TO Alan Robertson

WHILE YOU WERE OUT

DATE 3/9 TIME 4:30

M Charles Brockway

OF

PHONE: AREA CODE NUMBER EXT.

☑ Telephoned ☐ Returned Your Call ☐ Will Call Again

☑ Please Call ☐ Called to See You

Wenyss file Letter Ecamal eff = 17% in 1975

ROUTING SLIP

DATE MAR 9 '78 TIME

TO: ALAN ROBERTSON | REF. No. (if any)

FROM: (show title) DEWAYNE & KIM.

FOR YOUR:
☐ Information
☐ Approval
☐ Signature

REVIEW AND:
☐ Call Me ☐ See Me
☐ Comment & Return
☐ Take Proper Action
☐ Draft a Reply for Me

PER:
☐ Our Conversation
☐ Your Request
☐ Boss's Request

HERE ARE THE IRRIGATION METHOD ACREAGE SUMMARIES FOR THE TETON.

TO
WHILE YOU WERE OUT
DATE TIME
M
OF
PHONE: AREA CODE NUMBER EXT.
☐ Telephoned ☐ Returned Your Call ☐ Will Call Again
☐ Please Call ☐ Called to See You

1977

Service District	Sprinkled	Flood Damage Not in Production 1977	Furrow (Flood)
East Teton	1660	—	100
Teton Irrigation	2195	195	990
Bigle Slough	—	130	150
Wilford	790	540	340
Saddlock - Stewart - Pioneer	530	400	—
Pincock - Byington	18	80	40
Pincock - Sandack	310	—	20
Thompson - Woodmassey	1045	—	260
Teton Lateral (Allied Canal)	1040		240
Teton Island	3730	580	940
Salem Irrigation	1840	580	830
River [illegible]	120	—	—
[illegible]	—	410	450
Roxanna	140	250	310

STUDY/PROJECT REQUEST

TO: Alan Robertson

FROM: Ron Carlson Date Initiated 10/1/81

Requested Completion date 12/1/81

TITLE: 1980 water masters Report

PROBLEM AND/OR PURPOSE: Review text, Complete figures, add appended material & coordinate text preparation Prior to Printing.

SCOPE (level or extent of detail):

DESCRIPTIONS OF WORK REQUESTED:

1. Review & edit text and data to assure accuracy and clarity.
2. Coordinate work w/ drafting to get necessary figures prepared or Completed
3. Write introduction to appended data & add appended material to report.

REQUEST ORIGINATOR:

TYPE OF REPORT:

DISPLAY TABLES: YES NO

ANTICIPATED MAN-DAY EFFORT: 4

APPROVED BY: ASSIGNED TO: DATE:

ACTUAL MAN-DAYS:

STUDY/PROJECT REQUEST

TO: _____

FROM: _____ Date Initiated _____

Requested Completion date _____

TITLE: Upgrading Water Master System Programs

PROBLEM AND/OR PURPOSE: Some of the programs written for Water District #1 by Beverly Lindsay are not formatted to print out decimals. Numbers w/ decimals are now recieved thru Hydromet,

SCOPE (level or extent of detail): _____

DESCRIPTIONS OF WORK REQUESTED:

1. Modify existing programs to print real numbers with or without one place decimals.
2. Programs are WRD 263, WRD 269, WRP 272, WRP 273, possibly others.
3. _____

REQUEST ORIGINATOR: _____

TYPE OF REPORT: _____

DISPLAY TABLES: YES_____ NO_____

ANTICIPATED MAN-DAY EFFORT: _____

APPROVED BY: _____ ASSIGNED TO: _____ DATE: _____

ACTUAL MAN-DAYS: _____

WATER MASTER SYSTEM

PROGRAMS

NUMBER	NAME
WRD097	Daily Accounting Report (Bob Sutter)
WRD251	Updates Water History File
WRD252	Selects by Date, records from History & Allocation File
WRD253	Updates Water Allocation File
WRD254	NOT ACTIVE - Updates Water Allocation File
WRD255	Converts records to Water History File Format
WRD256	Deletes Duplicate Records on Water History File
WRD257	Missing Days Report
WRD258	Deletes Data by Station No. & Date from Water History File
WRD259	Copies data from Burley & produces report
WRD260	Water Master Report (Storage Diversion & Flow Stations)
WRD261	Water Master Report (Diversions & Reservoirs)
WRD262	Water Master Report (Diversions, Miscell. & All Diversions)
WRD263 -	D,F,R Station Report (no decimals) Water Yr.
WRD264	Purges Water History File
WRD265	Creates 8 output files for Input to WRD097
WRD266	Deletes Duplicate Records on Water Allocation File
WRD267	Inactive
WRD268	Deletes Data by Station No. & Date from Water Allocation file
WRD269 -	E,P Station Report - (Decimals) (Water Year)
WRD270	Gage Height & Shift Report
WRD271	Station Report - Allocation File - (Any field) (Water Yr)
WRD272 -	E, P Station Report (Decimals) (Irrigation Year)
WRD273 -	D, F, R Station Report (no decimals) (Irrigation Year)
WRD274	Station Report - Allocation File - (Any field) (Irrigation Year)

STUDY/PROJECT REQUEST

TO: _____

FROM: _____ Date Initiated _____

Requested Completion date _____

TITLE: Upgnading the Watenmaste History Program.

PROBLEM AND/OR PURPOSE: The Watenmaster history program update WRDWD01 treats duplicate data separtate from other data. A separate program WRD256 is run to elimdnate this.

SCOPE (level or extent of detail): _____

DESCRIPTIONS OF WORK REQUESTED:

1. The WRDWD01 program should update all data even the duplicate data. This may invalve combining the programs into one, or upgrading the watermaste history update program.

2. _____

3. _____

REQUEST ORIGINATOR: _____

TYPE OF REPORT: _____

DISPLAY TABLES: YES_____ NO_____

ANTICIPATED MAN-DAY EFFORT: _____

APPROVED BY: _____ ASSIGNED TO: _____ DATE: _____

ACTUAL MAN-DAYS: _____

WATER MASTER SYSTEM

PROGRAMS

NUMBER	NAME
WRD097	Daily Accounting Report (Bob Sutter)
WRD251	Updates Water History File
WRD252	Selects by Date, records from History & Allocation File
WRD253	Updates Water Allocation File
WRD254	NOT ACTIVE - Updates Water Allocation File
WRD255	Converts records to Water History File Format
WRD256	Deletes Duplicate Records on Water History File
WRD257	Missing Days Report
WRD258	Deletes Data by Station No. & Date from Water History File
WRD259	Copies data from Burley & produces report
WRD260	Water Master Report (Storage Diversion & Flow Stations)
WRD261	Water Master Report (Diversions & Reservoirs)
WRD262	Water Master Report (Diversions, Miscell. & All Diversions)
WRD263	D,F,R Station Report (no decimals)
WRD264	Purges Water History File
WRD265	Creates 8 output files for Input to WRD097
WRD266	Deletes Duplicate Records on Water Allocation File
WRD267	Inactive
WRD268	Deletes Data by Station No. & Date from Water Allocation file
WRD269	E,P Station Report - (Decimals) (Water Year)
WRD270	Gage Height & Shift Report
WRD271	Station Report - Allocation File - (Any field) (Water Yr)
WRD272	E, P Station Report (Decimals) (Irrigation Year)
WRD273	D, F, R Station Report (no decimals) (Irrigation Year)
WRD274	Station Report - Allocation File - (Any field) (Irrigation Year)

Pam:

These are the instructions used in calculating the Power Loss at Minidoka Dam. Our Regional Office has a computer Program that calculates the usable flows for Condition I and Condition II. However, I generally check the results in case incorrect data has been keyed into the computer. If you have any questions call me.

Keith Everold

PART II

CALCULATION OF USABLE-FLOWS AND POWER PRODUCTION

By way of illustration, this part describes the calculations that were made, in connection with Table 1, with respect to usable-flows available at Minidoka powerplant and the power that would be produced by units 1 to 6 from such flows; and also includes detailed computations for the water year 1945.

Computation of Flows Usable for Power Production.

The net annual power loss by Units 1-6 of the Minidoka Power Plant, as defined by contracts, referred to in Part I, is based on flows at the United States Geological Survey gaging station near Minidoka, Idaho, hereinafter referred to as the Minidoka gage, for two sets of conditions.

Condition I.--Under this condition the restrictions on use of the Minidoka water rights are in effect and Jackson Lake storage-flows are excluded during the irrigation season prior to October 1.

Condition II.--Under this condition there are no restrictions on use of the Minidoka water rights and all storage-flows are excluded during the irrigation season prior to October 1.

Following is an explanation of the methods used to derive these flows for the period October 1, 1931 through September 30, 1951. All basic flow data for this computation were taken directly from the annual reports on "Water Distribution and Hydrometric Work, District 36, Snake River, Idaho", except that the October through March flows for the water-years 1932, 1933, and 1934 were adjusted to reflect the restrictions

on the use of the water power rights at Minidoka Dam. The historical flows for water-years 1935 through 1951 were assumed to be essentially the same as would have occurred with restricted use of the Minidoka power rights under the terms of the contracts made or to be made under the terms of the 1950 Act.

The water-year was divided into two periods; the Storage Period and the Storage-release Period. The Storage-release Period was defined as that period during the irrigation season and prior to October 1, during which time storage-flows were indicated at the Minidoka gage, or at the United States Geological Survey gaging station near Blackfoot, Idaho, hereinafter referred to as the Blackfoot gage. The remainder of the water-year was considered to be the Storage Period. The computation of the flows available, under each of the two conditions, was made on a daily basis. The maximum hydraulic capacity of Units 1-6 of the Minidoka Power Plant is 3700 cubic feet per second, therefore, flows in excess of this amount cannot be used by these units. In recognition of this fact, usable-flows were limited to 3700 cubic feet per second. Inasmuch as elevation 4236 was used as the minimum elevation of Lake Walcott for satisfactory power generation, for the purpose of this computation it was assumed that during periods when the Lake Walcott pool was below elevation 4236 there were no usable-flows. Usable-flows are those flows which could have been utilized for power production by Units 1-6. The daily usable-flows for each month were converted to average monthly flows in order to simplify the power computations which are discussed in a later section of this document. The detailed compu-

tation of flows for water-year 1945 is shown in Tables 2 and 3 to illustrate the methods used.

Condition I. Usable-Flows, Units 1-6, with Restricted Use of the Minidoka Water Rights and excluding Jackson Lake Storage-Flows. The usable-flows under this condition were assumed to be the flows of the Snake River as recorded at the Minidoka gage, with adjustments to exclude Jackson Lake storage-flows which were present and to exclude flows which were in excess of the maximum hydraulic capacity of Units 1-6. The amount of Jackson Lake storage-flows passing the gaging station near Minidoka was determined by a comparison of the daily amounts of storage-flows at the Minidoka gage with those storage-flows indicated at the Blackfoot gage for the preceding day. One day travel-time was assumed between the two gages. All storage-flow data were taken from the table "Daily Segregation of Data at and between Snake River Gaging Stations," as contained in the annual reports "Water Distribution and Hydrometric Work, District 36, Snake River, Idaho." Three assumptions were used in determining the amount of Jackson Lake storage-flows passing the Minidoka gaging station.

1. When the storage-flows near Blackfoot exceeded the storage-flows at Minidoka then the Jackson Lake storage-flows at Minidoka were assumed equal to the total storage-flows at Minidoka.

2. When the storage-flows at Blackfoot were less than the storage-flows at Minidoka then the Jackson Lake storage-flows at Minidoka were assumed equal to the storage-flows at Blackfoot.

3. When the storage-flows at either Blackfoot or Minidoka were negative the Jackson Lake storage-flows at Minidoka were assumed to be zero.

No adjustment was required for Jackson Lake storage-flows at the Minidoka gage during the Storage Period since only the Storage-release Period flows from that reservoir are excluded under the terms of the contracts. All flows recorded at the Minidoka gage during the storage period are assumed to be natural flows. During the Storage-release Period, that part of the recorded flows at the Minidoka gage which remained, after the adjustment was made for Jackson Lake storage-flows, was considered to be available for use by Units 1-6 under Condition I. Usable-flows under this condition were limited to 3700 cubic feet per second, the maximum hydraulic capacity of Units 1-6. The detailed computation of these flows for the water year 1945 is shown in Table 2.

Condition II, Usable-Flows, Units 1-6, Without Restrictions on Use of Minidoka Water Rights and Excluding Storage-Flows. During the Storage-Period, usable-flows under this condition were computed by adjusting the recorded flow at the Minidoka gage as follows:

1. If the recorded flows at the Minidoka gage were in excess of 2700 cubic feet per second, the recorded flows up to 3700 cubic feet per second (maximum hydraulic capacity Units 1-6) were assumed to be the usable-flows.

2. If the recorded flows at the Minidoka gage were less than 2700 cubic feet per second, then the usable-flows without restriction on use of the Minidoka power rights were assumed to be equal to the adjusted-

flows at the Minidoka gage up to a maximum of 2700 cubic feet per second. The adjusted-flows are obtained by adding the amount of water stored in American Falls Reservoir for the same day. That part of the adjusted-flows which is in excess of 2700 cubic feet per second may be stored in American Falls Reservoir without adversely affecting the basic power right for 2700 cubic feet per second at Minidoka Dam and is not included as a part of the usable-flows.

During the Storage-release Period the usable-flows without benefit of storage-flows were considered to be the normal flows at the Minidoka gage as indicated in the table "Daily Segregation of Data at and between Snake River Gaging Stations," as contained in the annual reports, "Water Distribution and Hydrometric Work, District 36, Snake River, Idaho," or 3700 cubic feet per second whichever were least.

Table 3 shows the detailed computations for deriving the usable-flows under Condition II for water-year 1945.

Computation of Power Production

The power production by units 1 through 6 of the Minidoka plant was computed for both Conditions I and II for the period October 1, 1931, through September 30, 1951, based on the average monthly flows as determined by the methods previously discussed and the family of output curves (discharge versus kilowatts), and the capability curve, (head versus kilowatts) shown on drawing 17-100-139.

When the usable-flows equaled or exceeded the hydraulic capacity of the six units, the power output was determined from the power capability curve (head versus kilowatts) (drawing 17-100-139) and the curve value

multiplied by the factor 0.965. When usable-flows were below the hydraulic capacity of the six units, the power output was determined from the power output curves (discharge versus kilowatts) (drawing 17-100-139) and the curve value multiplied by the factor 0.9. Determination of the hydraulic capacity for the six units for any head was made from the hydraulic capacity curve shown on drawing 17-100-140 derived from the output curves. The upper limit of continuous output from the units has been established on the basis of past records, and this point is indicated on the power capability curve. Elevation 4236.0 was used as the minimum pool elevation of Lake Walcott for satisfactory power generation.

Table I, Annual Net Power Production Losses for the Period October 1, 1931 through September 30, 1951. The net power losses for each year for this period were determined from the power production calculations, later described and illustrated for water-year 1945 in Tables 4 and 5. Derivation of the net loss for each year is illustrated by the computations for the year 1945 as shown on Table 6. The annual net power losses for each year of the 20-year period are summarized on Table 1 and result in an average annual net power loss for the period of 5,699,000 kilowatt hours.

Condition I. Power Generation from the Average Monthly Usable-Flows with Restricted Use of the Minidoka Water Rights and Excluding Jackson Lake Storage-Flows. The computation of power generation was made by using the output curves (drawing 17-100-139) and the flows available for power production appearing in Table. 2. The average

gross power head was determined from the basic data shown in the annual reports on "Water Distribution and Hydrometric Work, District 36, Snake River, Idaho," and from reservoir area-capacity curves or tables and tailwater curves. The details are illustrated by the computation of power generation for the water-year 1945 shown in Table 4.

Condition II. Power Generation from the Average Monthly Usable-Flows without Restricted use of Minidoka Water Rights and Excluding all Storage-Flows. The average gross power head for this condition was taken to be the same as that used for Condition I based on assumptions which can be reasonably supported: (1) The operation of Lake Walcott without restriction of the Minidoka water rights would be essentially the same. (2) The same tailwater elevations were used although the tailwater elevation would be actually slightly different for the two conditions. This difference, besides being relatively small, also tends to be canceled out, since the difference is in one direction in the Storage Period and in the other direction in the Storage-Release Period. (3) The heads used are average for the month, further minimizing the difference in tailwater for the two conditions. (4) It would be a complicated procedure and a degree of refinement inconsistent with other data to adjust tailwater elevations for this condition. The detailed computation of the power generation for the water-year 1945 is shown in Table 5, derived in the same manner described for Condition I, using the flows available for power production appearing in Table 3.

By comparison of the results of the power generation for the two conditions, the losses due to restriction of the Minidoka water rights and the gains due to release of American Falls storage have been determined. The details of this computation for the water-year 1945 are shown on Table 6.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Minidoka Project Office
Burley, Idaho

December 3, 1981

MINUTES OF COMMITTEE MEETING HELD TO DETERMINE AND APPROVE THE NET POWER PRODUCTION LOSSES AT THE MINIDOKA POWER PLANT DURING 1980

The meeting was held at 10 a.m., December 3, 1981, in the Bureau of Reclamation Office, Burley, Idaho.

There was a net power production loss for the year ending September 30, 1980, of 18,850,000 kilowatthours. The average annual loss for the 20-year period ending 1980 is 6,307,500 kWh. The following table shows the 20-year average net power losses for the past eight years.

Year	KWH		Mills/KWH	Amount
1980	6,307,500	x	3.6	$ 22,707.00
1979	5,899,500	x	3.6	21,238.20
1978	6,314,000	x	3.6	22,386.80
1977	5,663,000	x	3.6	20,386.80
1976	5,663,000	x	3.6	20,386.80
1975	5,839,000	x	2.0	11,678.00
1974	5,839,000	x	2.0	11,678.00
1973	5,905,000	x	2.0	11,810.00

The distribution to the reservoirs of the $22,707.00 for 1980, in accordance with contract provisions, is as follows:

Island Park .....12% = $2,724.84
Palisades .....10% = $2,270.70
American Falls.....78% = $17,711.46

TOTAL $22,707.00

Table 1, Table 4-5, and Table 6 showing the annual power loss for the water year 1980 and the previous 20 years were given to each participant for review.

The following were in attendance:

Leo A. Busch, Bureau of Reclamation
V. Keith Ebersole, Bureau of Reclamation
Evan Rasmussen, Burley Irrigation District
Leonard Scheer, Minidoka Irrigation District
William C. Nichols, Minidoka Irrigation District
Pat R. O'Donnell, Minidoka Irrigation District
Dan L. Stapelman, Minidoka Irrigation District
Lester Saunders, North Side Canal (Committee of Nine)
John Rosholt, Attorney, Twin Falls Canal Company

The committee reviewed the computation methods for arriving at the annual power loss, and after these calculations were discussed it was moved and seconded that they be accepted and the data be presented to the Committee of Nine meeting scheduled this date. The motion was approved.

Leo A. Busch

Leo A. Busch
Secretary Pro Tem

TABLE 1

MINIDOKA POWER PLANT
UNITS 1-6

Net Power Production Loss Due to Restriction of Use of Minidoka Water Rights

Unit: Thousands of Kilowatthours

Water Year Oct.-Sept.	Loss From Restriction of Use of Water Rights	Gain From[1/] American Falls Storage	Net Loss
1961	25,253	5,298	19,955
1962	21,710	2,890	18,820
1963	15,959	4,667	11,292
1964	15,326	2,531	12,795
1965	0	0	0
1966	605	605	0
1967	23,559	3,114	20,445
1968	3,703	1,663	2,040
1969	0	0	0
1970	9,818	2,124	7,694
1971	0	0	0
1972	0	0	0
1973	0	0	0
1974	1,260	1,260	0
1975	0	0	0
1976	0	0	0
1977	0	0	0
1978	18,969	4,710	14,259
1979	0	0	0
1980	21,061	2,211	18,850
Total	157,223	31,073	126,150
20 yr. av.	7,861.15	1,553.65	6,307.5

6,307,500 x $.0036 = $22,707.00

Palisades = 10% x 22,707.00 = $2,270.70
Island Park = 12% x 22,707.00 = $2,724.84
American Falls = 78% x 22,707.00 = $17,711.46

1/ Limited to amount of winter losses occurring in the same year.

MINIDOKA POWER PLANT
UNITS 1-6

Net Annual Power Production Loss Due to
Restriction of Use of Minidoka Water Rights

October 1, 1979 to September 30, 1980

Month	1 Computed Output 1,000 KWH Condition II	2 Computed Output 1,000 KWH Condition I	3 Loss from Restriction of Use of Water Rights	4 Gain from American Falls Storage
Oct.	6,110.5	5,055.5	1,055	
Nov.	5,200.6	777.6	4,423	
Dec.	5,490.7	870.5	4,620	
Jan.	5,423.8	1,574.6	3,849	
Feb.	5,167.8	1,503.4	3,665	
Mar.	5,524.2	2,075.8	3,449	
Apr.	6,616.1	6.706.8	--	91
May	7,610.4	7,610.4	--	
June	7,336.8	7,336.8	--	
July	6,963.8	7,578.4	--	615
Aug.	6,374.6	7,646.1	--	1,272
Sept.	6,635.5	6,868.8	--	233
TOTAL	74,454.8	55,604.7	21,061	2,211

Total Annual Loss	21,061
Total Annual Gain 1/	2,211
Annual Net Loss	18,850

M I N I D O K A P O W E R P L A N T

U N I T S 1 - 6

CONDITION I - Net annual power production with restrictions on use of Minidoka Water Rights and Excluding Jackson Lake Storage Flow.

CONDITION II- Net annual power production without restrictions on use of Minidoka Water Rights and Excluding all Storage Flow.

October 1, 1979 to September 30, 1980

	CONDITION I (Table 4)				CONDITION II (Table 5)		
	Average Power Head	Average Usable Flow	Computed Output		Average Usable Flow	Computed Output	
	Feet	CFS	Average KW	1,000 KWH	CFS	Average KW	1,000 KWH
Oct.	43.04	2,515	6,795	5,055.5	3,066	8,213	6,110.5
Nov.	44.30	481	1,080	777.6	2,700	7,223	5,200.6
Dec.	46.23	445	1,170	870.5	2,700	7,380	5,490.7
Jan.	47.54	694	2,115	1,574.6	2,628	7,290	5,423.8
Feb.	48.56	716	2,160	1,503.4	2,700	7,425	5,167.8
Mar.	49.68	1,001	2,790	2,075.8	2,700	7,425	5,524.2
Apr.	48.85	3,505	9,315	6,706.8	3,334	9,189	6,616.1
May	48.75	3,700	10,229	7,610.4	3,700	10,229	7,610.4
Jun.	48.61	3,700	10,190	7,336.8	3,700	10,190	7,336.8
Jul.	48.53	3,700	10,186	7,578.4	3,514	9,360	6,963.8
Aug.	48.87	3,700	10,277	7,646.1	3,144	8,568	6,374.6
Sep.	49.13	3,500	9,360	6,868.8	3,330	10,240	6,635.5

United States Department of the Interior
BUREAU OF RECLAMATION
~~WATER AND POWER RESOURCES SERVICE~~
MINIDOKA PROJECT OFFICE
1359 HANSEN AVENUE
BURLEY, IDAHO 83318

IN REPLY
REFER TO: 405

July 13, 1982

Mr. Ron Carlson
Department of Water Resources (Water District No. 1)
150 Shoup
Idaho Falls, Idaho 83401

Dear Ron:

Enclosed is criteria for determination of power losses at Minidoka Dam Powerplant due to restrictions on use of water rights in order to provide for irrigation storage.

There are other documentations of procedures used by this office in reporting such losses. If you require additional information contact Keith Ebersole of this office.

Sincerely yours,

Donald E. Tracy

Donald E. Tracy
Project Superintendent

Enclosure

CRITERIA AND METHOD FOR DETERMINATION OF CERTAIN MINIDOKA POWERPLANT PRODUCTION LOSSES FROM RESTRICTIONS ON USE OF WATER RIGHTS

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Region I

August 1952

Boise, Idaho

Criteria and Method for Determination of Certain Minidoka Powerplant Production Losses from Restrictions on Use of Water Rights

In this document are set forth: In Part I, a statement, in general terms, of the purposes to be served by the curtailment in the exercise of the water rights held by the United States for power production at American Falls and Minidoka dams, and a statement in more specific terms of the measure of curtailment and the basic assumptions and criteria that, by contracts made and to be made with affected water users and water users' organizations under the terms of the Act of September 30, 1950, Public Law 864, 81st Congress (herein called the 1950 Act), are made controlling in these matters; and in Part II, by way of illustration, the methods and procedures used to determine the usable-flows available at the Minidoka powerplant and the related power production by units 1 through 6 from such flows for the period October 1, 1931, to September 30, 1951, under the basic assumptions and criteria, and, in more detail, the calculations for the water year 1945, being the 12-month period ending September 30, 1945.

PART I

BASIC ASSUMPTIONS AND CRITERIA

The need for conserving the waters of the Snake River above Milner Dam for irrigation purposes requires the limiting of the use of water for power generation at American Falls and Minidoka dams below amounts that would accrue to rights that are available to the United States for power production at those dams. The measure of the cultailment

in use of water is, by a series of contracts entered into or to be entered into under the terms of the 1950 Act, to be as follows:

"Except as it is determined by the Secretary that additional water may be passed through American Falls and Minidoka dams without the loss of water that could be stored for irrigation in the reservoir system, the United States will, during each storage season beginning October 1, 1952, * * * limit the release of water through those dams as follows:

To the amount of water required to provide flows below Minidoka Dam sufficient to meet existing diversion rights in the reach of the river through Milner Dam and the power rights required to be recognized under the provisions of the contract of June 15, 1923, between the United States and the Idaho Power Company (Symbol and No. Ilr-733), as those diversion and power rights may be modified from time to time."

Such curtailment in the exercise of power rights at Minidoka dam will result in a loss of generation at units 1 through 6 of that powerplant but will result in the saving of water for storage for irrigation use. The water so saved is, under the contracts made and to be made under the 1950 Act, to be credited to American Falls, Island Park, and Palisades reservoirs. In compensation for such losses in power generation, replacement power will be provided to the Minidoka power system, and, based on a moving average of the net annual amount of replacement power and energy required, the costs thereof will be charged to the

beneficiaries of the resultant water saving. By contracts made and to be made under the 1950 Act, these basic assumptions and criteria are controlling in determining the annual net power replacement requirements:

A. For the period beginning October 1, 1931, and ending September 30, 1951, the annual net power production losses for each year are those stated in Table 1, set out in the Part I appendices.

B. For each year thereafter, a net power production loss is to be calculated on the basis of the comparison of (1) the total energy that could have been produced by units 1 through 6 of the Minidoka powerplant, based on the water flows actually recorded at U.S.G.S. Minidoka gaging station (hereinafter called the Minidoka gage), corrected as hereinafter provided, and (2) the energy which theoretically could have been generated at these units with the flows at the Minidoka gage without the agreed curtailment in winter power operation and exclusive of irrigation storage releases. 1/

1/ The flows recorded at the Minidoka gage for (1), as corrected, or the flows at the Minidoka gage without curtailment in winter power operation and exclusive of irrigation storage releases for (2) used in accordance with this provision of the controlling contracts are not to be reduced by an allowance for leakage at Minidoka dam.

C. To correct flows under B(1) above, all storage releases except American Falls shall be excluded and the measure of American Falls storage passing the Minidoka gage shall be the increase in storage flow at that gage over that computed at the Blackfoot gaging station as shown in the annual report of the Watermaster, District No. 36, entitled "Water Distribution and Hydrometic Work, District 36, Snake River, Idaho", the latter further corrected for any American Falls storage that may have been present by reason of having been stored temporarily upstream and for that portion of Palisades storage which was diverted above the Minidoka gage. In measuring American Falls storage, it shall be assumed that downstream storage is released first. The flow at the Minidoka gage without storage shall be taken to be the normal flow at that gage as shown by that same report.

D. In determining water flows, with and without the agreed curtailment of power operations, these assumptions are to be used with respect to the power rights of units 1 through 6 of the Minidoka powerplant:

(1) There is a right for power production to maintain a flow of 2,700 second-feet at Minidoka dam during the storage season of each year in accordance with the decree entered June 20, 1913 (District Court of the Fourth Judicial District of Idaho in

the case of Twin Falls Canal Company v. Charles N. Foster, et al.), if that flow, disregarding the storage of saved water in the reservoir system, would be available at Minidoka dam.

(2) There is a right to use, within the hydraulic capacity of these units, whatever natural flow passes Minidoka dam during each irrigation season.

(3) Although there is no right to have water stored under American Falls reservoir rights released for power production, during the period that such storage is being released for irrigation there will be more energy produced by these units than is attributable to the natural flow rights therefor, which shall be taken into account as a compensating offset as provided in F. below.

E. The effective power head for any period shall be derived on the basis of recorded forebay and tailwater elevations for that period.

F. Using conclusions reached as to flows and heads, the power loss calculations for each year after September 30, 1951, under B above, will be made by utilizing the power production curves shown on drawing No. 17-100-139[2/], a copy of which is set out in the Part I appendices, but increases in energy in any year by reason of taking American Falls storage into account as indicated by subparagraph 3 of D above shall be accounted for as a compensating offset

up to but not exceeding energy losses accruing in that year by reason of curtailment in power operations as provided in the controlling contracts made and to be made under the 1950 Act.

The contracts made and to be made provide that the average replacement requirement for the year ending September 30, 1953, is to be 5,699,000 kilowatt-hours, being the average annual replacement requirement for the 20-year period ending September 30, 1951, and that the average annual replacement requirement for the year ending September 30, 1954, shall be the average of the annual replacement requirements for each year of the 20-year period ending September 30, 1953, and for each 12-month period after September 30, 1954, shall be the average of the annual replacement requirements of each year of the 20-year period ending September 30 of the prior year.

2/ Duplicate originals of this drawing are on file with the officer of the United States in charge of the Minidoka Project, the watermaster of District No. 36, and the Burley Irrigation District.

PART II

CALCULATION OF USABLE-FLOWS AND POWER PRODUCTION

By way of illustration, this part describes the calculations that were made, in connection with Table 1, with respect to usable-flows available at Minidoka powerplant and the power that would be produced by units 1 to 6 from such flows; and also includes detailed computations for the water year 1945.

Computation of Flows Usable for Power Production.

The net annual power loss by Units 1-6 of the Minidoka Power Plant, as defined by contracts, referred to in Part I, is based on flows at the United States Geological Survey gaging station near Minidoka, Idaho, hereinafter referred to as the Minidoka gage, for two sets of conditions.

Condition I.--Under this condition the restrictions on use of the Minidoka water rights are in effect and Jackson Lake storage-flows are excluded during the irrigation season prior to October 1.

Condition II.--Under this condition there are no restrictions on use of the Minidoka water rights and all storage-flows are excluded during the irrigation season prior to October 1.

Following is an explanation of the methods used to derive these flows for the period October 1, 1931 through September 30, 1951. All basic flow data for this computation were taken directly from the annual reports on "Water Distribution and Hydrometric Work, District 36, Snake River, Idaho", except that the October through March flows for the water-years 1932, 1933, and 1934 were adjusted to reflect the restrictions

on the use of the water power rights at Minidoka Dam. The historical flows for water-years 1935 through 1951 were assumed to be essentially the same as would have occurred with restricted use of the Minidoka power rights under the terms of the contracts made or to be made under the terms of the 1950 Act.

The water-year was divided into two periods; the Storage Period and the Storage-release Period. The Storage-release Period was defined as that period during the irrigation season and prior to October 1, during which time storage-flows were indicated at the Minidoka gage, or at the United States Geological Survey gaging station near Blackfoot, Idaho, hereinafter referred to as the Blackfoot gage. The remainder of the water-year was considered to be the Storage Period. The computation of the flows available, under each of the two conditions, was made on a daily basis. The maximum hydraulic capacity of Units 1-6 of the Minidoka Power Plant is 3700 cubic feet per second, therefore, flows in excess of this amount cannot be used by these units. In recognition of this fact, usable-flows were limited to 3700 cubic feet per second. Inasmuch as elevation 4236 was used as the minimum elevation of Lake Walcott for satisfactory power generation, for the purpose of this computation it was assumed that during periods when the Lake Walcott pool was below elevation 4236 there were no usable-flows. Usable-flows are those flows which could have been utilized for power production by Units 1-6. The daily usable-flows for each month were converted to average monthly flows in order to simplify the power computations which are discussed in a later section of this document. The detailed compu-

tation of flows for water-year 1945 is shown in Tables 2 and 3 to illustrate the methods used.

Condition I. Usable-Flows, Units 1-6, with Restricted Use of the Minidoka Water Rights and excluding Jackson Lake Storage-Flows. The usable-flows under this condition were assumed to be the flows of the Snake River as recorded at the Minidoka gage, with adjustments to exclude Jackson Lake storage-flows which were present and to exclude flows which were in excess of the maximum hydraulic capacity of Units 1-6. The amount of Jackson Lake storage-flows passing the gaging station near Minidoka was determined by a comparison of the daily amounts of storage-flows at the Minidoka gage with those storage-flows indicated at the Blackfoot gage for the preceding day. One day travel-time was assumed between the two gages. All storage-flow data were taken from the table "Daily Segregation of Data at and between Snake River Gaging Stations," as contained in the annual reports "Water Distribution and Hydrometric Work, District 36, Snake River, Idaho." Three assumptions were used in determining the amount of Jackson Lake storage-flows passing the Minidoka gaging station.

1. When the storage-flows near Blackfoot exceeded the storage-flows at Minidoka then the Jackson Lake storage-flows at Minidoka were assumed equal to the total storage-flows at Minidoka.

2. When the storage-flows at Blackfoot were less than the storage-flows at Minidoka then the Jackson Lake storage-flows at Minidoka were assumed equal to the storage-flows at Blackfoot.

3. When the storage-flows at either Blackfoot or Minidoka were negative the Jackson Lake storage-flows at Minidoka were assumed to be zero.

No adjustment was required for Jackson Lake storage-flows at the Minidoka gage during the Storage Period since only the Storage-release Period flows from that reservoir are excluded under the terms of the contracts. All flows recorded at the Minidoka gage during the storage period are assumed to be natural flows. During the Storage-release Period, that part of the recorded flows at the Minidoka gage which remained, after the adjustment was made for Jackson Lake storage-flows, was considered to be available for use by Units 1-6 under Condition I. Usable-flows under this condition were limited to 3700 cubic feet per second, the maximum hydraulic capacity of Units 1-6. The detailed computation of these flows for the water year 1945 is shown in Table 2.

Condition II, Usable-Flows, Units 1-6, Without Restrictions on Use of Minidoka Water Rights and Excluding Storage-Flows. During the Storage-Period, usable-flows under this condition were computed by adjusting the recorded flow at the Minidoka gage as follows:

1. If the recorded flows at the Minidoka gage were in excess of 2700 cubic feet per second, the recorded flows up to 3700 cubic feet per second (maximum hydraulic capacity Units 1-6) were assumed to be the usable-flows.

2. If the recorded flows at the Minidoka gage were less than 2700 cubic feet per second, then the usable-flows without restriction on use of the Minidoka power rights were assumed to be equal to the adjusted-

flows at the Minidoka gage up to a maximum of 2700 cubic feet per second. The adjusted-flows are obtained by adding the amount of water stored in American Falls Reservoir for the same day. That part of the adjusted-flows which is in excess of 2700 cubic feet per second may be stored in American Falls Reservoir without adversely affecting the basic power right for 2700 cubic feet per second at Minidoka Dam and is not included as a part of the usable-flows.

During the Storage-release Period the usable-flows without benefit of storage-flows were considered to be the normal flows at the Minidoka gage as indicated in the table "Daily Segregation of Data at and between Snake River Gaging Stations," as contained in the annual reports, "Water Distribution and Hydrometric Work, District 36, Snake River, Idaho," or 3700 cubic feet per second whichever were least.

Table 3 shows the detailed computations for deriving the usable-flows under Condition II for water-year 1945.

Computation of Power Production

The power production by units 1 through 6 of the Minidoka plant was computed for both Conditions I and II for the period October 1, 1931, through September 30, 1951, based on the average monthly flows as determined by the methods previously discussed and the family of output curves (discharge versus kilowatts), and the capability curve, (head versus kilowatts) shown on drawing 17-100-139.

When the usable-flows equaled or exceeded the hydraulic capacity of the six units, the power output was determined from the power capability curve (head versus kilowatts) (drawing 17-100-139) and the curve value

multiplied by the factor 0.965. When usable-flows were below the hydraulic capacity of the six units, the power output was determined from the power output curves (discharge versus kilowatts) (drawing 17-100-139) and the curve value multiplied by the factor 0.9. Determination of the hydraulic capacity for the six units for any head was made from the hydraulic capacity curve shown on drawing 17-100-140 derived from the output curves. The upper limit of continuous output from the units has been established on the basis of past records, and this point is indicated on the power capability curve. Elevation 4236.0 was used as the minimum pool elevation of Lake Walcott for satisfactory power generation.

Table I, Annual Net Power Production Losses for the Period October 1, 1931 through September 30, 1951. The net power losses for each year for this period were determined from the power production calculations, later described and illustrated for water-year 1945 in Tables 4 and 5. Derivation of the net loss for each year is illustrated by the computations for the year 1945 as shown on Table 6. The annual net power losses for each year of the 20-year period are summarized on Table 1 and result in an average annual net power loss for the period of 5,699,000 kilowatt hours.

Condition I. Power Generation from the Average Monthly Usable-Flows with Restricted Use of the Minidoka Water Rights and Excluding Jackson Lake Storage-Flows. The computation of power generation was made by using the output curves (drawing 17-100-139) and the flows available for power production appearing in Table. 2. The average

gross power head was determined from the basic data shown in the annual reports on "Water Distribution and Hydrometric Work, District 36, Snake River, Idaho," and from reservoir area-capacity curves or tables and tailwater curves. The details are illustrated by the computation of power generation for the water-year 1945 shown in Table 4.

Condition II. Power Generation from the Average Monthly Usable-Flows without Restricted use of Minidoka Water Rights and Excluding all Storage-Flows. The average gross power head for this condition was taken to be the same as that used for Condition I based on assumptions which can be reasonably supported: (1) The operation of Lake Walcott without restriction of the Minidoka water rights would be essentially the same. (2) The same tailwater elevations were used although the tailwater elevation would be actually slightly different for the two conditions. This difference, besides being relatively small, also tends to be canceled out, since the difference is in one direction in the Storage Period and in the other direction in the Storage-Release Period. (3) The heads used are average for the month, further minimizing the difference in tailwater for the two conditions. (4) It would be a complicated procedure and a degree of refinement inconsistent with other data to adjust tailwater elevations for this condition. The detailed computation of the power generation for the water-year 1945 is shown in Table 5, derived in the same manner described for Condition I, using the flows available for power production appearing in Table 3.

By comparison of the results of the power generation for the two conditions, the losses due to restriction of the Minidoka water rights and the gains due to release of American Falls storage have been determined. The details of this computation for the water-year 1945 are shown on Table 6.

PART I APPENDICES

There are set out hereinafter these documents referred to in the text of Part I:

Table I.--Net Power Production Loss Due to Restriction on Use of Minidoka Water Rights

Drawing No. 17-100-139.--Minidoka Powerplant - Units 1-6, Power Output Curves

TABLE I

MINIDOKA POWER PLANT
UNITS 1-6

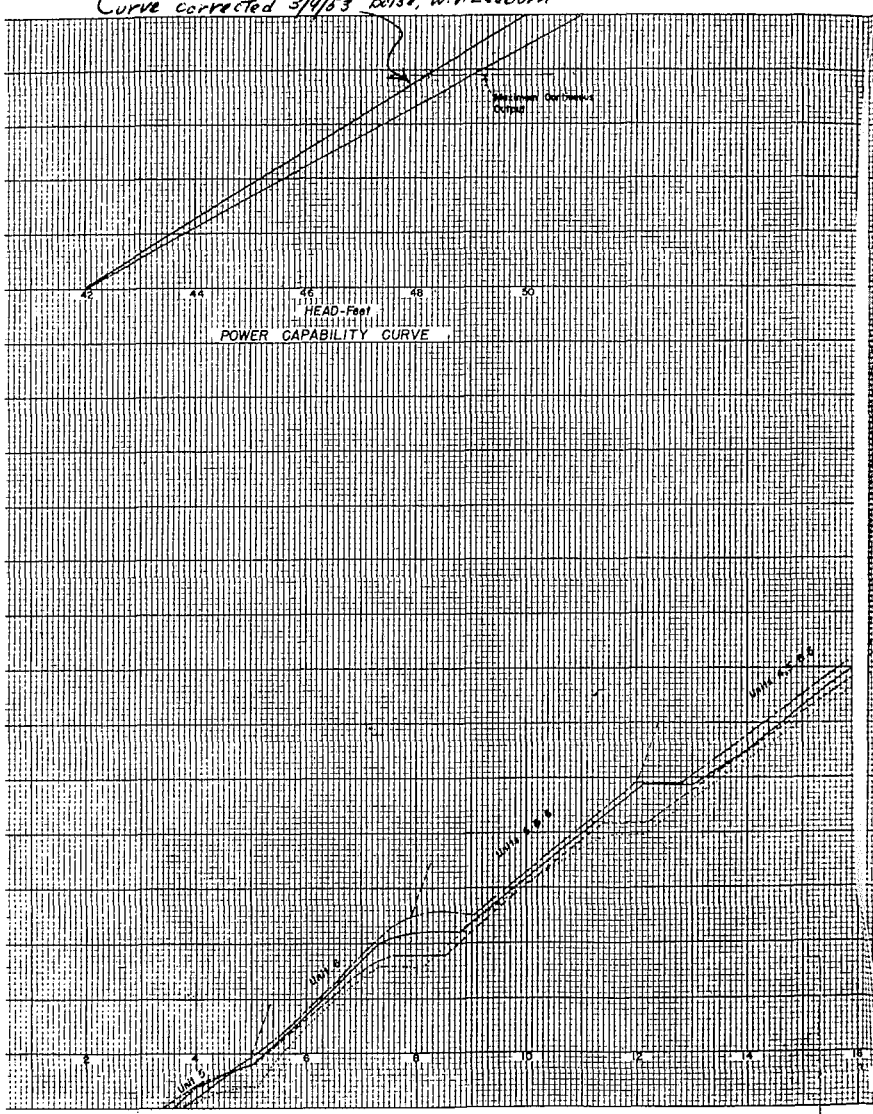
Net Power Production Loss Due to Restriction of use of Minidoka Water Rights

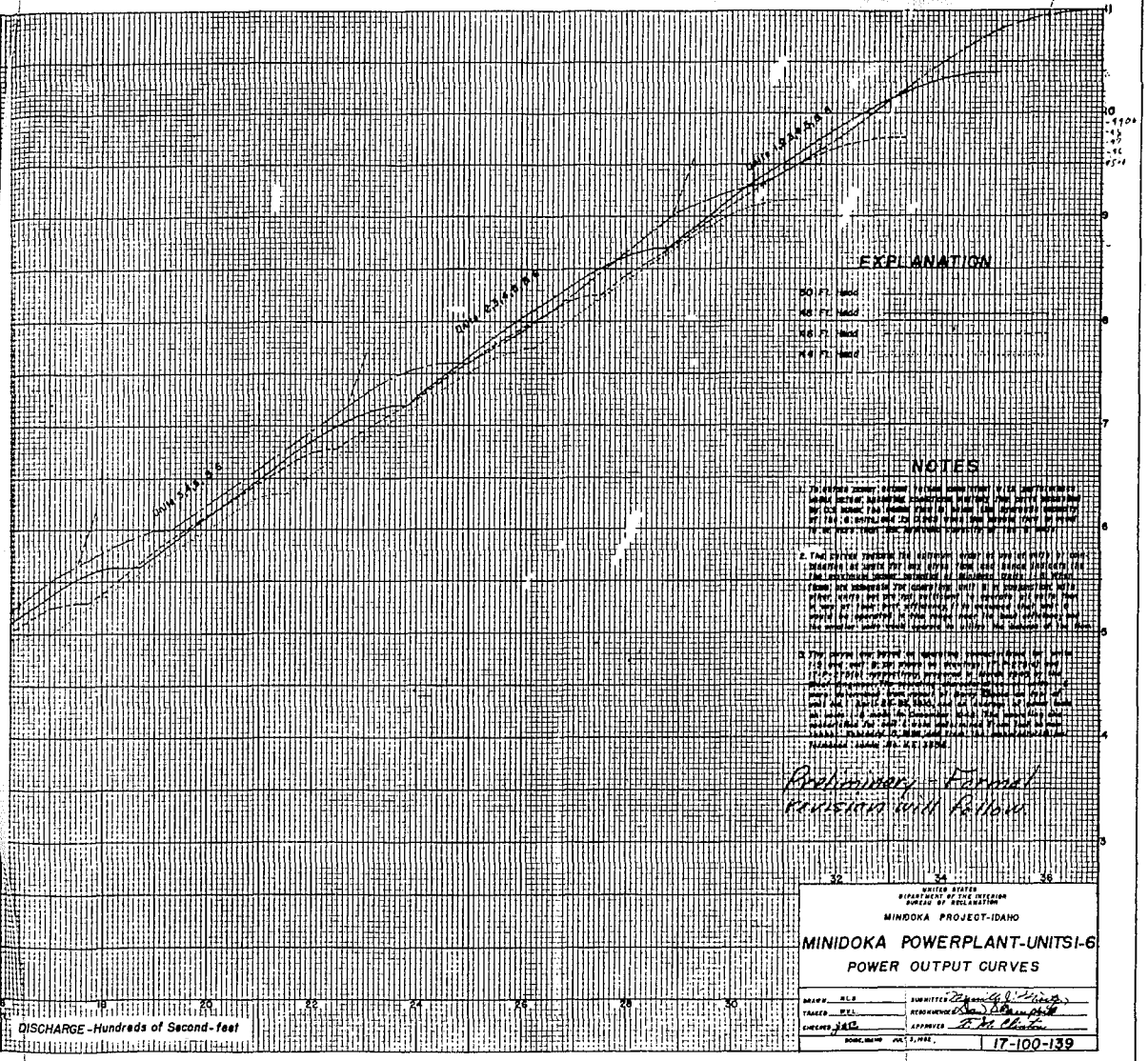
Unit: Thousands of kilowatthours

Water Year Oct.-Sept.	Loss From Restriction of use of Water Rights	Gain From 1/ American Falls Storage	Net Loss
1932	14,604	3,516	11,088
1933	16,530	4,667	11,863
1934	13,463	8,966	4,497
1935	18,322	4,969	13,353
1936	20,390	5,015	15,375
1937	16,492	5,381	11,111
1938	19,054	4,104	14,950
1939	8,764	5,451	3,313
1940	19,387	4,857	14,530
1941	10,381	4,138	6,243
1942	7,133	4,707	2,426
1943	3,417	2,327	1,090
1944	2,654	2,654	0
1945	5,769	1,632	4,137
1946	33	33	0
1947	1,808	1,808	0
1948	734	734	0
1949	3,108	3,108	0
1950	201	201	0
1951	0	0	0
20 year average	9,112	3,413	5,699

1/ Limited to amount of winter losses occurring in the same year.

Curve corrected 3/9/53 Boise, W.V. Losburn





EXPLANATION

50 Ft. Head
48 Ft. Head
46 Ft. Head
44 Ft. Head

NOTES

1. [illegible]

2. [illegible]

3. [illegible]

Preliminary - Typical
Revision with R.P.U.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

MINIDOKA PROJECT-IDAHO

MINIDOKA POWERPLANT-UNITS 1-6

POWER OUTPUT CURVES

DRAWN WLB	SUBMITTED
TRACED WLL	RECOMMENDED
CHECKED J&C	APPROVED
BOISE, IDAHO JULY 3, 1952	17-100-139

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PART II APPENDICES

There are set out hereinafter these documents referred to in the text of Part II. Tables 2 through 6 constitute a sample calculation of usable-flows and power production for water-year 1945.

Table 2.--Condition I. Usable-Flow with Restricted Use of Minidoka Water Rights and Excluding Jackson Lake Storage-Flow

Table 3.--Condition II. Usable-Flow without Restrictions on Use of Minidoka Water Rights and Excluding Storage-Flow

Table 4.--Condition I. Net Annual Power Production with Restrictions on Use of Minidoka Water Rights and Excluding Jackson Lake Storage-Flow

Table 5.--Condition II. Net Annual Power Production without Restrictions on Use of Minidoka Water Rights and Excluding all Storage-Flow

Table 6.--Net Annual Power Production Loss Due to Restriction of Use of Minidoka Water Rights

Drawing No. 17-100-140.--Minidoka Power Plant - Units 1-6, Hydraulic Capacity

TABLE 2

MINIDOKA POWER PLANT, UNITS 1-6

Sample Calculation

Condition I. Usable-Flow with Restricted Use of Minidoka Water Rights and Excluding Jackson Lake Storage-Flow

October 1, 1944 to September 30, 1945

Units: Cubic Feet Per Second

Date at Minidoka	Storage Period											
	October		November		December		January		February		March	
	Recorded Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Usable-Flow
1	1,620	1,620	1,750	1,750	1,380	1,380	1,890	1,890	2,790	2,790	2,900	2,900
2	1,470	1,470	1,580	1,580	1,280	1,280	2,560	2,560	2,680	2,680	2,900	2,900
3	1,050	1,050	802	802	1,220	1,220	2,840	2,840	2,970	2,970	2,900	2,900
4	890	890	1,020	1,020	1,150	1,150	2,920	2,920	2,960	2,960	2,920	2,920
5	1,280	1,280	842	842	1,280	1,280	2,820	2,820	2,810	2,810	2,940	2,940
6	1,960	1,960	1,020	1,020	1,480	1,480	2,730	2,730	2,840	2,840	2,940	2,940
7	2,560	2,560	1,570	1,570	1,550	1,550	2,750	2,750	2,820	2,820	2,920	2,920
8	2,240	2,240	1,860	1,860	1,570	1,570	3,580	3,580	2,860	2,860	2,920	2,920
9	1,940	1,940	1,860	1,860	1,550	1,550	3,210	3,210	2,840	2,840	2,920	2,920
10	1,660	1,660	1,880	1,880	1,580	1,580	2,720	2,720	2,790	2,790	2,920	2,920
11	1,410	1,410	1,850	1,850	1,640	1,640	2,750	2,750	2,790	2,790	2,940	2,940
12	1,300	1,300	1,880	1,880	1,550	1,550	2,750	2,750	2,750	2,750	2,970	2,970
13	1,320	1,320	1,900	1,900	1,580	1,580	2,770	2,770	2,770	2,770	3,030	3,030
14	2,290	2,290	1,890	1,890	1,670	1,670	2,790	2,790	2,840	2,840	3,050	3,050
15	2,750	2,750	1,900	1,900	1,750	1,750	2,790	2,790	2,860	2,860	2,990	2,990
16	2,790	2,790	1,970	1,970	1,740	1,740	2,770	2,770	2,810	2,810	2,970	2,970
17	2,650	2,650	2,350	2,350	1,540	1,540	2,750	2,750	2,810	2,810	2,900	2,900
18	1,670	1,670	2,350	2,350	1,590	1,590	2,750	2,750	2,810	2,810	2,880	2,880
19	1,570	1,570	2,370	2,370	1,580	1,580	2,750	2,750	2,820	2,820	2,880	2,880
20	1,580	1,580	2,630	2,630	1,620	1,620	2,750	2,750	2,820	2,820	2,880	2,880
21	1,700	1,700	2,840	2,840	1,650	1,650	2,770	2,770	2,820	2,820	2,860	2,860
22	1,930	1,930	2,280	2,280	1,800	1,800	2,770	2,770	2,820	2,820	2,860	2,860
23	1,810	1,810	1,550	1,550	1,680	1,680	2,770	2,770	2,820	2,820	2,900	2,900
24	1,760	1,760	1,270	1,270	1,590	1,590	2,770	2,770	2,840	2,840	2,900	2,900
25	1,850	1,850	1,270	1,270	1,450	1,450	2,770	2,770	2,810	2,810	2,880	2,880
26	1,760	1,760	1,280	1,280	1,570	1,570	2,790	2,790	2,810	2,810	2,900	2,900
27	1,720	1,720	1,220	1,220	1,600	1,600	2,810	2,810	2,840	2,840	2,900	2,900
28	1,720	1,720	1,310	1,310	1,700	1,700	2,810	2,810	2,880	2,880	2,920	2,920
29	1,730	1,730	1,520	1,520	1,780	1,780	2,810	2,810	---	---	2,920	2,920
30	1,720	1,720	1,460	1,460	1,810	1,810	2,810	2,810	---	---	2,940	2,940
31	1,730	1,730	---	---	1,780	1,780	2,790	2,790	---	---	2,480	2,480
Total	55,430	55,430	51,274	51,274	48,710	48,710	86,310	86,310	79,080	79,080	90,130	90,130
Mean	1,788	1,788	1,709	1,709	1,571	1,571	2,784	2,784	2,824	2,824	2,907	2,907

TABLE 2

MINIDOKA POWER PLANT, UNITS 1-6

Sample Calculation

Condition I. Usable-Flow with Restricted Use of Minidoka Water Rights and Excluding Jackson Lake Storage-Flow

October 1, 1944 to September 30, 1945

Units: Cubic Feet Per Second

Date at Minidoka	Storage Period						Storage-Release Period					
	April		May		June		July					
	Recorded Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Usable-Flow	Storage-Flow at Minidoka Gage	Storage-Flow at Blackfoot Gage	Recorded Flow at Minidoka Gage	Jackson Lake Storage-Flow at Minidoka Gage	Flow at Minidoka Gage w/o Jackson Lake Storage	Usable-Flow
1	1,760	1,760	5,280	3,700	8,540	3,700	0	0	15,200	0	15,200	3,700
2	3,010	3,010	6,280	3,700	9,550	3,700	0	0	14,700	0	14,700	3,700
3	3,950	3,700	7,020	3,700	10,800	3,700	0	0	10,400	0	10,400	3,700
4	4,100	3,700	8,030	3,700	10,700	3,700	0	0	7,880	0	7,880	3,700
5	4,260	3,700	9,110	3,700	10,900	3,700	0	0	7,970	0	7,970	3,700
6	4,260	3,700	10,100	3,700	10,200	3,700	0	0	8,180	0	8,180	3,700
7	4,000	3,700	10,400	3,700	12,000	3,700	0	0	8,510	0	8,510	3,700
8	3,810	3,700	13,600	3,700	17,500	3,700	0	0	8,540	0	8,540	3,700
9	3,760	3,700	13,900	3,700	16,300	3,700	581	0	8,510	0	8,510	3,700
10	3,760	3,700	9,270	3,700	20,000	3,700	1,631	0	8,720	0	8,720	3,700
11	3,760	3,700	12,800	3,700	22,800	3,700	2,373	0	8,780	0	8,780	3,700
12	3,760	3,700	14,100	3,700	20,300	3,700	2,086	0	8,690	0	8,690	3,700
13	3,720	3,700	8,570	3,700	18,100	3,700	1,636	0	8,660	0	8,660	3,700
14	4,060	3,700	7,590	3,700	19,000	3,700	969	0	8,810	0	8,810	3,700
15	4,410	3,700	7,620	3,700	18,200	3,700	725	0	8,900	0	8,900	3,700
16	4,760	3,700	7,880	3,700	17,700	3,700	1,118	-17	8,780	0	8,780	3,700
17	5,730	3,700	8,600	3,700	17,500	3,700	2,359	-16	8,540	0	8,540	3,700
18	8,270	3,700	9,140	3,700	15,700	3,700	2,600	-17	8,600	0	8,600	3,700
19	8,090	3,700	9,050	3,700	11,000	3,700	2,630	-122	8,630	0	8,630	3,700
20	7,650	3,700	8,360	3,700	7,560	3,700	2,510	-430	8,510	0	8,510	3,700
21	7,210	3,700	9,300	3,700	7,440	3,700	2,668	-490	8,390	0	8,390	3,700
22	3,620	3,620	12,200	3,700	7,530	3,700	3,770	-479	8,360	0	8,360	3,700
23	3,680	3,680	11,600	3,700	7,360	3,700	4,558	-553	8,360	0	8,360	3,700
24	3,830	3,700	8,420	3,700	7,330	3,700	5,050	-646	8,450	0	8,450	3,700
25	3,640	3,640	8,450	3,700	7,160	3,700	4,990	-774	8,390	0	8,390	3,700
26	3,890	3,700	8,480	3,700	7,270	3,700	5,120	-523	8,510	0	8,510	3,700
27	4,100	3,700	8,660	3,700	7,680	3,700	5,888	1,333	8,750	1,333	7,417	3,700
28	4,120	3,700	8,720	3,700	7,620	3,700	5,915	1,079	8,780	1,079	7,701	3,700
29	4,080	3,700	8,690	3,700	10,900	3,700	6,154	583	9,020	583	8,437	3,700
30	4,320	3,700	8,660	3,700	15,000	3,700	6,243	451	9,110	451	8,659	3,700
31	---	---	8,690	3,700	---	---	5,847	390	8,720	390	8,330	3,700
Total	---	108,210	---	---	---	---	---	---	280,350	3,836	276,514	---
Mean	---	3,607	---	3,700	---	3,700	---	---	---	---	---	3,700

TABLE 2

MINIDOKA POWER PLANT, UNITS 1-6

Sample Calculation

Condition I. Usable-Flow with Restricted Use of Minidoka Water Rights and excluding Jackson Lake Storage-Flow

October 1, 1944 to September 30, 1945

Units: Cubic Feet Per Second

Date at Minidoka	Storage-Release Period											
	August						September					
	Storage-Flow at Minidoka Gage	Storage-Flow at Blackfoot Gage	Recorded Flow at Minidoka Gage	Jackson Lake Storage-Flow at Minidoka Gage	Flow at Minidoka Gage w/o Jackson Lake Storage	Usable-Flow	Storage-Flow at Minidoka Gage	Storage-Flow at Blackfoot Gage	Recorded Flow at Minidoka Gage	Jackson Lake Storage-Flow at Minidoka Gage	Flow at Minidoka Gage w/o Jackson Lake Storage	Usable-Flow
1	5,423	387	8,300	387	7,913	3,700	5,050	216	8,000	216	7,784	3,700
2	5,776	498	8,660	498	8,162	3,700	5,033	866	7,970	866	7,104	3,700
3	5,949	342	8,840	342	8,498	3,700	4,997	1,921	7,970	1,921	6,049	3,700
4	6,088	193	8,990	193	8,797	3,700	4,931	2,303	8,000	2,303	5,697	3,700
5	5,957	273	8,870	273	8,597	3,700	4,928	2,102	8,060	2,102	5,958	3,700
6	5,861	790	8,780	790	7,990	3,700	5,002	1,430	8,120	1,430	6,690	3,700
7	5,772	1,738	8,690	1,738	6,952	3,700	4,609	967	7,680	967	6,713	3,700
8	5,559	2,351	8,510	2,351	6,159	3,700	4,303	657	7,360	657	6,703	3,700
9	5,289	2,085	8,360	2,085	6,275	3,700	4,114	624	7,180	624	6,556	3,700
10	5,081	2,140	8,090	2,140	5,950	3,700	4,033	740	7,100	740	6,360	3,700
11	5,015	2,433	8,000	2,433	5,567	3,700	3,788	960	6,880	960	5,920	3,700
12	5,078	1,880	8,030	1,880	6,150	3,700	3,298	696	6,520	696	5,824	3,700
13	5,278	1,772	8,240	1,772	6,468	3,700	3,271	599	6,490	599	5,891	3,700
14	5,252	1,187	8,210	1,187	7,023	3,700	3,368	594	6,600	594	6,006	3,700
15	5,248	1,067	8,240	1,067	7,173	3,700	3,535	545	6,790	545	6,245	3,700
16	5,209	938	8,270	938	7,332	3,700	3,753	498	7,040	498	6,542	3,700
17	5,278	772	8,360	772	7,588	3,700	3,721	503	7,040	503	6,537	3,700
18	5,519	592	8,600	592	8,008	3,700	3,496	620	6,820	620	6,200	3,700
19	5,641	428	8,720	428	8,292	3,700	3,206	691	6,120	691	5,429	3,700
20	5,631	315	8,720	315	8,405	3,700	2,466	800	5,280	800	4,480	3,700
21	5,481	412	8,570	412	8,158	3,700	1,535	1,313	4,960	1,313	3,647	3,647
22	5,324	1,442	8,510	1,442	7,068	3,700	647	2,171	4,000	647	3,353	3,353
23	5,069	2,639	8,360	2,639	5,721	3,700	-546	1,541	3,580	0	3,580	3,580
24	5,009	2,181	8,330	2,181	6,149	3,700	-916	1,387	3,030	0	3,030	3,030
25	5,060	1,628	8,360	1,628	6,732	3,700	-1,095	1,325	2,610	0	2,610	2,610
26	5,261	1,037	8,480	1,037	7,443	3,700	-1,025	921	2,400	0	2,400	2,400
27	5,327	588	8,480	588	7,892	3,700	-839	958	2,400	0	2,400	2,400
28	5,226	453	8,330	453	7,877	3,700	-1,353	981	2,100	0	2,100	2,100
29	5,218	207	8,270	207	8,063	3,700	-901	329	1,400	0	1,400	1,400
30	5,374	80	8,360	80	8,280	3,700	0	0	1,380	0	1,380	1,380
31	5,248	65	8,210	65	8,145	3,700	---	---	---	---	---	---
Total	---	---	261,740	32,913	228,827	---	---	---	170,880	20,292	150,588	99,900
Mean	---	---	---	---	---	3,700	---	---	---	---	---	3,330

TABLE 3

MINIDOKA POWER PLANT, UNITS 1-6

Sample Calculation

Condition II. Usable-Flow Without Restrictions on use of Minidoka Water Rights and Excluding Storage-Flow

October 1, 1944 to September 30, 1945

Units: Cubic Feet Per Second

Date at Minidoka	Storage Period											
	October				November				December			
	Recorded Flow at Minidoka Gage	Change in Storage in American Falls Res. 1/	Adjusted-Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Change in Storage in American Falls Res. 1/	Adjusted-Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Change in Storage in American Falls Res. 1/	Adjusted-Flow at Minidoka Gage	Usable-Flow
1	1,620	146	1,766	1,766	1,750	812	2,562	2,562	1,380	3,559	4,939	2,700
2	1,470	297	1,767	1,767	1,580	2,924	4,504	2,700	1,280	4,154	5,434	2,700
3	1,050	1,775	2,825	2,700	802	3,413	4,215	2,700	1,220	4,785	6,005	2,700
4	890	1,921	2,811	2,700	1,020	2,924	3,944	2,700	1,150	6,116	7,266	2,700
5	1,280	590	1,870	1,870	842	3,675	4,517	2,700	1,280	5,097	6,377	2,700
6	1,960	2,959	4,919	2,700	1,020	4,522	5,542	2,700	1,480	3,872	5,352	2,700
7	2,560	1,775	4,335	2,700	1,570	2,677	4,247	2,700	1,550	4,290	5,840	2,700
8	2,240	1,502	3,742	2,700	1,860	3,181	5,041	2,700	1,570	3,998	5,568	2,700
9	1,940	2,748	4,688	2,700	1,860	3,534	5,394	2,700	1,550	4,628	6,178	2,700
10	1,660	1,684	3,344	2,700	1,880	3,615	5,495	2,700	1,580	3,998	5,578	2,700
11	1,410	913	2,323	2,323	1,850	4,134	5,984	2,700	1,640	2,944	4,584	2,700
12	1,300	459	1,759	1,759	1,880	6,544	8,424	2,700	1,550	2,526	4,076	2,700
13	1,320	918	2,238	2,238	1,900	3,126	5,026	2,700	1,580	2,733	4,313	2,700
14	2,290	151	2,441	2,441	1,890	4,780	6,670	2,700	1,670	2,813	4,483	2,700
15	2,750	—	—	2,750	1,900	5,838	7,738	2,700	1,750	2,596	4,346	2,700
16	2,790	—	—	2,790	1,970	4,780	6,750	2,700	1,740	2,380	4,120	2,700
17	2,650	615	3,265	2,700	2,350	5,047	7,397	2,700	1,540	3,247	4,787	2,700
18	1,670	1,523	3,193	2,700	2,350	4,548	6,898	2,700	1,590	3,464	5,054	2,700
19	1,570	1,376	2,946	2,700	2,370	4,906	7,276	2,700	1,580	2,596	4,176	2,700
20	1,580	1,679	3,259	2,700	2,630	5,279	7,909	2,700	1,620	3,030	4,650	2,700
21	1,700	1,679	3,379	2,700	2,840	—	—	2,840	1,650	5,727	7,377	2,700
22	1,930	2,365	4,295	2,700	2,280	4,855	7,135	2,700	1,800	5,995	7,795	2,700
23	1,810	3,469	5,279	2,700	1,550	3,736	5,286	2,700	1,680	5,102	6,782	2,700
24	1,760	2,365	4,125	2,700	1,270	2,244	3,514	2,700	1,590	4,220	5,810	2,700
25	1,850	2,047	3,897	2,700	1,270	4,724	5,994	2,700	1,450	4,709	6,159	2,700
26	1,760	1,734	3,494	2,700	1,280	5,571	6,851	2,700	1,570	3,862	5,432	2,700
27	1,720	1,734	3,454	2,700	1,220	5,768	6,988	2,700	1,600	3,640	5,240	2,700
28	1,720	1,573	3,293	2,700	1,310	5,954	7,264	2,700	1,700	3,635	5,335	2,700
29	1,730	2,097	3,827	2,700	1,520	5,143	6,663	2,700	1,780	3,181	4,961	2,700
30	1,720	3,413	5,133	2,700	1,460	3,358	4,818	2,700	1,810	3,413	5,223	2,700
31	1,730	973	2,703	2,700	—	—	—	—	1,780	3,418	5,198	2,700
Total	—	—	—	79,104	—	—	—	81,002	—	—	—	—
Mean	—	—	—	2,551	—	—	—	2,700	—	—	—	2,700

1/ These values given in second-foot days where one second-foot day equals 1.9834 acre-feet.

TABLE 3

MINIDOKA POWER PLANT, UNITS 1-6

Sample Calculation

Condition II. Usable-Flow Without Restrictions on use of Minidoka Water Rights and Excluding Storage-Flow

October 1, 1944 to September 30, 1945

Units: Cubic Feet Per Second

Date at Minidoka	Storage Period											
	January				February				March			
	Recorded Flow at Minidoka Gage	Change in Storage in American Falls Res. 1/	Adjusted-Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Change in Storage in American Falls Res. 1/	Adjusted-Flow at Minidoka Gage	Usable-Flow	Recorded Flow at Minidoka Gage	Change in Storage in American Falls Res. 1/	Adjusted-Flow at Minidoka Gage	Usable-Flow
1	1,890	4,417	6,307	2,700	2,790	—	—	2,790	2,900	—	—	2,900
2	2,560	2,556	5,116	2,700	2,680	3,438	6,118	2,700	2,900	—	—	2,900
3	2,840	—	—	2,840	2,970	—	—	2,970	2,900	—	—	2,900
4	2,920	—	—	2,920	2,960	—	—	2,960	2,920	—	—	2,920
5	2,820	—	—	2,820	2,810	—	—	2,810	2,940	—	—	2,940
6	2,730	—	—	2,730	2,840	—	—	2,840	2,940	—	—	2,940
7	2,750	—	—	2,750	2,820	—	—	2,820	2,920	—	—	2,920
8	3,580	—	—	3,580	2,860	—	—	2,860	2,920	—	—	2,920
9	3,210	—	—	3,210	2,840	—	—	2,840	2,920	—	—	2,920
10	2,720	—	—	2,720	2,790	—	—	2,790	2,920	—	—	2,920
11	2,750	—	—	2,750	2,790	—	—	2,790	2,940	—	—	2,940
12	2,750	—	—	2,750	2,750	—	—	2,750	2,970	—	—	2,970
13	2,770	—	—	2,770	2,770	—	—	2,770	3,030	—	—	3,030
14	2,790	—	—	2,790	2,840	—	—	2,840	3,050	—	—	3,050
15	2,790	—	—	2,790	2,860	—	—	2,860	2,990	—	—	2,990
16	2,770	—	—	2,770	2,810	—	—	2,810	2,970	—	—	2,970
17	2,750	—	—	2,750	2,810	—	—	2,810	2,900	—	—	2,900
18	2,750	—	—	2,750	2,810	—	—	2,810	2,880	—	—	2,880
19	2,750	—	—	2,750	2,820	—	—	2,820	2,880	—	—	2,880
20	2,750	—	—	2,750	2,820	—	—	2,820	2,880	—	—	2,880
21	2,770	—	—	2,770	2,820	—	—	2,820	2,860	—	—	2,860
22	2,770	—	—	2,770	2,820	—	—	2,820	2,860	—	—	2,860
23	2,770	—	—	2,770	2,820	—	—	2,820	2,900	—	—	2,900
24	2,770	—	—	2,770	2,840	—	—	2,840	2,900	—	—	2,900
25	2,770	—	—	2,770	2,810	—	—	2,810	2,880	—	—	2,880
26	2,790	—	—	2,790	2,810	—	—	2,810	2,900	—	—	2,900
27	2,810	—	—	2,810	2,840	—	—	2,840	2,900	—	—	2,900
28	2,810	—	—	2,810	2,880	—	—	2,880	2,920	—	—	2,920
29	2,810	—	—	2,810	—	—	—	—	2,920	—	—	2,920
30	2,810	—	—	2,810	—	—	—	—	2,940	—	—	2,940
31	2,790	—	—	2,790	—	—	—	—	2,480	-277	—	2,480
Total	—	—	—	87,260	—	—	—	79,100	—	—	—	90,130
Mean	—	—	—	2,815	—	—	—	2,825	—	—	—	2,907

1/ These values given in second-foot days where one second-foot day equals 1.9834 acre-feet.

TABLE 3

MINIDOKA POWER PLANT, UNITS 1-6

Sample Calculation

Condition II. Usable-Flow Without Restrictions on use of Minidoka Water Rights and Excluding Storage-Flow

October 1, 1944 to September 30, 1945

Units: Cubic Feet Per Second

Date at Minidoka	Storage Period											
	April				May				June			
	Recorded Flow at Minidoka Gage	Change in Storage in American Falls Res. 1/	Adjusted Flow at Minidoka Gage	Usable Flow	Recorded Flow at Minidoka Gage	Change in Storage in American Falls Res. 1/	Adjusted Flow at Minidoka Gage	Usable Flow	Recorded Flow at Minidoka Gage	Change in Storage in American Falls Res. 1/	Adjusted Flow at Minidoka Gage	Usable Flow
1	1,760	6,302	8,062	2,700	5,280	—	—	3,700	8,540	—	—	3,700
2	3,010	—	—	3,010	6,280	—	—	3,700	9,550	—	—	3,700
3	3,950	—	—	3,700	7,020	—	—	3,700	10,800	—	—	3,700
4	4,100	—	—	3,700	8,030	—	—	3,700	10,700	—	—	3,700
5	4,260	—	—	3,700	9,110	—	—	3,700	10,900	—	—	3,700
6	4,260	—	—	3,700	10,100	—	—	3,700	10,200	—	—	3,700
7	4,000	—	—	3,700	10,400	—	—	3,700	12,000	—	—	3,700
8	3,810	—	—	3,700	13,600	—	—	3,700	17,500	—	—	3,700
9	3,760	—	—	3,700	13,900	—	—	3,700	16,300	—	—	3,700
10	3,760	—	—	3,700	9,270	—	—	3,700	20,000	—	—	3,700
11	3,760	—	—	3,700	12,800	—	—	3,700	22,800	—	—	3,700
12	3,760	—	—	3,700	14,100	—	—	3,700	20,300	—	—	3,700
13	3,720	—	—	3,700	8,570	—	—	3,700	18,100	—	—	3,700
14	4,060	—	—	3,700	7,590	—	—	3,700	19,000	—	—	3,700
15	4,410	—	—	3,700	7,620	—	—	3,700	18,200	—	—	3,700
16	4,760	—	—	3,700	7,880	—	—	3,700	17,700	—	—	3,700
17	5,730	—	—	3,700	8,600	—	—	3,700	17,500	—	—	3,700
18	8,270	—	—	3,700	9,140	—	—	3,700	15,700	—	—	3,700
19	8,090	—	—	3,700	9,050	—	—	3,700	11,000	—	—	3,700
20	7,650	—	—	3,700	8,360	—	—	3,700	7,560	—	—	3,700
21	7,210	—	—	3,700	9,300	—	—	3,700	7,440	—	—	3,700
22	3,620	—	—	3,620	12,200	—	—	3,700	7,530	—	—	3,700
23	3,680	—	—	3,680	11,600	—	—	3,700	7,360	—	—	3,700
24	3,830	—	—	3,700	8,420	—	—	3,700	7,330	—	—	3,700
25	3,640	—	—	3,640	8,450	—	—	3,700	7,160	—	—	3,700
26	3,890	—	—	3,700	8,480	—	—	3,700	7,270	—	—	3,700
27	4,100	—	—	3,700	8,660	—	—	3,700	7,680	—	—	3,700
28	4,120	—	—	3,700	8,720	—	—	3,700	7,620	—	—	3,700
29	4,080	—	—	3,700	8,690	—	—	3,700	10,900	—	—	3,700
30	4,320	—	—	3,700	8,660	—	—	3,700	15,000	—	—	3,700
31	—	—	—	—	8,690	—	—	3,700	—	—	—	—
Total	—	—	—	109,150	—	—	—	—	—	—	—	—
Mean	—	—	—	3,638	—	—	—	3,700	—	—	—	3,700

1/ These values given in second-foot days where one second-foot day equals 1.9834 acre-feet.

TABLE 3

MINIDOKA POWER PLANT, UNITS 1-6

Sample Calculation

Condition II. Usable-Flow Without Restrictions on use of Minidoka Water Rights and Excluding Storage-Flow

October 1, 1944 to September 30, 1945

Units: Cubic Feet Per Second

Date at Minidoka	Storage-Release Period					
	July		August		September	
	Normal-Flow at Minidoka Gage 1/	Usable-Flow	Normal-Flow at Minidoka Gage	Usable-Flow	Normal-Flow at Minidoka Gage	Usable-Flow
1	15,200	3,700	2,877	2,877	2,950	2,950
2	14,700	3,700	2,884	2,884	2,937	2,937
3	10,400	3,700	2,891	2,891	2,973	2,973
4	7,880	3,700	2,902	2,902	3,069	3,069
5	7,970	3,700	2,913	2,913	3,132	3,132
6	8,180	3,700	2,919	2,919	3,118	3,118
7	8,510	3,700	2,918	2,918	3,071	3,071
8	8,540	3,700	2,951	2,951	3,057	3,057
9	7,929 2/	3,700	3,071	3,071	3,066	3,066
10	7,089	3,700	3,009	3,009	3,067	3,067
11	6,407	3,700	2,985	2,985	3,092	3,092
12	6,604	3,700	2,952	2,952	3,222	3,222
13	7,024	3,700	2,962	2,962	3,219	3,219
14	7,841	3,700	2,958	2,958	3,232	3,232
15	8,175	3,700	2,992	2,992	3,255	3,255
16	7,662	3,700	3,061	3,061	3,287	3,287
17	6,181	3,700	3,082	3,082	3,319	3,319
18	6,000	3,700	3,081	3,081	3,324	3,324
19	6,000	3,700	3,079	3,079	2,914	2,914
20	6,000	3,700	3,089	3,089	2,814	2,814
21	5,722	3,700	3,089	3,089	3,425	3,425
22	4,590	3,700	3,186	3,186	3,353	3,353
23	3,802	3,700	3,291	3,291	4,126	3,700
24	3,400	3,400	3,321	3,321	3,946	3,700
25	3,400	3,400	3,300	3,300	3,705	3,700
26	3,390	3,390	3,219	3,219	3,425	3,425
27	2,862	2,862	3,153	3,153	3,239	3,239
28	2,865	2,865	3,104	3,104	3,453	3,453
29	2,866	2,866	3,052	3,052	2,301	2,301 3/
30	2,867	2,867	2,986	2,986	1,380	2,700 4/
31	2,873	2,873	2,962	2,962		
Total	—	109,623	—	94,239	—	95,114
Mean	—	3,536	—	3,040	—	3,170

1/ During period July 1-8, the normal-flow is equal to the recorded flow, since there is no storage-flow at the Minidoka gage.

2/ Storage releases begin on this date.

3/ Date of last irrigation storage release for the season.

4/ American Falls Reservoir storing water on this date. Adjusted-flow exceeds 2,700 c.f.s., so usable-flow equals 2,700 c.f.s.

Explanation of Columns - Tables 4 and 5

Column 1 - Lake Walcott reservoir content at end of month in acre feet obtained from Watermaster's Annual Report.

Column 2 - Lake Walcott reservoir elevation at end of month in feet referred to Minidoka gage whose zero elevation has been assumed at 4200.00 feet, M.S.L., read from capacity curve X-D-730.

Column 3 - Lake Walcott average reservoir elevation, in feet, referred to Minidoka gage, taken as the average between the value in Column 2 for the end of that month and the previous month.

Column 4 - Average tailwater elevation at Minidoka Dam in feet, referred to Minidoka gage, obtained from tailwater curve "Tailwater versus Release." Flow taken from Annual Reports on "Water Distribution and Hydrometric Work", District 36, Snake River near Minidoka, Idaho.

Column 5 - Average power head in feet is the difference between average reservoir and tailwater elevations, Column 3 - Column 4.

Column 6 - Average monthly usable flow, in cubic feet per second, taken from corresponding hydrologic data. (See accompanying hydrologic study).

Column 7 - Computed output, in kilowatts, obtained from output curves, drawing 17-100-139, as previously explained.

Column 8 - Total generation for the month, in thousands of kilowatt-hours, is obtained by multiplying average monthly generation Column (9), by the number of hours in the month.

TABLE 4

MINIDOKA POWER PLANT
UNITS 1-6

Sample Calculation

Condition I. Net Annual Power Production with Restrictions on Use of Minidoka Water Rights and Excluding Jackson Lake Storage Flow

October 1, 1944 to September 30, 1945

	1	2	3	4	5	6	7	8
	Lake Walcott							
	Recorded Content End of Month	Water Surface Elev. End of Month	Average Water Surface Elev.	Average Tail-water Elev.	Aver. Power Head (3-4)	Average Usable Flow	Computed Output	
	Acre Feet	Feet	Feet	Feet	Feet	CFS	Average KW	1000 KWH
O	64,140	4242.3	4243.0	4194.3	48.7	1788	5085	3783
N	65,670	4242.5	4242.4	4194.3	48.1	1709	4860	3499
D	67,870	4242.7	4242.6	4194.2	48.4	1571	4410	3281
J	66,660	4242.6	4242.6	4195.2	47.4	2784	7560	5625
F	66,660	4242.6	4242.6	4195.2	47.4	2824	7740	5201
M	89,010	4244.6	4243.6	4195.3	48.3	2907	7965	5926
A	94,720	4245.0	4244.8	4196.5	48.3	3607	10084	7260
M	94,950	4245.0	4245.0	4196.8	48.2	3700	10084	7502
J	96,390	4245.1	4245.0	4196.8	48.2	3700	10084	7260
J	96,870	4245.2	4245.1	4196.8	48.3	3700	10084	7502
A	95,670	4245.0	4245.1	4196.8	48.3	3700	10084	7502
S	91,460	4244.7	4244.9	4196.8	48.1	3330	9186	6610

TABLE 5

MINIDOKA POWER PLANT
. . . UNITS 1-6 .

Sample Calculation

Condition II. Net Annual Power Production Without Restrictions on Use of Minidoka Water Rights and Excluding all Storage Flow

October 1, 1944 to September 30, 1945

	Lake Walcott							
	Recorded Content End of Month	Water Surface Elev. End of Month	Average Water Surface Elev.	Average Tail-water Elev.	Aver. Power Head (3-4)	Average Usable Flow	Computed Output: Average	1000
	Acre Feet	Feet	Feet	Feet	Feet	CFS	KW	KWH
O	64,140	4242.3	4243.0	4194.3	48.7	2,551	7,047	5,243
N	65,670	4242.5	4242.4	4194.3	48.1	2,700	7,515	5,411
D	67,870	4242.7	4242.6	4194.2	48.4	2,700	7,497	5,578
J	66,660	4242.6	4242.6	4195.2	47.4	2,815	7,695	5,725
F	66,660	4242.6	4242.6	4195.2	47.4	2,825	7,740	5,201
M	89,010	4244.6	4243.6	4195.3	48.3	2,907	7,965	5,926
A	94,720	4245.0	4244.8	4196.5	48.3	3,638	10,084	7,260
M	94,950	4245.0	4245.0	4196.8	48.2	3,700	10,084	7,502
J	96,390	4245.1	4245.0	4196.8	48.2	3,700	10,084	7,260
J	96,870	4245.2	4245.1	4196.8	48.3	3,536	9,423	7,502
A	95,670	4245.0	4245.1	4196.8	48.3	3,040	8,370	6,227
S	91,460	4244.7	4244.9	4196.8	48.1	3,170	8,685	6,253

TABLE 6

MINIDOKA POWER PLANT
UNITS 1-6

Sample Calculation

Net Annual Power Production Loss Due to Restriction of Use of Minidoka Water Rights

October 1, 1944 to September 30, 1945

1	2	3	4	5
Year and Month	Computed Output 1000 KWH Condition II	Condition I	Loss from Restriction of use of Water Rights	Gain from American Falls Storage
1945				
Oct.	5,243	3,783	1,460	
Nov.	5,411	3,499	1,912	
Dec.	5,578	3,281	2,297	
Jan.	5,725	5,625	100	
Feb.	5,201	5,201	0	
Mar.	5,926	5,926	0	
Apr.	7,260	7,260	0	
May	7,502	7,502	0	
June	7,260	7,260	0	
July	7,502	7,502		0
Aug.	6,227	7,502		1,275
Sept.	6,253	6,610		357
Total:			5,769	1,632

Total Annual Loss 5,769

Total Annual Gain 1/ 1,632

Annual Net Loss 4,137

1/ Contractually limited not to exceed the amount of annual loss.

18 SEP 91 RTS

MINIDOKA PROJECT RETURN FLOW CREDIT
(ACRE-FEET)

1978	16982
1979	53624
1980	2203
1981	11772
1982	3698
1983	32791
1984	25060
1985	69620
1986	26171
1987	74691
1988	51052
1989	21639
1990	62457
1991	35028
1992	52033

Sent to Mike Hammond - 18 SEP 91
Updated - 7 SEP 93

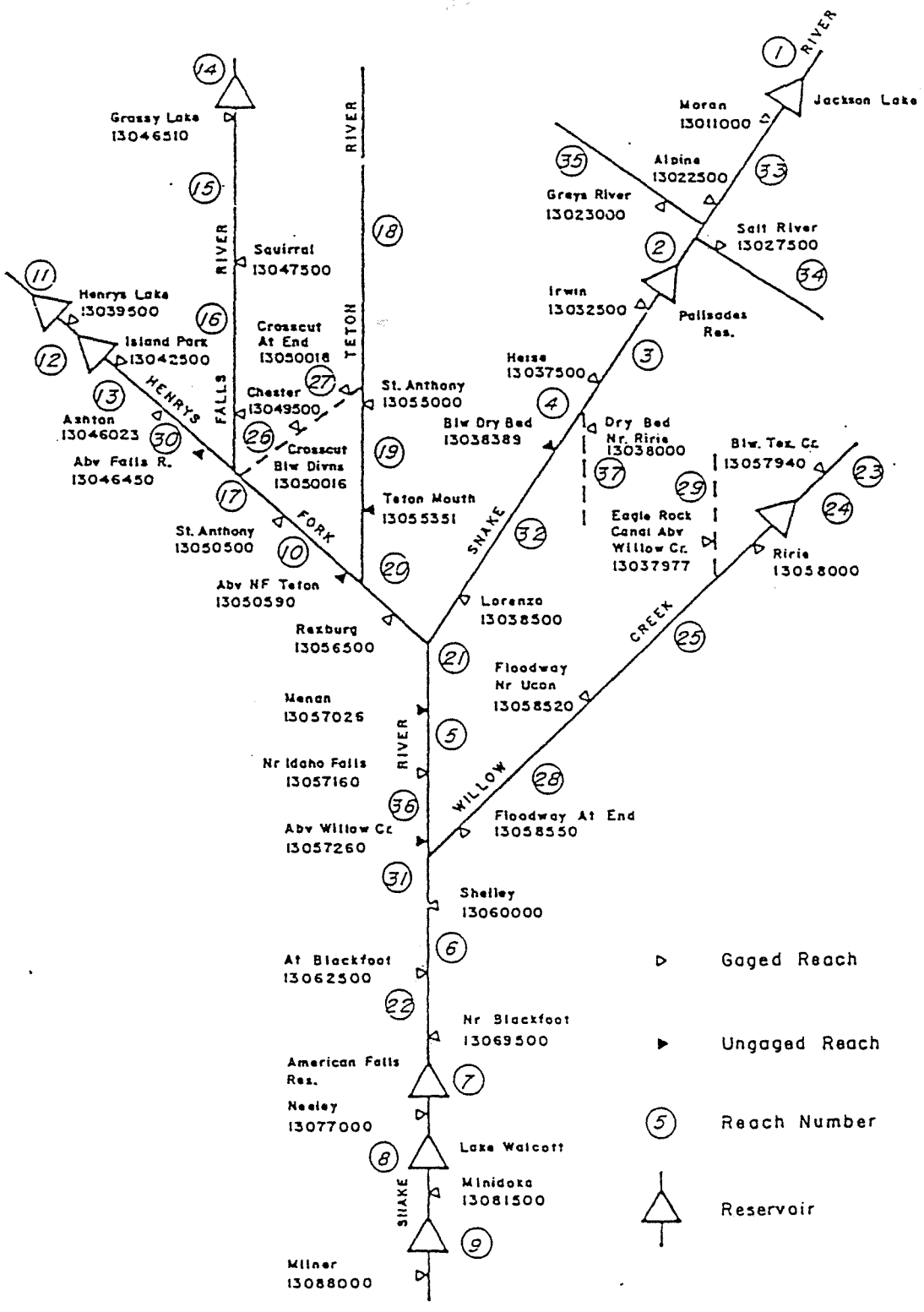


FIG. 2. Upper Snake System for Water Right Accounting.

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WATER DISTRICT NO. 1

John V. Evans
Governor

A. Kenneth Dunn
Director

150 Shoup
Idaho Falls, Idaho 83401
(208) 525-7172

April 2, 1984

Don Tracy
Bureau of Reclamation
1359 Hansen
Burley, ID 83318

Dear Don:

Based upon the data provided by the BOR we are in the process of reducing the area subject to evaporation on Palisades, Island Park, and Minidoka Reservoirs by 1125.5, 331.2 and 2314 acres respectively.

We have no plans to charge evaporation on Milner. It is my analysis that because Milner was in place at the time the Minidoka Project was constructed, Milner evaporation should not be a component of the Minidoka return flow credit. Also because there is no storage right associated with Milner, if evaporation were charged it would be charging a delivery loss on the natural flow diverted at the headgates of the Twin Falls canals. This, of course, is not done anywhere else in the system and I see insufficient reason for unique treatment in this case.

Very truly yours,

RONALD D. CARLSON
Watermaster

RDC:cw

cc: John Rosholt
Alan Robertson

PALISADES RESERVOIR
SURFACE AREA

ACTIVE CONTENTS (1000 ACRE-FT)	SURFACE AREA (1000 ACRES)	AREA LESS ORIGINAL RIVER SURFACE AREA (COL 2 LESS 1.1) (1000 ACRES)
0.0	4.9	3.8
200.0	7.2	6.1
400.0	9.1	8.0
600.0	10.7	9.6
800.0	12.5	11.4
1000.0	14.7	13.6
1200.0 (MAX)	16.3	15.2
1400.0	19.3	18.2

LAKE WALCOTT RESERVOIR
SURFACE AREA

ACTIVE CONTENTS (1000 ACRE-FT)	SURFACE AREA (1000 ACRES)	AREA LESS ORIGINAL RIVER SURFACE AREA (COL 2 LESS 2.3) (1000 ACRES)
0.0	9.2	6.9
20.0	10.0	7.7
40.0	10.6	8.3
60.0	11.0	8.7
80.0	11.3	9.0
100.0	11.8	9.5
120.0	12.8	10.5

Island Park Reservoir
Surface Area

Active Content (1000 Acre-Ft)	Surface Area (1000 Acres)	Area Less Original River Surface Area (Col 2 less 0.3) (1000 Acres)
0.0	0.1	0.0
20.0	1.5	1.2
40.0	3.2	2.9
60.0	4.7	4.4
80.0	5.9	5.6
100.0	6.8	6.5
120.0	7.7	7.4
140.0	8.4	8.1

United States Department of the Interior
BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043 - 550 WEST FORT STREET
BOISE, IDAHO 83724 - 0430

IN REPLY
REFER TO: PN 420
870.

SEP 28 1983

Mr. A. Kenneth Dunn, Director
State of Idaho
Department of Water Resources
Statehouse Mail
450 West State Street
Boise, Idaho 83720

Dear Mr. Dunn:

As a result of the June 24, 1983, meeting between representatives from the various canal companies and members of our respective staffs it was agreed that this office would provide you with the water surface area of the Snake River flowing through reservoir areas prior to construction of Reclamation's dams. These areas are as follows:

Reservoir	Surface Area of Snake River Within Reservoir Inundation Area Prior to Dam Construction
Minidoka Dam	2,314.0 acres
Island Park	331.2 acres
Palisades	1,125.5 acres

We understand that the computer model used in District 01 operations and water accounting will be modified to identify evaporation losses from the above acreages as a "nonproject" item.

Also, as indicated in the Minidoka Project Superintendent's letter of July 12, 1983, (copy of which was provided to your office) the evaporation from Milner Dam (approximately 8,000 acre-feet annually) should be credited to the Minidoka Project and deducted from the natural flows credited to the Twin Falls Canal Companies. This is based upon the reasoning that if the Minidoka Project did not exist, then the amount of evaporation from Milner would not be available to the Twin Falls Canal Companies.

The efforts you and your staff have made to improve District 01 operations and water accounting is commendable; and, your cooperation with this office is appreciated.

Sincerely yours,

L. W. Lloyd

Regional Director

United States Department of the Interior
BUREAU OF RECLAMATION
~~WATER AND POWER RESOURCES SERVICE~~
MINIDOKA PROJECT OFFICE
1359 HANSEN AVENUE
BURLEY, IDAHO 83318

IN REPLY
REFER TO: 100
870.

July 12, 1983

Memorandum

To: Regional Director, Boise, Idaho
Attention: 420

From: ACTING Project Superintendent, Burley, Idaho

Subject: Further Action on Foster Decree Concluded from June 24, 1983, Meeting, Minidoka Project, Idaho

The following comments are those derived from the meeting mentioned above. The Idaho Department of Water Resources Representative, Alan Robertson, and Ron Carlson, Watermaster of District No. 01 provided their explanation of present computer model concerning the Foster Decree as follows:

1. The Foster Decree provides that the River will be managed so that the Twin Falls tracts will be delivered the natural flows of the River as though the Minidoka Project (Minidoka Dam) had not been constructed. The computer model is intended to calculate the natural flow by making various credits and debits for project effects, rather than reliance upon the Neeley Gage as was done previously. The computer model is not perfect and it can be adjusted and corrected as more data is available. It is however, more detailed than the previous procedure.

2. Gains in the Minidoka-Milner reach are given to the Minidoka Project as daily natural flow whenever storage water is being used. This varies from past procedures in that such gains were accrued at the end of the irrigation season and credited as storage water.

3. The new water accounting procedures initiated after 1978 provide for more natural flows from the Upper Snake River Valley past Neeley gage which provides the Minidoka and Twin Falls Projects with more natural flows than in the past. Present accounting procedures were not previously feasible due to the large number of necessary calculations which computers are now performing.

Our concerns in being trustees for the Minidoka Project water rights as related to the Foster Decree are as follows:

1. The present hydrological accounting procedures within Neeley-Minidoka reach does not credit gains in offsetting losses to evaporation from Lake Walcott. Statistical analysis of this reach by Bureau's Planning Division during the

period of 1908-1980 indicates a hydrological increase in gain during the irrigation season. Reasons for these gains have been analyzed by District No. 01 (previously District No. 36) watermasters as:

a. Reduction in seepage losses due to lake sedimentation sealing previous loss sections of water and lake bottom.

b. Lowering of Lake Walcott during irrigation season allows bank storage in the upper section of the Reservoir to provide return flows.

c. Increase levels in the Snake River Aquifer contributing to spring inflows.

d. Possible end around flows from American Falls Reservoir water.

These various facts were fully discussed with all parties in attendance. It was agreed by Alan Robertson and Ron Carlson to subtract from the Walcott water surface area that portion of the Snake River that originally occupied the area now covered by the Reservoir. The Palisades and Island Park reservoirs were also agreed to be evaluated in a similar manner. Parry Harrison of the Regional Planning Division agreed to determine these areas.

The accuracy of the Snake River gage site below Minidoka Dam plus other gage sites are very important to proper determination of gains/losses. These gains/losses are small compared to large flows being introduced from above with a ratio as high as 40:1. The Project agrees to work with all parties to continue exploring procedures to improve accuracy.

The Project suggests further that in order to fully protect future litigation rights to gains in the Neeley-Minidoka reach due to the Minidoka Dam, that a claim be filed with the IDWR for 30,000 acre-feet of return flow credit. Such credit would be due to bank storage return from Lake Walcott.

We believe that since the Foster Decree states that the Watermaster of District No. 01 is to consider the distribution of natural flow as if the Minidoka Project did not exist, then Milner evaporation should be credited back to the Minidoka Project return flows. If the return flows did not exist then evaporation of approximately 8000 acre-feet annually would be lost from Twin Falls Canal Company's natural flow. This was discussed at the meeting, but never fully concluded as being a valid consideration.

The IDWR's position is to account for water as accurately as possible in accordance with the various water rights and decrees using the latest and best technology available which we wholeheartedly support. To more accurately accomplish the accounting as we interpret the Foster Decree we request that you respond to Ken Dunn's May 13, 1983, letter with the following:

1. Provide original river area in Lake Walcott with request that it be subtracted from evaporation loss.

2. Request that evaporation loss on the Milner Pool be included in return flows to Milner to be credited to the Minidoka Project.

Robert T. Pittard

cc: Burley Irrigation District, Route #1, Box 1416, Burley, Idaho 83318
Herman Bedke, Attorney, P.O. Box 249, Burley, Idaho 83318
Minidoka Irrigation District, Route #1, Box 8, Rupert, Idaho 83350
Kent Fletcher, Attorney, P.O. Box 910, Burley, Idaho 83318
Twin Falls Canal Company, P.O. Box 326, Twin Falls, Idaho 83301
North Side Canal Company, 921 North Lincoln, Jerome, Idaho 83338
Tom Nelson, Attorney, P.O. Box 1906, Twin Falls, Idaho 83301
Department of Water Resources, Water District No. 01, 150 Shoup, Suite 15, Idaho Falls, Idaho 83402
Alan Robertson, Idaho Department of Water Resources, Statehouse, Boise, Idaho 83720

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

December 17, 1982

MEMO

TO: Ron Carlson

FROM: Bob Sutter RMS

SUBJECT: STORED AND NATURAL FLOW ACCOUNTING ON WILLOW CREEK

The new procedures accounting for stored and natural flow on Willow Creek are now completed and can be used for the final accounting run for irrigation year 1982. The procedures used are based on conversations with you, Lyle, and Jim Steele. This memo explains how the stored and natural flow is computed on Willow Creek and the assumptions made to do this. The attached diagram of Willow Creek shows the major features involved and are referred to in the following discussion.

Losses Below Ririe to Floodway

The gain to reach 25 is first calculated as:

Gain 25 = Flow 25 - Flow 24 - Flow 29 + Total Diversions

If the gain is positive, it is simply considered a part of the natural flow in normal fashion. If the gain to Reach 25 is negative, the loss is assigned proportionally to the natural flow above Ririe, Eagle Rock Canal credited (not natural) flow, and stored flow below Ririe. The loss to natural flow above Ririe is assigned by simply using the value as a negative gain to Reach 25. The loss to the Eagle Rock Canal is assigned by reducing creditable flow in Reach 29. The stored flow loss below Ririe is totaled for the season and then must be subtracted from some stored water account manually at the end of the year, similar to any other stored water use. This procedure prevents large losses in Willow Creek below Ririe from negating small natural flows which normally occur in the summer. Although the irrigation years 1981 and 1982 show few losses in this reach, pre-1981 years exhibited large losses.

Eagle Rock Canal Flow Allocation

The flow from the Eagle Rock Canal (Reach 29) is compared to the sum of (1) miscellaneous, (2) Sand Creek, and (3) Willow Creek diversions. If the flow is greater than the sum of these diversions, the excess flow is considered a natural gain to the system and these diversions are completely satisfied from the Eagle Rock water. If the Eagle Rock flow is less than these diversions, there is no natural gain from the Eagle Rock Canal and the remaining difference can then be satisfied from natural flow if the rights of these diversions are in effect. The above diversion sum does not include the Idaho Canal diversion since it has no water supply available from the Eagle Rock Canal.

The Willow Creek natural flow (including any natural flow from the Eagle Rock Canal) is then distributed to all rights (including the Idaho Canal Company) on Willow Creek, but the miscellaneous, Sand Creek and Willow Creek diversion rights are limited to the above computed remaining difference, since the other portion will be satisfied (see below) from the Eagle Rock water. This allows the older rights on Willow Creek to use natural flow, rather than be satisfied from the Eagle Rock water.

Finally, the Eagle Rock water is then distributed to specific users on Willow Creek. This is important because it reduces the stored water used values for those credited with Eagle Rock water. The Eagle Rock water is credited to all "miscellaneous" users first, in downstream order. Any water still remaining is then credited to the Sand Creek and Willow Creek diversions, respectively. The effect of this procedure is that stored water used on Willow Creek will first show up for Willow and Sand Creek diversions and then for miscellaneous users in upstream order.

Losses in Ririe Reservoir

The gains to Reach 24 have consistently been negative, probably because of losses resulting from Ririe Reservoir. The gain to this reach is zeroed out in the accounting program and a season total (including gains and losses) is maintained. This total loss must also be subtracted from some storage account (presumably unallocated) at the end of the year.

Floodway Channel

The flow at the end of Reach 28 (the floodway) is presently set equal to the flow at the end of Reach 25. If a gage is ever installed at the end of the floodway, it may be advisable to assign losses (if they occur) in this reach to various sources similar to what is done for Reach 25. If so, this can easily be added later.

Report Printout

The revised accounting output printout includes several changes (see attached copy). The Eagle Rock Canal is now shown as a separate reach and any flow not credited to a diversion will be shown in the natural flow column. A reach gain is now shown in Reach 25, similar to all other reaches. The stored water used by all Willow Creek diversions is now correct and includes no Eagle Rock water, as before. The stored water used, therefore, should be charged to an account as is done for all other diversions.

There are three new cfs values and corresponding seasonal acre-feet totals at the bottom of the diversion printout. "RIRIE RESVR LOSS" is the loss (negative value) or gain in Reach 24; "WILLOW CREEK LOSS" is the loss (negative value) in Reach 25 assigned to the natural flow above Ririe; and "EAGLE ROCK CREDIT" is the amount of the Eagle Rock Canal water directly credited to Willow Creek diversions.

Significance of Changes

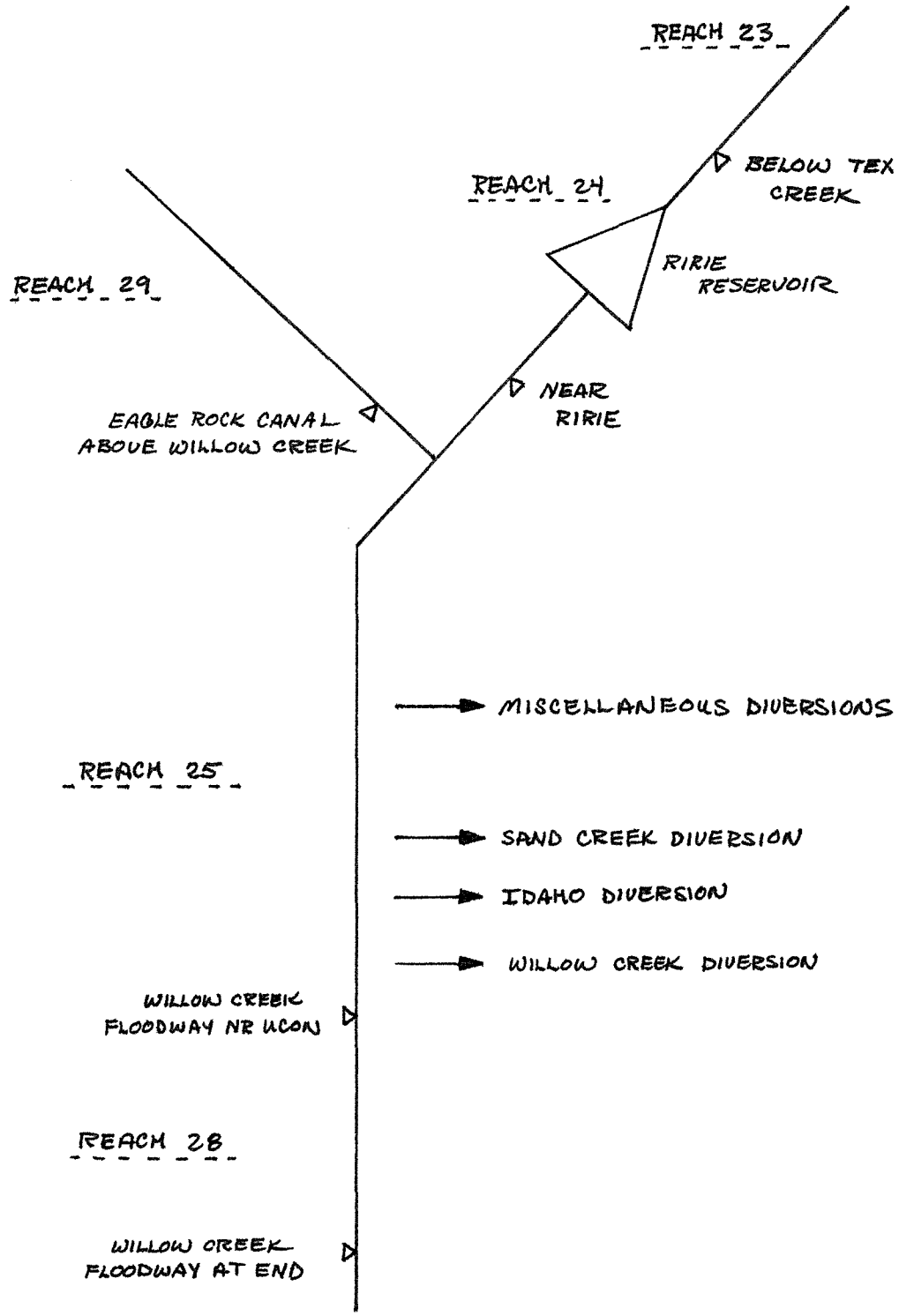
The major implication of the entire procedure is that enough water should be kept in Willow Creek to cover users who have Enterprise and Farmer's Friend water. Since these are primarily the "miscellaneous" diverters and the above procedure credits the Eagle Rock water to them first, it is assumed that this water is sufficiently present and that all stored water used (other than the Idaho) is by the Progressive Irrigation District. If it is not, the Willow and Sand Creek diversions (primarily Progressive Irrigation District) will inadvertently be charged too much storage. It will, therefore, be the Willow Creek Deputy Watermaster's job to assure that the Enterprise and Farmer's Friend water is there and, if not, to notify the Watermaster so that a correction can be made. Also, the procedure does not attempt to assign the stored water use to the proper Progressive Irrigation District diverters. The storage use is shown in the order described previously (primarily Sand and Willow diversions) for convenience only, and it remains the responsibility of the District to sort out or proportion the stored water use, if they wish to do so.

Future Work

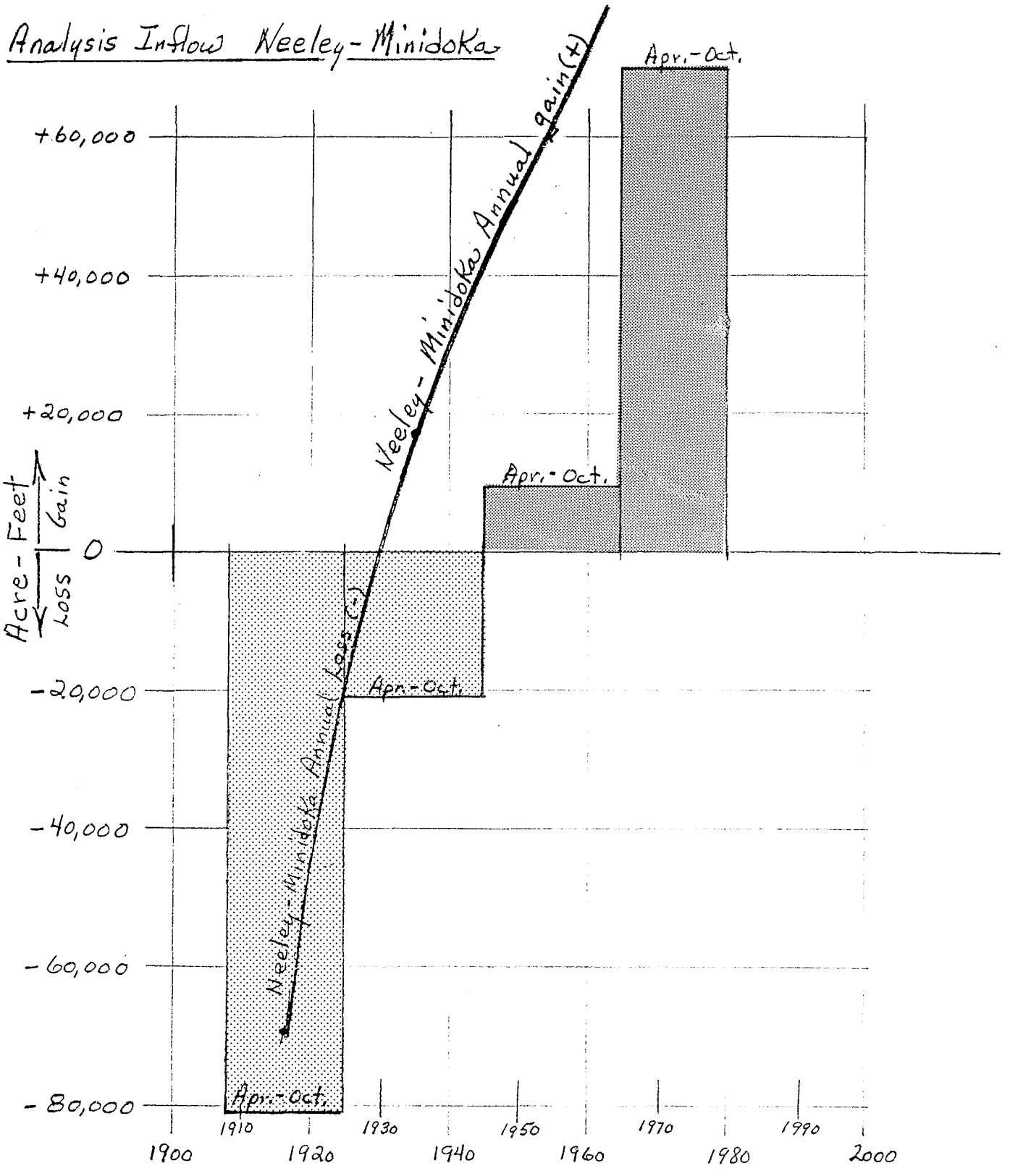
This, for the most part, completes my special work on Willow Creek and the Progressive Irrigation District. Although the procedure seems to work well under several test conditions, I have not yet recompiled the production program and will wait to do that until you have reviewed the above procedure and agree with it. There may be some changes you want to make if I have misinterpreted our discussions and/or you may wish additional values printed out. After we change the production program, I will also want to modify the documentation in the user's manual.

RJS:mb

DIAGRAM OF WILLOW CREEK AND MAJOR FEATURES
ASSOCIATED WITH WATER RIGHT AND FLOW ACCOUNTING



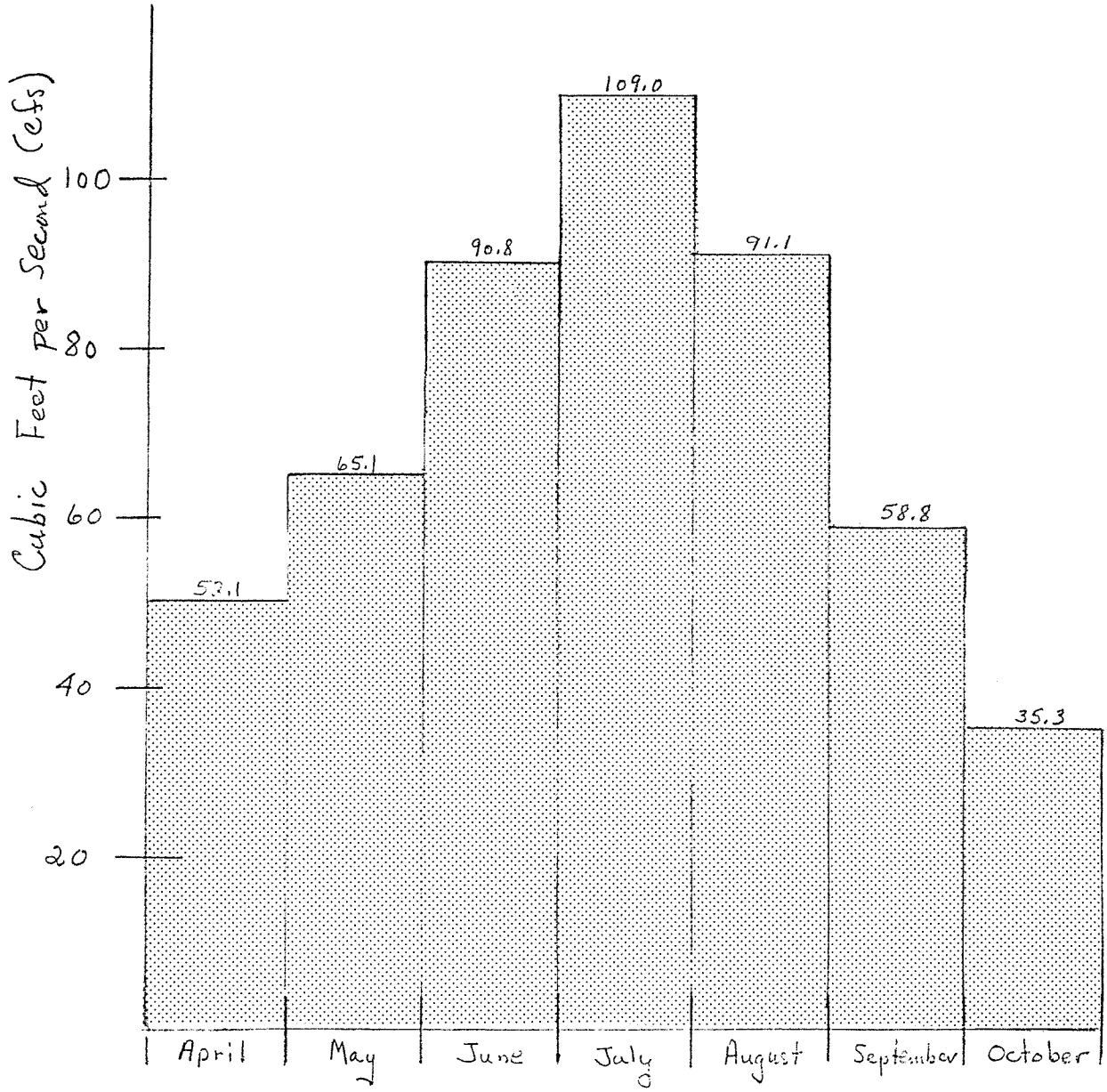
Analysis Inflow Neeley - Minidoka



June 9, 1982
USBR - Division of Planning - Boise PN

from USBR Burley 24Jun83

Est. - Lake Walcott Net Evaporation Loss[1]



[1] Estimated Lake evaporation minus precipitation on water surface.

from USBR - PN Boise Planning Division
6/9/1982

Twin Falls Canal Co. vs. Chas. N. Foster, et al.

This action was brought by the plaintiff, an Idaho corporation, operating under the Carey Act, in the District Court of the Fourth Judicial District of the State of Idaho for Twin Falls County, against Chas. N. Foster, R. A. Ballinger, Secretary of the Interior; C. H. Paul, Project Engineer, et al, to secure a decree determining the priorities of the parties to the suit to the use of the waters of Snake River. The plaintiff asked for 3000 second feet prior to all defendants. About 2500 parties were joined as defendants, of whom approximately one half were applicants for water rights under the Minidoka Project.

Summons was issued and complaint verified on February 10, 1909. In June, a temporary order was issued by the Court, distributing the waters of Snake River for the season of 1910, as between the canals of the Minidoka Project, and those of the Twin Falls North Side Land and Water Company and the plaintiff. The State Engineer was charged with the duty of determining the amount of stored water as a-part from the natural flow, at such time as the impounded waters from Jackson Lake reservoir were released. On July 25, 1911, P. M. Fogg, then Project Engineer was joined as a defendant, and on July 27th, a petition having been filed by the attorneys for the Service, the case was removed to the United States District Court. A stipulation was filed on August 11, 1911 for the distribution of the water during the season of 1911 in the same manner as for 1910, and on the following day, the Court issued a temporary order putting the stipulation into effect.

On September 31, 1911, motion was filed by the plaintiff to remand the case to the State Court; this was effected, and in May 1912, a temporary order, practically identical with those of the two previous years was issued to cover the distribution of the waters of the river for the season of 1912.

The case was not finally tried until June 1913, when a final decree was issued as to the priorities of the several parties, in accordance with stipulations agreed upon.

United States Department of the Interior
BUREAU OF RECLAMATION
~~WATER AND POWER RESOURCES SERVICE~~
MINIDOKA PROJECT OFFICE
1359 HANSEN AVENUE
BURLEY, IDAHO 83318

IN REPLY
REFER TO: 405

June 10, 1983

The Bureau of Reclamation has for the last couple of years been reviewing the water accounting procedures below American Falls Dam. Procedures associated with the Foster Decree particularly have been discussed with the Water District No. 01 Watermaster and Idaho Department of Water Resources (IDWR). Since your organizations are affected by this Decree, the Bureau feels a meeting of the various entities would be beneficial in clarifying areas of concerns, if any, by various parties.

A meeting date of Friday, June 24, at 10 a.m., here at the Minidoka Project Office in Burley was mutually agreed upon by yourselves via telephone conversation with Leo Busch. Ron Carlson, Water District No. 01 Watermaster and Idaho Department of Water Resources have been invited to take part in these discussions.

The meeting will deal with concerns in the interpretation of the Foster Decree as related to present water accounting procedures within the reaches of the Snake River between Neeley to Minidoka Dam to Milner Dam. The procedures in question are those dealing with computation of credit to the Minidoka Project (Burley and Minidoka Irrigation Districts) as to gains and/or losses and the effect of such computations on the natural flow rights of Twin Falls and North Side Canal Companies.

In order to give all parties additional knowledge of past/present hydrological facts, computational procedures, and Water District No. 01/IDWR/USBR reasoning, enclosures have been included of various reports and previous correspondence. Given below is a list of these enclosures:

1. Report of April 1, 1926, Water Distribution Below Neeley Gaging Station by Lynn Crandall.

2. Letter of September 25, 1981, from Minidoka Project to Water District No. 01 including various attached documents.

3. Response letter of October 21, 1981, from Water District No. 01 to Minidoka Project.

4. Letter of November 13, 1981, from Minidoka Project to USBR, Regional Director.

5. Letter of November 19, 1982, from USBR, Regional Director to IDWR Director requesting IDWR's answer to basic question on Foster Decree.

6. Response letter of May 13, 1983, from IDWR, Director to USBR, Regional Director on State's position as related to Foster Decree.

If further information is desired, contact Leo Busch of this office.

The desired outcome of this particular meeting is to explore interest of the affected parties involved and if there is any need to pursue this matter further.

Sincerely yours,

Donald E. Tracy
Project Superintendent

Enclosure

cc: Water District No. 01 Watermaster, 150 Shoup, Suite 15, Idaho Falls, Idaho 83402 (w/encl.)
Director, Idaho Department of Water Resources, Statehouse, Boise, Idaho 83720 (w/encl.)
Reg. Dir., Boise, Idaho, Attn: 420 (w/encl.) and 700 (w/o encl.)

Distribution: Burley Irrigation District
Minidoka Irrigation District
Twin Falls Canal Company
North Side Canal Company

700 766

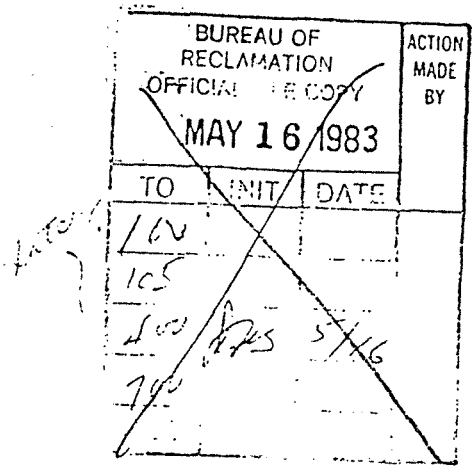
State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

May 13, 1983



RE: Minidoka Gain

Bill Lloyd, Jr.
Regional Director
Bureau of Reclamation
550 W. Fort Street
Boise, ID 83724

Dear Bill:

There has been a continuing discussion between the staffs of IDWR and Bureau of Reclamation regarding the calculation of gains and losses in the Neeley to Minidoka Dam to Milner Dam reaches of the Snake River and how these gains and losses should be credited to the Minidoka project and others such as Twin Falls Northside and Southside holding natural flow rights in the river. The Bureau of Reclamation staff has expressed a concern that the present procedure for computing gains and losses does not allow evaporation losses from Lake Walcott to be offset by gains between Neeley and Minidoka Dam. The procedure used prior to the present computer assisted technique apparently allowed evaporation losses to be balanced by these return flows.

The department and Water District #1 have been guided by the Foster Decree and the Idaho statutes in developing the procedure for distributing the Snake River waters. The relevant paragraph in the Foster Decrees is:

> "It is further ORDERED, ADJUDGED AND DECREED, until otherwise provided by Statute, the State Engineer of the State of Idaho, or his duly authorized deputy, shall determine what part of the water flowing in Snake River at the Minidoka and Milner Dams, is storage waters, and what part is natural flow, as provided by the Idaho Session Laws of 1909, entitled: 'An act to provide for the safe-guarding of the rights of those Conserving Public Waters in Reservoirs and Prohibiting Misappropriation of such waters by those having no Right to the Use of Same, and Declaring a 'Misdeameanor", the amount of the natural flow to be determined as such natural flow would be, if unaffected by the diversion or acts of the parties hereto or any or either of them or by the release of stored water, the natural flow to which the Twin Falls Projects are entitled to be measured to them at the Milner Dam. (emphasis added.)"

In accordance with the decree, the department and the water district have developed a computation procedure to remove the effects of the Minidoka project operation from the determination of natural flow belonging to the Twin Falls projects. Perhaps it does not duplicate the results of the previous computation procedure but, in my opinion, it is a technical procedure that more correctly achieves the intent of the decree. If the previous procedure used natural flow gain above Minidoka Dam to offset evaporation from the Minidoka Reservoir, the Twin Falls project would have received correspondingly less natural flow under their prior rights. Case law would not likely support a demand to have a less accurate practice of the past continued which injures the rights of others when the watermaster has available an improved method.

My understanding of the earlier meeting between the bureau and department is that you would have your field solicitor review the existing operation. If as a result of that review he develops some legal basis for re-evaluating this position, I will be happy to have my legal staff respond to such an analysis and then if necessary seek advice from the Attorney General's office.

Sincerely,

A. KENNETH DUNN
Director

AKD:alw

cc: Twin Falls Southside Canal Co.
Twin Falls Northside Canal Co
Ron Carlson, Watermaster--Water District 01

United States Department of the Interior
BUREAU OF RECLAMATION
~~WATER AND POWER RESOURCES SERVICE~~
MINIDOKA PROJECT OFFICE
1359 HANSEN AVENUE
BURLEY, IDAHO 83318

IN REPLY
REFER TO: 405

June 10, 1983

The Bureau of Reclamation has for the last couple of years been reviewing the water accounting procedures below American Falls Dam. Procedures associated with the Foster Decree particularly have been discussed with the Water District No. 01 Watermaster and Idaho Department of Water Resources (IDWR). Since your organizations are affected by this Decree, the Bureau feels a meeting of the various entities would be beneficial in clarifying areas of concerns, if any, by various parties.

A meeting date of Friday, June 24, at 10 a.m., here at the Minidoka Project Office in Burley was mutually agreed upon by yourselves via telephone conversation with Leo Busch. Ron Carlson, Water District No. 01 Watermaster and Idaho Department of Water Resources have been invited to take part in these discussions.

The meeting will deal with concerns in the interpretation of the Foster Decree as related to present water accounting procedures within the reaches of the Snake River between Neeley to Minidoka Dam to Milner Dam. The procedures in question are those dealing with computation of credit to the Minidoka Project (Burley and Minidoka Irrigation Districts) as to gains and/or losses and the effect of such computations on the natural flow rights of Twin Falls and North Side Canal Companies.

In order to give all parties additional knowledge of past/present hydrological facts, computational procedures, and Water District No. 01/IDWR/USBR reasoning, enclosures have been included of various reports and previous correspondence. Given below is a list of these enclosures:

1. Report of April 1, 1926, Water Distribution Below Neeley Gaging Station by Lynn Crandall.

2. Letter of September 25, 1981, from Minidoka Project to Water District No. 01 including various attached documents.

3. Response letter of October 21, 1981, from Water District No. 01 to Minidoka Project.

4. Letter of November 13, 1981, from Minidoka Project to USBR, Regional Director.

5. Letter of November 19, 1982, from USBR, Regional Director to IDWR Director requesting IDWR's answer to basic question on Foster Decree.

6. Response letter of May 13, 1983, from IDWR, Director to USBR, Regional Director on State's position as related to Foster Decree.

If further information is desired, contact Leo Busch of this office.

The desired outcome of this particular meeting is to explore interest of the affected parties involved and if there is any need to pursue this matter further.

Sincerely yours,

Donald E. Tracy
Project Superintendent

Enclosure

cc: Water District No. 01 Watermaster, 150 Shoup, Suite 15, Idaho Falls, Idaho 83402 (w/encl.)
Director, Idaho Department of Water Resources, Statehouse, Boise, Idaho 83720 (w/encl.)
Reg. Dir., Boise, Idaho, Attn: 420 (w/encl.) and 700 (w/o encl.)

Distribution: Burley Irrigation District
Minidoka Irrigation District
Twin Falls Canal Company
North Side Canal Company

700 766

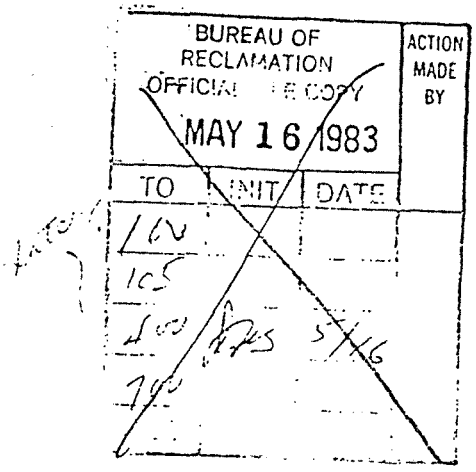
State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

May 13, 1983



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Sincerely,

A. KENNETH DUNN
Director

AKD:alw

cc: Twin Falls Southside Canal Co.
Twin Falls Northside Canal Co
Ron Carlson, Watermaster--Water District 01

December 2, 1982

MEMO

TO: Norm Young

THRU: Wayne Haas

FROM: Alan Robertson

SUBJECT: CREDIT OF GAIN TO MINIDOKA PROJECT

The Regional Director, USBR, in his November 19th letter to Ken Dunn, requests a joint review of the Foster Decree by their Field Solicitor and the Attorney General regarding how gains should be computed that are to be credited to the Minidoka Canals. I do not believe the decree requires legal interpretation in this respect because it does not define how such computations are to be made. The relevant paragraph in the Foster Decree is:

> It is further ORDERED, ADJUDGED AND DECREED, until otherwise provided by Statute, the State Engineer of the State of Idaho, or his duly authorized deputy, shall determine what part of the water flowing in Snake River at the Minidoka and Milner Dams, is storage waters, and what part is natural flow, as provided by the Idaho Session Laws of 1909, entitled: "An act to provide for the safe-guarding of the rights of those Conserving Public Waters in Reservoirs and Prohibiting Misappropriation of such waters by those having no Right to the Use of Same, and Declaring a "Misdemeanor", the amount of the natural flow to be determined as such natural flow would be, if unaffected by the diversion or acts of the parties hereto or any or either of them or by the release of stored water, the natural flow to which the Twin Falls Projects are entitled to be measured to them at the Milner Dam.

Paragraphs 2 and 3 of the attached memo of January 14, 1920 from USBR District Counsel, B.E. Stoutemeyer, to the USBR Project Manager at Burley, Barry Dibble, make amply clear the intent of the decree. Paragraph 2 answers question 1 of the Bureau's letter. The issue, if there is one, is not a difference in interpretation of the decree, but in the hydrologic procedure to remove the effects of the Minidoka Project from the determination of natural flow.

Our present method of accounting comes considerably closer to satisfying the intent of the Foster Decree than did the method used prior to 1978. The former method resulted in credits to the Minidoka Canals at times when their needs were entirely satisfied by natural flow rights. I do not believe that we should continue an improper practice simply because it was done that way for a number of prior years.

Copies of the first USBR letter (September 30, 1981) on this subject and Ron's October 21, 1982 response to Don Tracy are attached for your information.

ACR:mb

cc: Ron Carlson

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

MEMORANDUM

TO: Ron Carlson
Alan Robertson thru Wayne Haas
Phil Rassier

FROM: Norman Young

DATE: November 30, 1982

RE: Letter From BoR Regarding Water Distribution, Water District 01

The attached letter suggests that the A.G's office and the Field Solicitor review and interpret the Foster Decree to determine if the department and Water District 01 are properly distributing the Minidoka project rights. For the legal review to be meaningful and expedited, I suggest that Alan and Ron prepare a technical review of the questions raised before any legal review is commenced.

Idaho Falls, Idaho
March 21, 1957

Mr. Lawrence H. Duffin
Rupert, Idaho

Dear Mr. Duffin:

In reply to yours of the 19th instant:

After Minidoka dam was built in 1906 it became apparent from a study of the river flow records that it had created a substantial loss in stream flow. From 1906 to 1910 it has been calculated that 1,700,000 acre-feet of water went into ground storage in the lavas surrounding Lake Walcott (see U.S.G.S. Water Supply Paper 774, p. 196-97 for details).

This matter was well known to the waterusers at the time the Foster case (1910-13) was in the District Court. The Milner waterusers felt that the heavy loss should be a charge against the Minidoka Project water supply. Mr. Stoutemeyer countered with the proposal that there would be considerable return flow to the river from irrigation on the Minidoka Project that would partially offset the storage losses in Lake Walcott. He thereby was able to get a provision inserted in the Foster decree reading as follows:

> "It is further ordered, adjudged and decreed, until otherwise provided by Statute, the State Engineer of the State of Idaho or his duly authorized deputy, shall determine what part of the water flowing in Snake River at the Minidoka and Milner Dams, is storage waters, and what part is natural flow, as provided by the Idaho Session Laws of 1909, entitled: 'An Act to provide for the safe-guarding of the rights of those Conserving Public Waters in Reservoirs and prohibiting Misappropriation of such waters by those having no right to the use of the same, and Declaring a Misdemeanor,' the amount of the natural flow to be determined as such natural flow would be, if unaffected by the diversion or acts of the parties hereto or any or either of them or by the release of stored water, the natural flow to which the Twin Falls projects are entitled to be measured to them at the Milner Dam."

By the time the Foster decree was entered in 1913 the groundwater around the upper half of Lake Walcott had been raised to the Lake level and some silting occurred in the Lake so that the return flow from irrigation thereafter has usually been greater than the loss in the Lake. This result was not anticipated by the parties to the action except perhaps by Mr. Stoutemeyer.

The watermasters on the river following the entry of the Foster decree interpreted the above quoted provision of the decree to mean that the natural flow at Neeley would be delivered without loss or gain at the downstream headgates. This assumption is based upon two single measurements made in 1905, a very low water year when the river was dry at Blackfoot. The measurements showed the same flow at American Falls and at Montgomerys Ferry near Minidoka.

This same basic assumption has since been followed in water distribution. Due to fluctuating river flows, variable time intervals between gaging stations, etc., we don't try to calculate it by days, but calculate it by monthly gains between Neeley and Milner and allot it to the Minidoka Project for the period when that Project was drawing stored water. At times when the Minidoka Project diversions are being entirely supplied by its own natural flow rights, it is unable to use this gain and it then would be allotted to the next later priority right that could use it. We don't usually bother to allot the surplus gain in excess of the Minidoka Project's share as it doesn't amount to much for any individual company and only in a very dry year would anyone need it.

The water allotted to the Minidoka Project as gain is shown in the District 36 annual reports. It is shown on page 30 of the 1956 report, for example, and at a similar place in previous years reports. It is also shown on Hate 14 each year as one of the "Notes".

Water District No. 36 hired T. R. Newell to make a study of American Falls Reservoir evaporation, inflow, etc., during 1927 and 1928. The M.I.D. probably has a copy of these detailed reports as they were supplied with a copy at the time. Mr. Newell developed a formula for computing the natural flow between Blackfoot and Neeley gaging stations = measured flow at established gaging stations above the Reservoir flow line, plus 1/3 of such measured flow plus 840 second-feet. The unmeasured inflow of 840 second-feet plus 1/3 of the measured inflow has been running about 1,300 second-feet for some years past.

There has never been any formal agreement that I know of about this matter and it is only being used by the Watermaster as one of the details

of water distribution. We don't follow the formula in day to day calculations as there are fluctuations in the measured inflows due to rains, canal wastes, etc., that should not result in a similar fluctuation in the unmeasured inflow from deep seated springs. However, we use it as a guide to get about the same average results without showing such large day to day fluctuations in the unmeasured inflow. Our calculations of this item are shown on Plate 11 of each annual report.

Very truly yours,

Lynn Crandall
Watermaster

cc: H. R. Stinson
U.S.B.R., Boise
U.S.B.R., Burley
R. P. Parry

United States Department of the Interior
BUREAU OF RECLAMATION
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724

IN REPLY
REFER TO: PN 430
870.

NOV 19 1982

Mr. A. Kenneth Dunn
Department of Water Resources
State Office
450 West State Street
Boise, Idaho 83720

Dear Mr. Dunn:

This letter is per our discussion with your staff on September 8, 1982, in which a review was made of the Minidoka Project water rights. The discussion was primarily concerning the present Idaho Department of Water Resources (IDWR) interpretation of the Foster Decree as related to water rights of the Minidoka Project (presently the Minidoka and Burley Irrigation Districts). This interpretation is of interest to the United States, which holds in trust the Idaho State water rights for these Federal projects constructed under the Reclamation Act.

Various procedural changes were undertaken by the IDWR in 1978 with improved computerized water recordkeeping. One of the procedural changes which occurred was in crediting gain and loss of water in that reach of the Snake River between the Neeley Gage and Milner Dam. The IDWR personnel had assured that such interpretational changes were not injurious to the Minidoka Project water rights by comparison analysis of 1977 water year. However, the Minidoka Project office has found that the current accounting procedure results in a substantial reduction in credits to the Minidoka Project waterusers which, we believe may be contrary to the Foster Decree.

Interpretations of the Foster Decree by the Bureau and the Department have resulted in some differences which we believe need to be resolved. A review of the Foster Decree by our Field Solicitor's office and the State Attorney General's office would be helpful in resolving these differences of interpretation. We believe the basic questions to be answered are:

1. Is Lake Walcott part of the Minidoka Project when applying the Foster Decree to the calculation of the gain or loss in the Snake River to be credited to the Minidoka Project?

2. Which gaging stations should be used to calculate the credit to be applied to the Minidoka Project under the Foster Decree?

A chronology of references and court reviews surrounding the Foster Decree will be available for the Field Solicitor and the Attorney General's offices if so desired.

The computer has enabled the watermaster to maintain better control of the river for delivery of all stored and natural flow waters. Our primary interest is to assure all parties concerned that the model is allocating the waters properly.

Please contact this office if we may be of any assistance to you regarding the Foster Decree Review. We would propose a meeting between our organizations once the Decree has been reviewed by our respective legal organizations. Hopefully, this can be done prior to the 1983 irrigation season.

Sincerely yours,

JOHN W. KEYS

ACTING

Regional Director

cc: Field Solicitor
Project Superintendent, Burley, Idaho

bc: 420, 760

EThomas/LBusch?RAllen:rmf 11-10-82

United States Department of the Interior
BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
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NOV 23 1982
Department of Water Reso

IN REPLY
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John W. Keys, III

Acting Regional Director

cc: Field Solicitor
Project Superintendent, Burley, Idaho

Idaho Falls, Idaho
March 21, 1957

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Lynn Crandall
Watermaster

cc: H. R. Stinson
U.S.B.R., Boise
U.S.B.R., Burley
R. P. Parry

October 21, 1981

Mr. Donald E. Tracy
Project Superintendent
Minidoka Project Office
U. S. Bureau of Reclamation
1359 Hansen Avenue
Burley, Idaho 83318

Dear Don:

Your letter of September 29 questioned our method of determining the natual flow at Minidoka which is allocated to the Minidoka project canals and others below Minidoka. In setting up the procedure for natual flow determination and allocation in Water District 1, we have followed the requirements of Idaho law and the details of the various rights as they are expressed in the decrees. In the case of the gain from Neeley to Minidoka, we had originally reviewed the various materials supplied by USBR and these were discussed with staff of your office.

We did not find then, and still do not find, any basis for allocating natural gain above Minidoka Dam to the project canals. Please note carefully paragraphs 2 and 3 in the attached memo of January 14, 1920, which was supplied to us by USBR. The present method of accounting accomplishes the return flow allocation intent described in the memo because Minidoka project return flow (par.3) cannot occur above Minidoka Dam. The Neeley to Minidoka reach was apparently included in the original computations to account for unnatural losses in that reach. The fact that the previous accounting procedure did not distinguish between the two reaches does not somehow restrict us from making more equitable allocations now that we have capability for managing more data. A number of similar reach segregations have also been added in the upper basin and, as you know, some of these work to the benefit of the project canals and others during certain flow conditions.

The 1913 Foster Decree specifically refers to natural and storage flow computations to be made at Minidoka and Milner, and does not mention return flow. It should be noted that in no other instance in the upper

basin is a credit given for return flow as it is, and always has been, treated the same as natural flow.

With regard to evaporation, it cannot reasonably be argued that it is not caused by the reservoir, nor that other users should have less natural flow allocated to them because of it. The evaporation computation for Lake Walcott is similar to that used for other reservoirs and is consistent with the intent expressed in paragraph 2 of the enclosed memo.

Sincerely,

RONALD D. CARLSON
Watermaster

RDC:cw

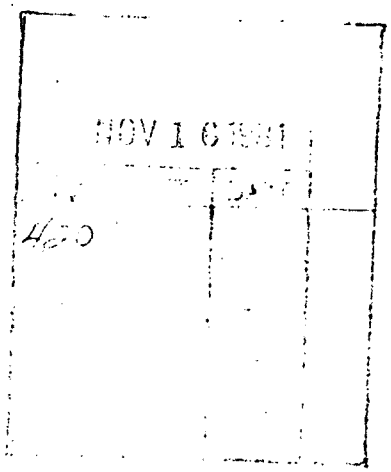
Enclosure

bc: Alan Robertson

United States Department of the Interior

BUREAU OF RECLAMATION
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MINIDOKA PROJECT OFFICE
1359 HANSEN AVENUE
BURLEY, IDAHO 83318

IN REPLY
REFER TO 400



November 13, 1981

Memorandum

To: Regional Director, Boise, Idaho
Attention: 420

From: ACTING Project Superintendent, Burley, Idaho

Subject: Clarification of Foster Decree Relative to Minidoka Project, Minidoka Project, Idaho

Since the State of Idaho Department of Water Resources (IDWR) initiated their computerized water accounting model of the Upper Snake River District No. 01 there has existed a question as to the proper interpretation of the Foster Decree. This matter was brought to the attention of the Watermaster of District No. 1 by our letter of September 25, 1981, a copy of which you received without attachments. The attached copy of letter dated October 21, 1981, is the Watermaster's reply to our September 25 letter.

We request that your office give consideration as to whether an established Water Right of the United States held in trust for the Minidoka Project has been forfeited due to the new interpretation placed on the 1913 Foster Decree which differs from that of all past District No. 36 and No. 01 Watermasters.

We feel the present Watermaster fails to recognize that the area which makes up the Minidoka Project includes Lake Walcott. The benefits from the Neeley-Minidoka reach to the Minidoka Project are the return flows from bank storage ← Oct & late and additional water from a decrease in seepage losses due to reservoir siltation and resulting sealant effect. This area has historically been a loss reach until the mid-1920's at which time a definite hydrological change was noted, in that gain was now appearing. As this gain became apparent as noted in "Water Distribution and Hydrometric Water District No. 36 - Reports" litigation was initiated in April 1927 against the Watermaster's method of water accounting relative to the Foster Decree. Letter, litigation, and reports are attached.

Special note should be made of this litigation by Twin Falls Canal Company, which started in the Eleventh Judicial District Court against the United States and Mr. G. Clyde Baldwin, Watermaster of District No. 36. This later was moved to Federal District Court with United States vs Twin Falls and Northside Canal Companies. This led to No. 1487 Decree of June 22, 1932, in which can be found clarifying arguments, especially that being the Amended Bill of complaint entered by Mr. Ray, U.S. Attorney and Mr. Stoutenyer, District Council.

The attached material gives emphasis to the fact that natural flow is an integral body of water occurring at Neeley Gage and was meant to be distributed through Lake Walcott intact. All previous Watermasters have treated the accrual of natural flow as being at the Neeley Gage site and distributed to Milner Dam. All losses and gains between Neeley and Milner were credited to the Minidoka Project whenever natural flow was being used by the Project.

This letter is intended to provide for initial discussion concerning this water right. We believe further discussion with the IDWR may be beneficial if you feel this subject needs additional investigation.

Please do not hesitate to contact this office regarding further information.

Robert A. Ballard

Enclosures

United States Department of the Interior
BUREAU OF RECLAMATION
~~WATER AND POWER RESOURCES SERVICE~~
MINIDOKA PROJECT OFFICE
1359 HANSEN AVENUE
BURLEY, IDAHO 83318

IN REPLY
REFER TO: 405
135.

September 29, 1981

Water District No. 01
Ronald D. Carlson, Watermaster
150 Shoup
Idaho Falls, Idaho 83402

Dear Ron:

Attached are copies of various litigations and materials of interest which Leo Busch has discussed with you concerning the Foster Decree as to the proper intended adjudication of gain or loss of water within that reach of the Snake River between the Neeley Gage and Milner Dam. It is our understanding that the present Idaho Department of Water Resources interpretation of the Foster Decree differs from all previous (1919-1977) State computational allocations of water within this reach. Since the United States holds in trust the water rights for the Minidoka Project (being in this case the Minidoka and Burley Irrigation Districts), it is felt that clarification of present procedures in allocation of water in this reach are necessary in order to determine whether these changes are injurious to the Minidoka Project water supply.

The basic computational method for this section (Neeley-Milner) of the Snake River is to treat it as two reaches between the stations of Neeley-Minidoka and Minidoka-Milner Dam. It is our understanding that the lower reach, being the Minidoka-Milner reach, is basically computed as has been done since 1919. The only noted exception of this is that the return flows are now credited to Minidoka Project as daily flow rather than the accrual of such water as storage and allocated at the end of the irrigation season. This, in our opinion, is only a difference in procedural methods of water accounting and should not be detrimental to Minidoka Project rights.

The present interpretation for the allocation of water between the stations of Neeley-Minidoka is felt to be injurious to the water supply of the Minidoka Project. The present allocation by yourself, as Watermaster, of gains in this reach of the Snake River are understood to be adjudicated as natural flow. In computing natural flow, the general procedure is to include evaporation from Lake Walcott which in turn would be charged to the Minidoka Project storage use.

This present method of allocation of water results in a substantial loss of water supply to the Minidoka Project. Initial analysis indicates a loss of

over thirty thousand acre-feet (30,000 acre-feet) based on the analysis of fifty (50) years of records (1931-1980 inclusive). This results from the fact that the average loss and/or gain of this reach indicates a near zero or balanced hydrological reach in terms of loss and/or gain. This then would result in over thirty thousand acre-feet of evaporational loss being taken from Minidoka Project irrigation storage supply. Documentation of such evaporational losses are included in an extracted section of a report on geology and ground water resources of Snake River Plain, a copy of which is attached. The possible loss of a valid water right under past Idaho State Statute gave rise to our researching the past history of the Foster Decree and analysis of these past records. We have highlighted what we feel are the pertinent parts in the enclosure. Below is only a brief summary of portions of various documents which, in our opinion, strongly indicate justification for the adjudication of all loss and/or gain from the stations of Neeley to Minidoka.

District No. 36 Annual Reports:

1. 1919 report was found to obtain the first water accounting of irrigation diversions within the Upper Snake River. On pages 30-31 a brief explanation is given on how the reach was to be treated under the Foster Decree. Table X verifies the fact that computations are carried out separately for each reach. It should be noted that 1919 was a drought year and with water supplies being critical each water right was subjectively analyzed by various water protection groups. Also, Mr. G. Clyde Baldwin and others were closest in time to the decision making that went into the Foster Decree in regard to the intent of the Decree as set forth by Judge Edward A. Walters.

2. 1920-1922 reports continue the computations in Table X. Minor discussion concerning loss and/or gain from Neeley-Milner.

3. 1923 report gives an analysis of Neeley-Minidoka reach as discussed in pages 35-37 in which bank storage is being realized and discussed as a possible water resource for the lower valley irrigation use.

4. 1924 report, page 24 gives some interesting discussion concerning bank storage. Dialogue as to the awareness of bank storage had arose, thus possibly leading to litigation mentioned in the 1927 report.

5. 1925 report, page 27 indicates an awareness of substantial gains taking place in reaches under question and analysis of such gains.

6. 1926 report, page 41 seems to substantiate that 1919 was the first year a water accounting record was kept.

7. 1927 report, page 14 provides for the initiation of litigation which gave rise for further clarification of the Foster Decree in the District Court of the United States, in and for the District of Idaho, Southern Division - No. 1487 Decree, a copy of which is attached.

8. 1928 report, page 32 provides again the gain from Neeley through to Milner as the algebraic combination of the two sections.

9. 1929 report, page 18 brings out the fact that the Jackson Lake Contract as having a direct influence on the Foster Decree. Also noteworthy on page 34 is mention of the new drains on return flow between Minidoka and Milner.

10. 1930-1977 District No. 36 and later District No. 1 reports provide for continuous evidence that computations were carried substantially the same even after Federal Court Decree No. 1487. Only the format was changed.

In our opinion, the supporting affidavits to the Federal Court Decree give added evidence that the intended adjudication is to treat the Neeley-Milner reach of the river the same as the past watermasters of the Upper Snake have done in interpreting the Foster Decree. We believe the historical methods and procedures as adopted by the previous watermasters should continue.

Please review the above and advise us of your thoughts on this important matter.

Sincerely yours,

Donald E. Tracy

Donald E. Tracy
Project Superintendent

Enclosure

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
Box 036 Federal Building, Room 365
550 West Fort Street
Boise, Idaho 83724

Copy

September 3, 1982

Mr. Ronald Carlson
Regional Supervisor, Eastern Region
Idaho Department of Water Resources
150 Shoup Street
Idaho Falls, ID 83401

Dear Mr. Carlson:

Several days ago, Mr. Alan Robertson relayed to us your request for cost estimates for a recommended plan of study to more adequately determine water budgets for Snake River reservoirs from Blackfoot to Milner. Enclosed is a project proposal stating the objectives of a proposed two-year study and estimated costs to be shared equally by WDOI and our agency under the federal-state cooperative program.

You also inquired concerning the cost of construction of stream-gaging facilities. Your share of the cost of a new cableway at Lorenzo will be $5,250. Your share of the cost for relocation of Snake River-Lewisville gage and installation of a new cableway will be $6,100. As usual, this agency will match your offerings on a matching 50-50 basis.

We will be pleased to provide any additional information that you request. Your early approval will allow us to begin gage construction and additional hydrologic data collection very quickly.

I am furnishing Mr. Alan Robertson a copy of this letter with the proposed project proposal.

Sincerely yours,

E. F. Hubbard
District Chief

Enclosure

cc: Mr. Alan Robertson, IDWR, w/encl

HAR:ljd

WATER BUDGETS FOR SNAKE RIVER RESERVOIRS FROM BLACKFOOT TO MILNER

A PROJECT PROPOSAL

U.S. Geological Survey
Boise, Idaho
September 1982

Problem

Snake River water is distributed to irrigators after determining daily water allocations using a complex accounting of inflow and outflow. Correct allocations are at times difficult because of apparent discrepancies found in attempting to balance the water-budget equation. Most problems occur along reaches of the river that include American Falls Reservoir, Lake Walcott, and Milner Lake. Of particular concern are ground-water--surface-water relationships in the vicinity of American Falls Reservoir.

Objectives

Objectives of this proposed study are to:

(1) Determine if discrepancies in inflow-outflow budget computations are significant in relation to normal errors of measurement or estimate that might be expected.

(2) Attempt to explain some of the misunderstandings of ground-water--surface water relationships that effect water-budget calculations.

(3) Determine if contents tables or gaging systems for American Falls reservoir and Milner Lake are in error and, if so, improve methods of estimating contents.

Approach

Daily gains or losses determined from an inflow-outflow budget can be highly variable owing to lag times, storage changes, and other less easily explained phenomena. Given a certain set of conditions, mainly steady riverflow into and out of the reach over several days, some limits as to the amount of change in gains or losses can be determined. Periods of time when these limits are exceeded will be examined for some diagnostic criteria, such as high or low ground-water levels. Expected limits will be defined to the extent possible.

Springs measurements have shown that ground-water discharge to American Falls Reservoir has been reasonably steady since 1927. Total mean annual ground-water discharge to the reservoir from 1912 to 1980 was estimated by Kjelstrom (1982) to be 2,540 ft^3/s. Miscellaneous measurements and estimates of Spring Creek discharge have been used by Thomas (1982, verbal communication) to estimate total ground-water discharge.

An attempt will be made to correlate total ground-water discharge with the gaged discharge of Spring Creek at Sheepskin Road near Fort Hall (13075983).

Movement of ground water into or out of American Falls Reservoir is dependent on reservoir elevation with respect to surrounding ground-water levels. Accordingly, ground-water levels adjacent to the reservoir will be monitored during rising and falling reservoir stages. An analysis will be made using newly collected and past ground-water-level data to determine seasonal variation in the relationship of reservoir levels to ground-water levels.

Leakage from the southwest corner of American Falls Reservoir may occur when ground-water levels are low and reservoir levels high. If true, ground-water levels in selected wells could be used to indicate when leakage occurs from the reservoir and would explain the unaccounted-for increase in discharge from Lake Walcott. Frequent water-level measurements will be needed to establish trends that might indicate leakage. Recorders will be installed on at least three wells and supplemental measurements will be made on additional wells.

Estimates of reservoir contents and changes in storage should be improved if additional recording stage gages were installed near Sterling and two other sites (possibly near mouth of Bannock Creek, Seagull Bay, or near Aberdeen). Contents will be determined from gaged data by using average elevations, weighted-average elevations, or other methods based on differences in gage height. Survey levels will be run to determine if the stage gage near American Falls dam is effected by drawdown and to establish gage datum of the reservoir gages. The possibility of adjusting the reservoir stage for wind effect will be examined.

A stage recorder gage near Declo and a wire-weight gage on the bridge at Burley will be used to check and adjust the theoretical backwater curve of Milner Lake for various combinations of stages at the dam and discharges in the channel. The contents table will then be revised and completed for all stages and discharges that have been verified by these gages.

Report Plans

An open-file report documenting results will be prepared after the completion of the 1983 irrigation season. The report will present procedures to be used to estimate storage contents in American Falls reservoir and Milner Lake. Results of the analysis of ground-water--surface-water interrelations will be presented.

Cost Basis

	FY 83	FY 84
Analyses, attendant services and report preparation	$16,700	$20,000
Data Collection		
4-stage recording gages (3-American Falls Reservoir and 1-Milner Lake)	29,000	
1-wire-weight gage on Milner Lake at Burley	1,280	
1-discharge gaging station on Spring Creek	4,260	
3-well recorders and miscellaneous well observations	13,000	
TOTALS	$64,240	$20,000
USGS Share	$32,120	$10,000
Water District Share	$32,120	$10,000

Personnel Requirements and Availability

The required personnel are available in the Idaho District. The project leader will be a senior hydrologist. Personnel in the Idaho Falls field office will collect the data needed. A ground-water specialist in the district is available for consultation concerning the movement of ground water to and from the river and reservoirs.

References

Newell, T.F., 1929, Segregation of water resources, American Falls basin and American Falls Reservoir, May 21 to October 17, 1928: Water District 36, Idaho Falls, Idaho, 127 p.

Kjelstrom, L.C., 1982, Flow characteristics of the Snake River and water budget for the Snake River Plain, Idaho and Eastern Oregon, U.S. Geological Survey Hydrologic Atlas (in review)

DICK

RECEIVED

JUL 10 1981

Department of Water Resources

INTER-DEPARTMENT MEMO — 1

ROM Lyle Swank

DATE July 9, 1981

O Bob Sutter

UBJECT

You requested.

Enclosed is most of the data. The Orme and Bigler appear to have quit diverting temporarily in May of 1976 do to the Teton Flood. The Bear Trap and Clement Canals were probably diverting prior to 1977 but since their diversion was not known about no readings were taken.

If you have any questions, call me.

Lyle Swank

SIGNATURE

9-192-a. (Rev. May 1971)

Daily Gage Height, in Feet, and Discharge, in Cubic Feet, per Second, of Cheney Canal Mc Linie

At Near _____ **for the Year Ending September 30, 19** 77

Drainage Area _____ **Square Miles. Water-Stage Recorder** _____ **Ratio** _____ : _____

Max Disch. _____ CFS at _____ on _____ Max. G. H. _____ ft. at _____ o

Min. Disch. _____ CFS on _____ Min. G. H. _____ ft. on _____

(G. H. _____ ft.). (G. H. _____ ft.).

CALENDAR YEAR

Day	~~October~~ April		~~November~~ May		~~December~~ June		~~January~~ July		~~February~~ Aug		~~March~~ Sept.	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1			1.15'	+63 8				0	D			
2			1.09'	8	1.13	(+13) 7		7	D			
3			1.03'	7		7		7	D			
4			.99'	6	1.06	8	1.09	7				
5			.91'	6	1.06	8	1.06	7			D	D
6			.93'	7		8		7			.60'	
7			.89'	6		7	1.04	6			.62'	
8			0	RD 0		7	1.06	6			D	D
9							1.14	7				
10							1.20	7				
11								8	D			
12								8	1.06			
13								6				
14							.70	4	1.10			
15									1.08			
16								6	D			
17								6				
18								7	1.12			
19								6	1.08			
20								7	D			
21								8				
22								7				
23								7	D			
24								7				
25								6				
26								6				
27								3				
28								7				
29								6				
30								0				
31			1.14'	9				0				
Total		23		69				197		2		6
Mean												
Maximum												
Minimum												
Cfsm												
Runoff in inches												
Acre-feet		0		0.1		0.3		0.4		0.1		0

038065

9-192-a. (Rev. May 1971)

Daily Gage Height, in Feet, and Discharge, in Cubic Feet, per Second, of Cheney

At Near _____ **for the Year Ending September 30, 19** 76

Drainage Area _____ **Square Miles.** **Water-Stage Recorder** _____ **Ratio** _____ : _____

Max Disch. _____ CFS at _____ on _____ Min. Disch. _____ CFS on _____

Day	~~October~~ May		November June		December July		January Aug.		February Sept		March Oct.	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	L.W. Dry	0										
2												
3												
4		0										
5	1.30	10										0
6	1.32	11		0								
7	1.20	10		10								
8	1.40	12										
9												
10												
11												
12												
13				0								0
14				10								
15	1.30	10						0				
16	Dry	0										
17	1.20	10										
18												
19												
20	1.39	11										0
21		11		14								
22	1.49	12										
23	Dry	0										
24	1.32	11										
25												
26												0
27												
28												
29	L.W. 0.63	4										
30												
31	1.30	10						0				
Total		258						38				
Mean												
Maximum												
Minimum												
Cfsm												
Runoff in inches												
Acre-feet		0.5		.5		.5		.2		.1		0

Calendar Year

☆U.S. GOVERNMENT

9-192-a. (Rev. May 1971)

Daily Gage Height, in Feet, and Discharge, in Cubic Feet, per Second, of Steele

At Near ____ **for the Year Ending September 30, 19**77

Drainage Area ____ **Square Miles. Water-Stage Recorder** ____ **Ratio** ____ : ____

Max Disch. ____ CFS at ____ on ____ (G. H. ____ ft.). Max. G. H. ____ ft. at ____ on ____

Min. Disch. ____ CFS on ____ (G. H. ____ ft.). Min. G. H. ____ ft. on ____

Day	~~October~~ April		November May		December June		January July		February Aug		March Sept	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1			1.42	10 17	1.22	1	1.58	43 14	1.38	60 8	1.0	0
2			1.44	10 17	1.14	(.36) 8	1.24	34 8	1.30	6		
3			1.13	12 11	1.08	.36 7	1.24	41 8	1.40	8		
4			1.12	12 11	1.08	7	1.22	36 7	"	8		
5			1.14	13 11	1.21	.36 9	1.18	37 7	"	60 8		
6			1.13	13 11	1.20	9	1.24	48 7	Dry	0		
7			1.11	14 11	1.18	.36 8	1.22	45 7		0	1.0	0
8			1.07	14 10	1.20	.36 9	1.20	30 6		0	.10	17
9			1.07	14 10	1.18	.37 8	1.20	31 6		0	1.00	7
10			1.04	15 10	1.16	8	1.14	31 5		0	1.00	0
11			1.03	10 10	1.02	7	1.06	32 5		0	1.00	(1) 1
12			0.98	16 8	1.12	.37 7	1.06	4		0		3
13			1.07	14 10	1.18	.37 8	1.19	(.52) 6		0		
14			1.05	14 10	1.18	.38 8	1.14	5		0		
15			1.08	18 10	1.16	8	1.14	5		0		
16			1.07	18 10	1.18	2	4	0		0		
17			1.12	20 10	"	2	"	.54 0				
18			1.09	21 9	"	.38 8	"	0				
19			1.10	23 1	"	.39 8	"	0	Dry			
20			1.08	21 1	1.19	.39 8	"	0	1.40	.91 3		
21			0.90	25 4	1.20	8	"	0	1.58	6		
22			—	11	"	8	"	0	1.60	(.91) 6		
23	0		0.00	21 4	1.25	.39 8	"	0	1.68	8		
24			0.16	18 3	1.20	.39 8	"	0	D	0		
25	1.32	.10 15	0.14	18 3	1.20	(.589) (.39) 8	D	0			1.0	0
26	1.26	14	0.13	29 3	1.20	8	1.80	.60 15				8
27	1.48	18	0.12	30 2	1.18	.40 8	1.34	7				0
28	1.36	16	0.12	30 2	1.2	.41 8	1.32	7				5
29	1.31	15	—		1.3	.41 9	1.34	7				
30	1.39	.50 16		0	1.26	.50 7	1.36	(.60) 7				0
31			1.16	.36 3			1.32	7				
Total		94		248						61		71
Mean											1.5	6
Maximum												
Minimum												
Cfsm												
Runoff in inches												
Acre-feet		.2		.5		.5		.3		.1		.2

CALENDAR YEAR

9-192-a. (Rev. May 1971)

Daily Gage Height, in Feet, and Discharge, in Cubic Feet, per Second, of Steele

At Near _____ **for the Year Ending September 30, 19**76

Drainage Area _____ **Square Miles. Water-Stage Recorder** _____ **Ratio** _____ : _____

Max Disch. _____ CFS at _____ on _____ (G. H. _____ ft.). Max. G. H. _____ ft. at _____ on _____

Min. Disch. _____ CFS on _____ (G. H. _____ ft.). Min. G. H. _____ ft. on _____

CALENDAR YEAR

Day	~~October~~ May		~~November~~ June		~~December~~ July		January Aug		February Sept		~~March~~ Oct	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	LW Dry	0		12	est	6	1.34	36 11	D	0		
2				"		"	0	0	"	"		
3				"	"	1	1.58	15	"	"		
4				"		"	1.52	14	"	"		
5				12	"	4	1.60	15	"	"		0
6				0	"	3	1.60	15	"	"		
7		0		12		"	1.64	16	"	"		
8		0		"	1.66	34 15	1.68	17	"	"		
9		14				"	1.68	17	1.82	14		
10		"			1.70	"	1.64	17	1.84	4		
11		"		"		"	1.66	16	1.62	36 1 10		
12		"		12	1.76	44 17	1.66	16	1.74	12		
13		"		0	1.58	14	1.62	16	1.62	10		0
14		"		12	1.56	13	1.62	36 16	1.64	11		
15		"		"	1.50	11	D	0	1.52	7		
16		6		"	1.57	12	"		1.78	22		
17		14		"	1.56	13			1.76	18		
18		"		"	1.62	14			1.92	15		
19		"		"	1.62	14				"		
20		"		12	1.60	34 14			D	"		0
21		"	1.28	31 12	D	2				"		
22	(1.32)	18 14		"	"	"			D	"		
23		0		12	"	3				"		
24		12		0	"	2			D	"		
25		"		"	D	2				"		
26		"		"	1.38	37 11				"		0
27		"		"	1.39	37 13			D	"		
28		"		"	1.87	36 20				"		
29	L.W. 1.65	18 19 12		"	1.82	"				"		
30		0		"	1.78	"				"		
31		12			1.76	11	1.74	0				
Total		273		252		344		201		177		
Mean										1.89		
Maximum												
Minimum												
Cfsm												
Runoff in inches												
Acre-feet		.5		.5		.7		.4		.3		0

9-192-a. (Rev. May 1971)

Daily Gage Height, in Feet, and Discharge, in Cubic Feet, per Second, of Croft Ditch

At Near _____ **for the Year Ending September 30, 19**77

Drainage Area _____ **Square Miles. Water-Stage Recorder** _____ **Ratio** _____ : _____

Max Disch. _____ CFS at _____ on _____ (G. H. _____ ft.). Max. G. H. _____ ft. at _____ on _____

Min. Disch. _____ CFS on _____ (G. H. _____ ft.). Min. G. H. _____ ft. on _____

CALENDAR YEAR _____

Day	~~October~~ April		~~November~~ May		~~December~~ June		~~January~~ July		~~February~~ Aug		~~March~~ Sept.	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1			est	4'	0		5.90	5'	6.12	6	0	0
2			✓	4'	5.50	(?) 5'	DRY	0	6.10	5	✓	0
3			✓	4'	0				6.08	5	5.14	6
4			✓	4'	5.56	est 5'			6.06	7	0	0
5			✓	5'	0				0	0	✓	0
6			0		0				✓	0	✓	0
7			0		6.04	est 6'			✓	0	✓	0
8			0		6.02	est 6'			✓	0	0	0
9			0		0				5.98	6	5.10	6
10			0		0		DRY	0	6.00	6	0	0
11			✓		0		5.34	5'	✓			0
12			✓		0		5.76	6'	0	0		0
13			✓		0		5.76	6'	0	0		0
14			0		0		5.81	6'	0	0		0
15			0		0			0	5.98	6		0
16			0		0				0	0		0
17			✓		0				6.02	6		0
18			0		0				0	0		0
19			0		5.80	e 6'			✓	0		0
20			0		0				✓	0		0
21			0		0				✓	0		0
22					0				✓	0		0
23	0		0		0				✓	0		0
24			✓		5.70	6'			✓	0		0
25	0		✓		0				✓			0
26	0		0		0				✓			0
27	0		0		0				✓			0
28	0		0		0				✓			0
29	Est	Water ran 6'			0				✓			0
30	Est	5'			5.56	5'			✓			0
31	✓	✓							✓			0
TOTAL		6		21		29		28				
Mean												177
Maximum												
Minimum												
Cfsm												
Runoff in inches												
Acre-feet												

RHC

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Station Number Croft? 1 1976

Used rating table dated

Gage Read to ..... Once / Twice a Day by .....

Gage heights used to half tenths between ..... and ..... feet; hundredths below and tenths above these limits.

April		May		June		July		August		September		Day
Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	
		L.W. Dry	0		6		6		6			1
									5			2
									6			3
									5	5.12	2	4
									5	6.12	5	5
									6	6.12	6	6
									5			7
									5			8
				L.W. 6.10		L.W.			6			9
									5			10
									6	5.18	2	11
									5			12
									1			13
									0			14
												15
												16
											0	17
									1	5.36	5	18
		Dry	0						0			19
									5	5.60	4	20
			2		6				6		2	21
			4						6			22
									5			23
									2			24
									2			25
					6				0			26
												27
												28
												29
					0							30
									0			31
			42		56		74		91			Period
												Year

Quarter: First / Second / Third / Fourth — Computed — Checked — Date

Quarter: First / Second / Third / Fourth — Disch. applied — Disch. checked — Date

Quarter: First / Second / Third / Fourth — G. H. copied — G. H. checked — Date

TING OFFICE: 1971—425-768

1977

9-192-a. (Rev. May 1971)

Daily Gage Height, in Feet, and Discharge, in Cubic Feet, per Second, of BIGLER SLOUGH

~~At~~ Near TETON **for the Year Ending September 30, 19**77

Drainage Area _____ **Square Miles.** **Water-Stage Recorder** _____ **Ratio** _____ : _____

Max Disch. _____ CFS at _____ on _____ (G. H. _____ ft.). Max. G. H. _____ ft. at _____ on _____

Min. Disch. _____ CFS on _____ (G. H. _____ ft.). Min. G. H. _____ ft. on _____

Day	~~October~~ MAY		~~November~~ JUNE		~~December~~ JULY		~~January~~ AUG.		~~February~~ SEPT.		~~March~~ OCT.	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	DRY	0										
2	✓	0										
3	✓	0										
4	✓	0				0						
5	✓	0				0						
6		✓										
7	✓	0										
8		.										
9	✓	0										
10	✓	0										
11	✓	0										
12		.										
13		.										
14	✓	0										
15		.										
16	✓	0	DRY	0								
17	✓	0										
18	✓											
19	✓											
20		.										
21	✓	0										
22		.										
23	✓	1					0	0				
24	✓	0					10	1				
25	✓	0					25	1				
26	✓	0					1	1				
27	✓	1					1	1				
28		.						1				
29		.						1				
30	.	1						1				
31	✓	0				0		1				
Total		0				0						
Mean												
Maximum												
Minimum												
Cfsm												
Runoff in inches												
Acre-feet												

CALENDAR YEAR

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Station Number ____________ 1976

Used rating table dated ____________

Gage Read to ____________ Once / Twice a Day by ____________

Gage heights used to half tenths between ____ and ____ feet; hundredths below and tenths above these limits.

April Gage height	April Discharge	May Gage height	May Discharge	June Gage height	June Discharge	July Gage height	July Discharge	August Gage height	August Discharge	September Gage height	September Discharge	Day
		est.	5		1							1
			✓	.58	.15 1							2
			2		10							3
			0	1.80	.11 18							4
		.42	0		0							5
			1									6
		.20										7
												8
												9
		.20										10
												11
		.20										12
												13
		.28										14
												15
												16
		.24										17
												18
		.32										19
												20
		.42	0									21
			0									22
			1									23
		.64	.13 1									24
			1									25
		.68	2									26
			✓									27
		.68	.13 2									28
			✓									29
			1		0							30
		.56	1									31
			25		30		0					Period / Year 55

Quarter: First, Second, Third, Fourth — Computed, Checked, Date
Quarter: First, Second, Third, Fourth — Disch. applied, Disch. checked, Date
Quarter: First, Second, Third, Fourth — G. H. copied, G. H. checked, Date

9-192-a. (Rev. May 1971)

Daily Gage Height, in Feet, and Discharge, in Cubic Feet, per Second, of Lannock Tim

At Near _____ **for the Year Ending September 30, 19**77

Drainage Area _____ **Square Miles. Water-Stage Recorder** _____ **Ratio** _____ : _____

Max Disch. _____ CFS at _____ on _____ (G. H. _____ ft.). Max. G. H. _____ ft. at _____ on _____

Min. Disch. _____ CFS on _____ (G. H. _____ ft.). Min. G. H. _____ ft. on _____

Day	~~October~~ April		~~November~~ May		~~December~~ June		~~January~~ July		~~February~~ August		~~March~~ Sept.	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1			.98	11	1.00	4	.92	13	.92	11	1.12	
2			1.02	23	1.00	4	.92	13	.92	11		
3			1.44	27	.90	1	.990	12	1.00	12		
4			1.46	29	.90	12	"	12	1.02	13		
5			1.48	30	.90	12	.992	11	1.12	13		
6			1.54	32	.90	11	"	11	.90	11		
7			1.62	35	.90	11	.994	10	.90	11		
8			1.20	23	1.06	17	1.04	16	.88	10		
9			1.22	23	1.10	18	1.02	15	.94	12		
10			1.20	19	1.12	19	.998	14	.94	9		
11			1.20	22	1.10	18	1.00	21	.94			
12			1.22	23	1.06	17	1.00	15	.94	10	1.12	
13			1.16	18	1.06	17	1.02	16	.92	12		
14			1.20	19	1.03	16	.998	12	1.10	17		
15			1.20	20	1.10	18	"	12	.98	14		
16			1.22	20	1.24	21	1.02	11	.76	12		
17			1.22	20	1.12	19	.98	11	.76	8		
18			1.04	15	1.10	18	"	11	.76	8		
19			1.04	15	1.18	20	0.98	12	.90	11		
20			1.10	17	1.16	20	1.04	16	.90	11		
21			1.12	17	1.16	20	1.02	16	.90	11		
22			1.02	14	1.20	21	"	16	.92	9		
23			1.00	14	1.08	17	1.06	18	.76	11		
24			1.06	14	.98	14	1.06	17	.66	6		
25			1.00	14	.88	11	1.02	17	.80	11		
26	1.10	16	1.06	16	.88	11	1.06	15	.92	9		
27	1.24	22	1.04	15	.88	11	.998	11	.64	6		
28	1.20	19	1.04	15	.80	9	1.04	10	.48	3		
29	1.00	12		14	.92	11	0.98	12	.88	8		
30	0.88	10	1.00	14	.90	12	"	12	.86	8		
31			1.02	14	—	—	0.98	6	.78	5		
Total		78		603		461						11
Mean												
Maximum												
Minimum												
Cfsm												
Runoff in inches												
Acre-feet												

CALENDAR YEAR

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Station Number Butler Is #2

Used rating table dated .....

Gage heights used to half tenths between ..... and ..... feet; hundredths below and tenths above these limits.

...ge Read to ..... Once / Twice a Day by .....

Day	April Gage height	April Discharge	May Gage height	May Discharge	June Gage height	June Discharge	July Gage height	July Discharge	August Gage height	August Discharge	September Gage height	September Discharge
1			1.06	+.13 3	0	+.15 0	1.26	+.17 5 K		.00		
2			1.19	4		0		+.11 5 K				
3			1.30	6	1.44	7	1.28	+.10 5 K				
4			1.44	7	1.36	+.15 7		+.09 5 K		.00 5		
5			1.46	7	1.30	+.15 7 K	1.26	+.08 4 K	0	0		
6			1.51	8	1.26	+.16 5 K	1.32	+.07 5 K				
7			1.54	+.13 6	1.24	+.16 5 K	1.27	+.06 4 K				
8			1.26	5	1.09	+.17 5 K	1.26	+.05 4 K				
9			1.25	5	1.16	+.18 4 K		4 K				
10			1.25	5	0	+.19 est. 2		+.05 4 K				
11			1.26	5	0	0	1.28	+.03 4 K				
12			1.26	5	0	0	1.30	4 K				
13			1.22	5	0	0	1.44	6 K				
14			1.14	4	1.24	+.19 7	1.38	5 K	0	0		
15			1.14	4	1.24	+.20 7	1.38	5 K	1.30	+.16 2		
16			0	0	1.36	+.21 7			1.14	+.17 2		
17			0	0	1.32	+.22 7				2		
18			0	0	1.36	+.22 7				+.17 2		
19			0	0	1.42	+.23 8	1.42	6 K	1.30	+.18 2		
20			0	0	1.34	+.23 7	1.42	6 K	1.48	+.19 4		
21					1.20	+.22 5 K	1.42		1.62	6		
22			0		1.20	+.21 5 K	1.42			6		
23			0		1.20	+.20 5 K	1.38		1.40	3		
24			0		1.20	+.19 5 K	1.38		1.37	3		0
25			0		1.16	+.18 4 K	1.30			1		
26	0		0		1.18	+.17 5 K	1.48			1		
27	1.66	+.13 0	0		1.16	+.16 4 K	1.32			2		
28	1.24	5	0		1.16	+.15 4 K	1.44					
29	1.24	1			1.28	+.14 5 K	1.24					
30	1.94	2	0		1.27	+.13 5 K		4.00				
31			0									
		8		79		138 143						

PERIOD
YEAR

Quarter: Fourth | Third | Second | First
Computed | Checked | Date
Disch. applied | Disch. checked | Date
G. H. copied | G. H. checked | Date

192-a. (Rev. May 1971)

Daily Gage Height, in Feet, and Discharge, in Cubic Feet, per Second, of Butler Island No. 2

At Near ____ **for the Year Ending September 30, 19** 76

Drainage Area ____ **Square Miles. Water-Stage Recorder** ____ **Ratio** ____ : ____

Max Disch. ____ CFS at ____ on ____ (G. H. ____ ft.). Max. G. H. ____ ft. at ____ on ____

Min. Disch. ____ CFS on ____ (G. H. ____ ft.). Min. G. H. ____ ft. on ____

Day	~~October~~ May		~~November~~ June		~~December~~ July		January Aug		February Sept		~~March~~ Oct.	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	L.W. DRY	0		5	1.53	To 6	1.41	60	1			
2							1.26	to 4				
3				5	1.51		1.38	to 4	.86	to 3		
4				6			1.28	to 4	.94			
5				6			1.26	to 4	.76			6
6					1.69	To 7	1.26	to 4	1.08	4		
7							1.4	to 4				
8					1.58	11	1.20	to 1	1.10			
9					1.65	11	1.22	to 5				
10			1.54	.05 6	1.62	11	1.24	to 5		5		
11							1.20	to 5	0.88	to 2		
12					1.60	To 6	1.08	to 3	1.12			
13					1.62		1.00	to 3	.92			6
14					1.61	To 7	1.06	4	.70			
15				6	1.61	60	1.06	4	.64			
16					1.62	60	1.10	to 4	.50			
17					1.56	50	1.12	to 5	1.2			
18					1.54		1.12	5	1.2			
19	L.W. .20	0			1.54	50	1.12	5				
20					1.56	60	1.14	5	1.2			6
21			1.58	.05	1.54	60	1.14	5				
22					1.54	06	1.14	5	1.2			
23		0			1.50		1.16	to 5				
24		2			1.48	06	.96	to 3	1.2			
25		5			1.54	To 4	.90	2				
26				6	1.54	4	.88	2				0
27					1.54	05	.90	2	1.2			
28					1.46	60	.86	to 2				
29	L.W. 1.42	.05 5			1.44			0				
30				1	1.46		1.2					
31					1.44	5	1.2	0				
	Total	37		1[illegible]		1[illegible]		112		[illegible]		
	Mean								1[illegible]	[illegible]		
	Maximum											
	Minimum											
	Cfsm											
	Runoff in inches											
	Acre-feet											

CALENDAR YEAR

White

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

C. STEPHEN ALLRED
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

MEMORANDUM

TO: Darrel Clapp, Wayne Haas DATE: April 2, 1980

FROM: Alan Robertson

SUBJECT: WORK ITEMS FOR WD-1 ACCOUNTING

Following is a list of work items that will help make WD-1 more independent of IDWR and/or improve the accounting and management processes. Some are essential and others are desirable for efficiency and accounting purposes. There probably are others that we have not thought of.

Item	Primarily Involves
Obtain CICS terminal for WM	B. Lindsay, WM
WM learns how to modify accounting program to to add diversions, reaches, rights	WM w/Hyd.
Program for digitizing recorder charts, compute flow	Hyd.
Set up process for digitizing recorder charts	WM, R. Mellin
Complete documentation of accounting program	Hyd.
Modify accounting program to use flow through power plant data	WM w/Hyd.
Review Willow Cr. rch gain below Ririe to floodwy. Modify program to correct for storage use	WM w/Hyd.
Change reservoir rights to include seasonal variations	WM w/Hyd.
Change diversion rights to include seasonal variations	WM w/Hyd.
Add reach to accounting program to define IPCO Twin Falls right entitlement at Milner	WM w/Hyd.
Set up JCL for WM to execute gage ht-shift-Q program	Hyd.
Set up JCL for WM to run BIOMED program to compute rating curves	Hyd.
Program to print WM weekly reports	WM
Program to print individual notices for storage used	WM
Program for billing	WM
Add new reaches, diversions, rights	WM

Until the CICS terminal has been installed the Watermaster cannot undertake any of the above items. He will continue to require assistance from us in running the accounting and other programs. None of the 1980 year has yet been run, but this will be necessary before spills at Milner stop (probably after mid-May). From then thru the irrigation season there will be almost constant pressure to keep the accounting current, and therefore necessity for frequent assistance from us. After the terminal is installed our involvement will be much less necessary, and the Watermaster will be able to begin some of the items listed above.

ACR:cjs

cc: Ron Carlson
Bob Fleenor

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

C. STEPHEN ALLRED
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

MEMORANDUM

TO: Mr. E. F. Hubbard
District Chief, USGS

DATE: January 23, 1980

FROM: Alan Robertson

SUBJECT: Data needs of Water District 1

The USGS gages shown on the attached sheet are used in accounting and management of flows by Water District 1. Gages now operated by WPRS on all the federal reservoirs and on Willow and Sand creeks are also used. Each day a reading of each gage is entered into the computer system and used for the daily accounting. After the irrigation season ends (October 31) it is necessary to recompute the entire year using updated data (mean daily values with most or all corrections made). The quality of the data needed at this point corresponds to your provisional data. It will be published in the annual watermaster report. Because of the time requirements involved in completing his annual report the watermaster cannot wait for final data.

As we discussed last week, it would be a great help to the watermaster if the provisional data could be made available to him quarterly. With that arrangement, he would be able to have his final accounting computations partially done before the end of the irrigation year. His most important need is to receive the data through October 31 by mid-December so that the accounting can be completed and the report prepared by the time of the district's annual meeting.

ACR:cjs

Encl.

cc: Ron Carlson

USGS GAGES USED IN DISTRICT 1 ACCOUNTING

No.	Station
13011000	Snake River near Moran
13032500	Snake River near Irwin
13037500	Snake River near Heise
13038500	Snake River near Lorenzo
13039000	Henrys Lake near Lake
13039500	Henrys Fork near Lake
13042500	Henrys Fork near Island Park
13046000	Henrys Fork near Ashton
13047500	Falls River near Squirrel
13049500	Falls River near Chester
13050500	Henrys Fork at St. Anthony
13055000	Teton River near St. Anthony
13056500	Henrys Fork near Rexburg
13060000	Snake River near Shelley
13062500	Snake River at Blackfoot
13069500	Snake River near Blackfoot
13077000	Snake River at Neeley
13081500	Snake River near Minidoka
13088000	Snake River at Milner
13023000	Greys River above Reservoir
13027500	Salt River above Reservoir
13057150	Snake River near Lewisville
13022500	Snake River near Alpine

DRAFT ACR:JEL:cjs 1-8-80

Please final

MEMORANDUM

TO: Ron Carlson

FROM: Alan Robertson

SUBJECT: Data requirements for flow computation program

Pending verification of four rating curves with you, the gage height-shift-flow program is ready to run the 1979 data. Data requirements are listed below. Improvements in the program are possible, but in the interest of getting the 1979 run completed we believe we should not make any more changes until that is completed. When all gage heights and shifts are entered we will list them for your checking prior to running the flow computation program. That appears to be the only way to catch errors prior to running the allocation program.

1. The program skips a specified number of records (days) for all the diversions before beginning any calculations. If shifts begin on differing dates, see next item.
2. The first interpolation of shifts is between the shift of the first record considered and the next non-zero shift, ~~following~~. Therefore, a shift (.001 or greater) should be entered for the first record after the skip period. ~~unless zero shift is appropriate~~. If, after the skip period zero shifts are appropriate for a period, a shift of .001 should be entered for the last day of the zero shift period.

3.4 On the last day of nonzero flow in each canal a shift should be entered. A shift must also be entered for October 31, 1979, for canals which have nonzero flow on that date.

4.5 A gage height must be entered for all records for which flow is to be calculated. If no gage height is entered, a gage height of zero (plus shift) is used to compute flow. Therefore, when a diversion declines to zero at the end of the season, or for a period in mid-season, zero flow should be entered. See item # 3.

5.3 If flow is entered as zero no new flow is calculated.

6. Before the allocations program can be run for the year records for all stations, (D,R,F,P,E) must be entered for every day for the period October 1, 1978, thru October 31, 1979.

WATER BUDGETS FOR SNAKE RIVER RESERVOIRS FROM BLACKFOOT TO MILNER

A PROJECT PROPOSAL

U.S. Geological Survey
Boise, Idaho
September 1982

Problem

Snake River water is distributed to irrigators after determining daily water allocations using a complex accounting of inflow and outflow. Correct allocations are at times difficult because of apparent discrepancies found in attempting to balance the water-budget equation. Most problems occur along reaches of the river that include American Falls Reservoir, Lake Walcott, and Milner Lake. Of particular concern are ground-water/surface-water relations in the vicinity of American Falls Reservoir.

In the American Falls reach, gains computed as the residual of the water budget can vary widely from day to day, casting considerable doubt on their accuracy. This possible gross inaccuracy makes it extremely difficult to manage and allocate the irrigation water for this reach of the river. The accuracy of the computed gains for the Lake Walcott and Milner Lake reaches might also be improved, although these gains seem more consistent and, therefore, more credible.

Objective

The objective of the study is to determine if the accuracy of the daily water budgets can be improved for the three reaches of the Snake River that contain American Falls Reservoir, Lake Walcott, and Milner Lake. If the discrepancies are not significant in relation to normal errors of measurement, then no changes in the methods of computing the water budgets would be recommended. If it appears that the accuracy can be improved, then the additional data and information needed to obtain the best possible accuracy will be stated. Possible changes in the methods used to compute the daily water budgets will be examined and recommended if discrepancies can be decreased.

The study will concentrate on American Falls Reservoir. Considerable effort will be made to determine if the estimation of the contents of the reservoir can be improved. An attempt will be made to

correlate ground-water discharge with measured spring flow. Ground-water/surface-water relations that may affect the water budget will be identified to the extent possible. The water budgets for Lake Walcott and Milner Lake will be examined to find sources of discrepancies. The method of estimating the contents of Milner Lake will be verified or corrected.

It is beyond the scope of this study to completely explain or quantify all aspects of the water budget in the three reaches in question. The scope does include making recommendations that concern monitoring the river, reservoir, and related data and computing water budgets.

Approach

The approach to this study consists of three principal efforts:

(1) Determine if discrepancies in inflow-outflow budget computations are significant in relation to normal errors of measurement or estimate that might be expected.

(2) Attempt to explain some of the misunderstandings of ground-water/surface-water relations that affect water-budget calculations.

(3) Determine if contents tables or gaging systems for American Falls Reservoir and Milner Lake are in error, and if so, improve methods of estimating contents.

Daily gains or losses determined from an inflow-outflow budget can be highly variable owing to lag times, storage changes, and other less easily explained phenomena. Given a certain set of conditions, mainly steady riverflow into and out of the reach over several days, some limits as to the amount of change in gains or losses can be determined. Periods of time when these limits are exceeded will be examined for some diagnostic criteria, such as high or low ground-water levels. Expected limits will be defined to the extent possible.

Springs measurements have shown that ground-water discharge to American Falls Reservoir has been reasonably steady since 1927. Total mean annual ground-water discharge to the reservoir from 1912 to 1980 was estimated by Kjelstrom (1982) to be 2,540 ft^3/s. Miscellaneous measurements and estimates of Spring Creek discharge have been used by Thomas (1982, oral commun.) to estimate total ground-water discharge.

An attempt will be made to correlate total ground-water discharge with the gaged discharge of Spring Creek at Sheepskin Road near Fort Hall (13075983).

Movement of ground water into or out of American Falls Reservoir is dependent on reservoir elevation with respect to surrounding ground-water levels. Accordingly, ground-water levels adjacent to the reservoir will be monitored during rising and falling reservoir stages. An analysis will be made using newly collected and past ground-water-level data to determine seasonal variation in the relation of reservoir levels to ground-water levels.

Leakage from the southwest corner of American Falls Reservoir may occur when ground-water levels are low and reservoir levels high. If true, ground-water levels in selected wells could be used to indicate when leakage occurs from the reservoir and would explain the unaccounted-for increase in discharge from Lake Walcott. Frequent water-level measurements will be needed to establish trends that might indicate leakage. Recorders will be installed on at least three wells and supplemental measurements will be made on additional wells.

Estimates of reservoir contents and changes in storage should be improved if additional recording stage gages were installed near Sterling and two other sites (possibly near mouth of Bannock Creek, Seagull Bay, or near Aberdeen). Contents will be determined from gaged data by using average elevations, weighted-average elevations, or other methods based on differences in gage height. Survey levels will be run to determine if the stage gage near American Falls Dam is affected by drawdown and to establish gage datum of the reservoir gages. The possibility of adjusting the reservoir stage for wind effect will be examined.

A stage recorder gage near Declo and a wire-weight gage on the bridge at Burley will be used to check and adjust the theoretical backwater curve of Milner Lake for various combinations of stages at the dam and discharges in the channel. The contents table will then be revised and completed for all stages and discharges that have been verified by these gages.

Report Plans

An Open-File Report documenting results will be prepared after the completion of the 1983 irrigation season. The report will present procedures to be used to estimate storage contents in American Falls Reservoir and Milner Lake. Results of the analysis of ground-water/surface-water relations will be presented.

Cost Basis

	FY 83	FY 84
Analyses, attendant services, and report preparation	$16,700	$20,000
Data collection	29,000	
4 stage recording gages (3 American Falls Reservoir and 1 Milner Lake)		
1 wire-weight gage on Milner Lake at Burley	1,280	
1 discharge gaging station on Spring Creek	4,260	
3 well recorders and miscellaneous well observations	13,000	
TOTALS	$64,240	$20,000
USGS Share	$32,120	$10,000
Water District Share	$32,120	$10,000

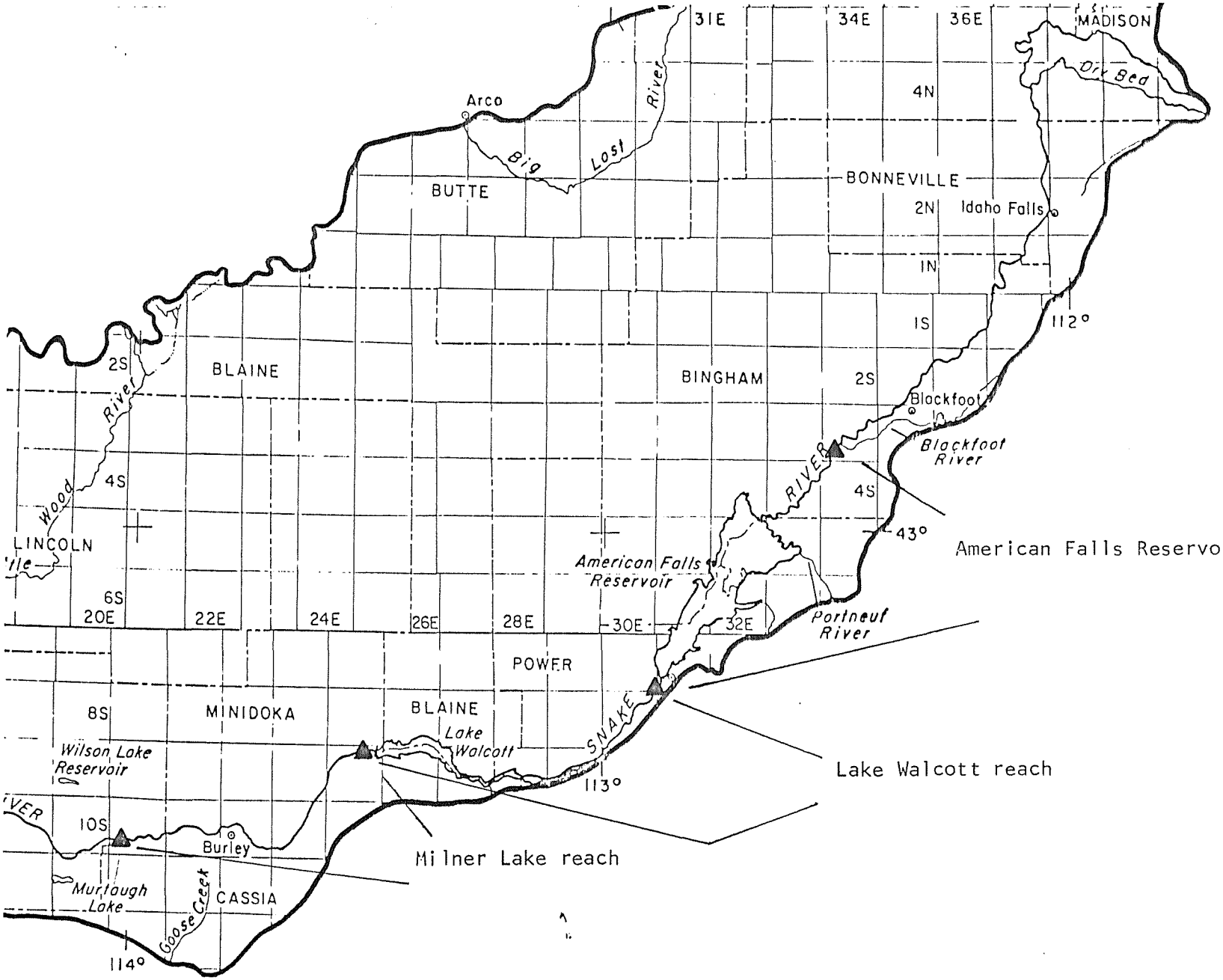
Personnel Requirements and Availability

The required personnel are available in the Idaho District. The project leader will be a senior hydrologist. Personnel in the Idaho Falls field office will collect the data needed. A ground-water specialist in the district is available for consultation concerning the movement of ground water to and from the river and reservoirs.

References

Newell, T. F., 1929, Segregation of water resources, American Falls basin and American Falls Reservoir, May 21 to October 17, 1928: Idaho Falls, Idaho, Water District 36, 127 p.

Kjelstrom, L. C., 1982, Flow characteristics of the Snake River and water budget for the Snake River Plain, Idaho and Eastern Oregon: U.S. Geological Survey Hydrologic Atlas, (in review).



MAP OF STUDY AREA

MEMO

TO: Bob Fleenor

FROM: Ron Carlson

DATE: November 2, 1979

On October 23, 1979, a Committee of Nine meeting was held to discuss river operations after November 1st. The meeting basically was called to encourage people to conserve water in an attempt to rebuild storage supplies as rapidly as possible and to advise them how canal diversions would be treated after November 1st.

The Bureau of Reclamation described the status of the system and discussed the reservoir operation they anticipated for the remainder of the year.

I told the Committee I needed their guidance in deciding how to regulate diversions after the first of November, since the decrees do not clearly show how the rights should be delivered after that date.

A motion was made to instruct the watermaster to shutoff all diversions after the first of November. However, the motion was not carried because John Rosholt intervened and indicated it probably was inappropriate since the watermaster's responsibility was to shutoff diversions when their rights no longer were in effect. However, the representatives from the Egin Bench area and the Great Feeder system were concerned that shutting water out of the system mean wells drying up, no water supplies for their livestock, and in the case of the Egin Bench, would mean they would be unable to establish adequate groundwater levels prior to the next irrigation season.

Reed Oldham said he would schedule a meeting for St. Anthony to discuss the problem with the water users. Later that week Reed called and said a meeting has been scheduled in St. Anthony for the evening of October 29th.

I arrived at the meeting a few minutes before it was scheduled to start and found the courtroom was packed and chairs were being moved in to seat the additional people. Leo Busch and Keith Ebersol from the Bureau of Reclamation were there, but Reed Oldham was not. Since I had counted on Reed to chair the meeting, it wasn't immediately clear how

to get it started. There was a feeling of tension in the room and it appeared likely that the meeting could become hostile, and consequently, unproductive if it were not handled properly. I decided to take charge of the meeting, explain the problems from the standpoint of next year's water supply and the watermaster's statutory responsibility. After a brief introduction, I asked Leo Busch from the Bureau to make his slide presentation showing the current reservoir status and projections for refilling for 1980. At the conclusions of Leo's presentation, I told the water users that I had three main concerns which I wanted to visit with them about.

The first was just a need to conserve water during the last two months of 1979 to increase the amount of water going to storage.

The second, I wanted them to understand that the decrees which grant their water rights do not provide for the diversion of water after November 1st. I explained that in view of the legislature's passage of 42-243, it is important that they be aware of any existing deficiencies in their recorded rights before 1983.

My third concern was that they understand the watermaster is limited by statute to deliver only those rights which are evidenced by license or decree, and that since their water rights become undefined at the end of the irrigation season, any water taken after that time will be accounted for in the watermaster's records as storage diverted.

We discussed these items for about three hours and it was the general consensus of the companys represented that they would reduce their diversions as much as possible and try to quantify the amount of water that was needed after the first of November. When an amount could be decided upon they would then, as a first step, file claim to a water right to preserve this evidence. Once the claims were filed, I would make the decision on how to adjust for the water charged against their 1980 storage allotments. I then recommended that the next step would be to pursue avenues of getting their claimed rights adjudicated.

Probably the most frequently expressed concern at the meeting was based upon the belief that by shutting off the canals during the winter

would not only be adversely effected but domestic wells through the entire area would begin to go dry. I tried to explain the difficulty of assuring a pumping lift for shallow domestic wells from both the standpoint of water rights and physical water supply.

On October 31, I was asked by Kent Foster to meet with representatives from the Feeder Canal and the Protective Union to provide them with a better understanding of how I am proposing to handle fall diversions for the 1979 season. I felt this was an extremely productive meeting. We discussed watermaster's responsibility, my instructions from the Committee of Nine concerning the regulation of fall diversions, the mandatory claims program, and the importance of water users having their water rights as clearly defined as possible in the records of the Department. We also discussed the operation of the Great Feeder and I explained the difficulty that existed because it is neither operated as a canal or as a branch of the river. I told them that this decision needed to be made because a different set of rules existed depending upon how that canal was classified. Kent Foster said the people he represents are not willing to make that decision since they feel it has been operating in its present manner for many years, they are not willing to make a decision that would jeopardize anything they feel they have established. While the option of having it classified as a river channel seems to be more palatable, Kent expressed concern that if it is so classified they would be in a position of having to deal with the Corps of Engineers and the Fish and Wildlife Service, which they see is a Pandora's box of federal interference.

After these discussions, I outlined the action that I felt the upper valley canals should take. I told them their first need was to quantify and identify the amount of water that they were using beneficially for stockwater purposes during the month of November. I recommended that once these amounts had been quantified, then claims should be filed with the Department. I told them that if this were done, I would recognize the right as evidenced by the claim in adjusting the late season storage use. I told them while this is not clearly provided for in the statutes, it appeared to be a reasonable approach if no other water users objected to it. I further advised them that while this proposal would be useful for the remainder of 1979 that

how is this done

ultimately these rights would have to be confirmed by the court. After further discussion, the water users decided that the best approach for them might be requesting the Department to come in and do an adjudication study and prepare findings for the court. They requested that I make an estimate of the costs to the Department of undertaking this adjudication and they would approach their legislators in an attempt to get the necessary funding approved by the legislature.

Memo

TO: Lyle Swank DATE: October 15, 1979

FROM: Bob Sutter

SUBJECT: Priority of Water Rights above Lorenzo on Snake River

This memo is in response to the discussion we had last week concerning the rights on Snake River above Lorenzo. Recently, the accounting techniques which we are now using have shown that rights above Lorenzo are on a priority of June 1, 1889, while the remainder of the Snake River is on a later priority of February 6, 1895. This situation had not occurred previously using the former accounting procedures.

The reason that different priorities on the main Snake River were never experienced above American Falls using the old (pre 1978) accounting procedures is that the natural flow was balanced at Blackfoot throughout the season. This, in effect, averaged all of the priorities on the main Snake above Blackfoot so that always only one priority was in effect. It was impractical to do otherwise using hand computations because of the volume of data involved.

The effect of present accounting techniques made possible through the use of data processing can be explained by looking at October 7, 1979, which was on the priorities described in the first paragraph above. The total natural flow of the entire river was 12,077 cfs, while total diversions were 16,189 cfs. Natural flow at Lorenzo was 2,910 cfs while diversions above Lorenzo were 3,321 cfs. The remaining natural flow at Lorenzo was zero and the natural flow diverted above Lorenzo was 2,910 cfs. From these values it can be seen that all of the natural flow at Lorenzo was diverted above that point. Because of the magnitude of the diversions above Lorenzo, the 2,910 cfs could fill rights only to June 1, 1889. Therefore, it is completely independent of the remainder of the system. To give the diversions above Lorenzo more natural flow to equal the priorities on the remainder of the river, would be to deliver more natural flow than was in the river.

In this year, 1979, the above condition first occurred on September 10. Prior to that time the river above Lorenzo was on the same priority as the main river above Blackfoot. This difference in priorities occurs when the natural flow above Lorenzo becomes small in relation to the total diversions above Lorenzo. This normally occurs late in the irrigation season.

RJS:cjs

WD 1 ACCOUNTING
GAGE NUMBERS

11 Oct 79
ACR

CHANGES TO NO's ON TETON R AREA MAPS (OK'd by USGS 10 Oct 79)

CHANGE	PRESENT NO.	TO! NO.	QUAD	
Rexburg Canal	055329	055334	REXBURG	Change on map
Russell Wilding	055319	055318	MOODY	" " "
W. Walker	055328	055331	REXBURG	" " "
R. BROWN XG WELL	-	055329	MOODY	Add to map (Not prev. numbered)
GARNER SIMONS XG	-	054804	NEWDALE	Add to map (Not prev. numbered)
B PARKINSON XG WELL	055036	055043	ST ANTH	Change on map.
V. SCHWENDIMAN " "	055037	055044	" "	" " "
M. PARKINSON " "	055038	055045	" "	" " "

NO's ON TETON R. AREA MAPS (OK'd by USGS 10 Oct 79)

	NO	NAME	DIV TO:	QUAD
13	055324	Ard XG Well	S. Fk Teton R.	Moody
	055316	Hoopes Bros XG Well	" " " "	"
	055199	C. Hoopes XG Well	N Fk " "	St Anthony
	~~055036~~	~~B. Parkinson XG Well~~	~~Teton R.~~	" "
	~~055037~~	~~V. Schwendiman XG Well~~	~~" "~~	" "
	~~055038~~	~~M. Parkinson XG Well~~	~~" "~~	" "
	055041	Canyon Cr Lat XG Well	Teton C. wstwy to S. Fk Teton	St. Anth.
	054048	Steveco Canyon XG Well	Unnamed trib Teton R	Drummond
	051281	G Nelson XG Well	Teton R	Driggs 15'

NO'S ADDED TO TETON R. AREA MAPS (Not yet OK'd by USGS 12 Oct 79)

053301	D. Ard XG Well	Teton R	Tetonia
053951	Teton Pipeline	Teton R	"
053971	J. Ricks	"	"
054041	Teton Hoopes-Ard	"	"
054043	Teton Clementsville	"	"
054031	Teton E. Hoopes	"	Packsaddle Lake
054291	R.L. Stott	Bitch Cr	Lamont
054046 053	K.J. Arnold 1	Teton R	Drummond
054111	R. & J. Brown	" "	"
054391	M. Parkinson, Kerbs	" "	"
054397	K.J. Arnold 2	" "	Linderman Dam
055049 rent	Rammel Bros	" "	St Anth

INTER-DEPARTMENT MEMO — 1

FROM Alan
THRU Darrel
TO Bob Fleener

DATE 11 Sep 79

SUBJECT Ron's work requests

1. Program documentation. we estimate 4 weeks of Bob's time.

2. Exchange well accounting
The program can be modified to eliminate the error caused for accounting for the other users by the exchange wells with about 2 days work. However, if the allocations program is also expected to adjust the storage use accounts of the exchange pumpers, we must know the "rules" under which such adjustment is to be calculated. The amount of work can be considerable if those rules are complex.

Alan
SIGNATURE

Ron wants to do only this much now
20 Sep 79

M E M O

TO: Steve Allred thru
Bob Fleenor

FROM: Ron Carlson

RE: Water District No. 1

DATE: August 24, 1979

The water district computer allocations program has been operating for about one year now. As you recall much of the original program development was done in a hurry to get something that would work for 1978. At the time not much thought was given to program efficiency, and because of the magnitude of the problems involved in allocating water to every diversion in District 1, we settled for a system that basically allocates water to the major diversions.

It now appears that we have a machine that has been wired together and is being operated as though development has been completed.

Consequently, we have made little progress in the last twelve months. It is, therefore, appropriate that we again review the Upper Snake water accounting system and evaluate what we want to accomplish.

If we want a computerized system that approximates the past allocation procedures then we probably can live with what we have, with only a few minor modifications. However, if we want to implement a system that is a significant improvement over the past and does the things we originally projected it would do then a substantial amount of development work still remains to be done.

I have tried to evaluate the work that must be completed to have a computer allocation system that can be operated with a mimimun of direct department involvement, and still function effectively and efficiently. I have attached a number of work requests which outline major areas where this additional work is needed.

I hope the completion of these requests can be given a high priority. While it is likely that there will be a need for some assistance from the State Office staff, the completion of the work I have outlined will do much to wean the water district from dependence on the State Office.

STUDY/PROJECT REQUEST

TO: Alan Robertson

FROM: Ron Carlson Date Initiated 8-20-1979

Requested Completion date 1-01-1980

TITLE: Allocation Program Documentation

PROBLEM AND/OR PURPOSE: Document the logic, and the physical operation of the water distribution program used in Water District No. 1

SCOPE (level or extent of detail):

DESCRIPTIONS OF WORK REQUESTED:

1. Prepare a written description of the logic involved in the water distribution program.
2. Fully document the allocations program.
3.

REQUEST ORIGINATOR: RONALD D. CARLSON

TYPE OF REPORT:

DISPLAY TABLES: YES NO

ANTICIPATED MAN-DAY EFFORT:

APPROVED BY: ASSIGNED TO: DATE:

ACTUAL MAN-DAYS:

STUDY/PROJECT REQUEST

TO: Alan Robertson

FROM: Ron Carlson Date Initiated 8-24-1979

Requested Completion date 11-01-1979

TITLE: Exchange Well Accounting

PROBLEM AND/OR PURPOSE: Relate total water use to sources, including ground water exchange

SCOPE (level or extent of detail):

DESCRIPTIONS OF WORK REQUESTED:

1. Modify the accounting program to include exchange wells.

2.

3.

REQUEST ORIGINATOR: RONALD D. CARLSON

TYPE OF REPORT:

DISPLAY TABLES: YES NO

ANTICIPATED MAN-DAY EFFORT:

APPROVED BY: ASSIGNED TO: DATE:

ACTUAL MAN-DAYS:

D 8/8

MEMORANDUM

TO: Steve DATE: August 20, 1979

FROM: Alan

SUBJECT: METHOD OF COMPUTING STORAGE ACCRUAL IN DISTRICT 1.

Until now the new accounting procedure has been based on the assumption that the annual storage accrual for a reservoir is limited by the difference between the total reservoir rights and the amount of carry-over from the previous year. Accrual, on paper, has been computed within this limit, whenever natural flow was available at the reservoir under its priority, whether water was actually stored or not. This method of accounting has been criticized by USBR and some of the water users who say that it discourages flood control operations because it will eventually put reservoir refill behind so many late rights that the space couldn't be refilled.

The purpose of this memo is to seek verification of the interpretation you made in our conversation last week: that the reservoirs should be allowed to annually accrue up to the amount of their total rights if sufficient carry-over had been released (such as for flood control) to make that amount of space available. To accomplish this accounting, the watermaster would have to periodically obtain from USBR information on sources of stored water releases so that the accounts could be adjusted downward to allow continued accrual.

ACR:cjs

cc: Ron Carlson

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 373 W. Franklin Street, Boise, Idaho

JOHN V. EVANS
Governor

C. STEPHEN ALLRED
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 384-2215

MEMORANDUM

TO: Ron Carlson DATE: August 20, 1979

FROM: Hydrology Section

SUBJECT: District 1 Water Right Accounting Using Lorenzo and Lewisville Gaging Stations.

The addition of the Snake River near Lorenzo and near Lewisville gages to the District 1 water right accounting program will require decisions to be made on the procedure of dividing the gains/losses in these reaches.

The presence of the Dry Bed of the Snake River, which is considered by decree part of the Snake, creates an unusual situation from Heise to Lorenzo and Lewisville.

From examination of 1978 data, it appears that the reach of the main Snake River from Heise to Lorenzo loses water from May 1 to mid-July in the range of 500 to 1,000 cfs, and then begins to gain into September about 500 cfs. The Dry Bed from near Ririe to near Lewisville gains and loses in small amounts (100 to 200 cfs) in May and then gains 500 to 600 cfs throughout the remainder of the irrigation season.

The above gain/loss is due to the rising water table throughout the summer as a greater portion of the river intersects the water table. The timing of the reach loss to gain switch would likely change from year to year with the magnitude of diversions in the area.

The attached schematic shows the major features of the Heise-Lewisville area. Almost all of the Dry Bed diversions occur above Rigby, but no measurement is made of the Dry Bed at this point. A comparison was made of the sum of all diversions from the Dry Bed with the flow in the Dry Bed near Ririe. Early in the irrigation season (May), the flow near Ririe may exceed the sum of diversions by 0 to 200 cfs, but by mid-June the diversions exceed the flow near Ririe by 0 to 250 cfs. Since the total flow is over 4,000 cfs in June and July, agreement between the two values is very close.

From the above calculations, it can be concluded that the Dry Bed gain occurs mainly below Rigby and that losses are greater on the main Snake River above Lorenzo than on the Dry Bed.

For water right accounting, there are several options that could be used. These are:

1. Consider Heise-Lewisville one reach and ignore Lorenzo flow.
2. Consider Heise-Lorenzo one reach with gain computed using Dry Bed near Ririe, but using individual Dry Bed canals for water right allocation.
3. Same as (2) but add reach below Dry Bed on main Snake.
4. Add Dry Bed near Rigby gage and create combined reach from Dry Bed to Lorenzo and Rigby.

Option (1) would make all gains/losses from Heise to Lorenzo available to all canals in this reach (except gain from Henrys Fork). Gains in the lower portions would probably more than offset losses in upper portions.

Option (2) would make canals above Rigby and Lorenzo subject to gains/losses above Lorenzo on main Snake.

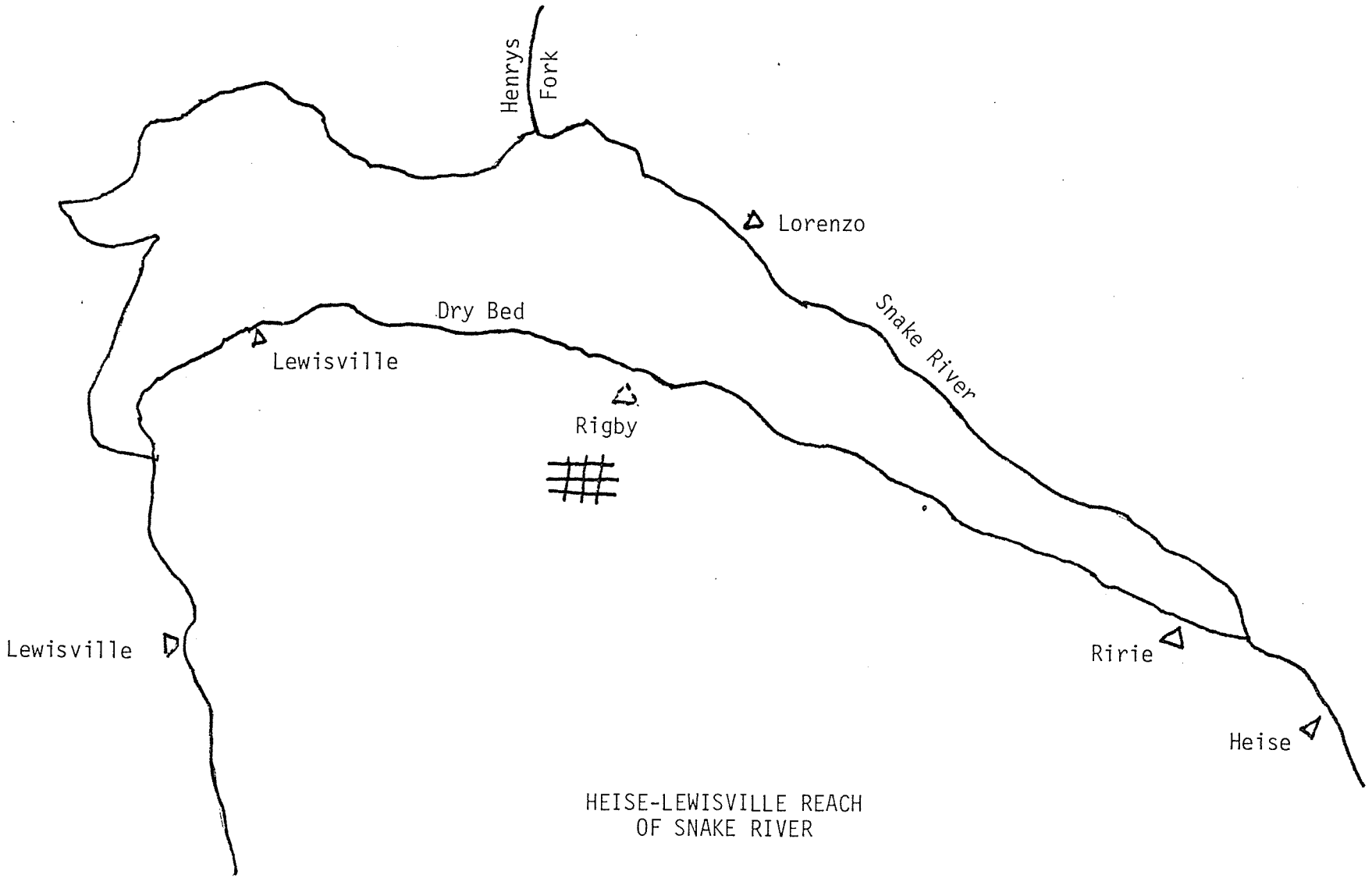
Option (3) would make canals above Rigby and Lorenzo subject to losses above Lorenzo on main Snake, but gains on main Snake from Heise to Lorenzo could not be used by Dry Bed canals.

Option (4) makes all losses/gains in both the main river to Lorenzo and the Dry Bed to Rigby available to all canals in these reaches.

Of our four options, the most equitable may be the third option since it most correctly describes the water supply available to the various canals. The first option would overestimate the water supply of the canals above Rigby and Lorenzo by computing the gain available to them at Lewisville. The second option would allow canals on the Dry Bed to use gains on the Snake to Lorenzo which are below its point of diversion.

If the third option is not chosen, the fourth option with a new Dry Bed gage at Rigby should be considered. The Dry Bed and Snake River from the Dry Bed to Lorenzo and Rigby would become one reach and the gains and losses would be shared evenly by all canals.

sjl
Attachment



HEISE-LEWISVILLE REACH
OF SNAKE RIVER

	WORK REQUEST	PURPOSE	NEEDED BY	DIRECTED TO
1.	Review all support programs for possible improvements in efficiency.	Computer costs appear to be excessive	1 Nov 79	B. LINDSAY
2.	Write program to interpolate shift, store it, and compute daily flow	Make data handling manageable		B. LINDSAY
3.	Digitize charts, write any necessary program changes for handling the data.	Improve accuracy of diversion data for major canals.		R. MELLIN B. LINDSAY
5.	Write program to allow the Watermaster Office to make program changes directly.	Minimize dependence on state office.		B. LINDSAY
6.	Modify accounting program to include exchange wells	Relate total water use to sources including GW exchg.		A. ROBERTSO
7.	Write documentation for allocation program.			A. ROBERTSO

2 May 79

Dan Yribar — USBR
Leo Busch — "
Keith Ebersal — "
Alan Jensen — "
Ron Carlson — Dist 1 WM
Lyle Swank — " , DWM
Bob Sutter — IDWR
Alan Robertson — "

AGENDA

1. 1978 ACCOUNTING SUMMARY

   A. Carry over 1977 to start 1978 accounting. RJS

   B. Allocation process. RC

   C. End of flood control operations.—

   D. Unaccounted for storage.

   E. Storage allocations.

   F. 1978 carry over.

2. CHANGES FOR 1979

   A. Input gage heights.

   B. Allocating unaccounted for storage to reservoirs.

   C. Include Snake River near Lorenzo and at Blackfoot.

   D. Flow passing power plants,

   E. Add Milner.

   F. Additional diversions.

   G. Exchange wells.

3. JOINT PROCESS

   A. Data entry responsibilities.

   B. Flood control ends.

   C. Determining from which reservoir flood releases were made.

   D. Canal allocations by Bureau from computed fill.

   E. Carry over by account.

Darrel

MEMORANDUM

TO: Ron Carlson and Water District 01 File DATE: July 25, 1979

FROM: Bob Sutter and Alan Robertson

SUBJECT: Island Park Reservoir Storage Rights

According to Department of Water Resources records, there were originally two water rights for storage of water in Island Park Reservoir. These are:

License 21-2156, 114,000 acre-feet, 14 Mar 1935
License 21-2157, 21,000 acre-feet, 12 Jun 1940

The priority dates of these rights were apparently altered by contracts between the United States and various canal companies for the Palisades Project. These contracts became recognizable by the State subsequent to inclusion in court decrees.

Under these contracts, all canal companies agreed to recognize License 21-2157 as having the same priority as License 21-2156, 14 Mar 1935.

Secondly, the contracts state that water saved by non-irrigation season curtailment of power at Minidoka (i.e. not demanding that the 2,700 cfs power right at Minidoka be filled) is to be credited first to Island Park Reservoir up to a maximum of 45,000 acre-feet, ahead of all other rights.

In order to accomplish this in the District 01 accounting program, Island Park was assigned a storage right of 45,000 acre-feet with a priority date of 29 Mar 1921. This date is the same as the priorities used for the winter water saving space in American Falls and Palisades. It is prior to the American Falls and Palisades main rights, but later than Jackson Lake, Walcott, and Henrys Lake rights.

There is probably a better method to handle this right, but more needs to be known about it before we make any changes. The following questions should be answered:

1. Should storage of water under the 45,000 acre-feet right be subject to the available supply at Island Park?
2. Should storage of water under the 45,000 acre-feet right be credited only to the amount of the difference between 2,700 cfs and the actual flow at Minidoka?
3. Is there any other basis for the 45,000 acre-feet than that mentioned in the Palisades Contract?

The latter question relates to early (1934) letters which discuss power curtailment at Shoshone Falls which would result in 45,000 acre-feet savings storable at Island Park. Is there an early contract with Idaho Power that also does this?

Because these rights have been modified by Bureau of Reclamation contracts, we do not have enough information in our office to properly administer them. We recommend that legal research on these questions be undertaken and, hopefully, completed before November 1, the beginning of the 1980 year.

sjl

cc: Glen Saxton

Darrel

MEMORANDUM

TO: Ron Carlson DATE: May 29, 1979

THRU: Bob Fleenor

FROM: Alan Robertson

SUBJECT: Ririe Reservoir Management

This is to call your attention to the marked paragraph on the attached page 15 from the USBR 1978 Water Management Status Report for the Minidoka Project. It appears that neither the districts nor the Bureau understand the method of accounting for water stored at Ririe.

Since Ririe cannot be credited with storage until its right is approved, the daily storage use by Willow Creek diversions should be limited to the flow in Eagle Rock canal at the end. During most of August, 1978, this constraint was violated. The Progressive and individual Willow Creek diverters, therefore, had the benefit of Ririe storage. It appears to me that we should notify the Willow Creek users that it will not be allowed to happen in 1979.

Actual regulation would be simplest if you could get the Bureau to not draft Ririe until after the irrigation season. Otherwise, it would be necessary to limit Willow Creek diversions to make sure that a flow equal to the negative storage changes at Ririe be passed at the floodway near Ucon gage.

ACR:cs

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WATER DISTRICT NO. 1

John V. Evans
Governor

C. Stephen Allred
Director

1515 Lincoln Road
Idaho Falls, Idaho 83401
(208) 522-5404

May 22, 1979

Mr. Carlos Randolph
Bureau of Reclamation
P.O. Box 549
Burley, Idaho 83318

Dear Carlos:

On May 2, 1979, we had the opportunity to discuss our computer allocation procedures with Leo Busch and Keith Ebersol of your office, and Dan Yribar and Alan Jensen from the Boise Office. I appreciated this opportunity and am confident that it will help in a better understanding between the Bureau of Reclamation and the State of Idaho.

In reviewing my notes of this meeting, I find several agreements that have been made between the Bureau and Water District 1 and would like to confirm these agreements to avoid any future misunderstandings which may arise.

The Burley Office of the BOR will enter data for the following stations each day for the Water District 1 accounting program:

Jackson Lake	Willow Creek blw Tex Creek
Snake River nr Moran	Ririe
Palisades	Willow Creek nr Ririe
Snake nr Irwin	Snake River nr Shelley
Snake nr Heise	Snake River nr Blackfoot
Snake nr Lorenzo	Falls Irrigation
Henrys Lake	American Falls
Henrys Fork nr Lake	Snake at Neeley
Island Park	Minidoka North
Henrys Fork nr Island Park	Minidoka South
Grassy Lake	Lake Walcott
Grassy Lake Outlet	Snake nr Minidoka
Henrys Fork at St. Anthony	A & B Irrigation
Teton nr St. Anthony	PA Lateral
Henrys Fork nr Rexburg	Milner Low Lift

A Lateral Diversion	Milner Reservoir
N.S. X-Cut Gooding	Snake at Milner
Reservoir District #2	Minidoka power flows
Twin Falls North	American Falls Power flows
Twin Falls South	

Each time the Water District's accounting program is used the output will be available to the Burley Office of the BOR through its Data Point 1500 system.

Water District 1, through the use of its allocations program, will calculate and provide to the Bureau the fill it recognizes for each of the Bureau reservoirs. Burley will, in turn, advise us of the storage allocations for the year for each entity holding space in a federal reservoir. Water District 1 will then account for the storage used by each space holder and will, at the end of the season, advise the Bureau of the total storage used. The BOR will then advise Water District 1 of the amount of water that has been used from each of its twenty (20) water right accounts. Given this information, we will then calculate carry-over and adjust each water right account accordingly to allow water again to be credited to each water right at the end of the irrigation season.

I am confident that this agreement will go far to remove some of the uncertainties inherent in past procedures, and will help promote the cooperative effort that is so vital to an efficient distribution system on the Upper Snake.

Very truly yours,

Ron

RONALD D. CARLSON
Watermaster

RDC:cw

INTER-DEPARTMENT MEMO — 1

FROM Glen S

DATE 5-30-79

TO Alan R

SUBJECT Storage – Henry's Lake

I have reviewed this matter again & have discussed it w/ Ron C. He agrees that the total storage rights can not exceed 90,000 A.F., but that apparently was not his question. He apparently wants to know how you are accounting for right 21-2154 in the amt of 4000 AF in your program, assuming that right might be used during a particular year to provide part of the 90,000 A.F.

SIGNATURE

Bob Sutter

R. KEITH HIGGINSON
State Reclamation Engineer

STATE OF IDAHO

DEPARTMENT OF RECLAMATION
STATEHOUSE – ANNEX 2
BOISE, IDAHO 83707

September 5, 1969

Mr. Art Larson, Watermaster
Water District No. 36
P. O. Box 697
Idaho Falls, Idaho 83401

Dear Mr. Larson:

Regarding the recent conversation you had with Keith Higginson concerning the water rights for the North Fork Reservoir Company on Henry's Lake.

Our records indicate there are two licensed rights on Henry's Lake, and one permit right. The licensed rights are:

What about 21-2074 Lic. No. 1252 5/15/17 4000 A F.

21-2152 R-75 for 79,350 acre feet with a priority date of 5-15-1917
21-2154 R-324 for 4,000 acre feet with a priority date of 9-14-1923 and the
21-2161 Permit Right is R-1211 for 10,650 acre feet with a priority date of 7-29-1965

79,350
4,000
91,000

In accord with the Idaho Code, you would allow storage to occur in Henry's Lake up to the cumulative total of the three above rights. It appears that the storage is somewhat less than the three rights; therefore, the capacity of the reservoir would govern the amount of water that could be stored. In distributing these rights, the dates of priority would have to be followed to insure that prior rights were not injured in allowing the company to store water. Because the last session of the legislature revised the code and provided for the distribution of licensed and permit rights on an adjudicated stream, you are now able to distribute the three rights on Henry's Lake as adjudicated rights are distributed.

I hope this answers your questions. If we can be of further help, please notify us. It is our intention at a future date to transmit to you, a summary of the water rights within your district. This should aid immensely in your task of distributing the water of district 36.

Sincerely,

A Kenneth Dunn

A. KENNETH DUNN, Assistant
State Reclamation Engineer

AKD:mjl

June 20, 1963

Re: R-75; 13122; R-324
North Fork Reservoir

H. C. Eagle
Engineer-in-Charge, U.S.G.S.
Watermaster, Water District 36
Idaho Falls, Idaho

Dear Mr. Eagle:

In R-75 — This is to correct the second paragraph in our letter of June 19, to read:

"It is the opinion of the writer that permits R-75 and 13122 are the original filings on Henrys Lake and that R-324 is on water from a supplementary source - Dry Creek - to fill the existing reservoir under R-75. Also, that diligent search through our files fails to show any documents or references indicating that the reservoir capacity is recorded as being over 79,350 acre-feet. As a matter of fact, the engineers who examined the completed works under R-75 and R-324 before licensing, show reservoir capacity on their sketch maps as 79,350 acre-feet. The engineer examining R-324 states in part, 'These works consist of a dam about 250 ft. long on top and about 20 ft. high . . . and creates a storage reservoir of about 78,000 acre-feet capacity, and it is for the filling of this reservoir that this right is sought.' "

Trust this will clarify the meaning of the paragraph.

Very truly yours,

CARL F. TAPPAN, Acting
State Reclamation Engineer

By:

H. PETRI
State Water Rights Clerk

HP:ew

R.

DISTRICT I ACCOUNTING

December 7, 1978

Ron Carlson, Bob Sutter, Alan Robertson

A. FINAL 1978 ACCOUNTING

(1) Will be run from March 1.

(2) Reservoir accounts on February 28 will be estimated from actual reservoir contents in November, 1977, and total natural flows for November-February period. Accrual of water in the Jackson Lake accounts will be based on proportionately reduced rights.

(3) Ron will input data beginning February 1, 1978. Done

(4) Storage use by diversions during periods of Milner spill after March 1 will be zeroed out.

(5) After Milner spill stops (about June 1) storage use will be recorded and used in computing the diversion storage allocations.

(6) Diversion storage allocations will be computed by Ron with USBR after maximum storage accrual occurs (early July).

(7) To allow storage to again accrue in the early fall, Ron will reduce the reservoir accounts in accordance with a use sequence specified by USBR. These are: (1) Jackson Lake (proportionally between the three rights), (2) American Falls, (3) Palisades.

(8) The final 1978 accounting will include the list of diversions and rights sent to Boise on November 27, 1978, plus one additional list to be sent in during the week of December 11. Hydrology Section will assign numbers for those diversions which do not already have them.

(9) The final accounting will be run as soon as all data are entered and checked, but must be completed in early January.

(10) The last day of the 1978 season will be defined as October 31, 1978.

B. 1978 WATERMASTER REPORT

(1) Will follow approximately the outline prepared by Alan.

(2) Hydrology Section will provide draft text describing accounting procedures.

C. 1979 ACCOUNTING

(1) New gages will include Lorenzo, Blackfoot, and Willow Creek floodway at end.

(2) Diversions will be measured if they occur in the winter.

(3) Ron will begin entering power diversions as soon as arrangements can be made.

(4) Swan Valley diversions will probably be included in the 1978 accounting.

November 3, 1978

MEMORANDUM

TO: Director

THROUGH: Darrel Clapp

FROM: Alan Robertson

SUBJECT: Watermaster Accounting Program(s)

We consider that our part of this work is essentially completed. The allocation program was developed in two steps: (1) the basic allocation computations using after-the-fact data, and (2) projection of certain data forward to permit current-day assessment of the water rights status. Item (1) was ready when the equipment and data entry permitted its use (early summer). Item (2) was completed in September and it was used in the late season. Like other computer programs they will continue to be modified, as necessary, in the future.

The commitment to change District 1 accounting is much larger than just development of the computer program. During 1978 allocations were made to the same list of water rights that had been used in prior years plus the Willow Creek rights. None of the pumps or headwater diversions (such as in the Teton basin) were included because the water rights have not been adequately identified.

A number of related computer programs will also have to be completed. These include listing of the seasonal data for the watermaster report (Beverly is working on this), a billing program, reduction of recorder chart data to mean daily flows (Garth has written the program, but it has not been tested yet), a program to allow use of stage data rather than flows, and possibly others. Since most of this work is data management for which FORTAN is not well suited, I believe it should be done by programmers rather than in the Hydrology Section.

ACR:cs

File:

Minutes of Meeting on Upper Snake Computer Operations

August 21, 1978

Attendees:

Chuck Carman	Harold Brush	Alan Robertson
Keith Ebersole	Dave Shaw	Bob Sutter
Dan Yribar	Bob Fleenor	Ron Carlson

Discussion Points:

1. Keith Ebersole will supply to the system by 9:30 a.m. reservoir data, streamgage data available by telephone, and canal data below Blackfoot. (North Fork gages will have BDT's (binary decimal transmitters) available soon.)

2. Burley Office should build off-line file on terminal for transmission to both a modified CYBER program and the State computer.

3. Ron Carlson will run the watermaster model by 3:00 p.m., including all diversions and water rights in effect.

4. CYBER programs should be modified to accept additional stations now available, such as Willow Creek below Tex Creek.

5. Determination should be made whether or not the Regional Office can communicate with the synchronous State computer.

6. The State will soon publish a watermaster model manual.

7. State will write letter covering terms of maintaining State-owned terminal in the Burley Office for Bureau signature. Bureau prefers parts and labor contract rather than monthly maintenance fee. Bureau will supply all expendables and wants 90-day notice of pullout.

8. Bureau will write agreement for State/Bureau management signature stating services to be provided by State, Bureau, and watermaster. This agreement will later be modified to include Hydromet.

9. Bureau will get daily Heise-Shelley and Shelley-Blackfoot diversions from watermaster model. Ron Carlson will provide missing May-June diversions by end of August.

10. Watermaster model Neeley-Milner gain computations will continue to be observed by the Bureau. Planned inclusion of many additional diversions in the model should improve natural flow in the lower system.

United States Department of the Interior

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724

RECEIVED
AUG 15 1978
Department of Water Resources

IN REPLY
REFER TO: 762

AUG 14 1978

Mr. Alan Robertson
Department of Water Resources
State of Idaho
373 W. Franklin
Boise, ID 83702

Dear Mr. Robertson:

Enclosed is an agenda for a meeting on August 21, 1978, concerning interchange of computer data in daily operations of Water District 01. It is hoped that this meeting will help solve or prevent problems surrounding the transition to automated data on the Upper Snake. If you are unable to attend, please call Mr. Harold Brush at 384-1381.

Sincerely,

Larry Kinsbrader

Regional Planning Officer

Enclosure

cc: Ron Carlson, District 01 Watermaster, Idaho Falls, Idaho
Keith Ebersole, Minidoka Project Office, Burley, Idaho
Charles Carman, Regional Data Processing, Boise, Idaho
(w/enclosure to each)
Dave Shaw, Idaho Dept. of Water Resources, Boise, Idaho (w/enclosure)

Agenda
for
Meeting on Interchange of Computer Data
Between Bureau of Reclamation and State of Idaho
August 21, 1978, 9:00 a.m.
Room 421
Regional Office, Bureau of Reclamation

1. Discussion of information needed daily by Project Office and Regional Office.

   a. Status of water rights
   b. Natural flow at selected points
   c. River gain in selected reaches
   d. Reservoirs and strategic gaging stations in the system
   e. Accumulation of storage used
   f. Diversions

2. Determination of daily information needed by the State and the Watermaster.

3. Recap of who is collecting and tabulating data needed in Items 1 and 2.

4. Discussion of how the following are completed:

   a. Data needed by Regional Office from Burley to Denver by 9:30 a.m. each day.

   b. Data needed by Watermaster or State from Burley to State computer by _____.

   c. Data needed by Burley from Watermaster to State computer by _____.

   d. Output needed by Burley from State computer by _____.

   e. Output needed by Regional Office from State computer by _____.

5. Discussion of whether computer programs are needed to help move data to, from, and between systems. If so, who will write them?

6. Arrangement of loan agreement for State terminal located in Minidoka Project Office.

   a. Maintenance
   b. Advance notice before removal
   c. Supplies
   d. Etc.

7. Discussion of overall picture for management (what this cooperative effort is supposed to accomplish, what each agency's responsibilities and obligations are, etc.).

Exchange of data - WM - Burley.
Letter of

INTER-DEPARTMENT MEMO — 1

FROM Glen Saxton DATE 6-26-78

TO Bob Sutter

~~SUBJECT~~ You asked last week if the Dept's program should account for stored water as related to some districts optional saving of Winter water. There is probably no reason why the program should not keep a record of that stored water in a similar credit & debit manner as is appropriate ~~to any~~ uses of stored water

GLS
SIGNATURE

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GLS
SIGNATURE

May 2, 1978

COPY

MEMORANDUM

TO: Bob Fleenor, Glen Saxton, and Steve Allred

FROM: Alan Robertson

SUBJECT: Priorities of Storage Rights for District 1 Accounting

Based upon a memo (enclosure 1) from the USDI field solicitor to USBR and data (enclosure 2) from Alan Jensen, USBR, it appears that the federal storage priorities should be treated as shown in enclosure 3. The basis for separating the priorities between winter and summer is contained in the last paragraph of the solicitor's memo in which he makes it clear that the winter water contracts changed only the winter storage priorities.

Since the winter water savings contracts, which are made a part of the decree, clearly state that the contracting canals cannot divert for 150 days, we will assume these canals have no diversion rights from 1 November through 30 March. This involves all canals shown on enclosure 2 except number 42, the North Side Canal. The North Side and Twin Falls canals participate in the winter water savings program, but only at their option, therefore, it does not appear that any winter diversion rights they may have have been affected by their contracts.

Advancement of 45,000 acre feet of the Island Park's right to 29 March 21 is apparently based on pages 62 and 63 of the Aberdeen Springfield vs. Henry Eagle decree which relate to storing winter flows made possible by curtailing power generation at Minidoka Dam. Advancement of the 12 June 1940 right of 21,000 acre feet in Island Park to 14 March 35 is based upon page 55.

Bob Sutter and I discussed these storage priorities in a meeting on April 24 with Alan Jensen, Dan Yribar, Rich Allen, and Perry Harrison of USBR.

ACR:rg
Encls.

MEMORANDUM

TO: Steve Allred DATE: July 20, 1978

THRU: Darrel Clapp

FROM: Alan Robertson

SUBJECT: Progress on Water Accounting Program

The program is currently operational. The Watermaster is now receiving regulation reports as data are entered by his office. Thus far, the regulations run have not been adequate for cutting rights and we understand that Ron is using calculations made by Art Larson to regulate diversions. These problems have been due almost entirely to data inadequacies over which we have no control. These include:

(1) data entry errors,

(2) delays in getting all necessary data,

(3) backlog of two months of data not entered which prevents proper storage accrual and use determination.

AR/sjd

FILE:

STORAGE RIGHTS
DISTRICT 1

CONTINUOUS FULL YEAR

	RESERVOIR	FLOW (cfs)	VOLUME (ac ft)	PRIORITY	REMARKS
1	JACKSON LAKE		298,981	23 Aug 06	Wyo
2	LAKE WALCOTT	2500	97,000	14 Dec 09	
3	JACKSON LAKE		138,829	8 Aug 10	Wyo
4	JACKSON LAKE		409,190	24 May 13	Wyo
5	HENRYS LAKE	1000	79,350	15 May 17	

1 NOV - 30 APR

6	PALISADES		259,600	29 Mar 21	winter wtr svgs
7	ISLAND PARK		45,000	29 Mar 21	" power curtailment
8	AMERICAN FALLS		159,400 1/	29 Mar 21	" wtr svgs
9	AMERICAN FALLS		1,540,600 2/	30 Mar 21	
10	ISLAND PARK		90,000	14 Mar 35	USBR contract, p 55.
11	GRASSY LAKE		15,204	13 Feb 36	Wyo
12	PALISADES		940,400	28 Jul 39	
13	HENRYS LAKE		10,650	29 Jul 65	
14	RIRIE		80,000	16 Jun 69	

1 MAY - 31 Oct

6	AMERICAN FALLS		1,700,000 3/	30 Mar 21	
7	ISLAND PARK		135,000	14 Mar 35	USBR contract, p 55.
8	GRASSY LAKE		15,204	13 Feb 36	Wyo
9	PALISADES		1,200,000	28 Jul 39	
10	HENRYS LAKE		10,650	29 Jul 65	
11	RIRIE		80,000	16 Jun 69	

1/ REDUCED TO 156,830 DUE TO SILTATION

2/ REDUCED TO 1,515,760 DUE TO SILTATION

3/ REDUCED TO 1,672,590 DUE TO SILTATION

DISTRICT 1 DIVERSION NUMBERS

	No.	Name	Diversion From	Quad
13	060005	Alan Cannon, Jr	Snake R	Woodville
	060055	Pete Hill	" "	"
	062471	Jay Wadsworth	" "	Morelan
	058994	I. F. Monroc, small	" "	I.F. S.
	058995	I.F. Monroc, large	" "	" "
	057149	Wayne Ward TR	" "	I.F. N.
	062453	Blackfoot Monroc	" "	Blackfoo
	062447	Hopkins Packing [Chgd No]	" "	"
	061677	Richard Lambert	" "	Rose
	038113	Merlin Hill	Dry Bed	Ririe
	038428	Ross Burns	Reid Canal abv gage	"
	038432	Wilcox	Texas slough	"
	057118	Loren Brown	Snake R	Lewisville
	038383	Idaho Fresh Pac	Dry Bed 2 mi W of Lewisville	"
	057140	V. O. Hegsted	Snake R	"
	057123	Bear Island East	Great Western abv gage	"
	057036	Grant Gunderson (2)	Snake R slough	Deer Parks
	054515	Canyon Cr Canal	Canyon Cr Canal	Wright Cr
	047695	Conant Cr Canal	Conant Cr	Drummond
	062460	Wearyrick	Snake R	
	062476	Watson	"	
	062481	Parsons	"	

DIVERSION NUMBERS

	No.	Name	Diversion from	Quad
	037305	Ira Spaulding E	Snake R	Heise SE
	037307	Ira Spaulding W	" "	" "
13	032505	Paul Bird pump no 1	Snake R	
	032510	Paul Bird pump no 2	" "	
	032515	Boy Scout pump	" "	
	032520	Limon Chusman pump	" "	
	032905	Holden diversion	Palisades Cr	
	033005	Weeks ditch	" "	
	033010	Palisades Canal	" "	
	033643	Jerry Fleming pump	Snake R	
	033646	Taylor Lott pump no 1	" "	
	033670	Beasley pump	" "	
	033675	Etzel Troughber	" "	
	033690	Taylor Lott pump no 2	" "	
	033698	Taylor Lott diversion	Indian Cr	
	034405	Corbet diversion	Rainey "	
	034408	Ivan Weeks diversion	" "	
	034410	Francis Beam div.	" "	
	034415	Gutchey & Shortliff	" "	
	034418	Weeks & Hyme	" "	
	034430	Archie McKay	" "	
	034440	Danny Troughber pump	" "	
	034441	Van Duren diversion	" "	
	034450	Peterson & Griffet	" "	
	034460	Lloyd Jacobsen pump	" " trib	
	034470	Griffet pump	" " "	
	034480	Wellington Bitten pump	" " "	
	033905	Brandywine slough	Snake R slough	
	037473	Brown tr pump	Riley C abv gage	
	037510	Blakely pump no 1	Snake R	
	037515	Blakely pump no 2	" "	
	037520	Heise canal	" "	
	037855	South Newby pump	Heise C, Kelly Cr	
	037860	North Newby pump	" "	
	037880	Newby river pump	Snake R. N channel	
	037979	Fox pump	" "	
	037984	Nelson pump	Great Feeder	
	037997	Hickman tr pump	" "	

12 Dec 78 R

DISTRICT 1 DIVERSION NUMBERS

	No.	Name		Diversion from
13	045807	Reid Richey		Henrys Fk
	047616	Ralph Sturm		Falls R.
	048278	Billy Bischoff		Conant Cr.
	047565	Russell Baum		Fall R.
	047530	Carl Lenz		" "
	048052	Hal Harringfield		Unnamed spr., trib to Squirrel Cr
	046084	Dick Nedrow		Henrys Fk trib 2 mi W. of Ashton
	055193	Norval Birch		Teton R, N. Fk.
	055317	R. Ricks		Teton R, S. Fk
	055328	Willis Walker		" " " "
	055325	Terry Brunson	[changed No]	" " " "
	055327	Gordon Wright		" " " "
	055319	Russel Wilding		Slough 1.5 mi E of Sugar City.
	048485	R. D. Miller		Fall R
	054822	Canyon Cr Lateral users		Teton R
	054420	Bob Parkinson		Teton R abv Canyon Cr
	054705	Val Schwendiman		Teton R blw " "
	054708	Carl Olsen		" " " " "
	048160 ~~047710~~	Keith Nyborg	[chgd No.]	Conant Cr
	055263	Jerry Harris		Teton R, N. Fk
	054590	Wayne Stevens		Canyon Cr
	054577	J. Neeley #1		" "
	054580	" " #2		" "
	054530	" " (Pony Cr.)		Pony Cr.
	045823	Richard Baker	[changed no]	Henrys Fk trib 3/4 mi N of Ashton
	~~045827~~	~~Jack Jassen~~		" " " 1½ " " " "
	045829	David Larson	[changed No.]	" " " " " " " "
	045811	Arden Stewart	(lower pump)	Henrys Fk
	046030	Carl Lenz HF		" "
	055323	City of Rexburg Canal	[formerly 055325]	Teton R, S. Fk.
	055326	James Wright		" " " "
	055345 ~~055313~~	Ed Gardner	[chgd no]	" " " " slough (Middle Fk ?)

	No	Name		Diversion From	Quad
13	038047	Covington XG well		Into Great Feeder abv Harrison	
	038393	Covington pump		Snake R	
	038405	Parkinson pump		"	
	038410	Sutton pump		"	
	038416	T. Cheny tr pump		N channel Snake	
	038417	M Cheny pump		" " "	
	038421	M Cheny ditch		" " "	
	038422	Lyle Robinson ditches (6)		Lenroot C abv gage and slough	
	038438	Roth pumps		Bannock Jim slough	
	038201	White Island pump		Great Fdr	
	038331	Jefferson Hills pump (E)		" "	Rigby
	038332	Jefferson Hills " (W)		" "	"
	038333	Hawkins-dellos pump		" "	
	038352	J.W. Jones pump		" "	
	038368	Fresh Pack pump		Slough trib to Dry Bed	
	038371	J T Jones pump		Dry Bed	
	038373	Norman Taylor pump		" "	
	057008	Jim Maupin pump		Snake abv Menan RR br	
	057013	Aden Gunderson pump		Butte & Mkt L. C. abv gage	
	057012	Harriert pump		" " " " "	
	057014	Ray-C. Miller pump		" " " " "	
	057015	Ray Miller S pump		" " " " "	
	057016	Ray Miller N pump		" " " " "	
	057018	Boyle ditch		" " " " "	
	057021	Butte Slough pump		Butte Slough	
	057031	Grant Gunderson pump		Slough N. of Snake nr RR br.	
	056705	Charles Thomason pump		Henrys Fk slough 1.6 mi E of Big Menan Butte	
	057030	Bear Trap Canal		Snake R	
	057038	Ellsworth pumps		Ponds S. of Deer Parks	
	057046	H Tomchak pump		Snake R.	
	057097	Fullmer pump		Spring Cr nr mouth	
	057105	Dean Boyce pump		Snake R	
	057106	B Tomchak pump		" "	
	057107	Clyde Boyce div		" "	
	038382	Reed Hunter pump	formerly 038384	Dry Bed W of Lewisville	
	038384	Vaughn Hunter pump	formerly 038384	" " " " "	
	038386	Erickson pump	formerly 057112	Dry Bed near end	
	057114	Steinke pump		Snake R.	

	No.	Name		Diversion from
13	045655	George Mortz (HF)		Henrys Fk
	045675	Lavar Cherry (BC)		Blue Cr
	045705	Forrest Howell		" "
	047510	Earl Griffel		Falls R.
	047515	Fred Griffel		" "
	047570	Henry Griffel		" "
	047900	Boom Cr Canal	—	Squirrel Cr
	048025	Squirrel Cr Canal	—	" "
	048050	Orem Canal	—	" "
	048080	Randlen & Harshbarger		" "
	048250	Bergman		Conant Cr
	048265	Zundell		" "
	048275	Lynn Loosli		" "
	048280	C & L Loosli		" "
	048290	Curtis Loosli (CC)		" "
	048300	Conant Cr nr mouth		" "
	047605	Anna Bergman		Falls R.
	047610	Everett Hesseman #2		" "
	047611	" "		" "
	047615	G. Mortz (FR)		" "
	047625	Mary Griffel		" "
	047635	Curtis Loosli (FR1)		" "
	048350	Jay Hill		" "
	048430	Dan Reynolds (FR)		" "
	048440	Curtis Loosli (FR2)		" "
	048470	Earl Potter		" "
	048480	Leon Martindale (FR1)		" "
	045710	Lavar Cherry (HF)		Henrys Fk
	045721	Edward Howell (SC1)		Strong Cr
	045724	" " (SC2)		" "
	045727	" " (SC3)		" "
	045755	Tom Holcomb		Henrys Fk
	045780	Bob Lee		" "
	045805	Z.G. Egbert (HF1)		" "
	045810	Arden Stewart		" "
	045813	Z.G. Egbert (HF2)		" "
	045849	Dick Seeley		Willows Cr
	045823	Richard Baker (HF4)	(chgd No 12 Dec 78)	Henrys Fk trib 3/4 mi N. of Ashton
	045829	David Larson	(chgd No 12 Dec 78)	" " " 1 " " " "

	No	Name		Diversion from
	0571 15	Carlson pump (N)		
13	0571 ~~16~~ 17	Carlson pump (S)		Snake R.
	0571 ~~17~~ 16	Carter pump		" "
	0571 19	Arrington N pump		" "
	0571 22	Arrington S pump		" "
	0571 21	Martin pump	formerly 057123	" "
	0571 ~~41~~ 42	McKay pumps (2)		Idaho C abv gage
	0571 ~~42~~ 43	Yorgenson pump		" " " "
	0571 24	Smith pump		Great Western C abv gage
	0571 26	Clemens pump		" " " " "
	0571 28	Kennedy diversions (3)		" " " " "
	0571 71	Butikoffer pump		Snake R.
	0599 90	Lyons pump		" "
	0599 05	Don Wadsworth pump		" "
	0599 10	Roy Hult pump		" "
	0615 22	Chet Adams pump		Peoples C abv gage
	0616 80	Christensen pump		Snake N channel
	0616 85	Stringham pump		Riverside C abv gage
	077755	Barkdull		Snake R

	No	Name	Diversion from
13	045860	Z.G. Egbert (HFt 1)	Henrys Fk trib N. of Ashton
	045880	" " (HF 3)	" "
	045930	" " (HF 4)	" "
	045940	George Nedrow	" "
	045950	Richard Baker (HF)	" "
	045960	Mac Reynolds (HF 1)	" "
	046015	Clark Baum	" "
	046020	John McCullach	" "
	046025	Mac Reynolds (HF2)	" "
	046070	Al Nedrow	Snow Cr
	046075	Jim Nedrow	Henrys Fk
	046080	E & S Clark	" " trib 2 mi W of Ashton
	046083	Darrel Kirkham	" " " " " " "
	046086	LaRue Fransen	" " " SW of Ashton
	046090	Lloyd Bratt	" " " " " "
	046095	Lynn Loosli (HF+)	" " " " " "
	046205	Dan Reynolds (SN)	Sand Cr
	046315	John Seeley (HF)	Henrys Fk
	048551	Leon Martindale (FR2)	Falls R via Bell
	049490	John Seeley (FR)	" "
	049495	Gail Blanchard	" "

DIVERSION	
1 JACKSON LAKE	
2 PALISADES	
3 RILEY	13037475
4 ANDERSON	13037505
5 EAGLE ROCK	13037975
6 FARMERS FRIEND	13037980
7 ENTERPRISE	13037985
8 BUTLER ISLAND	13038025
9 ROSS AND RAND	13038030
10 STEELE	13038050
11 HARRISON	13038055
12 CHENEY	13038065
13 RUDY	13038085
14 LOWDER & JENNING	13038090
15 BOOMER	13038095
16 KITE & NORD	13038098
17 BURGESS	13038110
18 CLARK & EDWARDS	13038115
19 EAST LABELLE	13038150
20 RIGBY	13038180
21 DILTS	13038205
22 ISLAND	13038210
23 W LABELLE & LONG	13038225
24 PARKS & LEWISVIL	13038305
25 NORTH RIGBY	13038315
26 BRAMWELL	13038360
27 ELLIS	13038362
28 NELSON	13038387
29 MATTSON-CRAIG	13038388
30 SUNNYDELL	13038392
31 ARNSBERGER	13038398
32 LENROOT	13038426
33 REID	13038431
34 TEXAS & LIBERTY	13038434
35 HILL PETTINGER	13038436
36 NELSON COREY	13038437
37 HENRYS LAKE	13049010
38 ISLAND PARK	
39 ASHTON POWER	
40 DEWEY	13046310
41 GRASSY LAKE	
42 YELLOWSTONE	13047305
43 MARYSVILLE	13047475
44 FARMERS OWN	13047575
45 ENTERPRISE	13048475

DIVERSION	
91 LOVETT NO 2	13058145
92 WALLACE REID	13058165
93 SARGENT & SUMMER	13058210
94 DORTCH PUMPS	13058230
95 REED PUMPS	13058250
96 SPERRY	13058270
97 CRVAL AVERY	13058290
98 ROY AVERY	13058310
99 STUKEY PUMPS	13058380
100 ROY COOPER	13058380
101 PROGRESSIVE(W) S	13058510
102 IDAHO ER SAND CR	13058515
103 PROGRESSIVE(W) W	13058530
104 IDAHO FALLS POWE	
105 WOODVILLE	13059505
106 SNAKE RIVER VALL	13059525
107 RESERVATION	13060500
108 BLACKFOOT	13061430
109 NEW LAVA SIDE	13061520
110 PEOPLES	13061525
111 ABERDEEN	13061610
112 CORBETT	13061650
113 NIELSON-HANSEN	13061670
114 RIVERSIDE	13061705
115 DANSKIN	13061995
116 TREGO	13062050
117 WEARYRICK	13062503
118 WATSON	13062506
119 PARSONS	13062507
120 FT HALL MICHAUD	13075900
121 FALLS IRRIGATION	13076400
122 AMERICAN FALLS	
123 AMERICAN FALLS P	
124 MINIDOKA NORTH S	
125 MINIDOKA STH (*)	
126 LAKE WALCOTT	
127 MINIDOKA POWER	
128 A & B IRR DIST	
129 PA LATERAL (*)	
130 MILNER LOW LIFT	
131 GOODING PROJECT	
132 NS IN GOODNG (*)	
133 TWIN FALLS NORTH	
134 TWIN FALLS SOUTH	
135	

DIVERSION	
46 BELL	13048555
47 FALL RIVER	13048560
48 CHESTER	13048705
49 CURR	13049015
50 SILKEY	13049010
51 LAST CHANCE	13049550
52 CROSSCUT TO TETO	13049560
53 CROSSCUT TO FALL	13049561
54 FARMERS FRIEND	13049705
55 TWIN GROVES	13049710
56 ST ANTHONY UNION	13049725
57 SALEM UNION	13049805
58 EGIN	13050525
59 ST ANTHONY UNION	13050530
60 INDEPENDENT	13050535
61 CONSOLIDATED FAR	13050545
62 WILFORD	13055030
63 GOOD LUCK	13055035
64 TETON IRRIGATION	13055040
65 SIDDOWAY	13055042
66 PIONEER	13055050
67 STEWART	13055060
68 EAMES-THOMPSON	13055195
69 PINCOCK-BYINGTON	13055205
70 TETON ISLAND FEE	13055210
71 NORTH SALEM	13055245
72 ROXANA	13055275
73 ISLAND WARD	13055280
74 SAUREY	13055295
75 MCCORMICK-ROWE	13055306
76 PINCOCK-GARNER	13055311
77 WOLDMANSEE-JOHNS	13055315
78 CITY OF REXBURG	13055325
79 REXBURG IRRIGATI	13055329
80 BUTTE & MARKET L	13057025
81 CSGOOD	13057125
82 KENNEDY	13057130
83 GREAT WESTERN	13057135
84 BEAR ISLAND	13057139
85 IDAHO	13057145
86 PORTER	13057250
87 LOERTSHER	13057938
88 RIRIE RESERVOIR	
89 LOVETTS PUMP	13058105
90 FERGUSON	13058125

Minutes of Meeting on Upper Snake Computer Operations

August 21, 1978

Attendees:

Chuck Carman	Harold Brush	Alan Robertson
Keith Ebersole	Dave Shaw	Bob Sutter
Dan Yribar	Bob Fleenor	Ron Carlson

Discussion Points:

1. Keith Ebersole will supply to the system by 9:30 a.m. reservoir data, streamgage data available by telephone, and canal data below Blackfoot. (North Fork gages will have BDT's (binary decimal transmitters) available soon.)

2. Burley Office should build off-line file on terminal for transmission to both a modified CYBER program and the State computer.

3. Ron Carlson will run the watermaster model by 3:00 p.m., including all diversions and water rights in effect.

4. CYBER programs should be modified to accept additional stations now available, such as Willow Creek below Tex Creek.

5. Determination should be made whether or not the Regional Office can communicate with the synchronous State computer.

6. The State will soon publish a watermaster model manual.

7. State will write letter covering terms of maintaining State-owned terminal in the Burley Office for Bureau signature. Bureau prefers parts and labor contract rather than monthly maintenance fee. Bureau will supply all expendables and wants 90-day notice of pullout.

8. Bureau will write agreement for State/Bureau management signature stating services to be provided by State, Bureau, and watermaster. This agreement will later be modified to include Hydromet.

9. Bureau will get daily Heise-Shelley and Shelley-Blackfoot diversions from watermaster model. Ron Carlson will provide missing May-June diversions by end of August.

10. Watermaster model Neeley-Milner gain computations will continue to be observed by the Bureau. Planned inclusion of many additional diversions in the model should improve natural flow in the lower system.

May 31, 1978

COPY

MEMORANDUM

TO: Ron Carlson

FROM: Hydrology

SUBJECT: Diversion and Reservoir ID Numbers

Enclosed is a list of identification numbers for the diversions and reservoirs that we assume will be included in initial 1978 water right allocations. The numbers are consistent with the USGS numbering system and have been agreed to by USGS. At the May 5, 1978 meeting on the Upper Snake water right accounting system, it was agreed that we should include canals for which we had water right data as of May 15. To date we have rights only for the canals on the attached list.

Therefore, you should begin entering the data for these canals and reservoirs, plus data for the reaches (river gages) which we previously sent to you. If any of these canals for which we have assigned numbers do not exist now, please eliminate them and let us know so we can do the same. Or if any of them have either switched to multiple measurements or have been combined, let us know and we will reassign numbers. Other diversion data should be held until their water rights have been identified. We will then assign numbers so that the accumulated data can be entered.

RJS:cs

Enclosure

WILLOW CR. DIVERSIONS

	DIV No.	
LOERTSCHER	13-057938	
LOVETTS PUMPS	058105	We assume this is Progressive (only Snake)
FERGUSON	058125	" "
LOVETT, NO 2	058145	" "
WALLACE REID	058165	
SARGENT & SUMMERS	058210	
DORTCH PUMPS	058230	" "
REED PUMPS	058250	" "
SPERRY (?) (REED PUMP)	058270	We assume this is Sperry. Needs to be checked in Idaho Falls
ORVAL AVERY	058290	
ROY AVERY	058310	
STUKEY PUMPS	058330	We assume this is Progressive " "
ROY COOPER	058380	" "
PROGRESSIVE SAND	058510	
IDAHO FROM SAND	058515	25-0224
PROGRESSIVE (U)	058530	
FLOODWAY AT END	058550	

March 16, 1978

COPY

MEMORANDUM

TO: Ron Carlson

FROM: Alan Robertson

SUBJECT: Data Sites

Attached is a list of sites for which you will need to arrange to collect daily data. The list does not include any of the sites in the upper Teton because this appears to be somewhat undefined yet. I have included the diversion gages measured by USGS from American Falls downstream, but all other diversions are omitted on the assumption you are already making those arrangements. Certain special canal measurements are included to remind you of the need for these sites. (Examples: 0490.09, 0500.12, 0585.15, 0865.20, etc.)

Data collection should begin at all non-USGS gages as soon as possible; certainly not later than the date on which diversions begin.

ACR:rg

Enclosure

cc: Bobby Fleenor

FILE:

COPY

March 1, 1978

MEMORANDUM

TO: Ron Carlson

FROM: Alan Robertson

SUBJECT: Willow Creek Water Rights

Enclosed is the revised list of rights by diversion on Willow Creek which I have compiled from Dennis Dunn's memo and lists sent on 23 February. Please discard the previous list to avoid confusion later.

ACR:cs

Enclosure

cc: Bob Fleenor

File:

DRAFT RJS:cs 4-19-78

MEMORANDUM

TO: Director

FROM: Hydrology Section

SUBJECT: Power Rights on Snake River Above Milner

This years's water right allocation on Snake River will include power rights at various locations. Power rights will be recognized in order of priority date as equal in stature to diversion rights. Natural flow is used and preserved (not allowed to be diverted by junior rights upstream) at the power plant site when a power right is in effect, regardless of how much stored flow is also present at that location. This treatment preserves prereservoir conditions of natural flow distribution.

The amount of flow allocated to a power right will be designated as "power flow" and will be documented each day throughout the year. Once a "power flow" has left the power plant it will revert to natural flow status and is then distributed below that point the same as all other natural flow.

Power rights that will be recognized this year (1978) are listed below in order of priority date, unless we are notified otherwise. Multiple rights are considered additive.

Description	CFS	Priority
1. City of Idaho Falls	1500	29 Dec, 1905
2. American Falls	1400	3 Sep, 1908
3. Minidoka	2500	15 Jun, 1909
4. Minidoka	200	1 Jul, 1912
5. Ashton	1000	16 Jan, 1913
6. Ashton	500	1 Nov, 1915
7. American Falls	4600	8 Mar, 1919
8. Ashton	1000	7 Mar, 1924

RJS:

cc: Ron Carlson

Glen Saxton

Bob Fleenor

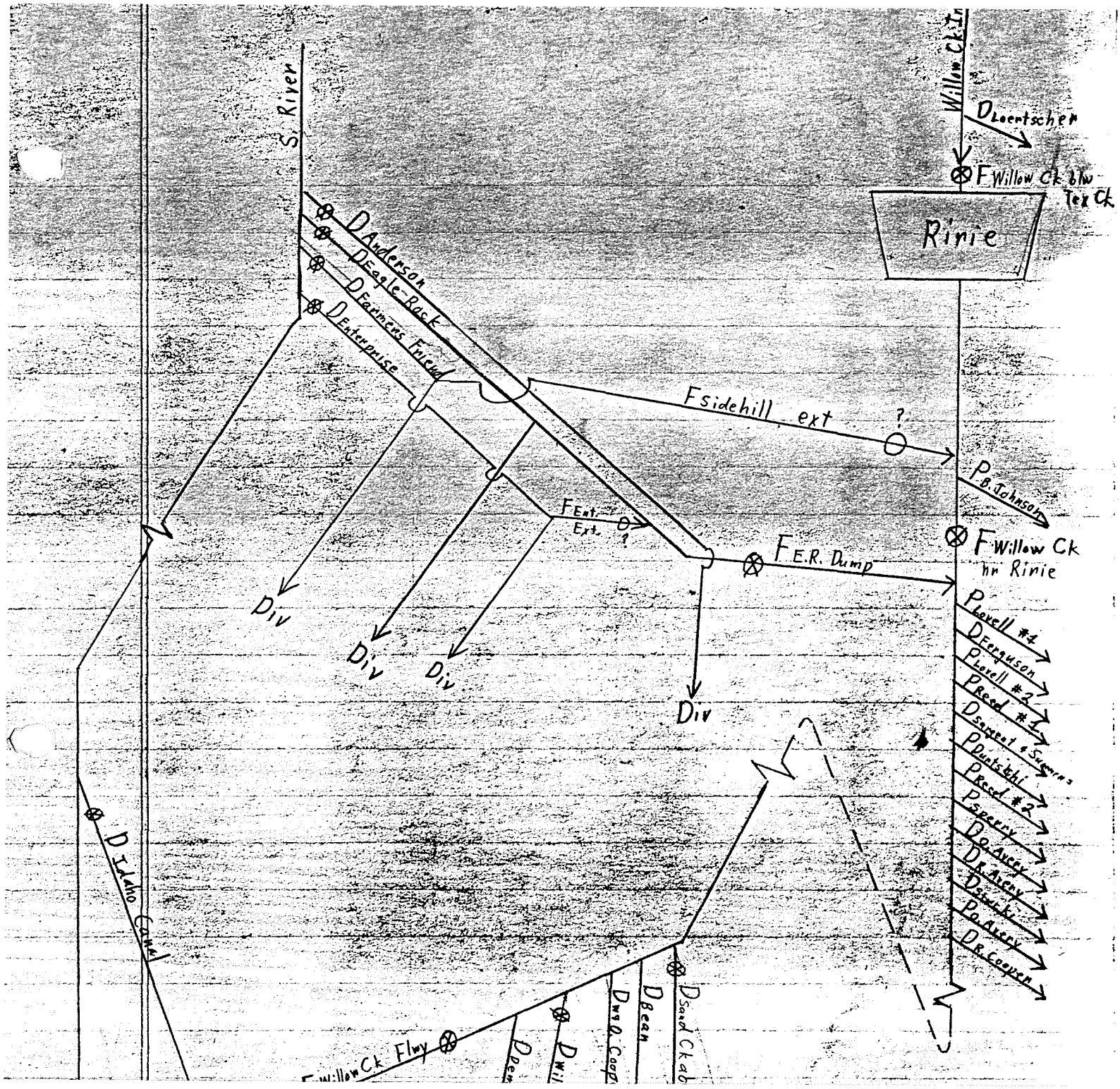
17 Feb 78
ACR.

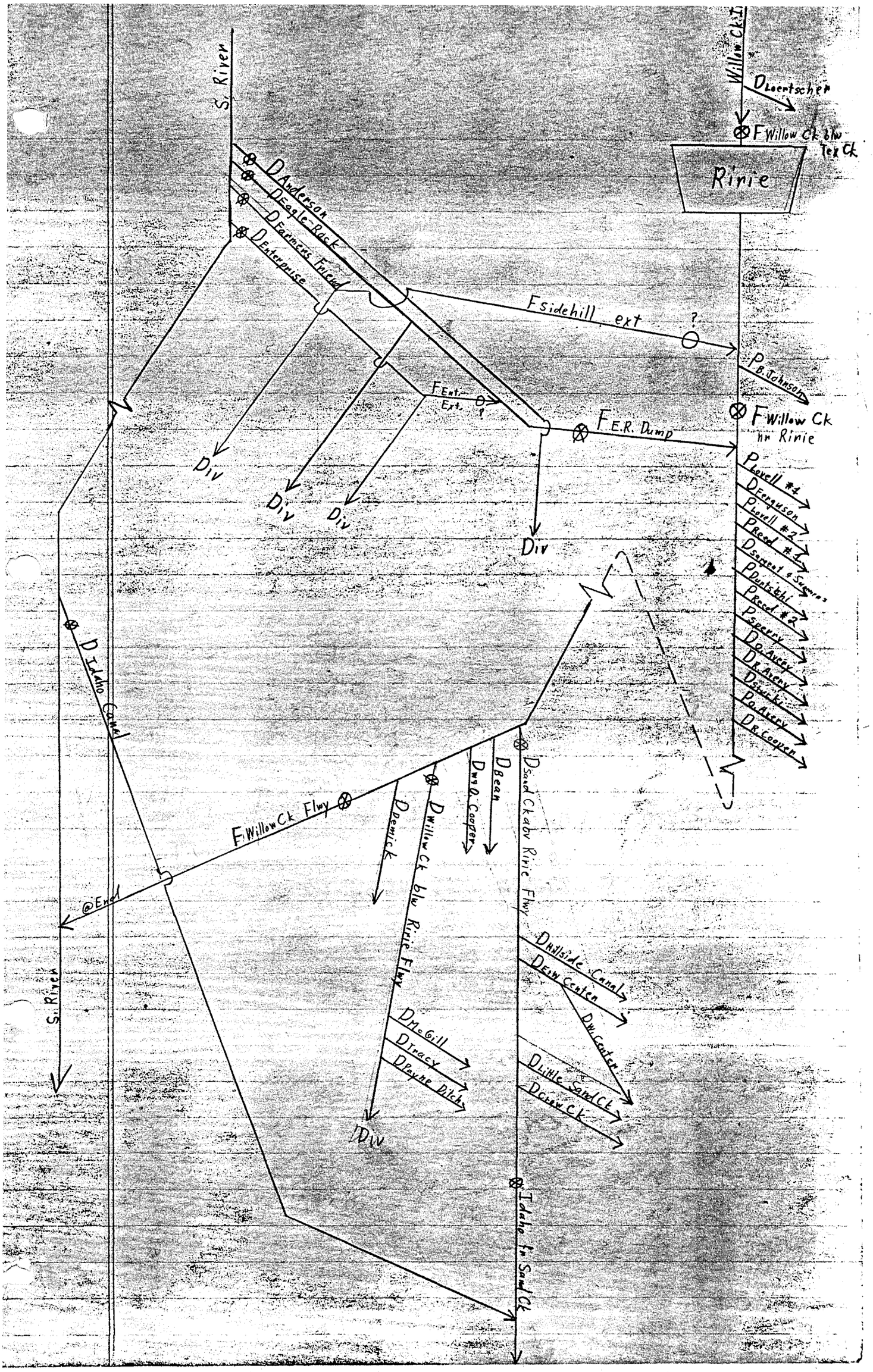
Rev 1 Mar 78

WILLOW CREEK WATER RIGHTS

	DIVERSION	DATE	CFS	REACH	RIGHT NUMBER(S)
1	LOERTSCHER	1 APR 74	1.60	ABV RIRIE RES	25-0055
2.	SARGENT & SUMMERS	1 APR 76	3.20	RIRIE RES TO FLDWY	25-0057, 0058
3.	ROY AVERY	1 APR 80	2.88	" " " "	25-0071, 0072, 0073
4.	ORVAL AVERY	1 APR 80	3.12	" " " "	25-0071
5.	PROGRESSIVE (W) WILLOW CR BLW FL	1 APR 80	3.20	BELOW FLDWY HEAD	25-0078
6.	ROY AVERY	1 APR 81	2.00	RIRIE RES TO FLDWY	25-0079
7	PROGRESSIVE (W) WILLOW CR BLW FL	1 APR 81	1.08	BELOW FLDWY HEAD	25-0078
8	SARGENT & SUMMERS	1 APR 82	3.00	RIRIE RES TO FLDWY	25-0057
9	PROGRESSIVE (W) WILLOW CR BLW FL	1 APR 82	0.80	BELOW FLDWY HEAD	25-0090
10	PROGRESSIVE (W) WILLOW CR BLW FL	1 APR 83	7.26	BELOW FLDWY HEAD	25-0080, 0074, 0075, 0076
11	PROGRESSIVE (W) WILLOW CR BLW FL	1 APR 84	22.17 3.30	BELOW FLDWY HEAD	25-0019, 0013, 0014, 0020, 0089, 0012, 0015,
11a	PROGR (W) SAND CR ABV FL DIV.	1 APR 84	18.87		0064, 0091, 0092
12	ORVAL AVERY	1 APR 84	1.00	RIRIE RES TO FLDWY	25-0073
13	REID	1 APR 84	1.60	RIRIE RES TO FLDWY	25-0061
14	FERGUSON	1 APR 84	2.90	" " " "	25-0062
15	SPERRY	1 APR 84	1.60	" " " "	25-0063
16	ROY AVERY	1 APR 84	1.80	" " " "	25-0073, 0085
17	PROGRESSIVE (W) WILLOW CR BLW FL	1 APR 85	3.14 30.88 (Σ=90.09)	BELOW FLDWY HEAD	25-0076, 0020, 0065, 0068, 0070, 0110, 0024,
17a	PROGR (W) SAND CR ABV FL DIV	1 APR 85	27.74		0017, 0021, 0025, 0067, 0087, 0088, 0018,
18	ROY AVERY	1 MAY 88	7.03	RIRIE RES TO FLDWY	25-0144, 0147, 0148, 0174
19	ORVAL AVERY	1 MAY 88	5.60	" " " "	25-0144, 0174
20	REID	1 MAY 88	2.40	" " " "	25-0138
21	FERGUSON	1 MAY 88	3.20	" " " "	25-0170
22	SPERRY	1 MAY 88	1.80	" " " "	25-0139
23	SARGENT & SUMMERS	1 MAY 88	4.80	" " " "	25-0136, 0137, 0168
24	PROGRESSIVE (W) WILLOW CR BLW FL	1 MAY 88	19.40 ~~8.26~~ (Σ=197.54)	" " " "	
24a	PROGRESSIVE (W) SAND CR ABV FL DIV.	1 MAY 88	63.22		
25	PROGRESSIVE (W) SAND CR ABV FLDWY	1 MAY 89	80.00	" " " "	25-0223
26	IDAHO	1 MAY 89	160.00	" " " "	25-0224
27	PROGRESSIVE (W) SAND CR ABV FL DIV	1 APR 02	2.00	" " " "	
	Total		439.54		

PROGRESSIVE (W) SEPARATED INTO WILLOW CR BLW FLDWY DIV AND SAND CR 22 Jan 80 ACR


S. River
D Anderson
D Eagle Rock
D Farmers Friend
D Enterprise
Div
Div
Div
Div
F sidehill ext
?
F Ent Ext ?
F E.R. Dump
P B. Johnson
F Willow Ck nr Rinie
Rinie
D Loertscher
F Willow Ck blw Tex Ck
Tex Ck
P Lovell #4
D Ferguson
P Lovell #2
P Reed #1
D Samet & Sweeney
P Puntenhi
P Reed #2
P Speery
D. Avery
D R. Avery
D Stanki
D R. Cooper
D Idaho Canal
F Willow Ck Fly
D Bean
D Sand Ck ab


S. River
Willow Ck
D Loentscher
F Willow Ck blw Tex Ck
Rinie
D Anderson
D Eagle Rock
D Farmers Friend
D Enterprise
F sidehill ext
?
P B. Johnson
F Ent. Ext.
?
F Willow Ck nr Rinie
F E.R. Dump
Div
Div
Div
Div
P Lovell #4
D Ferguson
P Lovell #2
P Reed #4
D Sargent & Sugarer
P Dunseth
P Reed #2
P Sperry
D P. Avery
D R. Avery
D Stucki
D P. Avery
D R. Cooper
D Idaho Canal
F Willow Ck Flwy
@ End
D Sand Ck abv Rinie Flwy
D Bean
D W.B. Cooper
D Prewick
D Willow Ck blw Rinie Flwy
D Hillside Canal
D Esw Center
D W. Center
D Little Sand Ck
D Esw Ck
D McGill
D Tracy
D Payne Ditch
Div
S. River
Idaho Ln Sand Ck

17 Feb 78
ACR.

Rev 1 Mar 78

WILLOW CREEK WATER RIGHTS

	DIVERSION	DATE	CFS	REACH	RIGHT NUMBER(S)
1	LOERTSCHER	1 APR 74	1.60	ABV RIRIE RES	25-0055
2.	SARGENT & SUMMERS	1 APR 76	3.20	RIRIE RES TO FLDWY	25-0057, 0058
3.	ROY AVERY	1 APR 80	2.88	" " " "	25-0071, 0072, 0073
4.	ORVAL AVERY	1 APR 80	3.12	" " " "	25-0071
5.	PROGRESSIVE (W)	1 APR 80	3.20	BELOW FLDWY HEAD	25-0078
6.	ROY AVERY	1 APR 81	2.00	RIRIE RES TO FLDWY	25-0079
7	PROGRESSIVE (W)	1 APR 81	1.08	BELOW FLDWY HEAD	25-0078
8	SARGENT & SUMMERS	1 APR 82	3.00	RIRIE RES TO FLDWY	25-0059
9	PROGRESSIVE (W)	1 APR 82	0.80	BELOW FLDWY HEAD	25-0090
10	PROGRESSIVE (W)	1 APR 83	7.26	BELOW FLDWY HEAD	25-0080, 0074, 0075, 0076
11	PROGRESSIVE (W)	1 APR 84	22.17	BELOW FLDWY HEAD	25-0019, 0013, 0014, 0020, 0089, 0012, 0015, 0064, 0091, 0092
12	ORVAL AVERY	1 APR 84	1.00	RIRIE RES TO FLDWY	25-0073
13	REID	1 APR 84	1.60	RIRIE RES TO FLDWY	25-0061
14	FERGUSON	1 APR 84	2.90	" " " "	25-0062
15	SPERRY	1 APR 84	1.60	" " " "	25-0063
16	ROY AVERY	1 APR 84	1.80	" " " "	25-0073, 0085
17	PROGRESSIVE (W)	1 APR 85	30.88 (Σ=90.09)	BELOW FLDWY HEAD	25-0096, 0020, 0065, 0068, 0070, 0110, 0024, 0017, 0021, 0025, 0067, 0087, 0088, 0018,
18	ROY AVERY	1 MAY 88	7.03	RIRIE RES TO FLDWY	25-0144, 0147, 0148, 0174
19	ORVAL AVERY	1 MAY 88	5.60	" " " "	25-0141, 0174
20	REID	1 MAY 88	2.40	" " " "	25-0138
21	FERGUSON	1 MAY 88	3.20	" " " "	25-0170
22	SPERRY	1 MAY 88	1.80	" " " "	25-0139
23	SARGENT & SUMMERS	1 MAY 88	4.80	" " " "	25-0136, 0137, 0168
24	PROGRESSIVE (W)	1 MAY 88	82.62 (Σ=197.54)	" " " "	
25	PROGRESSIVE (W)	1 MAY 89	80.00	" " " "	25-0223
26	IDAHO	1 MAY 89	160.00	" " " "	25-0224
27	PROGRESSIVE (W)	1 APR 02	2.00	" " " "	
	Total		439.54		

From Dennis Dunn 23 febuary 1978
To Alan Robertson
RE: Willow Creek

These people will have thier diversions measured by the watermaster. Several

1. David W. Laertscher
2. Hollis Sargent & Dee Summers
3. Roy Avery & Allen Avery & Alvin Campbell & W.A. Miller
4. Orval Avery
5. Wallace Reid
6. Dearold Ferguson
7. John Sperry

of them are diverted out of a common ditch. They will be measured in the order they are grouped, with both numbers 2 & 3 each being a ditch.

All of the flood rights date from May 1st, 1888 excluding the Eagle Rock & Willow Creek Water Company and the Idaho Canal Co. which date from May 1st 1889.

The willow Creek decree gave everyone who had a regular right a flood right also. I cross referenced the two numbers because even though the rights are seperate they go on the same peice of ground.

The people on the anderson canal no longer get willow creek water per se. There is an exchange. Thier willow creek rights are dumped in to the Snake river via the South fork of willow creek. In exchange they use snake river water via the Anderson Canal. Many years ago there were several canals that brought willow creek water to the people now serviced by the Anderson Canal. There isn't any enlargement of the Snake river rights

The copies of the flood rights & decreed rights that you are receiving are correct. I added all of the rights decreed through 1883 and those being delivered. The totals are equal

Dennis

Discussed Anderson Willow Cr rights w/ Fleenor 1 Mar 78. Best course of action is to ignore these unless Progressive files an exchange request with us.

R.

At meeting 10 Mar Steve assigned Fleenor to look into this for future. We won't worry about it now.

Anderson Canal

Point of diversion — SW¼ SW¼ Sec 5 3N 41E

1874

1-0055	Alfred Moore	SE¼ NE¼ Sec 11 3N 39E	1.60 cfs	4.2
25-0056	Stanley Cooper	E½ SW¼, NW¼ SW¼ Sec 11 3N 39E South of highway	1.96 cfs	
25-0056	A. H. Bortschi	SW¼ SW¼ Sec 11 3N 39E	0.64 cfs	

1880

25-0113	Progressive Irrigation Dist.	N½ NW¼ Sec 34 3N 38E	1.60 cfs	2.8
25-0113	Thomas Christensen	S½ SW¼ Sec 27 3N 38E	0.70 cfs	
25-0113	Thomas Christensen c/o David Stanger	N½ S½ SW¼ Sec 27 3N 38E	0.40 cfs	
25-0113	Thomas Christensen c/o Stanley Silgen	N½ S½ SW¼ Sec 27 3N 38E	0.10 cfs	

1882

25-0098	Max Johnson	W½ SW¼, NE¼ SW¼ Less tract 1 Sec 6 2N 38E	0.90 cfs	4.3
25-0099	James Laird	NE¼ NE¼ Sec 12 2N 37E	0.30 cfs	
25-0102	George Marshall	NW¼ NE¼ Lot 2 Sec 6 2N 38E	0.70 cfs	
25-0103	Oncel Haroldsen	SW¼ NE¼ Sec 5 2N 38E	1.30 cfs	
25-0112	Mrs Russell Brown	R SE¼ SW¼ Sec 6 2N 38E	0.60 cfs	
25-0112	Tom Jenkins	North 30 acres Lot 1 Sec 7 2N 38E	0.34 cfs	
0112	Kenneth Filmore	South 10 acres Lot 1 Sec 7 2N 38E	0.16 cfs	

1883

25-0008	Sam Bennion	N½ SE¼, SE¼ NE¼ Sec 32 3N 38E	2.40 cfs	6.4
25-0011	Morgan Haroldsen	SW¼, S½ NW¼, Sec 33 3N 38E	2.00 cfs	
25-0011	Oliver Haroldsen	SW¼, S½ NW¼, Sec 33 3N 38E	2.00 cfs	

1884

25-0061	A. H. Bortschi	SW¼ SW¼ Sec 11 3N 39E	1.20 cfs	1.2
25-0105	Mrs Byron C. Telford	SW¼ Sec 32 2N 38E	300 cfs	

TOTAL ANDERSON C. 21.90

Payne ditch

Point of diversion — NE¼ SE¼ Sec 27 3N 38E

1883

25-0074	F. R. Vandeweile	NE¼ Sec 33 3N 38E	1.30 cfs	
25-0074	Loyd Chase	SE¼ NE¼ Sec 33 3N 38E	0.20 cfs	
25-0074	Don Hackworth	NE¼ Sec 33 3N 38E	0.28 cfs	
25-0074	Herman P. Smith	NE¼ NE¼ Sec 33 3N 38E	0.65 cfs	
25-0074	Robert L. Flint	W½ NE¼ Sec 33 3N 38E	0.28 cfs	
25-0074	Lois M. Ball	NE¼ NE¼ Sec 33 3N 38E	0.35 cfs	
25-0074	Steven Harrison	NE¼ Tract 6 Sec 33 3N 38E	0.10 cfs	
5-0075	Oncel Haroldsen	N½ SE¼ Sec 33 3N, 38E	1.60 cfs	
25-0076	Dean Lomont	S½ SE¼ Sec 33 3N 38E	1.60 cfs	
			6.36	

1885

25-0096	Henery Payne c/o Lula P Ferebauer	NW¼ Sec 9 2N 38E	3.14 cfs	

Sand Creek

Point of diversion NE¼ SW¼ Sec 20 3N 39E

1884

25-0012	Wayne Cooper	16½ acres Sec 19 3N 39E	2.50 cfs
25-0012	Alton C. Ball	32 acres Sec 2 2N 39E	0.80 cfs
25-0013	Utah & Idaho Sugar	N½ SE¼ Sec 10 2N 38E	1.60 cfs
25-0014	Lin Johnson	NE¼ Sec 10 2N 38E	2.60 cfs
25-0014	Russell Rock	NE¼ NE¼ Sec 10 2N 38E	0.20 cfs
25-0014	Morris Duncan	NE¼ Sec 10 2N 38E	0.04 cfs
25-0015	Leland Hansen	NW¼ Sec 11 2N 38E	2.70 cfs
25-0019	LeRoy Stanger	NW¼ SE¼, NE¼ SE¼ Sec 3 2N 38E	0.72 cfs
25-0019	Myrlin C Odgen	NE¼ SE¼ & N½ SE¼ Sec 3 2N 38E	0.16 cfs
25-0019	Wm. Meierotto Jr.	N½ SE¼ Sec 3 2N 38E	0.54 cfs
25-0019	Thelma High c/o Stanley Boyle	SE¼ NW¼ from S½ NW¼ Sec 2 2N 38E	0.38 cfs
25-0020	Glen Stanger	SW¼ Sec 2 2N 38E	3.20 cfs
25-0089	Jess Croft	E½ NW¼ Sec 21 2N 38E	1.03 cfs
			16.47

1885

25-0020	Utah & Idaho Sugar	N½ Sec 15 2N 38E	3.20 cfs
25-0065	Utah & Idaho Sugar	SW¼ Sec 10 2N 38E	1.0 cfs
25-0068	Derrold Ricks	W½ SW¼, W½ E½ SW¼ Sec 27 2N 38E	1.66 cfs
25-0068	Donald Bjerrison	E½ E½ SW¼ Sec 27 2N 38E	1.24 cfs
25-0070	Ivan Ashment	NW¼ Sec 22 2N 38E	1.50 cfs
25-0110	Gilbert Price	S½ NE¼ Sec 25 3N 38E	0.24 cfs
			8.74

Little Sand Creek

Point of diversion SE¼ NE¼ Sec 35 3N 38E

1884

25-0064	Bertha McDonald	W½ NW¼ Sec 23 2N 38E	1.20 cfs
25-0064	John Heath	E½ NW¼ Sec 23 2N 38E	1.20 cfs
			2.40

1885

25-0024	Robert St. Clair	SE¼ SW¼ Sec 11 2N 38E	0.80 cfs

Sidehill canal

Point of diversion SW¼ NE¼ Sec 30 3N 39E

1885

25-0017	Lafaye Heuer	E½ SW¼, Sec 6 2N 39E	1.40 cfs
25-0017	Austin Scoresby	S½ NE¼ Sec 7 2N 39E	1.00 cfs
25-0017	James B. Steele	S½ NE¼ Sec 7 2N 39E	1.60 cfs
25-0021	C.N. Scoresby	E½ NW¼ Sec 6 2N 39E	1.30 cfs
25-0025	Joey Longhurst	E½ SW¼, W½ SE¼ Sec 7 2N 39E	3.20 cfs
25-0067	Ruby & Hugh Sharp	E½ SW¼ lots 3 & 4, Sec 30 3N 39E	3.20 cfs
25-0087	Blanche Heilson	W½ SW¼ Sec 31 3N 39E	0.50 cfs
25-0088	Lafaye Heuer	SE¼ NW¼ Sec 31 3N 39E	0.25 cfs
25-0088	Max Follmer	NE¼ NW¼ Sec 31 3N 39E	0.25 cfs
			12.70

Sargent & Summer Canal

Point of diversion — NW¼ SE¼ Sec 11 3N 39E

1876

25-0057	Hollis Sargent	N½ NE¼ Sec 15 3N 39E	1.60 cfs
25-0058	Dee Summers	S½ SE¼ less 6 acres Sec 10 3N 39E	1.60 cfs

1882

25-0059	Hollis Sargent	E½ NW¼, Less tract 1, Sec 15 3N 39E	3.00 cfs

East & West Center ditch

Point of Diversion — SW¼ NW¼ Sec 30, 3N 39E. Common diversion Point

East Center ditch

1885

25-0021	LaVod Olsen	W½ NW¼ Sec 6 2N 39E	0.98 cfs
25-0021	Reed Olsen	NW¼ NW¼ Sec 6 2N 39E	0.52 cfs
			1.50

West Center ditch

1885

25-0018	Gary Conrad	N½ NW¼ Sec 13 2N 38E	1.20 cfs
25-0018	Albion Smith	N½ NW¼ Sec 13 2N 38E	0.40 cfs
25-0018	David Stanger	S½ SW¼ Sec 13 2N 38E	1.40 cfs
			3.00

Crow Creek

Point of Diversion — NE¼ SW¼ Sec 35 3N 38E

~~1884~~ 1885 — See abstract p. 11 right no 0066 1885

25-0066	Larin Nelson	E½ W½ SE¼ Sec 9 2N 38E	0.25 cfs
25-0066	Dale Bowen	W½ W½ SE¼ Sec 9 2N 38E	0.25 cfs
25-0066	Henery Bennett	E½ SE¼ Sec 9 2N 38E	0.25 cfs
25-0066	Oliver Holford	E½ SE¼ Sec 9 2N 38E	0.25 cfs
			1.00

Tracy ditch

Point of Diversion — SW¼ SW¼ Sec 19 3N 39E

1880

25-0078	Bill Kepler	S½ SW¼ Sec 24 3N 38E	1.60 cfs
25-0078	Ray Lott	S½ SE¼ Sec 23 3N 38E	1.60 cfs
			3.2

1881

25-0079	Ray Lott	N½ NE¼ Sec 26 3N 38E	Transfer 280	1.08 cfs

1882

25-0090	Ray S Robinson	S½ NE¼, S½ NW¼ Sec 26 3N 38E 35 acres west of Slough	0.60 cfs
25-0090	Dene R Tracy	S½ NE¼ Sec 26 3N 38E East of slough less 6.5 acres	0.20 cfs
			.80

1883

25-0080	Jean Tracy	NW¼ Sec 25 3N 38E	0.90 cfs

Willow Creek

1874

25-0055	David W Loertscher	W½ W½ Sec 10 1N 40E Transferes 566 & 567 Point of diversion is above Rice Dam	1.60 cfs

1880

25-0071	Orval Avery	S.W¼ SE¼ Sec 20 3N 39E Point of diversion SE¼ SE¼ Sec 16 3N 39E	3.12 cfs

1884

25-0061	Wallace Reid	S½ NW¼ Sec 14 3N 39E Point of diversion SW¼ SW¼ Sec 12 3N 39E	1.60 cfs
25-0062	Dearold Ferguson	S½ SE¼, N½ NE¼ Sec 11 3N 39E Point of diversion SW¼ SE¼ Sec 12 3N 39E	2.90 cfs
25-0063	John Sperry	N½ SE¼, SE¼ NE¼ Sec 15 3N 39E Point of diversion	1.60 cfs
25-0073	Orval Avery	NE¼ SE¼, Sec 20, SE¼ NW¼ Sec 21 3N 39E Point of diversion SE¼ SE¼ Sec 16 3N 39E	1.00 cfs

Roy Avery Diversion

	Point of diversion	SE¼ SE¼ Sec 16 3N 3NE	

1880

25-0071	Allen Avery	NW¼ NW¼ Sec 21 3N 39E	0.08 cfs
0072	Allen Avery	SE¼ NE¼ Sec 20 3N 39E	2.26 cfs
0072	Roy Avery	SE¼ SE¼ Sec 20 3N 39E	0.54 cfs

1881

25-0079	W.A. Miller	S½ SE¼ Sec 17 3N 39E less 5.62 acres	2.00 cfs

1884

25-0073	Allen Avery	SW¼ NW¼ Sec 21 3N 39E	0.40 cfs
25-0085	Alvin Campbell	NW¼ Sec 20 3N 39E	1.40 cfs

Migill ditch

	Point of diversion	SE¼ SW¼ Sec 19 3N 39E	

1884

25-0091	Jean Tracy	S½ SW¼, S½ SE¼ Sec 26 3N 38E	0.60 cfs
25-0091	Ray S Robinson	S½ NE¼ Sec 26 3N 38E	0.60 cfs
25-0092	Samuel A. Hill	S½ SW¼ Sec 26 3N 38E	0.60 cfs
25-0092	Newell A. Piquet	Pt SW¼ Sec 27 3N 38E	1.00 cfs
25-0092	J. Milton Phillips	N½ SE¼ Sec 27 3N 38E	0.50 cfs
			3.30

Flood Rights

All rights date from May 1, 1888

Flood right		Cross Reference	Amount
		Anderson Canal	
25-0112	A. H. Dustschi	25-0061	2.4 c/s
25-0114	Sam Bennion	25-0008	2.4 c/s
25-0135	Alfred Moore	25-0055	2.4 c/s
25-0150	Morgan Haroldsen	25-0011	1.5 c/s
25-0150	Oliver Haroldsen	25-0011	1.5 c/s
25-0167	Stanley Cooper	25-0056	1.8 c/s
25-0167	A. H. Dustschi	25-0056	0.6 c/s
25-0185	Max Johnson	25-0098	1.8 c/s
25-0186	George Marshall	25-0102	0.56 c/s
25-0188	Mrs Byram C Telford	25-0105	2.4 c/s
25-0192	Mrs Russell Brown	25-0112	0.61 c/s
25-0192	Tom Jenkins	25-0112	0.34 c/s
25-0192	Kenneth Filmore	25-0112	0.05 c/s
25-0208	James Laird	25-0099	0.60 c/s
25-0209	Orcel Haroldsen	25-0103	2.40 c/s
25-0212	Progressive Irr. dist	25-0113	1.2 c/s
25-0212	Thomas Christensen	25-0113	0.9 c/s
			23.46
		Payne ditch	
25-0145	Orcel Haroldsen	25-0075	1.2 c/s
25-0175	J. R. Vandenweile	25-0074	1.34 c/s
25-0175	Loyd Chase	25-0074	0.21 c/s
25-0175	Don Hackworth	25-0074	0.29 c/s
25-0175	Herman P. Smith	25-0074	0.67 c/s
25-0175	Robert L. Flint	25-0074	0.29 c/s
25-0175	Lois M. Ball	25-0074	0.36 c/s
25-0175	Steven Harrison	25-0074	0.10 c/s
25-0176	Dean Lamont	25-0076	1.20 c/s
25-0207	Henry Payne	25-0096	~~1.80 c/s~~ 3.60 OK
			9.26 OK

See abstract p. 25 rt # 0207.

		Sand Creek	
25-0114	Wayne Cooper		4.80 c/s
25-0117	Len Johnson	25-0014	1.71 c/s
25-0117	Russell Rock	25-0014	0.13 c/s
25-0117	Morris Duncan	25-0014	0.03 c/s
25-0120	Glen Stanger	25-0020	2.40 c/s
25-0127	Utah & Idaho Sugar	25-0013	2.40 c/s
25-0140	Utah & Idaho Sugar	25-0065	2.40 c/s
25-0143	Ivan Eskment	25-0070	3.60 c/s
25-0152	LeRoy Stanger	25-0019	0.64 c/s
25-0152	Myrlin C Odgen	25-0019	0.14 c/s
25-0152	William Meirotto Jr	25-0019	0.48 c/s
25-0152	Thelma High	25-0019	0.34 c/s
			19.07

Flood rights

All rights date from May 1, 1888

Flood rights		Cross Reference	Amount
	Sand Creek		
25-0153	Utah & Idaho Sugar	25-0020	4.80 c/s
25-0173	Donald Ricks	25-0068	2.67 c/s
25-0173	Donald Bjernson	25-0068	2.13 c/s
25-0191	Gilbert Price	25-0110	2.50 c/s
25-0204	Jess Croft	25-0089	4.80 c/s
25-0228	Leland Hansen	25-0015	2.40 c/s
			19.20
	Little Sand Creek		
25-0122	Robert St. Clair	25-0024	0.60 c/s
25-0171	Bertha McDonald	25-0064	1.20 c/s
25-0171	John Heath	25-0064	1.20 c/s
			3.00
	Sidehill Canal		
25-0118	Lafaye Hauer	25-0017	1.68 c/s
25-0118	Austin Scoresby	25-0017	1.20 c/s
25-0118	James B. Steele	25-0017	1.92 c/s
25-0121	C.V. Scoresby	25-0021	1.30 c/s
25-0141	Roby & Hugh Sharp	25-0067	2.40 c/s
25-0155	Jay Longhurst	25-0025	2.40 c/s
25-0180	Blanche Heilson	25-0087	2.40 c/s
25-0181	Lafaye Hauer	25-0088	1.20 c/s
25-0181	Max Fillmer	25-0088	1.20 c/s
			15.70
	Sargent & Summers		
25-0136	Hollis Sargent	25-0057	1.20 c/s
25-0137	Hollis Sargent	25-0059	2.40 c/s
25-0168	Dee Summers	25-0058	1.20 c/s
	East Center		
25-0121	LaVod Olsen	25-0021	0.98 c/s
25-0121	Reed Olsen	25-0021	0.52 c/s
			1.50
	West Center		
25-0119	Dary Conrad	25-0018	0.90 c/s
25-0119	Albion Smith	25-0018	0.30
25-0119	David Stanger	25-0018	1.05
			2.25

All rights date from May 1, 1888

Flood Right	Cross Reference		Amount	
		Crow Creek		
25-0172	Lavin Nelson	25-0066	0.60	c/s
25-0172	Dale Brown	25-0066	0.60	c/s
25-0172	Henry Bennett	25-0066	0.60	c/s
25-0172	Oliver Halford	25-0066	0.60	c/s
			2.40	
		Tracy ditch		
25-0147	Ray Lott	25-0079	0.84	c/s
25-0177	Bill Rebler	25-0078	1.80	c/s
25-0177	Ray lott	25-0078	1.80	c/s
25-0178	Jean Tracy	25-0080	0.90	c/s
25-0182	Ray S Robinson	25-0090	0.72	c/s
25-0182	Gene R Tracy	25-0090	0.24	c/s
			6.30	
		Willow Creek		
25-0138	Wallace Reid	25-0081	2.40	c/s
25-0139	John Sperry	25-0063	1.80	c/s
25-0144	Orval Avery	25-0073	0.92	c/s
25-0170	Dearold Ferguson	25-0062	3.20	c/s
25-0174	Orval Avery	25-0071	4.68	c/s
		Migill ditch		
25-0182	Jean Tracy	25-0091	0.72	c/s
25-0182	Ray S Robinson	25-0091	0.72	c/s
25-0205	Samuel A Hill	25-0092	0.69	c/s
25-0205	Newell A Piquet	25-0092	1.14	c/s
25-0205	J. Milton Phillips	25-0092	0.57	c/s
			3.84	
		Roy Avery div.		
25-0144	Roy Avery	25-0072	0.50	c/s
25-0144	Allen Avery	25-0072	2.08	c/s
25-0144	Allen Avery	25-0073	0.37	c/s
25-0147	W. A. Miller	25-0079	1.56	c/s
25-0148	Alvin Campbell	25-0085	2.40	c/s
25-0174	Allen Avery	25-0071	0.12	c/s
			7.03	
25-0223	Eagle Rock & Willow Creek Water Co		80	c/s May 1 1889
25-0224	Idaho Canal Co		160	c/s May 1 1889

United States Department of the Interior

OFFICE OF THE SOLICITOR
PORTLAND REGION-BOISE FIELD OFFICE
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 020-550 WEST FORT STREET
BOISE, IDAHO 83724

APR 11 1978

To: Regional Planning Officer, Boise, Idaho

From: Field Solicitor, Boise, Idaho

Subject: Winter Water Savings, Minidoka Project (Your Memorandum Dated March 2)

The matter of winter water savings and the priority of these rights both with respect to federal storage and natural flow rights are covered in supplemental water decrees. All parties having water rights were made parties and the water agreements made in the Palisades contracts with all the various users were judicially examined and approved.

This adjudication was accomplished in two proceedings in district court. The Upper Valley users brought proceedings in Fremont County, Cause No. 6117, entitled Aberdeen-Springfield Canal Co. v. Henry Eagle, with decree entered March 12, 1969. The Lower Valley proceedings were in Twin Falls County, entitled Burley Irrigation District v. Henry Eagle, with the decree entered July 10, 1968. 01-4

The decree confirms all provisions of the existing storage contracts on the Snake River. The decrees, being supplemental to the initial Snake River decrees, also constitute judgment in rem and bind all parties and water users in the state. The decrees specifically approved the Palisades contract articles dealing with winter water savings and Island Park priorities (see, for example, Parsons Ditch Co., articles 11 and 23 respectively referred to and incorporated into the Fremont County decree).

The provisions for winter water savings were required by the United States as a condition precedent to building Palisades. The winter water users in consideration of exchanging this right, required and were granted bottom rights ahead of American Falls storage. This bottom right was agreed to by all the water users and confirmed by the court.

There is no conflict between this stored winter water and post 1921 natural flow rights as the two rights are in completely different categories. The winter water was a winter appropriative right changed to a winter storage right by agreement of all the water users and approval of the court. Use of such stored water in the irrigation season can of course have no impact on natural flow rights which can only be satisfied from water appearing naturally in the river.

I trust this answers your inquiry.

Joseph B Brooks

Joseph B. Brooks
Field Solicitor

OJP

✓ REV, 12-1-67

PRIORITY I = 6 PALISADES

OWNER (I, J)		NR	ND	NN	STGOWN	CANAL
J =	1	120	01	03	320	Riley
	2	119	11	03	11470	Progressive
	3	119	10	03	3810	Farmers Friend
	4	119	09	03	1820	Enterprise
	5	119	05	01	250	Butler Island
	6	119	02	03	4640	Harrison
	7	118	10	03	2000	Boomer- Rudy
	8	118	07	03	8000	Burgess
	9	118	06	01	660	Clark & Edwards
	10	118	09	03	400	Lowder & Jennings
	11	118	05	01	800	East Labelle
	12	117	06	03	1380	Sunnydell
	13	117	05	03	1530	Lenroot
	14	117	04	03	1930	Reid
	15	117	03	01	3280	Texas Feeder
	16	118	02	01	1450.	Rigby
	17	118	03	01	1310	Island
	18	118	04	03	260	Dilts
	19	117	11	01	2550	Parks & Lewisville
	20	117	10	01	540	North Rigby
	21	116	07	03	7250	Butte & Market Lake
	22	114	04	03	13040	Idaho
	23	116	06	03	2330	Osgood
	24	116	05	03	850	Kennedy.
	25	116	03	03	9990	New Sweden
	26	116	04	03	570	Martin
	27	114	03	01	360	West Side Mutual
	28	114	02	03	1090	Woodville
	29	114	01	03	7700	Snake River Valley
	30	113	12	03	4050	Blackfoot
	31	113	11	01	2180	New Lavaside
	32	113	10	03	6540	Peoples
	33	113	09	03	22860	Aberdeen-Springfield
	34	113	08	03	2180	Corbett Slough
	35	113	07	01	1180	Riverside
	36	113	05	01	2180	Danskin
	37	113	04	03	580	Trego
	38	113	03	01	580	Wearyrick
	39	113	02	01	1090	Watson Slough
	40	109	01	04	5328	N.S. Minidoka
	41	109	02	02	2672	S.S. Minidoka
*	42	108	01	02	116,600	North Side Canal

May 1, 1978

COPY

MEMORANDUM

TO: Glen Saxton, Bob Fleenor, Steve Allred

FROM: Alan Robertson

SUBJECT: Return Flow Credit to Minidoka Project

The Foster Decree states that the natural flow supply for the Twin Falls projects shall be determined as if the Minidoka Project did not exist. This decree, therefore, prevents any gains from Minidoka to Milner attributable to return flow from the Minidoka Project, or losses due to Lake Walcott, from being included in the natural flow computation at Milner Dam. These losses and gains have historically been absorbed by the Minidoka Project. The natural flow available at Milner was computed at Neeley below American Falls Dam. The gain or loss absorbed by the Minidoka Project was computed as the entire Neeley to Milner gain. The computation period was only during the time when some of the rights below Neeley were not completely filled. Actual computations were usually done after the irrigation season had ended using monthly data.

The daily water right accounting procedure prepared for use for the Upper Snake this year requires that the Minidoka Project return flow credit be computed somewhat differently. The credit does not follow normal water right computations since return flow is usually considered a part of natural flow and not credited back to the diversion. Since water right allocation computations will be done daily throughout the year, provision has been made to either include or exclude the Minidoka return flow (Minidoka to Milner gain). When the natural flow at Minidoka is high, the Minidoka Project will not be using stored water, and the return flow is then credited to the next priority.

Presently, the total system (Water District #1) diversions and natural flow at Milner are used as the indicator of how to account for the Minidoka return flow. If diversions exceed the Milner natural flow

by more than 2000 cfs on any given day, then it is probable that the canals below Neeley require stored water, and the Minidoka to Milner gain is withheld from the natural flow allocation. After the entire natural flow is allocated, the Minidoka to Milner gain is credited to the Minidoka Project up to the amount not met by natural flow. It is possible that only part, or none, of the gain is needed by the project. The portion not used is then reallocated to the rights below Minidoka in order of priority.

The above described daily approximation introduces only small errors in the allocation and is far more accurate than a monthly calculation. It eliminates the need for an iterative procedure to determine what portion of the Minidoka to Milner gain to include in the Milner natural flow supply.

A second variation in the accounting procedure is that the entire Neeley to Minidoka gain is included in the Milner natural flow supply. Previously, this gain was also credited to the Minidoka Project because losses in Lake Walcott were to be absorbed by the project. In the past five years, this reach has shown a predominant gain during the period of stored water use. The daily accounting procedure corrects for evaporation losses by adding the daily evaporation loss at Lake Walcott to the natural flow at Minidoka. Therefore, the natural flow at Minidoka includes the Neeley to Minidoka gain plus Lake Walcott evaporation and is allocated to all rights below Neeley in order of priority.

The Neeley to Minidoka gain will be continually observed for fluctuations, and if the gain should again show significant losses because of Lake Walcott, adjustments will be made to remove these effects from the natural flow supply for downstream rights.

ACR:rg

cc Ron Carlson

FILE:

STORAGE RIGHTS
DISTRICT 1

	RESERVOIR	RIGHT FLOW (cfs)	RIGHT VOLUME (ac ft)	PRIORITY
1	JACKSON LAKE*		298,981	23 Aug 06
2	LAKE WALCOTT	~2,500~	97,000	14 Dec 09
3	JACKSON LAKE*		138,829	18 Aug 10
4	JACKSON LAKE*		409,190	24 May 13
5	HENRYS LAKE	~1,000~	79,350	15 May 17
6	AMERICAN FALLS		1,700,000	30 Mar 21
7	ISLAND PARK		114,000	14 Mar 35
8	GRASSY LAKE*		15,204	17 Feb 36
9	PALISADES		1,200,000	28 Jul 39
10	ISLAND PARK		21,000	12 Jun 40
11	HENRYS LAKE		10,650	29 Jul 65
12	RIRIE		10,000	16 Jun 69

Restricted Capy
W.Y. 1985 → 624,960
284,450

*Wyoming rights from USBR storage priorities list.

	POWER RIGHT (CFS)	PRIORITY	HYDR CAP'Y (CFS)
PALISADES		28 Jul 39?	8025
ASHTON			
IDAHO FALLS			
AMERICAN FALLS	6000	3 Sep 08	13500?
	4600	8 Mar 19	
	2500	15 Jun 09	
MINIDOKA	200	1 Jul 12	5035

February 15, 1978

COPY

Mr. Rodney J. Vissia, Regional Director
U.S. Bureau of Reclamation
Box 043, 550 West Fort Street
Boise, ID 83724

Dear Rod:

As you know we have been preparing a computer program to do the computations for allocating natural flows in District 1. We have also been reviewing all water rights in the district to ensure that delivery of water will be accomplished correctly based upon recorded water rights. Although this work is not yet completed, we can now see that there will be quite a number of changes from the abstract of rights which has been used in the past.

Priority dates for the Bureau's storage rights are not clear because of provisions in the storage contracts, some of which have been included in court decrees. We would particularly like your interpretation of the priorities for Palisades and Island Park rights. The attached table, which we understand was developed in your office for your hydrologic model, reflects one assessment of those contracts, but we are unable to verify these amounts with information in our water rights files. We would also like to have your views as to whether the early priorities for Palisades and Island Park are valid against all later priorities or just against the more recent federal storage priorities.

Sincerely yours,

C. STEPHEN ALLRED
Director

CSA:ACR:rg

cc: Eastern Region
Art Larsen

FILE:

Storage Priorities

Priority No.	Date	Reservoir	Storage
1	8-23-06	Jackson Lake	298,981
2	12-14-09	Lake Walcott	97,000
3	8-18-10	Jackson Lake	138,829
4	5-24-13	Jackson Lake	409,190
5	5-15-17	Henrys Lake	80,350
6	3-29-21	Palisades (w.w.s.)*	259,600
7	3-29-21	Island Park	45,000
8	3-29-21	American Falls (w.w.s.)*	159,400
9	3-30-21	American Falls	1,540,600
10	9-04-23	Henrys Lake	4,000
11	3-14-35	Island Park	69,000
12	2-13-36	Grassy Lake	15,204
13	7-28-39	Palisades	1/ 940,400
14	6-12-40 686	Island Park	21,000 ?

1/ Includes 440 acre-feet for contingencies)

*w.w.s. - winter water savings.

INTER-DEPARTMENT MEMO — 1

FROM Martie

DATE 2/9/78

TO Alan Robertson

SUBJECT Additional Water Rights on Minidoka project

Please add:

01-0007	163.4 cfs	4/01/39
01-2060	240.0 cfs	11/21/55

SIGNATURE

"Watermaster" shall mean the officer of the State of Idaho charged by law with the distribution of Snake River water in the lower and upper valleys, or such other officer properly authorized by law and designated by mutual agreement of the Secretary and the Advisory Committee.

PROVISIONS RELATING TO NATURAL FLOW RIGHTS AND STORAGE IN LAKE WALCOTT
(Articles 7, 8 and 9)

NATURAL FLOW RIGHTS

7. (a) There are held for the Minidoka Project (Gravity Division and South Side Pumping Division) these amounts of natural flow from Snake River with these priorities:

	Amount	Priority
(1)	1/ 1726 cubic feet per second	March 26, 1903 1/
(2)	1/ 1000 cubic feet per second	August 6, 1908 1/
(3)	The amount of lawful gain in flow coming into the river between the Neeley gage and Milner Dam when stored water is being drawn for the project as measured by the Watermaster from time to time.	

The total of these three amounts shall be divided on a daily basis, when the maximum amount is not available to both divisions, in these percentages:

To the Gravity Division M·D	62%
To the South Side Pumping Division S·D	38%

1/ These are amounts and priorities of natural flow rights established by decree of the Fourth Judicial District of Idaho on June 20, 1913, in the case of Twin Falls Canal Company v. Charles N. Foster et al.

(b) The District shall use its allotment of natural flow first whenever available at the points of diversions.

LAKE WALCOTT STORAGE

8. The District shall have 66.5% of the water accruing to the right to store in Lake Walcott, under a priority of December 14, 1909, for the Gravity and South Side Pumping Divisions for use for irrigation and domestic uses under the decree to which reference is made in article 7, but this shall not preclude the making of any delivery of stored water, on paper, to the District to the extent that the District and its water users have rights in Lake Walcott.

LATER NATURAL FLOW RIGHTS

9. The United States will not oppose the establishment of natural flow rights for the Minidoka Project of a priority in advance of the priority established for the Palisades Dam and Reservoir in an amount of 430 cubic feet per second. This amount, so to be established by a summary supplemental decree, or other appropriate decree, will be divided between the Gravity Division and the South Side Division in these percentages:

Gravity Division	62%
South Side Pumping Division	38%

To allocate "return flow" gain below Minidoka

1. Cannot simply subtract Minidoka to Milner gain from Milner users after allocation because in many instances, Milner users would be penalized. Presence of Minidoka to Milner gain in the allocation would cause too little flow to be allocated to Milner users.

2. Cannot simply leave out Minidoka to Milner gain because at times the Minidoka Project could not use entire gain in addition to other rights. Assuming Minidoka Project would not be allowed to store this gain for future use, it should then be allocated to other rights.

3. In order to "correctly" allocate the Minidoka to Milner gain, it would probably be simplest, but not simple, to allocate flows as in 2 above, assuming no gain at all from Minidoka to Milner, then proceed with the following additional calculations.

a. Allocate as much of the gain as possible to the Minidoka Project.

b. Reallocate any excess gain to the Milner diversions.

MINIDOKA – MILNER GAIN
(NO AVERAGING)

	MAY		JUNE		JULY		AUG		SEP			
	WM	IDWR	WM	IDWR	WM	IDWR	WM	IDWR	WM	IDWR		
75	-10880	-6849	-2218	8117	29220	29066	42070	40366	41520	44559	99,712	115,25
74	43220	43403	26510	25420	40280	48873	32010	34350	37900	41749	179,920	193,79
73	22370	20265	34490	33747	48580	50022	37860	39841	28650	40017	171,950	183,92
72	38930	42123	41940	37591	28560	35804	42440	42758	38220	42151	190,090	200,42
71	1690	4556	48340	41078	18610	30556	29400	30536	27150	29255	125,180	135,98
70	39370	31494	40130	41731	26990	32849	39810	39616	30980	39652	177,280	185,34
69	27230	32494	36840	39287	22960	27696	38100	41053	30670	35727	155,800	176,25
68	26390	25321	23450	21824	27610	27210	33040	36965	41930	44117	152,420	155,43
67	17800	12984	34800	30734	28350	31072	27000	27733	12240	15356	120,190	117,87
66	21740	21229	22770	21204	23560	22550	25110	26039	38460	44553	131,640	135,57
									Avg		150,418	159,98

NEELEY – MINIDOKA GAIN
NO AVERAGING
incl evap.

75	79060	83867	62040	74404	24260	31461	-5850	784	-9700	-2044	149,810	188,47
74	22180	32755	-1070	3037	-6100	10597	440	10796	-1310	3339	14,140 (97,193)	60,52
73	41064	45351	-2339	3384	7152	14363	-20	8496	21834	30168	67,691 (96,551)	101,76
72	57220	66162	38960	43093	28130	38147	12190	16775	19790	28233	156,300	192,4
71	15790	26189	-2900	-3523	-12,380	-3651	-6570	574	13,170	15498	7120 (19281)	35,01
70	24910	25415	-35460	-30047	-5770	5506	-5450	2013	12,440	20696	-9340	23,58
69	-15430	-3993	-40260	-31995	-13640	-7725	-9050	-1876	10,020	18581	-68,360	-27,0
68	4820	9115	-33680	-28000	-15070	-7621	8910	18321	-1220	2975	-36,240	-5,19
67	-4860	-3888	-12880	-10379	-23680	-14207	-25030	-17092	7210	14,632	-59,240	-30,93
66	12660	17788	-2560	3633	-3850	4455	-14470	-6050	-12010	-5189	-20,230	14,63
									Avg		20,165	55,33

differences are largely due to evap.

COPY

January 26, 1978

MEMORANDUM

TO: Ron Carlson

FROM: Alan Robertson

SUBJECT: Willow Creek Rights Allocations

In response to the rights list and map which you sent this week we propose the following reaches for allocation of Willow Creek rights:

Reach	Rights
Above Willow Cr. below Tex. Cr. gage	All diversions above reservoir
Willow Cr. below Tex. Cr. to nr Ririe gage	Ririe Res. storage right
Willow Cr. nr Ririe to gage on floodway	Various pumps and Sand Cr. and Lwr Willow Cr. uses

Data Requirements	Data Source
1. Willow Cr. below Tex. Cr.	USBR
2. Ririe Res.	USBR
3. Willow Cr. nr Ririe	USBR
4. Eagle Rock Canal below Anderson Canal	WM
5. Sand Cr. below floodway	USBR
6. Willow Cr. diversion from floodway	USBR
7. Floodway below Willow Cr. diversion	USBR
8. Sand Cr. above Idaho Canal	WM

As we discussed by phone today, we plan to identify all the users below the head of the floodway except the Idaho Canal as "PROGRESSIVE (W)," this name meaning Progressive District and all other users of Willow and Sand creeks below the head of the floodway. Their diversion will be

measured as the sum of gages 5 and 6, above. The Progressive District will be responsible for allocating all water below these gages except that amount delivered to the Idaho Canal.

Rights on the Anderson Canal (page 1 of your list) appear to be located such that they can only use Progressive's Snake River water. I am assuming, therefore, that they do not have Willow Creek rights and that they will be satisfied entirely by Snake River rights. If this is incorrect, please let me know.

The program will add together the diversion measurements on the Eagle Rock and Anderson canals at the Snake River. These will be satisfied under their several Snake River rights. The flow at gage 4 will be deducted from the sum of gages 5 and 6 to determine the amount of Willow Creek flow being used by "PROGRESSIVE (W)" and the Idaho Canal. It will then compute the Willow Creek natural flow allocations and storage use. The program will treat the flow of Sand Creek above Idaho Canal (gage 8) as a diversion from the floodway. It will not be included in the "PROGRESSIVE (W)" diversion. Whenever the flow at gage 8 exceeds 160 cfs, the Idaho Canal's Willow Creek right, the Idaho will be charged with storage use.

Please review the attached table of rights which I compiled from your list. Will all diversions with asterisks be separately measured? What is the cfs right of 0063, Sperry? This list should be continued in priority sequence through all later valid rights.

ACR:rg

Enclosure

cc: Steve Allred
Bobby Fleenor

FILE:

January 18, 1978

COPY

MEMORANDUM

TO: Bob Fleenor

FROM: Alan Robertson

SUBJECT: Exchange Pumps

FROM RON 10 MAR

In order to properly account for the operation of the groundwater exchange pumps we will need (a) pump names, (b) receiving river reach (see list attached to 22 December 77 memo) and, daily data in cfs on pumpage as it occurs in 1978.

STEVE, FLEENOR, KEND, RON AGREED 10 MAR THAT THEY WOULD REQUIRE THEM TO BE EQUAL

For accounting purposes the exchange pumping rates do not have to equal river diversions by the exchange operator. Diversions which exceed natural flow entitlements will be charged to storage. The program will accumulate an amount of pumpage for each operator (pump name). If, in late season, he has used more storage than he has pumped the watermaster would require him to increase the pumping rate to make up the deficit so that other storage accounts would not be injured.

The need to control the exchange pumps so that they do not force unwanted operations on other diverters and the reservoir operators is separate from the accounting problem.

ACR:cs

cc: Steve Allred
Ron Carlson

File:

January 18, 1978

COPY

MEMORANDUM

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FROM: Alan Robertson

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ACR:cs

cc: Steve Allred
Ron Carlson

File:

January 3, 1978

COPY

MEMORANDUM

TO; Bob Fleenor, Coordinator for District 1 management change

FROM: Alan Robertson

SUBJECT: Winter water rights

The water right accounting program as now operating charges all diversions in excess of natural flow rights to storage. Steve has indicated that the river is to be on regulation at all time and measurements taken of diversions whenever they occur. If the program is to be used in the non-irrigation season to determine reservoir storage accruals we will need to know the variations in rights which occur during those times.

10 MAR 78 STEVE ASSIGNED THIS TO FLEENOR TO BE DETERMINED

This question involves:

(a.) What are the beginning and ending dates for the irrigation season?

(b.) What are the rights, if any, (stock water, subirrigation, etc.) during the remainder of the year?

I realize these rights may not be quantifiable, and if they are not we will assume that the priority dates and amounts are the same as the irrigation season rights.

ACR:cs

cc: Steve Allred
Ron Carlson

for 4 pm

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

John V. Evans
Governor

C. Stephen Allred
Director

Statehouse
Boise, Idaho 83720
(208) 384-2215

December 16, 1977

MEMORANDUM

TO: Bob Fleenor

FROM: Alan Robertson

SUBJECT: Minidoka Project Canal Rights

In 1967 Henry Eagle presented a report to the Idaho Water Resource Board on District 36 (now District 1) operation. On page 5 he stated:

> At the time the Government made filings for the Minidoka Project it also filed on any return flow that might return to the river as a result of use of water on the project land. . . . . The Minidoka Project is credited with the gain from Neeley to Milner during the period this project is using stored water.

For the purposes of the accounting program we need to know if there is such a return flow right, and if so, should Minidoka be credited with all gains Neeley to Milner or something less?

ACR:rg

MEMORANDUM

January 5, 1978

From: Jim Johnson J.S.
To: Dave Shaw

Re: Minidoka Project Canal Rights

I have reviewed all of the Bureau of Reclamation filings on the Minidoka Project and can not find any water right which would utilize Minidoka Profect return flow as a result of water on project land. All of the rights including decrees allocate either "natural waters" of the Snake River or Marsh Creek.

Water Rights for the Minidoka Project are summarized as follows:

Water Right No.	Amount CFS	Priority	
01-2000	1,726.0	3/26/03	
01-0214	1,000.0	8/06/08	
45-0512	150.0	4/10/09	(Marsh Creek)
01-0217	2,500.0	6/15/09	(power)
01-2019	2,500.0	12/14/09	used to fill Lake Wallcott
45-2064	150.0	7/16/10	(Marsh Creek)
01-2016	888.0	6/16/11	
01-0218	200.0	7/10/12	(power)
01-0008	266.6	4/01/39	Minidoka Irrig Dist
01-0007	163.4	4/01/39	Burley Irrig Dist.
01-2060	240.0	11/21/55	"A" Project (A&B Irrig Dist)

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 373 W. Franklin Street, Boise, Idaho

JOHN V. EVANS
Governor

C. STEPHEN ALLRED
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 384-2215

December 12, 1977

MEMORANDUM

TO: Norm Young, Bob Fleenor, Ron Carlson, Alan Robertson, Bob Sutter, Dave Shaw

FROM: C. Stephen Allred CSA

RE: Water District 01

The Department will be accepting a new and expanded role in the distribution of water in Water District 01 next year. Successful fulfillment of this role will require the cooperation and coordination of many areas of expertize in the Department.

To provide this coordination, I am naming Bob Fleenor, as Regional Offices Bureau Chief, to be project coordinator.

Additionally, to bring everyone presently involved with the project together, each of you should plan to attend a meeting to be held December 20 at 9:00 am in the State office conference room. This meeting will allow each person to identify their role and to point up areas of concern or misunderstanding. Each of you should bring anyone else who you feel will have a substantial input to the meeting.

The results of this meeting should be a fairly complete implementation plan with specific task assignments and target dates. Additional resources that are not presently available should also be identified and a time table for their acquisition established.

DS:cf

December 9, 1977

COPY

MEMORANDUM

TO: Norm Young

THROUGH: Darrel Clapp

FROM: Alan Robertson

SUBJECT: Data handling for Upper Snake Watermaster Operation

Good progress is being made on the program which is being written to determine natural flow and to allocate it to the various rights. It is, however, only one small part of the effort required to change over to the new system. Some of the other needed items include:

1. Installation of data processing equipment.
2. Preparation of a program to store the large amounts of data in a form needed by the allocation program.
3. Compilation of the water rights for each of the diversions, including pumps, that will be measured.
4. Installation of measuring equipment on all diversions.
5. Installation of measuring equipment on the Snake River at Lorenzo, Henrys Lake (stage), Cross Cut Canal at head, and Eagle Rock Canal above Willow Creek.
6. Arrangements for exchange of data between the watermaster and the USBR, Burley, and between IDWR and the USBR, Boise.

7. Determination of how storage rights relate to later priority diversion rights and under what rules storage management relates to reservoir rights.

8. Explanation of changes in the new system to affected parties.

Hydrology Section is particularly concerned that items 2 and 3 be completed well before the 1978 regulation season. We have been assuming someone else would do item 2, but if the Hydrology Section is expected to do it a major commitment of Garth Newton's time during the next few months will be required. We would also have to have some assistance from Dave Shaw.

Item 7 is principally a question for USBR and possibly the Fremont - Madison District, owner of the Henrys Lake storage right. We have discussed it with the USBR staff, but probably a formal request will be required to get a firm response.

I believe there is an urgent need to name a coordinator whose primary responsibility is this project or we may end up with some missing pieces next spring

ACR:cs

File:

Alan

December 8, 1977

COPY

MEMORANDUM

TO: Norm Young

FROM: Hydrology Section

SUBJECT: Upper Snake Reservoir Storage Rights

In preparing a new water right accounting system for the Upper Snake, we must include a correct procedure to account for reservoir storage accumulation. Initially we are including seven reservoirs: Jackson Lake, Palisades, Henrys Lake, Island Park, Grassy Lake, American Falls, and Lake Walcott. Ririe Reservoir will be added when the Willow Creek rights and diversion measurement sites have been determined.

This memo is to request the correct priority dates and quantities of water that can be stored for the above seven reservoirs. Presently we have the two attached lists of storage priorities for the Upper Snake, one from the USBR and one from the District 01 watermaster. These lists differ in two respects. First, in the watermaster list some rights are listed in cfs while the USBR lists only acre-feet. If the cfs amount is correct, how should the right be administered (i.e., should the storage in any one day be limited to the cfs value)? If only the acre-feet values are correct, should total storage in any one year be limited to that amount, or should storage be allowed to accrue whenever space exists?

Second, the USBR list has advanced some priority dates under winter water savings. Are these adjusted dates ~~rights~~ valid? And, if so, how should they be administered? Do they supercede canal rights which have a later priority than the advanced date, but earlier than the original storage priority?

ACR:BJS:rg

Attachments

FILE:

SUMMARY OF IRRIGATION DIRECT FLOW RIGHTS

Location	Rights in Sec.-ft.
Snake River, Heise to Milner	36,519.643
Falls River & Henrys Fork below Fall River	4,679.58
Lower Teton River	2,038.52
Snake River Tributaries above Heise, in Idaho	534.54
Minor Tributaries Heise to Milner	675.52*
Henrys Fork & Tributaries above Warm River	525.46**
Minor Tributaries to Henrys Fork below Warm River	400.93
Teton Basin in Idaho	2,505.40

*Plus 100 AF reservoir storage
**Plus one right for all flow of small unnamed springs and one right for all flow of Kelleys Canyon.

TOTAL ALL RIGHTS (except footnotes above) 47,879.593 Sec.-ft.

RIGHTS DECREED EXCLUSIVELY FOR POWER USE

Stream	Priority	Owner	Location	Quantity In Sec.-ft.
Snake River	Nov. 18, 1898	G. G. Wright	Idaho Falls	75
Snake River	June 15, 1909	U. S.	Minidoka Dam	2,500 ✓
Snake River	July 1, 1912	U. S.	Minidoka Dam	200 ✓
Snake River	Dec. 29, 1905	City of Idaho Falls	Lower Plant	1,500
Snake River	Dec. 3, 1907	City of Idaho Falls (L.3304)	Central Plant	600
Snake River	Sept 7, 1915	U.P. & L. Co.(P.11600)	Shelley Plant	100
Snake River	Nov. 14, 1924	U.P. & L. Co	Gem State Plant	1,500
Snake River	Oct. 28, 1927	City of Idaho Falls (L.6799)	Upper Plant	500
Snake River	Feb. 14, 1936	City of Idaho Falls (L.18271)	Upper Plant	1,500
Henrys Fork	Jan. 16, 1913	U.P. & L. Co.	Ashton Plant	1,000
Henrys Fork	Nov. 1, 1915	U. P. & L. Co.	Ashton Plant	500
Henrys Fork	Mar. 7, 1924	U. P. & L. Co.	Ashton Plant	1,000
Henrys Fork	Aug. 17, 1901	St. Anthony L.&P. Co.	St. Anthony	97
Henrys Fork	Dec. 20, 1913	U.P. & L. Co.	St. Anthony	700
Teton River	Oct. 1, 1889	Rexburg Milling Co.		60
Teton River	June 1, 1891	Siddoway Briggs Co.		52
Teton River	June 1, 1903	Siddoway Briggs Co.		84
Teton River	Oct. 1, 1921	Teton V.P.&M. Co.	Teton River	80

Teton V.P.&M. Co. has additional licensed rights.

1 and 2 (2) Hydro Copy

STORAGE RIGHTS
(acre-feet)

CANAL	JACKSON LAKE	PALISADES	AMERICAN FALLS
Riley (Poplar District)	1,589	1,550	673
Progressive Irrigation District	7,209	28,500	12,485
Farmers Friend	2,000	9,400	0
Enterprise Canal Co.	11,252	19,600	8,923
Craig-Mattson Canal Co.	0	1,440	0
Butler Island Canal Co.	0	250	0
Harrison Canal Co.	11,943	23,500	12,025
Rudy Irrigation Co.	3,530	15,700	2,649
Burgess Canal Co.	10,603	31,400	9,496
Clark & Edwards	0	800	0
Lowder Canal Co.	1,040	1,600	0
Labelle Irrigation Co. (East)	0	800	0
Sunnydell Irrigation Dist.	4,000	6,300	0
Lenroot Canal Co.	5,234	7,850	3,868
Reid Canal Co.	1,472	3,150	2,549
Texas Slough Irrigation Canal Co.	0	2,350	0
Liberty Park Irrigation Co.	0	2,350	0
Rigby Canal & Irrigation Co.	0	6,300	0
Island Irrigation Co.	0	4,700	0
Dilts Irrigation Co.	511	1,200	886
Long Island Ditch Co.	0	5,000	0
West Labelle Irrigation Co.	0	1,000	0
Parks & Lewisville Irrig. Co.	0	5,500	0
North Rigby Irrigation & Canal Co.	0	1,200	0
Butte & Market Lake Canal Co.	2,695	44,000	4,666
Utah-Idaho Sugar Co. (Osgood)	7,771	15,250**	13,459
Sam Sakaguchi (Smith)	41	0	71
Ray Andrus (Bear Island)	110	0	191
Clement Bros. (Kennedy)	155	0	0
Owners Mutual Irrigation Co.(Kennedy)	200	290	0
Idaho Irrigation District	13,230	58,800	22,911
New Sweden Irrig.District	19,857	31,400	25,731
Martin Canal Co.	2,659	5,600	2,006
West Side Mutual Canal Co.	0	2,350	0
Woodville Canal Co.	3,491	6,000	6,047
Snake River Valley Irrigation Dist.	30,225	35,300	26,367
Blackfoot Canal Co.	7,370	4,050	12,763
New Lava Side Ditch Co.	0	11,750	0
Peoples Canal & Irrig. Co.	20,365	35,000	21,415
Aberdeen-Springfield Canal Co.	74,626	152,800	55,591
Corbett Slough Ditch Co.	1,961	6,300	3,396
Riverside Ditch Co.	0	1,500	0
Danskin Ditch Co.	0	2,350	0
Trego Ditch Co.	758	3,200	1,314
Wearyrick Ditch Co.	0	600	0
Watson Slough Ditch & Irrigation Co.	0	2,350	0
Parsons Ditch Co.	0	700	0
Michaud Div. Fort Hall Project	0	83,900	47,700

FIRST RDGS ON 28 JUN — APPARENT START UP DATE

43 a 4329

Month of July 1977

Name of Present Owner	Address	Name or Number of Right as Shown in Decree	Priority Date	Amount Sec. Feet	Total Right Sec. Feet
"		"			
EXCHANGE Wells					
Simmons well into Canyon Crk.				*	
Grant Klingler					
Schwendiman - Parkinson				*	
Botts				*	
Hoopes #1					
Hoopes #2					
Canyon Creek Pipeline					
Pump #1					
Pump #2					
Pump #3					
Pump #4					
Pump #5					
Pump #6					
Eddie Gardner					
Russ Wilding					
Terry Brunson E					
Gordon Wright (W					
Jerry Harris					
Bob Ricks (Howo meter)					
Hayden Muir - N of Brunsons (white Tractor)					
Willis Walker (Portable)					0.8 cfs

Note:

NOTE — Figures to be given in cubic feet per second for 24-hour periods, or 24-hour second feet. Give name

Accum. Acre Feet

1	2	3	4	5	Acres ultimated	Sec.	Twp.	R
2	2	2						
0	0	0						
347.13	370.31	403.07	423.12	448.71				
159.48	176.56	200.80	215.64	234.68				
66.73	82.20	96.67	121.64	139.90				
Repair			52.71	57.16	63.27			
off			on	on	on			
off			on	on	on			
off			on	on	on			
off			on	on	on			
240.77	Lee called said check end of canal		282.89	283.58	283.58			
			.13	5.77	7.22	8.97		
15.71	16.94		19.78	21.31	21.91			
yes (7)	yes		yes	yes	yes			
yes (5)	yes		NO	yes	yes			
NO	NO		NO	yes	yes			
7.4	7.4		7.4	7.4				
yes	yes		yes	yes	yes			
	Yes		Yes					

45a 1 5 3 4329

Month of

NOTE — Figures to be given in cubic feet per second for 24-hour periods, or 24-hour second feet. Give name

Feet

11:30 AM

Name of Present Owner	6	7	8	9	10	11	12	13	14	15	Acres ulti-ated	Sec.	Twp
EXCHAN	—	—	—							started 3			
Simmons Well	—	—	—										
Grant Klingl	473.39	498.50	523.43	559.11	579.24	600.14	625.40	650.17	676.53	701.11			
Schwendiman	252.59	271.02	288.98	315.04	330.05	345.53	363.89	381.92	401.29	419.44			
Botts	157.89	176.24	192.94	218.11	232.37	246.45	246.45	246.45	261.14	278.45			
Hoopes #1													
Hoopes #2													
Canyon Cr	68.66	74.60	80.26	88.54	—	92.62	98.15	104.67	110.87	116.62			
Pump #1	off	off	off	off	—	6	6	6	6	6			
Pump #2	5	6	6	8	—	6	off	6	6	6			
Pump #3	5	6	6	off	—	off	off	off	off	off			
Pump #4	off	off	off	off	—	off	off	off	off	off			
Pump #5													
Pump #6	302.76	325.33	346.31	364.56	—	376.45	394.68	413.19	432.40	451.00			
Eddie Gaedner	8.77	10.62	13.05	18.20	18.32	18.32	18.32	18.32	—	—			
Russ Wilding	23.79	25.88	27.91	30.37	30.37	30.46	33.65	34.86	37.40	39.11			
Terry Brunso	no	no	yes	no	yes	yes	yes	yes	no	no			
Gordon Wrig	yes	no	no	no	yes*	no	yes	no	no	no			
Jerry Harris	no	no		no	no	no	no	no	no	no			
Bob Ricks	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4			
Hayen Muir - N	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes			
Willis Walker		yes		yes	yes		yes		yes				

Note:

* Daily Rea

Month of

Feet

NOTE — Figures to be given in cubic feet per second for 24-hour periods, or 24-hour second feet. Give name

Name of Present Owner	16	17	18	19	20	21	22	23	24	25	Acres Cultivated	Sec.	Twp
EXCHA													
Simmons W&H	3	3	3	3	3	3	3			7.41			
Grant Kling	0	0	0	0	0	0							
Schwendiman	724.82	754.73	775.58	802.10	826.14	8[illegible]	12[illegible]11	903.0	932.70	952.40			
Botts	436.59	457.43	[illegible]74.50	493 81	511 87	533	[illegible]549.47	567.98	589.59	604.25			
Hoopes #1	295.11	317.10	333 85	349.81	367.33	385 [illegible]	403 91	422.33	[illegible]	456.91			
Hoopes #2	7.49	16.40	26.11	36.85	46.00	[illegible]	65.24	75.15	85 82	92 88			
Canyon Cr													
Pump #1	122.17	128.27	134 89	140 58	146.25	152 16	158 04	163 61	163.68	163 68			
Pump #2	— 6	[illegible]	[illegible]	6	6	6	6	6	[illegible]	[illegible]			
Pump #3	— 6	[illegible]	[illegible]	6	6	6	6	6	[illegible]	[illegible]			
Pump #4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
Pump #5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
Pump #6	470.37	481 67	491 [illegible]	512 80	[illegible]	553 14	574.39	595.81	[illegible]18.68	623 01			
Eddie Gaedner	1832	1832	[illegible]	1832	1978	22 72-23	57	26.32	27 67	27 67			
Russ Wilding	41,00	43.70	46.11	48.80	51 37	53 63	56.91	60 47	63.78	64 37			
Terry Brunso		NO	Reg. Pump	0.99	1.91	2.98	3 88	4.71	4.85	4 85			
Gordon Wrig		NO	no	no	no	yes	no	no	no	no			
Jerry Harris		[illegible]	[illegible]	[illegible]	no	no	no	no	no	no			
Bob Ricks	7.4	7.4	14.2	29.5	46.0	56.7	56.7	56.7	56.7	56.7			
Hayen Muir - N													
Willis Walker	yes	yes	yes	yes	yes	yes	yes	yes	— 0	— 0			
					no	yes	yes	yes	— 0	— 0			

Note:

* daily Rea

Month of

Feet

NOTE — Figures to be given in cubic feet per second for 24-hour periods, or 24-hour second feet. Give name

Name of Present Owner	26	27	28	29	30	31	Total in 24-hour Sec. Feet	Remarks	Acres Cultivated	Sec.	Twp.
EXCHAN											
Simmons Well	11.50	15.50	19.26	23	54	29 41	28.31				
Grant Klingl	979.49	1005 07	1029.36	1053.85	1079.99		1106.79				
Schwendiman	624.39	643.16	661 18	679.21	698.44		716.96				
Botts	476.20	494.47	512.89	530 41	548.91		570.05				
Hoopes #1	102 61	111 63	121.88	131.63	141.63		151.72				
Hoopes #2											
Canyon Cr											
Pump #1	off	off	off	off	off		off				
Pump #2	off	off	off	off	off		off				
Pump #3	off	off	off	off	off		off				
Pump #4	off	2	6	6	off		off				
Pump #5	off	off	off	off	off		off				
Pump #6	off	624.22	646.47	666.13	685 95		708.79				
Eddie Gaedtke	27.67	27.67	27.67	27.67	27.67		27.67				
Russ Wilding	66 57	68 93	71.11	72.16	73.93		75.49				
Terry Brunso	4.90	6.01	7.04	7.93	8.61		8 61				
Gordon Wig	no	no	no	no	no		no				
Jerry Harris	no	no	no	no	no		no				
Bob Ricks	no	no	no	no	no		no				
Hayen Muir	no	no	no	no	no		no				
Willis Walker	.74 (59)	1.14 (59)	1.26	.69	2.67 (60)						
	.40	.70	.40	.30	(30)		(30)				

Note:

* Daily Re

Month of August

NOTE — Figures to be given in cubic feet per second for 24-hour periods, or 24-hour second feet. Give name

Name of Present Owner	Address	Name or Number of Right as Shown in Decree	Priority Date	Amount Sec. Feet	Total Right Sec. Feet	1	2	3	4	5	Acres Irrigated	Sec.	Twp.
Simmons, Klingler, Botts, Hooper #1, Hooper #2	Teton Pipeline (Still drilling)					32.1	35.26	38.46	41.91	45 30	est. 20% (non		
						735.7	754.19	772.66	791.75	808.87			
						585.7	604.11	621.67	641.06	658.03			
						160.8	171.18	181.74	192.60	202.31			
Shvendiman	Parkinson					1125.84	1147.25	1170.49	1196.43	1220.30			
Pump #1		163.68											
Pump #2													
Pump #3													
Pump #4													
Pump #5													
Pump #6													
Eddie Andrew						725.45	744.65	764.61	784.29	802.52			
Russ Welling						27.67	0	0	0	0			
Terry Brunson						76.12	79.53	79.53	80.86	81.47			
Gordon Wright	(Portable)					9.34	9.63	10.46	11.41	12.09			
Larry Harris	(Portable)					0	0	0	0	0			
Bolt Tracks	(12 s/ per day) when running 24 Hrs.					0	0	0	0	0			
Hayes Mini	(Portable)					56.7	56.7	0	0	0			12 s. / day when running
Willis Walker						0	0	0	0	0			
Willis Walker	(Portable)					3.62	3.89	.80	x 180 3.37	60			
						.30	.40	0	140	40			

Willis Walker (Portable)

Month of Augus-t

Feet

NOTE — Figures to be given in cubic feet per second for 24-hour periods, or 24-hour second feet. Give name

Name of Present Owner	6	7	8	9	10	11	12	13	14	15	cres altitted	Sec.	Twp
			Aug 8										
Simmons	49.02	53.81	55.92	59.66	61.35	63.21	65.98	70.33	74.18	77.42			
Klingler							*Hit water in well						
Botts	828.69	851.11	870.04	883.79	902.04	920.30	939.73	959.92	979.46	994.97			
Hooper #1	676.72	699.76	720.66	732.9	750.28	768.18	787.60	807.81	830.06	850.2			
Hooper #2	213.57	226.12	236.14	244.19	254.39	264.62	267.05	267.05	267.05	267.05			
Schwendiman Pa	1248.01	1279.96	1309.12	1336.41	1352.38	1378.42	1406.01	1434.43	1462.26	1484.35			
Pump #1	off	4:30 PM cc	164.30	170.60	176.65	182.41	188.92	195.48	201.14	206.38			
Pump #2	off	hot	6	off	off	off	off	off	off	off			
Pump #3	off	hot	6	off	off	off	off	off	off	off			
Pump #4	6	hot	6	off	off	off	off	off	off	off			
Pump #5	off	hot	6	6	6	off	off	7	6	off			
Pump #6	820.11	844.22	846.46	867.87	875.84	875.84	off	off	off	879.17			
Eddie Gardner	0	0	0	0	0	0	0	0	0	0			
Russ Weddle	82.14	82.91	83.4	84.2	84.9	85.0	86.56	87.44	88.35	88.35			
Terry Brunt	12.55	13.04	13.04	13.14	13.14	13.16	0	0	0	0			
Gordon Wright	0	0	0	0	0	0	0	0	0	0			
Terry Harris	0	0	0	0	0	0	0	0	0	0			
Bert Fuchs	0	0	0	0	0	0	0	0	0	0			
Hayes Muir	0	0	0	0	0	0	0	0	0	0			
Willis Walker	.80	0	0	0	0	0	0	0	0	0			
Willis Walker	.60	0	0	0	0	0	0	0	0	0			

12 c. ft. / second

* Klingler well was pumping some water down canyon wall

Month of August

Feet

NOTE — Figures to be given in cubic feet per second for 24-hour periods, or 24-hour second feet. Give name of owner of water right or ditch

Name of Present Owner	16	17	18	19	20	21	22	23	24	25	Acres Cultivated	Sec.	Twp
Simmons	30			112.03									
Klingler													
Botts	19.211		49.93	670.98		109.95		141.40	150.80				
Hooper #1	275.75		293.656	305.50		321.10		345.08	357.24				
Hooper #2	105	89.467		913.81		941.58		987.10	991.6				
Schwendeman	16			1588.67		1647.70	1668.0		1722.46				
Pump #1				229.49	235.8	243.31			255.85				
Pump #2													
Pump #3													
Pump #4													
Pump #5													
Pump #6				956.25	974.94	994.44			037.91				
Eddie Graber	0	0	0	0	0		0	0					
Russ Weeks	90	90	90	193.420			0	0	93.83				
Terry Brun	16	0	0	0	0		0	0	15.75				
Gordon Wrig	0	0	0	0	0								
Terry Harris	0	0	0		0		0	0					
Bob Fuchs	12 Full load		12	122 Pea				153 Pea					
Hooper Irri	0	0	0	0	0	0	0	0					
Willis Walk	0	0	0	0	0	0	0	0					
Willis Walker	0	0	0	0	0	0	0	0					

Month of August

NOTE — Figures to be given in cubic feet per second for 24-hour periods, or 24-hour second feet. Give name

Name of Present Owner	26	27	28	29	30	31	Total in 24-hour Sec. Feet	Remarks	Acres Cultivated	Sec.	Twp
Simmons											
Klingler											
Botts											
Hooper #1											
Hooper #2											
Schwendiman Pa	1776.30						1883.3				
Pump #1											
Pump #2											
Pump #3											
Pump #4											
Pump #5											
Pump #6							144.7				
Eddie Gardner											
Russ Riddle											
Terry Brunson											
Gordon Wright											
Larry Harris											
Bolt Tech											
Hayes Mini											
Willis Walker											
Willis Walker											

PARRY, ROBERTSON, DALY & LARSON
LAWYERS
THE IDAHO FIRST NATIONAL BANK BUILDING
P. O. BOX 525
TWIN FALLS, IDAHO 83301

R. P. PARRY
T. M. ROBERTSON
JOHN H. DALY (1913-1968)
BERT LARSON
C. G. McINTYRE
JOHN R. COLEMAN
THOMAS G. NELSON
JOHN A. ROSHOLT
FRED D. DECKER
ROBERT C. PAINE
J. EVAN ROBERTSON

TELEPHONE
(208) 733-3722

OUR FILE NUMBER

June 21, 1977

Mr. Stephen Allred, Director
Department of Water Resources
Statehouse
Boise, Idaho 83720

Mr. Art Larson, Watermaster
Water District No. 1
Federal Building
P. O. Box 1099
Idaho Falls, Idaho 83401

Re: Insufficient Controlling Works & Measuring Devices

Gentlemen:

It has been called to my attention by my clients that several diverters from the Snake River system in Water District No. 1 do not have control works at their point of diversion that can be locked and closed by the watermaster, or measuring devices to determine the amount being diverted.

Perhaps it took a drought year to bring the problem into focus. Ironically, most of the organizations or individuals that do not have control works and measuring devices have rights that were either adjudicated in Rexburg, Foster, or the supplemental decree of Burley Irrigation District, et al v. Eagle. They also have substantial storage rights. My clients have natural flow rights of inferior priorities, but certainly deserve to be assured that when their storage water is moved from the reservoirs to their diverting works, that the same will not flow freely into the systems of others.

On behalf of our clients, we officially request that you invoke the authority contained in Chapter 7 of Title 42 of the Idaho Code to insure that adequate controlling works and measuring devices are installed throughout Water District No. 1 as soon as possible.

Respectfully submitted,

John A. Rosholt

JOHN A. ROSHOLT

JAR:bg
cc: American Falls Reservoir District
Twin Falls Canal Company
North Side Canal Company

June 29, 1977

Mr. Arthur Larsen
Watermaster
Water District 01
Box 1099
Idaho Falls, Idaho 83401

Dear Art:

I was not sure whether or not you received a copy of a letter from John Rosholt requesting installation of measuring devices in District No. 1. In the event that you did not, I am enclosing a copy for your information. The letter you have recently sent out should help the situation that Mr. Rosholt refers to. Incidently, I would appreciate receiving a copy of that letter along with the list of people to whom it was sent. I would suggest that you conduct an inventory of the points of diversion where you deliver water and description as to whether or not the diversion works can be locked and closed by the Watermasters and the type of measuring device that is in place. I am sure that you already have much of this information or that perhaps it can be collected through your regular operations the next time someone visits the headgate. I believe it is important, however, to obtain the inventory within the next couple of weeks.

If you have any questions, please feel free to give me a call.

Sincerely,

C. STEPHEN ALLRED
Director

CSA:lm
Encl.
cc: Eastern District

June 29, 1977

Mr. John A. Rosholt
Parry, Robertson, Daly & Larson
The Idaho First National Bank Bldg.
P.O. Box 525
Twin Falls, Idaho 83301

Dear Mr. Rosholt:

With regard to your letter of June 21st requesting that we order the installation of control works and measuring devices throughout Water District No. 1, I have asked Water District No. 1 personnel to inventory as soon as possible the types and locations of control works and measuring devices at the various points of diversion.

As soon as that has been accomplished, hopefully within the next couple of weeks, I will be in touch with you about future actions.

Sincerely,

C. STEPHEN ALLRED
Director

CSA:lm
cc: Mr. Arthur Larsen
Eastern District

From USBR 6 Sep 77

USBR Automation Plans FY78 and FY79

Dams (Pool elev. and discharge)	Stream Gages
Anderson Ranch	Payette R near Lowman
Arrowrock*	Payette R near Horseshoe Bend
Lucky Peak**	Snake R near Murphy
Wildhorse	New York Canal Headworks
Cascade	Boise R at Boise
Black Canyon	Snake R at Lorenzo***
Payette Lake	Snake R at Heise
Henry's Lake	Snake R at Shelley
Palisades	Snake R at Blackfoot
Ririe	Henry's Fork nr. Rexburg
Little Wood	Little Wood R near Carey
Jackson Lake	Buffalo Fork above Lava Creek, WY
	Pacific Creek at Moran, WY****
	Snake R below Flat Creek, WY
	Snake R at Alpine, WY
	Greys R above Reservoir, near Alpine, WY
	Salt R above Reservoir, near Etna, WY

* No discharge measurement
** Communications furnished by USBR, all other equipment furnished by USCE
*** New Station, proposed by USBR
**** To be re-established

Needs Grassy Lake Island Park

Am F
Is Plk
Milner
Minidoka

Alan

August 2, 1977

MEMORANDUM

TO: Director

FROM: Alan Robertson

SUBJECT: Hydromet Stations in Relation to Upper Snake Watermaster Operation

Most of the sites listed by the Bureau (attached) would be useful to an improved watermaster operation. The Bureau list implies new stream gages will be added on the Snake below Flat Creek and at Lorenzo. Lorenzo would be especially useful to improve the watermaster work.

A computerized computation procedure would, of course, require that all necessary data be available to the watermaster each day. The hydromet system would allow the watermaster to obtain data from certain sites without the necessity of a deputy visiting them. It may also result in getting more than one readout per day, thereby improving the accuracy of the mean flow estimate for the day.

If additional automated sites could be added, we would suggest the following:

Henrys Lake
Henrys Fork near lake
Henrys Fork near Ashton
Falls R. near Squirrel
Falls R. near Chester
Willow Cr. floodway
Blackfoot R. near Blackfoot and flood bypass
Portneuf R. at Pocatello
Cross Cut Canal at head and at end
Eagle Rock Canal into Willow Cr.
Major canals.

ACR?rg

FILE:

IMPROVED OPERATIONS OF WATER DISTRICT 01

	Proposed Improvements	Implement	Operational	Estimated Cost
1.	Allocation of carryover storage at end of irrigation season.	1977	1977	USBR - no cost
2.	Tabulate all stream gages, reservoirs, and diversions daily, lock diversion structure with operation by watermaster only.	1978	1978	$20,000-$30,000/year. W.D.#01 IDWR develop typical budget.
3.	Computerize water bookkeeping procedures, programming and development.	1977	1978	$12,000 - IDWR
4.	Acquire computer terminal for watermaster.	--	1978	$ 5,000/yr. W.D.#01
5.	Establish rating section for each diversion.	1978	1980	Diversion being inventoried by Individual IDWR.
6.	Install additional recorders on larger canals.	1978	1980	$50,000-$100,000 W.D.#01 and canals - IDWR.
7.	Computerize operations correlating release and diversions. (a) Computerize program to determine quantity of stored water to be released to meet demands (b) Automatic polling of field stations (some of data will be available through hydromet)	1978	1980	Contact Larry Vincenhauler PNWRC and USBR
8.	Supervisory control of major diversions.		Future	$24,000/yr. W.D.#01
9.	Hydromet be implemented as programmed[1/]		1981	
10.	Further measurement stations if necessary			

1/ Reservoir elevation and discharge

Jackson Lake	Lake Walcott
Grassy Lake	Lake Milner
Palisades	Little Wood
Island Park	Ririe
American Falls	Blackfoot

Streamflow stations

Buffalo Fork at Lava Creek	Snake River nr Shelley
Snake River below Flat Creek	Snake River nr Blackfoot
Greys River at Alpine	Little Wood River nr Carey
Snake River at Heise	Snake River nr Lorenzo
Henrys Fork at St. Anthony	Teton River nr St. Anthony
Henrys Fork nr Rexburg	

Funding Possibilities

1. Additional watermaster expenses paid by District (including labor, locks, terminal, etc.).

2. Computer software to be written by State with State money or Bureau G.I. funding as part of Water Management Study.

3. Hydromet fully funded by Bureau.

4. USGS possibly participate in rating sections and additional recorders.

5. Possible expansion of State matching fund appropriation in 1978.

Logistice

1. Approach Committee of Nine with possibilities.

2. Ask for establishment of Watermaster Transition Subcommittee to work with State and Bureau.

3. Write job qualifications and advertise watermaster's job, keeping in mind program.

4. Ask support of Art Larson for improvements.

5. Establish Improvement Task Force for actual implementation with representatives of Committee of Nine, State, Bureau, and Watermaster.

Roberta Please type

STUDY/PROJECT REQUEST

TO: Bob Fleenor

FROM: Alan Roberton

Date Initiated Sept 2, 1977

Requested Completion date Dec 1, 1977

TITLE: Verification of District 01 Water Rights

PROBLEM AND/OR PURPOSE: A computer program for water rights accounting is being written. First application will be in District 01.

SCOPE (level or extent of detail):

DESCRIPTIONS OF WORK REQUESTED:

1. Verify or correct list of "Decreed Rights in Water District No. 01", by Art Larson Aug 76.
2. Does this constitute all rights in District 01? Does it include all tributaries? Are rights on all these tributaries subject to downstream rights?
3.

REQUEST ORIGINATOR: Alan Roberton

TYPE OF REPORT: Revised or verified list of rights

DISPLAY TABLES: YES____ NO____

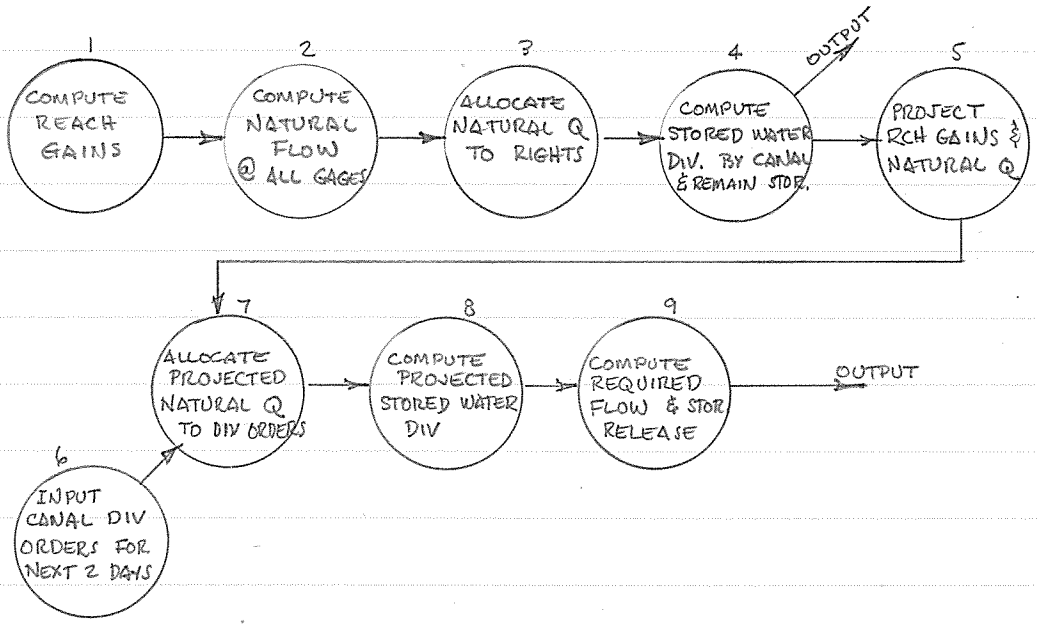
ANTICIPATED MAN-DAY EFFORT:

APPROVED BY: _____ ASSIGNED TO: _____ DATE: _____

ACTUAL MAN-DAYS: _____

WATERMASTER ACCOUNTING PROGRAM
STATUS
15 Sep 77

1. Program is general.
2. What it does or will do:



3. Parts 1 thru 4 are completed and have been tested using single day 1973 data. Additions will have to be made for these parts to include lags in computing natural flow and to charge transmission losses, if any.
4. Accounting which is unique in the Upper Snake will have to be added. This includes the Cross-cut Canal, shared rights between the Gooding Project and American Falls Reservoirs, and probably several others of which we may not yet be aware.
5. Items 5 thru 9 remain to be written. Also software for data management will have to be written.

UPPER SNAKE RIVER WATERMASTER OPERATIONS

ACR 17 Aug 77

ITEM	PRESENT METHOD	PLANNED METHOD [INITIAL]
1. Annual Storage Alloc.	USBR determines	USBR determines
2. Data Collection		
a. Res contents, outflows	WM obtains from USBR	WM obtains from USBR
b. River flows	WM hydrographers, telemarks	WM hydrographers, telemarks
c. Canal diversions	WM hydrographers	WM hydrographers
3. Daily allocation of natural flow and determination of storage use.	Natural flow not determined. WM periodically balances accum stored flow at Blackfoot computed as $\Sigma \Delta S$ minus chgd trans losses minus storage deliv above Blackfoot with accum stored flow at Blackfoot computed from total flow there minus natural gain below lowest div (Parsons Canal) near Blackfoot gage. These are balanced by cutting natural flow rights, which adjusts the storage deliv values. This balance is made only after the "normal flow" below the Parsons Canal recedes to zero. "Normal flow" is observed flow at a gage less stored flow. It is the remaining natural flow after upstream diversions have taken their natural flow entitlements. This remaining natural flow will be used d/s by other canals. The "normal flow" method works only in situations where upstream rights are all older than the downstream rights. In balancing stored flows at Blackfoot by means of adjusting computed storage deliveries the natural flow rights are cut to the proper priorities periodically.	For each reach: reach gain = O - I + ΔS + Σ div Reach gains are summed downstream to each gage to get natural flow at the gage. Natural flows are allocated to oldest priorities. Additional diversions are stored water.
4. Gain to American Falls Reservoir	"Newell" formula, sometimes modified.	Similar to all other reaches Am F. reach gain = O - I + ΔS + Σ div

ITEM	PRESENT METHOD	PLANNED METHOD [INITIAL]
5. Output		
a. Timing	A lag of one to several days occurs in doing all data work and balancing stored flow at Blackfoot to get priority date cuts.	All data handling and computation for the previous 24 hours can be done each day.
b. Decision process	After computation by WM.	WM would not do computations. With computer output available daily he would be free to make the daily decisions involved in cutting rights, informing water users, managing data aquisition, etc.
c. Billing	"Several frantic weeks in getting the bills out" (after Oct 1.)	Since total diversions would be available daily the bills could be sent out almost immediately after Oct 1.
d. Watermaster Report	Present format. Published by 1 March	Similar to present format except where method of water right allocation differs. All data would be listed by computer for direct insertion into the report.
6. Structure of WM Operations.		
a. Snake River below Neeley	Daily supervision of diversions by USBR, Burley. Data provided to WM for current reports.	Supervision by WM.
b. Snake River above Neeley	Supervision by WM	Supervision by WM.
c. Henrys Fk basin	Fremont-Madison District provides deputy WM services including computations of water right allocation. Data provided periodically to WM.	Supervision by WM.
d. Headwater tribs.	Separately managed. Data provided to WM periodically.	Supervision by WM.
7. Equipment	Office equipment.	Typewriter style terminal connected to State Auditor's computer in Boise.

ITEM	PRESENT METHOD	PLANNED METHOD [INITIAL]
8. River management to meet div. requests.	Relies on WM experience. In normal years releases are made to provide a flow of 1000-2000 cfs at Blackfoot. In dry years it is attempted to minimize the Blackfoot flow. There is no systematic procedure to base releases on the expected natural flow and div. orders for the next day or two.	Reach gains would be projected for the next three days based upon the trend in the immediate past gains. These would be summed to determine projected natural flows. Diversion orders which would be submitted to the WM up to two days in advance of need would be used with the projected natural flow to identify a change in storage release required to meet the diversions, taking tvl times into consideration. This computation is similar to the daily natural flow allocation determination except that required storage release is determined instead of the actual stored flow. The WM would then notify USBR, which would determine where the drafts would be made.

July 1, 1977

MEMORANDUM

COPY

TO: Director

FROM: Bob Sutter and Dave Shaw

SUBJECT: Data Processing for Upper Snake Watermaster

There are two time consuming calculation procedures that the District #1 Watermaster must make daily in order to determine the remaining storage of canals throughout the irrigation season. These are the daily flow segregation and the daily storage diversion determination shown for the main Snake River as Plates 12 through 14 in the District #1 Watermaster Report. The Daily flow segregation is used to compute the stored and remaining natural flow at Blackfoot and Neeley from which the "cuts" in rights are made. Based on the rights remaining, storage use and remaining storage are computed in the daily storage diversion determination. Similar computations are made for the Henrys Fork in Tables 21 through 23 of the District #1 Report.

We presently have completed a Fortran program which computes the daily flow segregation on the main Snake River and Henrys Fork. In order to provide the Upper Snake Watermaster with a system that would give him an accurate account of each canal's storage use and balance, the following would be required:

1. Code all diversion rights by canal and priority date.

2. Write a system program to accept and store basic flow and diversion data for use by scientific programs.

3. Write a scientific program to determine storage diversions from canal measurements and flow segregation data.

4. Provide Watermaster with necessary terminal equipment to transmit basic data to processing facility, and receive and print a storage remaining report.

The initial three steps would be done simultaneously. Our office could do steps 1 and 3 with some assistance from the Watermaster in understanding the many peculiarities which occur in accounting and are not explained in

the Watermaster Report. The programs and data would be tested and checked at our office using the Auditor's computer facility. This would require from two to three man-months and would initially include only the main Snake River canals.

Assuming the Auditor's computer would be used to process the data, they would write the basic data handling program (step 2). It is uncertain how soon they could schedule this.

The terminal at the Watermaster's office would consist of a typewriter style terminal for entering data and receiving reports and a modem with dial phone. Acquiring and installing this equipment would require about six to nine weeks.

Proposed daily operation would be similar to the following. The Watermaster's secretary would receive canal and river data each morning from ditchriders and hydrographers (same as present operation). The secretary would then enter data via terminal and phone line to the Auditor's facility in Boise before noon. A report of canal storage diversions for that day, and remaining total reservoir storage for the year, would be received back at the Watermaster's office before five O'clock. Other reports could also be printed, such as reservoir and river situation summaries and year-to-date accumulations. Access to the data and reports would be available to our office.

Total time for program and data preparation, equipment installation, and testing would be at least six months. Initially, the system would only duplicate methods and reports presently used by the Watermaster and would only include the main Snake River. The Henrys Fork and other tributaries would be added at a later date, as well as revisions in methods and report formats.

BS:cf

DUTIES AND FUNCTIONS OF THE WATERMASTER

by A. L. Larson

One of the main purposes of this meeting is to get everyone acquainted with all the internal workings of Water District No. 36 and most of the Geological Survey Sub-district Office functions.

A number of the present members of the Committee of Nine have served for many years. Mr. Gillette, I find, has served intermittently since 1940; Mr. Walker and Mr. Graham since 1948; Mr. Scoresby since 1953; Mr. Murdock since 1954; Mr. Peters since 1959; and so on, for an aggregate total total of 171 years. That's a lot of years experience in the water business and all of you are either directors or managers of various irrigation groups. Therefore, as we present our interpretation of this river operation, if anything appears to be inconsistent with procedures which you recognize as having been established in the past, please put us straight.

We will solicit and appreciate any suggestions, comments, or changes that may come to mind, and I am certain any and all questions can be answered here today. We are going to attempt to present in some detail a typical operation in moving stored water through the system. We will try not to get too involved, as at best we can do little more than scratch the surface in the time available.

The watermaster's year begins on the first Monday in March, when the waterusers within the district assemble and vote their decreed rights in conducting the business of the water district. The users, following the recommendations of the Committee of Nine, assign certain duties to their elected watermaster, by means of a number of resolutions. These, of course, are in addition to the duties and responsibilities as set down by the Idaho code through the Department of Water Administration.

The main resolutions, as generally adopted annually, define the transmission losses to be charged to stored water being moved down the river from the various reservoirs.

Pre-reservoir conditions are to be maintained as nearly as possible by allowing for bank storage and time of travel.

The users approve and accept the budget for the ensuing year, as prepared by the Watermaster and the Geological Survey, and previously reviewed by the Committee of Nine, usually at a special meeting the day or evening before the general meeting.

They authorize the watermaster to borrow a limited amount of money each year in order to pay outstanding bills near the end of the irrigation season.

The users recommend a committee to assist and advise the watermaster in the renting of surplus stored water to canals or individuals in need of supplemental water.

By state law, he is required to deliver water according to decreed rights, and when decrees can no longer be filled by the natural flow of the river, he must then determine the amount of stored water being delivered to the user and keep a running total of the balance so that the user can prorate his remaining storage over the balance of the season.

State law stipulates that annually, or as requested, reports must be filed with the Department of Water Administration. Also, the watermaster must file with the Department an official bond in the penal sum of $500.

Regular reports are issued at weekly intervals during the non-regulating season, and three times weekly during the time the river is on regulation. This report keeps interested parties informed of the river flows, reservoir contents, decrees in effect, and noteworthy items regarding precipitation and snow conditions on the watershed. You are all familiar with it. Incidentally, to indicate the widespread interest in such data regarding the Upper Snake River, the mailing list for the report includes addresses in Washington, D.C., Denver, Salt Lake City, Boise, and almost every city and town in the Snake River Valley.

Part of the responsibilities of the watermaster is active participation on a number of committees involved in various aspects of river operation. Currently, they are the Committee of Nine, the Storage Pool Committee, the Ririe Reservoir Allocation Committee, and the State Reclamation Education Committee. Typical of most committees, they operate intermittently, but can become quite demanding when suddenly activated.

As with any organization, people are required to make it function. The permanent force of Water District 36 and the U.S.G.S. Sub-district office amounts to four persons. The watermaster, his assistant, one hydrographer, and a clerk. In addition to Water District duties, they are responsible for all the U.S.G.S. assignments in SE Idaho and the Snake River in Wyoming. Part time help the year around amounts to a hydrographer and several gage readers, who are paid only for the actual time worked.

When the irrigation season begins on May 1, "some kind of record" is attempted on all diversions. Most of the larger canals have stage recorders on them, pumped canals are rated through line meters, or pump data, and the majority of the diversions are gaged by daily gage readings. During the flood water season, canal company watermasters are furnished gage height books and are asked to record their gage readings as often as possible. Most of them do a conscientious job of this, and these readings furnish the basis for most of the early season diversion records.

From May 1 to the time regulation begins, usually about July tenth, current meter measurements are made on the canals by one hydrographer at St. Anthony, one here at Idaho Falls, and one at Burley. Current meter measurements are necessary to properly relate gage heights to cubic feet per second flow. Also, towards the end of May, a deputy watermaster is employed in the Teton Basin to gather hydrometric data and read canal and ditch gages in order to properly administer the decrees in the basin. Likewise, a deputy is employed on a part-time basis in the Swan Valley from about the first of July to about the first of September.

When the river goes on regulation, the river riders are put on to furnish us with daily canal readings so that the latest information can be had regarding distribution of stored water. Two additional men are employed thusly in the St. Anthony area, and four in the Idaho Falls area, usually for a period of about 75 to 90 days. Readings in the lower valley are phoned into the Bureau of Reclamation office by canal company personnel, and then relayed to the Idaho Falls office for inclusion in the daily data.

Now to go through some of the motions of how this data is obtained, tabulated and eventually condensed into final form for publication in both the watermaster's annual report, and in the U.S. Geological Survey's "Water Resources Data for Idaho".

A typical day's operation in mid-summer begins with about a dozen phone calls submitting data to aid in determining just where we are on the river operation. Reports come in from the river riders responsible for the canal gage readings in their respective reaches of the river. Also, included are a number of river readings, such as Heise, Rexburg, and Blackfoot. Probably the key river reading is the one from the telemark at the Shelley station. This gage is situated at a strategic location in the river reach and reflects the water usage upstream. As has been stated so many times, beginning with the Palisades contracts, the ideal river operation is to keep the river as low as possible at the Blackfoot station. Ideally, this would be nearly zero, but that would be impractical and unfair to the last few canals in the Blackfoot area. It seems that if a flow of between one and two thousand cfs can be maintained past the Blackfoot gage, it keeps everyone happy, and still keeps a "cushion" there if the demand should suddenly pick up, and keeps as much stored water as possible upstream.

The St. Anthony office works very similarly,only the two full-time hydrographers and the one part-time hydrographer make their gage reading rounds first thing in the morning, report into the office, then do their current meter work in the afternoons. In the Idaho Falls area, one man does all the current meter measuring, full time, and four individuals work part-time reading the gages.

The deputy watermaster in the Teton Basin sends in weekly reports from which a figure is determined to be stored water used in the Basin. This is somewhat tentative at times, but is close enough to keep the Teton River operation in balance. At the end of the season when all data is available, all storage figures are corrected and revised slightly before publication. This is especially important in years of short supply when carryover storage is a big item.

We have referred to the storage rental pool, and the way this works is as follows. If a person or a canal company owns storage, and they do not anticipate using any or all of it, they notify the water district office well ahead of the irrigation season, and this block of water is pooled with other offers to form a source of supplemental water to those who do not have an adequate supply of stored water. The watermaster's office acts as a broker, receiving money for water rented and disbursing it at the end of the season to those who offered it for rent. The only remuneration to the District for this service is the use of the rental money for a period of several months to pay current district expenses. Stored water is rented at the rate of 50 ¢ an acre-foot apparently based on the Palisades Water Users

Contract which calls for annual payment of 25 ¢ an acre-foot per year. Therefore, a Palisades water user cannot offer for rent more than one-half his storage allotment so that he can no more than break even on his storage assessment.

As soon after October 1 as possible, depending on the ease and speed with which all canal records can be accumulated, the total canal discharges for the summer are totalled up, and the billing sent out to the various users. The assessment is computed as follows: All water district expenses are added up for the past year, October 1 to September 30, and divided by the total number of cfs days of water diverted from May 1 to September 30, except in the lower valley where the season is longer and April 15 is the initial date. However, the lower valley rate is the lowest in the District, and is the base rate. To that rate the Committee of Nine expense, upper valley members only, is added on. For the Swan Valley users, a portion of the Swan Valley deputy's expense is added on, and likewise in the Teton Basin.

Canal companies, districts, and a number of individuals are billed directly. However, all of the Teton Basin, Swan Valley, and various groups of unorganized ditches and individuals are billed through the Counties via the Tax rolls. And, in this respect, a problem has arisen this year. Teton County auditors have ruled that the county has no obligation to pay their assessment until all the water taxes are collected by them. Therefore, out of a total billing of $1,798.49, they have collected and paid to us the sum of $1,448.28, short some $350.21, so far. It seems some clarification is in order here. The Idaho Code is somewhat ambiguous and does not spell out in so many words as to how the counties are to collect that last penny to reimburse the Water District.

For many years the Water District Office has sold the Geological Survey topographic maps, originally mostly as a public service. In recent years, however, the demand for thdse maps has grown to where we now sell them on a commercial basis, that is, at the same rates as the stationery stores. The profit realized from the sale of these maps go into Water District funds, and is now at about $650 annually.

It seems the Water District gets more than its share of the attention at this type of a meeting, and rightfully so, as that is where your primary concern lies. But let us dwell on what role the Geological Survey plays in the scheme of things here. First, they are the recognized authority on stream-gaging, ground water levels, and quality of water. Earlier, I mentioned that the Watermaster's year begins about March 1, and how the regulation season goes. When the irrigation season ends September 30, there are several frantic weeks getting the bills out. In this process the canal records are finalized. Then comes several months of assembling all the river and canal data for compilation into the "black book". Usually, this is completed and sent to Mr. Higginson's office for duplication and binding by the end of January so that the annual report is available by the March 1 meeting. Now we finally come to the time of year that we can devote most of our time to the Geological Survey.

Gaging station records outside the district have been largely neglected since the last April or May, and they must now be brought up to date, first through the past September 30, so that they can be sent to the Boise office for editorial review and then forwarded to the printers for publishing and binding.

It is usually possible to bring all records up to date by about April or May, when it is again time to start concentrating on District 36 duties. Of course, stream-gaging is not the only Geological Survey function we perform for the District office. With all the accent lately on water pollution, etc., quality of water has become very important, and our office has the responsibility of collecting samples at several dozen sites. We also collect sediment samples during part of the year at about six sites. Within the ground-water program, the Idaho Falls Sub-district office is responsible for measuring about two dozen wells on a monthly basis.

I trust this has been of some information to you, and that you have gotten as much out of it, as I have in bringing it to you.

Arthur L. Larson, Watermaster
Water District No. 36
State of Idaho

December 30, 1977

COPY

MEMORANDUM

TO: Bobby Fleenor, Coordinator for District 1 Management Changes

FROM: Alan Robertson

SUBJECT: Proposed Changes in Water Accounting Procedures

This is to record some of the changes in water accounting that we are proposing to use. We assume they will require some kind of approval but are proceeding on the assumption that they will be in effect in 1978.

1. American Falls gain. PROPOSED CHANGE: Eliminate the "Newell Formula" and replace it with a regularly computed reach gain including evaporation. EXPLANATION: The Newell formula was developed in about 1927 to compute the natural gain to the Snake River between the Blackfoot (Clough) gage and Heeley without the effect of American Falls Reservoir. The Newell formula is: Total inflow = 4/3 x measured inflow + 840. Measured inflow is the sum of 27 creeks and irrigation wasteways which discharge into the reach. A concern for loss of water to bank storage may have been one reason for developing the Newell formula.

REASONS FOR CHANGE:

(a) Newell formula is costly, requiring 27 measurements or estimates daily. Many of these are on the Ft. Hall Reservation and are probably not measurable by a state watermaster. These sites are not in the USGS Cooperative program and, therefore, would not be measured in 1978 without extra funding to USGS.

(b) There is no reason why the American Falls Reservoir reach is different from the other reservoir reaches where the reach gain equation has been used in the past.

(c) The reach gain equation is a water budget for each day and is as accurate as the input data allows. Inaccuracies in the data are self-compensating in that the adjacent reaches are offset by the amount

of any inaccuracies. The Newell formula, on the other hand, is empirical and there is no self-compensation for inaccuracies in the 27 measurements. The reach gain method should be considered the standard for accuracy.

(d) Losses to bank storage undoubtedly do occur (as they do in nearly all reservoirs), but the bank storage returns when the reservoir is lowered. The net effect probably is a relatively small loss to winter natural flows with a corresponding increase in summer natural flows.

(e) Comparisons of the gain computed by the Newell formula and the reach gain equation show differences between the two methods but no systematic bias in either direction. When evaporation is included in the reach gain equation, it generally shows greater natural flow in the late summer, the time of most importance to lower valley canals having the best natural flow rights. The Newell formula usually shows greater flow in May.

2. Reservoir evaporation. PROPOSED CHANGE: Include evaporation in the reach gain computation for Palisades, American Falls, Lake Walcott, and Island Park. EXPLANATION: Evaporation has not been used in the natural flow determination (except that at American Falls the Newell formula avoided the need for evaporation data) at any reservoirs. Evaporation should not be included on reservoirs that were natural lakes (Jackson, Henrys Lakes) because its occurrence there was a factor in the natural flows.

REASONS FOR CHANGE:

(a) Reservoirs cause this increment of loss and it should not be charged to natural flow users by omission.

(b) It can be estimated daily with reasonable accuracy.

(c) Evaporation is a major loss exceeding 500 cfs at American Falls and 100 cfs at Lake Walcott at times.

3. Storage transmission losses. PROPOSED CHANGE: Eliminate the practice of charging storage transmission losses. EXPLANATION: The Committee of Nine has annually adopted storage transmission losses for the various Snake River reaches above Blackfoot totaling 13.4% and on the Henrys Fork, 6.5%. In computing natural flow these percentages have been applied to the stored flow and added to the outflow and inflow gage differences for the reach. The method of original derivation of these percentages is unknown, but they appear to have been used since the early 1920's.

Since it is impossible to know which reservoir is supplying stored water a particular canal is using, the various canal storage accounts are

not charged variable percentages based upon their location. In recent years Snake River canal storage accounts above American Falls have been increased a flat 6.67% of their storage diversions to account for transmission losses.

Below Neeley, storage transmission has not been charged, except that the Minidoka Project canals have been credited with all gain Neeley to Milner when storage is being released to them. When the computed gain is negative, these canals are, in effect, charged all the loss in that reach.

REASONS FOR CHANGE:

(a) It is not possible to compute a correct "storage transmission loss."

(b) While some increment in river losses may occur in some reaches because of stored water transmission, there are also times when the loss is reduced because water is being withheld by storage. There are also circumstances in which the gain is greater because of storage deliveries upstream.

(c) The percentages which have been used are believed to be excessive.

(d) Proper application of transmission losses would involve using the same amounts in the canal storage accounts as in the computation of natural flow. This has not been done; but if it were included in the computerized method, it would require an iterative computation process which would increase computer costs. It would also require designation of a reservoir source for each storage diversion.

(e) Charging for evaporation losses (item 2) is much more justifiable than for transmission losses and will more than offset the effects of dropping the transmission loss charge.

4. Regulation date. PROPOSED CHANGE: Compute natural flow and storage use during the full year instead of only after the first draft of storage. Diversion rates in excess of natural flow rights would be charged to storage. EXPLANATION: Past practice has been to put the lower river on regulation when American Falls draft began. The upper river went on regulation when Jackson draft began.

REASONS FOR CHANGE:

(a) Recent rights above American Falls should be cut before older downstream rights during the period between first draft at American Falls and Jackson.

(b) Several reservoir rights are older than many recent irrigation rights. The present practice makes reservoir priorities meaningless with regard to later irrigation priorities.

(c) Accounting for storage use during the entire year should result in more careful use during periods of low need, and therefore increase the fill reliability.

ACR:rg

cc: Steve Allred
Ron Carlson

FILL:

December 22, 1977

MEMORANDUM

TO: Bob Fleenor, Coordinator for District 1 management changes

FROM: Alan Robertson

SUBJECT: Water Rights Data Needed for Accounting Program

The water rights inventory needs to be carefully coordinated to minimize unnecessary work involved in duplicate numbering systems, names, etc. For the accounting program we need all the rights listed in a format similar to that on pages 10-22 of "Decreed Water Rights, District No. 01, Snake River, Idaho" by Art Larson. Information in order of priority should include diversion name, priority date, flow right in cfs, and reach of river. River reaches which we are now using are shown on the attached listing. Willow Creek reaches will have to be added when Ron has defined his measuring points; but these may include above Mirie Dam, Mirie Dam to head of Sand Creek, Sand Creek, and Willow Creek below Sand Creek. Water rights numbers are not needed for the accounting program but, if you want them included in the program listing of rights being accounted for, they should be supplied to us in the inventory list.

Our memo of December 6 to Norm requested clarification of the reservoir rights. We also need a list of all valid power rights.

ACR:rg

Enclosure

cc Ron Carlson

FILE:

Alan

December 16, 1977

COPY

MEMORANDUM

TO: Bob Fleenor

FROM: Alan Robertson

SUBJECT: Minidoka Project Canal Rights

In 1967 Henry Eagle presented a report to the Idaho Water Resource Board on District 36 (now District 1) operation. On page 5 he stated:

> At the time the Government made filings for the Minidoka Project it also filed on any return flow that might return to the river as a result of use of water on the project land. . . . . The Minidoka Project is credited with the gain from Neeley to Milner during the period this project is using stored water.

For the purposes of the accounting program we need to know if there is such a return flow right, and if so, should Minidoka be credited with all gains Neeley to Milner or something less?

ACR:rg

FILE:

Based on [illegible]
Steve has [illegible] this right as [illegible] for the gain Minidoka [illegible] not to exceed the amount being diverted on that day

DEVELOPMENT OF SNAKE RIVER IRRIGATION

Henry C. Eagle
Watermaster, Idaho Water District No. 36

INTRODUCTION

The following material has been hurriedly assembled for presentation to the Idaho Water Resources Board at its October 1967 meeting. Its purpose is to furnish background material in connection with the study of a proposed enlarged American Falls Reservoir.

It is possible that essentially the same material may be included in an appendix to the Annual Hydrometic Report of District 36 and also made a part of the Annual Report of the Committee of Nine. With these possibilities in mind the report is now being given a wide circulation. Those receiving it are asked to make suggestions for changes, additions or corrections that may seem pertinent. A wide response will contribute much to the quality of the finished article.

DEVELOPMENT OF SNAKE RIVER IRRIGATION

Henry C. Eagle
Watermaster, Idaho Water District No. 36

"The earliest water rights in the upper Snake River Valley were established in 1874 when the waters of Willow Creek northeast of Eagle Rock (now Idaho Falls) were first diverted for irrigation use. . . . . The first water right on the main Snake River dates from June 1, 1880 when water was diverted to serve lands now under the Long Island Canal near Menan. On August 1 of the same year work started on the diversion of 160 cfs by the Eagle Rock and Willow Creek Canal near Heise." [1]. From this modest beginning irrigation development has continued until about 1,300,000 acres were being irrigated in 1967 from the surface waters of Snake River and its tributaries.

During the period 1884-1896 construction had been commenced on practically all of the canals now diverting water above American Falls. The combined capacity of these canals was about 16,000 cfs. During these early years there was no indication that there would ever be a shortage of water on Snake River. The crops were mostly hay and grain with little demand for late season water.

"The filing for the first project below American Falls was made on October 11, 1900, for the Twin Falls Project designed to serve 200,000 acres. .... The National Reclamation Act was passed by Congress in 1902 and and on March 26, 1903, the Government made a filing on 1,726 cfs of water for the Minidoka Project. . . . . The filing for the Jerome Project was made in 1925." [1]

"The year of 1905 was the first year that the Snake River canals experienced any water shortage of consequence. During the late summer of that year Snake River was dry for a distance of about 10 miles in the vicinity of Blackfoot. At that time the lower users in the vicinity of Blackfoot endeavored, without much success, to get the canals further upstream to turn down some water. A serious shortage was also experienced on Teton River in the same year. As a consequence a suit was started soon after to adjudicate the water rights on Snake River and tributaries above Blackfoot. This culminated in the so-called Rexburg decree in 1910 covering water rights in the upper valley. The Foster Decree adjudicating lower valley rights was handed down in 1913. In later years many of the canals increased their diverting capacity and in the so-called Woodville Decree of 1929 additional floodwater rights of 1916 priority were awarded by stipulation to these canals." [1]

Most of the Rexburg decrees appear to have been made on the basis of one inch of water per acre. Some in areas of heavy gravel or sub-irrigation were permitted 2 to 4 inches per acre. Several of the larger projects were set up on the basis of 5/8 inch per acre. Most of these now try to deliver 10% to 20% in excess of this amount when water is available.

Prior to the construction of Palisades Reservoir, many canals had been diverting water in excess of their established decrees. These diversions had increased as brush areas were cleared and water applied to a larger part

of the land to which the decrees applied. Also, some ground has been found to require more water after years of use than was originally required. Further, the changes in crop practices have created a need for additional water.

In agreement with the practice of not letting a new development interfere with established uses it was decided to permit these canals to make supplemental filings for the additional amounts that had been used above their decrees. This decision was made a part of the Palisades Contracts. Suits were commenced in 1967 in the District Courts in Idaho Falls and Twin Falls to have decrees of April 1, 1939 granted to the above canals. The Idaho State Reclamation Engineer has intervened in these suits raising a question as to whether these high diversions can be considered a beneficial use. He notes that this question is especially pertinent in the Rigby area where increased use of water in recent years has raised the ground water to damaging levels. There is probably no way to arrive at a conclusion as to just how the water was being used at the times of these maximum diversions. However, the presumption seems logical that these canals would not have gone to the trouble and expense of maintaining these diversions if they were not considered beneficial.

"To provide storage for the Minidoka Project the Government in 1906 constructed a log-crib dam at the outlet of Jackson Lake to store 300,000 acre-feet of water. This dam washed out in 1910 and was replaced by an earth dam storing 380,000 acre-feet. . . . In 1915 the Government decided that the Minidoka Project as then constructed did not need all its space in Jackson Lake, and sold 102,000 acre-feet to various canals in the upper valley above American Falls."[1]

The Milner diversion dam was completed in 1905 and Minidoka dam in 1906. The latter dam was built about nine feet higher than needed for the canal diversions and provides about 97,000 acre-feet of usable storage.

In 1915 the Jackson Lake dam was raised and the outlet channel dredged. This increased the reservoir capacity to 847,000 acre-feet with so-called bottom rights of about 409,000 and top rights of 438,000 acre-feet. The latter space is owned by the Twin Falls Canal Company and the North Side Canal Company.

"The year of 1919 was a severe shock to the Snake River waterusers. The river runoff was very low and large crop losses were sustained by users under the various canals, all the way from Ashton to King Hill."[1] A river operating organization was set up in the spring of 1919 to deal with growing problems in the distribution of the waters of Snake River. This resulted in the creation of the Committee of Nine and the setting up of Water District 36 on a year-round basis.

"In District No. 36 on Snake River the work of water distribution requires constant use of stream flow records. Discharges from the river and canal gaging stations are necessary daily during the water regulation period. On account of this intimate connection between the work of stream gaging and water distribution a cooperative agreement was entered into in 1919 and has

since continued in effect between the U. S. Geological Survey, State of Idaho, and Water District No. 36 whereby the District Engineer of the U. S. Geological Survey is elected annually as watermaster by the Snake River waterusers. An executive order authorizes him to hold both Federal and State positions as part of the Geological Survey's cooperative program with the states. The Geological Survey and the State of Idaho contribute towards the cost of the work from cooperative stream-gaging funds an amount equal to what it would cost to operate and maintain the gaging stations in the District that are of general public interest. The balance of the cost of operations relating to water distribution is paid by the waterusers of Water District No. 36. The cooperative feature of the work has made it possible to get the streamflow records computed and available for use much more speedily than is the case elsewhere." [2] This cooperative agreement eliminates duplication of work and personnel. The combined responsibilities provide a challenge and interest to those in charge that would be diminished if the work were divided among two or more organizations. It has been an effective and efficient arrangement which might well be copied in other areas of joint Federal-State-Municipal endeavors.

The Committee of Nine is the executive body acting for the waterusers. Members are elected from the various areas of the district to provide a wide representation. The Committee has no legal authority but its recommendations receive much public support. Its prestige has increased through the years as a result of calm, studied,decisions on countless controversial matters. "The Committee has gradually grown in influence; it passes on the annual budget, determines policies and generally acts in the capacity of the Board of Directors of a corporation of which the watermaster acts as manager. It acted as the Idaho Compact Commission in the agreement between Idaho and Wyoming for division of the waters of Snake River between the two states. This plan of river operation that has evolved on Snake River through 40 years of operating experience, ranging from extreme drought to heavy floodwater years, is essentially a democratic plan controlled by the waterusers, in proportion to their respective interests. They have demonstrated their ability to resolve their differences among themselves. The Committee of Nine provides an organized well-informed group that can sit down with the Bureau of Reclamation, for example, and discuss any differences of ideas as to what ought to be done in the way of water development or operation. At times the Committee has strongly opposed plans of the Bureau of Reclamation for developments on the river but through mutual discussion it has always so far been found possible to agree upon a plan that has been mutually acceptable and which has probably been more equitable than if one party had been able to impose its will upon the other." [2]

The watermaster acts as an executive secretary for the Committee of Nine and supervises the many details of the district operations. Each year, after his election, he is appointed watermaster by the Idaho State Reclamation Engineer. He delivers the water in accordance with court decrees and state law and under the supervision of the Idaho Department of Reclamation. In other areas he acts under the supervision of the District Chief of the U. S. Geological Survey or the Committee of Nine.

As a result of the 1919 water shortage the government made a 1921 filing on the American Falls Reservoir. This reservoir was completed in late 1926,

with a capacity of 1,700,000 acre-feet, and filled for the first time in 1927. Canal companies paid for the construction in advance and could be persuaded to buy only one-half of the available space. The government paid for the balance of the space. Shortly after the reservoir was built, 400,000 acre-feet of space was disposed of to the old Idaho Irrigation Project on Big Wood River. The Milner-Gooding canal was constructed for delivery of this water. The remaining 433,000 acre-feet was leased to the Idaho Power Company until January 1931. Thereafter, it was leased for irrigation to various canal companies in the district. It was finally disposed of to various canal companies under terms of the Palisades contracts.

During the years 1929-42 the Snake River water supply was much below that of any previous period of record. Only the 1936 and 1938 years were near average. Runoff at Moran was about 67% of average in 1930 and 53% in 1934. Heavy crop losses occurred in all the Snake River area and emphasized the need for additional storage reservoirs. In 1939 the Bureau of Reclamation completed Island Park and Grassy Lake reservoirs with a combined capacity of 146,000 acre-feet. Together with Henrys Lake reservoir which was constructed by the North Fork Reservoir Company in 1923, these reservoirs took care of the most pressing needs for storage in the Henrys Fork area. A filing was made by the Bureau of Reclamation in July 1939 for the Palisades Reservoir. Studies and negotiations continued until 1952 when construction was started. The reservoir was completed in 1956 with 1,200,000 acre-feet of usable storage.

The addition of reservoirs to the river system has introduced complications in its operation. Perhaps the first was the problem of running storage water down the river from Jackson Lake and past the upper valley canals to the lower valley. This required measurements of the transmission losses in the various sections of the river. Computations for the 1910 season showed a transmission loss of over 29% between Jackson Lake and Minidoka dam. Studies in following years showed variable losses of mostly a lesser amount. By 1925 the losses in the various sections of the river were fairly well defined. Since that date practically the same river losses have been approved each year by the waterusers at their annual meeting. The loss from Moran to Blackfoot is now accepted as 12.8 %. There is a gain in the section from Blackfoot to Neeley and Neeley to Milner.

The schedule of transmission losses on stored water that has been approved by the waterusers on the main river during recent years is as follows: 1.7% Moran to Palisades; 0.8% Palisades to Heise; 4.4% Heise to Lorenzo; 0.5% Lorenzo to Woodville, 6% Woodville to Shelley. To compute separate losses to each of the canal diversions would be a cumbersome matter and one of endless contention among the various canals. Instead, a uniform charge is made against all of the canals from Heise to Blackfoot. Prior to the time of Palisades Reservoir a river loss of 7.25% was added to the storage diverted by each canal to compute the storage withdrawal at Jackson Lake. Since Palisades water has been available a loss of 6.5% has been added to storage diverted to get the reservoir equivalent. The reduction is possible since less loss now occurs with most of the water being used from the lower reservoir.

There is enough inflow below Blackfoot so that part of the October 11, 1900 right remains in effect throughout the irrigation season. Prior to the construction of American Falls Reservoir this inflow was directly available to the lower canals. With the building of the reservoir this inflow was impounded. Studies by T. R. Newell related the inflow above the reservoir flow line to that below. All significant tributaries were measured where they entered the reservoir. These same points are now measured periodically during the irrigation season and their total is the measured inflow. The Newell formula (unmeasured inflow in cfs = 840 plus 1/3 measured inflow) is used to compute the inflow available to the 1900 right.

At the time the Government made filings for the Minidoka Project it also filed on any return flow that might return to the river as a result of use of water on the project land. This was a departure from previous practices on the river but was permitted by the waterusers. No attempt is made to compute this gain on a daily basis. The losses and gains in all sections of the river are computed on a monthly basis. The Minidoka Project is credited with the gain from Neeley to Milner during the period this project is using stored water. In the dry year of 1961 this amounted to 43,000 acre-feet; in 1966 it was 113,000 acre-feet.

From time to time other entities on the river have requested that they be given credit for waste water or return flow from their areas. This has always been denied. Pressure has come especially from the Henrys Fork area, from which a large amount of water returns to the river. Again, the practice has been to retain for the natural flow users the conditions that existed at the time of their decrees. In the case of the Henrys Fork users and others on the river their projects had been in use for a long period and were a part of the river system at the time of the river decrees. The Minidoka Project, however, was a later project and its return flow became an added source of supply to the river.

A division of the costs of administering the water district between users of stored water and normal flow is a matter of consequence. For many years prior to 1941 the costs were paid for, 60% by normal flow users and 40% by those using stored water. Since 1941 assessments have been made in proportion to the amount of water diverted, with no distinction being made between stored and normal flow diversions. Some special charges, such as the cost of the groundwater investigations around American Falls, are assessed against those having a direct interest in the projects involved.

With the raising of Jackson Lake a difference of opinion was created as to the nature of the upper and lower rights in that reservoir. The matter of holding over from one year to another in the bottom space storage not used by upper space owners was in dispute. Mr. Barry Dibble, Superintendent of the Minidoka Project ruled that there were no holdover rights in Jackson Lake and top right owners could only get water after bottom rights were filled.[3]

This position was modified somewhat in the American Falls Reservoir purchase contracts. These provided that upper valley purchasers of American Falls space would have the water exchanged each year for an equal amount in Jackson Lake and would have the privilege of holding over until the next year any

unused portion. In providing in the Palisades contracts for holdover rights on all water in Jackson Lake the above disagreement has been settled.

Idaho law permits transfers in the place of use of decreed water. This process requires the consent of the Idaho Department of Reclamation and can be accomplished unless someone can show that he will be injured. In early years such transfers were made with little objection. It later became apparent that some of these transfers were creating an additional demand on the river. For example, water was being transferred from the Long Island area where the ground water is tributary to the river above Idaho Falls to the New Sweden area. The ground water is at great depth in this latter area and does not get back to Snake River above Blackfoot. Return flow which could be used again above Blackfoot if water was applied on Long Island would be lost if used on New Sweden land. Such transfers are now permitted but only 50% of the water transferred may be used at the new diversion. No transfers are permitted from areas above Blackfoot to points below American Falls.

Users in headwater areas are permitted to divert natural flow in excess of their decrees in exchange for storage water. In areas where return flow comes back directly to the stream such users have been permitted to divert twice as much water as they are charged for storage. This attempts to charge them for the amount of water actually used.

As new developments have occurred, an attempt has been made to maintain the natural flow rights as they would have been without these changes. Early in the season the cuts in decrees are delayed a few days to compensate for heavy losses to bank storage and evaporation. Later in the season this stored water is recovered from return flow from bank storage. With the addition of reservoirs to the river system nearly all users now have reservoir storage to supplement their decreed rights. As a result the former division between the two groups has almost disappeared.

Additional reservoirs have increased the degree of control on the river. At the same time they have made more complicated the river computations. Water is credited to the various reservoirs in accordance with their several priorities. Reservoirs are operated to retain as much as possible in the upstream reservoirs. This sometimes results in differences of opinion on reservoir allotments. In 1961 American Falls Reservoir failed to fill. This was the first year since 1935 that this had occurred. In the intervening years Island Park and Grassy Lake reservoirs had been completed. These two reservoirs had stored 81,500 acre-feet of water in 1961 that was creditable to the American Falls priority. Also 55,000 acre-feet of water had been stored in American Falls that was creditable to Palisades Reservoir under terms of the Palisades contracts. These contracts allow Palisades to store up to 426,000 acre-feet ahead of American Falls and which is made available from winter water savings. These savings are effected by shutting canals dry for 150 days during the winter. With the above adjustments the American Falls right was only 94% filled. Except for winter water savings, there was no water available for storage to Palisades reservoir rights.

There was about 190,000 acre-feet of storage in the three Henrys Fork reservoirs at the beginning of the 1961 irrigation season. However, much of this belonged to downstream reservoirs because of storage adverse to American

Falls and overuse of stored water during the 1960 season. Only 81,000 acre-feet was creditable to these reservoirs. This was supplemented by rental of 31,253 acre-feet of American Falls storage from the Idaho Power Company and 13,000 acre-feet from other sources. It was not necessary to run any of the Henrys Fork storage down to lower valley users. At the end of the 1961 season there was 55,000 acre-feet of holdover water in the Henrys Fork reservoirs, all of which was creditable to Snake River reservoirs. Fortunately, 1962 was a good water year. All reservoirs filled and eliminated possible controversies over the 1961 allotments. In a series of dry years in the future it will again be hard to convince users on the Henrys Fork that water stored in their reservoirs may be called upon to supply the earlier American Falls rights.

At the time American Falls Reservoir was built there was comparatively little effect on the river flow by other storage reservoirs. The reservoir was operated to furnish irrigation water during the summer and complete filling during the period of flood runoff. This did not result in the reservoir being full during ice periods and the dam was not designed to withstand ice pressures.

With the addition of other reservoirs and particularly after Palisades became available it has been necessary to alter the former storage practices at American Falls. It can usually be fairly well filled during the winter period allowing upper reservoirs to be filled by the heavy spring runoff. American Falls reservoir has been full at several times while ice was on the reservoir. After the deterioration of the concrete in the American Falls dam was discovered it seemed unwise to permit the reservoir to be full while it was still covered with ice. In some years this makes it impossible to fill the reservoir between the time the ice leaves and heavy canal diversions begin. As a result water is spilled down the river that could be stored if a properly designed dam were available. The wasted water is kept to a minimum by keeping as much water as possible in upstream reservoirs.

In operating the reservoir system to keep water upstream it is usually possible to store more water than would be the case if reservoirs were physically filled in the order of their priorities. In many years water is retained during the storage season in Palisades Reservoir that is creditable to the American Falls storage right. When American Falls later fills physically this water is credited to Palisades.

Questions arise regarding the American Falls refill right. One point of view is that after the reservoir once fills it should not be permitted to store further water during that season. However, the reservoir storage rights are operated in the same order as decreed rights for canal diversions. During many years there is a period in the early spring when users in the lower valley are diverting more water than is entering American Falls reservoir. This occurs before the heavy snowmelt begins and at a time when storage is likely taking place in upper reservoirs. At these times American Falls is drawn down below its capacity. Later in the season there is more than enough normal flow in the river to fill all rights earlier than the American Falls 1921 storage right. This reservoir is then either refilled physically or credited with adverse storage in Palisades or other reservoirs. Here, again,

the attempt is to preserve for American Falls reservoir the storage rights it was entitled to prior to the time of later reservoirs. While this reduces the amount of water available to Palisades users in many years it is in accordance with a proper administration of the decreed rights. During many of these same years, Palisades Reservoir has already been credited with American Falls water held over or adversely stored.

Further complications must be faced if an enlarged American Falls Reservoir becomes a reality. With additional space available in the downstream reservoir, some of the established storage practices may be questioned. Should Palisades or other upstream reservoirs be permitted to adversely store American Falls water which would otherwise be available for storage in the enlarged space? Should these same reservoirs be allowed to hold over American Falls water and have it credited to their space when the present American Falls reservoir space fills? It appears to the writer that the above practices have established a right by use that should not be interfered with by an enlarged American Falls reservoir. A straightforward approach (and one that would be simple to administer) would be to allow an American Falls enlarged reservoir to be credited with only the water actually physically stored above the present 1,700,000 acre-foot capacity. However, this would not prevent the top rights from holding water over in the bottom space as long as it caused no loss of water to the earlier rights.

An enlarged American Falls Reservoir will require surveys to determine the new contents. This will make it possible to compute the amount of silting that has taken place during the life of the reservoir. Crandall[3] estimated that this might amount to as much as 2.5% of the original reservoir space. It would seem advisable to allot the bottom 1,700,000 acre-feet of an enlarged reservoir to the original space holdovers. Any loss of space from future silting would then be equally shared by all of the space holders of the enlarged reservoir.

Others[4] have noted that with an enlarged American Falls Reservoir there will likely be new land developed in the downstream area. This will result in a larger withdrawal of water each year from that reservoir. Under these new conditions it will be necessary to arrive at operating rules that will not permit upstream reservoirs to hold over and acquire title to storage that should go to the American Falls top right.

There is wide difference of opinion as to the merits of an enlarged American Falls Reservoir. Possibly the most serious objections arise from the loss of grazing land to the Fort Hall Indians. It would seem that other low ground in nearby areas could be purchased and exchanged with the Indians for the ground that would be lost to an enlarged reservoir. With an American Falls Reservoir of the present size and even after the development of Lynn Crandall or another upstream reservoir, there will be years when water will spill to waste that could be stored if a larger reservoir were available. A dam built at this time should be usable for up to 100 years. It is almost a certainty that at that time there will be demand for all possible storage on the Snake River above Milner. To develop a site now, at less than its potential would seem short sighted and not in the best public interest.

Footnotes

[1] History of Irrigation Development in the Snake River Valley - Lynn Crandall

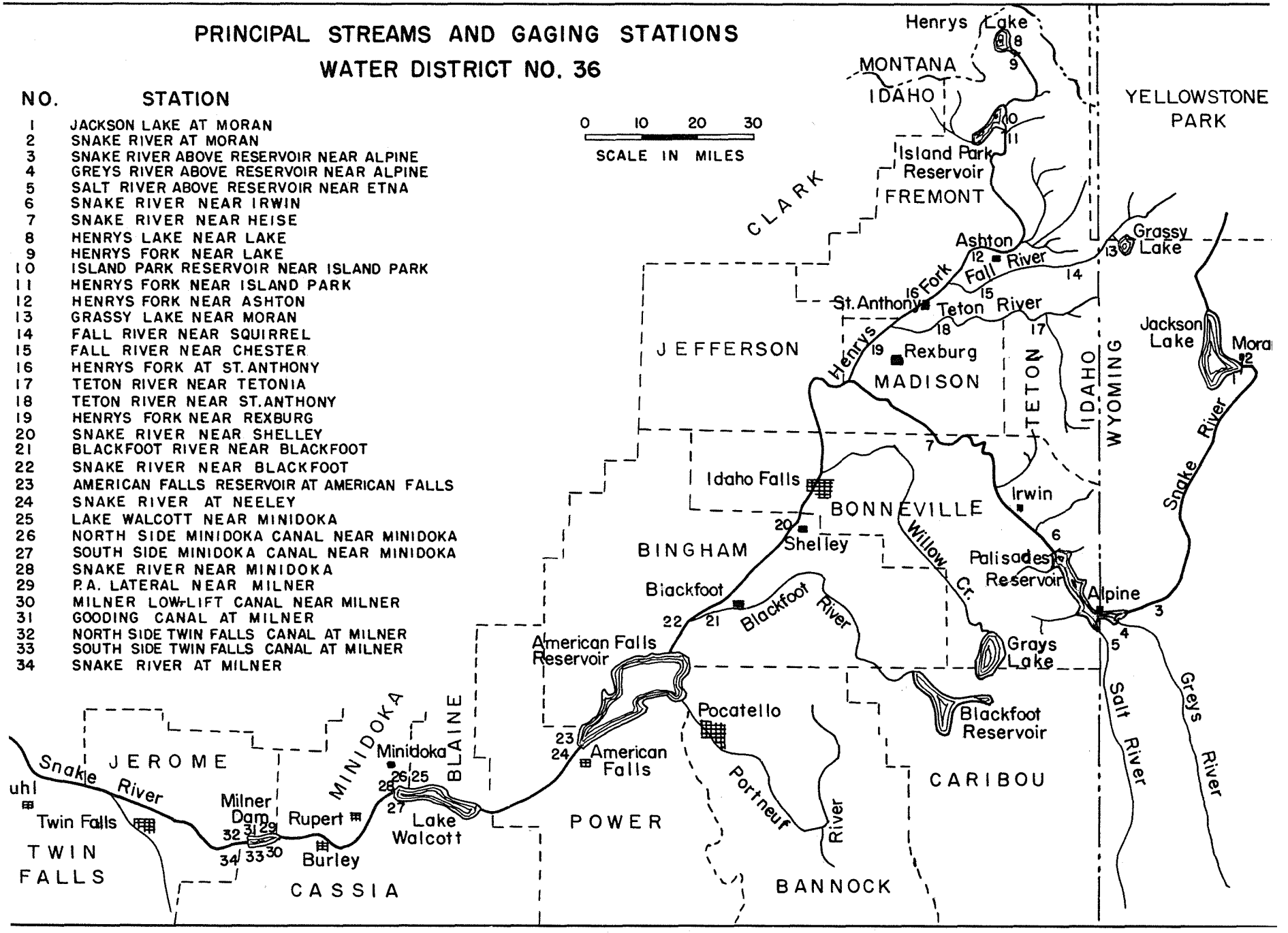
[2] Snake River - Lynn Crandall

[3] Open letter in 1954 from Lynn Crandall to Minidoka Irrigation District.

[4] Martin K. Fulcher, U. S. Bureau of Reclamation, Boise, Idaho

PRINCIPAL STREAMS AND GAGING STATIONS
WATER DISTRICT NO. 36

NO.	STATION
1	JACKSON LAKE AT MORAN
2	SNAKE RIVER AT MORAN
3	SNAKE RIVER ABOVE RESERVOIR NEAR ALPINE
4	GREYS RIVER ABOVE RESERVOIR NEAR ALPINE
5	SALT RIVER ABOVE RESERVOIR NEAR ETNA
6	SNAKE RIVER NEAR IRWIN
7	SNAKE RIVER NEAR HEISE
8	HENRYS LAKE NEAR LAKE
9	HENRYS FORK NEAR LAKE
10	ISLAND PARK RESERVOIR NEAR ISLAND PARK
11	HENRYS FORK NEAR ISLAND PARK
12	HENRYS FORK NEAR ASHTON
13	GRASSY LAKE NEAR MORAN
14	FALL RIVER NEAR SQUIRREL
15	FALL RIVER NEAR CHESTER
16	HENRYS FORK AT ST. ANTHONY
17	TETON RIVER NEAR TETONIA
18	TETON RIVER NEAR ST. ANTHONY
19	HENRYS FORK NEAR REXBURG
20	SNAKE RIVER NEAR SHELLEY
21	BLACKFOOT RIVER NEAR BLACKFOOT
22	SNAKE RIVER NEAR BLACKFOOT
23	AMERICAN FALLS RESERVOIR AT AMERICAN FALLS
24	SNAKE RIVER AT NEELEY
25	LAKE WALCOTT NEAR MINIDOKA
26	NORTH SIDE MINIDOKA CANAL NEAR MINIDOKA
27	SOUTH SIDE MINIDOKA CANAL NEAR MINIDOKA
28	SNAKE RIVER NEAR MINIDOKA
29	P.A. LATERAL NEAR MILNER
30	MILNER LOW-LIFT CANAL NEAR MILNER
31	GOODING CANAL AT MILNER
32	NORTH SIDE TWIN FALLS CANAL AT MILNER
33	SOUTH SIDE TWIN FALLS CANAL AT MILNER
34	SNAKE RIVER AT MILNER



From 1964 WM report

WATER DISTRICT NO. 36 OPERATIONS

BEGINNING OF REGULATION SEASON

The 1964 irrigation season provides a good example for study of the details of river regulation. All reservoirs were full at the beginning of the season thus eliminating many complications that arise when this is not the case.

Referring to Plate 12 for the 1964 report one can determine when regulation starts. It is noted that the first drop in American Falls Reservoir is on July 9. Normal flow at Neeley on July 9 is computed by adding flow at Blackfoot (July 8) plus calculated inflow (9,240 + 2,809). This is sufficient to fill part of the March 30, 1921, right as follows:

Minidoka Canals	2,726 cfs
North Side Canal	4,050
Twin Falls Canal	3,600
Milner Low Lift	135
	10,511

The remainder (12,049 - 10,511) is 1,538 which is divided equally between Gooding project and storage in American Falls Reservoir (see explanation under Gooding March 30, 1921, decree in mimeographed decree book). The 769 cfs normal is shown under Gooding Canal on July 10.

There is some question as to how best to handle the 769 cfs stored to American Falls credit. As shown on Plate 12 it is included in the 9,323 normal flow shown under Snake River near Minidoka. Probably a better computation would be to deduct it from the above figure leaving 8,554 normal at Minidoka. This is the amount needed to fill downstream normal flow (4,050 + 3,600 + 135 + 769). As

computed on Plate 12 it indicates that the 769 cfs went downstream for storage in Lake Milner.

STORAGE COMPUTATIONS AT RIVER STATIONS

For July 10 the normal at Neeley is 7,780 plus 2,756 cfs. This is distributed as follows and fills most of the August 6, 1920 right.

Minidoka canals	2,726
North Side	4,075
Twin Falls	3,600
Milner Low Lift	135
	10,536

The first drop of consequence at Jackson Lake occurs on July 9, as shown by lower contents on the morning of July 10. The drop of 1,060 acre-feet is equal to 580 cfs. Deducting 1.7% loss this becomes 570 at Alpine. Palisades Reservoir did not change and after deducting 0.8% loss the stored at Heise is 565. There were no stored diversions and no stored inflow from Henrys Fork. Subtracting 4.88% loss to Shelley and 6% loss to Blackfoot leaves 505 cfs storage at Blackfoot on July 12. The normal at Blackfoot is (4,980 - 505) 4,475. This added to calculated inflow of 2,752 gives a normal of 7,227 at Neeley on July 13. This is enough to fill part of the August 7, 1905 right, as follows:

Minidoka Canals	1,726
North Side	2,501
Twin Falls	3,000
	7,227

The drop at Jackson on July 10 is 650 cfs which becomes 639 at Alpine. Palisades Reservoir dropped 3,000 a.f. on July 11 which would equal 1,510 cfs. As will be explained later there are fluctuations in the reservoir and exact drops each day are not always used.

Instead adjustments are made to smooth out some of the extremes. For July 11, 1,010 cfs was used as the drop. This added to 639 gives 1,649 stored at Irwin and 1,463 at Blackfoot.

On July 13 the storage release at Jackson was 450 cfs or 442 at Alpine on July 14. Palisades Reservoir stored 3,000 a.f. or 1,510 cfs, making a stored release at Irwin of -1,068 (442 - 1,510). This means that the water was stored at Palisades and withdrawn instead from American Falls Reservoir. This gives a -947 cfs storage balance at Blackfoot on July 16. The normal flow at Blackfoot is the actual flow (3,510) minus the -947 stored balance or 4,457 cfs. If Palisades Reservoir had remained level on July 14 instead of storing the 3,000 a.f. there would have been 1,510 cfs more released. This would have been about 1,340 cfs more at Blackfoot and actual discharge there on July 16 would have been 4,850 cfs. The 442 cfs storage at Alpine would have been 393 at Blackfoot. Normal flow would have been (4,850 - 393) 4,457 which is the same as computed above.

From the above it will be noted that storage is moved down the river from Moran to Blackfoot on the basis of a loss schedule. From reservoir releases the appropriate losses and diversions are deducted to determine stored water at next downstream station.

From Blackfoot to Milner the computations are based on normal flow data. To the normal at Blackfoot is added inflow Blackfoot to Neeley to obtain normal at Neeley. Normal flow deliveries to Minidoka project are deducted from Neeley normal to obtain Minidoka normal. This is then distributed to Milner canals according to their priorities.

BALANCING STORAGE COMPUTATIONS

It will be noted that the figures under Theoretical Balance of Storage at Blackfoot and Snake River near Blackfoot stored column are the same through July 18. Up until the time the October 11, 1900 rights are cut in the upper valley there is some stored water being run past Blackfoot to the lower valley users. The figures for the above-mentioned columns are the same for this period because of the method of computation. After that right is cut all the normal flow is theoretically used by upper valley canals and lower valley storage needs are supplied from American Falls Reservoir.

If it were possible to perfectly control the reservoir releases only enough water would be turned down to completely fill all diversions and no storage would pass the Blackfoot gage. Under these conditions the flow at the Snake River near Blackfoot gage would consist of about 190 cfs inflow (1964 conditions) plus the inflow from the Blackfoot River.

The daily river computations are simplified after the October 11, 1900 rights are cut by using a normal flow at Blackfoot of the 190 cfs plus the flow of the Blackfoot River. This is shown on Plate 12 for July 22 for instance. Blackfoot River flow was 14 cfs and normal flow is computed as 204. The stored figure is 996 compared to a Theoretical Balance of 19. This indicates that the decreed rights should have been cut back another 975 cfs on that day.

There are many fluctuations in diversions and supply (especially during the first few days after upper valley regulation begins). It is impractical to change the rights being filled each day to account

for all these variations. Substantially the same result is accomplished by adjusting computations to make the two columns (Theoretical Balance of Storage and Stored for Snake River near Blackfoot) add up to the same total at the end of the season.

During the season a running total is kept of these two computations and changes in decrees being filled are made to keep them in balance. It is the practice to delay cuts for a few days at the start of the season to allow for possible heavy losses when the reservoir and rivers are high. This assures the normal flow rights of not being deprived of water that they might lose if cuts in rights followed immediately the actual river drops. This delay in cuts causes the above computations to get out of balance. It is compensated for later in the season when reservoirs are dropping and some return flow from bank storage is being added to river flow.

Computations on Plate 12 were made each day during the regulation season to guide in the cutting of decrees. As originally computed the two columns at Blackfoot were the same through July 22. On July 23 the October 11, 1900, rights were cut off above Blackfoot and the Snake River near Blackfoot normal was computed as (190 + 4) 194.

At the end of the season after final figures were available for canal diversions and river stations the figures on Plates 12, 12A, and 13 were revised. These corrected data showed season totals on Plate 13 of 108,429 for Theoretical Balance of Storage at Blackfoot and 103,375 under Stored column for Snake River near Blackfoot. This indicated that computations should be changed to show more stored water (thus less natural flow) at Blackfoot. This was accomplished

by using 190 plus the flow of Blackfoot river for July 20, 21, 22. The remainder of the needed adjustment was taken care of on July 19 making the totals for the season balance.

The above adjustments balance the computations so that all storage can be accounted for and theoretically properly divides natural flow and storage diversions. In many years there is a surplus of stored water spilled during the last few days of the season when canals are cutting down. The adjustment can then be made during this period instead of at the beginning of the season. The adjusted records indicate that the October 11, 1900 rights should have been cut on July 19 instead of July 23 to balance the season operations. During the above four days storage was charged to lower valley canals that should have been charged to upper valley canals.

There is often uncertainty as to when to start upper valley regulation. If daily canal readings were available it is likely that regulation would commence a few days earlier. However, it is doubtful if this would benefit the lower valley users to any extent. If regulation were in effect many of the upper valley canals would cut their diversions. This would mostly be reflected in reduced spill to the river and would not make much difference in the natural flow at Blackfoot. Also, as mentioned earlier, the cuts in decrees are purposely delayed a few days in the early season to assure no infringement on natural flow rights. With adequate storage available in most years it seems a useless expense to start obtaining daily readings before they are required. This is emphasized by the fact that a great part of the added expense would be borne by the large users in the lower valley.

Commencing on July 16, storage charges were started in the upper valley. These are tabulated on Plate 12 as "Stored Diversions" Heise to Shelley and Shelley to Blackfoot. These figures are subtracted from available storage supply to obtain the storage at the next downstream gaging station.

On July 21 and through September 30, figures are shown in column headed Stored Inflow Henrys Fork. These figures indicate the amount of stored water that is being delivered or withheld from the main river by Henrys Fork users. This storage is added to the computed storage at Shelley and is carried downstream. Details of the computations of this Henrys Fork storage balance are discussed in another section.

During the summer storage releases at Moran were computed each day and entered on Plates 12, 12A and 13. For the period July 9 to August 14, the drop in Jackson Lake was (851,900 - 726,500) which is 125,480 acre-feet or 63,263 24-hr cfs. Provisional daily figures were smoothed and adjusted to obtain a total of 63,263 under the stored column for Snake River at Moran. After subtracting 1,074 cfs loss this becomes 62,189 inflow to Palisades Reservoir.

An erroneous reading on July 17 indicated that Jackson Lake had stored water for the period July 15 and 16. The negative storage balance at Moran had been carried down the river in all computations and was not discovered until all computations had been completed. Had these days been corrected to show a plus storage release some other days would have had to be reduced a like amount. The net results for the season would not be changed and no attempt was made to correct the computations.

For provisional computations daily releases at Palisades were listed in the reservoir contents column of Plates 12, 12A and 13. The total for period July 11 to August 15 was 81,414 cfs. Palisades drop was (1,405,000 - 1,243,000) which is 162,000 acre-feet or 81,675 cfs. The above provisional dailies were smoothed and adjusted to obtain a total of 81,675. The daily figures for Snake River near Irwin were then computed by adding the revised daily release figures to the daily inflow figures. The total for Plate 12 is 143,864. This is equal to the 62,189 plus 81,675 and is a check on computations.

All totals shown for storage should check from Moran to Blackfoot. They will not check exactly from Blackfoot to Milner. There is a difference owing to loss or gain in American Falls Reservoir and in the river from Neeley to Milner. These differences should be analyzed and commented on each year in the text of the report.

CANAL DIVERSIONS

In order to compute daily storage deliveries it is necessary to record each canal diversion. This is accomplished by obtaining daily gage readings. River riders phone in these readings which are listed on a work sheet in the Water District office. Current-meter measurements are obtained on each canal at about ten-day intervals. From these measurements and the gage readings the daily discharge for each canal is computed and entered on the work sheet. These diversions are totaled for various sections of the river and the total diversion figures are included in reports sent out from the District office. In 1964 these reports were sent out three times a week instead of five times as in prior years. The reports include contents of reservoirs, discharge at many river stations, decrees

being filled, precipitation data and other significant information. They are used by the canal officers in their operation schedules.

Reservoir releases are adjusted to keep sufficient water in the river for all canals yet to avoid spilling large amounts of water past the lowest canal at Blackfoot. Most of the 215,000 acre-feet of stored water passing Blackfoot in 1964 was during the period July 19 to October 17. This is an average daily flow of 1,340 cfs of stored water and is greater than in many years. The best management of the river system requires keeping as much water as possible in the upper reservoirs. This calls for low spills at Blackfoot. With the abundance of water in 1964 and the large reservoir holdovers this is of little consequence. American Falls will fill in 1965 and the spill at Milner will be only slightly different than if more water had been retained upstream.

A record of daily storage diversions of each canal is computed and tabulated on almost a daily basis during the regulation season. The figures of storage diversions in each section of the river are required to properly regulate the decrees in effect. Also a cumulative total of storage used is needed by each canal. It enables the individual watermasters to plan diversions for the balance of the season and is required in the District office to insure that storage allotments are not overdrawn.

To determine the storage diversions for each canal reference is made to the mimeographed decree book. On the District work sheet the name of each canal is tabulated. At the left of the sheet the amount of decree in effect for each canal is written. The storage for each day is then determined by subtracting this figure from the total

amount diverted by the canal. This is the figure that is entered on the canal storage sheet. As regulation continues and decrees are cut or restored the figures at the left of the work sheet are changed.

A storage sheet is prepared for each canal showing storage allotments for the season. The daily storage diversions are entered on this sheet and cumulative totals determined frequently. As discharge measurements are obtained the daily discharge for canals is computed. The provisional storage charges are revised to fit final discharge computations and new cumulative totals are computed. This makes storage information available for each canal watermaster. It is transmitted either by phone or by mailing a memorandum to the watermaster. Many canals have sufficient storage so that they need not watch their diversions closely. One of the responsibilities the Water District 36 watermaster must assume is to watch the individual storage accounts and advise with those who may be in danger of exhausting their storage supply.

When final records of canal diversions are available the figures on canal storage sheets are adjusted and totaled. These figures are then tabulated on Plate 14.

Direct supervision of canal diversions below Neeley is under the Burley Office of the Bureau of Reclamation. Gage readings for all canals are reported daily to the Burley office along with requests for changes in deliveries. Releases from American Falls and Lake Walcott are scheduled by the Bureau of Reclamation to fill canal demands. Information is phoned to the Watermaster's office in Idaho Falls for inclusion in current reports.

Records of all canal diversions (upper and lower valley) are computed in the Water District office in Idaho Falls together with

storage computations. When required, information is exchanged between Idaho Falls and Burley to assure a harmonious operation of the river.

STORAGE ALLOTMENTS

It is the responsibility of the Bureau of Reclamation to determine the storage allotments for each canal for the reservoirs under its supervision. For years such as 1964 this is a simple matter since all reservoirs were full at the beginning of the season. Each canal was, therefore, allotted the full amount of space that they owned in the reservoir. Storage allotments are shown in the text of the report and also on Plate 14.

When all reservoirs do not fill more involved computations are required. Reference must be made to the amount and location of holdovers for each canal. In such years the Water District records should show these figures either in the previous annual report or in later computations that can be included in the current year's report. This data is shown on pages 26 and 27 of the 1963 report. In such years close consultation is required between Water District and Bureau of Reclamation personnel to determine the end of the storage season and the amount of water to be credited to various reservoirs.

In years when it appears that all reservoirs may not fill it is helpful to make preliminary computations as the storage season progresses. This can be done either by the Watermaster or Bureau officials and such information circulated to interested parties. Discussion of various viewpoints can follow as required with time to resolve differences prior to the end of the storage period.

INFLOW TO AMERICAN FALLS RESERVOIR

Inflow to American Falls Reservoir is computed for the May to September period. This inflow plus the normal flow at Blackfoot determines the amount of normal flow available for lower valley canals.

Inflow computations are based on the results of studies by T. R. Newell for a few years before and after American Falls Dam was built. Gaging stations were established above the reservoir flow line on the inflowing streams and a formula developed for computing the unmeasurable inflow (unmeasured inflow in second feet = 840 plus 1/3 measured inflow). During the May to September period measurements are made at two or three-week intervals on the inflowing streams. Discharge for intervening days is interpolated and results tabulated on Plate 11. Records for Portneuf River at Pocatello are computed from a continuous recorder. Daily records of wastes from the Aberdeen project are furnished by Mr. Jake Isaak, manager. The Newell formula is somewhat modified to allow for high early season flows in the Portneuf River and canal wastes.

With increased groundwater pumping and especially with the pumping of water from the Portneuf River by the Fort Hall Michaud Project further modifications of the inflow computations are required. On Plate 11 of the 1964 report the actual daily inflow is computed and totaled by months. Below this data the daily pumping from the Portneuf is shown. This figure was added to the actual inflow each day to obtain a theoretical inflow. This theoretical inflow was used on Plates 12, 12A and 13 in computing the normal flow at Neeley. The above computations comply with section 8 (b) of Fort Hall Michaud - Palisades contract.

With increased pumping from ground water there has likely been a reduction in the inflow to American Falls Reservoir. This is of little consequence in years when American Falls Reservoir fills. Storage charges are made against Simplot, Westvaco, City of Pocatello and the Fort Hall Michaud project in accordance with terms of their Palisades contracts. This usually results in a credit to Palisades reservoir. However, in a year when American Falls does not fill that reservoir would receive this credit since it is the one that has been deprived of the extra inflow.

MINIDOKA PROJECT

Decreed rights of 1,726 cfs of March 26, 1903 priority and 1,000 cfs of August 6, 1908 priority are owned by the Minidoka canals. Computations on Plates 12, 12A and 13 do not divide this decree between the Burley and Minidoka Irrigation Districts. However, it is necessary in many years to make a division of the water between the two districts. This division is also required in apportioning the costs of water distribution by Water District 36. An approximate division of total diversions is made each year and shown in tabulation of canal diversions in the text of the Watermaster's report (P. 17). This division is based on data furnished by the Bureau of Reclamation showing proportion of water in South Side Minidoka Canal going to each district.

Tabulated below is a summary of the various rights available to the two districts:

Right	Burley District	Minidoka District
Natural flow rights	38%	62%
Lake Walcott contents	33½%	66½%
Gains Neeley to Milner	33½%	66½%
Minidoka North Side Canal	0	100%
Minidoka South Side Canal	84% (about)	16% (about)

The Neeley to Milner gain is discussed on page 30 of the 1964 report. This gain is credited to Minidoka canals for periods when they are drawing storage.

In years when all reservoirs do not fill the storage diversions and reservoir holdovers for the two Minidoka Canals for the previous season can be computed on the basis of the above rights.

In most years Lake Walcott is not drawn down and its contents is not used. However, it can be drawn down in dry years for use by the above canals.

IDAHO POWER COMPANY RIGHTS

The rights of the Idaho Power Company are set out in a contract with the United States Commissioner of Reclamation, October 13, 1921.

Among the rights acquired by the company are the "entitlement to the perpetual use of 45,000 acre-feet of storage capacity" of American Falls Reservoir and a secondary right to the following flow at Twin Falls:

690 second-feet	October 1 to November 30
790 second-feet	December 1 to January 31
690 second-feet	February 1-12
590 second-feet	February 13 to April 15
690 second-feet	April 16 to June 10

There are certain restrictions on the above rights. For instance, the above flows need not be maintained in any year after storage draft has started on American Falls Reservoir. Neither are the October flows required until storage in American Falls has started.

Each year a figure is included in the annual report showing the amount of water spilled past Milner in excess of Idaho Power Company rights.

The computations for 1964 are tabulated below:

Milner spill and excess over Idaho Power rights
(all figures in acre-feet)

Period	Idaho Power Right	Observed run-off		Excess
Oct. 1 to Nov. 30, 1963	83,480	123,640	(Kimberly)	40,160
Dec. 1 to Jan. 31, 1964	97,150	238,900	"	141,750
Feb. 1-12	16,420	40,980	"	24,560
Feb. 13 to Apr. 15	73,730	208,660	"	134,930
Apr. 16 to June 10	76,640	786,240	"	709,600
June 11 to Sept. 30	45,000	484,540	(Milner)	439,540
Totals	392,420	1,882,960		1,490,540

In 1964 storage charges against the Idaho Power Company primary right were started on July 9. Total stored release at Milner through September 30 was 27,362 cfs. On Plate 14 daily storage charges to the Power Company are shown. Actual discharge on some days was greater than desired by the company and storage charges were reduced. The total on Plate 14 was computed as 21,089 cfs or 41,829 a.f. This is 3,171 a.f. less than the company's 45,000 right. This is of academic interest only as the flow during the 1964-65 storage season will remain well above power requirements.

SUPPLY AND DISPOSAL OF STORED WATER

An accounting is made each year of stored water available at the beginning of season and its disposal. This accounting appears on page 24 of the 1964 report.

The supply consists of the contents of the various reservoirs prior to the start of storage withdrawal. In addition the Sheridan Creek natural flow right (Plate 21) and gain Neeley to Milner are listed for convenience in accounting.

Figures in the disposal accounting are obtained from the several plates of the report. Storage used by Snake River rights is shown by grand total figure on Plate 14. The figure for Henrys Fork rights

is the total for various sections of Henrys Fork on Plate 22 plus total for Teton River from Plate 23. Transmission loss figure for Snake River is the sum of the losses in the several sections of the river as totaled on Plate 13. That for the Henrys Fork is obtained from Plate 21. Cross Cut loss is computed on Plate 23A.

It will be noted that there was a theoretical balance of storage at Blackfoot on Oct. 15-17. This was storage water in transit from reservoirs which is not accounted for at Neeley. It has, therefore, been included in the Disposal tabulation and was actually delivered to American Falls storage.

The Milner stored total for the season is segregated as follows:

Idaho Power Co. (July 9 to Sept. 30) (Plate 14)	21,089 cfs	41,829 a.f.
Milner Stored Oct. 1-17	6,991	13,866
Operation waste (July 9 to Sept. 30)	5,281	10,475
Total	33,361	66,170

In 1964 there was a difference of only 2,227 acre-feet between the total supply and the total disposal with more water accounted for than required. The small difference is much less than the accuracy of water measurements and less than observed in most years.

In many reports in prior years the computations made the figures of supply and disposal balance. Referring to pages 26 and 27 of the 1958 report it will be noted that both supply and disposal totaled 4,189,760 acre-feet. Whatever small difference existed in computations was apparently eliminated by an adjustment to the figures of operation waste past Milner.

On pages 26 and 27 of the 1959 report the accounting shows a difference of 41,386 acre-feet which was taken care of by showing an adjustment of that amount. In that year storage withdrawals from

American Falls started early in April. Water was stored adversely in Jackson Lake and Palisades reservoirs until July 8, when upper valley regulation began. With the varying dates of allotments for the different reservoirs a strict accounting of all storage was not obtained. Fortunately American Falls reservoir filled in 1960 thus canceling the effect of any errors in the 1959 storage computations.

So far as possible reservoir allotments should all be made on the same date (with account taken of time of travel between reservoirs). After withdrawals start at American Falls there may still be some storage to credit to all reservoirs. This will usually be determined by computations on Plate 12 and can become quite involved. The basic rule is to divide available storage with preference to reservoirs according to the priorities of their storage rights.

HENRYS FORK REGULATION

Supervision of Henrys Fork diversions is under direction of a deputy watermaster at St. Anthony. Daily readings are obtained on all canals and provisional computations made in the St. Anthony office. A summary of data is sent daily to the Idaho Falls office to furnish required information for a coordinated river operation.

Current-meter measurements are made on all canals at about two-week intervals and results used in day-to-day discharge computations.

Releases from Island Park reservoir are ordered by the St. Anthony office to keep sufficient water available for the lowest diversions below St. Anthony. When a shortage develops on the Teton River, stored water is delivered through the Cross-Cut Canal from the Henrys Fork. Storage is run from Grassy Lake as required for

delivery to Fall River canals. A fairly uniform release of water from Henrys Lake is made throughout the season with usually somewhat less water released than the Henrys Lake storage used.

Records are sent to the Idaho Falls office at the end of each month where final discharge computations are made. These final records are furnished to the St. Anthony office so that their provisional storage computations may be revised.

STORAGE COMPUTATIONS

Reference is made to Plate 21 of the 1964 report for details of storage computations. The drop in Henrys Lake is computed between available gage readings and converted to daily second-feet. These figures are shown under "Henrys Fork near Lake - Stored". There is no practical means of determining the inflow to Henrys Lake, which is a factor in computing the stored release from the lake. Occasional observations are made of the more important streams entering the lake. These do not include some submerged streams and many small springs around the lake. Past records indicate that there is a loss of around 3,000 acre-feet from Henrys Lake during the summer. Figures in stored column are adjusted to obtain a total stored release which is somewhat more than the drop in Henrys Lake contents minus 3,000 acre-feet. For example, total for 1964 is 8,793 cfs or 17,441 acre-feet. Drop in Henrys Lake was 82,300 minus 62,800 or 19,500, which indicates a 2,059 acre-feet loss.

Daily storage releases are run down the river as shown on Plate 21. Storage losses of 4% are charged from Henrys Lake to Island Park and 2.5% from Island Park to Ashton. A Cheridan Creek natural flow right of 12.0 cfs is owned by the Fremont-Madison

District. During the regulation season this is credited to them by showing 12 cfs stored inflow to Island Park. In dry years the Sheridan Creek supply is not sufficient to furnish the full 12 cfs. In such years a smaller figure is shown. Several users from Sheridan Creek or other Island Park tributaries own storage water. They are permitted to divert a part or all of the above 12 cfs of normal flow and are charged a corresponding amount against their storage allotments. For many years it has been the practice to charge against storage only 50% of the actual diversions in headwater areas. This assumes that half of the water diverted gets back to the river during the irrigation season.

Storage releases from Island Park are computed by converting daily reservoir drop to second-feet and adding the figure of stored inflow. An adjustment is made to compensate for heavy loss during early part of season when reservoir is high. These adjustments are explained on pages 31 and 32 of the 1964 report and in many previous reports.

Storage releases from Grassy Lake are converted to daily second-feet and listed on Plate 21. A one-day time of travel is accounted for by listing one day later than actual release. Total of stored release for season is made to equal the stored drop with no charge for reservoir loss.

CANAL DELIVERIES

A work sheet is kept in the St. Anthony office listing each canal. Daily gage readings and discharges are entered on this sheet. Also, a separate sheet is prepared for each canal on which storage allotments and daily storage diversions are shown. This data is

computed by subtracting from the daily diversion of a canal the amount of decreed right owing the canal. The difference is the storage diversion for that day. These figures are based on preliminary discharge computations. When final figures are furnished from Idaho Falls the preliminary figures are revised.

A cumulative total of storage diversions is kept throughout the season and canal watermasters are advised concerning their storage accounts. In many years some canals divert water in excess of their natural flow and storage rights. This excess is balanced by either exchange or rental from other canals or rental from Fremont-Madison District.

Total storage diversions for groups of canals are entered on Plate 21 and used in computing stored balance at Rexburg.

For a balanced operation of the river the total storage releases from reservoirs should be equal to total of stored loss plus stored diversions. This would produce a zero figure in the "stored" column for Henrys Fork near Rexburg. This would be modified by credits for storage used by Henrys Fork canals from their allotments in downstream reservoirs. See page 37 of 1964 report for details. Briefly, there was 11,305 acre-feet of storage diversions by Henrys Fork users in 1964 which was charged to their allotments in American Falls, Jackson and Palisades Reservoirs. Not considering any river loss the above figure added to -30,123 acre-foot storage balance at Rexburg leaves 18,818 acre-feet owing the main river by Henrys Fork users. This is water that was delivered from Palisades or American Falls reservoirs instead of from the Henrys Fork reservoirs.

Allowing a deficit in Henrys Fork operations is consistent with the practice of keeping all possible holdovers in upstream reservoirs.

However, it must be understood that in years when American Falls Reservoir does not fill a part of the Island Park, Grassy Lake, or Henrys Lake storage may be credited to American Falls (see page 38 of 1961 report). This deficit can be prevented, if desired, by releasing more water from the above reservoirs either during or after the irrigation season. It is well to notify Fremont-Madison officers of their approximate storage situation about midseason. They can then advise if they wish to draw more from their reservoirs to reduce the end of season deficit.

REGULATION SCHEDULE

In many years the water supply on the Henrys Fork drops below the canal demands a few days earlier than on the main river. In this event cuts in decreed rights and release of stored water may start there earlier than on the main river. As a rule the demands on the main river increase rapidly and the decrees in effect soon coincide with those on the Henrys Fork. Thereafter they usually follow the main river regulation schedule.

In most years the supply on the Teton River is insufficient to operate on the main river schedule (this was not true in 1964). Decreed rights are cut back to earlier years to balance the available supply with the canal diversions. Stored water is then run through the Cross Cut Canal to furnish canal demands in excess of normal flow. Decrees in effect are determined to keep storage deliveries to canals about equal to storage received from Cross Cut less storage spilled back to Henrys Fork. Allowance is made in storage deliveries for storage being delivered in Teton Basin. An extra charge is made against Teton Canals for loss in Cross Cut Canal. No charge was

A deputy watermaster is in immediate charge of regulation in Swan Valley under the direction of the Water District office. In recent years Palisades storage has been obtained by most Swan Valley users. Practically all the available natural flow of the creeks is diverted in exchange for this stored water.

In most years the discharge of streams is not sufficient to supply all demands. The Swan Valley deputy also serves as a local watermaster, dividing the water among the various waterusers.