THIRD ANNUAL REPORT

BEAR RIVER

1960



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

LOGAN, UTAH

March 18, 1961



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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

Е,	о.	Larson	Salt	Lal	ke i	City,	Utah	1
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COMMITTEES

Budget

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

Operations

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

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)

	Fiscal Year	Fiscal Year	Total Biennìum
Compact Administration	Ending 6-30-1960	Ending 6-30-1961	Ending 6-30-1961
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	\$10,750	\$11,050	\$21,800
Stream-Gaging Program			
Geological Survey	29,500	30,100	59,600
Totals	\$40,250	\$41,150	\$81,400
ALLOCATION O)F BUDGI	ET	
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	\$40,250	\$41,150	\$81,400

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. Records 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. Irrigationseason 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

Anonaa

	1943-60	1959	1960
Upper Bear River		100,500	82,800
Smiths Fork		73,400	72,300
Total		173,900	155,100
Ru	noff in Acre-feet Water Year		
	Average 1943-60	1959	1960
Upper Bear River		118,900	108,300
Smiths Fork		105,300	109,600
Total		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	Beginning of	End of	End of
Year	Water Year	Storage Period	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 peripherial 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 directflow 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	9.3	percent
Lower	Utah Section Diversions	10.5	percent
Lower	Wyoming Section Diversions	9.6	percent

Hydrographs of divertible flow and diversions in the Upper Divison 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	
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 declaraton 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 distibution 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:

Canacity

Reservoir

		~
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 acrefeet). 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.







CENTRAL DIVISION - SMITHS FORK SUPPLY



8EAR LAKE ~ 1959



PLATE 4

UPPER DIVISION - DIVERSION

CUBIC FEET PER SECOND









CENTRAL DIVISION - IDAHO SECTION CUBIC FEET PER SECOND

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PLATE 8

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REAN CROCKETT CANAL	44	42	1.2	44	45	15	45	46	42	48	49	50	50	1.8	52	151	54	- 5	54	- 2	<u>8</u>	1.32	53	52	51	50	49	1.2	42	27		1,459	1
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LARCOCO KENT CANAL	12	122-		12-	12	-13	12	12	1,12_	111	12	-12-	- 23	123	14	14	13	22	16	19	39	17	15	11	23	12	1-12	12	1 32	1.3	1	40)	1
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BAINED INIST CANAL (IRAR L.)	- 2	19	20	20	21	22	22	22	127	21	22	23	2)	23	- 25	-24-			25	- 23	- 25	29_	22	- 21	21	22	22	23	21	22	4	659	1
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REVERTIBLE MAN IN DIVISION	757	1789	837	846	861	1860	854	1860	851	1859	915	915	893	697	505	1889	878	572	892	880	863	852	604	.25?	. 730	692	661	656	628	624		24,672]
TEAHO ALLOCATION (521)	431	450	427	492	491	490	487	1692_	4.22	502		1322	509	1		507	300	497	528	502	492	486	458	434	416	394	377	774	359	265	1		1
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TABLE 2

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SNTUER ROCKY PODAT	9	2	9 8	9 7	3	- 9	3	<u>8</u> 6	8 12	9 12	9 4	2	6	5	2		1	- <u>i</u>	4		Ť	5	5	5	5		5		4	1		199	
TRUETARY CANALS	- 93	. 42	- 49	45	- 42	ι			- 29	35	25	42	62	-75	60	48	49	42	33	- 35	39	40	39	39_	37	37	23	23	23	22	22	1,221	
PINE CREEK ABOVE DIVERSIONS GRADE CREEK CAMAL	18 4	18	-18	18 4	18	18	18	17	17	18	18	1	18	28 3	20	18	18	18	18	38	18	18	18	18	18	18	1-17	17	17	1.2	10	332	
DIANOND PAC 11 (BRUNER CR.) HAGGERTY WEST (PIKT CREEK)	0	5		5	1	1-1	5	1	6	6	6	6	6	6	8	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	C 0		1
SUBLETTS CR. AS INCHP. RCR.		2	3	- ?		i2.	2	2	- 2	2	2	<u> </u>	2	2	2	2	-2	2	2	2	2	5	2	2	2	2	2	2	2	2	2]
CUTIN - SOURNE BUTTOS - FLAT	<u>.</u> ų		10	10	10	10		- 8	- 2	- 8	8 - 2	8	8	- 2	8	8	8	8	- 9	8	?-	- 7	2	Ţ					Ţ.		-3	- 231	1
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COVET CASAL FROM SPRING CR. TANNER, RUNT & GARRETT		5	-5	- 5	13	5	5		4		4	,		4	-4	4	4	4	4	4	4	4	4	4	4	4	<u>i</u> 4		4	5		132 121	1
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FORCEON (COLLETT CREEK) STORER-NTCROLS (SO. BRANCH)		2	ž	2	2	2	2	2	2	2	2		2	2	2	- 2			1	2			2	- 2	2		2	2		2	2	31 61	
COCONTLE WATER (SO, BE.)					1		2	2		1	- ŝ	<u> </u>		1		- Ť	1	3	2	2	1	1	2	2	2 	2	2	2	2	<u> </u>	4	118	
SWITHS FORK CLIMAL (SO. BR.)		į	1-2	13	12	Ę	1	12	1	2	2		2		2	2	2	- 2		1	1	1	1		1	-4	1	2	- 4	2	2	<u></u>	ļ
SO, DR. #1 (SHITES FORT)	-15	16	n	12	12	12	2	12	n	. 11	10	10	10	Į į		8	-8	8	2	- 2	<u> </u>	- 2	8	- 8	. 8	9	- 9	- 2	3	<u> </u>	. 9	<u></u>	
TOTAL WYONDIG DIVERSIONS	299	295	305.	-39%.	294	290	283	281	287	-269	248	264	259	272	256	290	336	232	212	208.	206	211	-209	205.	188	197	125	190	187	185	187	2.35?	1
HTLLER DITCH	17	<u>5</u> 18	4	4	4	21	4	4	19	5	38	5	12	3	16	4	4	4	4	4		. 3	Ţ			ÿ	1	1.3	- 2	12	2	129	
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LOYD DITCH DINGLE INRIGATION CANAL	28	28	28	29	1	2		- 2	77		- 35	35	16	38	1	2	30	30	29	2 30	2	2 39	19	38	1 39	- 19	10	2	2	l i	-10	127	1
BLACK OTTER CARAL PRESTON KONTPULSER CANAL	- 8	1 š	62	-22	G 1	i iii		77	72	69	-57	1	40	39	27	1	譡	- 44 - 34 - 31	12	- 22	10	- 20	20	30	33	22	20	12	23	24	28	1,194	1
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VAINEW INLET CANAL (BEAR L.)	-456	22	22	22	22	19	19	197	28	68	63	65	\$7	-552	68	1 XiL	74	63	-184	52	186	- 192	193	- 191	191	185	172	151	144	144	20	7.093	
BEAR RIVER BELOW STEWART DAM	9	0	. B	B	8	- ÷	8	8	- 8	16	32	12	37	17	22	12	17	12	18	17_	28	19		18	18_	19	19	20	20	- 20	21	472	
TAND DIVERTIBLE (COMPACT)	202	225	328	202	157 294	1.351 220 213	281	281	351	333	317 240	264	250	232	- 32B - 255	312.	285	275	267	263	206	267	256	251	251 199	246	241	226	224	236	231 187	9.128	
TORING ALLOCATION (47%)	262	262	272	283	***	276	280	282	364	259	243	247 328	.259	262	331	232 237 315	224	215	206	203	201	336	200	196	. 193 255	190	-179	. 179	177	420 181 230	180	2.152	
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TABLE 3

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TABLE 4

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IR RIVER BELOW STEWART DAM	15	15	13	11	1-11		10	9	9	9		1	18	8	6	3	ů.	1-2		20	11	14	34	22	2	9	2	JZ	2	2		
			+	<u> </u>	+	+		f			{ · · · ·	-	1	+	<u> </u>			+	t			I	+	+				<u> </u>	+·	ł	<u> </u>	
BO DIVERTIBLE (COMPACT)	154	149	.139	134	132	125	122	124	125	126.	127	131	122	128	128	128	134	39	131	146	156	162	262	166	160	160	149	133	158	159		4,236
MING DIVERSION (COMPACT)	. 136	236	116	_ ورد	1.125	تتبل	126	119	115	1.224	112	1.113	1.112	201	1-32-	56	- 57	1 95	98	96	. 95		104	105	- 97	81	1 81	89	93	108	1	1.245
MING ALLOCATION (4781	125	127	128	127	114	1 m	愤	104	103	103	103	105	104	98	1 97		6	1101	98	104	108	110	114	117	- m	10	1-1-20	102	208	+ 207		1.212
	165	162	1 3 52	1335	1 152	1242	111	139	132	132	115	132	132	132	128	325	132	1 134	1.11	128	143	146	152	194	146	139	135	1 225	1 141	1 152	t	4.264

APPENDIX A

Lincoln G. Kelly and Company Certified Public Accountants

Suite 608 WALKER BANK BUILDING TELEPHONE DAVIS 8-0141 Salt Lake City II, Utah

October 19, 1960

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

REPARTENTED IN THE PRINCIPAL CITIES OF THE UNITED STATES, CAMADA, CUEA AND BY CORRESPONDENTS ABROAD

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.

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.

ours very truly,

Exhibit A

BEAR RIVER COMMISSION

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

	Budget <u>Estimates</u>	Amount Realized or <u>Expended</u>	Balance or <u>Deficit (~)</u>
CASH REVENUES: Balance funds on hand at July I, 1959	\$ 7,260.00	\$ 7,260.00	
State of Utah State of Idaho	8,500.00 8,500.00 <u>8,500.00</u> 32,760.00	8,500,00 8,500,00 <u>8,500,00</u> 32,760,00	•••••• ••••••
<u>NON-CASH REVENUES:</u> United States Geological Survey	14,750.00	_14,665.00	85.00-
Total funds available	47,510.00	47, 425.00	85.00-
APPROPRIATION ACCOUNTS: Stream gauging Personal services Travel and subsistence General office expense Printingannual report Transcript of minutes Washington office service charge Fiscal charge Miscellaneous Accounts payable at July 1, 1959 Unappropriated at July 1, 1959	$\begin{array}{c} 29,500.00\\ 6,300.00\\ 1,200.00\\ 610.00\\ 700.00\\ 400.00\\ 150.00\\ 690.00\\ 400.00\\ 300.00\\ 40,250.00\\ 6,218.00\\ 46,468.00\\ 1.042.00\\ 47,510.00\\ \end{array}$	$\begin{array}{c} 29, 330, 00\\ 6, 300, 00\\ 1, 200, 00\\ 530, 00\\ 385, 00\\ 250, 00\\ 70, 00\\ 690, 00\\ 346, 00\\ 100, 00\\ 39, 201, 00\\ 6, 218, 00\\ 45, 419, 00\\ \hline\end{array}$	170.00
BALANCE	<u>\$</u>	<u>\$ 2,006.00</u>	<u>\$2,006.00</u>
FUNDS ON HAND AT JUNE 30, 1960: Cash on deposit		<u>\$ 2,006.00</u>	<u>\$2,006.00</u>

Exhibit B

BEAR RIVER COMMISSION

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

		Stream -Ga	uging Prog	ram	
	Allocable Expenditure	U. S. Geolo- gical Survey <u>50%</u>	Bear River Comm. 50%	Non- allocable Direct <u>Admn.</u>	Total Expense to Bear River <u>Commission</u>
Personal services	\$21,192.00	\$10,596.00	\$10,596.0	0 \$6, 300.00	\$16,896.00
Travel and subsistence	2,478.00	1,239.00	1,239.0	0 1,200.00	2,439.00
General office expense	2,406.00	1,203.00	1,203.0	510.00	1,713.00
Fiscal charges	1,009.00	504.50	504.5	346.00	850.50
Washington office charge	2,213.00	1,106.50	1,106.5	690.00	1,796.50
Miscellaneous	32.00	16.00	16.0	0 100.00	116.00
	<u>\$29,330.00</u>	<u>\$14,665.00</u>	<u>\$14,665.0</u>	<u>\$9,146.00</u>	<u>\$23,811.00</u>

Schedule A-1

BEAR RIVER COMMISSION

Statement of Revenue and Expenditures for the Fiscal Year Ended June 30, 1960

REVENUE: State of Wyoming State of Utah State of Idaho		\$ 8,500.00 8,500.00 <u>8,500.00</u> 25,500.00
EXPENDITURES note 1: Stream gauging	\$14,665.00 6,300.00 1,200.00 530.00 385.00 250.00 70.00 690.00 346.00 100.00	24, 536, 00
REVENUE OVER EXPENDITURES FOR THE FISCAL YEAR ENDED JUNE 30, 1960		<u>\$ 964.00</u>
NOTE 1: Expenditures, as above, consisted of: Stream-gauging program exhibit B Additional general office expense postage Printing annual report Treasurer's bond Audit of accounts Transcripts of the minutes of the Commission's meetings	\$23,811,00 20.00 385.00 50.00 200.00 <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-footdays 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 SE14 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 (133,900 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.

Day	Qet.	Ner.	Dec.	jen,	Føb.	Mor.	Арг.	May	June	July	Aug.	Sept.
1 2 3 4 5	58 58 53 58 56 54	92 90 88 82 68	ъ 38 538 539 539 539 530 530 530 530 530 530 530 530 530 530	21 19 <u>18</u> 21 25	36 36 28 ъ 31 ъ 32	२ २ २ २ २ २ २ २ २ २ २	44 4 52 69	123 134 137 137 137 129	919 1,110 1,180 1,140 1,010	210 195 199 195 187	2421 34 59 47)2 42 36 38 34
6 7 8 9 10	73 86 71 84 113	71 86 76 74 73	ъ 31 ъ 32 ъ 34 ъ 33 ъ 31	29 32 36 39	33 33 34 34	32 32 33 34 Ъ 34	94 106 118 149 176	134 180 239 322 433	1,000 928 919 858 704	199 195 166 152 149	46 46 42 40 42	33 33 31 29 27
11 12 13 14 -15	96 98 88 84 84	69 68 54 42 59	ь 30 ь 30 ь 30 ь 27 ь 24	39 38 38 38 36 34	34 234 232 233 233 233 233	534 55 32 33 5 23 5 24	191 187 156 163 152	607 850 <u>983</u> 884 767	688 688 728 720 681	146 137 132 123 110	42 49 38 36 36	27 29 27 28 27
16 17 18 19 20	86 80 80 84 84 80	58 54 55 55 51	b 23 b 25	31 27 25 25 31	} b 34	ъ 35 ъ 35 ъ 36 36	143 118 132 140 134	728 696 593 464 392	628 644 621 593 543	103 % 92 % 84	36 38 38 36 35	27 30 30 27 26
21 22 23 24 25	78 78 90 115 115	50 52 58 53 54	26	34 35 36 37 38	אל אל אל אל אל אל אל אל אל אל אל אל אל א	98 99 42 44 44	218 <u>288</u> 256 199 169	392 483 543 421 458	446 375 354 312 298	74 71 66 62 56	32 35 47 40 38	25 29 33 30 27
28 27 28 29 30 31	115 115 <u>146</u> 108 103 88	b 36 b 43 b 41 b 40 b 39	21 20 21 22 23 22	39 39 37 b 33 b 31 b 31 b 31	ხ 30 ხ 30 ხ 30 ხ 30	5.2209 & 8 4 4 4 4	152 140 134 129 118	471 543 477 614 751 775	270 261 248 235 222	52 51 50 <u>47</u> 52 69	36 35 33 33 30 22	26 25 <u>24</u> 24 26
Total	2,733	1,837	859	994	959	3,195	4;215	14,857	19,323	3,612	1,263	882
Meon	88.2	61.2	27.7	32.1	35.1	38.5	140	479	644	117	40.7	29.4
Ac-Fi	5,420	3,640	1,700	1,970	1.900	2.370	8,360	29,470	38,330	7,160	2,510	1,750

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

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

Year Mean 144

Acre-Feet 104,600

157. SULPHUR CREEK ABOVE RESERVOIR, NEAR EVANSTON, WYOMING

Location. — Lat 41°09', long 110°48' in SW1/4 sec. 35, T. 14 N., R. 119 W., on right bank about 11/4 miles downstream from Willow Creek, 2 miles upstream from Sulphur Creek Dam, and 111/2 miles southeast 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

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.

				Í	1	<u>г</u>						
Dey	Qei.	Nov.	Dec.	Jan.	Feb.	Har.	Apr.	Μαγ	June	ylut	Aug.	Şepi.
1 2 3 4 5	0,4 .4 .4 .4	0.5 .6 .6	0.5 .5 .4 .3			2.0 2.0 2.0 2.0 5.0	18 17 27 35 37	9.3 <u>8.0</u> 10 16 24	14 16 15 15 15	2.2 2.0 2.0 1.7 1.0	0,4 .9 .9 .9	000000
6 7 8 9 10	.4 .5 .4 .5 .5	5 5 5 5 5 5 5 5	.4 .5 .4 .4			8.0 8.0 8.0 8.0 6.0	39 26 24 20 16	21 12 11 15 22	16 24 42 25 28	1.0 1.2 1.4 1.4 1.4	22222	0 0 0 0
11 12 13 14 15	.5 •4 •4 •4	.5.5.4.4	,6 ,5 ,6	> 1.5	2	} 4.0	12 12 9.9 9.3 7.7	29 37 <u>42</u> 30 21	17 13 11 9.9 9.6	1.0 .6 .6 .6	.2 .2 .1 .1 0	0 0 0 0
10 17 18 19 20	.4 .4 .5 .5	.4 .4 .5 .5 .4				16 25	6.8 6.8 6.3 7.4 8.4	14 15 20 26 19	12 9.6 15 11 12	<u>, 1</u> ; , 4 , 4 , 4 , 4	0 0 0 0	0 0 0 0
21 22 23 24 25	.5 .5 .5 .5	.4 .5 .5 .5	.5			50 100 100 100 150	6.5 <u>6.0</u> 8.4 9.0 10	13 13 16 15 12	9.0 11 9.9 13 9.3	.4 .4 .4 .4 .4	0 0 0 0	0 .1 .22 .2
26 27 28 29 30 31	\$ \$ <u>5</u> 5 5	•5 •4 •5 •4		J]	208 208 81 39 35 24	12 19 21 17 15	13 17 21 18 18 18	7.7 5.2 3.5 2.6 <u>2.2</u>	4 4 4 4 4	0 0 0 0	.2 .2 .2 .2 .2
Total	14.8	14.6	15.1	46.5	58	1,219	469.5	574.3	403.5	25.0	3.2	1.8
Mean	0.48	0.49	0.49	1.5	2	39.3	15.6	18.5	13.4	0,81	0.10	0.06
Ac-Ft	29	29	.30	92	115	2,420	931	1,140	800	50	6.3	3.6

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

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

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Year
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Heon <u>7.77</u> Acre-Fees <u>5,650</u>

159. SULPHUR CREEK BELOW RESERVOIR. NEAR EVANSTON, WYOMING

Location. --- Lat 41°09', long 110°49', in SE14SE14 sec. 28, T. 14 N., R. 119 W., on left bank 6.3 miles upstream from mouth and 101/2 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,

Doy	Óсı,	Nov.	Dec.	ion.	F46.	Hor.	Aşr.	Hay	June	July	Aug.	Sept.
1 2 3 4 5	0.2 .2 .2 .1 .1	3.4 3.4 3.4 3.4 3.4	3.0 3.0 3.0 3.0 3.0	2:2 2.2 2.2 2.2 2.2		0 0 0 0	24 <u>31</u> 31 31 31	4.2 4.4 4.4 4.4 4.4	24 26 27 26 27	12 12 12 12 12 12 13	29 13 14 14 15	22 24 28 27 27 27
6 7 8 9 10	.1 .1 .1 .1 .1	3.4 3.4 3.4 3.4 3.4 3.4	3.0 <u>3.2</u> 3.2 3.2 3.2 3.2 3.2	2.2 2.3 2.2 2.2 2.2 2.2		0.0 0.2 0.0 0	31 31 31 31 31	4.4 4.4 5.4 14 14	27 27 45 70 72	15 24 40 49 48	16 16 17 15 13	19 7.8 8.1 7.8 7.8 7.8
11 12 13 14 15	.1 -5 <u>3.4</u> 3.4 3.4	3.4 3.4 3.4 3.2 <u>3.5</u>	3.2 3.2 3.2 3.2 3.2 2.5	2.2 2.2 2.2 2.2 2.2 2.2 2.2		0 0 0 0	31 31 31 31 31 31	20 35 38 <u>51</u> 51	66 57 48 20 20	50 52 54 60 61	13 12 13 13 16	7.8 7.8 5.4 3.7 4.4
16 17 18 19 20	3.2 3.2 3.2 3.2 3.2 3.2	3.4 3.4 3.4 <u>3.0</u> 3.0	2.0 2.0 2.0 2.2 2.2 2.2	2.2 2.3 2.3 2.3 2.3 2.3		0 0 0 0	19 10 7.2 4.4 4.7	50 24 8.1 8.1 8.1	17 <u>10</u> 10 10 10	58 57 56 48 49	19 18 16 16 16	5.7 5.7 6.0 5.7 5.7
21 22 23 24 25	3.2 3.4 3.4 3.4	3.0 3.0 3.0 3.0 3.2	2.2 2.2 2.2 2.2 2.2 2.3	2.3 2.2 1.8 1.2 0.8		0 0 0 0	4,4 4,4 4,2 4,4 4,4 4,4	8.1 5.7 4.0 <u>1.7</u>	10 12 18 18 18	47 60 66 66 66	15 11 6.5 6.2 5.4	6.0 6.0 6.2 6.2 6.2
26 27 28 29 30 31	3.2 3.2 3.4 3.4 3.4 3.4	3.0 3.0 3.0 3.0 3.0	2.3 2.2 2.2 2.2 2.0 2.0	0.5 0.2 0.1 0.1 0.1 0.1 0		0 0 0 10 22	4.4 4.4 4.2 4.2 4.2	4.0 4.2 4.2 5.7 16 22	18 18 18 18 18 16	64 62 64 67 66 59	12 22 26 24 24 24	6.5 6.5 6.5 6.8 6.8
Totol	64.7	\$7.3	80.6	53.8	0	32.2	546.7	438.9	808	1,460	488.1	300.1
Mech	2.09	3.24	2.60	1.74	0	1.04	18,2	14.2	26.9	47.1	15.7	10.0
AC-11	128	<u>193</u>	160	107	0	64	1,080	871	1,600	2,900	968	595

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

Meon______11.9 Acre-Feet _____81670

Year

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

- Location. Lat 41°24', long 111°02', in SE¹/₄ sec. 36, T. 17 N., R. 121 W., on right bank at highway bridge, 6¹/₂ 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 NW1/4 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.

Day	Oet.	Nov.	Dec.	Jan.	Feb.	Mor.	Apr.	May	ي. مرز	ylut	Aug.	Sept.
1 2 3 4 5	61 60 51 58 66	0.8 .7 .6 .6	0,8 .8 .6 b.5			0 0 0 bl	4.? <u>3.2</u> 4.7 31 53	36 36 38 40 43	70 78 76 76 78	12 6.0 2.8 .4 .2		
6 7 8 9 10	65 76 95 90 91	.5 .6 1.1 <u>1.5</u> .8	b.5 b.5 b.5 b.5 b.5			b 2 b 4	57 58 56 56 67	40 37 38 45 49	83 62 76 87 87	.5 .9 4.5 5.5 3.0		
11 12 13 14 16	<u>100</u> 99 98 96 95	.6 .6 .4 .2	0d 0 0 0 0			\$05	68 70 63 57 57	82 <u>114</u> 114 102 95	75 86 90 82 80	1.8 2.6 3.0 1.5 5.8		
16 17 18 19 20	91 66 65 65 65	b.6 b.6 .6 .8 .6	0 0 0 0			b 10 b 15	55 49 47 47 52	97 85 71 61 48	81 71 63 51 53	12 8.5 5.5 1.9 6.3		
21 22 23 24 25	48 1.9 1.6 1.5 2.2	8. b.8 b.8 b.8 b.8 b.8	b 1.1 <u>4.5</u> .2 0 0			b 20 b 25 b 30 b 35 b 35	5133551 42 99	40 38 57 68 49	58 46 38 41 30	2.6 3.0 <u>14</u> 9.4 9.4		
26 27 28 29 30	1.6 1.8 1.6 2.2 1.5	.7 .5 .7 .8 .9	0 0 0 0			b 30 b 35 b 20 20 8.5 5.8	38 37 39 39 37	49 52 68 64 63 68	20 22 22 22 22 19	8.8 11 14 1.4 .4 0		
Intol	1 618.8	21-0	11.8	0	0	351.3	1,439.6	1,687	1,823	158.7	0	0
Maon	52.2	0.70	0.38	0	0	11.3	48.0	60.9	60.8	5,12	0	0
Ac+Fi	3.210	42	23	0	0	697	2,860	3,740	3,620	315	0	0

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

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

Yeor

Acre-Feel 14,510

205. BEAR RIVER NEAR WOODRUFF, UTAH

Location. — Lat 41°31′25″, long 111°01′00″, in SW1⁄4 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.

Day	Qci .	Nov.	Dec.	, net,	fob.	Mar.	Age .	Hay	June	July	. وحد ا	Sept.
1 2 8 4 5	28 24 <u>22</u> 24 24 24	113 113 111 111 111 90	43 43 42 39 36	25 25 25 25 30	} 45	50	245 206 196 199 209	203 <u>189</u> 192 213 234	354 455 666 784 830	16 13 11 9.8 7.2	3.4 4.7 5.1 4.2 3.0	0 0 0 0
6 7 8 9 10	24 24 26 33 30	100 108 103 98 98	38 40 40 38 37	33 37 40 44 45		60 95 115 150 185	234 256 249 234 242	234 209 223 283 391	738 712 731 851 817	6.8 6.8 6.8 5.1 3.8	2.5 2.5 2.5 2.0 2.0	0 0 0 0
11 12 13 14 15	37 51 41 39 35	96 89 89 74 64	35 35 33 33 31	45 45 45 45 45		185 220 200 160 160	253 245 238 183 177	497 666 878 <u>1.010</u> 900	596 497 434 424 391	3.4 4.2 3.2 3.0 2.5	2.0 1.5 1.5 1.5 1.5 1.0	0 0 0 0
16 17 18 19 20	30 33 36 36 35	64 65 68 70 70	28	35	50	190 220 250 290 340	161 149 <u>121</u> 132 144	757 653 590 514 420	359 316 299 276 253	2.5 2.0 2.0 1.5 1.5	1.0 1.0 .5	00000
21 22 23 24 25	36 80 92 98 116	71 72 72 72 62	30	40		380 450 510 590 705	132 196 299 <u>350</u> 272	337 299 341 350 249	213 161 126 106 82	1.0 1.0 1.0 .5 .5	.2 .2 .1 0 0	0 0 0 0 0
26 27 28 29 30 31	116 121 124 146 141 124	\$9. 5 .97 子 才	28	} 45		692 <u>810</u> 790 465 333 283	245 234 238 245 230	213 196 223 213 245 320	61 52 43 28 <u>18</u>	5 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	000000000000000000000000000000000000000	0 0 <u>7.4</u> <u>7.4</u> <u>7.4</u>
Totel	1,826	2,388	1,014	1,199	1,425	9:078	6,514	12,242	11,673	117.9	43.4	6.8
Heen	58.2	79-6	32.7	38.7	49.1	293	217	395	389	3.80	1,40	0.23
Ac-Ft	131620	4,740	2,010	2,380	2,830	18,010	12,920	_24,280	23,150	234	86	_13

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

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.

Mean 130

Acre-Feel 94,270

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

Location. — Lat 41°56'20", long 110°59'05", in SE14SE14 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 1314.

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.

Day	Qui.	Nov.	Dac.	Jan.	Føb.	Mar.	Apr.	Μαγ	june .	July	Aug.	Sept.
1 2 3 4 5								28 27 28 27 28 27 26	8.6 8.2 9.2 9.0 8.0	2 <u>.6</u> 85 77 71 51	28 33 34 28 26	16 17 17 17 17 17
6 7 8 9 10								24 22 17 12 10	8.6 8.6 9.0 8.4 7.8	48 52 52 53 54	23 23 23 21 25	16 15 <u>14</u> 14 15
11 12 13 14 15								9.0 7.8 6.7 6.4	7.6 6.4 5.4	55 50 61 70 52	28 26 23 21 20	14 14 14 14 15
16 17 18 19 20								<u>6.1</u> 6.1 6.1 6.4	4.2 3.6 6.4 6.4 4.6	72 56 64 58	17 18 20 20 18	15 17 17 17 17 17
21 22 23 24 25								6.7 7.8 8.6 9.0 8.2	3.6 2.8 2.6 2.6 2.6	55 57 56 55 54	18 17 17 17 16	19 19 17 18 18
26 27 28 29 30 31								7.8 7.8 8.2 7.8 7.8 7.4	2.6 2.6 2.8 2.6 2.6 2.6	52 51 48 47 34 29	16 16 15 15	18 18 18 19 18
Totol			_					375.9	167.6	1,679.6	653	494
Mean								12.1	5,59	54.2	21,1	16.5
Ac-Fr	L							746	332	3,330	1,300	980

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

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

Hay 1 to Sept. 30 Acre-Fael ----

Mean 6,690

Location. — Lat 42° 17', long 110°52', in NW14 sec. 33, T. 27 N., R. 118 W., on left bank 41/2 miles upstream from Howland Creek, 6 miles downstream from Hobble 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.

0 ay	Qel.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	ine	July	Aug.	Sept.
1 2 3 4 5	101 101 101 101 99	89 89 89 <u>91</u> 89	78 78 76 72 68	300 S S S	60 64 68 86	******	24 71 73 83 101	199 209 250 254 261	467 485 522 542 527	232 225 222 219 216	<u>142</u> 133 130 124 121	22 99 99 99 99 96
6 7 8 9 10	99 105 101 103 103	90 91 88 88 88	72 ?4 ?4 ?4 ?4 ?4 ?4	58 60 62 61 60	64 68 72 70 66	64 64 64 60 62	133 169 181 232 <u>276</u>	298 318 353 403 458	508 489 471 458 476	209 209 209 202 196	119 117 115 113 115	94 97 96 94 94
11 12 13 14 15	99 103 101 97 96	85 88 82 78 81	74 76 78 74 70	60 60 60 60 60	69 64 60 58 62	58 62 60 60 62	254 250 222 229 190	532 599 <u>662</u> 599 562	445 437 420 415 432	196 193 184 161 178	115 113 117 113 115	94 93 91 91 91
16 17 18 19 20	94 94 93 93 91	82 82 82 82 82 86	68 72 74 74 74	6 % 5 %	64 64 60 58 58	68 65 59 58 59	172 153 156 158 150	517 503 485 441 420	407 403 386 370 357	169 166 166 164 158	121 119 113 109 101	89 93 91 89 88
21 22 23 24 25	89 91 105 103 99	83 82 83 83 83	74 76 74 78	58 62 62 62	62 62 58 55 58	60 62 64 66 70	187 250 276 219 196	420 432 424 420 420	337 318 306 295 283	158 156 153 150 145	97 99 109 103 101	89 94 91 88 85
26 27 28 29 30 31	97 96 97 91 91 89	80 73 76 76 76	70 66 64 66 66	60 62 60 60 60 60	56 52 53 53 53	73 80 85 80 79 76	184 187 199 184 184	403 420 407 420 432 441	272 264 254 239 236	142 140 137 135 133 135	99 99 99 99 99 99 97 96	<u>83</u> 83 85 85 83
Total	3,022	2,525	2,250	1,837	1,773	2,018	5,395	12,962	11,821	5,478	3,463	2,743
Mean	97.5	83.8	72.6	59.3	61.1	65.1	180	418		177	112	91.4
~~~~	2+220	4,990	4,460	3,640	_3,520 1	4,000	10,700	25,710	23,450	10,870	6,870	5,440

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

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.

Aur-Feet ____ 109,600

Y and

# 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 Wyom-ing-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.

Day	Oct.	Nov.	Dec.	Jon.	Feb.	Mor.	Apr.	Моу	•مد •	July	Aug.	Sept.
1 2 3 4 5	212 208 203 205 201	246 253 255 <u>261</u> 230	210 210 210 205 200	140 140 140 <u>130</u> 140	165 <u>170</u> 165 160 155	150 150 150 150 155	872 761 711 690 694	336 345 374 405 400	294 345 336 372 360	224 207 244 240 230	124 1 <u>32</u> 130 129 124	83 82 78 80 80
6 7 8 9 10	195 197 199 199 203	185 244 246 246 251	200 200 205 205 190	140 145 150 155 155	150 150 150 150 160	160 165 170 185 200	733 779 736 743 769	408 419 438 464 472	350 348 340 340 345	266 242 234 230 220	119 116 114 110 110	77 75 75 78 80
11 12 13 14 15	195 195 199 201 197	246 260 250 220 190	190 190 190 180 170	160 160 165 165 165	165 170 170 165 165	220 225 250 280 300	729 669 616 499 427	505 567 632 652 577	362 333 343 357 355	232 230 226 224 208	110 111 105 106 106	78 80 78 78 89
15 17 18 19 20	199 199 199 199 234	230 220 230 235 220	165 160 165 170 170	165 165 165 155 150	165 165 165 165 165	330 305 275 270 290	377 348 310 288 <u>283</u>	481 441 416 411 382	338 321 340 348 350	191 188 175 176 169	110 113 113 111 111 110	88 95 101 <u>104</u> 102
21 22 23 24 25	212 201 203 214 214	225 230 240 250 250	180 170 190 180 180	150 155 155 160 165	165 165 165 165 165	380 500 630 800 932	288 321 360 387 357	355 350 352 326 331	343 326 301 283 272	166 166 164 160 157	106 104 108 113 113	98 98 104 102 99
26 27 25 29 30	210 218 228 232 238	235 210 210 208 210	180 175 160 140 140	165 165 160 160 160	150 150 150 150	$\frac{1,280}{1,220}$ 1,230 1,160 1,100 1,020	333 312 331 355 340	314 310 322 294 296 277	255 248 234 <u>228</u> 228	149 134 146 139 144 116	106 104 99 96 95 89	99 101 102 99 93
1 of	6 453	6.986	5.620	4,905	4,655	14.632	15,418	12,652	9,595	5,997	3,436	2,676
Mago	208	233	181	155	161	472	514	408	320	193	111	89.2
Ac-F	12,800	13,860	11,150	9,530	9,230	29,020	30,580	25,090	19,030	11,890	6,820	5,310
L	<u></u>			Stated b	- 1.00				M	*****	.25	4

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

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

Year

Acre-Fee) _184.300

### 460. RAINBOW INLET CANAL NEAR DINGLE, IDAHO

- Location. Lat 42°13'00", long 111°17'30", in SE14 sec. 3, T. 14 S., R. 44 E., on left bank 11/2 miles west of Dingle and 13/4 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.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	وسخ	July	Aug.	Sept.
1 2 3 4 5	210 208 205 201 201	231 231 240 <u>243</u> 240	185 <u>188</u> 185 160 175	95 95 100 103 100	120 124 128 125 125	120 124 122 118 120	1,040 882 804 784 777	420 420 432 469 501	19 19 20 20 21	22 22 21 20 20	75 64 63 60 49	12 12 12 12 12 12
6 7 8 9 10	201 199 196 196 192	188 214 219 236 228	165 149 145 137 137	99 107 116 113 113	123 122 120 <u>113</u> 128	128 135 139 143 168	815 878 910 866 866	472 478 491 <u>507</u> 488	22 22 22 21 21 21	<u>19</u> 19 19 19 30	44 44 41 40 40	11 12 13 12 12
11 12 13 14 18	194 188 <u>185</u> 185 190	231 231 233 221 170	139 140 145 144 135	116 118 12) 128 <u>130</u>	133 132 130 127 124	203 177 194 219 270	894 839 773 716 610	441 447 444 429 423	22 23 23 24 24	64 80 <u>95</u> 95 88	44 40 34 27 28	13 13 13 12 12 12
16 17 18 10 20	<u>183</u> 190 194 194 192	<u>159</u> 1% 185 188 1%	131 118 128 133 133	125 125 120 110 100	122 129 132 128 128	298 280 268 275 270	530 478 435 402 371	365 270 236 185 157	24 24 24 <u>25</u> 25	82 72 68 64 57	33 34 34 36 34	12 12 12 11 11
21 22 23 24 25	236 214 199 210 208	192 212 224 226 221	130 126 126 130 130	104 111 113 122 120	129 128 127 126 125	296 360 482 646 827	354 379 382 453 466	135 120 85 24 21	25 23 22 21 21	58 56 45 42 42	35 46 50 49 45	15 15 15 21 24
26 27 28 29 30 31	210 210 221 219 221 221 221	185 192 179 179 181	134 130 108 100 <u>90</u> 90	118 122 122 122 122 122 122	124 123 122 121	955 1,260 <u>1,340</u> 1,260 1,180 1,120	444 408 402 420 438	19 19 19 19 19 19	22 22 23 22 22 22 22	45 50 51 58 72 74	42 19 17 15 14 13	24 25 26 <u>27</u> 27
Total	6,273	6,271	4,286	3,534	3,638	13,7497	18,816	8,574	668	1,570	1,209	461
M ++ m	202	209	138	114	125	435	627	277	22,3	50.6		15,4
L~~!!	12,440	12,440	8,500	7,010	7,220	26,770	37,320	17,010	1,320	3,110	2,400	214

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

Year Mean

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.

0 oy	Qel.	Nov.	Dec.	Jan .	Feb.	Mar.	Apr.	Мау	June	<b>ب</b> اید	Aug.	Sept.
1 2 3 4 5	12 12 12 12 12 12	<u>1.9</u> 2.3 2.3 4.0 5.4	9.8 9.8 9.8 7.7 8.1	8.9 8.5 8.5 7.2	8.9 8.9 8.9 7.3 7.3	6.28 28 28 26 66 66 66	<u>9.4</u> 8.1 7.0 7.0 7.0	4.7 4.7 4.7 5.1	<u>6.6</u> 6.6 7.3 7.3 7.7	9.8 9.4 8.5 <u>8.1</u> 8.5	20 20 20 20 20 20	15 14 13 11
6 7 5 9 10	13 13 13 12 12 12	2.9 7.3 <u>11</u> 11 11	8.1 7.3 6.6 6.6 7.0	7.3 7.3 7.7 8.5 8.9	7.7 7.3 7.7 8.5 8.9	7.7 8.1 8.5 10 11	7.0 7.3 7.7 7.3 7.7	4.7 4.7 5.1 5.4 8.5	8.5 9.4 8.9 8.9 8.9	8.1 8.5 8.5 8.5 16	21 20 20 20 21	9.8 9.4 8.9 9.4 9.4
11 12 13 14 15	12 11 11 11 12	11 11 11 7.3 5.8	5.8 6.2 4.7 4.7 4.7	9.8 9.8 9.4 8.5	8.9 8.5 8.5 8.5 8.5	11 11 12 13 14	8.1 8.1 7.3 7.3 7.0	13 13 12 13 12	9.8 10 9.8 9.8 11	17 17 16 17 17	21 21 20 20 19	8.9 8.9 8.5 8.5 8.1
16 17 18 19 20	12 12 13 13 13	6.6 8.5 8.9 10 9.8	4.7 <u>3.3</u> 4.0 4.3 4.3	8.5 10 11 11 11	8,5 8,5 8,1 8,5 8,9	13 13 13 11 11	6.6 6.2 5.8 5.4 5.1	12 11 12 12 16	11 11 20 11 11	17 17 18 17	20 20 21 21 21 21	8.1 8.1 9.4 9.8
21 22 23 24 25	13 13 13 13 13	9.8 11 11 11 11	4.0 4.0 4.3 5.8	11 10 9.4 8.5 9.8	8,5 8,9 8,1 <u>10</u> 8,5	11 9.8 14 11 9.8	4.7 <u>4.3</u> 4.7 4.7 5.1	15 14 14 16 15	12 12 11 10 9.4	18 20 19 18 18	21 21 20 21 20 21 20	11 14 14 12 9.4
28 27 28 29 30 31	13 6.6 <u>.7</u> .9 .9 .9 1.2	6.6 8.1 7.3 8.5 10	5.4 8.1 9.8 9.8 9.8 9.8 9.8 9.4	94 89 89 89 89 94	8.1 8,9 <u>7.0</u> 7.7	15 17 <u>19</u> 11 11 11	5.1 5.4 5.1 5.1 5.1 5.1	8.5 4.7 4.7 6.6 6.2 6.6	8.5 7.7 7.7 9.8 11	19 19 20 20 20 20 21	21 20 19 18 17 16	8.9 <u>7.0</u> 7.3 7.0 7.0
Total	332.3	243.3	201.9	283.8	242.5	338.3	191.7	288.6	283.6	475.9	620	295.3
Ac-Ft	10.7 659	8.11 489	400	9,15 \$\$3	0,36 481	671	380	572	563	944	1,230	586

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

Mean 10.4 .

Year

# 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, 14.30 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.

Day	Qei,	Nov.	Dec.	Jan.	Fab.	Her.	Apr.	May	June	ylut	Aug.	Sept.
1 2 3 4 5	907.1 907.1 907.1 907.1 907.1 906.4	911.1 911.1 911.8 911.8 911.8 911.8	<u>914.5</u> 915.2 915.2 915.2 915.9	<u>917.3</u> 917.3 917.3 917.9 917.9	928.2 929.6 930.3 931.0 931.6	955-5 956-9 957-6 957-6 958-3	<u>995.4</u> 998.2 1,001.0 1,004.4 1,007.9	1.039.6 1.041.0 1.043.8 1.045.2 1.046.6	$\frac{1.046.6}{1.047.8}$ 1.047.8 1.041.0 1.038.2 1.035.5	<u>980.3</u> 978.2 975.4 972.7 970.0	<u>900.2</u> 897.5 894.7 891.3 888.6	804.2 802.9 801.6 800.9 800.2
6 7 8 9 10	906.4 905.7 905.0 905.0 905.0	911.8 911.8 912.5 912.5 912.5 912.5	915.9 915.9 915.9 916.6 916.6	917.9 917.9 918.6 918.6 918.6	932.3 932.3 933.0 933.0 933.7	959.7 960.4 961.7 962.4 963.1	1,009,9 1,012,7 1,014.8 1,016.8 1,018,9	1,048.7 1,050.0 1,051.4 1,052.8 1,054.2	1,032.7 1,029.9 1,027.2 1,024.4 1,022,4	967.2 963.8 962.4 960.4 957.6	885.9 833.2 879.8 876.4 873.0	799.6 798.2 796.9 796.2 794.9
11 12 13 14 15	905.0 905.0 904.3 904.3 904.3	912.5 912.5 912.5 912.5 912.5 913.2	916.6 916.6 916.6 916.6 916.6 916.6	918.6 918.6 918.6 918.6 919.3	934.4 935.7 937.1 937.8 939.1	963.1 963.8 963.8 964.5 965.2	1,021.0 1,021.7 1,023.0 1,023.7 1,025.1	1,054.9 1,056.3 1,057.6 1,059.0 1,059.7	1,020.3 1,018.9 1,017.5 1,016.1 1,014.8	954.9 954.2 952.1 949.4 947.3	869.6 866.2 862.8 860.0 856.6	793.5 792.2 790.8 789.5 788.2
16 17 18 19 20	904.3 904.3 904.3 905.0 905.0	913.2 913.2 913.2 913.9 913.9 913.9	916.6 916.6 916.6 916.6 916.6	919.3 919.3 919.3 919.3 919.3	939.8 941.2 941.8 943.2 943.9	965.8 967.2 967.8 969.2 970.0	1,025.8 1,027.2 1,027.9 1,028.6 1,028.6	<u>1,061,1</u> 1,061,1 1,061,1 1,061,1 1,061,1	1,013.4 1,012.0 1,010.6 1,009.2 1,007.9	945.3 942.5 940.5 937.8 935.0	853.9 850.5 846.5 842.4 839.1	786.8 785.5 784.8 784.2 782.8
21 22 23 24 25	905.7 906.4 907.1 908.4 909.1	913.9 914.5 914.5 914.5 914.5 914.5	916.6 916.6 916.6 916.6 916.6	919.3 920.0 920.7 921.3 922.0	944.6 946.0 947.3 948.0 949.4	971.3 972.7 974.0 976.1 978.9	1,029.2 1,029.2 1,029.2 1,030.6 1,032.0	1,061,1 1,061,1 1,061,1 1,061,1 1,060,4	1,005.8 1,003.7 1,001.6 999.6 996.8	931.6 928.9 926.2 922.7 920.0	835.1 831.7 829.7 827.7 824.4	281.5 280.8 779.5 778.1 777.4
28 27 28 29 30 31	909.8 909.8 910.5 910.5 <u>911.1</u> 911.1	914.5 914.5 914.5 914.5 914.5 914.5	916.6 916.6 916.6 916.6 <u>917.3</u> 917.3	922.0 922.7 924.1 924.8 926.2 927.5	950.8 952.1 952.8 954.2	981.6 982.3 985.8 987.2 989.2 989.2 989.2	1,032.7 1,034.1 1,035.5 1,036.8 1,038.2	1,059.7 1,059.0 1,057.6 1,055.6 1,052.8 1,050.0	994.1 991.3 988.5 985.8 983.0	917.3 913.9 911.1 908.4 905.7 903.0	821.0 817.6 815.0 812.3 809.6 806.9	776.1 774.8 774.1 772.8 771.4
Total							[					
Mean Ac-F	<u> </u>											

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

Meo

Acre-Feat .....

### 595. BEAR LAKE OUTLET CANAL NEAR PARIS, IDAHO

Location. — Lat 42°13′00″, long 111°20′30″, in SW1⁄4 sec. 8, T. 14 S., R. 44 E., on right bank 2,000 ft downstream from headgates (at dike) and 3 miles southeast of Paris.

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 5,920 ft (from topographic map).

Average discharge. - 38 years, 340 cfs (246,100 acre-ft per year).

Extremes. — Maximum discharge during year, 1,370 cfs July 23 (gage height, 18.46 ft); minimum daily 4 cfs many days. 1922-60: Maximum daily discharge, 1,870 cfs Aug. 8, 1924;

1922-60: Maximum daily discharge, 1,8'/0 cfs Aug. 8, 1924; minimum daily, 1 cfs for many days in 1937, 1954, 1959.

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

			Placing	,	1001 HOI 104	Wild's wasar	100. 00.00	~ 1399	oop on oo	2700		
0 07	Qc1.	Nev.	D.e.c.	Jan.	Feb.	Mor.	Apr.	May	) ana	July	Aug.	Sept.
1 2 3 4 5	12 12 12 12 12 12 12	10 10 10 10 10 10	3 <u>8</u> 88	8 8 8 8	5 8 8 8 8 8	00000	ปกรรรษ	4 4 4 4 4	1,080 1,020 1,010 1,010 1,020	1,240 1,250 1,250 1,240 1,240	1,020 970 1,070 1,130 <u>1,140</u>	415 348 233 233 234
8 7 8 9 10	12 12 12 12 12 12	9 9 9 9 9	8 8 8 8 8 8	8 8 8 8 8	? ? ? ?	6 6 6 6	55555	4 4 4 4 4	1,100 1,220 <u>1,270</u> 1,210 1,120	1,260 1,210 1,220 1,230 1,240	1,140 1,140 1,140 1,150 1,140	225 212 208 206 205
11 12 13 14 15	12 12 12 12 12 12	9 9 9 9	8 8 8 8 8	8 8 8 8 8	???????????????????????????????????????	6 6 6 6	55555	4 4 4 4 4	1,120 1,110 1,040 957 954	1,230 1,230 1,260 1,270 1,260	1,140 1,140 1,130 1,130 1,090	205 206 205 <u>198</u> 205
15 17 18 19 20	12 12 12 12 12 12	999999	8 8 8 8 8	8 8 8 8	? ? ? ?	6 6 6 6 6	4 4 4 4 4	139 326 283 303 303	964 <u>852</u> 970 980 977	1,240 1,230 1,220 1,300 1,340	1,080 1,090 1,090 1,080 1,050	206 205 205 201 201 205
21 22 23 24 25	12 12 12 12 12 11	9 9 9 8 8	6 8 8 8 8	8 8 8 8 8	? ? ? ?	6 6 5 5	4 4 4 4	297 277 415 662 930	970 964 1,030 1,110 1,100	1,350 1,360 1,350 1,340 1,350	1,050 931 453 658 928	208 206 205 206 212
26 27 28 29 30 31	11 11 11 11 11 10	8 8 8 8 8 8	8 8 8 8 8 8 8	8 8 8 8 8 8	? ? <u>6</u>	\$55555	4 4 4 4 4	1,130 1,120 1,110 1,120 1,130 1,130	1,100. 1,100 1,100 1,110 1,170	1,320 1,330 1,340 1,300 1,190 1,090	899 819 683 635 558 458	213 210 210 213 213 210
Totol	364	268	248	248	207	178	135	10.755	31,738	39,290	30,132	6,653
Mean	11.7	8.9	8.0	8.0	7.1	5.7	4.5	347	1,058	1,267	972	222
Ac-FI	722	\$32	492	492	411	353	268	21,330	62,950	77,930	59,770	13,200

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

Year Mean <u>328</u> Acre-Fael <u>238,400</u>

### 1180. BEAR RIVER NEAR COLLINSTON, UTAH

Location. — Lat 41°50', long 112°03', in NW14SE14 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 51/2 miles north of Collinston.

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

Brainage area. — 0,000 sq nn, 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 Reclamtion). Prior to Nov. 8, 1913, staff gage and Nov. 8, 1913, to Sept. 19, 1938, waterstage 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. B

devisions. (mater years) WSP 100	sions. (water years). — WSP 1564:	1902.
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Discharge, in cubic feet per second, water year October 1959 to September 1960

Doy	Oct.	Ner.	Dec.	Jan.	Føb.	Mor.	Apr.	May	Are	ylu	Aug.	Sept.
1 2 3 4 5	764 <u>1,150</u> 586 1,010 <u>396</u>	715 741 737 782 708	735 757 800 819 604	598 824 749 1,000 514	892 871 852 881 851	1,290 1,390 1,420 1,620 1,780	2,320 2,260 2,240 2,110 1,970	2,020 1,850 1,580 1,110 1,210	2 <u>1</u> 21 21 21 22 22	22 20 20 20 20 21	20 19 19 18 20	23 23 23 23 23 24
6 7 8 9 10	506 1,150 880 846 605	712 747 935 803 526	616 702 711 ?34 859	570 848 760 745 932	884 876 992 1,330 1,210	2,290 2,100 2,090 <u>2,660</u> 2,570	1,960 2,280 2,400 2,510 2,450	1,640 1,340 1,450 1,400 1,600	22 23 23 23 23 23	21 21 21 22 22 24	21 24 23 22 22 22	23 24 24 24 24 25
11 13 13 14 18	748 954 889 793 675	658 684 814 586 704	954 799 <u>1,020</u> 823 600	959 <u>1,190</u> 1,040 952 793	1,450 <u>1,500</u> 1,420 1,040 937	2,330 1,690 1,570 1,950 1,220	2,660 1,960 2,250 2,030 2,110	1,620 1,340 1,290 1,380 1,180	24 24 24 24 24 24 24	21 21 17 16 16	22 22 23 23 23 23	25 24 24 25 25
16 17 18 19 20	936 743 715 656 780	935 789 749 850 629	741 774 728 686 842	886 778 727 656 690	778 837 1,030 817 813	1,330 1,250 1,070 1,290 1,300	1,930 1,910 1,650 1,650 1,480	583 682 481 344 101	23 22 22 22 22 22	16 16 16 17 16	25 <u>30</u> 25 25 25 25	24 23 23 23 23 767
21 22 23 24 25	612 798 691 677 697	709 <u>1,070</u> 812 581 745	884 681 865 814 915	655 1,000 974 <u>407</u> 1,030	704 825 874 838 687	1,740 877 1,760 2,000 2,070	1,300 1,410 1,430 1,530 1,700	20 20 20 20 20 20	22 23 23 23 23 22	16 16 16 16 16	24 25 25 26 25	21 22 24 23 23
26 27 28 29 30 31	1,000 537 734 791 695 835	769 828 946 743 713	942 833 956 609 573 528	956 949 922 976 976 918	810 884 229 1,100	2,110 2,220 2,020 2,450 2,430 2,430	1,860 1,960 1,720 1,720 2,010	20 43 20 20 20 20	22 23 22 22 22 22	17 17 17 19 18 18	26 26 25 26 24 23	23 <u>760</u> 20 22 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	757		838	.940	1,813	1,959	789	22.5	18.4	23.4	72.7
L AC-FI	147.260	45.060	47,410	51,520	54,070	111,500	116,600	48,480	1,340	1,130	1,440	4,320

Mean ______ 730