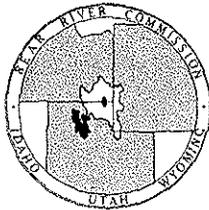


THIRD ANNUAL REPORT

BEAR RIVER  
COMMISSION

1960



For the Report-Year October 1, 1959 to  
September 30, 1960

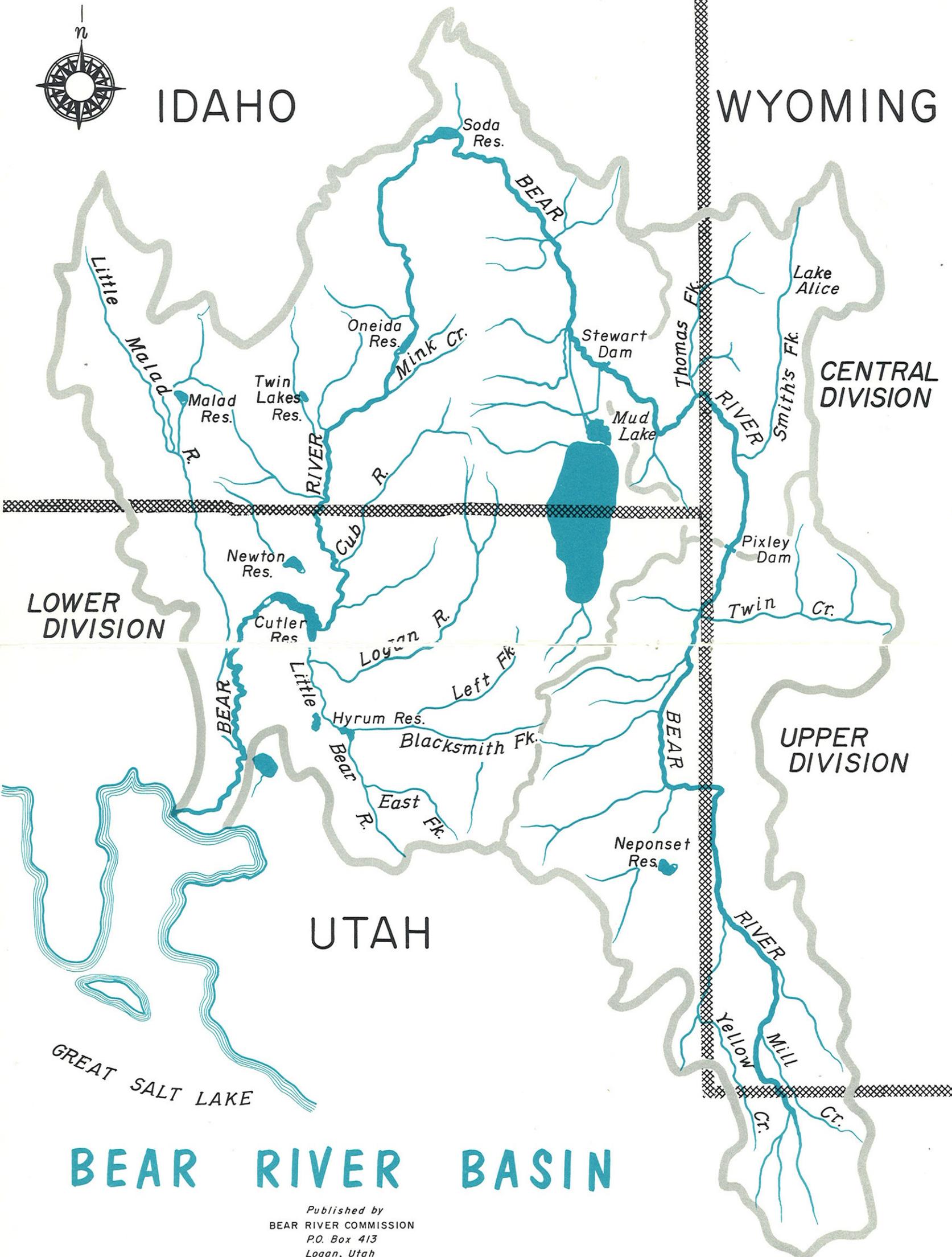
LOGAN, UTAH

March 18, 1961



IDAHO

WYOMING



LOWER DIVISION

CENTRAL DIVISION

UPPER DIVISION

UTAH

GREAT SALT LAKE

# BEAR RIVER BASIN

Published by  
BEAR RIVER COMMISSION  
P.O. Box 413  
Logan, Utah

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# THIRD ANNUAL REPORT OF THE BEAR RIVER COMMISSION

March 18, 1961

## **I. Introduction**

The Bear River Compact is an interstate pact which determines the rights and obligations of the signatory States of Wyoming, Idaho, and Utah with respect to the waters of Bear River. Federal consent was given by the Congress, and legislation was approved March 17, 1958 by the President. The Bear River Commission was established as the interstate administrative agency to carry out provisions of the Compact.

Article III D 2 of the Compact provides that the Bear River Commission shall compile annually a report covering the work of the Commission for the water year ending the previous September 30 and transmit it to the President of the United States and to the Governors of the signatory States on or before April 1 of each year.

Activities of the Bear River Commission during the water year ending September 30, 1960 are summarized in this report. Financial report of the auditors and daily stream-gaging records at key stations are included in the appendixes.

## **II. Organization**

Ten commissioners, three representing each State and one the United States, constitute the Bear River Commission. The Federal representative serves as Chairman without vote.

Organization of the Commission remained as originally constituted except the office of Vice-Chairman to which J. W. Myers was elected April 18, 1960.

## OFFICERS

Chairman .....	E. O. Larson, Salt Lake City, Utah
Vice-Chairman .....	J. W. Myers, Evanston, Wyoming
Secretary-Treasurer .....	Jay R. Bingham, Bountiful, Utah
Assistant Secretary .....	Wallace N. Jibson, Logan, Utah

## MEMBERS

### Idaho

Fred M. Cooper .....	Grace, Idaho
Melvin Lauridsen .....	Montpelier, Idaho
George N. Carter .....	Boise, Idaho

### Utah

Jay R. Bingham .....	Bountiful, Utah
Lawrence B. Johnson .....	Randolph, Utah
A. V. Smoot .....	Corinne, Utah

### Wyoming

Earl Lloyd .....	Cheyenne, Wyoming
S. Reed Dayton .....	Cokeville, Wyoming
J. W. Myers .....	Evanston, Wyoming

### United States

E. O. Larson .....	Salt Lake City, Utah
--------------------	----------------------

## COMMITTEES

### Budget

A. V. Smoot .....	Corinne, Utah
J. W. Meyers .....	Evanston, Wyoming
Melvin Lauridsen .....	Montpelier, Idaho

### Operations

Fred M. Cooper .....	Grace, Idaho
Lawrence B. Johnson .....	Randolph, Utah
S. Reed Dayton .....	Cokeville, Wyoming

### III. Meetings

Meetings of the Commission were held in accordance with the bylaws as follows:

Annual Meeting — April 18, 1960 — Salt Lake City, Utah

Regular Meeting — November 28, 1960 — Salt Lake City, Utah

### IV. Budget and Fiscal Disbursements

#### ADOPTED BUDGET (As Revised)

	<i>Fiscal Year Ending 6-30-1960</i>	<i>Fiscal Year Ending 6-30-1961</i>	<i>Total Biennium Ending 6-30-1961</i>
<b>Compact Administration</b>			
Personal Services .....	\$ 6,300	\$ 6,840	\$13,140
Travel and Subsistence .....	1,200	1,200	2,400
General Office Expense .....	610	400	1,010
Printing and Reproduction .....	700	700	1,400
Treasurer (Bond and Audit) .....	400	400	800
Transcribing Minutes .....	150	150	300
Washington Office Service Charge ..	690	710	1,400
Fiscal Unit Charge .....	400	350	750
Miscellaneous .....	300	300	600
Sub-Totals .....	<u>\$10,750</u>	<u>\$11,050</u>	<u>\$21,800</u>
<b>Stream-Gaging Program</b>			
Geological Survey .....	29,500	30,100	59,600
Totals .....	<u>\$40,250</u>	<u>\$41,150</u>	<u>\$81,400</u>

#### ALLOCATION OF BUDGET

United States (Geo. Survey) .....	\$14,750	\$15,050	\$29,800
State of Idaho .....	8,500	8,700	17,200
State of Utah .....	8,500	8,700	17,200
State of Wyoming .....	8,500	8,700	17,200
Totals .....	<u>\$40,250</u>	<u>\$41,150</u>	<u>\$81,400</u>

All disbursements of Commission funds are made by check on vouchers signed by the Secretary-Treasurer, and approved and countersigned by the Chairman or Vice-Chairman.

The audit of accounts and records, including balance sheet of June 30, 1960, statement of budget revenue and appropriation accounts for the fiscal year ended June 30, 1960, are included in this report as appendix A.

### V. Stream-gaging Program

A cooperative, basin-wide program is administrated from the Geological Survey project office at Logan, Utah. This program is financed equally by the Geological Survey and the Bear River Commission. Re-

cords were secured at 32 gaging stations, most of which are operated for determination of water resources in the basin, and an additional 11 stations operated by Utah Power & Light Company under FPC license. Three additional gaging stations were installed during the year on South Fork Little Bear River (Utah), Bloomington Creek (Idaho), and Eightmile Creek (Idaho). Daily discharge records for several stations in the basin are published herein as appendix B.

Water commissioners, employed by irrigation district or State, collected seasonal daily or partial records on about 130 irrigation canals above Bear Lake. These records were made available once or twice each week to the Commission office and were used to determine section allocations as required by the Compact. Geological Survey personnel spot checked discharge measurements and gaging procedures for adherence to standards of the Commission. Daily discharge records for canals in the Central Division are shown in tables 1-5; those in the Upper Division are maintained in the Commission file but are not published herein.

## VI. Hydrology

### A. Water Supply

Snow cover in the higher elevations and precipitation on agricultural areas of the basin averaged about 70 percent of normal. Irrigation-season runoff from headwater areas of Bear River and Smiths Fork also was near 70 percent, while water-year runoff was about 78 percent of the 18-year average. Below-average runoff became more critical to irrigators as summer precipitation failed to materialize.

Hydrographs of Bear River and Smiths Fork runoff are shown on plates 1 and 2 and the data summarized in the following tables:

#### *Runoff in Acre-feet May-September*

	<i>Average 1943-60</i>	<i>1959</i>	<i>1960</i>
Upper Bear River .....	115,200	100,500	82,800
Smiths Fork .....	103,700	73,400	72,300
Total .....	218,900	173,900	155,100

#### *Runoff in Acre-feet Water Year*

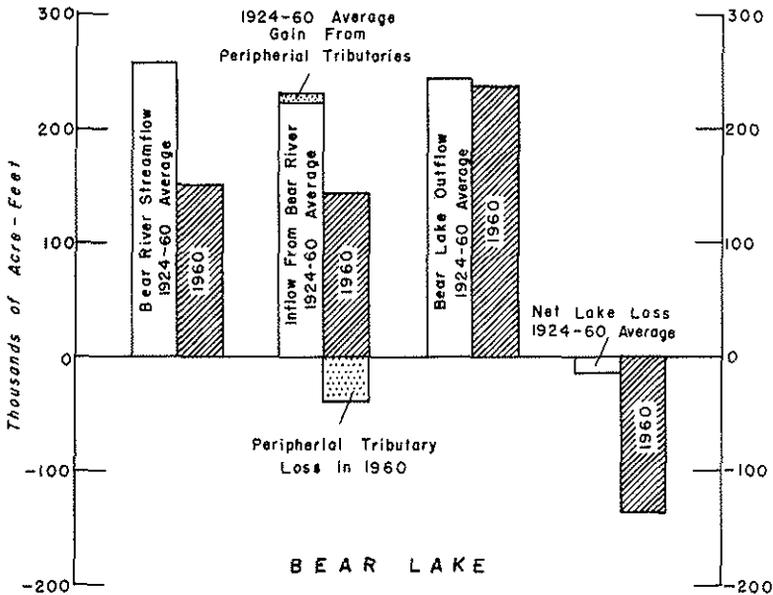
	<i>Average 1943-60</i>	<i>1959</i>	<i>1960</i>
Upper Bear River .....	137,600	118,900	108,300
Smiths Fork .....	140,200	105,300	109,600
Total .....	277,800	224,200	217,900

Bear Lake gained 157,000 acre-feet during the 1959-60 storage period which exceeded the corresponding gain of last year. Irrigation requirement on stored water however was much greater, and the change in content for the water year was 136,000 acre-feet compared to 74,000 in the preceding year. Bear Lake hydrographs for 1959 and 1960 are shown on plate 3, 1960 daily contents in appendix B, and comparative elevations in the following table:

*Bear Lake elevation*  
*Utah Power & Light Co. datum*

Water Year	Beginning of Water Year	End of Storage Period	End of Water Year
1958 .....	5,917.66	5,920.48	5,917.37
1959 .....	5,917.35	5,918.78	5,916.27
1960 .....	5,916.27	5,918.51	5,914.30

If the total discharge of Bear River were allowed to bypass Bear Lake and the inflow from the lake's peripheral tributaries retained in storage, a small annual gain over evaporation and other losses would occur in the average year. A loss would have resulted under such conditions in 1960 (and 1959) as shown in the following bar chart which compares 1960 streamflow with 1924-60 average data.



## **B. Weather Modification Program**

A cloud-seeding program sponsored by Utah Power & Light Company has been in operation for the past several years and was continued during 1960. Silver iodide is released from smoke generators situated at strategic points over the upper basin.

## **VII. Administration of Bear River Compact**

### **A. General**

The Bear River Commission is charged with administration of the Compact. Administration of water rights within each signatory State is in accordance with State law, subject to limitations provided in the Compact.

Annual cooperative agreements with the Geological Survey for stream gaging provide for a supplemental program of administrative assistance to the Commission. The program, financed by the Commission without matching Federal funds, is under supervision of the Geological Survey Project Engineer at Logan, Utah. The Survey office also serves as principal office for the Commission.

The Project Engineer serves as Assistant Secretary to the Commission with responsibility to provide technical assistance and current streamflow data as required to operate under terms of the Compact. He establishes operational procedures, prepares hydrologic studies, and maintains the files and records of the Commission. Annual reports are compiled by the Assistant Secretary and Secretary-Treasurer.

Expenses incurred by the Bear River Commission are paid equally by the signatory States. Compensation and expenses of the Federal representative, each commissioner, and each adviser are paid by the Government which he represents.

### **B. Distribution of Streamflow**

Records needed by the Commission to compute interstate allocation of streamflow (direct flow) were collected by State or district commissioners and the Geological Survey. They were computed by the Assistant Secretary who reported diversion and allocation data, by State section, to Commission representatives.

Streamflow to supply direct-flow needs of irrigators above Bear Lake has been below average in each of the three seasons of operation under the Compact. Deficient runoff coupled with negligible precipitation during the growing season marked 1960 as one of the drier years since 1934.

Wyoming irrigators, located in areas near and upstream from State-line crossings have developed irrigation practices over a period of years which require diversion rates far in excess of State-adjudicated rights. Prior to Compact operation, regulation was not required for the benefit of users in a lower State, and the practice was essentially one of unrestricted diversion. When provisions of the Compact limit total

diversions in a State section, individual rights must be administered in accordance with State law, and drastic reductions in diversion rates are required for this type of operation. In 1960, these severe regulatory measures met with resistance by a few users in the Coakville area. Though a difficult situation, it should not be a reflection on direct-flow provisions of the Compact.

### 1. Upper Division

The Upper Division comprises that portion of the basin above and including Pixley Dam and includes two sections in Wyoming and two in Utah. The Compact provides that when the total diversions in the division plus the flow passing Pixley Dam is less than 1,250 cfs (divertible flow), a water emergency exists and such divertible flow is allocated to sections as follows:

Upper Utah Section Diversions .....	0.6 percent
Upper Wyoming Section Diversions .....	49.3 percent
Lower Utah Section Diversions .....	40.5 percent
Lower Wyoming Section Diversions .....	9.6 percent

Hydrographs of divertible flow and diversions in the Upper Division are shown on plates 4 and 5. Divertible flow was below 1,250 cfs for about a week in May, then following high water, it again decreased below this amount on June 22 and remained below for the balance of the season.

Regulation of individual canals in Upper Wyoming Section began June 22 in order to maintain section diversions within Compact allocation. However, streamflow was decreasing so rapidly that it became very difficult to determine accurately and currently the divertible flow in the Division. By July 4, streamflow reaching Woodruff Narrows had fallen below 10 cfs and the most beneficial use thereafter was obtained by using available natural flow in Upper Utah and Upper Wyoming Sections.

It is rather evident that in years such as 1960, even though a certain amount of benefit is derived from interstate regulation in the Upper Division, the gain to the two lower sections is extremely limited by the rapid depletion of available flow. Regulatory measures however, directed by Compact operation and new storage development, have aided in distributing streamflow in accordance with State water rights.

Amounts diverted in the various sections during the principal demand period are shown below:

*Diversion in acre-feet per acre  
May 15 - August 1*

Upper Utah Section .....	3.63
Upper Wyoming Section .....	1.86*
Lower Utah Section .....	1.58
Lower Wyoming Section .....	1.54

\*Excludes reservoir water.

## 2. Central Division

The Central Division comprises that part of the basin from Pixley Dam down to and including Stewart Dam (the point of diversion to Bear Lake). It includes a section in Wyoming and one in Idaho.

Article IV of the Compact provides that when either the divertible flow in the division is less than 870 cfs, or the flow passing Bear River at Border gaging station is less than 350 cfs, a water emergency shall exist and total Wyoming diversions shall be limited to 43 percent of the divertible flow.

Hydrographs for the Central Division are shown on plates 6 to 8; plate 6 shows the total divertible flow, plates 7 and 8 show diversions and Compact allocations in the respective sections. It is noted that a water emergency, as defined above, occurred May 19 and lasted through the season except for the period June 11, 14-15. An emergency, being defined by either of two criteria, was somewhat difficult to determine in the first part of June. Streamflow passing the Border gaging station can be readily checked each day, but it is impractical to gather and compute each day all diversion records from which divertible flow is computed.

Resistance to regulation at the time available records indicated that streamflow was hovering above and below the point of regulation combined to prevent full compliance. By June 16 however, the situation was remedied and very tolerable differences were maintained thereafter between diversions and allocations. Seasonal diversion in Wyoming exceeded allocation by less than two percent. Section diversions are summarized below:

*Diversion in acre-feet per acre  
June-September*

	1954	1956	1958	1959	1960
Wyoming Section.....	4.86	5.40	4.00	3.83	2.99
Idaho Section* .....	2.01	2.61	2.54	2.52	2.30

\*Excludes flow passing Stewart Dam and flow diverted to Bear Lake.

## 3. Lower Division

Authority is given the Commission upon its own motion to declare a water emergency in any Division, and in the Lower Division such declaration also may be made upon petition of an aggrieved Utah user against an Idaho user. Upon declaration of an emergency, the Commission is required to enforce water-delivery schedules based on priority of rights without regard to State lines.

There were no petitions filed with the Commission or water emergencies declared in the Lower Division in 1960.

#### 4. Interstate Tributaries

An aggrieved lower-State user on an interstate tributary may petition for declaration of a water emergency and distribution of flow under direction of the Commission. Interstate arbitration on tributaries was not requested in 1960.

### C. Storage

#### 1. New Storage

The Compact defines storage rights in existing reservoirs above Bear Lake and provides for an additional storage allowance of 36,500 acre-feet annually. Idaho users on Thomas Fork are allotted 1,000 acre-feet of this amount and the remainder is divided equally between Wyoming and Utah.

Water was stored in 1960 in the following reservoirs constructed under additional storage provisions of the Compact:

<i>Reservoir</i>	<i>Capacity</i>
Sulphur Creek (Wyoming).....	4,615 ac-ft
J. L. Martin, Bazoo Hollow, Sulphur Creek (Wyoming).....	88 ac-ft
A. J. Barker, Yellow Creek (Utah).....	162 ac-ft

An off-stream dam from West Fork Bear River has been impounding water without State right for the past few years. Reservoir releases were made in 1960 by order of the Utah State Engineer.

#### 2. Bear Lake

A Bear Lake irrigation reserve is provided by article V of the Compact. The reserve is increased by steps as new storage is developed above Bear Lake and is presently at elevation 5,913.24 feet (703,300 acre-feet). It provides that stored water shall not be released solely for power generation when the lake surface is below this elevation. The 1960 range in Bear Lake elevation was from a high of 5,918.51 feet to a low of 5,914.26 feet and therefore was maintained above the reserve throughout the year. (See plate 3.)

### D. Applications for Appropriation

Article X of the Compact states, "Applications for appropriation, for change of point of diversion, place and nature of use, and for exchange of Bear River water shall be considered and acted upon in accordance with the law of the State in which the point of diversion is located, but no such application shall be approved if the effect thereof will be to deprive any water user in another State of water to which he is entitled. The official of each State in charge of water administration shall, upon the filing of an application affecting Bear River water, transmit a copy thereof to the Commission."

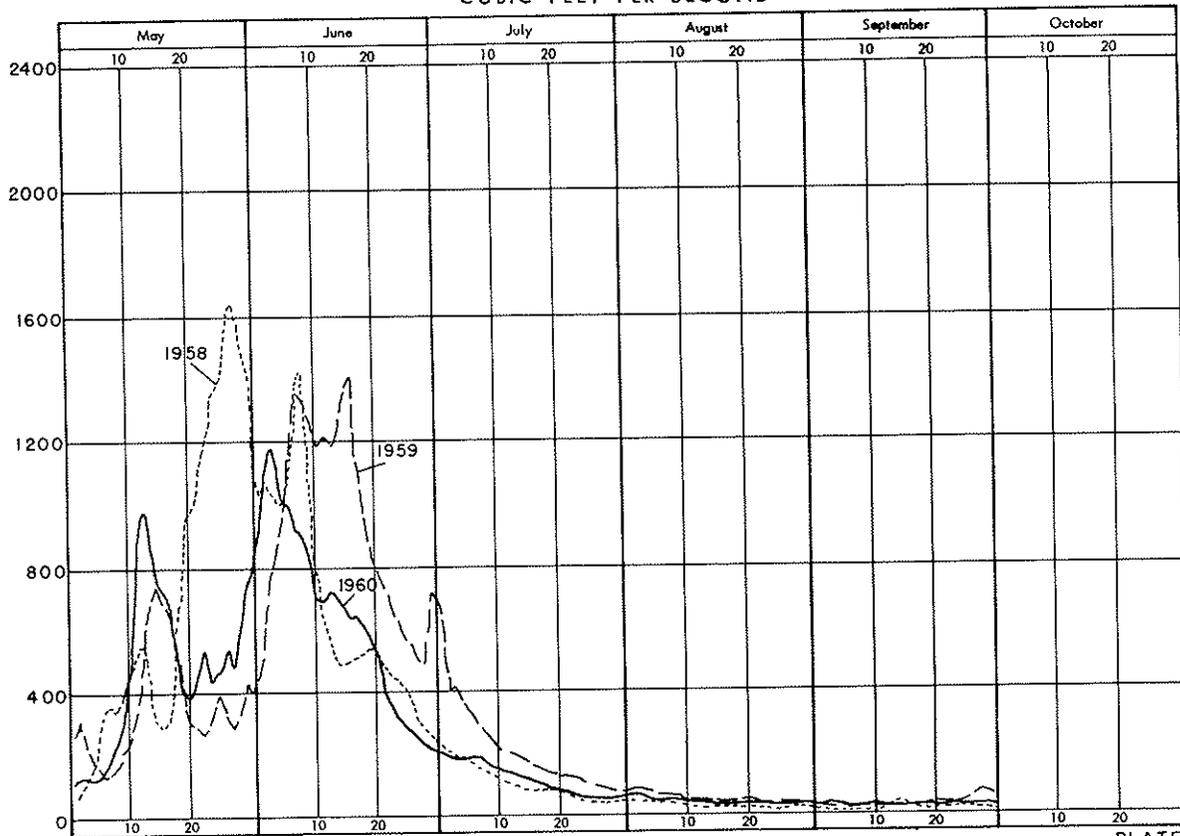
A number of applications for appropriation were submitted to the Commission in 1960, including an application to Wyoming by the Utah Water and Power Board for a dam at Woodruff Narrows (Wyoming) to impound the balance of Utah's allocation of new storage.

The majority of applications received deal with ground-water development and stock-water reservoirs. These applications are subject to provisions of article X, and stock-water rights are subject further to article V C which states, "Subject to existing rights, each State shall have the use of water for farm and ranch domestic, and stock watering purposes, and subject to State law shall have the right to impound water for such purposes in reservoirs having storage capacities not in excess, in any case, of 20 acre-feet, without deduction from the allocation made by paragraph A of this Article."

Members of the Commission have questioned the extent of such new rights for underground development and stock watering which might be granted without adverse effect on users in a lower State. The question has been referred to a committee of the three State Engineers, but agreement has not been reached by this committee on recommendations to be followed by their respective offices in acting upon such applications.

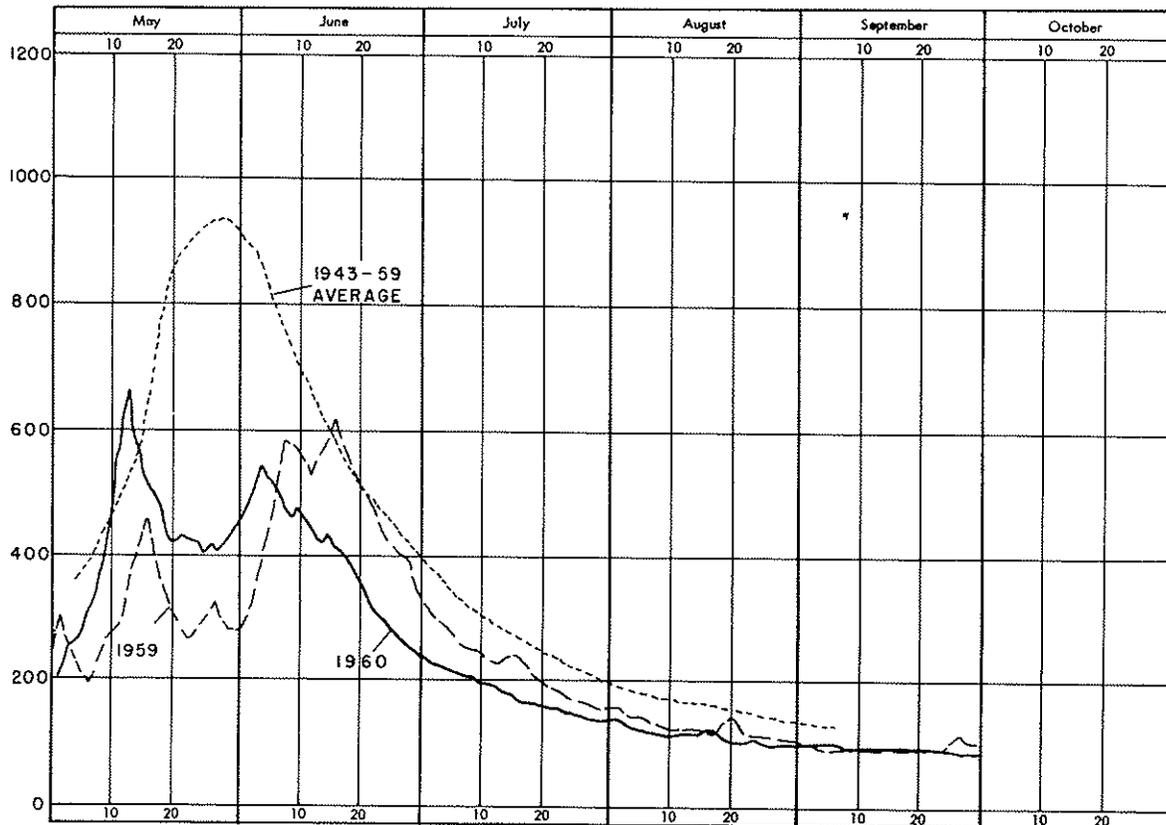
UPPER DIVISION - BEAR RIVER SUPPLY  
CUBIC FEET PER SECOND

19

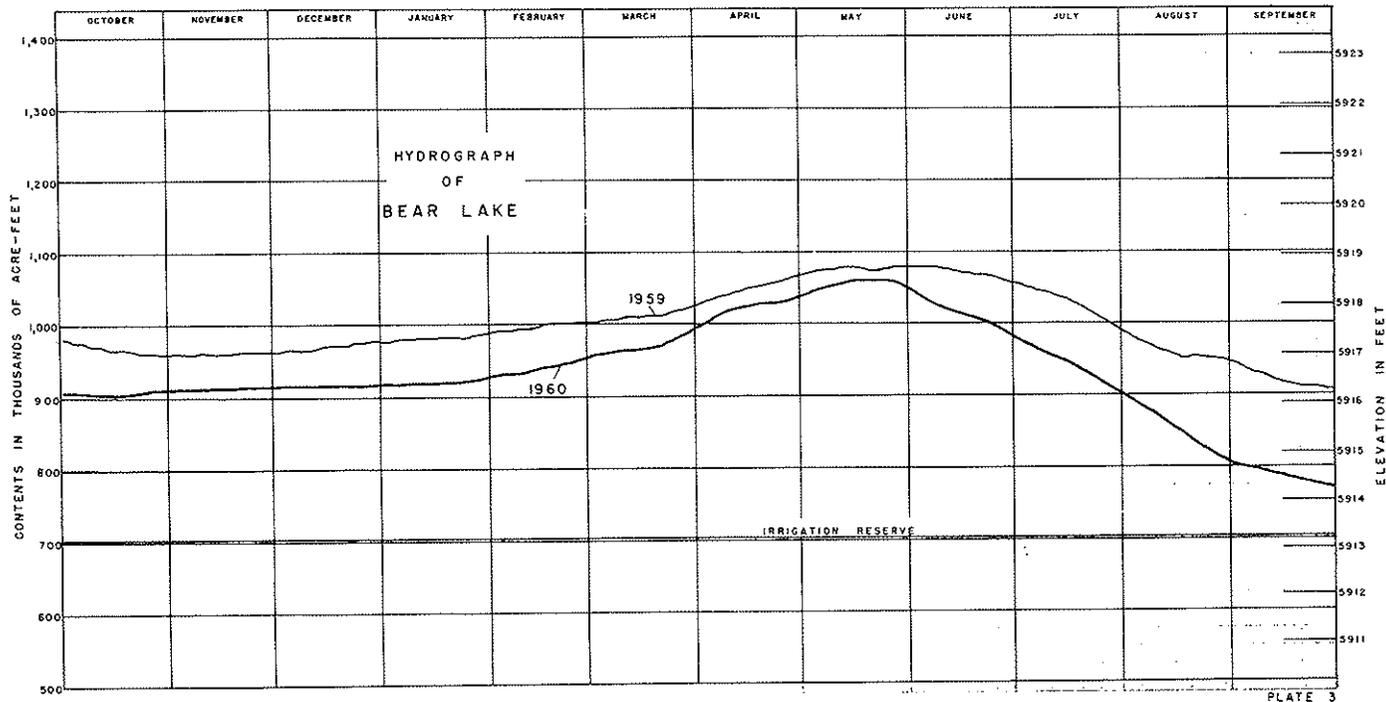


CENTRAL DIVISION - SMITHS FORK SUPPLY  
CUBIC FEET PER SECOND

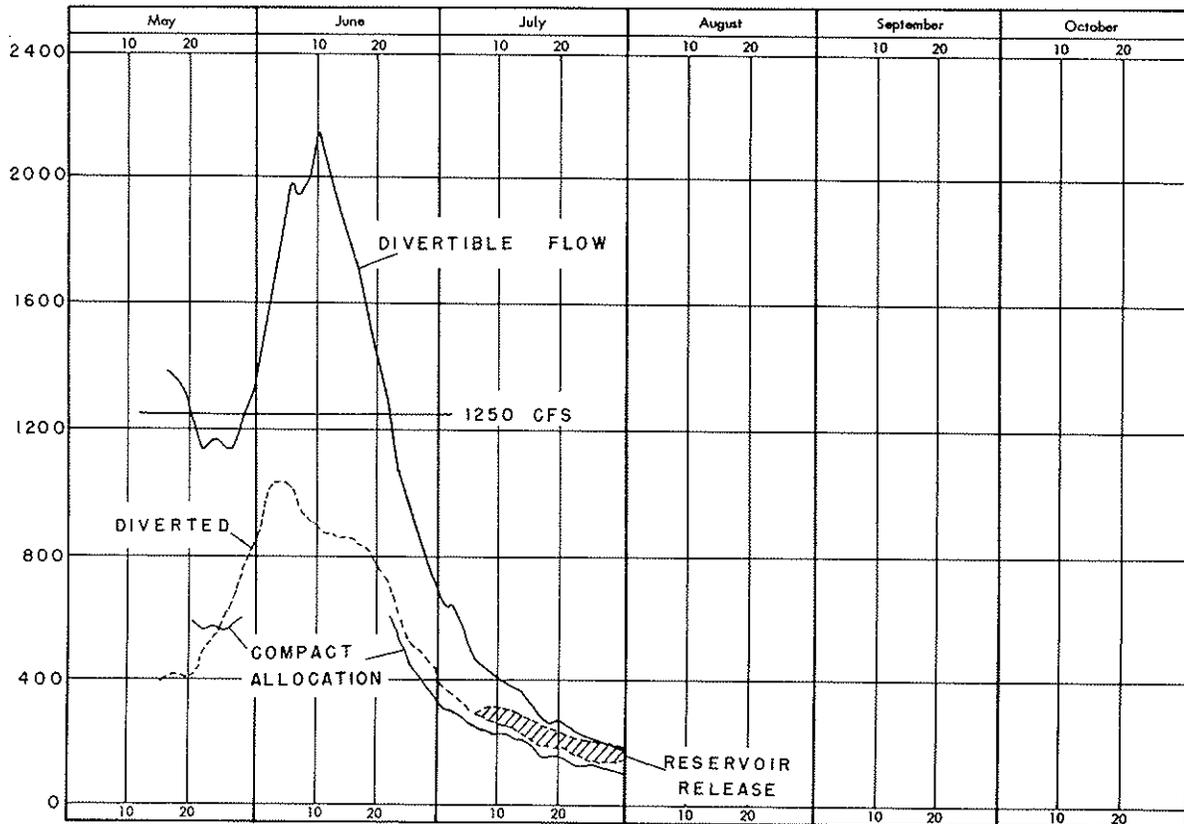
20



BEAR LAKE - 1959

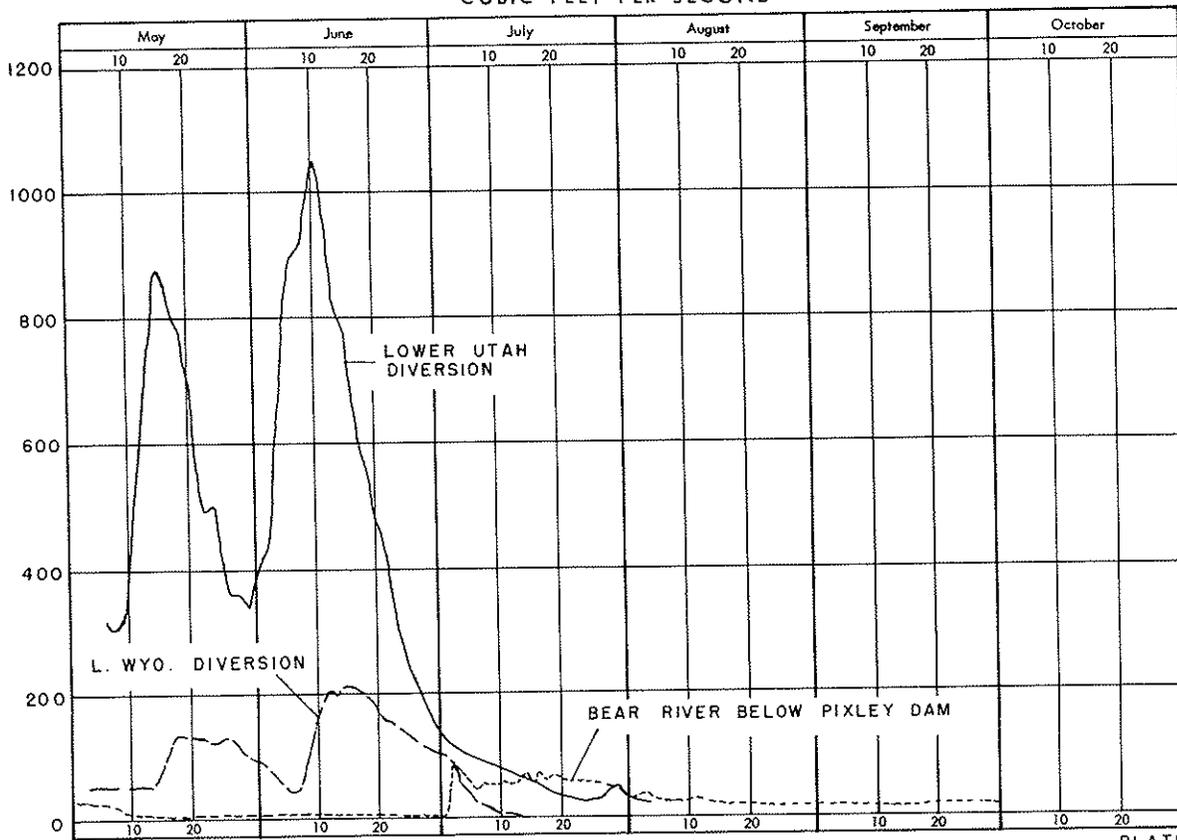


UPPER DIVISION - UPPER WYOMING SECTION  
CUBIC FEET PER SECOND



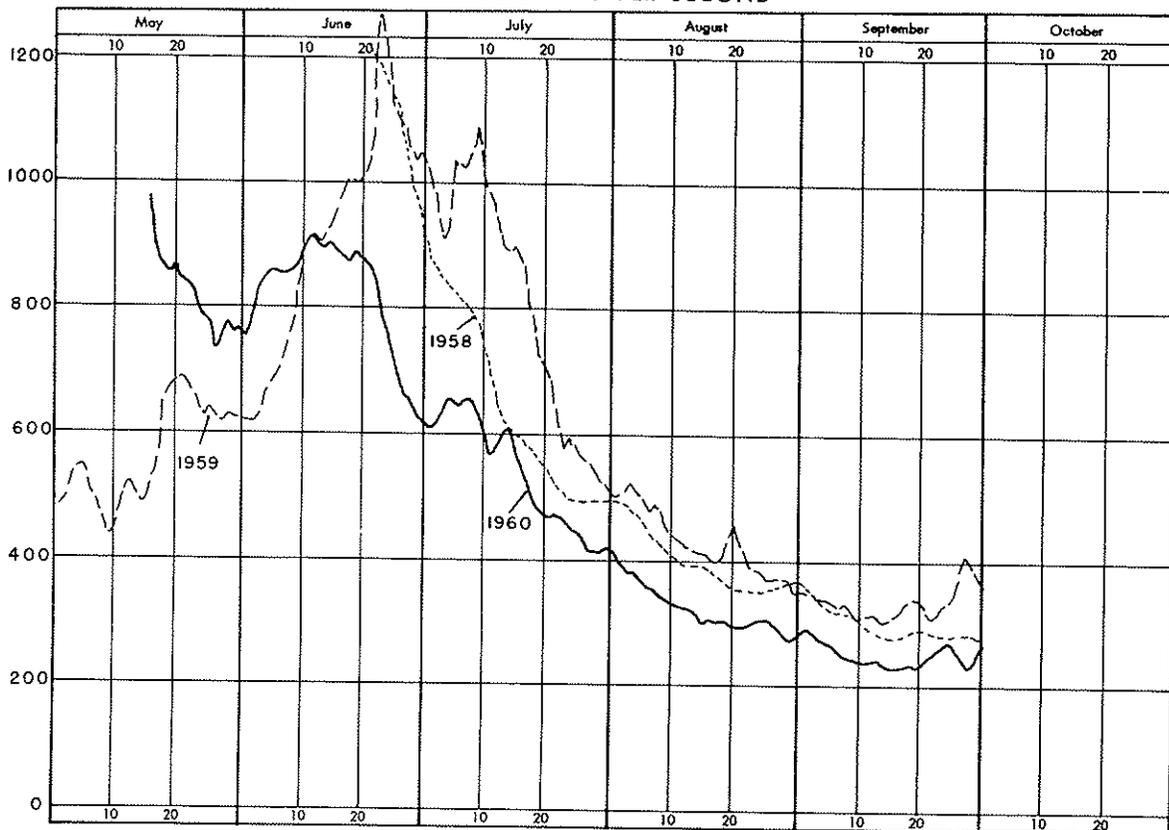
22

UPPER DIVISION - DIVERSION  
CUBIC FEET PER SECOND



28

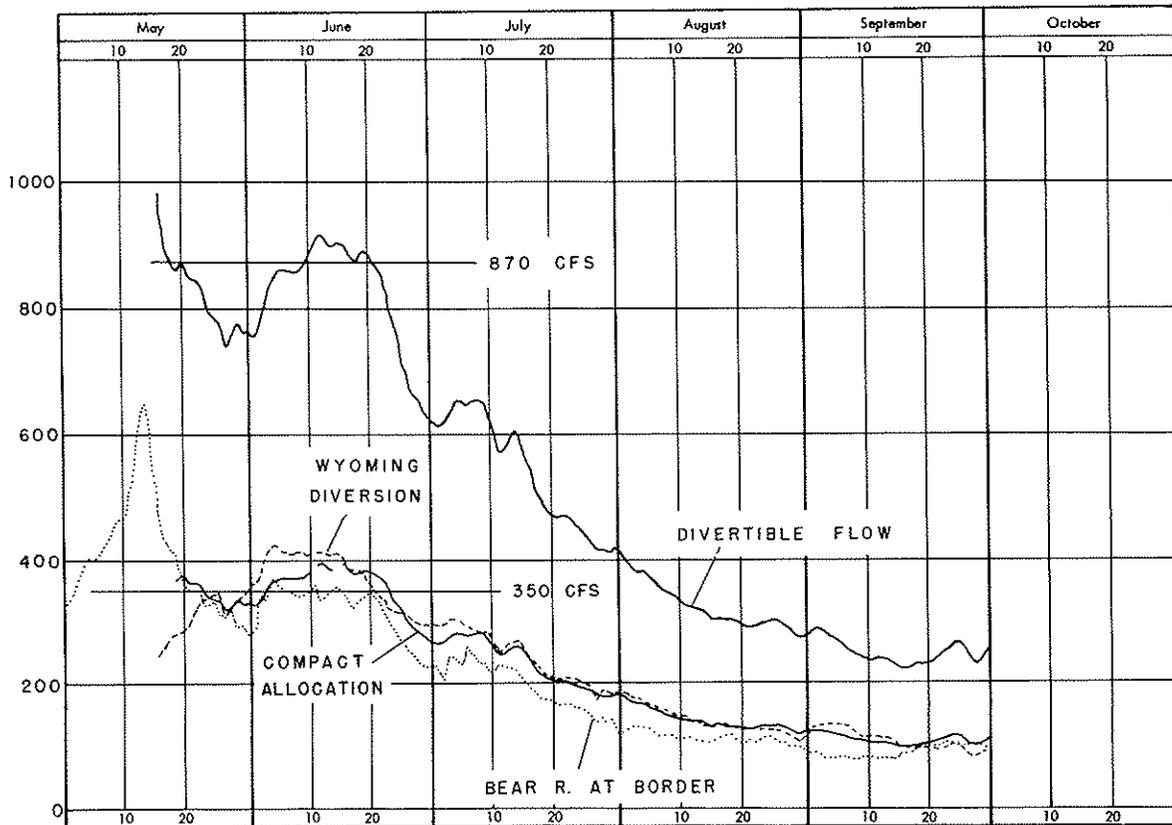
CENTRAL DIVISION - DIVERTIBLE FLOW  
CUBIC FEET PER SECOND



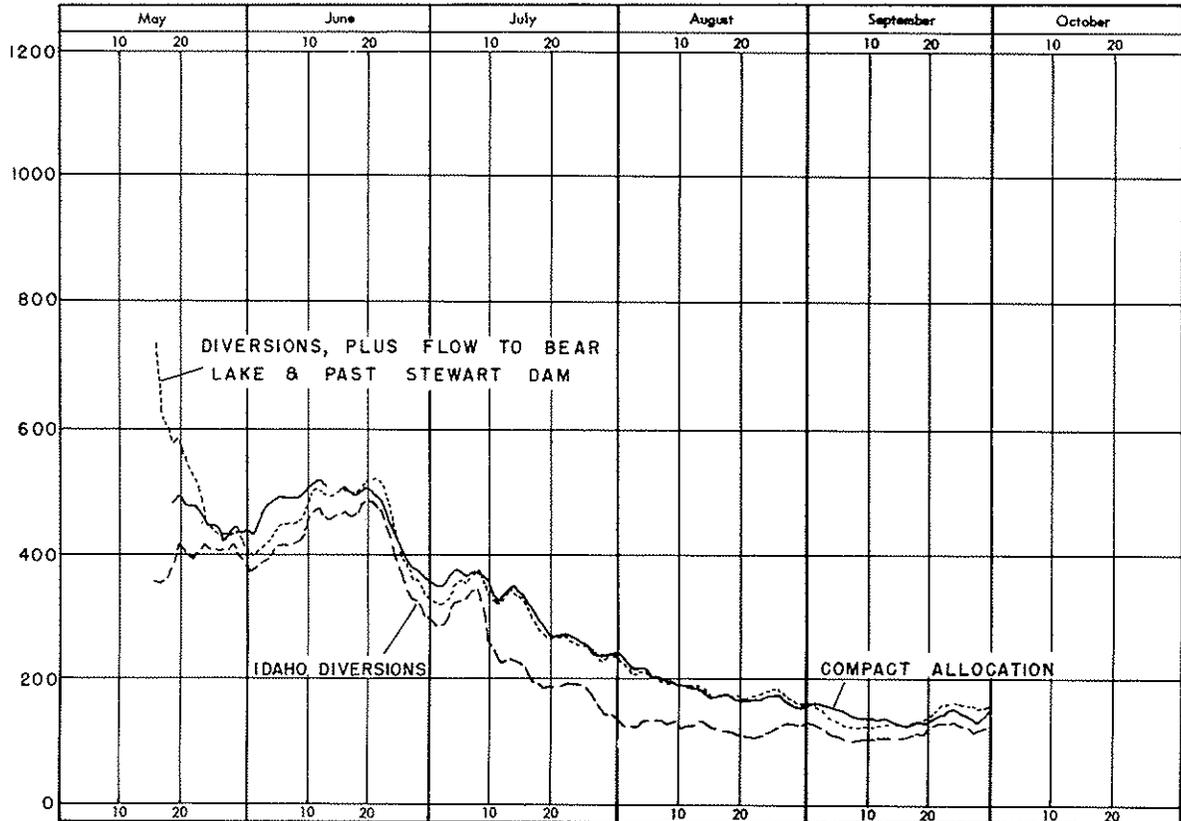
24

CENTRAL DIVISION — WYOMING SECTION  
CUBIC FEET PER SECOND

25



CENTRAL DIVISION — IDAHO SECTION  
CUBIC FEET PER SECOND



26





DAILY DISCHARGE IN C.F.S. OF SMITHS FORK & BEAR RIVER CANALS

JULY 1960		WITH COMPACT ALLOCATION IN CENTRAL DIVISION																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
WORKING DIVISIONS																																
BEAR RIVER CANALS																																
CANOPY	2	2	2	1	1	4	3	4	4	4	4	4	1	2	1	2	2	2	2	1	3	3	0	0	0	0	0	0	0	0	60	
STONEY	4	2	4	4	4	7	7	7	7	6	6	6	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	164		
WYMAN EAST	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	75		
WYMAN WEST	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	96		
WYMAN	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	129		
ROCKY POINT	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	129		
COOK	43	42	44	45	43	40	38	39	39	35	35	42	62	73	60	48	49	42	33	35	32	30	30	39	37	37	23	24	23	22	22	1,221
TRIESTEAD CANALS																																
PIPER CREEK ABOVE DIVISIONS																																
OSAGE CREEK CANAL	18	18	18	18	18	18	16	17	17	18	18	16	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	17	17	18	552	
DIAMOND PAC #1 (BRIDGE CR.)	1	2	5	4	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	89	
MAGNETT WEST (PIPER CREEK)	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
SUBLETTE CR. AT TRAMP. BR.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	62	
SMITHS FORK CANALS																																
GUTH-BOROUGH	12	10	10	10	10	10	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	251	
WYMAN EAST	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	124	
PERRY PARTISAN	3	4	5	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	154	
PROGRESS	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	60	
SHIPLE	16	17	18	19	19	18	16	16	12	10	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7	6	5	6	6	128	
WYMAN	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	180	
WYMAN EAST	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	129	
COVEY CANAL AT ROAD	65	65	67	67	65	65	64	62	63	58	57	62	46	68	66	68	68	69	66	63	64	66	66	56	56	44	46	46	48	48	1,631	
COVEY CANAL FROM SPRING CR.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	152	
LOWRY CANAL FROM SPRING CR.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	152	
TAMMERS, BENT & GARRETT	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	121	
WYMAN WEST	19	19	18	18	18	17	17	16	16	16	15	16	15	16	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	488
MARTIN (COLLETT CREEK)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	111	
JOHN BOURNE (COLLETT CREEK)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	61	
POWELL (COLLETT CREEK)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STONEY WYMAN (S.W. BRANCH)	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	238	
ROGUE (SOUTH BRANCH)	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	238	
COVINGTON WYMAN (S.W. BR.)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	130	
TAMMERS #1 (SOUTH BRANCH)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	89	
SMITHS FORK CANAL (S.D. BR.)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	121	
SO. BR. #2 (SMITHS FORK)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	121	
SO. BR. #1 (SMITHS FORK)	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	342	
TOTAL WORKING DIVISIONS	269	295	305	304	284	280	283	281	282	269	246	265	259	322	256	260	236	222	211	208	206	211	202	205	158	167	174	180	187	184	2,469	
DRAIN DIVISIONS																																
WYMAN DRAIN																																
WYMAN CANAL	6	5	4	4	4	4	4	4	4	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	129	
WYMAN DRAIN	17	18	20	21	19	21	20	20	19	18	18	18	17	17	16	14	13	13	12	12	11	12	11	11	11	11	11	11	11	11	11	409
WYMAN DRAIN	16	15	15	13	8	8	8	8	8	11	15	13	12	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	346
JENSEN DRAIN	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	270
LOVE DRAIN	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	212	
FINCHES IRRIGATION CANAL	28	28	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	1,023	
FINCHES CROCKETT CANAL	39	39	40	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	1,423	
BLACK OYER CANAL	66	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	2,000	
PRINSON MONTPELIER CANAL	9	14	28	41	41	40	46	48	45	42	40	46	45	42	41	39	33	31	30	24	25	31	30	30	30	31	31	31	31	31	1,176	
LANCASTER KING CANAL	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	379	
ESSY FORK CANAL	72	66	67	68	68	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	2,174	
PERKINS DRAIN	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	180	
SUBTOTAL	286	284	298	321	327	324	342	347	315	251	236	228	230	221	221	211	199	190	181	182	186	192	191	191	191	185	172	153	144	144	135	7,051
WYMAN WEST CANAL (HEAD L.)																																
WYMAN WEST CANAL (HEAD L.)	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	702	
BEAR RIVER BEYOND STRAIGHT DAM																																
BEAR RIVER BEYOND STRAIGHT DAM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DRAIN DIVISIONS (CONTRACT)																																
DRAIN DIVISIONS (CONTRACT)	117	115	128	143	157	161	169	174	151	133	117	111	106	107	108	112	105	102	102	102	102	102	102	102	102	102	102	102	102	102	9,178	
WORKING DIVISIONS (CONTRACT)																																
WORKING DIVISIONS (CONTRACT)	296	295	305	304	284	280	283	281	282	269	246	265	259	322	256	260	236	222	211	208	206	211	202	205	158	167	174	180	187	184	2,469	
INVESTIBLE FIRM IN DIVISION																																
INVESTIBLE FIRM IN DIVISION	610	611	657	654	641	632	635	632	629	628	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	2,469	
WORKING ALLOCATION (CWA)																																
WORKING ALLOCATION (CWA)	261	282	272	283	285	286	288																									





## APPENDIX A

### Lincoln G. Kelly and Company

Certified Public Accountants

SUITE 608 WALKER BANK BUILDING

TELEPHONE DAVIS 8-0141

Salt Lake City 11, Utah

REPRESENTED IN THE PRINCIPAL  
CITIES OF THE UNITED STATES, CANADA,  
CUBA AND BY CORRESPONDENTS ABROAD.

October 19, 1960

Bear River Commission  
Utah State Capitol Building  
Salt Lake City, Utah

Gentlemen:

We have examined the financial records of the Bear River Commission for the fiscal year ended June 30, 1960, and the statement of budget revenue and appropriation accounts for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As a result of our examination, we present this report which includes comments and explanatory detail and the following described statements:

Exhibit A--Statement of budget revenue and appropriation  
accounts for the fiscal year ended June 30, 1960

Exhibit B--Statement of expenditures --United States  
Geological Survey Program--for the fiscal year  
ended June 30, 1960

Schedule A-1--Statement of revenue and expenditures

#### GENERAL COMMENTS

The cash on deposit in the First Security Bank of Utah, N. A. , was confirmed by direct communication with the depository.

At June 30, 1960, all obligations incurred by the Commission during the fiscal year had been satisfied, including the fourth and final payment to the United States Geological Survey for services performed.

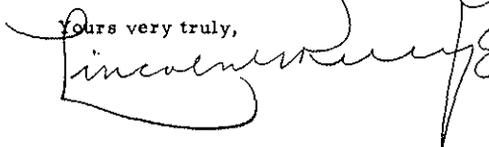
The Bear River Commission, representing the three States of Wyoming, Utah, and Idaho, was duly organized in Salt Lake City on April 5, 1958, and by-laws were adopted April 26, 1958. All expenses incurred by the Bear River Commission are to be charged to and paid by the three States on an equal basis.

On July 1, 1959, the Commission entered into a cooperative agreement with the Geological Survey, United States Department of the Interior, for the operation and maintenance of a gauging-station network. Expenses pertaining to this work are shared equally by the Commission and the Geological Survey, while other expenses incurred by the United States Geological Survey which directly relate to the compact administration are wholly financed by the Commission. This is the same agreement as was in effect for the preceding fiscal year. Details of the financial transactions relating to this agreement for the fiscal year ended June 30, 1960, are presented in exhibit B.

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In our opinion, the accompanying statements present fairly the cash position of the Bear River Commission at June 30, 1960, and the results of the cash transactions for the period then ended, in conformity with generally accepted accounting principles applicable in the circumstances.

Yours very truly,



BEAR RIVER COMMISSION

Statement of Budget Revenue and Appropriation Accounts  
for the Fiscal Year Ended June 30, 1960

	<u>Budget</u> <u>Estimates</u>	<u>Amount</u> <u>Realized or</u> <u>Expended</u>	<u>Balance</u> <u>or</u> <u>Deficit (-)</u>
<u>CASH REVENUES:</u>			
Balance--funds on hand at			
July 1, 1959 . . . . .	\$ 7,260.00	\$ 7,260.00	
Revenue receipts:			
State of Wyoming . . . . .	8,500.00	8,500.00	.....
State of Utah . . . . .	8,500.00	8,500.00	.....
State of Idaho . . . . .	<u>8,500.00</u>	<u>8,500.00</u>	<u>.....</u>
	<u>32,760.00</u>	<u>32,760.00</u>	<u>.....</u>
<u>NON-CASH REVENUES:</u>			
United States Geological Survey	<u>14,750.00</u>	<u>14,665.00</u>	<u>85.00-</u>
Total funds available . . . . .	<u>47,510.00</u>	<u>47,425.00</u>	<u>85.00-</u>
<u>APPROPRIATION ACCOUNTS:</u>			
Stream gauging . . . . .	29,500.00	29,330.00	170.00
Personal services . . . . .	6,300.00	6,300.00	.....
Travel and subsistence . . . . .	1,200.00	1,200.00	.....
General office expense . . . . .	610.00	530.00	80.00
Printing--annual report . . . . .	700.00	385.00	315.00
Treasurer's bond and audit . . . . .	400.00	250.00	150.00
Transcript of minutes . . . . .	150.00	70.00	80.00
Washington office service charge	690.00	690.00	.....
Fiscal charge . . . . .	400.00	346.00	54.00
Miscellaneous . . . . .	<u>300.00</u>	<u>100.00</u>	<u>200.00</u>
	40,250.00	39,201.00	1,049.00
Accounts payable at July 1, 1959	<u>6,218.00</u>	<u>6,218.00</u>	<u>.....</u>
	46,468.00	45,419.00	1,049.00
Unappropriated at July 1, 1959	<u>1,042.00</u>	<u>.....</u>	<u>1,042.00</u>
	<u>47,510.00</u>	<u>45,419.00</u>	<u>2,091.00</u>
<u>BALANCE</u> . . . . .	<u>\$ .....</u>	<u>\$ 2,006.00</u>	<u>\$2,006.00</u>
<u>FUNDS ON HAND AT</u>			
<u>JUNE 30, 1960:</u>			
Cash on deposit . . . . .		<u>\$ 2,006.00</u>	<u>\$2,006.00</u>

BEAR RIVER COMMISSION

Statement of Expenditures--United States Geological Survey Program,  
for the Fiscal Year Ended June 30, 1960

	Stream-Gauging Program				Total Expense to Bear River Commission
	Allocated				
	Allocable Expenditure	U. S. Geolo- gical Survey 50%	Bear River Comm. 50%	Non- allocable Direct Admn.	
Personal services	\$21,192.00	\$10,596.00	\$10,596.00	\$6,300.00	\$16,896.00
Travel and subsistence . . .	2,478.00	1,239.00	1,239.00	1,200.00	2,439.00
General office expense . . . . .	2,406.00	1,203.00	1,203.00	510.00	1,713.00
Fiscal charges . .	1,009.00	504.50	504.50	346.00	850.50
Washington office charge . . . . .	2,213.00	1,106.50	1,106.50	690.00	1,796.50
Miscellaneous . .	<u>32.00</u>	<u>16.00</u>	<u>16.00</u>	<u>100.00</u>	<u>116.00</u>
	<u>\$29,330.00</u>	<u>\$14,665.00</u>	<u>\$14,665.00</u>	<u>\$9,146.00</u>	<u>\$23,811.00</u>

BEAR RIVER COMMISSIONStatement of Revenue and Expenditures  
for the Fiscal Year Ended June 30, 1960REVENUE:

State of Wyoming . . . . .	\$ 8,500.00
State of Utah . . . . .	8,500.00
State of Idaho . . . . .	<u>8,500.00</u>
	25,500.00

EXPENDITURES--note 1:

Stream gauging . . . . .	\$14,665.00
Personal services . . . . .	6,300.00
Travel and subsistence . . . . .	1,200.00
General office expense . . . . .	530.00
Printing--annual report . . . . .	385.00
Treasurer's bond and audit . . . . .	250.00
Transcript of minutes . . . . .	70.00
Washington office service charge . . . . .	690.00
Fiscal charge . . . . .	346.00
Miscellaneous . . . . .	<u>100.00</u>
	<u>24,536.00</u>

REVENUE OVER EXPENDITURES FOR THE  
FISCAL YEAR ENDED JUNE 30, 1960 . . .\$ 964.00NOTE 1: Expenditures, as above, consisted of:

Stream-gauging program--exhibit B . . . . .	\$23,811.00
Additional general office expense--postage . . . . .	20.00
Printing--annual report . . . . .	385.00
Treasurer's bond . . . . .	50.00
Audit of accounts . . . . .	200.00
Transcripts of the minutes of the Commission's meetings . . . . .	<u>70.00</u>
Total expenditures . . . . .	<u>\$24,536.00</u>

## APPENDIX B

### GAGING-STATION RECORDS

Records of streamflow for State line and other key stations are included herein. The record consists of description of the station and a table showing the daily discharge in cubic feet per second and monthly and yearly runoff in acre-feet for the 1960 water year.

The description of the station gives the location, drainage area, records available, type and history of gage, average discharge, extremes of discharge, general remarks, and a statement of cooperation where applicable. This is essentially the same data as published in annual water-supply papers of the Geological Survey.

In the table of daily discharge, the figures for the maximum day and the minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total second-foot-days for the month. The line headed "Mean" gives the average flow in cubic feet per second (second-feet) during the month. Runoff for the month is expressed in acre-feet (line-headed "Ac-ft").

Records included herein have been collected by the U. S. Geological Survey in accordance with cooperative agreement with the Bear River Commission and by the Utah Power & Light Company. All streamflow records are to be considered as provisional pending final review by the Survey.

## 115. BEAR RIVER NEAR UTAH-WYOMING STATE LINE

**Location.** — Lat 40°58', long 110°51', in SE¼ sec. 30, T. 3 N., R. 10 E., on left bank just downstream from West Fork and 2.8 miles upstream from Utah-Wyoming State line.

**Drainage area.** — 176 sq mi.

**Records available.** — July 1942 to September 1960.

**Gage.** — Water-stage recorder. Altitude of gage is 7,965 ft (from river-profile map.)

**Average discharge.** — 18 years, 185 cfs (183,900 acre-ft per year).

**Extremes.** — Maximum discharge during year, 1,490 cfs June 3 (gage height, 3.28 ft); minimum, not determined (occurred during period when intake was frozen).

1942-60: Maximum discharge, 2,800 cfs June 6, 1957 (gage height, 4.27 ft); minimum determined, 16 cfs Apr. 11, 1951, Nov. 5, 1954, Nov. 1, 1955, Oct. 30, 1956.

**Remarks.** — Records good except those for periods of ice effect or no gage-height record, which are fair. Two diversions above station for irrigation of about 200 acres above and 2, 600 acres below station.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	82	b 38	21	36	b 20	44	123	919	210	74	32
2	26	50	b 38	19	36	b 31	44	134	1,110	195	61	42
3	52	88	b 38	18	38	32	44	134	1,180	199	54	36
4	61	82	b 30	21	b 31	32	52	137	1,140	195	50	38
5	64	68	b 28	25	b 32	32	69	129	1,010	187	47	34
6	73	71	b 31	29	33	32	94	134	1,000	199	46	33
7	86	86	b 32	32	33	32	106	180	928	195	46	33
8	71	76	b 34	36	33	33	118	239	919	166	42	31
9	84	74	b 33	39	34	34	149	322	858	152	40	29
10	113	73	b 31	40	34	b 34	176	433	704	149	42	27
11	96	69	b 30	39	34	b 34	191	607	688	146	42	27
12	98	68	b 30	38	b 34	35	187	850	688	137	40	29
13	88	54	b 30	38	b 32	32	156	983	728	132	38	27
14	84	42	b 27	36	b 33	33	163	884	720	123	36	28
15	84	59	b 24	34	b 34	b 34	152	767	681	110	36	27
16	86	58	b 23	31	b 34	b 35	143	728	628	103	36	27
17	80	54	b 25	27	b 34	b 35	118	696	644	96	38	30
18	80	56	25	25	b 34	b 36	132	593	621	92	38	30
19	84	55	25	25	b 34	b 36	140	464	593	92	36	27
20	80	51	31	31	36	36	134	392	543	84	35	26
21	78	50	26	34	b 34	38	218	392	446	74	32	25
22	78	52	34	35	b 34	40	288	483	375	71	35	29
23	90	58	36	36	b 33	42	256	543	354	66	47	33
24	115	58	37	37	b 31	44	199	421	312	62	40	30
25	115	54	38	38	b 30	46	169	458	298	56	38	27
26	115	b 36	21	39	b 30	54	152	471	270	52	36	26
27	115	b 43	20	39	b 30	62	140	543	261	51	35	25
28	146	b 41	21	37	b 30	59	134	477	248	50	33	24
29	108	b 40	22	b 33	b 30	48	129	634	235	47	33	24
30	103	b 39	23	b 31	48	48	118	751	222	52	30	26
31	88	22	23	b 31	46	46	775	775	69	27	27	27
<b>Total</b>	<b>2,733</b>	<b>1,837</b>	<b>859</b>	<b>994</b>	<b>959</b>	<b>1,195</b>	<b>4,215</b>	<b>14,857</b>	<b>19,323</b>	<b>3,612</b>	<b>1,263</b>	<b>882</b>
<b>Mean</b>	<b>88.2</b>	<b>61.2</b>	<b>27.7</b>	<b>32.1</b>	<b>35.1</b>	<b>38.5</b>	<b>140</b>	<b>479</b>	<b>644</b>	<b>117</b>	<b>40.7</b>	<b>29.4</b>
<b>Ac-Ft</b>	<b>5,420</b>	<b>2,640</b>	<b>1,700</b>	<b>1,970</b>	<b>1,900</b>	<b>2,370</b>	<b>8,360</b>	<b>29,470</b>	<b>38,330</b>	<b>7,160</b>	<b>2,510</b>	<b>1,750</b>

**Note.**—No gage-height record Dec. 18 to Jan. 28; discharge estimated.  
b. Stage-discharge relation affected by ice; discharge estimated.

Year \_\_\_\_\_ Mean \_\_\_\_\_ 144  
Acres-Foot \_\_\_\_\_ 104,600

## 157. SULPHUR CREEK ABOVE RESERVOIR, NEAR EVANSTON, WYOMING

**Location.** — Lat 41°09', long 110°48' in SW¼ sec. 35, T. 14 N., R. 119 W., on right bank about 1¼ miles downstream from Willow Creek, 2 miles upstream from Sulphur Creek Dam, and 11½ miles south-east of Evanston.

**Drainage area.** — 64 sq mi, approximately.

**Records available.** — December 1957 to September 1960.

**Gage.** — Water-stage recorder. Altitude of gage is 7,170 ft (from river-profile map).

**Extremes.** — Maximum discharge during year, 499 cfs Mar. 26 (gage height, 4.88 ft); no flow Aug. 15 to Sept. 21.

1957-60: Maximum discharge, 560 cfs Apr. 18, 1958 (gage height, 5.07 ft), from rating curve extended above 100 cfs by logarithmic plotting; no flow at times each year.

**Remarks.** — Records good except those for periods of ice effect, which are fair.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.5	0.5			2.0	18	9.3	14	2.2	0.4	0
2	.4	.6	.5			2.0	17	8.0	16	2.0	.3	0
3	.4	.6	.5			2.0	27	10	15	2.0	.3	0
4	.4	.6	.4			2.0	35	16	15	1.7	.3	0
5	.4	.5	.3			5.0	37	24	15	1.0	.3	0
6	.4	.5	.4			8.0	39	21	16	1.0	.2	0
7	.5	.5	.5			8.0	28	12	24	1.2	.2	0
8	.4	.5	.4			8.0	28	11	42	1.4	.2	0
9	.5	.5	.4			8.0	20	15	25	1.4	.2	0
10	.5	.5	.5			6.0	16	22	28	1.4	.2	0
11	.5	.5	.6				12	29	17	1.0	.2	0
12	.4	.5	.5				12	37	13	.6	.2	0
13	.4	.5	.6				9.9	42	11	.6	.1	0
14	.4	.4					9.3	30	9.9	.6	.1	0
15	.4	.4		1.5	2	4.0	7.7	21	9.6	.5	0	0
16												
17	.4	.4					6.8	14	12	.4	0	0
18	.4	.4					6.8	15	9.6	.4	0	0
19	.5	.5					6.3	20	15	.4	0	0
19	.5	.5				16	7.4	26	11	.4	0	0
20	.5	.4				25	8.4	19	12	.4	0	0
21	.5	.4	.5			50	6.5	13	9.0	.4	0	0
22	.5	.5	.5			100	6.0	13	11	.4	0	.1
23	.5	.5	.5			100	8.4	16	9.9	.4	0	.1
24	.5	.6	.5			160	9.0	15	13	.4	0	.2
25	.5	.5	.5			150	10	12	9.3	.4	0	.2
26	.5	.5				208	12	13	7.7	.4	0	.2
27	.6	.4				208	19	17	5.2	.4	0	.2
28	.7	.5				81	21	21	3.5	.4	0	.2
29	.7	.4				39	17	18	2.6	.4	0	.2
30	.6	.5				35	15	18	2.2	.4	0	.2
31	.5					24	17	17		.4	0	0
Total	14.8	14.6	15.1	46.5	58	1,219	469.5	574.3	403.5	25.0	1.2	1.8
Mean	0.48	0.49	0.49	1.5	2	39.3	15.6	18.5	13.4	0.81	0.30	0.06
Ac-Ft	29	29	30	92	115	2,420	931	1,140	800	50	6.3	3.6

Note.—Stage-discharge relation affected by ice Dec. 14 to Mar. 25; discharge estimated.

Year Mean 7.77  
Acres-Foot 5,650

**159. SULPHUR CREEK BELOW RESERVOIR,  
NEAR EVANSTON, WYOMING**

**Location.** — Lat 41°09', long 110°49', in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 28, T. 14 N., R. 119 W., on left bank 6.3 miles upstream from mouth and 10 $\frac{1}{2}$  miles southeast of Evanston.

**Drainage area.** — 68 sq mi, approximately.

**Records available.** — March 1958 to September 1960.

**Gage.** — Water-stage recorder. Altitude of gage is 7,110 ft (from river-profile map).

**Extremes.** — Maximum discharge during year, 79 cfs June 9 (gage height, 2.77 ft); maximum gage height, 2.82 ft July 31; no flow Jan. 31 to Mar. 7, Mar. 9-29

1958-60: Maximum discharge, 164 cfs June 29, 1959, (gage height, 3.67 ft); no flow at times each year.

**Remarks.** — Records good. Flow regulated by Sulphur Creek reservoir (capacity, 4,600 acre-ft) completed December 1957.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	3.4	3.0	2.2		0	24	4.2	24	12	22	22
2	.2	3.4	3.0	2.2		0	31	4.4	26	12	13	24
3	.2	3.4	3.0	2.2		0	31	4.4	27	12	14	28
4	.1	3.4	3.0	2.2		0	31	4.4	26	12	14	27
5	.1	3.4	3.0	2.2		0	31	4.4	27	13	15	27
6	.1	3.4	3.0	2.2		0	31	4.4	27	15	16	19
7	.1	3.4	3.2	2.3		0.0	31	4.4	27	24	16	7.8
8	.1	3.4	3.2	2.2		0.2	31	5.4	4.5	40	17	8.1
9	.1	3.4	3.2	2.2		0.0	31	14	70	49	15	7.8
10	.1	3.4	3.2	2.2		0	31	14	22	48	13	7.8
11	.1	3.4	3.2	2.2		0	31	20	66	50	13	7.8
12	.5	3.4	3.2	2.2		0	31	35	57	52	12	7.8
13	3.4	3.4	3.2	2.2		0	31	30	48	54	13	5.4
14	3.4	3.2	3.2	2.2		0	31	51	20	60	13	3.2
15	3.4	3.5	2.5	2.2		0	31	51	20	61	16	4.4
16	3.2	3.4	2.0	2.2		0	19	50	17	58	19	5.7
17	3.2	3.4	2.0	2.3		0	10	24	10	57	18	5.7
18	3.2	3.4	2.0	2.3		0	7.2	8.1	10	56	16	6.0
19	3.2	3.0	2.2	2.3		0	4.4	8.1	10	48	16	5.7
20	3.2	3.0	2.2	2.3		0	4.7	8.1	10	40	15	5.7
21	3.2	3.0	2.2	2.3		0	4.4	8.1	10	47	15	6.0
22	3.2	3.0	2.2	2.2		0	4.4	5.7	12	60	11	6.0
23	3.4	3.0	2.2	1.8		0	4.2	4.0	18	66	6.5	6.2
24	3.4	3.0	2.2	1.2		0	4.4	4.0	18	66	6.2	6.2
25	3.4	3.2	2.5	0.8		0	4.4	2.7	18	66	5.4	6.2
26	3.2	3.0	2.3	0.5			4.4	4.0	18			
27	3.2	3.0	2.3	0.2		0	4.4	4.2	18	64	12	6.5
28	3.4	3.0	2.2	0.1		0	4.4	4.2	18	62	26	6.5
29	3.4	3.0	2.2	0.1		0	4.2	5.7	18	67	24	6.8
30	3.4	3.0	2.0	0.1		10	4.2	16	16	66	24	6.8
31	3.4		2.0	0		22		22		59	23	
Total	64.7	27.3	80.6	53.8	0	22.2	546.7	438.9	808	1,460	489.1	300.1
Mean	2.09	3.24	2.60	1.74	0	1.04	18.2	14.2	26.9	47.1	15.7	10.0
Ac-Ft	128	193	160	107	0	64	1,080	871	1,600	2,900	968	595

Year 11.9  
Acre-Feet 8,670

**195. CHAPMAN CANAL AT STATE LINE,  
NEAR EVANSTON, WYOMING**

**Location.** — Lat 41°24', long 111°02', in SE¼ sec. 36, T. 17 N., R. 121 W., on right bank at highway bridge, 6½ miles downstream from headgates and 10 miles northwest of Evanston.

**Records available.** — April 1942 to September 1960 (prior to October 1944 irrigation seasons only). Monthly discharge only for some periods, published in WSP 1314.

**Gage.** — Water-stage recorder. Altitude of gage is 6,570 ft (from river-profile map). Prior to Oct. 11, 1946, staff gage at same site and datum.

**Average discharge.** — 16 years (1944-1960), 17.7 cfs (12,810 acre-ft per year).

**Extremes.** — 1942-60: Maximum daily discharge observed, 129 cfs Apr. 14, 1946; no flow at times each year.

**Remarks.** — Records good except those for periods of ice effect, which are fair. Canal diverts water from Bear River in NW¼ sec. 36, T. 16 N., R. 121 W. Many diversions above station for irrigation in Wyoming. Flow at station is for storage in Neponset Reservoir, Utah, and irrigation in Saleratus basin, Utah.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	0.8	0.8			0	4.7	26	70	12		
2	60	.7	.8			0	3.2	26	78	6.0		
3	51	.6	.8			0	4.7	38	76	2.8		
4	58	.6	.6			0	31	40	76	.4		
5	56	.6	b.5			b1	53	43	78	.2		
6	65	.5	b.5			b 2	57	40	83	.5		
7	76	.6	b.5			b 4	58	37	62	.9		
8	95	1.1	b.5				56	38	76	4.5		
9	90	1.5	b.5				56	45	87	5.5		
10	91	.8	b.5				67	49	87	3.0		
11	100	.6	b0				68	82	75	1.8		
12	99	.6	b0				70	114	66	2.6		
13	98	.4	0			b 5	63	114	90	3.0		
14	96	.2	0				57	102	82	1.5		
15	95	.6	0				57	95	80	5.8		
16	91	b.6	0				55	97	81	12		
17	66	b.6	0				49	85	71	8.5		
18	65	.6	0				47	71	63	5.5		
19	65	.8	0			b 10	47	61	51	1.9		
20	66	.6	0			b 15	52	48	53	6.3		
21	48	.8	b 1.1			b 20	51	40	58	2.6		
22	1.9	b.8	1.2			b 25	83	38	46	3.0		
23	1.6	b.8	.2			b 30	81	57	38	14		
24	1.5	b.8	0			b 35	40	68	41	9.4		
25	2.2	b.8	0			b 35	39	49	30	9.4		
26	1.6	.7	0			b 30	38	49	20	8.8		
27	1.8	.5	0			b 35	37	52	22	11		
28	1.6	.8	0			b 20	39	68	22	14		
29	2.2	.8	0			20	39	64	22	1.4		
30	1.5	.9	0				8.5	37	63	.4		
31	.9		0				5.8	68	68	0		
Total	1,638.8	21.0	11.8	0	0	351.3	1,432.6	1,887	1,823	158.7	0	0
Mean	52.2	0.70	0.38	0	0	11.3	48.0	60.9	60.8	5.12	0	0
Ac-Ft	3,210	42	23	0	0	697	2,860	3,740	3,620	315	0	0

b. Stage-discharge relation affected by ice; discharge estimated.

Year \_\_\_\_\_ Mean \_\_\_\_\_ 20.0  
Acres-Foot \_\_\_\_\_ 14,510

## 205. BEAR RIVER NEAR WOODRUFF, UTAH

**Location.** — Lat  $41^{\circ}31'25''$ , long  $111^{\circ}01'00''$ , in SW  $\frac{1}{4}$  sec. 20, T. 18 N., R. 120 W., in Wyoming, on left bank 2.8 miles upstream from Wyoming-Utah State line and 7.6 miles east of Woodruff.

**Drainage area.** — 870 sq mi, approximately.

**Records available.** — April 1942 to September 1960.

**Gage.** — Water-stage recorder. Altitude of gage is 6,360 ft (from river-profile map).

**Average discharge.** — 18 years, 205 cfs (148,400 acre-ft per year).

**Extremes.** — Maximum discharge during year, 1,040 cfs May 14 (gage height, 3.45 ft); no flow Aug. 24 to Sept. 28.

1942-60: Maximum discharge, 3,010 cfs Apr. 28, 1952 (gage height, 5.32 ft); maximum gage height, 5.98 ft Mar. 21, 1951 (ice jam); no flow at times each year 1942-49, 1954-60.

**Remarks.** — Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 45,000 acres above station.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	113	43	25			245	203	354	16	3.4	0
2	24	113	43	25			206	189	455	13	4.7	0
3	22	111	42	25			196	192	666	11	5.1	0
4	24	111	37	25			199	213	784	9.8	4.2	0
5	24	90	36	30			209	234	830	7.2	3.0	0
6	24	100	38	33		60	234	234	738	6.8	2.5	0
7	24	108	40	37		95	256	209	712	6.8	2.5	0
8	26	103	40	40		115	249	223	731	6.8	2.5	0
9	33	98	38	44		150	234	283	851	5.1	2.0	0
10	30	98	37	45		185	242	391	817	3.8	2.0	0
11	37	96	35	45		185	253	497	596	3.4	2.0	0
12	51	89	35	45		220	245	666	497	4.2	1.5	0
13	41	89	33	45		163	238	878	424	3.2	1.5	0
14	39	74	33	45		163	183	1,032	424	3.0	1.5	0
15	35	64	31	45		160	177	900	391	2.5	1.0	0
16	30	64	28			190	161	757	359	2.5	1.0	0
17	33	65				220	149	653	316	2.0	1.0	0
18	36	68				250	121	590	299	2.0	.5	0
19	36	70				290	132	514	276	1.5	.5	0
20	35	70				340	144	420	253	1.5	.5	0
21	36	71				380	132					
22	80	72				450	196	337	213	1.0	.2	0
23	92	72				510	299	341	161	1.0	.2	0
24	98	72				590	350	350	126	1.0	.1	0
25	116	62				705	272	249	82	.5	0	0
26												
27	116	50				692	245	213	61	.5	0	0
28	121	54				810	234	196	52	.5	0	0
29	124	50				790	238	223	43	.2	0	0
30	146	47				465	245	213	28	.2	0	3.4
31	141	44				333	230	245	18	.2	0	3.4
31	124					283		320		.2	0	
<b>Total</b>	<b>1,826</b>	<b>2,388</b>	<b>1,014</b>	<b>1,199</b>	<b>1,425</b>	<b>9,078</b>	<b>6,514</b>	<b>12,242</b>	<b>11,673</b>	<b>117.9</b>	<b>43.4</b>	<b>6.8</b>
<b>Mean</b>	<b>58.9</b>	<b>79.6</b>	<b>32.7</b>	<b>38.7</b>	<b>49.1</b>	<b>291</b>	<b>217</b>	<b>395</b>	<b>389</b>	<b>3.80</b>	<b>1.40</b>	<b>0.23</b>
<b>Ac-Ft</b>	<b>3,620</b>	<b>4,740</b>	<b>2,010</b>	<b>2,380</b>	<b>2,830</b>	<b>18,010</b>	<b>12,920</b>	<b>24,280</b>	<b>23,150</b>	<b>234</b>	<b>86</b>	<b>13</b>

Note.—No gage-height record July 15-31, Aug. 6 to Sept. 28; Discharge estimated.  
 Stage-discharge relation affected by ice Nov. 5-9, Nov. 15 to Mar. 24;  
 Discharge estimated.

Year \_\_\_\_\_ Mean \_\_\_\_\_ 130  
 Acre-Foot \_\_\_\_\_ 24,270

## 285. BEAR RIVER BELOW PIXLEY DAM, NEAR COKEVILLE, WYOMING

**Location.** — Lat 41°56'20", long 110°59'05", in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 25, T. 23 N., R. 120 W., 800 ft downstream from Pixley Dam, 17.5 miles downstream from Twin Creek, and 11 miles south of Cokeville.

**Drainage area.** — 2,040 sq mi, approximately.

**Records available.** — October 1941 to November 1943 (published as Bear River near Cokeville), October 1952 to September 1956, May 1958 to September 1960 (irrigation seasons only). Monthly discharge only for some periods published in WSP 1814.

**Gage.** — Water-stage recorder. Altitude of gage is 6,185 ft (from river-profile map). Oct. 31, 1941, to Nov. 30, 1943, at site 200 ft downstream at different datum.

**Average discharge.** — 6 years (1941-43, 1952-56), 137 cfs (99,180 acre-ft per year).

**Extremes.** — Maximum discharge during period, 189 cfs July 2 (gage height, 3.49 ft); minimum daily recorded, 2.6 cfs June 23-27, June 29 to July 1.

1941-43, 1952-56, 1958-60: maximum daily discharge, 2,300 cfs Mar. 25, 1956; minimum daily recorded, that of June 23-27, June 29 to July 1, 1960.

**Remarks.** — Records good except those for period of no gage-height record, which are fair. Natural flow of stream affected by diversions for irrigation and return flow from irrigated areas. No diversion between station and Collett Creek Branch of Smiths Fork.

Discharge, in cubic feet per second, water year October to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								28	8.6	2.6	28	16
2								27	8.2	85	33	17
3								28	8.2	77	34	17
4								27	9.0	71	28	17
5								26	8.0	51	26	17
6								24	8.6	48	23	16
7								22	8.6	51	23	15
8								17	9.0	52	23	14
9								12	8.4	51	21	14
10								10	7.8	54	25	15
11								9.0	7.2	55	28	14
12								7.8	6.6	50	26	14
13								6.7	6.0	61	23	14
14								6.7	5.4	70	21	14
15								6.4	4.8	52	20	15
16								6.1	4.2	72	17	15
17								6.1	3.6	56	18	17
18								6.1	6.4	61	20	17
19								6.1	6.4	64	20	17
20								6.4	4.6	58	18	17
21								6.7	3.6	55	18	19
22								7.8	2.8	57	17	19
23								8.6	2.6	56	17	17
24								9.0	2.6	55	17	18
25								8.2	2.6	54	16	18
26								7.8	2.6	52	16	18
27								7.8	2.6	51	16	18
28								8.2	2.8	48	16	18
29								8.2	2.6	47	15	19
30								7.8	2.6	34	15	18
31								7.8		29	15	
Total								375.9	167.6	1,679.6	653	494
Mean								12.1	5.59	54.2	21.1	16.5
Ac-Ft								746	332	3,330	1,300	980

Note.—No gage-height record June 9-16; discharge estimated.

Year—1958—22.0  
Ac-Ft—6,690  
May 1 to Sept. 30

### 320. SMITHS FORK NEAR BORDER, WYOMING

**Location.** — Lat 42° 17', long 110° 52', in NW $\frac{1}{4}$  sec. 33, T. 27 N., R. 118 W., on left bank  $4\frac{1}{2}$  miles upstream from Howland Creek, 6 miles downstream from Hobbles Creek, and 12 miles northeast of Border.

**Drainage area.** — 165 sq. mi.

**Records available.** — May 1942 to September 1960.

**Gage.** — Water-stage recorder. Altitude of gage is 6,650 ft (from topographic map). Prior to Oct. 16, 1945, at site 0.8 mile downstream at different datum.

**Average discharge.** — 18 years, 193 cfs (139,700 acre-ft per year).

**Extremes.** — Maximum discharge during year, 710 cfs May 13 (gage height, 3.50 ft); minimum, 49 cfs Mar. 11, but may have been less during periods of ice effect.

1942-60: Maximum discharge, 1,500 cfs June 7, 1957 (gage height, 4.56 ft); minimum recorded, 35 cfs Mar. 21, 1955, result of freezeup.

**Remarks.** — Records good except those for periods of ice effect, which are fair. One diversion for irrigation of about 200 acres above station.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	101	89	78	64	60	52	74	199	467	232	142	99
2	101	89	78	64	60	56	71	209	485	225	133	99
3	101	89	76	56	64	60	73	250	522	222	130	99
4	101	91	72	54	58	64	83	254	522	219	124	99
5	99	89	68	56	60	64	101	261	527	216	121	96
6	99	90	72	58	64	64	133	298	508	209	119	94
7	105	91	74	60	68	64	169	318	489	209	117	97
8	101	88	74	62	72	64	181	353	471	209	115	96
9	103	88	74	61	70	60	232	403	458	202	113	94
10	103	88	74	60	66	62	276	458	476	196	115	94
11	99	85	74	60	69	58	254	532	445	196	115	94
12	103	88	76	60	64	62	250	599	437	193	113	93
13	101	82	78	60	60	60	222	662	420	184	117	91
14	97	78	74	60	58	60	229	399	415	181	113	91
15	96	81	70	60	62	62	190	562	432	178	115	91
16	94	82	68	60	64	68	172	517	407	169	121	89
17	94	82	72	56	64	65	153	503	403	166	119	93
18	93	82	74	54	60	59	156	485	386	166	113	91
19	93	82	74	52	58	58	158	441	370	164	109	89
20	91	86	74	58	58	59	150	420	357	158	101	88
21	89	83	74	58	62	60	187	420	337	158	97	89
22	91	82	76	60	62	60	250	432	318	156	99	94
23	105	83	74	62	58	64	276	424	306	153	109	91
24	103	83	76	64	55	66	219	420	295	150	103	88
25	99	83	78	62	58	70	196	420	283	145	101	85
26	97	80	70	60	56	73	184	403	272	142	99	83
27	96	73	66	62	53	80	187	420	264	140	99	85
28	94	76	64	60	53	85	199	407	254	137	99	85
29	93	76	66	60	53	80	184	420	239	135	99	85
30	91	76	66	60	79	79	184	432	236	133	97	83
31	89	83	66	60	76	76	184	441	235	135	96	83
<b>Total</b>	<b>3,022</b>	<b>2,515</b>	<b>2,250</b>	<b>1,837</b>	<b>1,773</b>	<b>2,018</b>	<b>5,395</b>	<b>12,962</b>	<b>11,821</b>	<b>5,478</b>	<b>3,463</b>	<b>2,743</b>
<b>Mean</b>	<b>97.5</b>	<b>83.8</b>	<b>72.6</b>	<b>59.3</b>	<b>61.1</b>	<b>65.1</b>	<b>180</b>	<b>418</b>	<b>394</b>	<b>177</b>	<b>112</b>	<b>91.4</b>
<b>Ac-Ft</b>	<b>5,990</b>	<b>4,990</b>	<b>4,460</b>	<b>3,640</b>	<b>3,520</b>	<b>4,000</b>	<b>10,700</b>	<b>25,710</b>	<b>23,450</b>	<b>10,870</b>	<b>6,870</b>	<b>5,440</b>

**Note.**—Stage-discharge relation affected by ice  
 Nov. 6, 14-18, Nov. 26 to Dec. 2, Dec. 4 to Feb. 8,  
 Feb. 12 to Mar. 8; Discharge estimated.

Year 151  
 Mean 109,600  
 Acra-Foot

### 395. BEAR RIVER AT BORDER, WYOMING

**Location.** — Lat 42°11', long 111°03', in NE¼NE¼, sec. 15, T. 14 S., R. 46 E, in Idaho, on left bank a quarter of a mile west of Wyoming-Idaho State line, half a mile west of Border, and 2.1 miles upstream from Thomas Fork.

**Drainage area.** — 2,490 sq mi, approximately.

**Records available.** — October 1937 to September 1960.

**Gage.** — Water-stage recorder. Datum of gage is 6,051.63 ft above mean sea level, unadjusted.

**Average discharge.** — 23 years, 396 cfs (286,700 acre-ft per year).

**Extremes.** — Maximum discharge during year, 1,410 cfs Mar. 26 (gage height, 5.17 ft); minimum, 72 cfs Sept. 7.

1937-60: Maximum discharge, 3,680 cfs May 11, 1952 (gage height, 8.89 ft); minimum daily, 30 cfs Aug. 18-22, 1940.

**Remarks.** — Records good except those for periods of ice effect, which are fair. Diversions for irrigation of about 124,000 acres above station.

Discharge, in cubic feet per second, water year October 1939 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	212	245	210	140	165	150	872	336	294	224	124	83
2	208	253	210	140	170	150	781	345	345	207	132	82
3	203	255	210	140	155	150	711	374	336	244	130	78
4	205	261	205	130	160	150	690	405	372	240	129	80
5	201	230	200	140	155	155	694	400	360	230	124	80
6	195	185	200	140	120	160	733	408	350	266	119	77
7	197	244	200	145	150	165	779	419	348	242	116	75
8	199	246	205	150	150	170	736	438	340	234	114	75
9	199	246	205	155	150	185	743	464	340	230	110	78
10	203	251	190	155	160	200	769	472	345	220	110	80
11	195	246	190	160	165	220	729	505	362	232	110	78
12	195	260	190	160	170	225	669	567	333	230	111	80
13	199	250	190	165	170	250	616	632	343	226	105	78
14	201	220	180	165	165	280	499	652	357	224	106	78
15	197	190	170	165	165	300	427	577	355	208	106	89
16	199	230	165	165	165	330	377	481	338	191	110	88
17	199	220	160	165	165	305	348	441	321	188	113	95
18	199	230	165	165	165	275	310	416	340	175	113	101
19	199	235	170	155	165	270	288	411	348	176	111	104
20	234	220	170	150	165	290	283	382	350	169	110	102
21	212	225	180	150	165	380	288	355	343	166	106	98
22	201	230	170	155	165	500	321	350	326	166	104	98
23	203	240	190	155	165	630	360	352	301	164	108	104
24	214	250	180	160	165	800	387	326	283	160	113	102
25	214	250	180	165	160	932	357	331	272	157	113	99
26	210	235	180	165	150	1,280	333	314	255	149	106	99
27	218	210	175	165	150	1,220	312	310	248	134	104	101
28	228	210	160	160	150	1,230	331	322	234	146	99	102
29	232	208	140	160	150	1,160	355	294	228	139	96	99
30	238	210	140	160		1,100	340	296	228	134	95	93
31	244		140	160		1,020		227		116	82	
<b>Total</b>	<b>6,453</b>	<b>6,986</b>	<b>5,620</b>	<b>4,895</b>	<b>4,655</b>	<b>14,632</b>	<b>15,418</b>	<b>12,652</b>	<b>9,595</b>	<b>5,997</b>	<b>3,436</b>	<b>2,676</b>
<b>Mean</b>	<b>208</b>	<b>232</b>	<b>181</b>	<b>155</b>	<b>161</b>	<b>472</b>	<b>314</b>	<b>408</b>	<b>320</b>	<b>193</b>	<b>111</b>	<b>89.2</b>
<b>Ac-Ft</b>	<b>12,800</b>	<b>13,860</b>	<b>11,150</b>	<b>9,530</b>	<b>9,230</b>	<b>29,020</b>	<b>30,580</b>	<b>25,090</b>	<b>19,030</b>	<b>11,890</b>	<b>6,820</b>	<b>5,310</b>

Note.—Stage-discharge relation affected by ice Nov. 5-6, Nov. 12 to Mar. 24; discharge estimated.

Year Mean  
Acres-Ft 184,300

## 460. RAINBOW INLET CANAL NEAR DINGLE, IDAHO

**Location.** — Lat 42°13'00", long 111°17'30", in SE¼ sec. 3, T. 14 S., R. 44 E., on left bank 1½ miles west of Dingle and 1¼ downstream from headworks at Stewart Dam.

**Records available.** — October 1945 to September 1960 in reports of Geological Survey. January 1922 to September 1945 in files of Salt Lake City district office, Geological Survey.

**Gage.** — Water-stage recorder. Altitude of gage is 5,950 ft (from topographic map).

**Average discharge.** — 38 years, 299 cfs (216,500 acre-ft per year).

**Extremes.** — Maximum discharge during year, 1,770 cfs Mar. 27 (gage height, 5.48 ft); minimum daily, 11 cfs Sept. 5, 6. 1945-60: Maximum discharge, 4,180 cfs May 7, 1952 (gage height, 8.62 ft); minimum daily, 6.5 cfs Sept. 24, 1956.

**Cooperation.** — Records collected by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	230	231	185	95	120	120	1,040	420	19	22	75	12
2	208	231	188	97	124	124	882	420	19	22	64	12
3	205	240	185	100	128	122	904	452	20	21	63	12
4	201	243	180	103	125	118	784	469	20	20	60	12
5	201	240	175	100	125	120	777	501	21	20	49	11
6	201	188	165	99	123	128	815	472	22	19	44	11
7	199	214	149	107	122	135	878	478	22	19	44	12
8	196	219	145	106	120	139	910	491	22	19	41	13
9	196	236	137	113	113	143	866	507	21	19	40	12
10	192	228	137	113	128	168	866	488	21	20	40	12
11	194	231	139	116	131	203	894	441	22	64	44	13
12	188	231	140	118	132	177	839	447	23	80	40	13
13	185	233	145	123	130	194	773	444	23	95	34	13
14	185	221	144	128	127	219	715	429	24	35	27	12
15	190	170	135	130	124	270	610	423	24	88	28	12
16	183	159	131	125	122	298	530	365	24	82	33	12
17	190	196	118	125	129	280	478	270	24	72	34	12
18	194	185	128	120	132	268	435	236	24	68	34	12
19	194	188	133	110	128	275	402	185	25	64	36	11
20	192	196	133	100	128	270	371	157	25	57	34	13
21	236	192	130	104	129	296	354	135	25	58	35	15
22	214	212	126	111	128	360	379	120	23	56	46	15
23	199	224	126	113	127	482	382	85	22	45	50	15
24	210	226	130	122	126	646	453	24	21	42	49	21
25	208	221	130	120	125	827	466	21	21	42	45	24
26												
27	210	185	134	118	124	955	444	19	22	46	42	24
28	210	192	130	122	123	1,260	408	19	22	50	19	25
29	221	179	108	122	122	1,260	402	19	23	51	17	26
30	219	179	100	122	121	1,260	420	19	22	58	15	22
31	221	181	90	122		1,180	438	19	22	72	14	27
			90	122		1,120		19		74	13	
Total	6,273	6,271	4,286	3,534	3,638	13,497	18,816	8,574	668	1,570	1,209	461
Mean	202	209	138	114	125	435	627	277	22.3	50.6	39.0	15.4
Ac-ft	12,440	12,440	8,600	7,010	7,220	26,770	37,320	17,010	1,320	3,110	2,400	914

Year                      Mean                      188  
Acre-Feet                136,500

## 165. BEAR RIVER BELOW STEWART DAM, NEAR MONTPELIER, IDAHO

**Location.** — Lat 42°15'30", long 111°17'30", in NE¼ sec. 34, T. 13 S., R. 44 E., on right bank 300 ft downstream from Stewart Dam and 4½ miles south of Montpelier.

**Records available.** — October 1945 to September 1960 in reports of Geological Survey. January 1922 to September 1945 in files of Salt Lake district office, Geological Survey.

**Gage.** — Water-stage recorder. Altitude of gage is 5,950 ft (from topographic map).

**Average discharge.** — 38 years, 64.0 cfs (46,330 acre-ft per year).

**Extremes.** — Maximum daily discharge during year, 21 cfs several days; minimum daily, 0.7 cfs Oct. 28.  
1922-60: Maximum daily discharge, 3,050 cfs June 3, 1923; no flow July 15, 1956.

**Cooperation.** — Records collected by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	1.9	2.8	8.9	8.9	6.2	2.4	4.7	6.6	9.8	20	15
2	12	2.3	9.8	8.5	8.9	5.8	8.1	4.7	6.6	9.4	20	14
3	12	2.3	9.8	8.5	8.9	6.2	7.0	4.7	7.3	8.5	20	13
4	12	4.0	7.7	8.5	7.3	6.6	7.0	4.7	7.3	8.1	20	11
5	12	5.4	8.1	7.3	7.3	6.6	7.0	5.1	7.7	8.5	20	11
6	13	2.9	8.1	7.3	7.7	7.7	7.0	4.7	8.5	8.1	21	9.8
7	13	7.3	7.3	7.3	7.3	8.1	7.3	4.7	9.4	8.5	20	9.4
8	13	11	6.6	7.7	7.7	8.5	7.7	5.1	8.9	8.5	20	8.9
9	12	11	6.6	8.5	8.5	10	7.3	5.4	8.9	8.5	20	9.4
10	12	11	7.0	8.9	8.9	11	7.7	8.5	8.9	16	21	9.4
11	12	11	5.8	9.8	8.9	11	8.1	13	9.8	17	21	8.9
12	11	11	5.2	9.8	8.5	11	8.1	13	10	17	21	8.9
13	11	11	4.7	9.8	8.5	12	7.3	12	9.8	16	20	8.5
14	11	7.3	4.7	9.4	8.5	13	7.3	13	9.8	17	20	8.5
15	12	5.8	4.7	8.5	8.5	14	7.0	12	11	17	19	8.1
16	12	6.6	4.7	8.5	8.5	13	6.6	12	11	17	20	8.1
17	12	8.5	3.3	10	8.5	13	6.2	11	11	17	20	8.1
18	13	8.9	4.0	11	8.1	13	5.8	11	20	27	21	8.5
19	13	10	4.3	11	8.5	11	5.4	12	11	18	21	9.4
20	13	9.8	4.3	11	8.9	11	5.1	16	11	17	21	9.8
21	13	9.8	4.0	11	8.5	11	4.7	15	12	18	21	11
22	13	11	4.0	10	8.9	9.8	4.3	14	12	20	21	14
23	13	11	4.0	9.4	8.1	14	4.7	14	11	19	20	14
24	13	11	4.3	8.5	10	11	4.7	16	10	18	21	12
25	13	11	5.8	9.8	8.5	9.8	5.1	15	9.4	18	20	9.4
26	13	6.6	5.4	9.4	8.1	15	5.1	8.5	8.5	19	21	8.9
27	13	8.1	8.1	8.9	8.9	17	5.4	4.7	7.7	19	20	7.0
28	13	7.3	9.8	8.9	7.0	12	5.1	4.7	7.7	20	19	7.3
29	13	8.5	9.8	8.9	7.7	11	5.1	6.6	9.8	20	18	7.0
30	13	10	9.8	9.4	11	11	5.1	6.6	11	20	17	7.0
31	13	1.2	9.4	2.4	11	11	11	6.6	11	21	16	11
Total	332.3	243.3	201.9	283.8	242.5	338.3	191.7	288.6	283.6	475.9	620	295.3
Mean	10.7	8.11	6.51	9.15	8.36	10.9	6.39	9.31	9.45	15.4	20.0	9.84
Ac-Ft	659	483	400	563	481	671	380	572	563	944	1,230	586

Year \_\_\_\_\_ Mean \_\_\_\_\_ 10.4  
Acres-Ft \_\_\_\_\_ 2,530

555. BEAR LAKE AT LIFTON, NEAR ST. CHARLES, IDAHO

Location. — Lat 42°07'20", long 111°19'20", in NE¼ sec. 16, T. 15 S., R. 44 E., in Lifton pumping plant of Utah Power & Light Co., 3½ miles east of St. Charles.

Records available. — October 1903 to June 1906 (gage heights only), October 1945 to September 1960. January 1921 to September 1945 (elevations only) in files of Salt Lake district office, Geological Survey. Published as Bear Lake at Fish Haven 1903-6.

Gage. — Water-stage recorder. Datum of gage is 5,900 ft above mean sea level, unadjusted (levels by Utah Power & Light Co.). October 1903 to June 1906 staff gage at different site and datum.

Extremes. — Maximum contents during year, 1,061,100 acre-ft May 16-24 (gage height, 18.51 ft; minimum, 771,400 acre-ft Sept. 30 (gage height, 14.80 ft).

1921-60: Maximum contents, 1,423,000 acre-ft June 10, 1923 gage height, 23.68 ft; no usable contents Nov. 9-19, 1935 (gage height, 2.00 ft, lower limit of pumps).

Cooperation. — Gage heights furnished by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project. Contents computed by Geological Survey from capacity table based on data furnished by Utah Power & Light Co.

Contents in thousands of acre-feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	907.1	911.1	914.5	917.3	928.2	955.5	995.4	1,039.6	1,046.6	980.3	900.2	804.2
2	907.1	911.1	915.2	917.3	929.6	956.9	998.2	1,041.0	1,041.8	978.2	897.5	802.9
3	907.1	911.8	915.2	917.3	930.3	957.6	1,001.0	1,043.8	1,041.0	975.4	894.7	801.6
4	907.1	911.8	915.2	917.9	931.0	957.6	1,004.4	1,045.2	1,038.2	972.7	891.3	800.9
5	906.4	912.8	915.9	917.9	931.6	958.3	1,007.9	1,046.6	1,035.5	970.0	888.6	800.2
6	906.4	911.8	915.9	917.9	932.3	959.7	1,009.9	1,048.7	1,032.7	967.2	885.9	799.6
7	905.7	911.8	915.9	917.9	932.3	960.4	1,012.7	1,050.0	1,029.9	965.8	883.2	798.2
8	905.0	912.5	915.9	918.6	933.0	961.7	1,014.8	1,051.4	1,027.2	962.4	879.8	796.9
9	905.0	912.5	916.6	918.6	933.0	962.4	1,016.8	1,052.8	1,024.4	960.4	876.4	796.2
10	905.0	912.5	916.6	918.6	933.7	963.1	1,018.9	1,054.2	1,022.4	957.6	873.0	794.9
11	905.0	912.5	916.6	918.6	934.4	963.1	1,021.0	1,054.9	1,020.3	954.9	869.6	793.5
12	905.0	912.5	916.6	918.6	935.7	963.8	1,021.7	1,056.3	1,018.9	954.2	866.2	792.2
13	904.3	912.5	916.6	918.6	937.1	963.8	1,023.0	1,057.6	1,017.5	952.1	862.8	790.8
14	904.3	912.5	916.6	918.6	937.8	964.5	1,023.7	1,059.0	1,016.1	949.4	860.0	789.5
15	904.3	913.2	916.6	919.3	939.1	965.2	1,025.1	1,059.7	1,014.8	947.3	856.6	788.2
16	904.3	913.2	916.6	919.3	939.8	965.8	1,025.8	1,060.1	1,013.4	945.3	853.9	786.8
17	904.3	913.2	916.6	919.3	941.2	967.2	1,027.2	1,061.1	1,012.0	942.5	850.5	785.5
18	904.3	913.2	916.6	919.3	941.8	967.8	1,027.9	1,061.1	1,010.6	940.5	846.5	784.8
19	905.0	913.9	916.6	919.3	943.2	969.2	1,028.6	1,061.1	1,009.2	937.8	842.4	784.2
20	905.0	913.9	916.6	919.3	943.9	970.0	1,028.6	1,061.1	1,007.9	935.0	839.1	782.8
21	905.7	913.9	916.6	919.3	944.6	971.3	1,029.2	1,061.1	1,005.8	931.6	835.1	781.5
22	906.4	914.5	916.6	920.0	946.0	972.7	1,029.2	1,061.1	1,003.7	928.9	831.7	780.8
23	907.1	914.5	916.6	920.7	947.3	974.0	1,029.2	1,061.1	1,001.6	926.2	829.7	779.5
24	908.4	914.5	916.6	921.3	948.0	976.1	1,030.6	1,061.1	999.6	922.7	827.7	778.1
25	909.1	914.5	916.6	922.0	949.4	978.9	1,032.0	1,060.4	996.8	920.0	824.4	777.4
26	909.8	914.5	916.6	922.0	950.8	981.6	1,032.7	1,059.7	994.1	917.3	821.0	776.1
27	909.8	914.5	916.6	922.7	952.1	982.3	1,034.1	1,059.0	991.3	913.9	817.6	774.8
28	910.5	914.5	916.6	924.1	952.8	985.8	1,035.5	1,057.6	988.5	911.1	815.0	774.1
29	910.5	914.5	916.6	924.8	954.2	987.2	1,036.8	1,055.6	985.8	908.5	812.3	772.8
30	911.1	914.5	916.6	924.8	954.2	987.2	1,038.2	1,052.8	983.0	905.7	809.6	771.4
31	911.1	914.5	917.3	927.5	954.0	987.0	1,038.2	1,050.0	981.0	903.0	806.9	
Total												
Mean												
Ac-Ft												

Year Mean  
Acres-Ft



## 1180. BEAR RIVER NEAR COLLINSTON, UTAH

**Location.** — Lat 41°50', long 112°03', in NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 27, T. 13 N., R. 2 W., on right bank 800 ft downstream from Cutler plant of Utah Power & Light Co., 2,000 ft downstream from Cutler Dam, and 5 $\frac{1}{2}$  miles north of Collinston.

**Drainage area.** — 6,000 sq mi, approximately.

**Records available.** — July 1889 to September 1960.

**Gage.** — Water-stage recorder. Datum of gage is 4,276.13 ft above mean sea level (levels by Bureau of Reclamation). Prior to Nov. 8, 1913, staff gage and Nov. 8, 1913, to Sept. 19, 1938, water-stage recorder, at site three-quarters of a mile downstream at different datums.

**Extremes.** — Maximum discharge during year, 3,780 cfs Jan. 22 or 23 (gage height, 4.75 ft); minimum daily, 16 cfs July 14-18, 20-25.

1889-1960: Maximum discharge observed, 11,600 cfs June 7-10, 1909 (gage height, 7.70 ft, site and datum then in use); practically no flow at 12 p.m. Aug. 5, 1920.

**Remarks.** — Records excellent. Natural flow of stream affected by storage reservoirs, power developments, diversions for irrigation, and return flow from irrigated areas.

**Cooperation.** — Nine discharge measurements furnished by Utah Power & Light Co.

**Revisions. (water years).** — WSP 1564: 1902.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	764	715	725	598	892	1,290	2,320	2,020	21	22	20	23
2	1,230	741	757	824	871	1,390	2,260	1,850	21	20	19	23
3	566	737	800	749	852	1,420	2,240	1,580	21	20	19	23
4	1,010	762	819	1,000	881	1,620	2,110	1,110	21	20	18	23
5	296	708	604	514	851	1,780	1,970	1,210	22	21	20	24
6	506	712	616	570	884	2,250	1,960	1,640	22	21	21	23
7	1,150	747	702	848	876	2,100	2,280	1,340	23	21	24	24
8	880	935	711	760	992	2,090	2,400	1,450	23	21	23	24
9	846	803	734	745	1,330	2,660	2,510	1,400	23	22	22	24
10	605	526	859	932	1,210	2,570	2,450	1,600	23	24	22	25
11	748	698	954	959	1,450	2,330	2,660	1,620	24	21	22	25
12	994	694	799	1,190	1,520	1,690	1,960	1,340	24	21	22	24
13	869	814	1,020	1,040	1,420	1,570	2,250	1,290	24	17	23	24
14	793	586	823	952	1,040	1,950	2,030	1,380	24	16	23	25
15	675	704	600	793	937	1,220	2,110	1,180	24	15	23	25
16	936	935	741	886	778	1,330	1,930	689	23	16	25	24
17	743	789	774	778	837	1,250	1,910	682	22	16	30	23
18	715	749	728	727	1,030	1,070	1,650	481	22	16	25	23
19	656	850	686	656	817	1,290	1,650	344	22	17	25	23
20	780	629	842	690	813	1,300	1,480	101	22	16	25	267
21	612	709	884	655	704	1,740	1,300	20	22	16	24	21
22	798	1,070	681	1,000	825	827	1,410	20	23	16	25	22
23	691	812	865	974	874	1,760	1,430	23	23	16	25	24
24	677	581	814	407	838	2,000	1,530	20	23	16	26	23
25	697	745	915	1,030	687	2,070	1,700	20	22	16	25	23
26	1,000	769	942	956	810	2,110	1,860	20	22	17	26	23
27	537	828	833	949	884	2,220	1,960	43	23	17	26	260
28	734	946	956	922	222	2,020	1,720	20	22	17	25	20
29	791	743	869	976	1,100	2,450	1,720	20	22	19	26	22
30	695	713	373	376		2,430	2,010	20	22	18	24	23
31	835	328	918			2,330		20	22	18	23	
Total	23,829	22,720	23,904	25,974	27,262	56,217	58,770	24,444	675	570	726	2,180
Mean	769	727	771	838	840	1,811	1,928	789	22.5	18.4	23.4	72.7
Ac-Ft	47,260	45,060	47,410	51,520	54,070	111,500	116,600	48,480	1,340	1,130	1,440	4,320

Year \_\_\_\_\_ Mean \_\_\_\_\_ 730  
Ac-Ft \_\_\_\_\_ 530,100