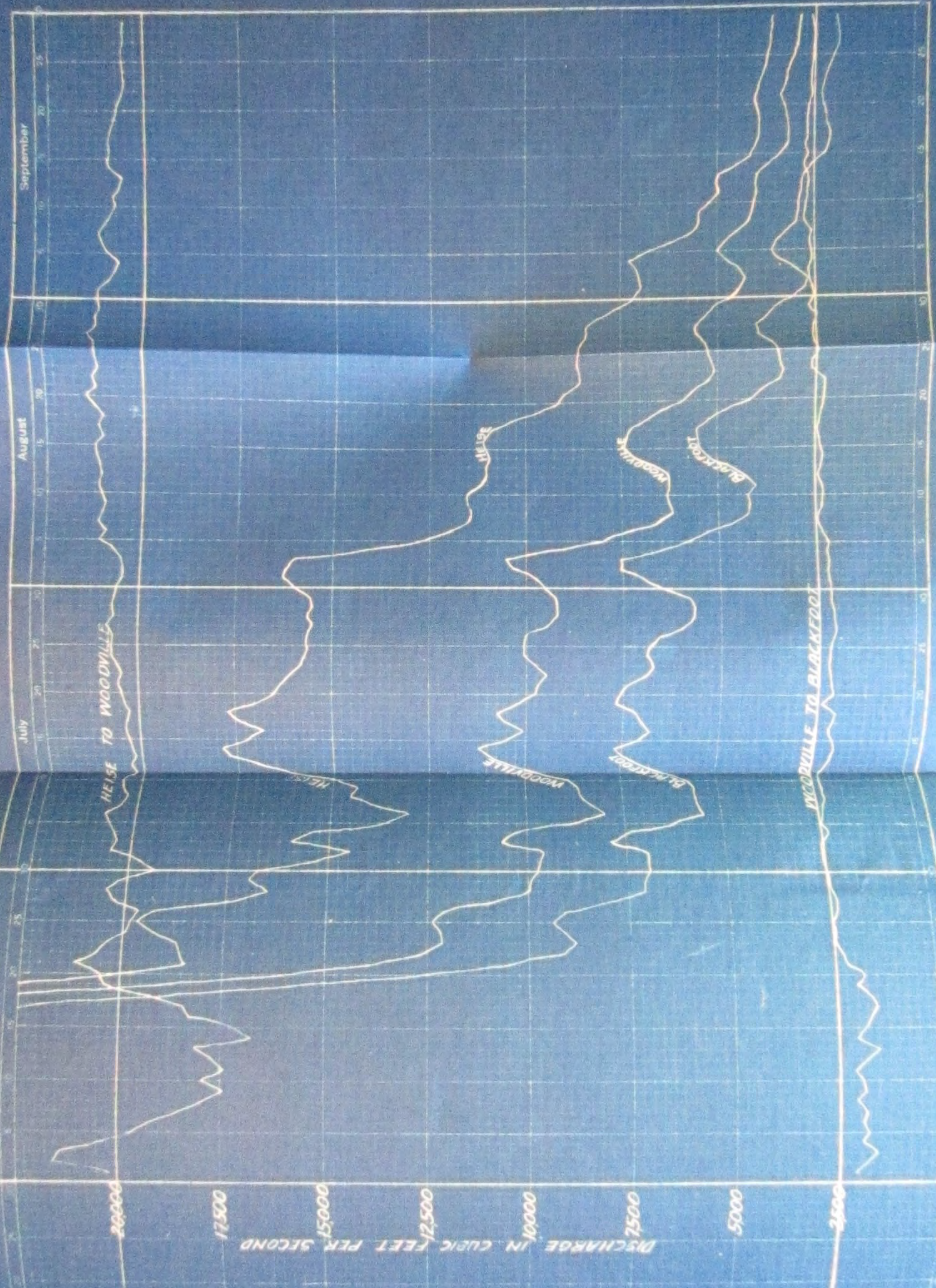
RIVER LOSSES AND GAINS.

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 XI contains hydrographs of the total flow passing the Heise, Woodville and Blackfoot gaging stations during the period from June to September together with graphs showing the net losses and gains in the two intervening sections. All graphs are plotted to the same scale and with a time interval allowance to make them coincide with the Heise dates.

The same tendency toward increased losses coincident with sharp rises in river stage and the reverse of decreased losses or increased gains at the time of rapid drops in the river, to which attention has been called in both the 1919 and 1920 reports, is again noted. In fact the general characteristics of these graphs differ but little from





these of former years.

Variations in the quantity of water diverted by intervening canals, in the amount of return flow or loss and in the discharge of tributary streams account for the differences noted in the shape of the three hydrographs.

No diagrams are included for the Porterville station, but complete data are listed on Plates VII and VIII, in accordance with previous practice.

During 1920 it became evident that the computed losses on some sections of the river were less than the actual losses because surface waste or return flow from adjacent canal systems was not measured and accounted for in the computations. Because of the insufficient supply of water available in 1919 very little waste of this character was then noted. In the two following years, however, the water supply was more abundant, irrigation methods were less efficient and the waste consequently increased. This was especially noticeable in the section of the river between the Woodville and Blackfoot gaging stations. The Advisory Committee recognized this condition and as a compromise measure agreed to the plan under which the inflow from Blackfoot River has for the last two years been credited as natural flow available to upper valley canals.

Because of the constantly fluctuating character of surface waste it would be not only difficult but also very expensive to secure a dependable daily record of this quantity. On the other hand, without some knowledge as to its amount little progress could be made in determining the equity of any plan for compensation or adjustment.

Occasional measurements of this waste throughout the 1921 season were therefore decided upon and two complete sets were secured for the Woodville to Blackfoot section of the river. These had to be obtained as time was available and without serious detriment to other more urgent work; hence are not consecutive as to dates.

The following is a detailed summary of the two sets of measurements:

Right Bank River

Left Bank River

Name	Date	Amt.	Date	Amt.	Name	Date	Amt.	Date	Amt.
------	------	------	------	------	------	------	------	------	------

Fugal Gulch	7/28	0.30	9/8	0.20					
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Woodville Bridge - - - - -

# 1	7/28	0.04	9/8	0.20	#1 (Big Channel)	7/28	0.30	9/8	15.1
# 2	"	Dry	"	0.10	#2 (File Drain)	"	0.06	"	0.20
# 3	"	Dry	"	0.10					
# 4 (Woodville)	"	1.20	"	3.00					
# 5	"	0.30	"	Dry					
# 6	"	0.10	"	0.10					
# 7 (Woodville)	"	1.39	"	15.7					
# 8 (Wood Flume)	"	0.20	"	0.10					
# 9 (New Sweden)	"	4.43	"	34.9					

Lower Shelley Bridge - - - - -

#10	7/28	Dry	9/8	Dry	#3	7/28	0.20	9/8	0.80
#11	"	0.50	"	1.20	#4	"	Dry	"	2.00
#12 (Wood Flume)	"	1.14	"	0.20	#5 (Cox Ranch)	"	0.25	"	0.15
#13	"	0.40	"	Dry	#6 (Cox Ranch)	"	Dry	"	0.65
					#7 (Comes under Reser. Canal)	"	1.00	"	8.50
#14-16	"	Dry	"	0.40	#8	"	0.40	"	Dry
#17	"	2.00	"	0.30	#9	"	0.20	"	Dry
#18	"	Dry	"	Dry	#10	"	Dry	"	0.20
#19 (Gulch)	"	0.90	"	Dry					
#20 (End Lateral)	"	Dry	"	Dry					
#21	"	Dry	"	Dry					
#22 (Gulch)	"	0.50	"	Dry					
#23-25	"	1.00	"	Dry					

Firth Bridge - - - - -

Name	Date	Amt.	Date	Amt.	Name	Date	Amt.	Date	Amt.
#26 (New Lavaside)	7/29	1.00	9/22	28.2	#11 (Slough)	7/29	1.00	9/22	0.50
#27	"	Dry	"	0.15	#12	"	0.06	"	Dry
#28	"	Dry	"	0.10	#13 (Slough)	"	0.30	"	1.38
#29	"	0.10	"	0.15	#14	"	0.04	"	0.20
#30 (Gulch)	"	0.10	"	0.20	#15	"	0.30	"	Dry
#31 (Gulch)	"	0.20	"	0.15	#16 (Nielsen-Hansen)	"	0.25	9/23	Dry
#32 (Regular Wasteway)	"	1.00	"	32.2	#17	"	Dry	"	0.20
					#18	"	0.35	"	Dry
					#19 (End Lateral)	"	2.42	"	0.30
					#20	"	0.88	"	Dry
					#21	"	0.10	"	0.10

Porterville Bridge

#33	8/2	Dry	8/30	Dry	#22	7/29	Dry	8/30	0.50
#34-35	"	0.20	"	0.20	#23 (Channel)	"	0.20	"	7.00
#36-37	"	0.30	"	1.00	#24 (Blackfoot)	8/2	45.0	"	72.0
#38-41	"	1.00	"	0.80	#25 (Channel)	"	1.80	"	0.50
#42 (Metal Culvert)	"	Dry	"	Dry					
#43 (Rock Culvert)	"	Dry	"	Dry					
#44 (Regular Wasteway)	"	10.8	"	4.67					
#45	"	0.80	"	1.48					

Lower Blackfoot Bridge

#46-47	8/2	Dry	8/30	0.10	#26	8/3	1.50	8/30	0.50
#48	"	0.80	"	0.20	#27	"	0.50	"	0.10
#49	"	0.20	"	Dry	#28-34	"	0.90	"	Dry
#50 (Gulch)	"	6.15	"	Dry	#35	"	1.00	"	0.33
#51 (Trego)	"	1.00	"	21.1					
#52	"	0.20	"	Dry					
#53 (Parsons)	"	0.50	"	1.50					
#54 (Watson)	8/3	0.20	"	2.27					
#55 (Combined Wasteway)	"	37.1	"	34.8					
#56 (Peoples)	"	0.40	"	3.46					
#57-58	"	0.10	"	1.25					

Blackfoot Gaging Station on Snake River

Total Right Bank	76.55	190.28	Total Left Bank	59.01	109.21
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Most of the larger quantities noted in this summary were actually measured with a current meter, while those not measured were estimated as

closely as possible by the hydrographers who made the investigation.

The fluctuating character of this surface waste is indicated not only by the difference in the totals of the two sets of determinations but also by the variation in the discharge of individual wasteways on different dates. The fact that much more waste is shown by the second set of measurements than by the first tends to substantiate general conclusions heretofore reached to the effect that this quantity may be expected to increase as the demand for water decreases.

Without additional data it would be unwise to attempt much more definite statements as to the variation of this waste throughout the irrigation season.

Some idea concerning the effect upon computed losses may be obtained by assuming that the total waste indicated by each of these two determinations is applicable during each day the respective determination was in progress and then recomputing the river losses after first crediting the waste as inflow. During the first period, without taking into account the ground or sub-surface return flow, this procedure would increase the average river loss between the Woodville and Black-foot gaging stations by 136 second-feet or from 4.4 per cent to 6.0 per cent, while during the second period 299 second-feet would be added to the loss, changing it from a net gain of 1.9 per cent to a loss of 6.1 per cent.

During the first period the average amount of storage to which this increased loss would apply was 6,755 second-feet. 1.6 per cent of 6,755 second-feet gives 108 second-feet as the resulting average in-

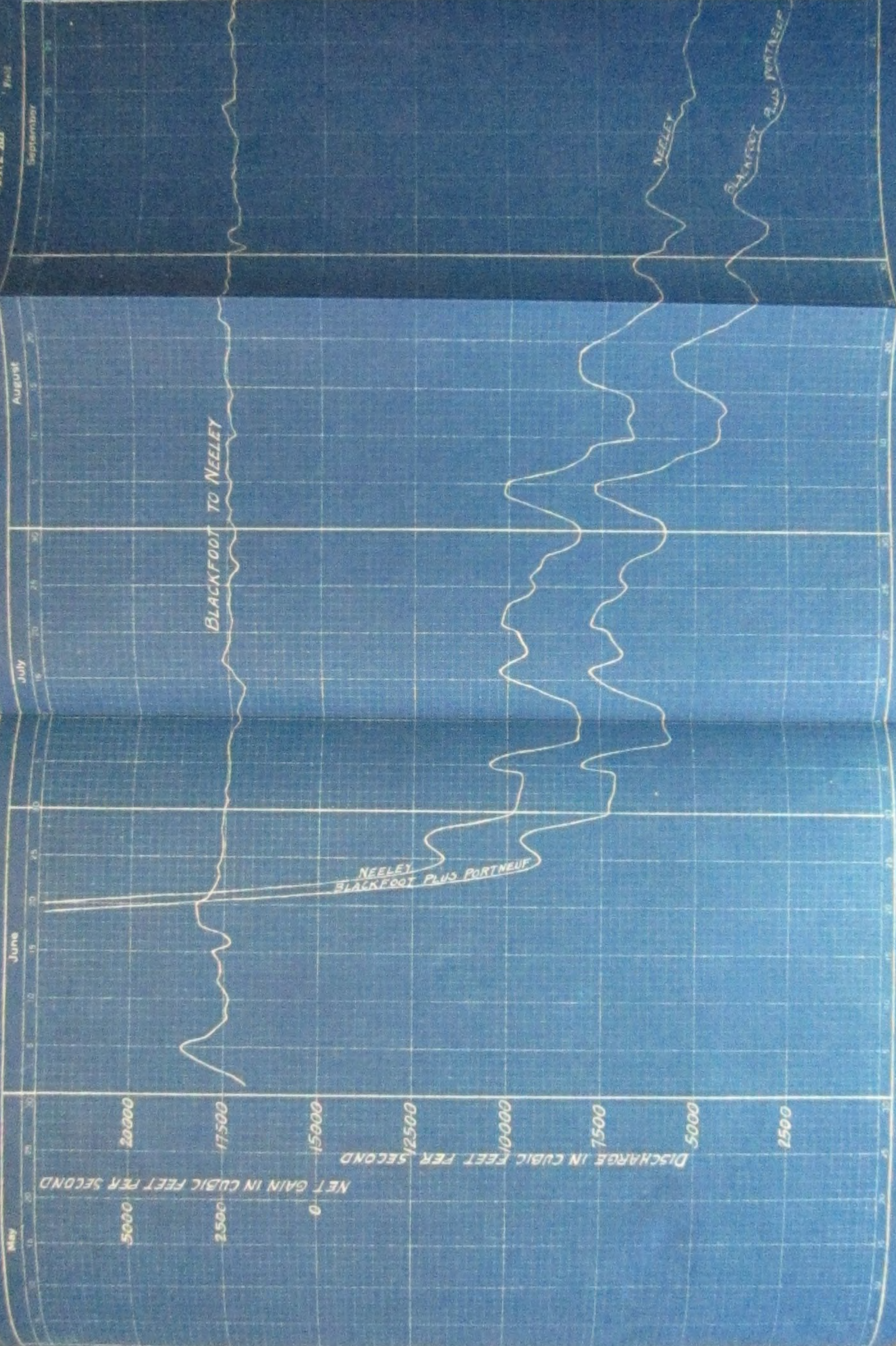
crease in storage loss which may be compared to 98 second-feet, the mean inflow from Blackfoot River on these four days.

No storage was in transit on September 22 and 23, so a similar mean computation for the second period would perhaps not be consistent. Using the individual days, August 30 and September 8 however, storage losses would be increased respectively by 177 second-feet and 26 second-feet in comparison with 288 second-feet and 292 second-feet, the inflow from Blackfoot River on these two days.

The results of these investigations will be presented to and undoubtedly will be carefully considered by the Advisory Committee before the plan for 1922 operation is adopted.

Plate XII contains graphs similar to those shown on Plate XI but covering the section between the Blackfoot and Neeley gaging stations. Neeley dates are here used. The average net gain indicated amounts to about 2,500 second-feet for the entire four months period or about 100 second-feet greater than that for 1920. The increase can doubtless be explained as greater return flow from intervening irrigated lands on the theory of the more abundant water supply available, but there is a possibility that changes in the inflow from springs whose origin is farther removed may be responsible.

Plate XIII 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 graphs showing the fluctuations in water surface elevation at both Lake Walcott and Lake Milner. All graphs are plotted to coincide with Lake Walcott or Minidoka dates.



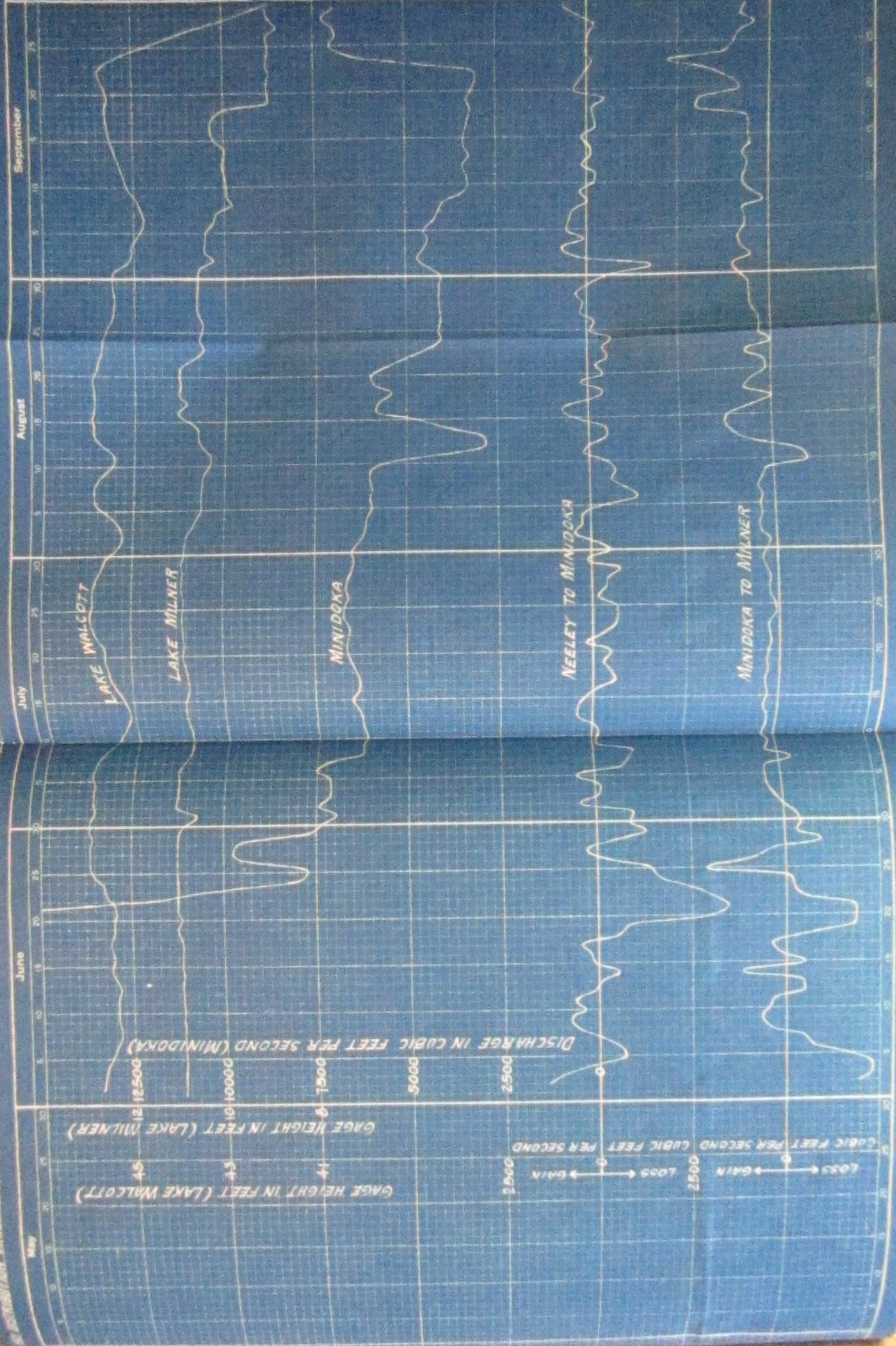
Power requirements at the Minidoka Dam were again emphasized, and a stage of 45.33 feet was set as the minimum to which Lake Walcott might be drawn down prior to the latter part of August. As noted from the graph the limit was not exceeded by more than about 0.2 foot during this period.

Authority was granted to draw more heavily upon Lake Walcott storage beginning September 1, but since the demand upon the part of natural flow rights decreased more rapidly than was anticipated, little actual benefit was derived from this concession.

The pronounced drop in the Minidoka graph which begins on August 10 is explained by the shutting of the North Side Canal headgates at Milner for the purpose of killing moss and conserving storage. A change of such magnitude at the lowest point on the river system involving, as it did, regulation at Jackson Lake, 300 miles upstream, proved very difficult to handle exactly and probably should not be attempted in the future unless a more extensive use of Lake Walcott as an equalizing reservoir is possible.

The general trend of the loss curves is not materially different from that of 1920 but still greater irregularities are noted. Some of these latter are difficult of explanation, but most can be accounted for by the failure of a single time interval to apply at all stages of the river, by the effect of wind on the backwater above the two dams and in a few instances by Lake Milner storage, of which no account has been taken in this report.

While the average losses for the season differed somewhat on the individual sections, the mean gain of 42 second-feet from Neeley to



Milner compares very favorably with the gain of 21 second-feet noted for 1920.

NORMAL FLOW COMPARISON.

Attention has previously been called to the fact that the total run-off during the year is not necessarily a dependable measure of the natural water supply available during the irrigation season.

The diagrams contained on Plate XIV will help to illustrate this fact and will afford a better means of comparison than tabulation of total run-off.

Each hydrograph represents the sum of the computed normal flow at the Heise gaging station and the total discharge past the Rexburg station. In other words, except for increases from return flow or tributaries, and for losses in transit, the hydrographs show the supply available to fill natural flow rights originating below these two gaging stations.

The data for these diagrams were obtained from the reports of the Special Deputy State Commissioner of Reclamation for the respective years indicated.

STORAGE RELEASED VERSUS WASTE.

Plate XV shows graphically the way in which storage was released from Jackson Lake, together with the amount of water passing Milner Dam during the storage delivery periods. The diagrams cover the three years of 1919, 1920 and 1921, which comprise the period of activities of the present distribution organization.



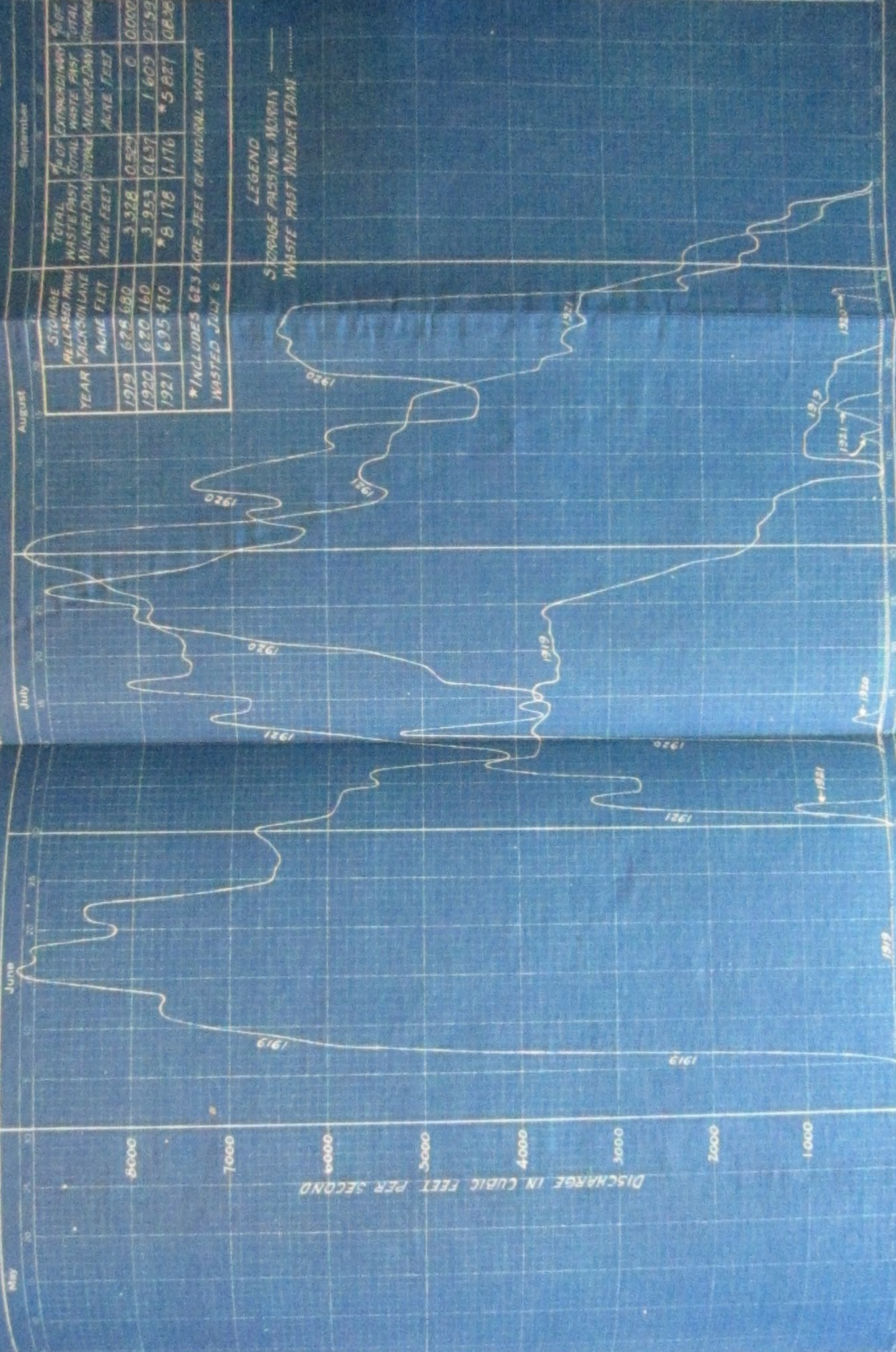
All hydrographs have been plotted to the same scale and have been adjusted to correspond with Jackson Lake or Moran dates.

Water flowing past Milner Dam drops down into Snake River canyon and is absolutely wasted in so far as irrigation benefits within District No. 36 are concerned. On this account the quantity passing this point during the low water period of each irrigation season may be used to some extent to indicate the efficiency of the distribution.

The unavoidable leakage through the Milner Dam, which varies from about 9 to 45 second-feet, depending upon the head in Lake Milner and the care taken in calking around the gates, has been included on the diagrams and in the "Total Waste" column of the accompanying tabulation, but has been eliminated from the "Extraordinary Waste" column.

Inspection of the tabular summary shows that the extraordinary waste which may be attributed to inefficient regulation varied from 0 in 1919 to 5,827 in 1921. Because of the 1919 deficiency in water supply less power was needed to operate the Minidoka project pumps, and consequently, during that year, Lake Walcott could be utilized as an equalizing reservoir to a greater extent than was permitted during 1920 and 1921. It was therefore less difficult to secure efficient distribution in 1919 than in either of the two subsequent years.

The extent to which the delivery orders of the lower canals are filled should also be considered in any comprehensive study of efficiency. In this respect the year 1921 was more satisfactory than 1920, although at the same time the waste was greater.



YEAR	STORAGE RELEASED FROM JACKSON LAKE ACRE FEET	TOTAL WASTE PAST MILNER DAM ACRE FEET	% OF EXTRAORDINARY TOTAL WASTE PAST MILNER DAM	% OF TOTAL STORAGE
1919	628 680	3 328	0.529	0.000
1920	620 160	3 953	0.637	0.159
1921	695 470	*8 178	1.176	*5.827
*INCLUDES 623 ACRE-FEET OF NATURAL WATER WASTED JULY 6				

LEGEND
 STORAGE PASSING MORAN
 WASTE PAST MILNER DAM

- 35 -

DISTRIBUTION OF NATURAL FLOW ORIGINATING
FROM HENRY'S FORK AND TRIBUTARIES.

On April 1, 1921, C. A. McClelland replaced E. C. Howard as hydrographer and was assigned to work in the Henrys Fork area. A little later Mr. McClelland was appointed Deputy Water Master and placed in direct charge of all distribution above the Rexburg gaging station, subject only to general supervision and instructions from the Idaho Falls office.

Following the plan inaugurated in 1920, desk space was rented from Lieut. Governor C. C. Moore at St. Anthony, and an office was maintained there during the period June 1 to September 15.

The general plan of operation in the Henrys Fork, Fall and Teton River territory was in other respects almost identical with that of the preceding year. The following abstract from a brief report prepared by Mr. McClelland explains the work in greater detail:

Stevens' 8 Day Recording Gages were installed early in the season at the stations on Henrys Fork near Ashton, Fall River near Chester and Teton River near St. Anthony. Several staff gages were reset or repaired and a number of foot-bridges were either strengthened or rebuilt. In addition to this construction work one or more meter measurements were secured at practically all gaging stations within the Ashton-St. Anthony-Rexburg territory prior to June 1. W. F. Dawson who arrived at St. Anthony on May 12 assisted materially in the latter work.

Beginning June 1 daily records were obtained at all gaging stations, and on the same day the St. Anthony headquarters office was established in the Haines Building.

The water supply was ample to fill all demands during the months of May and June, and when orders were received on July 1 to cut to record rights, the entire irrigated area was well watered and in good shape, with the possible exception of lands served by the Enterprise Canal, on which a serious break had occurred a few days earlier.

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRY'S FORK AND TRIBUTARIES FOR JUNE 1921

FALL RIVER CANALS

HENRY'S FORK CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
DREWY	10	10	10	10	10	14	18	17	16	17	16	16	18	12	34	25	25	24	22	22	21	22	23	24	25	26	27	28	29	30	
LAST CHANCE	34	40	46	38	29	46	64	64	74	74	74	74	92	90	69	86	88	83	79	69	96	94	451	32	27	31	31	19	29	21	
STANTHONY UNION	292	265	268	255	319	278	399	397	589	461	451	458	451	447	438	472	458	394	397	370	422	418	451	505	494	524	564	506	454	824	
FARMERS FRIEND	171	192	126	126	126	126	126	107	215	220	233	233	233	259	287	259	233	267	220	205	202	178	178	176	195	183	179	187	189	226	
TWIN GROVES	140	135	130	130	135	133	57	153	169	164	160	160	184	184	210	157	147	147	159	147	121	70	61	90	34	36	76	108	130	243	
Salem Union	142	139	134	134	129	134	152	181	209	206	203	217	215	215	229	195	192	203	203	204	192	169	187	187	184	184	192	201	258	182	400
Egan	210	226	226	226	246	238	238	231	262	266	330	343	302	309	172	218	238	258	309	300	287	283	274	270	295	308	282	121	153	2	7467
STANTHONY UNION FEEDER	59	27	59	54	54	57	74	76	74	73	72	72	72	39	94	69	67	64	64	63	59	58	60	57	74	65	75	74	62	62	1940
INDEPENDENT	152	208	217	217	223	221	217	245	253	257	257	237	269	282	307	292	282	257	247	241	257	247	243	245	265	287	241	248	269	203	7418
CONSOLIDATED FARMERS	187	187	191	187	187	219	224	219	219	219	219	219	219	219	231	231	291	240	240	240	240	240	270	270	270	270	270	270	270	270	7023
TOTAL	1422	1386	1421	1371	1463	1458	1671	1904	1889	1947	2015	2049	2043	2069	2180	2046	2021	1877	1853	1863	1874	1863	1850	1891	2001	2001	2001	1750	1869	1600	56934

TETON RIVER CANALS

FALL RIVER CANALS

HENRY'S FORK CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
DEWEY	21	24	22	22	22	22	9	14	13	17	25	25	25	24	24	24	24	23	23	22	23	21	20	22	22	20	19	16	8	8	16	630
LAST CHANCE	82	72	71	70	68	68	56	56	62	59	56	54	54	52	50	50	49	50	59	58	59	55	50	54	54	54	53	52	46	35	802	
ST ANTHONY UNION	319	387	394	404	336	336	305	223	465	440	444	422	422	422	434	455	440	438	478	478	502	502	292	288	350	357	390	436	436	434	17,514	
FARMERS FRIEND	155	157	157	157	155	155	129	120	136	123	85	107	105	108	82	84	82	67	56	78	75	77	82	80	83	84	93	36	43	42	3,000	
TWIN GROVES	197	90	94	101	97	94	72	45	82	70	101	45	114	114	128	128	135	120	124	136	136	134	122	121	119	110	108	103	103	103	3,168	
SALEM UNION	171	168	166	178	173	142	137	139	173	202	225	206	203	223	223	223	223	215	215	201	220	217	193	195	168	147	145	141	145	153	78	577
EGIN	0	257	308	327	296	254	287	295	300	287	287	298	296	298	300	298	288	299	298	298	298	298	298	287	294	266	254	283	295	287	287	8714
ST ANTHONY UNION FEEDER	85	74	72	21	62	57	50	36	56	58	50	53	48	47	47	45	45	42	45	45	49	54	47	52	60	50	52	45	46	50	44	1,523
INDEPENDENT	744	261	253	249	293	257	217	225	225	209	197	201	190	221	225	190	190	186	186	190	190	229	190	229	229	229	233	171	171	171	159	6,543
CONSOLIDATED FARMERS	249	224	224	211	211	179	179	151	151	151	145	199	183	179	175	140	140	245	236	266	248	274	274	261	261	252	233	205	179	163	199	6,467
TOTAL	1560	1742	1763	1745	1675	1534	1441	1306	1642	1627	1613	1610	1642	1651	1746	1674	1652	1763	1747	1754	1804	1641	1580	1580	1590	1582	1495	1495	1571	1584	50,447	

TETON RIVER CANALS

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRY'S FORK AND TRIBUTARIES FOR AUGUST 1931

FALL RIVER CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
YELLOWSTONE	10	10	10	10	9	9	9	9	9	11	11	11	11	11	11	11	11	11	11	11	10	10	10	13	9	8	8	8	8	3
HARRIGFIELD	17	17	17	17	17	17	17	17	17	16	16	17	17	17	17	17	17	16	16	15	15	15	15	15	15	15	15	15	15	14
MARYSVILLE	74	60	60	60	60	60	50	50	50	50	60	60	60	60	70	70	65	66	65	65	65	65	65	67	67	67	67	67	50	15
FARMERS DWN	24	24	24	24	23	23	18	18	18	18	18	18	18	18	18	18	18	18	17	17	17	17	17	14	14	14	13	13	13	3
ENTERPRISE	50	47	36	116	113	113	79	88	79	79	79	78	78	78	86	104	120	117	121	119	121	121	123	123	121	121	121	121	121	23
BELL	5	5	4	5	4	4	4	3	3	3	0	3	3	4	4	4	3	3	2	2	2	2	2	3	5	4	4	5	5	3
FALL RIVER	314	314	314	310	310	310	305	314	305	314	292	292	292	292	296	224	222	225	225	211	216	216	222	237	222	222	222	222	222	109
M'BEE	10	9	9	8	8	7	6	7	7	7	6	6	6	6	6	1	0	0	0	0	0	1	3	5	4	4	4	4	4	4
CHESTER	37	37	33	22	19	28	20	20	20	20	20	20	20	20	20	25	24	40	36	37	39	39	40	43	39	39	40	39	37	189
GILKEY	24	24	24	23	12	19	12	12	8	8	6	6	5	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CURN	50	27	30	29	24	24	24	24	24	24	12	12	12	12	12	12	12	12	10	9	9	9	9	0	0	0	0	0	0	234
WHITE	2	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	21
TOTAL	446	545	581	624	603	614	544	562	539	551	520	523	523	524	547	492	493	509	566	488	497	498	493	515	525	494	499	486	482	4596

HENRY'S FORK CANALS

[illegible]

TETON RIVER CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
GIDDOWAY	12	12	14	14	13	12	12	11	10	14	14	14	14	14	14	14	14	14	12	12	12	12	12	12	12	12	13	14	13	14	13
WILFORD	115	107	117	113	105	101	99	95	93	94	95	95	97	97	95	96	96	94	92	78	77	77	77	85	87	86	83	82	82	83	84
TETON IRRIGATION	60	54	61	60	50	48	63	57	57	61	61	58	60	58	58	58	54	50	45	50	48	46	44	45	46	42	42	42	42	42	43
GOOD LUCK	16	16	11	11	11	9	9	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	8
PIONEER	12	12	18	14	14	13	12	12	11	12	11	11	11	11	11	11	11	10	10	9	9	8	8	8	8	10	10	10	10	10	10
STEWART	15	18	21	19	16	17	17	17	17	16	17	17	17	18	18	19	18	17	17	18	17	17	15	16	15	14	14	14	14	14	14
PINEDECK BYINGTON	3	3	3	3	3	3	3	3	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
PINECK GARNER	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
TETON ISLAND FEEDER	179	175	179	177	172	170	168	168	161	161	161	158	161	165	163	170	165	161	154	152	152	152	149	152	154	150	145	145	145	145	145
ROXANA	3	2	21	21	18	21	21	25	29	31	33	36	19	23	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
ISLAND WARD	36	41	50	60	58	56	43	52	52	53	52	51	51	55	55	59	6	7	6	6	6	6	5	4	4	4	4	4	4	4	4
WOODMANSEE JOHNSON	48	47	53	51	47	45	40	40	34	33	34	34	36	41	41	46	43	40	37	38	35	34	30	37	36	36	34	34	34	34	34
CITY OF REXBURG	45	46	52	50	52	47	44	45	41	38	39	36	37	38	37	37	40	41	38	38	36	34	30	37	36	36	34	34	34	34	34
REXBURG IRRIGATION	139	150	176	172	174	160	163	162	163	162	160	156	151	162	160	163	194	193	181	185	183	181	187	170	172	154	154	154	154	154	154
TOTAL	683	691	769	771	741	708	689	686	676	676	678	688	691	661	652	677	673	650	615	603	598	588	564	592	605	605	574	574	574	574	574

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRY'S FORK AND TRIBUTARIES FOR SEPT. 1934

FALL RIVER CANALS

HENRY'S FORK CANALS

[illegible]

TETON RIVER CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
BIDGWAY	14	14	14	15	15	16	15	14	14	14	12	10	13	6	4	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	236
WILFORD	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	1320
WETON IRRIGATION	39	37	35	34	32	35	35	35	35	35	35	32	30	29	27	26	25	24	24	23	23	23	23	23	23	23	23	23	23	23	925
GOOD LUCK	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	277	
PIONEER	10	6	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	303	
STEWART	20	20	19	18	17	17	16	16	15	15	14	14	13	13	12	12	11	10	9	8	8	7	6	6	6	6	6	6	6	6	14
FINCHOCK PYINGTON	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	50
FINCHOCK GARNER	11	11	12	12	13	14	14	15	15	16	16	17	17	17	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	2047
WETON INLAND FEEDER	137	152	146	140	135	137	122	115	109	102	99	97	94	91	89	84	83	81	78	78	77	77	77	77	76	76	76	76	76	76	2047
WYONA	6	7	6	6	6	6	4	4	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
SLAND WARD	20	19	18	19	16	16	17	17	17	15	12	10	6	5	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	232
WOODMANSEE JOHNSON	26	24	29	40	40	41	41	42	42	43	44	44	45	45	46	46	45	45	44	43	42	42	42	41	40	40	40	40	40	40	1261
CITY OF ALEXBURG	40	38	37	37	36	35	34	34	34	34	35	35	35	36	36	36	34	33	30	28	28	28	28	28	28	28	28	28	28	28	517
BEAVER CRRIGATION	134	100	96	92	80	65	79	75	74	74	74	72	72	72	72	71	69	66	63	61	60	59	59	59	59	59	59	59	59	59	1170
TOTAL	272	523	510	493	427	447	450	441	433	423	414	404	394	384	367	357	355	354	343	337	329	329	329	324	321	301	301	301	301	301	11710

Provision for aiding canals which might be later cut off because of the comparatively recent priority dates of their decreed rights was discussed at a meeting of the directors of the North Fork Water Users' Association held at St. Anthony on July 6. Assistance through the medium of temporary transfers from valid rights was agreed upon, with the understanding that all transfers were to be handled through a representative committee consisting of J. T. Fisher, Geo. Harrigfeld and Wm. Lavery, in the manner first adopted during the preceding season.

This action was confirmed at a general meeting of water users held on July 9, at which time the necessary resolutions were adopted to put it into effect.

During the next four weeks the temporary transfers secured through this pooling committee undoubtedly prevented material crop losses under several canal systems, and at the same time promoted a spirit of harmony between the water users of this section.

While the above description applies more especially to the Henrys Fork and Fall River canals the distribution on Teton River differed but little. W. F. Dawson acted in the combined capacity of hydrographer, deputy water master and river rider for this section.

Before the middle of August the need for water had decreased materially, and by the end of the month there appeared to be no further need for regulation. Consequently the services of Deputies Pincock and Braun and of Miss Arnold, the part-time clerk in the St. Anthony office, were terminated on August 31.

With the assistance of Mr. Dawson, each canal was visited about once each week or oftener, and at least two meter measurements were secured at most of the stations, during September. In addition some repair work was done and a cable measuring equipment was installed at the gaging station on Henrys Fork near Ashton.

Actual deliveries to the canals diverting from Henrys Fork, Fall and Teton Rivers are shown on Plates XVI, XVII, XVIII and XIX.

Plates XX and XXI 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 from the existing data.

The time interval basis used for the computation of records from the river gaging stations as presented in these tables is as follows:

FALL RIVER

HENRY'S FORK

TETON RIVER

HENRY'S FORD										ION RIVER														
DATE	SQUIR REL	CANALS ABOVE STATION	CANALS SQUIR + CANALS ABOVE STATION	DATE 1921	TOTAL DIVER SIGNS	THEO BALANCE CHESTER	CHESTER	GAIN ABOVE CHESTER	ASHTON FALL RIVER MISSION	DIVER ASHTON TO STANTH	THEO BAL	ST ANTH	GAIN ASHTON TO STANTH	DIVERS BELOW ST ANTH	THEO BAL	E ST BALANCE BELOW DIVERS	ST ANTH	TOTAL DIVERS	THEO BAL	E ST BALANCE BELOW DIVERS	BAL HIGH FIVE ST ANTH	BAL HIGH FIVE ST ANTH	HENRY'S FORD ST ANTH	GAIN BELOW ST ANTH
June 1	2935	26	2961	JUNE 2	190	2771	3720	449	3310	741	6389	6160	229	645	5312		1740	738	3002		1740	738	3002	267
2	2525	0	2525	3	172	2353	2740	387	3530	754	5386	5750	164	687	5063		2430	646	2784		2430	646	2784	123
3	2510	0	2510	4	329	2181	2590	409	3340	693	5297	5470	233	684	4786		3250	679	2577		3250	679	2577	123
4	2760	0	2760	5	314	2446	2850	404	3230	750	5330	5680	350	712	4968		3440	636	2764		3440	636	2764	467
5	2960	0	2960	6	343	2617	2980	363	3190	733	5437	5580	143	735	4845		3620	724	2896		3620	724	2896	28
6	2980	20	3000	7	500	2500	2900	400	3120	898	5122	5260	138	773	4487		3770	733	3037		3770	733	3037	28
7	3020	20	3040	8	561	2479	2830	400	3120	990	4841	5200	359	835	4365		3880	733	3142		3880	733	3142	66
8	3130	21	3151	9	597	2524	3040	351	3010	990	4841	5200	172	809	4282		4180	733	3408		4180	733	3408	47
9	3130	40	3170	10	604	2566	2950	486	2950	1072	4918	5090	72	815	4025		4380	733	3422		4380	733	3422	280
10	3110	41	3151	11	596	2555	2950	384	2950	1132	4768	4840	72	815	4025		4580	841	3422		4580	841	3422	67
11	3350	42	3392	12	813	2579	2900	345	2840	1137	4603	4440	37	878	3762		4780	841	3422		4780	841	3422	119
12	3430	65	3495	13	632	2663	3110	447	2760	1158	4542	4640	98	891	3749		4980	841	3422		4980	841	3422	64
13	3375	58	3433	14	835	2598	3090	492	2630	1187	4557	4640	83	860	3730		5180	841	3422		5180	841	3422	23
14	3250	65	3315	15	880	2435	2810	375	2550	1187	4453	4600	147	868	3732		5380	841	3422		5380	841	3422	78
15	2855	96	2951	16	870	2081	2420	339	2380	1266	3924	4010	86	864	3146		5580	841	3422		5580	841	3422	450
16	2435	112	2547	17	853	1694	2100	406	2360	1196	3584	3490	-94	870	2620		5780	841	3422		5780	841	3422	97
17	2055	109	2164	18	817	1347	1680	406	2260	1143	3217	3040	-177	878	2162		5980	841	3422		5980	841	3422	171
18	1825	106	1931	19	837	1094	1330	333	2260	1058	2882	2660	-222	819	1841		6180	841	3422		6180	841	3422	1214
19	1755	120	1875	20	923	952	1230	2	2180	1072	2438	2440	2	859	1581		6380	841	3422		6380	841	3422	1107
20	1705	131	1836	21	937	899	1110	278	2100	1019	2311	2440	-79	843	1257		6580	841	3422		6580	841	3422	738
21	1610	148	1758	22	947	811	1010	199	2100	1031	2179	2100	-195	828	1092		6780	841	3422		6780	841	3422	762
22	1585	177	1762	23	986	774	976	202	2080	975	2115	1920	-195	828	1092		6980	841	3422		6980	841	3422	635
23	1625	187	1812	24	1009	803	985	182	2020	996	2003	1850	-153	857	993		7180	841	3422		7180	841	3422	660
24	1640	201	1841	25	1012	829	976	147	1900	1027	1858	1820	-38	864	956		7380	841	3422		7380	841	3422	609
25	1580	200	1780	26	1022	758	891	133	1880	1097	1759	1700	-59	904	796		7580	841	3422		7580	841	3422	676
26	1455	206	1661	27	970	691	792	101	1900	1076	1715	1700	-15	900	800		7780	841	3422		7780	841	3422	712
27	1345	206	1551	28	986	565	687	122	1860	1090	1562	1660	98	851	809		7980	841	3422		7980	841	3422	624
28	1260	214	1474	29	698	776	654	78	1820	1126	1548	1660	112	653	977		8180	841	3422		8180	841	3422	614
29	1215	231	1446	30	901	545	938	393	1760	1054	1644	1620	24	546	1074		8380	841	3422		8380	841	3422	628
30	1160	231	1391	JULY 1	899	492	564	72	1700	1052	1312	1450	138	608	842		8580	841	3422		8580	841	3422	866
July 1	1075	225	1300	2	853	447	525	78	1780	1058	1312	1450	41	846	604		8780	841	3422		8780	841	3422	1108
2	1025	237	1262	3	823	439	533	84	1840	1066	1409	1450	-17	857	593		8980	841	3422		8980	841	3422	1030
3	987	235	1222	4	813	409	517	108	1840	1066	1409	1450	-17	857	593		9180	841	3422		9180	841	3422	950
4	950	228	1178	5	763	415	474	59	1780	1066	1409	1450	47	824	626		9380	841	3422		9380	841	3422	906
5	936	182	1118	6	643	475	481	6	1760	1066	1409	1450	26	747	703		9580	841	3422		9580	841	3422	950
6	864	66	930	7	768	162	408	246	1670	1066	1409	1450	-30	733	607		9780	841	3422		9780	841	3422	588
7	776	224	1000	8	766	234	340	106	1520	1066	1409	1450	-171	707	453		9980	841	3422		9980	841	3422	627
8	763	237	1000	9	831	169	258	89	1800	1066	1409	1450	-47	732	318		10180	841	3422		10180	841	3422	601
9	742	236	980	10	797	183	230	47	1630	1066	1409	1450	2	702	235		10380	841	3422		10380	841	3422	570
10	702	238	940	11	871	69	150	81	1570	1066	1409	1450	10	679	117		10580	841	3422		10580	841	3422	507
11	658	239	897	12	856	41	122	81	1590	1066	1409	1450	-80	751	22		10780	841	3422		10780	841	3422	540
12	654	239	893	13	913	-20	96	116	1550	1066	1409	1450	27	719	31		10980	841	3422		10980	841	3422	426
13	643	245	888	14	883	5	98	93	1570	1066	1409	1450	3	745	-24		11180	841	3422		11180	841	3422	362
14	605	247	852	15	854	-2	76	78	1570	1066	1409	1450	76	747	-26		11380	841	3422		11380	841	3422	601
15	608	249	857	16	775	32	58	-24	1500	1066	1409	1450	57	673	-59		11580	841	3422		11580	841	3422	570
16	616	205	821	17	785	36	103	67	1500	1066	1409	1450	-50	673	-59		11780	841	3422		11780	841	3422	489
17	601	205	806	18	815	-9	98	107	1480	1066	1409	1450	76	773	-94		11980	841	3422		11980	841	3422	508
18	594	205	799	19	808	-9	98	107	1480	1066	1409	1450	103	765	-86		12180	841	3422		12180	841	3422	496
19	590	204	794	20	747	47	147	100	1480	1066	1409	1450	31	803	-138		12380	841	3422		12380	841	3422	559
20	590	204	794	21	767	27	159	132	1480	1066	1409	1450	58	786	-107		12580	841	3422		12580	841	3422	510
21	616	204	820	22	796	24	127	103	1480	1066	1409	1450	-31	855	-105		12780	841	3422		12780	841	3422	510
22	616	197	773	23	854	-81	94	175	1380	1066	1409	1450	1	819	-105		12980	841	3422		12980	841	3422	530
23	586	192	778	24	818	-40	74	114	1360	1066	1409	1450	26	790	-90		13180	841	3422		13180	841	3422	511
24	579	190	769	25	848	-79	74	153	1380	1066	1409	1450	26	790	-90		13380	841	3422		13380	841	3422	441
25	590	197	767	26	834	-47	84	131	1440	1066	1409	1450	143	784	-12		13580	841	3422		13580	841	3422	501
26	590	194	784	27	741	43	135	92	1460	1066	1409	1450	60	807	-34		13780	841	3422		13780	841	3422	515
27	612	191	803	28	685	118	122	4	1460	1066	1409	1450	43	821	6		13980	841	3422		13980	841	3422	493
28	635	107	745	29	609	136	159	23	1400	1066	1409	1450	5	704	92		14180	841	3422		14180	841	3422	477
29	631	107	735	30	631	107	185	78	1400	1066	1409	1450	46	691	120		14380	841	3422		14380	841	3422	471
30	624	107	731	31	626	105	198	93	1420	1066	1409	1450	63	674	137		14580	841	3422		14580			

FALL RIVER

HENRYS FORK

TETON RIVER

[illegible]

Gaging Station	Period Used For Comparable Daily Means
Henrys Fork near Ashton	Day ending at 4 p.m.
Fall River near Squirrel	Day ending at 10 a.m.*
Fall River near Chester	Day ending at 5 p.m.
Henrys Fork at St. Anthony	Day ending at 12 midnight*
Teton River near St. Anthony	Day ending at 6 p.m.
Henrys Fork near Rexburg	Day ending at 8 a.m. 1st day following

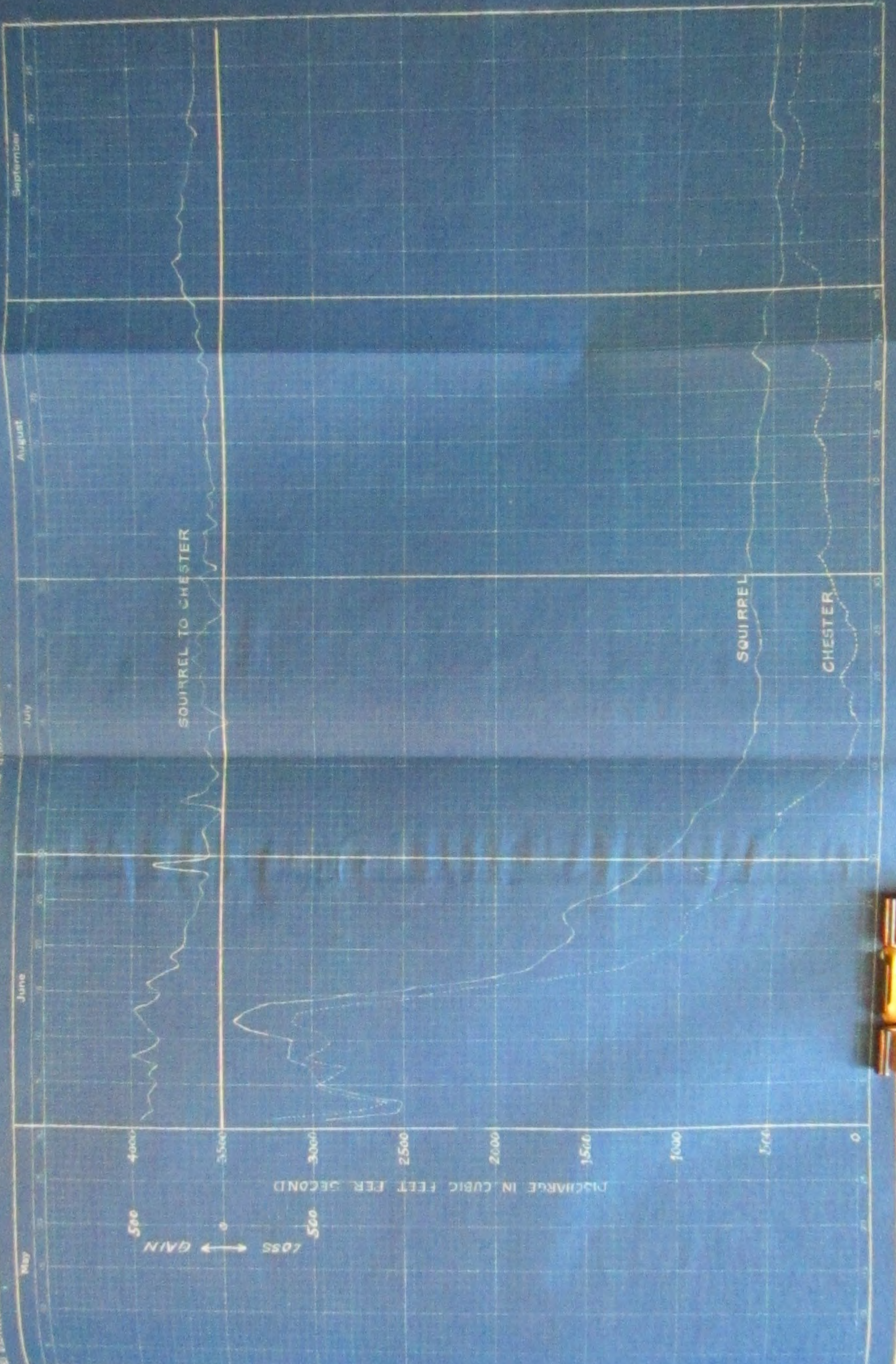
* Approximate means used. No recording gage records available.

This schedule is so arranged as to make the data correspond to the river records on Plates VII and VIII. The dates indicated in the tables are the nearest midnight to midnight or calendar day.

No satisfactory sites have been found for gaging stations located immediately below the lowest canals diverting from Henrys Fork and Teton River, and on this account data have been included in the column headed "Estimated Balance Below Diversions" only for days when these quantities were determined either by actual measurements or by estimates.

The period during which the quantity of water passing the lowest canal on Henrys Fork was limited to leakage through the diversion dam is slightly shorter than in 1920, while the two determinations of Teton River waste would seem to indicate a larger contribution from that source than during preceding seasons. The latter were made some distance below the last point of diversion, however, and probably include return flow which could not be utilized by Teton canals. The south channel of the Teton is known to have been dry immediately below the head of the Rexburg Irriga-

DISTRIBUTION WATER DISTRICT NO. 36 - HYDROGRAPHS ILLUSTRATING THE NET LOSSES AND GAINS BETWEEN THE SQUIRREL AND CHESTER GAGING STATIONS, FALL RIVER - PLATE XXII



tion Co. canal during a considerable portion of the summer, and this fact, together with other miscellaneous information, leads to the conclusion that except for a possible increased return flow at the lower end of the stream the utilization of available supply was probably about as complete as during former years.

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

The large gains noted during June undoubtedly can be attributed to unmeasured inflow from Squirrel Creek and other small tributaries which later in the season may not reach the main river. Likewise the increased gains in September may be partially due to a pick-up in these minor sources of supply.

The effect of the break in the Enterprise Canal during the latter part of June is very noticeable on the Chester graph. Other small irregularities can doubtless be explained by the fact that the Squirrel station is not equipped with a recording gage.

The hydrograph for the Rexburg station and graphs showing gains and losses on Henrys Fork above and below St. Anthony are included on Plate XXIII. These curves are all plotted to agree with the Rexburg dates.

Comparison with similar diagrams for 1920 shows a larger gain or return flow in 1921 below St. Anthony, with a corresponding increase in the minimum discharge for the season at the Rexburg station.

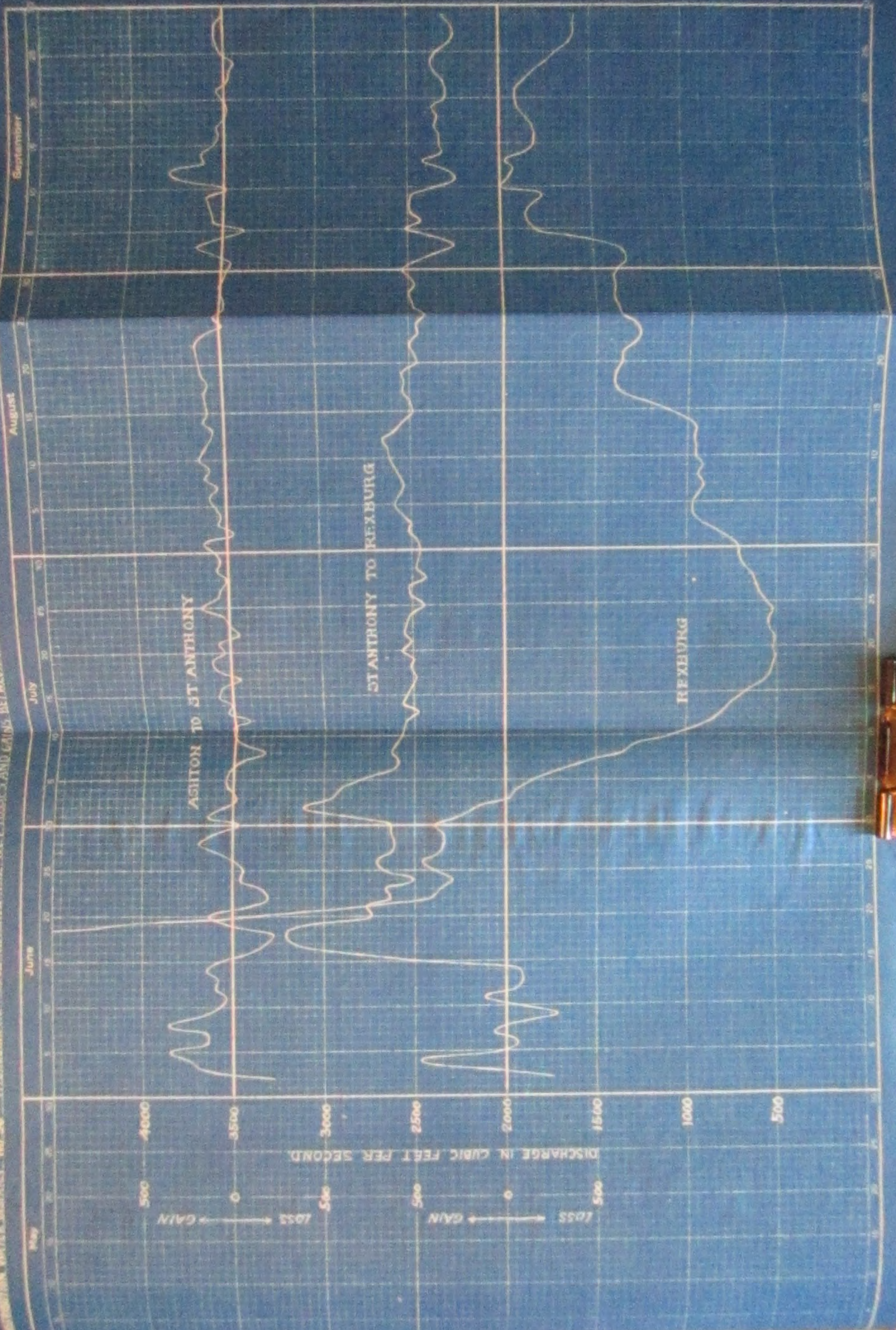


Plate XXIV shows hydrographs at the Rexburg station for the summer months throughout the entire period for which records are available. This plate should be of especial interest in connection with water supply studies covering several years.

DISTRIBUTION IN SWAN VALLEY.

Swan Valley water distribution was handled in the same manner as during 1920. A deputy water master was appointed for this section but his salary and other expenses incident to the work were paid directly by the local water users; hence no charges against the canals in this area were included in the annual water master's bill. Copies of all instructions regarding cuts were forwarded to this deputy, who was directed to regulate diversions in accordance with these orders.

DISTRIBUTION ON SAND CREEK, FREMONT COUNTY.

The system followed in Swan Valley was also adopted to govern the distribution of the flow of Sand Creek in Fremont County. This stream is nominally tributary to Henrys Fork, but during the summer months does not actually contribute any surface inflow.

NEW CONSTRUCTION AND REPAIRS.

New gaging stations were established during the season on the Independent Canal in Jefferson County and on the Smith-Maxwell Canal near Blackfoot.

Wooden shelter houses and float wells were constructed and Stevens' 6 Day Recording Gages were installed at the gaging stations on Henrys

1921 DISTRIBUTION WATER DISTRICT NO. 36 HYDROGRAPHS HENRY'S FORA NEAR REXBURG IDAHO 1909-1921





Fork near Ashton, Fall River near Chester and Teton River near St. Anthony. The first of these was also equipped with a cable and car from which measurements could be secured more accurately and expeditiously than was possible from the old highway bridge.

The wooden shelter and float well which had been in use at the Neeley station on Snake River ever since 1910 was replaced by a substantial reinforced concrete structure. This was completed about October 1, as a part of the general plan to gradually provide permanent equipment at all of the principal river gaging stations.

RECOMMENDATIONS.

Two revisions of the Idaho statutes which were urged in the 1919 report are still needed. These are, briefly:

(1) Adequate provision should be made for the prompt payment of natural flow distribution expenses.

(2) Present limitations as regards the compensation of water masters, deputy water masters and special deputies should either be materially increased or should be altogether eliminated.

Attention has already been directed to the misuse of the permanent transfer or change of point of diversion statute; hence it now seems proper to advocate its amendment to the extent necessary to prevent merchandising of decreed water rights. Those who favor the present system call attention to the fact that the sale of water as a commodity encourages the use of less water per acre and thus promotes a higher duty. They frequently overlook, however, the injustice which is done to water rights which are younger than those involved in the transaction, due to

the fact that after a transfer is completed the water is almost invariably more fully utilized than before, and in consequence later rights must be cut off at an earlier date each year than was required prior to the change.

Recommendations concerning changes in the methods of distribution will be presented to the Advisory Committee in accordance with the practice of preceding years.

EXPENDITURES.

A complete statement of expenditures covering the year ending March 31, 1922, follows. This statement includes all items which appeared in the annual water master's bill for the season of 1921, 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.

The winter expenses charged against the normal flow and stored water users have been prorated on a basis of 61.8 per cent to the former and 38.2 per cent to the latter, in accordance with the relative expense incurred in the two classes of distribution during the 1921 irrigation season. This method of division differs slightly from that of the preceding year since it does not include hydrometric work performed during May in the totals from which the relative winter percentages are determined, even though expenditures for such work come within the irrigation season (May 1 to September 30). The present division adheres more strictly to the provisions of the resolution adopted on April 28, 1919, by the special water users' committee of nine.

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EXPENDITURES FOR WATER DISTRIBUTION AND HYDROMETRIC WORK.

April 1, 1921 to March 31, 1922.

	Irrigation Season	Winter Season
<u>Water Master</u>		
John Empey, Salary May 31-Sept.30, 123 days at \$7	861.00	
Expense (telephoning)	.90	
Auto hire, May 31-Sept.30, 123 days at \$5	615.00	
<u>Deputy Water Masters</u>		
W. J. Kremer, Salary June 1-Aug.31, 92 days at \$4	368.00	
Auto hire do do 6	552.00	
Antone Christensen, Salary do do 4	368.00	
Auto hire do do 5	460.00	
Albert Terry, Salary do do 4	368.00	
Auto hire do do 6	552.00	
Chas. A. McCurdy, Salary do do 4	368.00	
Auto hire do do 5.50	506.00	
F. C. Braun, Salary do do 3	276.00	
Auto hire do do 3	276.00	
Geo. A. Pincock, Salary do do 4	368.00	
Auto hire do do 6	552.00	
W. N. McConnel, Salary June 1-Sept.24, 3 4/5 mo. at 50	190.00	
<u>Special Deputy</u>		
G. Clyde Baldwin, Salary May 1-Sept.30, 5 mo. at \$400	2000.00	
Expenses do	42.39	
Auto hire do	189.60	
Salary April 1-30, 1 mo. at \$300		300.00
Oct.1-Mar.31, 6 mo. at 400		2400.00
Expenses April 1-30; Oct.1-Mar.31		392.99
Auto hire do do		14.25
<u>Hydrographers</u>		
T. R. Newell, Salary May 1-Sept.30, 5 mo. at \$250	1250.00	
Expenses do	125.25	
Auto hire do	802.05	
Salary April 1-30, 1 mo. at \$200		200.00
Oct.1-Mar.31, 6 mo. at 250		1500.00
Expenses April 1-30; Oct.1-Mar.31		51.30
Auto hire do do		111.60

		Irrigation Season	Winter Season
C.A. McClelland,	Salary May 1-Sept. 30, 5 mo. at \$190	950.00	
	Expenses do	6.05	
	Auto hire do	737.55	
	Salary April 1-30; Oct. 1-Mar. 31,		
	7 mo. at \$190		1330.00
	Expenses April 1-30; Oct. 1-Mar. 31		148.31
	Auto hire do do		65.90
Frank A. Backman,	Salary May 1-Sept. 24,		
	4 4/5 mo. at \$150	720.00	
	Expenses May 1-Sept. 24,	81.45	
	Auto hire do	997.50	
W. F. Dawson,	Salary May 11-Sept. 30,		
	4 2/3 mo. at \$150	700.00	
	Expenses May 11-Sept. 30	70.90	
	Auto hire do	869.25	
L. L. Bryan,	Salary August 23	7.50	
	Expenses do	5.00	
<u>Stenographers</u>			
Mrs. Edith M. Cure,	Salary May 1-Sept. 30, 5 mo. at \$130	650.00	
	April 1-30; Oct. 1-Mar. 31,		
	7 mo. at \$130		910.00
Miss Phebe Arnold,	Salary June 1-Aug. 31, 3 mo. at \$50	150.00	
E. Hazel Haugse,	Salary May 15-16 (job)	7.50	
<u>Observers</u>			
H. R. Wallis,	Salary May 1-31, 4 3/7 wk. at \$2	8.86	
	June 1-Sept. 30, 4 mo. at \$50	200.00	
	April 1-30; Oct. 1-Dec. 10,		
	14 2/7 wk. at \$2		28.57
	Dec. 15-Mar. 25,		
	3 11/30 mo. at \$15		50.50
	Mar. 26-31, 6/7 wk. at \$2		1.71
Harold Fuqua,	Salary May 1-31; Sept. 1-30,		
	2 mo. at \$5	10.00	
	June 1-Aug. 31, 3 mo. at \$12	36.00	
	April 23-30, 8/30 mo. at \$5		1.33
Oliver Kofoed,	Salary May 8-31; June 1-15,		
	1 8/30 mo. at \$5	6.33	
	June 16-Aug. 31, 77 days at \$1	77.00	
	July 20-Aug. 31, 43 days at 50¢	21.50	
	Sept. 1-30, 1 mo. at \$9	9.00	
E. L. Jennings,	Salary July 1-Aug. 31, 62 days at \$1	62.00	

		Irrigation Season	Winter Season
Lena Byington,	Salary April 8-30, 22/30 mo. at \$7.50		5.75
	May 1-31, 1 mo. at \$7.50	7.50	
	Sept. 1-15, 15 days at \$1	15.00	
J. A. Clough,	Salary April 1-30; Oct. 1-Mar. 31, 7 mo. at \$10		70.00
	May 1-31; Sept. 16-30; 1 1/2 mo. at \$10	15.00	
	June 1-Sept. 15, 107 days at \$1	107.00	
Mrs. Fred Monk,	Salary April 25-30, 6/30 mo. at \$5		1.00
	May 1-31, 1 mo. at \$5	5.00	
	June 1-Sept. 15, 107 days at \$1	107.00	
E. Luetjen,	Salary April 1-30, 1 mo. at \$8		8.00
	May 1-31, 1 mo. at \$8	8.00	
	Sept. 1-30, 1 mo. at \$9	9.00	
	Oct. 1-Mar. 31, 6 mo. at \$9		54.00
A. A. Lehmann,	Salary April 17-30; Oct. 1-31, 1 14/30 mo. at \$15		22.00
	May 1-Sept. 30, 5 mo. at \$15	75.00	
Axel Anderson,	Salary April 1-30; Oct. 1-31, 2 mo. at \$15		30.00
	May 1-Sept. 30, 5 mo. at \$15	75.00	
H. E. Sheppard,	Salary Nov. 1-Mar. 31, 5 mo. at \$15		75.00
S. W. Pincock,	Salary April 17-30, 14/30 mo. at \$8		5.75
	May 1-Sept. 30, 5 mo. at \$8	40.00	
Mrs. J. F. Johnson,	Salary April 19-30; Oct. 7-Mar. 31, 6 1/5 mo. at \$5		31.00
	May 1-11, 11/30 mo. at \$5	1.83	
James Thorne,	Salary April 21-30, 1/3 mo. at \$7.50		2.50
	May 1-31, 1 mo. at \$7.50	7.50	
P. W. Wernette,	Salary April 1-30; Oct. 1-Mar. 31, 7 mo. at \$5		35.00
	May 1-Sept. 30, 5 mo. at \$5	25.00	
R. E. Reid,	Salary April 1-30; Oct. 1-Mar. 31, 7 mo. at \$10		70.00
	May 1-Sept. 30, 5 mo. at \$10	50.00	
C. N. Kemper,	Salary April 3-30; Oct. 1-Nov. 30, 2 28/30 mo. at \$4		11.75
	May 1-Sept. 30, 5 mo. at \$4	20.00	
Earl Killian,	Salary April 2-30; Oct. 1-Nov. 30, 21 trips at \$2		42.00
	May 1-Sept. 30, 59 trips at \$2	78.00	
M. A. Jensen,	Salary April 1-30; Oct. 1-Nov. 19, 2 19/30 mo. at \$9		23.70
	May 1-Sept. 30, 5 mo. at \$9	45.00	

	Irrigation Season	Winter Season
S. Henderson, Salary Oct.9-Dec.9, 2 mo. at \$8		16.00
Wm. Reitzel, Salary Oct.9-Feb.11;Mar.17-31, 4 12/30 mo. at \$3		23.00
Chas. Jensen, Salary Oct.9-Mar.31, 5 22/30 mo. at \$5		23.67
Telephone toll and rental, May 1-Sept.30	298.30	
April 1-30;Oct.1-Mar.31		58.30
Miscellaneous field and office supplies	304.89	257.17
Materials and equipment for gaging stations	509.83	96.04
Premiums and filing fees for official bonds	44.00	
Filing fees in case of Enterprise Canal Co. vs. City of Idaho Falls	10.00	
Rent of office space at St. Anthony, June 1-Sept.15, 3 1/2 mo. at \$20	<u>70.00</u>	<u> </u>
Total expenditures during irrigation season (May 1-Sept.30)	\$19401.43	
Total expenditures during winter season (April 1-30;Oct.1-Mar.31)		\$3472.05

SOURCES OF REVENUE.

Normal Flow Fund	10815.14	3496.13
Stored Water Users (through State)	6297.82	1875.29
Stored Water Users (through U.S.Geological Survey)		286.66
U. S. Geological Survey	211.21	973.55
State of Idaho (Cooperative Stream Measurement Fund)	1123.75	1016.13
State of Idaho (Lad Lake Investigations)		140.69
State of Idaho (Commissioner of Reclamation)	15.96	
U. S. Indian Service	896.22	625.60
U. S. Treasury (Federal Salary Bonus)	17.33	40.00
Idaho Irrigation District (Willow Creek Gage Reader)	<u>24.00</u>	<u>18.00</u>
	\$19401.43	\$3472.05

FUNDS AVAILABLE APRIL 1, 1922.

Normal Flow Fund (a)	\$ 1,201.21
U. S. Geological Survey (b)	200.70
State of Idaho (c)	
Cooperative Stream Measurement Fund	1,360.77
U. S. Indian Service (b)	
Actual expenditures not exceeding	731.99
Stored Water Users (a)	
Estimated	<u>742.50</u>
	\$ 4,237.17

- (a) Additional funds probably available on or about June 1, 1922.
 (b) Represents amount available for expenditure prior to July 1, 1922.
 (c) Amount allotted for expenditure prior to July 1, 1922,
 (subject to slight change)

Because of the cooperation with the U. S. Geological Survey it has been possible to secure adequate office quarters in the Federal Building at Idaho Falls without any expenditure for rent.

The cost of securing the necessary prints for 35 copies of the 1920 report, together with the expense for binding these reports, was paid by the State Commissioner of Reclamation.

Since the exact value of these items is not known they have been omitted from all the preceding summaries.

WATER RIGHTS.

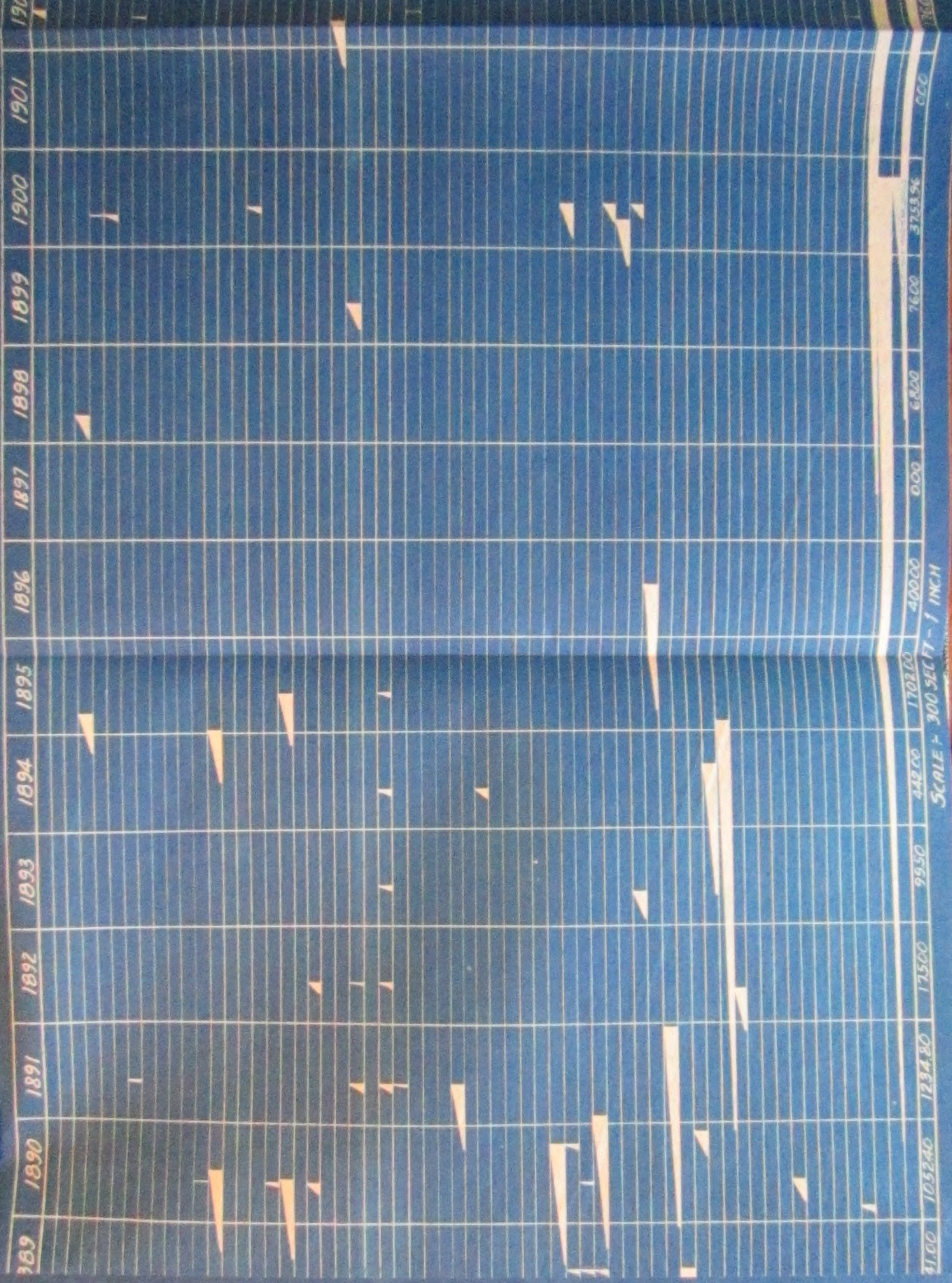
Revised diagrams and summaries of all the principal decreed water rights are shown on Plates XXV, XXVI and XXVII. The revisions take account of changes resulting from all supplementary decrees and permanent transfers which were reported prior to March 1, 1922. Rights decreed to canals in comparatively remote or isolated portions of the district have not, in general, been listed on these plates.

On the diagrams, the longer vertical line at the right hand side of each triangular block represents approximately the priority date, and the horizontal length of the block the size of the right. Very small rights appear simply as vertical lines. Exact dates and amounts are given in the adjacent tabular summary. Wherever two names appear in the latter for a single decreed right, the larger letters refer to the canal through which the water is now diverted and the smaller to the source from which the right was obtained. Under the "Decree" heading the amount of the individual right is listed; under "Total" the total of all decreed rights to which the canal is entitled; and under "Older" the total of all older valid rights is given.

Storage rights in Jackson Lake Reservoir are also shown in one column on Plate XXV.

1921 DISTRIBUTION WATER DISTRICT NO 36

PARTY OR CANAL	TOTAL SF	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889
RILEY	24										
ANDERSON & LAGLE ROCK & WICK	800										
FARMERS FRIEND	30283										
ENTERPRISE	188										
NELSON	1										
MATTSON CRAIG	1776										
ARNISBERGER	6										
HEISE	56										
BUTLER ISLAND	5991										
HICKMAN	24										
ROSS & RAND	334										
STEELE	38										
HARRISON	45923										
CHENEY	6										
BOOMER & IDAHO	1000										
RUDY	19126										
KITE & NORD	88										
BURGESS	800										
CLARK & EDWARDS	70										
LOWDER & JENNINGS	52										
EAST LABELLE	140										
CONSOLIDATED FEEDER	184										
LENROOT	220										
REID	150										
TEXAS FEEDER	280										
NELSON COREY	168										
HILL PETTINGER	13										
ROSTAN	1.6										
LONG ISLAND	4944										
ISLAND	290										
RIGBY	160										
DILTS	28										
WEST LABELLE	1099										
PARKS & LEWISVILLE	35112										
NORTH RIGBY	50										
WHITE	64										
BUTTE & MARKET LAKE	3664										
OSGOOD	18025										
KENNEDY & BURGRAFF (LYLE)	2481										
GREAT WESTERN & PORTER (MARTIN)	549										
TAYLOR & GOSHEN	46										
CITY OF IDAHO FALLS	188										
WOODVILLE	1255										
SNAKE RIVER VALLEY	710										
RESERVATION	600										
BLACKFOOT	3668										
NEW LAVASIDE	152										
PEOPLES	4242										
ABERDEEN SPRINGFIELD	1250										
CORBETT SLOUGH	23943										
NIELSEN HANSEN	15										
RIVERSIDE	100										
DANSKIN	180										
TREGO	6541										
WEARYRICK	412										
WATSON SLOUGH	974										
PARSONS	22										
THORSEN	4										
SMITH MAXWELL	178										
USRS MINIDOKA CANALS	2726										
TFSS CANAL	3000										
TFNS CANALS	3000										
ANNUAL TOTALS IN SEC. FT.	202884	20000	6000	6000	16000	48300	68040	45420	26480	177474	204100



RT AND TABULAR SUMMARY OF PRINCIPAL SOUTH FORK AND SNAKE RIVER WATER RIGHTS

1902	1903	1904	1905	1906	1907	1908	STORAGE	DATE	DEGREE	PARTY OR CANAL	TOTAL	OLDER	DATE	DEGREE
1							12000	1908 AUG 6 1000	USRS "FOSTER"	USRS "FOSTER"	2726	1726	1892 MAY 1 130	
							0	JUN 16 350	TFNSLWCO "FOSTER"	TFNSLWCO "FOSTER"	3000	2650	1891 DEC 14 600	
							2000	1905 OCT 7 2250	DO	DO	3000	400	JUN 1 4	
							6100	JUN 1 36	RUDY	RUDY	19126	15526	" 1 6	
							0	1904 OCT 22 48	CITY OF IDAHO FALLS	CITY OF IDAHO FALLS	188	140	" 1 15	
							0	1903 SEP 1 110	SNAKE RIVER VALLEY	SNAKE RIVER VALLEY	710	600	" 1 15	
							0	JUN 1 100	LENROOT	LENROOT	220	120	" 1 195	
							0	" 1 10	HILL-PETTINGER	HILL-PETTINGER	13	3	" 1 195	
							0	MCH 26 1726	Carlson-Fagerstrom	Carlson-Fagerstrom	2726	0	" 1 14	
							0	1902 JUN 1 3	USRS "FOSTER"	USRS "FOSTER"	13	0	JAN 24	
							5000	" 1 24	HILL-PETTINGER	HILL-PETTINGER	24	0	1890 NOV 24 72	
							0	" 1 4	RILEY	RILEY	4	0	OCT 16 17	
							2000	" 1 4	THORESEN	THORESEN	56	0	" 16 34	
							5120	MAY 1 56	Reese-King	Reese-King	184	44	" 16 10	
							0	APR 14 140	HEISE	HEISE	3000	0	JUL 12 24	
							1040	1900 OCT 11 400	CONSOLIDATED FEEDER	CONSOLIDATED FEEDER	46	0	JUN 10 24	
							4000	" 11 3000	TFNSLWCO "FOSTER"	TFNSLWCO "FOSTER"	13025	8025	" 1	
							3000	JUN 16 46	TFSS CANALCO "FOSTER"	TFSS CANALCO "FOSTER"	1255	855	" 1	
							0	" 16 100	TAYLOR & GOSHEN	TAYLOR & GOSHEN	19126	14126	" 1	
							0	" 16 40	OSGOOD	OSGOOD	1	0	FEB 21 17	
							0	" 1 14	Taylor & Goshen	Taylor & Goshen	1776	48	1889 JUL 10 36	
							0	APR 30 1	WOODVILLE	WOODVILLE	188	0	" 10 10	
							0	" 30 1296	RUDY	RUDY	220	44	" 10 10	
							0	" 20 140	NELSON	NELSON	188	0	" 10 10	
							0	1899 JUN 1 76	BC & CG Mattson	BC & CG Mattson	220	44	JUN 2	
							355	1898 APR 15 68	MATTSON CRAIG	MATTSON CRAIG	188	0	" 1	
							6500	" 20 140	BC & CG Mattson	BC & CG Mattson	220	44	" 1	
							0	1899 JUN 1 76	CITY OF IDAHO FALLS	CITY OF IDAHO FALLS	188	0	" 1	
							0	1898 APR 15 68	LENROOT	LENROOT	220	44	" 1	
							0	1896 JUL 9 400	ENTERPRISE	ENTERPRISE	188	0	" 1	
							0	1895 JUN 1 12	SNAKE RIVER VALLEY	SNAKE RIVER VALLEY	710	200	" 1	
							0	" 1 160	TEXAS FEEDER	TEXAS FEEDER	280	268	" 1	
							15000	MCH 22 120	Texas Slough Co	Texas Slough Co	800	640	" 1	
							0	FEB 6 1250	BURGESS	BURGESS	188	0	" 1	
							0	JAN 9 160	ENTERPRISE	ENTERPRISE	45928	29928	" 1	
							8000	1894 AUG 18 400	ABERDEEN-SPRINGFIELD	ABERDEEN-SPRINGFIELD	4242	242	" 1	
							42685	JUN 1 23	American Falls Co	American Falls Co	28	0	" 1	
							0	" 1 14	HARRISON	HARRISON	280	254	" 1	
							0	1893 JUN 1 14	PEOPLES	PEOPLES	280	240	" 1	
							0	APR 30 855	DILTS	DILTS	1255	0	" 1	
							0	1892 JUN 1 5	Dills & LaBeile Co	Dills & LaBeile Co	220	39	" 1	
							325810W	" 1 14	TEXAS FEEDER	TEXAS FEEDER	280	226	" 1	
							97183	" 1 26	Texas Slough Co	Texas Slough Co	52	26	" 1	
							322007		LOWDER & JENNINGS	LOWDER & JENNINGS				
17660	194600	4800	2286.00	000	000	135000	8470000W							

* OTHER STORAGE THAN JACKSON LAKE IS AVAILABLE

VECEE	PARTY OR CANAL	TOTAL	OLDER	DATE	DECEE	PARTY OR CANAL	TOTAL	OLDER	DATE	DECEE	PARTY OR CANAL	TOTAL	OLDER	DATE	DECEE	PARTY OR CANAL	TOTAL	OLDER
130	CORBETT SLOUGH	23943	10943	1889 JUN 1	043	HARRISON	45928	4685	1888 JAN 18	300	FARMERS FRIEND	30283	283	1885 JUN 1	9	LENA		
600	RESERVATION	600	0	"	1	026	KENNEDY & BURGRAFF	2481	1116	1887 JUN 15	20	RIGBY	160	"	1	30		
48	Idaho Canal & Imp Co	168	12	MAY 11 700		IDAHO	740	40	"	1	90	RIVERSIDE	100	"	1	64		
6	NELSON-COREY	6	0	"	1	10943	CORBETT SLOUGH	23949	0	"	1	38	TEXAS FEEDER	"	1	37		
15	PO Carlson	220	24	"	1	775	OSGOOD	18025	5107	"	1	12	Liberty Park Co	"	1	5991		
195	Supplemental	290	95	"	1	282	CORBETT SLOUGH	2481	834	"	1	48	NELSON-COREY	"	1	726		
14	LENROOT	280	212	APR 15 300		KENNEDY & BURGRAFF	800	500	"	1	30	RACRAIG	290	"	1	283		
400	6-1-03499 Amended	549	149	"	6	200	ANDERSON & ER & WCRK	710	0	"	1	5833	LONG ISLAND	"	1	5833		
72	ISLAND	152	80	"	1	60	FARMERS PROGRESS	152	20	"	1	064	OSGOOD	"	1	064		
17	105 Supplemental	3664	3494	MCH 1 60		NEW LAVA SIDE	2481	334	"	1	064	HARRISON	45928	"	1	064		
3494	TEXAS FEEDER	3664	3494	JAN 12 5		KENNEDY & BURGRAFF	19126	1126	"	1	039	Long Island	257	"	1	039		
106	Butte & Market Lake	3664	0	1888 AUG 13 100		WLSyle Amendment	740	0	1886 JUL 23 100		DANSKIN	130	0	"	1	039		
240	BURGESS	800	400	"	13	40	IDAHO	260	0	JUN 15 10		RIGBY	160	"	1	039		
88	KITE & NORD	88	0	"	13	260	BOOMER	974	672	"	10	BURGESS	800	"	1	039		
03	Katfield - Nord	38	3	JUL 15 302		Idaho Canal & Imp Co	4242	76	"	1	16	WATSON SLOUGH	974	"	1	039		
6541	STEELE	6541	0	"	15	166	PEOPLES	412	38	"	1	15	ISLAND	"	1	039		
459	TREGO	2481	2022	"	15	32	Watson Slough	160	40	"	1	08	TEXAS FEEDER	"	1	039		
26	LOWDER & JENNINGS	52	0	JUN 15 120		RIGBY	800	20	"	1	48	OSGOOD	18025	"	1	039		
178	6-1-00 Error	178	0	"	10	380	BURGESS	140	48	"	1	2	Martin	"	1	039		
3668	SMITH-MAXWELL	3668	0	"	1	92	DANSKIN	280	136	"	1	40	RUDY	"	1	039		
104	Blackfoot	18025	5925	"	1	38	TEXAS FEEDER	35112	140	"	1	5834	LONG ISLAND	"	1	039		
140	GR WESTERN & PORTER	549	135	"	1	21112	Liberty Park Co	45928	1797	"	1	064	OSGOOD	"	1	039		
88	KENNEDY & BURGRAFF	2481	1142	"	1	2828	PARKS & LEWISVILLE	16	08	"	1	064	Long Island	"	1	039		
6	CHENEY	6	0	"	1	08	HARRISON	19126	926	"	1	064	HARRISON	"	1	039		
6	Streper	220	18	"	1	2	ROSS & RAND	334	0	"	1	38	WEARYRICK	"	1	039		
30	LENROOT	19126	11126	"	1	334	Supplemental	38	1	"	1	2	OSGOOD	"	1	039		
20	RUDY	150	70	"	1	24	Supplemental Probert	24	0	"	1	120	GR WESTERN & PORTER	"	1	039		
44	REID	124	0	"	1	2832	HICKMAN	4944	4472	"	1	22	New Sweden Dist	"	1	039		
38	CONSOLIDATED FEEDER	280	174	"	1	30	LONG ISLAND	290	45	"	15	10	PARSONS	"	1	039		
12	Sunnydell-Lyman	45928	4728	"	1	065	ISLAND	18025	5042	"	10	124	RIGBY	"	1	039		
1888	TEXAS FEEDER	4944	47552	"	1	065	Long Island	45928	1732	"	1	10	HARRISON	"	1	039		
20	Liberty Park Co	290	75	"	1	038	Long Island	2481	296	"	1	48	ST & W Summers	"	1	039		
043	HARRISON	18025	5832	"	1	32	KENNEDY & BURGRAFF	974	64	"	1	100	STEELE	"	1	039		
	Long Island			"	1	10	WATSON SLOUGH	18025	4942	"	1	43	RIVERSIDE	"	1	039		
	Long Island			"	1	10	HM Palmer			"	1	43	TEXAS FEEDER	"	1	039		
	Long Island			"	1	10	OSGOOD (Morgan)			"	1	43	PARKS & LEWISVILLE	"	1	039		
	Long Island			"	1	10	OSGOOD (Morgan)			"	1	43	EAST LA BELLE	"	1	039		

DATE	DECREE	PARTY OR CANAL	TOTAL	OLDER
1885 JUN 1	9	LENROOT	220	9
" 1	30	REID	150	0
" 1	1099	WEST LA BELLE	1099	0
" 1	64	WHITE	64	0
" 1	37	West La Belle	180.25	37.64
" 1	5991	OSGOOD	5991	0
" 1	726	BUTLER ISLAND	191.26	0
" 1	2.83	RUDY	302.83	0
" 1	5833	FARMERS FRIEND	494.4	272.2
" 1	064	Butler Island	180.25	37.0
" 1	064	LONG ISLAND	459.28	3.
" 1	064	OSGOOD	459.28	3.
" 1	039	Long Island	24.81	1.8
" 1	039	KENNEDY & BURGRAFF	24.81	1.8
" 1	039	Long Island	97.4	0
" 1	039	WATSON SLOUGH	424.2	0
" 1	039	PEOPLES	70	0
" 1	039	Watson Slough	180.25	3
" 1	039	CLARK & EDWARDS	152	0
" 1	039	OSGOOD	351.12	20
" 1	039	Independent	220	0
" 1	039	NEW LAVA SIDE	494.4	213.86
" 1	039	PARKS & LEWISVILLE	180.25	2.36
" 1	039	LONG ISLAND	459.28	2.36
" 1	039	OSGOOD	459.28	2.36
" 1	039	Long Island	24.81	1.42
" 1	039	HARRISON	24.81	1.42
" 1	039	Long Island	160	160
" 1	039	KENNEDY & BURGRAFF	160	160
" 1	039	Long Island	50	0
" 1	039	ANDERSON & E. R. & W. C. R. 800	50	0
" 1	039	Farmers Progress	351.12	0
" 1	039	NORTH RIGBY	15	0
" 1	039	PARKS & LEWISVILLE	549	0
" 1	039	NIELSEN-HANSEN	549	0
" 1	039	GR WESTERN & PORTER	549	0
" 1	039	Nielsen-Hansen	549	0
" 1	039	LONG ISLAND	494.4	155.53
" 1	039	OSGOOD	180.25	1.72
" 1	039	Long Island	459.28	1.72
" 1	039	HARRISON	24.81	1.03
" 1	039	Long Island	494.4	97.19
" 1	039	OSGOOD	180.25	1.08
" 1	039	Long Island	459.28	1.08
" 1	039	HARRISON	24.81	0.65
" 1	039	Long Island	24.81	0.65
" 1	039	KENNEDY & BURGRAFF	24.81	0.65
" 1	039	Long Island	24.81	0.65

DATE	DECREE	PARTY OR CANAL	TOTAL	OLDER
1881 JUN 1	5831	LONG ISLAND	494.4	38.88
" 1	065	OSGOOD	180.25	0.43
" 1	065	Long Island	459.28	0.43
" 1	065	HARRISON	24.81	0.26
" 1	039	Long Island	24.81	0.26
" 1	039	KENNEDY & BURGRAFF	24.81	0.26
" 1	039	Long Island	24.81	0.26
" 1	039	ANDERSON & E. R. & W. C. R. 800	24.81	0.26
" 1	039	Farmers Progress	24.81	0.26
" 1	039	LONG ISLAND	24.81	0.26
" 1	039	OSGOOD	24.81	0.26
" 1	039	Long Island	24.81	0.26
" 1	039	HARRISON	24.81	0.26
" 1	039	Long Island	24.81	0.26
" 1	039	KENNEDY & BURGRAFF	24.81	0.26
" 1	039	Long Island	24.81	0.26

NOTE: ALL DECREES ARE LISTED IN SECOND FEET IN ABOVE SUMMARY.
LICENSE AND PERMIT RIGHTS DO NOT APPEAR.