# WATER DISTRIBUTION

# AND

# HYDROMETRIC WORK

## WATER DISTRICT NO. 01

## SNAKE RIVER, IDAHO

1977

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# WATER DISTRIBUTION AND HYDROMETRIC WORK

## WATER DISTRICT No. 01

## SNAKE RIVER, IDAHO

### Introduction

The annual meeting of Water District No. 01 was held at Idaho Falls on March 7, 1977. Arthur L. Larson was elected as Watermaster for the ensuing year.

The following were elected as members of the Committee of Nine:

Leonard Graham, chairman; Lynn Loosli, vice-chairman; Reed Murdock, secretary; Bill Watt, Clifford N. Scoresby, R. Willis Walker, Lester Saunders, Kenneth Anderson, and George Stromire.

Alternate: Burdell Curtis.

Advisory members: Carlos Randolph, representing the Bureau of Reclamation; Wendell Johnson, representing the Gooding Project; and Merle Kunz, representing Teton Basin.

Principal resolutions adopted at the annual meeting were as follows:

1. That the following transmission losses be charged on stored water: 1.7% Moran to Palisades; 0.8% Palisades to Heise; 4.4% Heise to Lorenzo; 0.5% Lorenzo to Woodville; 6% Woodville to Blackfoot; 4% Henrys Lake to Island Park; 2% Island Park to Warm River; 0.5% Warm River to Ashton.

2. Adopted a budget of $126,280 to cover the expense of operating the District during the coming year.

3. Recommended the continuation of a pool committee to obtain and allocate rental water.

4. Reaffirmed support of an integrated multipurpose Lynn Crandall Project, the Salmon Falls Division of the Upper Snake River Project, and the Lower Teton Project.

5. Opposed any legislation which would establish minimum flows that would demand the waters of Idaho.

The year of 1977 has been termed the worst drought year on record. First indications were apparent in November, 1976, when precipitation was nil at many of the reporting stations, and remained much below normal until May of 1977. Near normal amounts of precipitation were recorded thereafter. The lack of precipitation during the winter months left the watersheds with only about a fifty percent normal snow pack, practically ruling out any "flood waters". Average precipitation at nine representative stations for the year was 12.38 inches compared to a normal of 15.91 inches. The November through April total was 3.09 inches compared to a normal of 8.42 inches.

Snow surveys on April 1 showed forty-one percent of average above Jackson Lake, thirty-nine percent in the Island Park area, and forty-eight percent on the Teton River. The normal flow at Heise was the lowest in 65 years of record, the yearly mean being 3,577 cubic feet per second as compared to 3,840 cubic feet per second in 1934.

Stored water use began on April 8th in the lower valley and on April 26th above American Falls, and ceased generally on about September 26th. The latest rights filled were the 1905 priorities for only a few days the latter part of May and early June. The earliest rights cut were the August 13, 1888, priorities on August 21st and 22nd. In contrast, the 1888 rights were not cut in 1961, but in 1934 were only partially filled after July 1. Timely rains in 1977 eased the situation considerably. Nearly all canals curtailed their diversions from the beginning of the season to make their storage last. With the careful use of water, the supply was nearly adequate and few serious crop losses resulted.

American Falls Reservoir was completely rebuilt and began storing for the 1978 season in mid-October. A more ideal year for rebuilding the dam could not have been selected, as conditions permitted draining the reservoir on schedule for breaching of the old dam. All users below American Falls agreed to share water on a pro-rata basis during the breaching because of the necessarily restricted low flow through the reservoir during that time.

Island Park and Palisades were also almost completely drained. Combined usable storage in the reservoir system on September 30 was 371,700 acre-feet, compared to the previous low since Palisades of 513,500 acre-feet in 1961.

Flow past Milner during the storage use season (April 6-September 30) was 2,820 acre-feet.

Flow past the Minidoka Dam was curtailed for upstream storage, or storage use, beginning September 25th, and continued well into 1978.

The U. S. Geological Survey elected to terminate their direct co-operative working agreement with the Water District to coincide with the retirement of A. L. Larson. The Geological Survey will continue to supply the

Water District with timely streamflow records at co-operative river gaging sites. The Water District need for real-time data at the lower valley canal gaging stations will probably necessitate continuation of the Water District role in collecting this data on an evaluated service basis. The Water District is scheduled to relocate and reorganize following the 1978 annual meeting.

The Committee of Nine met a number of times throughout the irrigation season. Many issues were resolved and much information exchanged as to current operational problems and proposed procedures. It must surely be a credit to the individual members that they returned to their respective areas and assisted the District in maintaining as smooth an operation as possible. The members of the Committee of Nine should be commended for their attendance and dedication to their elected responsibilities.

## PERSONNEL

People engaged in water distribution in Water District No. 01 during 1977 were as follows:

| | |
|---|---|
| Arthur L. Larson | Watermaster |
| C. Michael Bennett | Deputy Watermaster |
| Val Richards | Deputy Watermaster & Hydrographer, St. Anthony |
| L. C. Anderson | Hydrographer, St. Anthony |
| Harold W. Blauer | Hydrographer, Burley |
| W. Lee Wright | Hydrographer, Idaho Falls |
| Lola Dunn | Clerk |
| Arthur W. Wilson | Deputy Watermaster & Hydrographer, Teton Basin |
| Reed Brower | Deputy Watermaster, Teton Basin |
| Gail Blanchard | Deputy Watermaster, Lower Teton River |
| Sam B. Garrett | Deputy Watermaster, Henrys Fork |
| Elmer Lenz | Deputy Watermaster, Upper Falls River |
| Wilbur Brown | Deputy Watermaster, Heise Division |
| Russell Taylor | Deputy Watermaster, Rigby Division |
| Verall Smith | Deputy Watermaster, Blackfoot Division |
| Howard Hatfield | Deputy Watermaster, Swan Valley Division |
| Carlos Randolph | Supt., Minidoka Project, Bureau of Reclamation |
| Allan Templeton | Supt., American Falls Reservoir, Bureau of Reclamation |
| Tom Gates | Supt., Ririe Reservoir, Bureau of Reclamation |
| Owen Warren | Supt., Jackson Lake, Bureau of Reclamation |

Jeff Randall, Blanche Zollinger, Warren Travis, Doug Jackson, Roy Flavel, R. H. Seymour, Mario M. Purin, and Jess Jackson, gage readers.

## SNOW SURVEYS

The results of snow surveys for the past ten years are shown in the following tabulations. The figures for earlier years are shown in previous annual reports of the District. Normals are those computed by the Soil Conservation Service and are mostly for period 1958-72.

Depths in Inches (S-Snow; W-Water)

| YEAR | JAN 1 S | JAN 1 W | FEB 1 S | FEB 1 W | Mar 1 S | Mar 1 W | APR 1 S | APR 1 W |
|---|---|---|---|---|---|---|---|---|
| Moran (Snake River) | | | | | | | | |
| 1968 | 21 | 3.3 | 35 | 7.3 | 35 | 9.9 | 33 | 9.9 |
| 1969 | 28 | 5.5 | 44 | 11.4 | 49 | 13.6 | 44 | 14.0 |
| 1970 | 21 | 3.8 | 42 | 11.2 | 40 | 13.0 | 42 | 13.7 |
| 1971 | 33 | 7.8 | 41 | 13.0 | 47 | 14.8 | 51 | 17.9 |
| 1972 | 34 | 8.0 | 50 | 15.5 | 52 | 18.3 | 38 | 16.9 |
| 1973 | 24 | 4.6 | 30 | 7.2 | 36 | 9.4 | 35 | 10.0 |
| 1974 | 37 | 7.2 | 36 | 10.2 | 44 | 12.6 | 46 | 16.3 |
| 1975 | 21 | 3.9 | 36 | 8.0 | 47 | 12.9 | 52 | 15.4 |
| 1976 | 31 | 7.3 | 42 | 11.5 | 51 | 15.3 | 58 | 18.5 |
| 1977 | 12 | 1.4 | 20 | 4.0 | 23 | 4.1 | 25 | 5.6 |
| Normal | | 5.3 | | 9.6 | | 11.9 | | 12.6 |
| Moran Bay (Snake River) | | | | | | | | |
| 1968 | | | 42 | 10.4 | 56 | 16.3 | 51 | 17.8 |
| 1969 | | | 56 | 16.2 | 63 | 19.0 | 55 | 20.0 |
| 1970 | | | 66 | 18.8 | 60 | 21.4 | 63 | 23.6 |
| 1971 | | | 62 | 21.9 | 69 | 25.0 | 81 | 32.1 |
| 1972 | | | 68 | 21.5 | 78 | 28.8 | 67 | 30.0 |
| 1973 | | | 45 | 12.5 | 60 | 16.7 | 55 | 18.7 |
| 1974 | | | | | 72 | 23.8 | 82 | 30.4 |
| 1975 | | | 49 | 13.3 | 63 | 18.7 | 83 | 25.3 |
| 1976 | | | 66 | 21.7 | 82 | 26.9 | 88 | 31.9 |
| 1977 | | | 25 | 5.7 | 32 | 6.9 | 37 | 9.5 |
| Normal | | | | 14.7 | | 19.2 | | 21.9 |
| Arizona Station (Snake River) | | | | | | | | |
| 1968 | 24 | 4.7 | 41 | 9.6 | 47 | 13.7 | 50 | 16.1 |
| 1969 | 34 | 8.4 | 67 | 18.6 | 70 | 21.9 | 63 | 22.5 |
| 1970 | 28 | 5.3 | 58 | 14.8 | 51 | 16.3 | 57 | 19.8 |
| 1971 | 50 | 12.6 | 62 | 19.8 | 66 | 22.6 | 79 | 29.0 |
| 1972 | 44 | 11.2 | 55 | 16.6 | 64 | 21.7 | 57 | 23.0 |
| 1973 | 31 | 6.7 | 37 | 9.9 | 47 | 13.3 | 50 | 15.8 |
| 1974 | 45 | 10.3 | 56 | 15.8 | 65 | 20.0 | 50 | 26.1 |
| 1975 | 24 | 4.3 | 41 | 10.2 | 58 | 16.2 | 70 | 20.6 |
| 1976 | 38 | 10.3 | 53 | 16.2 | 70 | 21.9 | 80 | 26.7 |
| 1977 | 12 | 1.2 | 19 | 3.7 | 24 | 4.3 | 30 | 6.9 |
| Normal | | 7.8 | | 12.8 | | 16.5 | | 19.4 |

| YEAR | JAN 1 S | JAN 1 W | FEB 1 S | FEB 1 W | MAR 1 S | MAR 1 W | APR 1 S | APR 1 W |
|---|---|---|---|---|---|---|---|---|
| Huckleberry Divide (Snake River) | | | | | | | | |
| 1968 | 31 | 6.5 | 49 | 11.4 | 57 | 16.4 | 53 | 17.7 |
| 1969 | 36 | 8.6 | 66 | 17.8 | 70 | 21.7 | 60 | 21.9 |
| 1970 | 28 | 5.5 | 60 | 13.7 | 49 | 15.6 | 57 | 19.6 |
| 1971 | 50 | 12.2 | 59 | 18.6 | 64 | 21.3 | 76 | 26.4 |
| 1972 | 42 | 10.7 | 55 | 16.9 | 66 | 20.9 | 54 | 22.0 |
| 1973 | 32 | 7.5 | 39 | 10.6 | 48 | 13.8 | 53 | 16.1 |
| 1974 | 45 | 10.3 | 58 | 15.6 | 63 | 19.0 | 77 | 25.6 |
| 1975 | 30 | 5.7 | 48 | 12.3 | 56 | 15.7 | 77 | 22.1 |
| 1976 | 42 | 11.7 | 54 | 16.8 | 75 | 24.1 | 81 | 29.4 |
| 1977 | 15 | 2.2 | 23 | 5.1 | 31 | 6.2 | 38 | 9.6 |
| Normal | | 7.9 | | 14.6 | | 18.8 | | 21.6 |
| Snake River Station (Snake River) | | | | | | | | |
| 1968 | 29 | 5.8 | 47 | 10.7 | 57 | 17.0 | 56 | 19.2 |
| 1969 | 40 | 9.1 | 59 | 17.3 | 63 | 20.1 | 59 | 21.2 |
| 1970 | 32 | 6.2 | 69 | 16.8 | 58 | 19.4 | 63 | 23.2 |
| 1971 | 55 | 12.7 | 66 | 21.4 | 71 | 24.8 | 79 | 30.3 |
| 1972 | 44 | 11.0 | 63 | 19.6 | 77 | 26.1 | 65 | 27.4 |
| 1973 | 32 | 8.2 | 40 | 11.3 | 48 | 14.6 | 52 | 16.8 |
| 1974 | 45 | 9.8 | 61 | 16.8 | 65 | 21.0 | 74 | 26.5 |
| 1975 | 29 | 6.1 | 49 | 12.7 | 59 | 16.9 | 71 | 21.5 |
| 1976 | 43 | 12.7 | 61 | 20.3 | 74 | 23.9 | 88 | 29.9 |
| 1977 | 16 | 2.0 | 23 | 5.2 | 31 | 6.3 | 37 | 9.2 |
| Normal | | 8.2 | | 13.8 | | 18.3 | | 21.0 |
| Lewis Lake Divide (Snake River) | | | | | | | | |
| 1968 | 45 | 11.6 | 82 | 21.4 | 90 | 28.3 | 94 | 33.0 |
| 1969 | 59 | 15.4 | 110 | 34.4 | 117 | 42.0 | 104 | 42.4 |
| 1970 | 52 | 12.2 | 109 | 28.7 | 97 | 35.1 | 109 | 42.6 |
| 1971 | 111 | 29.3 | 124 | 44.7 | 135 | 53.5 | 156 | 65.6 |
| 1972 | 78 | 20.1 | 114 | 40.6 | 150 | 49.8 | 133 | 57.7 |
| 1973 | 52 | 14.7 | 68 | 21.4 | 82 | 28.1 | 88 | 32.4 |
| 1974 | 84 | 23.0 | 119 | 37.3 | 125 | 45.0 | 150 | 60.8 |
| 1975 | 46 | 9.4 | 75 | 21.1 | 104 | 32.2 | 125 | 43.6 |
| 1976 | 78 | 26.6 | 102 | 38.0 | 125 | 45.5 | 148 | 58.1 |
| 1977 | 20 | 2.9 | 29 | 6.8 | 45 | 9.4 | 57 | 15.8 |
| Normal | | 17.0 | | 27.5 | | 35.9 | | 42.1 |
| Aster Creek (Snake River) | | | | | | | | |
| 1968 | 33 | 7.9 | 69 | 16.3 | 66 | 20.3 | 67 | 22.5 |
| 1969 | 47 | 10.7 | 106 | 30.6 | 107 | 36.3 | 94 | 36.1 |
| 1970 | 34 | 7.6 | 84 | 20.6 | 69 | 23.0 | 79 | 28.8 |
| 1971 | 85 | 21.2 | 99 | 33.8 | 104 | 38.2 | 126 | 49.6 |
| 1972 | 62 | 15.1 | 92 | 30.3 | 119 | 39.9 | 100 | 42.7 |
| 1973 | 39 | 10.1 | 51 | 14.2 | 61 | 18.9 | 65 | 21.9 |
| 1974 | 66 | 17.5 | 88 | 24.9 | 94 | 26.4 | 116 | 44.0 |
| 1975 | 36 | 7.0 | 52 | 13.2 | 74 | 21.3 | 95 | 29.1 |
| 1976 | 56 | 17.7 | 67 | 24.4 | 90 | 30.0 | 109 | 40.3 |
| 1977 | 13 | 1.3 | 21 | 4.1 | 28 | 5.2 | 46 | 10.5 |
| Normal | | 12.7 | | 21.1 | | 26.6 | | 31.0 |

| YEAR | JAN 1 S | JAN 1 W | FEB 1 S | FEB 1 W | MAR 1 S | MAR 1 W | APR 1 S | APR 1 W |
|---|---|---|---|---|---|---|---|---|
| Colter Creek (Snake River) | | | | | | | | |
| 1968 | | | | | 56 | 18.6 | 55 | 19.6 |
| 1969 | | | 62 | 18.7 | 64 | 21.5 | 57 | 20.9 |
| 1970 | | | | | 64 | 22.8 | 66 | 25.0 |
| 1971 | | | | | 76 | 25.6 | 84 | 32.6 |
| 1972 | | | | | 82 | 26.0 | 61 | 23.7 |
| 1973 | | | | | 51 | 14.5 | 54 | 18.4 |
| 1974 | | | | | | | 88 | 31.3 |
| 1975 | | | | | 63 | 19.6 | 73 | 24.4 |
| 1976 | 61 | 16.6 | 68 | 23.2 | 81 | 29.3 | 85 | 34.2 |
| 1977 | 20 | 3.1 | 25 | 5.7 | 33 | 6.8 | 40 | 11.4 |
| Normal | | | | | | 19.7 | | 22.2 |
| Glade Creek (Snake River) | | | | | | | | |
| 1968 | 29 | 5.9 | 50 | 11.8 | 59 | 18.1 | 57 | 19.3 |
| 1969 | 36 | 9.1 | 64 | 18.1 | 67 | 21.0 | 63 | 23.0 |
| 1970 | 32 | 6.6 | 68 | 17.1 | 59 | 19.6 | 64 | 22.8 |
| 1971 | 61 | 15.1 | 71 | 24.0 | 75 | 26.8 | 89 | 34.8 |
| 1972 | 45 | 11.4 | 66 | 20.3 | 79 | 26.9 | 69 | 28.6 |
| 1973 | 36 | 9.1 | 44 | 12.5 | 56 | 16.9 | 58 | 19.5 |
| 1974 | 51 | 12.4 | 67 | 20.0 | 75 | 25.5 | 83 | 32.9 |
| 1975 | 32 | 6.2 | 51 | 13.7 | 68 | 20.4 | 79 | 25.1 |
| 1976 | 50 | 15.1 | 69 | 23.8 | 82 | 27.5 | 94 | 34.8 |
| 1977 | 17 | 2.0 | 27 | 5.8 | 34 | 7.3 | 40 | 11.1 |
| Normal | | 8.6 | | 14.7 | | 19.0 | | 22.2 |
| Base Camp (Snake River) | | | | | | | | |
| 1968 | 31 | 6.6 | 42 | 10.5 | 55 | 16.1 | 53 | 17.5 |
| 1969 | 42 | 9.0 | 61 | 16.7 | 62 | 20.4 | 58 | 20.3 |
| 1970 | 29 | 5.7 | 64 | 16.7 | 55 | 18.9 | 57 | 21.9 |
| 1971 | 54 | 14.0 | 69 | 22.7 | 74 | 25.0 | 86 | 32.2 |
| 1972 | 43 | 10.8 | 68 | 21.0 | 80 | 28.3 | 69 | 29.9 |
| 1973 | 37 | 7.8 | 37 | 11.1 | 45 | 13.3 | 45 | 15.1 |
| 1974 | 50 | 11.7 | 67 | 18.5 | 69 | 22.4 | 85 | 29.2 |
| 1975 | 24 | 4.7 | 44 | 10.7 | 57 | 16.0 | 68 | 20.5 |
| 1976 | 44 | 11.2 | 57 | 18.5 | 40 | 10.9 | 81 | 28.7 |
| 1977 | 13 | 1.6 | 21 | 4.3 | 26 | 5.3 | 32 | 7.5 |
| Normal | | 8.1 | | 13.9 | | 17.8 | | 20.1 |
| Average water content of ten Jackson Lake courses. | | | | | | | | |
| 1968 | | | | 12.9(9) | | 17.5 | | 19.3 |
| 1969 | | | | 20.0(9) | | 23.8 | | 24.2 |
| 1970 | | | | 17.6(9) | | 20.5 | | 24.1 |
| 1971 | | | | 24.4(9) | | 27.8 | | 35.0 |
| 1972 | | | | 22.5(9) | | 28.7 | | 30.2 |
| 1973 | | | | 12.3(9) | | 16.0 | | 18.5 |
| 1974 | | | | 19.9(8) | | 24.0(9) | | 32.3 |
| 1975 | | | | 12.8(9) | | 19.0 | | 24.8 |
| 1976 | | | | 21.2(9) | | 25.5 | | 33.2 |
| 1977 | | | | 5.0(10) | | 6.2 | | 9.0 |
| Normal | | | | 15.7(9) | | 20.4 | | 23.4 |

| YEAR | FEB 1 S | FEB 1 W | MAR 1 S | MAR 1 W | APR 1 S | APR 1 W | MAY 1 S | MAY 1 W |
|---|---|---|---|---|---|---|---|---|
| Turpin Meadows (Buffalo River) | | | | | | | | |
| 1968 | 29 | 6.3 | 33 | 9.5 | 36 | 10.4 | | |
| 1969 | 35 | 8.5 | 36 | 9.5 | 35 | 10.1 | | |
| 1970 | 40 | 9.1 | 34 | 10.5 | 34 | 11.3 | | |
| 1971 | 35 | 9.3 | 41 | 11.3 | 44 | 13.9 | | |
| 1972 | 37 | 10.0 | 41 | 12.6 | 30 | 12.0 | | |
| 1973 | 23 | 5.1 | 27 | 5.8 | 24 | 6.6 | | |
| 1974 | 39 | 10.0 | 42 | 12.5 | 46 | 14.3 | | |
| 1975 | 31 | 6.9 | 36 | 9.0 | 41 | 11.1 | | |
| 1976 | 40 | 11.6 | 46 | 13.6 | 49 | 15.9 | | |
| 1977 | 18 | 3.0 | 23 | 4.1 | 24 | 4.9 | | |
| Normal | | 7.4 | | 9.6 | | 10.3 | | |
| Four Mile Meadows (Buffalo River) | | | | | | | | |
| 1968 | 41 | 9.5 | 47 | 12.3 | 52 | 14.9 | | |
| 1969 | 42 | 10.3 | 43 | 11.9 | 44 | 13.1 | | |
| 1970 | 44 | 10.3 | 39 | 11.9 | 43 | 13.4 | | |
| 1971 | 42 | 11.5 | 49 | 14.0 | 57 | 17.8 | | |
| 1972 | 45 | 12.4 | 52 | 14.8 | 48 | 17.3 | | |
| 1973 | 28 | 6.4 | 34 | 7.8 | 39 | 9.1 | | |
| 1974 | 45 | 11.9 | 48 | 13.9 | 59 | 18.0 | | |
| 1975 | 37 | 8.3 | 41 | 10.6 | 52 | 13.5 | | |
| 1976 | 42 | 11.3 | 48 | 13.6 | 55 | 17.1 | | |
| 1977 | 20 | 3.6 | 26 | 4.6 | 35 | 7.4 | | |
| Normal | | 9.0 | | 11.6 | | 13.6 | | |
| Black Rock (Buffalo River) | | | | | | | | |
| 1968 | 59 | 15.3 | 67 | 20.3 | 69 | 22.6 | | |
| 1969 | 60 | 16.8 | 62 | 19.8 | 65 | 21.9 | | |
| 1970 | 64 | 16.6 | 59 | 18.9 | 64 | 22.0 | | |
| 1971 | 69 | 20.6 | 76 | 24.8 | 94 | 31.1 | | |
| 1972 | 63 | 18.8 | 80 | 24.1 | 76 | 28.6 | | |
| 1973 | 39 | 9.8 | 46 | 11.8 | 49 | 13.4 | | |
| 1974 | 67 | 17.7 | 67 | 21.6 | 85 | 28.3 | | |
| 1975 | 52 | 13.7 | 61 | 17.7 | 72 | 21.5 | | |
| 1976 | 62 | 19.6 | 76 | 23.6 | 81 | 28.6 | | |
| 1977 | 30 | 6.3 | 38 | 8.1 | 49 | 12.2 | | |
| Normal | | 14.5 | | 18.6 | | 22.3 | | |
| Togwotee Pass (Buffalo River) | | | | | | | | |
| 1968 | 62 | 18.3 | 77 | 25.0 | 78 | 27.8 | 73 | 29.1 |
| 1969 | 80 | 23.8 | 81 | 27.4 | 79 | 29.8 | 62 | 28.6 |
| 1970 | 82 | 21.5 | 72 | 23.9 | 82 | 29.9 | 106 | 37.1 |
| 1971 | 87 | 27.6 | 97 | 33.5 | 118 | 43.6 | 116 | 48.9 |
| 1972 | 84 | 27.1 | 107 | 34.9 | 97 | 40.8 | 96 | 44.0 |
| 1973 | 50 | 14.0 | 59 | 17.0 | 68 | 20.1 | 71 | 24.7 |
| 1974 | 83 | 23.1 | 81 | 26.9 | 108 | 38.3 | 90 | 41.1 |
| 1975 | 66 | 18.4 | 78 | 24.4 | 97 | 31.0 | 103 | 39.2 |
| 1976 | 75 | 24.9 | 98 | 32.0 | 102 | 38.8 | 100 | 41.2 |
| 1977 | 36 | 4.0 | 46 | 11.1 | 58 | 16.4 | 31 | 13.4 |
| Normal | | 20.0 | | 25.4 | | 30.6 | | 33.9 |

| YEAR | JAN 1 S | JAN 1 W | FEB 1 S | FEB 1 W | MAR 1 S | MAR 1 W | APR 1 S | APR 1 W |
|---|---|---|---|---|---|---|---|---|
| Valley View Ranch (Henry's Fork) | | | | | | | | |
| 1968 | 37 | 8.0 | 54 | 13.6 | 51 | 16.9 | 50 | 17.8 |
| 1969 | 33 | 6.3 | 75 | 22.4 | 85 | 28.1 | 69 | 28.1 |
| 1970 | 23 | 3.2 | 40 | 8.6 | 35 | 10.1 | 51 | 16.4 |
| 1971 | 47 | 12.2 | 55 | 17.9 | 65 | 22.2 | 69 | 26.1 |
| 1972 | 47 | 10.8 | 54 | 16.9 | 51 | 19.1 | 46 | 17.6 |
| 1973 | 24 | 4.1 | 33 | 6.3 | 32 | 8.0 | 39 | 10.8 |
| 1974 | 34 | 7.0 | 38 | 10.2 | 44 | 14.1 | 55 | 19.7 |
| 1975 | 24 | 3.5 | 33 | 7.7 | 47 | 12.8 | 61 | 19.2 |
| 1976 | 38 | 7.8 | 40 | 12.0 | 53 | 17.6 | 58 | 21.6 |
| 1977 | 8 | 1.4 | 20 | 2.2 | 21 | 4.9 | 25 | 6.3 |
| Normal | | 6.3 | | 12.3 | | 15.4 | | 17.7 |
| Big Springs (Henrys Fork) | | | | | | | | |
| 1968 | 32 | 5.9 | 55 | 12.1 | 51 | 16.8 | 50 | 17.9 |
| 1969 | 41 | 8.4 | 69 | 21.3 | 85 | 26.0 | 68 | 27.2 |
| 1970 | 30 | 5.4 | 62 | 16.3 | 55 | 18.6 | 67 | 23.2 |
| 1971 | 51 | 14.6 | 68 | 22.3 | 75 | 26.2 | 80 | 30.8 |
| 1972 | 59 | 12.4 | 67 | 20.7 | 70 | 25.6 | 62 | 27.1 |
| 1973 | 32 | 7.6 | 45 | 11.1 | 49 | 14.7 | 53 | 18.1 |
| 1974 | 51 | 10.6 | 62 | 18.2 | 69 | 22.3 | 80 | 30.0 |
| 1975 | 32 | 5.0 | 42 | 10.5 | 61 | 18.0 | 71 | 22.6 |
| 1976 | 45 | 10.5 | 50 | 15.3 | 64 | 21.5 | 68 | 24.6 |
| 1977 | 10 | 1.8 | 23 | 3.4 | 31 | 6.0 | 30 | 7.7 |
| Normal | | 7.8 | | 14.4 | | 18.6 | | 21.3 |
| Island Park (Henry's Fork) | | | | | | | | |
| 1968 | 26 | 4.4 | 46 | 8.9 | 44 | 12.9 | 30 | 13.5 |
| 1969 | 36 | 6.4 | 64 | 19.4 | 77 | 23.5 | 52 | 23.4 |
| 1970 | 27 | 4.6 | 54 | 12.6 | 48 | 15.1 | 58 | 19.4 |
| 1971 | 58 | 11.3 | 60 | 18.2 | 66 | 20.7 | 68 | 25.2 |
| 1972 | 51 | 10.6 | 54 | 15.9 | 51 | 17.6 | 45 | 16.3 |
| 1973 | 28 | 5.2 | 40 | 8.6 | 44 | 12.0 | 43 | 13.2 |
| 1974 | 43 | 8.8 | 51 | 13.3 | 59 | 17.7 | 63 | 22.2 |
| 1975 | 30 | 4.4 | 41 | 9.0 | 56 | 15.6 | 68 | 20.8 |
| 1976 | 40 | 8.8 | 44 | 12.9 | 58 | 18.4 | 60 | 21.5 |
| 1977 | 8 | 1.4 | 21 | 3.1 | 27 | 5.2 | 25 | 6.4 |
| Normal | | 6.1 | | 11.6 | | 14.7 | | 16.4 |
| Grassy Lake (Falls River) | | | | | | | | |
| 1968 | 55 | 12.9 | 81 | 22.4 | 91 | 30.2 | 89 | 33.8 |
| 1969 | 59 | 15.9 | 84 | 27.6 | 97 | 32.5 | 86 | 34.1 |
| 1970 | 54 | 12.4 | 102 | 27.4 | 91 | 33.2 | 101 | 33.8 |
| 1971 | 75 | 22.1 | 98 | 34.7 | 110 | 41.1 | 125 | 51.0 |
| 1972 | 76 | 18.9 | 99 | 33.1 | 116 | 43.3 | 108 | 45.9 |
| 1973 | 51 | 14.5 | 64 | 20.1 | 76 | 25.9 | 83 | 29.8 |
| 1974 | 73 | 18.8 | 96 | 30.8 | 106 | 33.4 | 119 | 48.8 |
| 1975 | 49 | 11.1 | 74 | 21.8 | 93 | 29.8 | 109 | 37.2 |
| 1976 | 72 | 22.9 | 97 | 34.4 | 110 | 40.4 | 126 | 50.3 |
| 1977 | 24 | 3.5 | 38 | 9.9 | 50 | 12.4 | 62 | 18.1 |
| Normal | | 14.1 | | 23.2 | | 30.1 | | 35.0 |

| YEAR | JAN 1 S | JAN 1 W | FEB 1 S | FEB 1 W | MAR 1 S | MAR 1 W | APR 1 S | APR 1 W | MAY 1 S | MAY 1 W |
|---|---|---|---|---|---|---|---|---|---|---|
| State Line (Teton River) | | | | | | | | | | |
| 1968 | 22 | 4.7 | 33 | 7.4 | 34 | 10.1 | 40 | 11.6 | 0 | 0 |
| 1969 | 32 | 6.4 | 44 | 11.3 | 53 | 15.1 | 46 | 16.4 | 10 | 4.2 |
| 1970 | 24 | 4.3 | 47 | 11.7 | 40 | 13.1 | 51 | 16.8 | 57 | 20.3 |
| 1971 | 31 | 7.1 | 41 | 12.3 | 48 | 14.1 | 51 | 18.1 | 37 | 15.7 |
| 1972 | 31 | 8.3 | 53 | 16.2 | 54 | 19.1 | 42 | 18.2 | 22 | 10.7 |
| 1973 | 22 | 5.0 | 32 | 8.3 | 37 | 10.8 | 49 | 13.9 | 33 | 12.2 |
| 1974 | 34 | 6.7 | 45 | 11.1 | 49 | 13.5 | 52 | 17.0 | 31 | 13.0 |
| 1975 | | | 36 | 8.3 | 49 | 14.1 | 57 | 17.5 | 58 | 20.2 |
| 1976 | 45 | 10.9 | 40 | 12.8 | 65 | 18.1 | 63 | 20.3 | 48 | 19.6 |
| 1977 | 7 | 1.2 | 16 | 2.7 | 19 | 2.6 | 31 | 7.0 | 0 | 0 |
| Normal | | 5.7 | | 9.9 | | 12.8 | | 14.9 | | 8.4 |
| Grover Park Divide (Salt River) | | | | | | | | | | |
| 1968 | 23 | 4.3 | 30 | 6.8 | 33 | 10.1 | 37 | 11.9 | 27 | 11.1 |
| 1969 | 32 | 6.1 | 39 | 9.8 | 43 | 13.4 | 40 | 14.0 | 14 | 5.3 |
| 1970 | 19 | 3.0 | 43 | 10.1 | 36 | 12.4 | 43 | 14.9 | 43 | 14.9 |
| 1971 | 29 | 6.8 | 43 | 13.4 | 51 | 15.1 | 54 | 20.5 | 42 | 17.6 |
| 1972 | 27 | 5.9 | 44 | 11.4 | 47 | 16.2 | 40 | 15.4 | 28 | 13.9 |
| 1973 | 28 | 6.0 | 33 | 8.5 | 36 | 9.9 | 38 | 12.0 | 31 | 11.6 |
| 1974 | | | 45 | 8.5 | 38 | 11.1 | 38 | 14.2 | 24 | 10.2 |
| 1975 | | | 36 | 8.6 | 43 | 12.6 | 52 | 15.8 | 47 | 17.4 |
| 1976 | 22 | 5.2 | 30 | 8.4 | 40 | 11.6 | 56 | 18.6 | 41 | 15.0 |
| 1977 | 5 | 0.7 | 14 | 2.6 | 17 | 3.6 | 31 | 7.3 | 0 | 0 |
| Normal | | 5.1 | | 8.2 | | 11.3 | | 12.8 | | 9.6 |
| CCC Camp FF12 (Salt River) | | | | | | | | | | |
| 1968 | 22 | 4.1 | 25 | 5.3 | 31 | 8.4 | 30 | 10.0 | 22 | 8.9 |
| 1969 | 30 | 5.4 | 39 | 9.6 | 48 | 13.5 | 42 | 14.0 | 11 | 4.7 |
| 1970 | 20 | 2.9 | 38 | 8.6 | 33 | 9.1 | 41 | 12.5 | 40 | 14.2 |
| 1971 | 33 | 7.9 | 46 | 14.1 | 56 | 17.3 | 58 | 21.7 | 44 | 18.2 |
| 1972 | 27 | 6.4 | 49 | 12.1 | 48 | 15.8 | 40 | 14.7 | 27 | 13.2 |
| 1973 | 25 | 5.1 | 29 | 7.7 | 32 | 8.3 | 39 | 11.2 | 33 | 12.0 |
| 1974 | | | 36 | 8.4 | 38 | 11.2 | 43 | 14.8 | 23 | 9.5 |
| 1975 | | | 38 | 8.3 | 43 | 11.4 | 52 | 15.6 | 44 | 16.1 |
| 1976 | 22 | 5.0 | 30 | 7.9 | 40 | 10.9 | 50 | 16.4 | 36 | 12.6 |
| 1977 | 6 | 0.8 | 16 | 3.3 | 19 | 3.3 | 29 | 7.2 | 0 | 0 |
| Normal | | 4.9 | | 8.2 | | 11.1 | | 12.2 | | 8.2 |
| Salt River Summit (Salt River) | | | | | | | | | | |
| 1968 | 25 | 4.8 | 31 | 7.1 | 40 | 10.4 | 39 | 12.6 | 29 | 11.3 |
| 1969 | 38 | 6.6 | 53 | 13.6 | 60 | 17.8 | 51 | 18.1 | 23 | 9.4 |
| 1970 | 23 | 3.5 | 50 | 11.3 | 43 | 12.7 | 46 | 15.6 | 47 | 16.0 |
| 1971 | 43 | 10.6 | 62 | 19.1 | 66 | 21.6 | 72 | 26.2 | 59 | 26.3 |
| 1972 | 37 | 7.9 | 61 | 16.0 | 63 | 21.4 | 54 | 22.1 | 44 | 21.4 |
| 1973 | 29 | 5.6 | 35 | 8.1 | 41 | 12.0 | 49 | 13.9 | 41 | 7.4 |
| 1974 | | | 48 | 13.0 | 48 | 15.1 | 55 | 18.4 | 36 | 14.6 |
| 1975 | | | 43 | 11.0 | 51 | 14.2 | 63 | 19.8 | 58 | 22.0 |
| 1976 | 31 | 7.4 | 38 | 10.4 | 52 | 15.0 | 64 | 22.4 | 52 | 20.4 |
| 1977 | 7 | 0.9 | 18 | 3.6 | 23 | 4.2 | 33 | 7.9 | 3 | 1.2 |
| Normal | | 6.4 | | 10.8 | | 14.6 | | 16.2 | | 13.9 |

| YEAR | JAN 1 S | JAN 1 W | FEB 1 S | FEB 1 W | MAR 1 S | MAR 1 W | APR 1 S | APR 1 W | MAY 1 S | MAY 1 W |
|---|---|---|---|---|---|---|---|---|---|---|
| Greys Boundary | | | | | | | | | | |
| 1968 | 24 | 4.3 | 35 | 8.4 | 34 | 10.6 | 28 | 10.4 | 0 | 0 |
| 1969 | 32 | 5.5 | 31 | 8.2 | 32 | 11.9 | 32 | 11.9 | | |
| 1970 | 19 | 2.9 | 33 | 10.0 | 36 | 11.7 | 37 | 13.3 | 31 | 10.5 |
| 1971 | 27 | 4.8 | 39 | 10.9 | 41 | 13.1 | 41 | 15.2 | 16 | 7.0 |
| 1972 | 28 | 7.4 | 36 | 9.5 | 40 | 13.3 | 30 | 11.4 | | |
| 1973 | 22 | 5.3 | 31 | 6.6 | 40 | 10.6 | 36 | 11.4 | 10 | 3.9 |
| 1974 | -- | ---- | 41 | 10.9 | 45 | 13.7 | 38 | 15.6 | 8 | 3.2 |
| 1975 | | | 25 | 6.6 | 46 | 12.0 | 46 | 16.2 | 38 | 14.7 |
| 1976 | 23 | 5.2 | 33 | 9.3 | 42 | 12.8 | 51 | 17.4 | 28 | 11.1 |
| 1977 | 6 | 0.8 | 19 | 3.2 | 20 | 3.5 | 23 | 6.6 | 0 | 0 |
| Normal | | 4.4 | | 7.9 | | 10.4 | | 10.9 | | 2.1 |

On April 1, 1977, the snow (water content) was the following average percent of normal: above Jackson Lake 41%; Moran to Heise 53%; Island Park 39%; Falls River 52%; Teton River 48%.

Comparable figures for runoff during the year ending September 30, 1977, as percent of normal were: Snake River at Moran 45%; Snake River near Heise 51%; Henrys Fork near Ashton 99%; Falls River near Squirrel 69%.

The following tables show forecasts of streamflow made last spring compared to observed run-off:

Forecasts by Soil Conservation Service - April 1, 1977

| Station | Runoff in acre-feet from April through Sept. Forecast | Observed | % Difference |
|---|---|---|---|
| Snake River at Moran | 420,000 | 340,500* | +23 |
| Snake River near Heise | 1,750,000 | 1,490,000* | +17 |
| Salt River near Etna | 70,000 | 115,000 | -39 |
| Henrys Fork near Ashton | 420,000 | 542,200* | -23 |
| Teton River near St. Anthony | 250,000 | 160,000 | +56 |

*Corrected for storage in upstream reservoirs.

## FORECASTS BY NATIONAL WEATHER SERVICE - APRIL 1, 1977

| | Runoff in Acre-Feet - April through July | | |
|---|---|---|---|
| | Forecast | Observed | % Difference |
| Snake River at Moran | 304,000 | 302,840* | +0.4 |
| Snake River near Heise | 1,300,000 | 1,173,000* | +10.8 |
| Salt River near Etna | 93,000 | 83,900 | +10.8 |
| Henrys Fork near Ashton | 310,000 | 327,300* | -5.3 |
| Henrys Fork near Rexburg | 553,000 | 557,000** | -0.7 |
| Falls River near Squirrel | 190,000 | 190,000* | 0.0 |
| Teton River near St. Anthony | 193,000 | 125,000 | +54.4 |

*Corrected for storage in upstream reservoirs
**Corrected for diversions and storage.

## 1977 REGULATION SCHEDULE

| Date | Priority Being Filled |
|---|---|
| Apr. 8 | Mar. 30, 1921 |
| 13 | Aug. 6, 1908 |
| 15 | Oct. 7, 1905 |
| 24 | Oct. 11, 1900 |
| 27 | Feb. 6, 1895 |
| May 1 | Jan. 9, 1895 |
| 4 | June 1, 1894 |
| 6 | Part of Dec. 14, 1891 |
| 10 | Jan. 24, 1891 |
| 12 | Jan. 9, 1895 |
| 16 | June 1, 1894 |
| 18 | Part of Mar. 26, 1903 |
| 20 | Part of Oct. 11, 1900 |
| 23 | Part of Feb. 6, 1895 |
| 25 | Part of Apr. 1, 1896 |
| 27 | Part of Oct. 7, 1905 |
| 31 | Part of Jan. 9, 1895 |
| June 3 | Part of Nov. 24, 1890 |
| 6 | Part of Mar. 26, 1903 |
| 15 | Part of Feb. 6, 1895 |
| 17 | Jan. 9, 1895 |
| 20 | June 1, 1893 |
| 24 | June 1, 1891 |
| 27 | Nov. 24, 1890 |
| 30 | June 1, 1890 |
| July 1 | June 2, 1889 |
| 3 | July 3, 1889 |
| 4 | July 12 1890 |
| 8 | Nov. 24, 1890 |
| July 11 | June 1, 1890 |
| 14 | May 11, 1889 |
| 25 | Nov. 24, 1890 |
| 28 | July 12, 1890 |
| 29 | July 10, 1889 |
| 30 | June 2, 1889 |
| 31 | May 11, 1889 |
| Aug. 5 | July 10, 1889 |
| 7 | Oct. 16, 1890 |
| 10 | June 10, 1890 |
| 11 | June 1, 1890 |
| 12 | June 2, 1889 |
| 13 | May 11, 1889 |
| 14 | May 1, 1889 |
| 21 | Aug. 13, 1888 |
| 23 | Apr. 6, 1889 |
| 24 | Apr. 15, 1889 |
| 25 | May 11, 1889 |
| 26 | July 12, 1890 |
| 27 | Oct. 16, 1890 |
| Sept. 1 | July 10, 1889 |
| 9 | June 2, 1889 |
| 11 | May 1, 1889 |
| 16 | June 11, 1889 |
| 17 | June 2, 1889 |
| 19 | June 1, 1890 |
| 21 | July 12, 1890 |
| 22 | Aug. 18, 1894 |
| 25 | Regulation Discontinued |

## WATER SUPPLY

Runoff in acre-feet at various gaging stations duirng the year ending September 30, 1977, was as follows:

| Station | 1977 Runoff | Average Runoff Past Years | Years of Record | 1977 % of Average |
|---|---|---|---|---|
| Snake River at Moran | 475,200 | 1,050,000 | 74 | 45 |
| Snake River near Heise | 2,583,000 | 5,048,000 | 67 | 51 |
| Snake River at Neeley | 2,995,000 | 5,235,000 | 51 | 57 |
| Falls River near Squirrel | 390,000 | 567,000 | 63 | 69 |
| Henrys Fork near Ashton | 1,039,000 | 1,051,000 | 57 | 99 |
| Henrys Fork near Rexburg | 991,450 | 1,461,000 | 68 | 68 |

The runoff at Moran has been corrected for Jackson Lake holdovers; near Heise for Jackson Lake and Palisades holdovers; at Neeley for Palisades and American Falls holdovers; at Squirrel for Grassy Lake holdovers; at Ashton for Island Park and Henrys Lake holdovers; at Rexburg for Grassy Lake, Island Park, and Henrys Lake holdovers.

Maximum mean dialy discharges were as follows:

| | |
|---|---|
| Snake River at Moran | 4,980 cfs on June 25 |
| Snake River near Heise | 12,700 cfs on June 9 |
| Snake River near Blackfoot | 6,130 cfs on May 27 |
| Henrys Fork near Rexburg | 2,710 cfs on Oct. 4 |
| Blackfoot River near Blackfoot | 1,217 cfs* on Nov. 2 |
| Snake River at Milner | 9,040 cfs on Dec. 2 |

*Includes 753 cfs in bypass channel.

Unregulated flow at Heise would have been 12,300 cfs on June 10.

Annual reservoir holdovers in thousands of acre-feet on September 30, during the past ten years are shown in the following tabulation:

| Year | Jackson Lake | Palisades | American Falls | Lake Walcott | Henrys Lake | Island Park | Grassy Lake | Total |
|---|---|---|---|---|---|---|---|---|
| 1968 | 585.5 | 1,094 | 751 | 94.0 | 77.8 | 90.2 | 9.2 | 2,701.7 |
| 1969 | 569.7 | 648 | 239 | 92.3 | 72.6 | 52.1 | 7.0 | 1,680.7 |
| 1970 | 573.9 | 918 | 811 | 93.8 | 73.7 | 72.2 | 11.4 | 2,554.0 |
| 1971 | 598.3 | 1,066 | 1,285 | 93.7 | 83.5 | 93.7 | 12.8 | 3,233.0 |
| 1972 | 584.8 | 1,047 | 984 | 96.4 | 82.5 | 86.7 | 9.5 | 2,890.9 |
| 1973 | 607.4 | 629 | 82 | 82.4 | 79.9 | 71.8 | 9.7 | 1,562.2 |
| 1974 | 586.7 | 1,018 | 251 | 93.9 | 82.0 | 109.3 | 10.3 | 2,151.2 |
| 1975 | 577.0 | 1,070 | 428 | 97.6 | 76.8 | 104.5 | 9.9 | 2,363.8 |
| 1976 | 563.6 | 1,120 | 265 | 96.5 | 81.3 | 50.2 | 10.3 | 2,186.9 |
| 1977 | 227.3 | 32 | 0 | 34.4 | 60.2 | 11.1 | 6.8 | 371.7 |
| Avg. | 547.4 | 864 | 510 | 87.5 | 77.0 | 74.2 | 9.7 | 2,170.1 |

The Palisades figures are after deducting 201,000 acre-feet dead storage. The usable capacities of the above reservoirs total 4,082,000 acre-feet when American Falls is at its unrestricted cpacity of 1,700,000 acre-feet. The 1977 holdover is the lowest of record since Palisades and compares to 513,500 in 1961, the previous low.

## PERMITS, TRANSFERS, AND EXCHANGES

The following permits to appropriate the public waters of the State of Idaho in Water District No. 01 were approved by the Idaho Department of Water Resources during the past year.

21-7098 - Marsdon, John, 3.20 cfs, priority Nov. 22, 1976, from an unnamed spring, non-tributary, with the point of diversion in NE¼NW¼ sec. 8, T. 8N, R. 45E., in conjunction with a 15 acre-foot storage reservoir.

21-7105 - Reynolds, Dan, 3.00 cfs, plus 300 acre-feet storage, priority of March 8, 1977, from Sand Creek with a point of diversion in SW¼NW¼ sec. 24, T. 9N., R. 42E.

21-7111 - Threet, Charles &/or Wilma, 0.20 cfs priority of April 26, 1977, from Blue Spring Creek, with a point of diversion in NE¼NE¼ sec. 17, T. 12N., R. 43E.

21-7131 - Momberger, J. C., 0.42 cfs from East Garner Spring, tributary of Jones Creek tributary to Henrys Fork, priority of July 13, 1977, point of diversion NW¼NW¼ sec. 5, T. 14N., R. 44E.

22-7205 - Parkinson, Bob, 11.0 cfs, priority Jan. 18, 1977, from Teton River in NE¼SE¼ sec. 23, T. 7N., R. 41E.

22-7243 - Thomason, Charles G., 1.60 cfs from Cedar Point Drain, tributary to Texas Slough, point of diversion in SE¼SW¼ sec. 2, T. 5N., R. 39E., priority of June 6, 1977.

22-7254 - Potter Enterprises, Inc., 1.0 cfs from Neville Spring, non-tributary, with priority of Aug. 15, 1977, point of diversion in SW¼SE¼ sec. 24, T. 6N., R. 43E.

27-7085 - Burns, Zelma C., .80 cfs from unnamed drain to Snake River, priority date of May 17, 1977, point of diversion in NE¼SW¼ sec. 25, T. 1S, R. 36E.

29-7408 - Cooper, Gerald D., 0.50 cfs from Sunbeam Creek, tributary to Snake River, priority date of June 10, 1977.

35-7518 - Strochein Ranches, Inc., 3.20 cfs, from an unnamed drain tributary to Snake River, diversion point in SE¼SW¼ sec. 19, T. 4S., R. 32E., with a priority date June 26, 1975.

## EXCHANGES

21-7120 - Nedrow, George Jr., 5.00 cfs, from groundwater into Ashton Reservoir and rediverted, all within the SE¼SE¼ sec. 21, T. 9N., R. 42E., with a priority date of May 16, 1977.

21-7127 - Griffel, Mary C., 4.20 cfs from a groundwater source in SE¼SE¼ sec. 5, T. 8N., R. 43E., into Falls River and rediverted in NW¼NE¼ sec. 8, T. 8N., R. 43E., priority June 15, 1977.

22-7265 - Parkinson, Bob, 4.50 cfs from a well in SW¼NE¼ sec. 29, T. 7N., R. 41E., into the Teton River, and rediverted in NE¼SE¼ sec. 23, T. 7N., R. 42E., priority of November 16, 1977.

25-7106 - Covington Brothers, 8.00 cfs from a well in SW¼SW¼ sec. 27, T. 4N, R. 40E., into the Dry Bed of the Snake River, and rediverted in SE¼ NE¼ sec. 26, T. 4N., R. 40E., priority of April 15, 1977.

43-7076 - Kuwanna, Masaki M., 2.44 cfs from a well in Lot 2, sec. 19, T. 9S., R. 28E., into the Snake River and to be rediverted in SW¼SW¼ sec. 21, T. 9S., R. 28E., priority of May 24, 1977.

## CANAL DELIVERIES

Daily diversions from Snake River by canals above American Falls Reservoir during the 1977 season are shown on plates 6-10C and 16-20B.

Daily diversions for canals below American Falls are included on Plates

Miscellaneous measurements of various canals and streams in the headwater areas are shown on Plate

Total canal diversions during 1977 irrigation season by all canals in the district, including headwater areas, as tabulated in the annual billing for District No. 01, amounted to 6,484,880 acre-feet. This is 1,193,183 acre-feet less than 1976 and 440,000 less than 1961.

### DIVERSIONS DURING 1977 IRRIGATION SEASON BY SNAKE RIVER CANALS

May thru September for upper valley canals; April 15 thru September for lower valley canals.

(Canals in downstream order from Heise)

| Canal | Diversions (Acre-Feet) | Acres Irrigated | Acre-Feet Per Acre |
|---|---|---|---|
| Riley | 4,550 | 900 | 5.1 |
| Progressive Irrig. District | 189,300 | 33,000 | 5.7 |
| Farmers Friend | 104,800 | 10,500 | 10.0 |
| Enterprise Canal | 38,200 | 5,200 | 7.4 |
| Nelson | 405 | 55 | 7.4 |
| Mattson-Craig | 3,420 | 485 | 7.1 |
| Ross and Rand | 708 | 145 | 4.9 |
| Butler Island | 10,150 | 1,100 | 9.2 |
| Harrison | 114,400 | 13,000 | 8.8 |
| Cheney (includes Steele) | 2,430 | 323 | 7.5 |
| Rudy Irrigation Co. | 58,560 | 5,000 | 11.7 |
| Kite and Nord | 1,450 | 210 | 6.9 |
| Burgess | 201,900 | 22,000 | 9.2 |
| Clark and Edwards | 21,570 | 1,940 | 11.1 |
| Lowder | 8,320 | 1,000 | 8.3 |
| East Labelle | 34,370 | 3,000 | 11.5 |
| Sunnydell | 30,170 | 3,780 | 8.0 |
| Lenroot | 24,900 | 3,100 | 8.0 |
| Reid | 39,350 | 5,500 | 7.2 |
| Texas Feeder | 62,860 | 10,000 | 6.3 |
| Nelson-Corey | 1,450 | 270 | 5.4 |
| Hill-Pettinger | 1,020 | 200 | 5.1 |
| Rigby | 46,870 | 4,000 | 11.7 |
| Dilts | 4,470 | 620 | 7.2 |
| Island | 38,620 | 5,500 | 7.0 |
| W. Labelle & Long Island | 150,500 | 10,500 | 14.3 |
| Parks and Lewisville | 98,540 | 8,500 | 11.6 |
| North Rigby | 14,690 | 1,400 | 10.5 |
| White | 600 | 110 | 5.5 |
| Ellis | 417 | 70 | 6.0 |

| Canal | Diversions (Acre-Feet) | Acres Irrigated | Acre-Feet Per Acre |
|---|---|---|---|
| Bramwell | 1,030 | 470 | 2.2 |
| Butte and Market Lake | 77,080 | 20,000 | 3.9 |
| Osgood | 14,670 | 6,210(c) | 2.4 |
| Bear Island and Smith | 1,090 | 330 | 3.3 |
| Idaho | 268,000 | 35,850 | 7.5 |
| Kennedy | 3,970 | 2,200 | 1.8 |
| Great Western and Porter | 176,900 | 30,220 | 5.9 |
| Woodville | 15,700 | 2,350 | 6.7 |
| Snake River Valley | 141,970 | 20,790 | 6.8 |
| Reservation | 119,860(e) | 54,770 | 2.2 |
| Blackfoot | 81,580 | 15,000 | 5.4 |
| New Lava Side | 34,550 | 6,000 | 5.8 |
| Peoples | 92,580 | 20,000 | 4.6 |
| Aberdeen | 277,100 | 63,000 | 4.4 |
| Corbett | 37,980 | 6,000 | 6.3 |
| Nielsen-Hansen | 2,370 | 460 | 5.2 |
| Riverside | 29,300 | 5,000 | 5.9 |
| Danskin | 50,380 | 8,000 | 6.3 |
| Trego | 14,500 | 1,620 | 9.0 |
| Wearyrick | 16,410 | 1,600 | 10.3 |
| Watson | 26,480 | 3,000 | 8.8 |
| Parsons | 11,220 | 930 | 12.1 |
| Ft. Hall Michaud Canal | 33,340(f) | 14,819 | 2.2 |
| Falls Irrigation District | 22,770(g) | 7,868(g) | 2.9 |
| Minidoka Irrigation District | 384,840 | 72,000 | 5.3 |
| Burley Irrigation District | 207,030 | 48,000 | 4.3 |
| A & B Irrigation District | 53,470 | 14,520 | 3.7 |
| Twin Falls Canal Co. | 937,880 | 202,700 | 4.6 |
| North Side Canal | 815,540 | 160,000 | 5.1 |
| Milner Low Lift | 56,340 | 12,825(h) | 4.4 |
| Gooding | 304,490 | 63,700 | 4.8 |
| TOTAL | 5,619,390 | 1,052,252 | 5.3 |

(a) Received additional water from Willow and Sand Creeks.
(b) Used additional water from Willow Creek early in season.
(c) Water pumped from wells for about 600 acres of this land.
(d) Includes 7,680 acres outside New Sweden District to which water was delivered.
(e) Supplements main supply from the Blackfoot River.
(f) Includes 12,919 acre-feet pumped from wells.
(g) Acreage includes 691 acres of non-project land supplied from canal. An additional 3,378 acres of project land were irrigated by pumping 6,321 acre-feet from wells.
(h) Six hundred and forty-five acres outside the district did not receive water this year.

These main river canals diverted about 20 percent less water than in 1976. Of the 2,759,520 acre-feet diverted by lower valley canals (below Neeley), 1,845,643 acre-feet, or 67 percent was stored water. Upper valley main canals diverted 2,859,800 acre-feet of which 837,982 acre-feet, or 29 percent, was stored water.

The following tabulation shows the monthly diversions in various sections of the district during the past ten years:

Diversions in Thousands of Acre-Feet

| Year | May | June | July | Aug. | Sept. | Season |
|---|---|---|---|---|---|---|
| Heise to Blackfoot | | | | | | |
| 1968 | 541 | 720 | 871 | 534 | 492 | 3,158 |
| 1969 | 649 | 679 | 838 | 741 | 547 | 3,454 |
| 1970 | 287 | 780 | 840 | 760 | 475 | 3,142 |
| 1971 | 383 | 748 | 817 | 720 | 462 | 3,130 |
| 1972 | 673 | 752 | 840 | 662 | 543 | 3,470 |
| 1973 | 564 | 876 | 831 | 747 | 460 | 3,478 |
| 1974 | 539 | 874 | 903 | 720 | 639 | 3,675 |
| 1975 | 134 | 759 | 924 | 756 | 625 | 3,198 |
| 1976 | 324 | 704 | 909 | 654 | 543 | 3,134 |
| 1977 | 570 | 686 | 676 | 537 | 383 | 2,852 |
| Average | 466 | 758 | 845 | 683 | 517 | 3,269 |
| Henrys Fork and Tributaries (excluding headwater areas) | | | | | | |
| 1968 | 207 | 217 | 246 | 154 | 124 | 948 |
| 1969 | 238 | 223 | 248 | 194 | 135 | 1,038 |
| 1970 | 146 | 259 | 248 | 215 | 109 | 977 |
| 1971 | 179 | 239 | 250 | 208 | 109 | 985 |
| 1972 | 240 | 236 | 251 | 199 | 114 | 1,040 |
| 1973 | 186 | 267 | 233 | 208 | 129 | 1,023 |
| 1974 | 217 | 263 | 248 | 190 | 164 | 1,082 |
| 1975 | 84 | 239 | 264 | 207 | 145 | 939 |
| 1976 | 166 | 157 | 201 | 173 | 93 | 790 |
| 1977 | 153 | 186 | 163 | 106 | 68 | 676 |
| Average | 182 | 229 | 235 | 185 | 119 | 950 |
| Minidoka Project | | | | | | |

| | April | May | June | July | Aug. | Sept. | Season |
|---|---|---|---|---|---|---|---|
| 1968 | 45 | 169 | 146 | 199 | 101 | 97 | 757 |
| 1969 | 63 | 192 | 138 | 197 | 179 | 95 | 864 |
| 1970 | 36 | 124 | 135 | 192 | 175 | 83 | 745 |
| 1971 | 21 | 120 | 150 | 201 | 180 | 97 | 769 |
| 1972 | 52 | 172 | 142 | 190 | 162 | 82 | 800 |
| 1973 | 24 | 154 | 155 | 182 | 155 | 80 | 750 |
| 1974 | 31 | 169 | 163 | 186 | 152 | 102 | 803 |
| 1975 | 53 | 68 | 153 | 188 | 146 | 107 | 715 |
| 1976 | 13 | 148 | 152 | 185 | 127 | 85 | 710 |
| 1977 | 105 | 50 | 132 | 153 | 122 | 62 | 624 |
| Average | 44 | 137 | 147 | 187 | 150 | 89 | 754 |

Diversions in thousands of acre-feet - continued:

| Year | April | May | June | July | Aug. | Sept. | Season |
|---|---|---|---|---|---|---|---|
| North Side Canal Co. Project | | | | | | | |
| 1968 | 98 | 200 | 208 | 249 | 202 | 163 | 1,120 |
| 1969 | 89 | 214 | 212 | 236 | 237 | 172 | 1,160 |
| 1970 | 71 | 183 | 202 | 234 | 231 | 153 | 1,074 |
| 1971 | 111 | 189 | 202 | 241 | 240 | 172 | 1,155 |
| 1972 | 81 | 208 | 212 | 240 | 231 | 162 | 1,134 |
| 1973 | 63 | 203 | 213 | 243 | 227 | 147 | 1,096 |
| 1974 | 57 | 204 | 220 | 246 | 222 | 165 | 1,114 |
| 1975 | 26 | 130 | 206 | 240 | 223 | 169 | 994 |
| 1976 | 47 | 176 | 207 | 246 | 212 | 150 | 1,038 |
| 1977 | 156 | 212 | 213 | 255 | 221 | 83 | 1,140 |
| Average | 80 | 192 | 210 | 243 | 225 | 154 | 1,102 |
| Twin Falls Project | | | | | | | |
| 1968 | 106 | 220 | 204 | 239 | 193 | 157 | 1,112 |
| 1969 | 125 | 225 | 197 | 227 | 220 | 157 | 1,158 |
| 1970 | 80 | 194 | 194 | 228 | 231 | 144 | 1,071 |
| 1971 | 62 | 186 | 196 | 240 | 238 | 164 | 1,086 |
| 1972 | 86 | 210 | 196 | 236 | 223 | 150 | 1,101 |
| 1973 | 60 | 207 | 197 | 228 | 216 | 149 | 1,057 |
| 1974 | 63 | 213 | 203 | 228 | 216 | 154 | 1,077 |
| 1975 | 29 | 102 | 194 | 240 | 232 | 176 | 973 |
| 1976 | 30 | 203 | 213 | 241 | 213 | 146 | 1,046 |
| 1977 | 139 | 177 | 176 | 197 | 189 | 108 | 986 |
| Average | 78 | 194 | 197 | 230 | 217 | 150 | 1,067 |
| Gooding Project | | | | | | | |
| 1968 | 30 | 91 | 94 | 100 | 84 | 74 | 473 |
| 1969 | 16 | 77 | 73 | 95 | 95 | 76 | 432 |
| 1970 | 17 | 85 | 89 | 97 | 93 | 77 | 458 |
| 1971 | 22 | 76 | 88 | 100 | 97 | 82 | 465 |
| 1972 | 31 | 89 | 91 | 98 | 99 | 79 | 487 |
| 1973 | 41 | 85 | 88 | 95 | 90 | 70 | 469 |
| 1974 | 18 | 83 | 93 | 98 | 90 | 80 | 462 |
| 1975 | 11 | 57 | 85 | 96 | 96 | 79 | 424 |
| 1976 | 21 | 75 | 89 | 99 | 85 | 75 | 444 |
| 1977 | 52 | 60 | 67 | 75 | 65 | 8 | 327 |
| Average | 26 | 78 | 86 | 95 | 89 | 70 | 444 |

## RIVER DATA

The usual methods of segregating stored water and normal flow at the reservoir outlets was continued in use during 1977. Palisades reservoir was operated on the same basis as Jackson Lake, namely, convert the daily drop in lake level to second-feet and call it storage from Palisades. For some time after storage draft started, a lag of several days was maintained in making normal flow cuts to avoid any possible natural flow losses at the high lake levels existing at Palisades and Jackson Lake. Later on in the season when dropping lake and river levels resulted in bank storage return, this water was gradually recovered for credit as stored water so that it balanced out by the end of the irrigation season.

Daily figures showing segregation of flow at the various river gaging stations and storage diversions by canals are shown in Plates 12 and 13 for Snake River and Plate 21 for Henrys Fork.

Storage use started on April 8 in the lower valley and April 26 in the upper valley and continued through about September 26.

Total theoretical storage passing the Blackfoot station during the season amounted to 250,000 acre-feet versus 240,000 as computed at the station. The discrepancy is attributed to accumulative errors early in the season in setting decreed dates and would indicate rights may not have been cut back far enough at times.

Blackfoot River reservoir holdover on September 30 was 103,400 acre-feet. The Indian Service 1891 decree was cut off for much of the summer.

A variation from standard deliveries was mutually agreed upon in the lower valley for the period of September 7-25 when American Falls Reservoir had to be at zero contents and minimum pass-through flow for the breaching of the old dam. All entities involved agreed to a pro-rata share of the available water comprised of about 500 to 1,200 cfs past Blackfoot, 2,750 cfs spring inflow to the reservoir, about 300-400 cfs river gain Neeley to Milner, and 12,000 acre-feet yield from Lake Walcott. The Twin Falls Canal Co. relinquished some of their natural flow right, the Gooding shut down or off, and through the agreed upon "sharing agreement", this period of critical water supply was survived in reasonably good shape.

A program of exchanging ground water for natural flow was utilized in several areas. This consisted of pumping from a ground water source into a live stream and then recapturing this same supply elsewhere on the stream. This system replaced the rental water supply by some users, which was not available this year, or initiated a completely new supply. This system was used extensively on the Teton River where developments predicated on the Teton Reservoir had to have an alternate supply. In all cases water pumped from the river was replaced by the ground water exchange.

Some minor discrepancies in stream-flow discharges as shown in this report and the final published figures in the "Water Resources for Idaho" may occur due to the lag time in final reviewed data by the USGS. In order to expedite this Water District report, provisional figures are used, but the error of the final computations is expected to be minute.

## STORED WATER DELIVERIES

### RESERVOIR ALLOTMENTS

Jackson Lake filled 75 percent, American Falls filled 100 percent of its 66.2 percent restricted capacity, and Palisades filled 100 percent. Allotments were made as follows:

| | |
|---|---|
| American Falls | 1,124,780 acre-feet |
| Jackson Lake | 634,036 acre-feet |
| Palisades | 1,200,000 acre-feet |

### 1977 Storage Allotments in Acre-Feet

(Downstream order from Heise)

| Canal | Am. Falls | Jackson Lake | Palisades | Total |
|---|---|---|---|---|
| Poplar Irrigation District | 445 | 1,340 | 1,550 | 3,335 |
| Progressive Irrig. Dist. | 8,261 | 6,078 | 28,500 | 42,839 |
| Farmers Friend | | 1,685 | 9,400 | 11,085 |
| Enterprise Canal Co. | 5,904 | 10,407 | 19,600 | 35,911 |
| Mattson-Craig | | | 1,440 | 1,440 |
| Butler Island | | | 250 | 250 |
| Harrison | 7,956 | 10,070 | 23,500 | 41,526 |
| Rudy | 1,753 | 793 | 15,700 | 18,246 |
| Burgess | 6,283 | 8,940 | 31,400 | 46,623 |
| Clark and Edwards | | | 800 | 800 |
| Lowder | | 877 | 1,600 | 2,477 |
| East Labelle | | | 800 | 800 |
| Sunnydell | | 3,372 | 6,300 | 9,672 |
| Lenroot | 2,559 | 4,708 | 7,850 | 15,117 |
| Reid | 1,687 | 331 | 3,150 | 5,168 |
| Texas and Liberty Park | | | 2,350 | 2,350 |
| Enterprise Irr. Dist (N.F.) | 6,741 | 4,961 | | 11,702 |
| Fremont-Madison Irr. Dist. | | | 1,000* | 1,000 |
| Rigby | | | 6,300 | 6,300 |
| Island | | | 4,700 | 4,700 |
| Dilts | 586 | 431 | 1,200 | 2,217 |
| West Labelle | | | 1,000 | 1,000 |
| Long Island | | | 5,000 | 5,000 |
| Parks and Lewisville | | | 5,500 | 5,500 |
| North Rigby | | | 1,200 | 1,200 |
| Butte and Market Lake | 3,087 | 2,538 | 44,000 | 49,625 |
| Osgood (U&I Sugar Co) | 8,905 | 7,652 | 15,250* | 31,807 |
| Bear Island | 126 | 24 | | 150 |
| Sakaguchi (Smith & Kennedy) | 47 | 77 | | 124 |
| Clement Bros. (Kennedy) | | 88 | | 88 |
| Owners Mutual | | 168 | 290 | 168 |
| Idaho | 15,159 | 11,154 | 58,800 | 85,113 |
| Martin | 1,327 | 2,242 | 5,600 | 9,169 |
| New Sweden Irr. Dist. | 17,025 | 16,743 | 31,400 | 65,168 |
| West Side Mutual | | | 2,350 | 2,350 |
| Woodville | 4,001 | 3,337 | 6,000 | 13,338 |

1977 Storage Allotments in Acre-Feet - Continued
(downstream order)

| Canal | Am. Falls | Jackson Lake | Palisades | Total |
|---|---|---|---|---|
| Snake River Valley | 17,445 | 25,484 | 35,300 | 78,229 |
| Palisades Water Users | | | 54,130 | 54,130 |
| Blackfoot | 8,444 | 6,734 | 4,050 | 19,228 |
| New Lava Side | | | 11,750 | 11,750 |
| Peoples | 14,169 | 19,368 | 35,000 | 68,537 |
| Aberdeen | 36,781 | 72,037 | 152,800 | 261,618 |
| Corbett | 2,247 | 1,889 | 6,300 | 10,436 |
| Riverside | | | 1,500 | 1,500 |
| Danskin | | | 2,350 | 2,350 |
| Trego | 869 | 640 | 3,200 | 4,709 |
| Wearyrick | | | 600 | 600 |
| Watson | | | 2,350 | 2,350 |
| Parsons | | | 700 | 700 |
| TOTAL ABOVE BLACKFOOT | 171,807 | 224,168 | 656,160 | 1,052,135 |
| Michaud (Indian Service) | 31,560 | | 83,900 | 115,460 |
| Falls Irrig. Dist. | 15,416 | | 40,900 | 56,316 |
| Minidoka Irrig. Dist. | 55,288 | 156,852 | 35,000 | 247,140 |
| Burley Irrigation Dist. | 104,500 | | 39,200 | 143,700 |
| Minidoka N.S. Pump | 31,489 | | 90,800 | 122,289 |
| Milner Low Lift | 30,228 | | 44,500 | 74,728 |
| Twin Falls Canal Co. | 100,029 | 60,091 | | 160,120 |
| Hillsdale | 27,224 | | | 27,224 |
| North Side Canal Co. | 262,811 | 192,925 | 116,600 | 572,336 |
| Gooding | 264,654 | | 1,000* | 265,654 |
| Idaho Power Co. | 29,774 | | | 29,774 |
| City of Pocatello | | | 50,000 | 50,000 |
| Westvaco | | | 5,000 | 5,000 |
| J. R. Simplot | | | 2,500 | 2,500 |
| U. S. (Wyoming) | | | 33,000 | 33,000 |
| U.S. (Not allocated) | | | 440 | 440 |
| Salmon River Canal Co. | | | 1,000* | 1,000 |
| TOTAL BELOW BLACKFOOT | 952,973 | 409,868 | 543,846 | 1,906,681 |
| GRAND TOTAL | 1,124,780 | 634,036 | 1,200,000 | 2,958,816 |

*Contract not negotiated at this time.

## STORAGE RENTAL

The storage rental committee, consisting of John Walker, Leonard Graham, and Art Larson, supervised water rentals.

### Summary of Water District No. 01 Rentals - 1977

| Owner | Acre-Feet | Area of Use | Acre-Feet |
|---|---|---|---|
| Falls Irrig. District | 10,000 | Swan Valley | 160 |
| Mabel Winterfeld | 200 | Heise to Blackfoot | 16,419 |
| Elvin McCulloch | 659 | North Fork | 659 |
| Rockford (Canyon View) | 14,919 | Fremont-Madison | 15,814 |
| City of Pocatello | 50,000 | Lower Valley | 51,494 |
| U.S.B.I.A. | 688 | | |
| U.S.* | 8,080 | | |
| | 84,546 | | 84,546 |

*Composed of Palisades space for which contracts have not been signed, plus Wyoming allocation and contingencies in Palisades and Ririe space, all in the aggregate amount of 25,000 acre-feet.

A variable rate was used in the rentals due to some American Falls and Jackson Lake water offered for rent at one dollar per acre-foot. Palisades water remained at the usual fifty-cents, and a number of rentals made early were made at that rate. The Jackson and American Falls water when averaged in with the remainder of the Palisades water was at a rate of nearly fifty-five cents per acre-foot.

### Supply and Disposal of Stored Water - 1977

#### SUPPLY

| | | Acre-feet |
|---|---|---|
| Jackson Lake Contents | April 3 | 617,400 |
| Palisades (usable) | April 4 | 1,177,000 |
| American Falls | April 7 | ~~1,177,000~~ 1,123,400 |
| Lake Walcott | April 7 | 101,400 |
| Henrys Lake | April 5 | 87,000 |
| Island Park | April 5 | 132,600 |
| Grassy Lake | April 5 | 11,000 |
| Indian & Bergman Reserv. Yield | | 802 |
| Sheridan Creek Right | | 3,618* |
| Gain - Neeley to Milner | | 87,000 |
| TOTAL | | 3,341,220 |

*Special natural flow rights considered as storage for convenience in tabulation.

## DISPOSAL

| | | Acre-Feet |
|---|---|---|
| Used by Snake River Rights | | 2,680,400 |
| Used by Henrys Fork rights | | 215,138 |
| Storage transmission loss, Snake River | | 182,130 |
| Storage transmission loss, Henrys Fork | | 4,909 |
| Storage transmission loss, Cross Cut | | 3,927 |
| River operation waste past Milner | | 600 |
| Henrys Lake Loss | | 3,000 |
| Used by FMC & Simplot | | 2,525 |
| TOTAL | | 3,092,629 |
| Holdovers: | | |
| Jackson | Sept. 29 | 227,000 |
| Palisades (usable) | Sept. 30 | 32,000 |
| American Falls | | 0 |
| Lake Walcott | Sept. 24 | 17,500 |
| Henrys Lake | Sept. 24 | 60,000 |
| Island Park | Sept. 25 | 11,000 |
| Grassy Lake | Sept. 25 | 6,800 |
| TOTAL | | 354,300 |

The computed disposal exceeds the supply by 105,709 acre-feet or about three percent. This difference is greater than in most years and can probably be attributed to errors in main river gaging station records, river transmission losses, evaporation, and reservoir bank storage quantities peculair to a record low water year.

The location of holdovers in the various reservoirs was computed by the U. S. Bureau of Reclamation. The allocation was preliminary and subject to change upon finalizing of this report. However, by February 1, the forecasted water supply appeared to be more than adequate to fill the reservoirs for the 1978 season, so these computations became academic.

Some of the provisions in making these allocations are as follows:

A. Due to small errors in gaging station records and various computations, seldom do the available and disposable storage figures come out equal at the end of the season. In 1977, the storage charged was greater than the supply by about 100,000 acre-feet, about three percent of the total. Preliminary computations indicated about 50,000 acre-feet which amount was distributed to those having carryover storage and was based on the total percentage of each spaceholder's carryover within the reservoir system.

B. Due to construction activities at American Falls Dam, American Falls spaceholders below American Falls (excluding Falls Irrigation District) agreed to share Walcott Reservoir holdover storage. This allocation was shared on a

percentage based on each spaceholders total storage within American Falls reservoir for those having carryover storage.

C. Next, allocation was made of Jackson Lake holdover storage.

D. Finally, carryover allocation was provided in Palisades Reservoir for Palisades spaceholders. However, Jackson Reservoir contained approximately 119,000 acre-feet of Palisades holdover, and 48,000 acre-feet in Ririe, Island Park, and Grassy Lake Reservoirs.

The 1977 regulation season was about 170 days long, twice normal. Weekly storage reports were issued by Water District No. 01, a new management tool for the drought situation, and was well received by the users.

MINIDOKA PROJECT 1977 PRELIMINARY RESERVOIR SPACE CARRY OVER ALLOCATIONS

| Canal Companies and Irrig. Districts | Jackson Lake | Palisades | Walcott |
|---|---|---|---|
| A & B Irrigation District | | 52,944 | 1,715 |
| Aberdeen-Springfield Canal Co. | 191 | | |
| American Falls Reservoir District No. 2 | | | |
| Andrus, Ray, Jr. | 24 | | |
| Blackfoot Irrigation Company | 3,635 | | |
| Burgess Canal & Irrigating Co. | 1,010 | | |
| Burley Irrigation District | | 2,484 | 5,688 |
| Butler Island Canal Co., Ltd. | | 31 | |
| Butte and Market Lake Canal Co. | 2,538 | 7,301 | |
| Clark and Edwards Canal Company | | 117 | |
| Clement Brothers and Owners Mutual | 333 | | |
| Corbett Slough Ditch Company | 1,889 | 4,229 | |
| Craig-Mattson Canal Company | | 1 | |
| Dilts Irrigation Company, Ltd. | | | |
| Enterprise Canal Company, Ltd. | | | |
| Enterprise Irrigation District | 739 | | |
| Falls Irrigation District | | 20,504 | |
| Farmers Friend Irrigation Co., Ltd. | 1,685 | 926 | |
| Harrison Canal & Irrig. Co. | | | |
| Idaho Irrigation District | 11,154 | 35,051 | |
| Idaho Power Company | | | |
| Island Irrigation Company | | | |
| East LaBelle Irrigating Co. | | 559 | |
| Lenroot Canal Company | 3,035 | | |
| Lowder Slough Canal Co., Ltd | | | |
| Martin Canal Company | 2,242 | 568 | |
| Milner Low Lift | | 9,863 | 1,645 |
| Minidoka Irrigation District | 31,594 | | 3,010 |
| New Lava Side Ditch Company | | 4,790 | |
| New Sweden & West Side Mutual | 4,142 | | |
| N. Rigby Irrig. & Canal Co. | | 572 | |
| North Side Canal Company | | | |
| Palisades Water Users, Inc. | | 7,743 | |
| Parks & Lewisville Irrig. Co. | | 2,275 | |
| Parson Ditch Company, Ltd. | | | |
| Peoples Canal & Irrigation Company | 3,583 | | |
| | 67,794 | 149,958 | 12,058 |

Minidoka Project....Carry Over Allocations - continued

| Canal Companies and Irrig. Districts | Jackson | Palisades | Walcott |
|---|---|---|---|
| Poplar Irrigation District | | | |
| Progressive Irrigation District | 6,078 | 24,483 | |
| Rigby Canal & Irrigation Co., Inc. | | 5,132 | |
| Riverside Ditch Company | | 657 | |
| Rudy Irrigation Canal Company | 793 | 654 | |
| Snake River Valley Irrigation Dist. | 186 | | |
| Sunnydell Irrigation District | 833 | | |
| Texas Slough & Liberty Park | | 2,298 | |
| The Reid Canal Company | 331 | 1,404 | |
| Trego Ditch Company | 132 | | |
| Twin Falls Canal Company | 25,680 | | 5,442 |
| Watson Slough Ditch & Irrigation Co. | | 1,856 | |
| Wearyrick Ditch Company | | 422 | |
| West Labelle & Long Island | | 3,857 | |
| Woodville Canal Company | 2,677 | | |
| City of Pocatello | | 14,586 | |
| Food Machinery Co. (WESTVACO) | | 3,596 | |
| J. R. Simplot Co. | | 782 | |
| U. S. Indian Irrigation Service | | 10,086 | |
| U. S. (Wyoming) | | | |
| Utah-Idaho Sugar Co. (Osgood) | 4,327 | | |
| | 41,037 | 69,816 | 5442 |
| | 108,831 | 219,774 | 17,500 |

It was necessary to deliver some storage water past Blackfoot for use of lower valley canals. This required that they be charged river transmission loss on the storage involved. Charges were computed as follows:

| | Allotment Below Blackfoot | Storage Use | Excess Over Lower Reservoir Allotment |
|---|---|---|---|
| Ft. Hall Michaud | 31,560 | 98,416 | 66,856 |
| Falls Irrig. Dist. | 15,416 | 22,770 | 7,354 |
| Minidoka Irrig. Dist. | 334,788 | 509,686 | 174,898 |
| A & B Irrig. Dist. | 31,489 | 53,790 | 22,301 |
| Gooding Project | 264,654 | 306,147 | 41,493 |
| N.S. Canal | 319,809 | 618,152 | 298,343 |
| Twin Falls Canal Co. | 100,029 | 122,616 | 22,587 |
| Milner Low Lift | 30,228 | 55,034 | 24,806 |
| Total | | | 658,638 |
| Upper valley American Falls space for exchange: | | | 171,807 |
| Balance to deliver from upstream reservoirs: | | | 486,831 |

Deliver $\frac{486,831}{658,638}$ = 73.915% from upstream reservoirs.

| | To Deliver From Upstream | Storage Loss | Total Storage Charge |
|---|---|---|---|
| Ft. Hall Michaud | 49,416 | 5,584 | 104,000 |
| Falls Irrig. Dist. | 5,436 | 614 | 23,384 |
| Minidoka Irrig. Dist. | 129,276 | 16,549 | 526,235 |
| A & B Irrig. Dist. | 16,484 | 1,863 | 55,653 |
| Gooding Project | 30,670 | 3,466 | 309,613 |
| N.S. Canal | 220,520 | 26,730 | 644,882 |
| S.S. Canal | 16,695 | 2,137 | 124,753 |
| Low Lift | 18,335 | 2,089 | 57,123 |
| Total | 486,831 | 59,032 | |

## MICHAUD PROJECT USE OF STORED WATER

The annual reports since 1958 have contained detailed analyses of the water used on the Michaud Project by the Falls Irrigation District. Tabulated below is a summary of this data for the past five years.

### Area No. 1
### Tributary to American Falls

From data furnished by Falls Irrigation District

(Figures in Acre-Feet)

| | From Wells | | | From American Falls Reservoir | | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Acres | Pumped | Consumed | Acres | Del'd | Consumed | Excess | Contr. to Gr. Water |
| 1973 | 2,968 | 4,884 | 5,350 | 5,481 | 16,332 | 9,870 | 6,462 | 1,112 |
| 1974 | 2,968 | 5,468 | 5,350 | 5,481 | 17,493 | 9,870 | 7,623 | 2,273 |
| 1975 | 2,968 | 4,725 | 5,350 | 5,481 | 18,568 | 9,870 | 8,968 | 3,348 |
| 1976 | 2,722 | 4,688 | 4,900 | 5,270 | 12,845 | 9,870 | 2,975 | -1,925 |
| 1977 | 2,441 | 4,116 | 4,390 | 5,280 | 11,508 | 9,500 | 2,008 | -2,382 |

### Area No. 2
### Tributary Below American Falls

From data furnished by Falls Irrigation District

(Figures in Acre-Feet)

| | From Wells | | | From American Falls Reservoir | | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Acres | Pumped | Consumed | Acres | Del'd | Consumed | Excess | Contr. to Gr. Water |
| 1973 | 838 | 2,188 | 1,510 | 2,514 | 8,173 | 4,525 | 3,648 | 2,138 |
| 1974 | 838 | 2,555 | 1,510 | 2,514 | 8,807 | 4,525 | 4,282 | 2,772 |
| 1975 | 838 | 2,424 | 1,510 | 2,514 | 7,796 | 4,525 | 3,271 | 1,761 |
| 1976 | 1,054 | 2,191 | 1,900 | 2,563 | 7,282 | 4,610 | 2,672 | 772 |
| 1977 | 937 | 2,205 | 1,690 | 2,542 | 5,258 | 4,580 | 678 | -1,012 |

The above data has been computed assuming a consumptive use of 1.8 acre-feet per acre. Deliveries to East Branch Canal are reduced by four percent for estimated canal loss in the one and one-half miles which is non-tributary to American Falls Reservoir. No account is taken of this four percent loss in the contribution to ground water in Area No. 2.

In the tabulations in this report, the Falls Irrigation District was charged only with water pumped from American Falls Reservoir as determined from U. S. Geological Survey records from pump data furnished by the District.

## GROUND WATER PUMPING

An additional credit to American Falls Reservoir is water now pumped from wells by the City of Pocatello, Westvaco Co., J. R. Simplot Co., and Ft. Hall Michaud Project. Palisades contracts for Westvaco and Simplot provide that storage charges be made on one-half of the water pumped. The City of Pocatello (including Alameda) is permitted to pump 10,000 acre-feet each season before there is any charge. In the case of the Fort Hall Michaud Project, 22,400 acre-feet of pumping from wells is permitted before there is any charge against their reservoir storage.

Tabulated below is a summary of above pumping for the period April 1 to September 30, 1977:

| User | Acre-Feet | |
|---|---|---|
| | Pumped | Storage Charge |
| City of Pocatello (Incl Alameda) | 7,729 | 0 |
| FMC Corporation* | 1,827 | 914 |
| Ft. Hall Michaud Project (wells) | 12,919 | 0 |
| J. R. Simplot Co.** | 3,222 | 1,611 |

*Reported 1,827 acre-feet pumped and 52.8 percent of this used consumptively.

**Reported 3,222 acre-feet pumped and 80 percent used consumptively.

## RIVER LOSSES AND GAINS

Gains and losses between river stations for the months of May through September (using time intervals shown on Plate 15) are shown in the following tabulations:

### GAIN IN SNAKE RIVER, MORAN TO ALPINE GAGING STATION - 1977

(Alpine dates and 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| Snake nr Moran | 27,580 | 117,660 | 117,440 | 58,310 | 31,680 | 352,670 |
| Snake nr Alpine | 92,280 | 235,250 | 163,710 | 107,820 | 67,230 | 666,290 |
| Total gain cfs | 64,700 | 117,590 | 46,270 | 49,510 | 35,550 | 313,620 |
| Mean gain cfs | 2,087 | 3,920 | 1,493 | 1,597 | 1,185 | 2,050 |
| Total gain ac-ft | 128,300 | 233,300 | 91,800 | 98,200 | 70,500 | 622,100 |

The gains compare to 1,041,000 acre-feet in 1961, and 2,054,600 acre-feet in 1976, sharply reflecting the severe drought conditions.

## GAIN IN SNAKE RIVER, ALPINE GAGING STATION TO STATE LINE - 1977

(Alpine dates and 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| Greys River | 10,439 | 11,604 | 7,080 | 6,355 | 5,931 | 41,409 |
| Salt River | 9,471 | 8,310 | 9,424 | 10,262 | 10,255 | 47,721 |
| Total gain cfs | 19,910 | 19,914 | 16,504 | 16,616 | 16,186 | 89,130 |
| Mean gain cfs | 642 | 664 | 532 | 536 | 540 | 582 |
| Total gain ac-ft | 39,490 | 39,500 | 32,740 | 32,960 | 32,100 | 176,800 |

## GAIN IN SNAKE RIVER, STATE LINE TO HEISE - 1977

(No corrections for time of flow. 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| Palisades release | +182,300 | +70,800 | +134,200 | +131,000 | +33,000 | +551,300 |
| Total supply* | 294,490 | 325,964 | 314,414 | 255,436 | 116,415 | 1,036,720 |
| Heise | 319,330 | 351,600 | 341,350 | 268,980 | 130,230 | 1,411,490 |
| Riley | 295 | 733 | 655 | 441 | 172 | 2,296 |
| Total Acc'd for | 319,625 | 352,333 | 342,005 | 269,421 | 130,402 | 1,413,786 |
| Total gain cfs | 25,135 | 26,369 | 27,591 | 13,985 | 13,986 | 107,066 |
| Mean gain cfs | 811 | 879 | 890 | 451 | 466 | 700 |
| Total gain acre-feet | 49,860 | 52,300 | 54,730 | 27,740 | 27,740 | 212,370 |

*Sum of Snake River near Alpine, Greys & Salt Rivers plus Palisades releases.

The gains in the above three reaches reflect the deficient snow pack and are one-third or less of the 1976 season.

## GAIN IN SNAKE RIVER, HEISE TO SHELLEY - 1977

(Heise dates and 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| Rexburg | 44,610 | 28,660 | 26,520 | 42,960 | 38,410 | 181,160 |
| Total supply* | 364,235 | 380,993 | 368,525 | 312,381 | 168,812 | 1,594,946 |
| Diversions | 201,960 | 249,212 | 242,025 | 198,471 | 145,570 | 1,037,238 |
| Shelley | 191,970 | 162,760 | 155,240 | 162,800 | 68,170 | 740,940 |
| Total acc't for | 393,930 | 411,972 | 397,265 | 361,271 | 213,740 | 1,778,178 |
| Total gain cfs | 29,695 | 30,979 | 28,740 | 48,890 | 44,928 | 183,232 |
| Mean gain cfs | 958 | 1,033 | 927 | 1,577 | 1,498 | 1,263 |
| Total gain ac-ft | 58,900 | 61,450 | 57,010 | 96,970 | 89,110 | 363,400 |

*Rexburg plus Heise and Riley from previous table.

The mean gain was 1,263 cfs compared to 1,870 cfs in 1976. This gain included inflow from Market Lake Springs, which is credited to Owners Mutual Canal Co.

## GAIN OR LOSS IN SNAKE RIVER, SHELLEY TO BLACKFOOT - 1977

(Shelley dates and 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| Shelley | 189,441 | 163,560 | 155,620 | 163,525 | 69,300 | 741,446 |
| Blackfoot River* | 3,730 | 1,545 | 1,919 | 2,685 | 2,028 | 11,907 |
| Total supply | 193,171 | 165,105 | 157,539 | 166,210 | 71,328 | 753,353 |
| Diversions | 85,362 | 96,591 | 98,600 | 72,268 | 47,665 | 400,486 |
| Snake Ri nr Blackfoot | 102,860 | 67,710 | 53,550 | 81,250 | 25,530 | 330,900 |
| Total acc't for | 188,222 | 164,301 | 152,150 | 153,518 | 73,195 | 731,386 |
| Total diff cfs | -4,949 | -804 | -5,389 | -12,692 | 1,867 | -21,967 |
| Mean diff cfs | -160 | -27 | -174 | -409 | 62 | -144 |
| Total diff ac-ft | -9,820 | -1,590 | -10,700 | -25,170 | 3,700 | -43,000 |

*Includes bypass.

The mean loss of 144 cfs for the season is unusual as in most years this reach shows a small gain. However, in 1934 and again in 1961 there were small losses, probably attributable to reduced return flows.

## GAIN OR LOSS IN SNAKE RIVER, BLACKFOOT TO NEELEY - 1977

(Neeley dates and 24-hour cfs except as noted)

| | Apr. | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|---|
| Blackfoot | 58,320 | 106,340 | 64,430 | 53,550 | 81,190 | 26,630 | 390,460 |
| Inflow* | 83,659 | 80,480 | 77,062 | 75,655 | 80,583 | 82,075 | 479,514 |
| Am Falls Draft | 70,910 | 56,400 | 128,900 | 221,000 | 80,800 | 8,010 | 566,020 |
| Total supply | 212,889 | 243,220 | 270,392 | 350,205 | 242,573 | 116,715 | 1,435,994 |
| Diversions | 670 | 2,389 | 7,802 | 8,935 | 5,158 | 3,334 | 28,288 |
| Neeley | 205,650 | 218,830 | 280,330 | 334,330 | 231,090 | 119,660 | 1,389,890 |
| Total use | 206,320 | 221,219 | 288,132 | 343,265 | 236,248 | 122,994 | 1,418,178 |
| Total diff cfs | -6,569 | -22,001 | 17,740 | -6,940 | -6,325 | 6,279 | -17,816 |
| Mean diff cfs | -219 | -710 | 591 | -224 | -204 | 209 | -97** |
| Total diff ac-ft | -13,030 | -43,640 | 35,190 | -13,770 | -12,550 | 12,450 | -35,340 |

*A tabulation of inflow data is shown on Plate 11. Nine sets of measurements were obtained for the period and figures interpolated between measurements. Portneuf River inflow as depleted by pumping for Indian Service Michaud Canal. Amount pumped each day is shown on Plate and included in Portneuf River inflow below Pocatello on Plates 11 - 11E. Monthly totals in above table are actual inflow. Inflow figures shown on Plates 12 through 13A are theoretical inflow including pump diversion fiugres in actual inflow. These are shown on last line of Plate 11 series. The above computations fulfill requirements of Section 8(b) of Fort Hall Michaud Division, Palisades Contract. Daily figures of waste from the Aberdeen Project were furnished by Mr. Myron Dance, Manager. Unmeasured inflow as computed from the "Newell Formula" varied from 1,216 to 1,347 cfs.

**The average loss of 97 cfs from Blackfoot to Neeley for 1977 compares to an average loss of 227 cfs in 1976.

## REUGAR SPRINGS

The following measurements of Reugar Springs flows were obtained:

| Date | Discharge in cfs | Date | Discharge in cfs |
|---|---|---|---|
| April 9, 1977 | 24 | Aug. 5, 1977 | 21 |
| April 30, 1977 | 24 | Aug. 29, 1977 | 21 |
| May 13, 1977 | 20 | Sept. 17, 1977 | 21 |
| June 22, 1977 | 21 | Oct. 3, 1977 | 21 |
| July 13, 1977 | 21 | | |

## GAIN OR LOSS IN SNAKE RIVER, NEELEY TO MINIDOKA - 1977

(Minidoka dates and 24-hour cfs except as noted)

| Station | Apr. | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|---|
| (A) Neeley | 204,300 | 219,400 | 278,600 | 335,000 | 232,400 | 121,730 | 1,391,430 |
| (B) Walcott | +2,117 | -756 | +454 | -1,210 | +38,203 | -1,865 | 36,943 |
| (C) Total supply (A+B) | 206,417 | 218,644 | 279,054 | 333,790 | 270,603 | 119,865 | 1,428,373 |
| (D) N. Minidoka | 32,025 | 14,875 | 37,159 | 39,594 | 32,650 | 15,714 | 172,017 |
| (E) S. Minidoka | 20,701 | 10,212 | 29,232 | 37,506 | 28,952 | 15,333 | 141,936 |
| (F) Snake at Minidoka | 160,300 | 207,700 | 215,800 | 251,800 | 219,200 | 83,200 | 1,138,000 |
| (G) Total acc't for (D+E+F) | 213,026 | 232,787 | 282,191 | 328,900 | 280,802 | 114,247 | 1,451,953 |
| (H) Total diff cfs (G-C) | 6,609 | 14,143 | 3,137 | -4,890 | 10,199 | -5,618 | 23,580 |
| (I) Mean diff cfs (H÷30) | 220 | 456 | 105 | -158 | 329 | -187 | 129 |
| (J) Total diff ac-ft (H×1.983) | 13,110 | 28,050 | 6,220 | -9,700 | 20,230 | -11,140 | 46,770 |

## GAIN IN SNAKE RIVER, MINIDOKA TO MILNER - 1977

(Milner Dates and 24-hour cfs except as noted)

| Station | Apr. | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|---|
| Snake at Minidoka | 158,400 | 208,200 | 214,700 | 252,200 | 221,400 | 84,240 | 1,139,140 |
| Minidoka N.S.Pump | 2,245 | 3,639 | 5,451 | 7,738 | 5,905 | 2,143 | 27,121 |
| PA Lateral | 687 | 1,833 | 1,771 | 2,144 | 2,016 | 1,240 | 9,691 |
| Milner Low Lift | 2,344 | 4,790 | 5,281 | 7,501 | 5,805 | 2,791 | 28,512 |
| Milner North Side | 34,691 | 51,160 | 53,510 | 71,250 | 55,591 | 15,637 | 281,839 |
| Gooding at Head | 47,360 | 56,660 | 59,320 | 64,890 | 59,030 | 15,840 | 303,100 |
| Milner South Side | 69,858 | 89,470 | 88,800 | 99,070 | 95,310 | 54,680 | 497,188 |
| Lake Milner Stored | 151 | -504 | 1,411 | -151 | -2,621 | -2,218 | -3,932 |
| Snake at Milner | 5,676 | 150 | 218 | 387 | 278 | 255 | 6,964 |
| Total acc't for | 163,012 | 207,198 | 215,762 | 252,829 | 221,314 | 90,368 | 1,150,483 |
| Total gain cfs | 4,612 | -1,002 | 1,062 | 629 | -86 | 6,128 | 11,343 |
| Mean gain cfs | 154 | -32 | 35 | 20 | -3 | 204 | 62 |
| Total gain ac-ft | 9,150 | -1,990 | 2,110 | 1,250 | -170 | 12,150 | 22,500 |

## TOTAL GAIN IN SNAKE RIVER, NEELEY TO MILNER - 1977

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total gain, ac-ft | 22,260 | 26,060 | 8,330 | -8,450 | 20,060 | 1,010 | 69,270 |

The total gain Neeley to Milner for period April 1 through September was 69,270 acre-feet. This gain is credited to the Minidoka Project as stored water as has been done for many years.

## DISTRIBUTION ON HENRYS FORK

Mr. Val Richards served as deputy watermaster at St. Anthony in charge of water distribution on Henrys Fork, Falls River, and Lower Teton River. C. Michael Bennett, assistant Water District No. 01 watermaster, supervised inventorying of pump diversions and exchange wells.

Holdovers in Henrys Fork reservoirs at the end of the season were 77,800 acre-feet, or about 33 percent of capacity. Most of this, 60,000 acre-feet, was in Henrys Lake. The Fremont-Madison District used 31,886 acre-feet of natural flow in lieu of their stored water and owes this amount to the system in 1978 if American Falls does not fill.

Releases from Grassy Lake were discontinued on August 29. Releases from Henrys Lake and Island Park were discontinued September 17.

The usual methods described in previous reports of segregating stored water and normal flow at the outlets of Henrys Lake and Island Park reservoirs were continued in 1977. During the period June 16-28, stored water was charged a daily loss of 30 cfs. During the period July 11-23, stored releases were credited with a like amount. This adjustment has been used in past years, and presumably corrects the observed normal flow to pre-reservoir conditions. When Island Park Reservoir is full, there is a loss to ground water which is later recovered when the reservoir level drops. By making the above adjustment, normal flow is more nearly distributed to the rights that would be in effect if Island Park Reservoir were not in the river system.

The following observations of stream flows in the Island Park and Henrys Lake areas were made by Water District deputies during their trips to regulate the much lower than normal supply.

| | MAY | | JUNE | | | JULY | | AUGUST | | | SEPT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STREAM | 4 | 16 | 7 | 8 | 30 | 14 | 19 | 3 | 15 | 17 | 6 |
| At County Road | | | | | | | | | | | |
| Sheep Creek | 1.5 | 3 | 3 | | 2 | | 0.8 | | 0.5 | | 0.5 |
| Icehouse Creek | 7 | 10 | 9 | | 7 | | 10 | | 6 | | 8 |
| Sheridan Creek | 8 | 6 | 7 | | 6 | | 8 | | 16 | | 25 |
| Willow Creek | 0 | 0 | 0 | | 0 | | 0 | | 0 | | 0 |
| Hotel Creek | | 14 | 12 | | 7 | | 5 | | 4 | | 3 |
| At Forest S. Road | | | | | | | | | | | |
| Sheridan Creek | 34 | 45 | 50 | | 44 | | 39 | | 36 | | 36 |
| Morraine Creek | 0 | 0 | 0.5 | | 0 | | 0 | | 0 | | 0 |
| Snider Creek | 5 | 3.5 | 3 | | 3 | | 3 | | 2 | | 2 |
| Blind Canyon | 1 | 0.8 | 0.6 | | 0.4 | | 0.4 | | 0.3 | | 0.4 |
| Myers Creek | 4 | 5.0 | 4 | | 3 | | 2 | | 2 | | 1 |
| Willow Creek | 8 | 15 | 12 | | 6 | | 4 | | 3 | | 3 |
| Icehouse Creek | | 12 | 13 | | 11 | | 12 | | 10 | | 9 |
| Dry Creek | | | 4 | | 3 | | 2 | | 0.5 | | 0.6 |

| STREAM | MAY 4 | MAY 16 | JUNE 7 | JUNE 8 | JUNE 30 | JULY 14 | JULY 19 | AUGUST 3 | AUGUST 15 | AUGUST 17 | SEPT 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Henrys Lake Area | | | | | | | | | | | |
| Rock Creek | | 0 | | 3 | | 3 | | 4 | | -- | |
| Duck Creek | 10 | 7 | | 4 | | 5 | | 3.5 | | 6 | |
| Rock Creek Divers. | 0 | | | 2.6 | | 2.6 | | 3.4 | | 4 | |
| Duck Creek Divers. | | | | | | 6.5 | | 4.8 | | 5 | |
| Hope Creek | | 1 | | 1.5 | | 1 | | 0.4 | | 0.5 | |
| Targhee Creek | 10 | 20 | | 28 | | 12 | | 6 | | 5 | |
| Howard Creek | 8 | | | 5 | | 4 | | 4 | | 5 | |
| Targhee Divers. | 0 | 19 | | 21 | | 10 | | 6 | | 5 | |
| Targhee into Lake | | 1 | | 7 | | 1.5 | | 1 | | 0.6 | |
| N. Twin Divers. | 3.5 | 4 | | 3 | | 2.5 | | 2 | | 0.6 | |
| S. Twin Divers. | 2 | 5 | | 3 | | 0 | | 1.5 | | 1 | |
| Middle Twin Divers. | 0.2 | 0 | | 2 | | 4.5 | | 1 | | 2 | |
| Jesse Creek | | 1 | | 1 | | 1 | | 1 | | 1.5 | |

1977 REGULATION SCHEDULE

The Henrys Fork followed the same priorities as the main river throughout the season. For most of the season the Teton River was cut to earlier priorities. An abbreviated schedule when different from the main river is as follows:

| | |
|---|---|
| June 21 filled 60% of June 1, 1885 | Aug. 4 filled 10% of June 1, 1884 |
| June 28 filled 80% of June 1, 1884 | Sept. 1 filled 80% of June 1, 1884 |
| July 13 filled 30% of June 1, 1884 | Sept. 8 filled May 22, 1884 |
| July 31 filled June 10, 1883 | Sept. 15 filled June 1, 1885 |

Figures showing the operation of the Cross Cut Canal in 1977 are shown on Plate 23A. It delivered about 36,000 acre-feet to the Falls River Canal and 51,825 acre-feet to the Teton River with an average transmission loss of 7.04%.

CANAL DELIVERIES IN HENRYS FORK BASIN

Diversions during the 1977 irrigation season, May to September, from Falls River, Henrys Fork, and Lower Teton River were as follows:

| Falls River Canals | Diversions (Acre-Feet) | Area Irrigated (acres) | Acre-Feet Per Acre |
|---|---|---|---|
| Yellowstone | 1,468 | 2,100 | 0.7 |
| Marysville | 24,240 | 16,000 | 1.5 |
| Farmers Own | 11,590 | 5,800 | 2.0 |
| Enterprise | 20,100 | 5,890 | 3.4 |
| Bell | 0 | 110 | --- |
| Falls River | 66,800(a) | 9,000 | 7.4 |
| McBee | 61 | 125 | 0.5 |
| Chester | 4,890 | 1,400 | 3.5 |
| Silkey | 3,650 | 1,080 | 3.4 |
| Curr | 9,840 | 1,300 | 7.6 |
| TOTAL FALLS RIVER | 142,639 | 42,935 | 3.3 |

(a) Includes 34,460 acre-feet diverted through the Cross Cut Canal.

| Henrys Fork Canals | Diversions (Acre-feet) | Area Irrigated (acres) | Acre-Feet Per Acre |
|---|---|---|---|
| Dewey | 2,360 | 1,200 | 2.0 |
| Last Chance | 12,850 | 1,860 | 6.9 |
| St. Anthony Union | 115,370 | 9,700 | 11.9 |
| Farmers Friend | 8,650 | 3,025 | 2.9 |
| Twin Groves | 17,830 | 2,500 | 7.1 |
| Salem Union | 41,250 | 5,500 | 7.5 |
| Egin | 80,360 | 7,000 | 11.5 |
| St. Anthony Union Feeder | 29,210 | 2,300 | 12.7 |
| Independent | 28,000 | 6,000 | 4.7 |
| Consolidated Farmers | 47,270 | 6,000 | 7.9 |
| TOTAL HENRYS FORK | 383,150 | 45,085 | 8.5 |
| Lower Teton Canals | | | |
| Wilford | 14,960 | 2,300 | 6.5 |
| Teton Irrigation(a) | 18,140 | 2,500 | 7.3 |
| Good Luck | 0 | 330 | |
| Pioneer | 282 | 300 | 0.9 |
| Stewart | 930 | 478 | 1.9 |
| Pincock-Byington | 1,154 | 260 | 4.4 |
| Pincock-Gardner | 958 | 480 | 2.0 |
| Teton Island Feeder | 55,690 | 10,400 | 5.4 |
| Roxana | 2,610 | 880 | 3.0 |
| Island Ward | 3,130 | 3,300 | 0.9 |
| North Salem(b) | 48 | 450 | 0.1 |
| Woodmansee-Johnson(c) | 1,610 | 1,320 | 1.2 |
| City of Rexburg | 2,450 | 950 | 2.6 |
| Rexburg Irrigation | 39,310 | 5,280 | 7.4 |
| Saurey-Sommers | 3,090 | 275 | 11.2 |
| Eames-Thompson | 0 | 70 | --- |
| TOTAL LOWER TETON | 144,362 | 29,573(d) | 4.9 |
| TOTAL FALLS RIVER, HENRYS FORK & LOWER TETON | 540,151 | 117,593(d) | 4.6 |

(a) Siddoway included in Teton Irrigation
(b) Used additional water from Henrys Fork through Salem Union.
(c) Used additional water from Moody Creek
(d) Acreage prior to Teton Flood. Figure subject to change as flood damaged lands are reclaimed or abandoned.

## HENRYS FORK STORAGE OPERATIONS - 1977

(All figures in acre-feet)

Henrys Lake

| Canal | Henrys Lake Storage Used | |
|---|---|---|
| Dewey | 1,201 | |
| Last Chance | 9,746 | |
| St. Anthony Union | 16,056 | |
| Egin | 1,965 | |
| Independent | 22,596 | |
| Consolidated | 16,943 | |
| TOTAL | 68,507 | |
| Storage released from Henrys Lake | 27,902 | |
| Excess use over release | 40,605 | |
| Henrys Fork near Rexburg storage balance | | -59,830 |
| Credit from main river sources: | | |
| Enterprise | 10,130 | |
| Palisades Water Users | 2,000 | |
| Rented from Water District No. 01 | 15,814 | 27,944 |
| Henrys Fork owes main river | | 31,886 |

At the end of September there was 40,605 acre-feet of Island Park storage in Henrys Lake. This amount will revert back to Henrys Lake when Island Park fills in 1978, or when a like amount spills from Henrys Lake after filling. The 31,886 acre-foot deficit at rexburg will be cancelled after American Falls fills and spills that amount. This may all be academic as at the time of writing this report (Feb. 1), all indications point to an excessive runoff year with all reservoirs predicted to fill and spill.

## RIVER GAINS IN HENRYS FORK BASIN - 1977

The following time intervals have been used in preparing the tabulations by river sections:

| | |
|---|---|
| Lake to Island Park | 20 hours |
| Island Park to Ashton | 19 hours |
| Ashton to St. Anthony | 5 hours |
| St. Anthony to Rexburg | 12 hours |
| Squirrel to Chester | 8 hours |

GAIN IN HENRYS FORK, LAKE TO ISLAND PARK - 1977

(Island Park dates and 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| H. F. nr Lake | 1,290 | 2,875 | 8,015 | 5,561 | 473 | 18,214 |
| I. P. release | 1,410 | 10,230 | 25,000 | 20,820 | 4,380 | 61,840 |
| Total supply | 2,700 | 13,105 | 33,015 | 26,381 | 4,853 | 80,054 |
| H. F. at Isl Park | 18,536 | 27,295 | 47,660 | 43,805 | 19,514 | 156,810 |
| Total gain cfs | 15,836 | 14,190 | 14,645 | 17,424 | 14,661 | 76,756 |
| Mean gain cfs | 511 | 473 | 472 | 562 | 489 | 502 |
| Total gain ac-ft | 31,410 | 28,150 | 29,050 | 34,560 | 29,080 | 152,250 |

The average gain is 502 compared to 820 in 1976, and 505 in 1961.

GAIN IN HENRYS FORK, ISLAND PARK TO ASHTON - 1977

(Ashton dates and 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| H.F. at Isl Park | 18,870 | 28,690 | 47,640 | 43,250 | 19,320 | 157,770 |
| Ashton | 42,100 | 47,990 | 69,040 | 83,510 | 50,440 | 293,080 |
| Total gain cfs | 23,230 | 19,300 | 21,400 | 40,260 | 31,120 | 135,310 |
| Mean gain cfs | 750 | 643 | 690 | 1,299 | 1,037 | 884 |
| Total gain ac-ft | 46,080 | 38,280 | 42,450 | 79,860 | 61,730 | 268,400 |

The mean gain is 946 cfs compared to 1,450 cfs for 1976 and 816 in 1961.

GAIN IN HENRYS FORK, ASHTON TO ST. ANTHONY - 1977

(St. Anthony dates and 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| Ashton | 42,100 | 48,000 | 69,000 | 83,530 | 50,400 | 293,030 |
| Chester | 33,264 | 19,357 | 2,287 | 4,337 | 9,584 | 68,829 |
| Total supply | 75,364 | 67,357 | 71,287 | 87,867 | 59,984 | 361,859 |
| Diversions | 31,375 | 36,638 | 37,754 | 23,482 | 16,213 | 145,462 |
| St. Anthony | 52,280 | 37,941 | 33,554 | 42,134 | 35,220 | 201,129 |
| Total acc't for | 83,655 | 74,579 | 71,308 | 65,616 | 51,433 | 346,591 |
| Total gain cfs | 8,291 | 7,222 | -21 | -22,251 | -8,551 | -15,268 |
| Mean gain cfs | 267 | 241 | 1 | -718 | -285 | -100 |
| Total gain ac-ft | 16,450 | 14,320 | 42 | -44,100 | -16,960 | -30,280 |

The average loss of 100 cfs compares to a gain of 179 cfs in 1976, and is contrary to past performance. It would appear that due to some peculiar hydrologic quirk, or more likely a discrepancy in the Ashton record, the river gained abnormally in the Island Park to Ashton reach, and lost in the Ashton to St. Anthony reach during August and September. Using the overall reach, Island Park to Ashton results look reasonable with a gain of 784 cfs, compared to 849 cfs in 1961, and 1,571 cfs in 1976.

## GAIN IN FALLS RIVER, SQUIRREL TO CHESTER - 1977

(Chester dates and 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| Squirrel | 37,235 | 27,510 | 10,069 | 9,809 | 10,963 | 95,586 |
| Diversions | 9,450 | 12,770 | 9,480 | 6,760 | 3,120 | 41,580 |
| Chester | 33,260 | 19,360 | 2,290 | 4,340 | 9,570 | 68,820 |
| Total acc'd for | 42,710 | 32,130 | 11,770 | 11,100 | 12,690 | 110,400 |
| Total gain cfs | 5,820 | 8,770 | 1,730 | 1,265 | 1,670 | 19,255 |
| Mean gain cfs | 188 | 292 | 56 | 41 | 56 | 126 |
| Total gain ac-ft | 11,540 | 17,400 | 3,430 | 2,510 | 3,310 | 38,190 |

## GAIN IN HENRYS FORK AND TETON RIVER, ST. ANTHONY TO REXBURG - 1977

(St. Anthony dates and 24-hour cfs except as noted)

| Station | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|
| Teton River | 17,518 | 18,557 | 10,404 | 9,664 | 8,130 | 64,273 |
| H.F. at St. Anthony | 52,280 | 37,941 | 33,554 | 42,134 | 35,220 | 201,129 |
| Total Supply | 69,798 | 56,498 | 43,958 | 51,798 | 43,350 | 265,402 |
| H.F. Diversions | 22,677 | 23,857 | 20,656 | 15,912 | 10,077 | 93,179 |
| Teton Diversions | 15,456 | 21,220 | 17,680 | 10,274 | 8,222 | 72,852 |
| H.F. near Rexburg | 44,600 | 28,300 | 26,700 | 43,200 | 38,400 | 181,200 |
| Total acc'd for | 82,733 | 73,377 | 65,036 | 69,386 | 56,699 | 347,231 |
| Total gain, cfs | 12,935 | 16,879 | 21,078 | 17,588 | 13,349 | 81,829 |
| Mean gain, cfs | 417 | 563 | 680 | 567 | 445 | 535 |
| Total gain, ac-ft | 25,660 | 33,480 | 41,810 | 34,890 | 26,480 | 163,320 |

The average daily gain of 535 cfs is 129 cfs less than that for 1975 and 43 cfs more than that for 1961.

## TETON BASIN

Mr. Arthur Wilson, with summer office at Driggs, continued as deputy watermaster in the Teton Basin during 1977.

The water content of snow on April 1 on the Teton watershed was about 48 percent of normal. April to September precipitation at Driggs was 7.93 inches compared to the normal of 8.08 inches.

There were practically no flood waters in the basin. Trial runs were made on most streams in May to see if they would reach live water in the Teton River. Generally after five days most lacked a mile or more of reaching their mouths. There were some crop losses owing to the shortage of water. Except for some timely rains, losses could have been severe.

Many users overdrew their storage accounts. The Fremont-Madison District rented 1,896 acre-feet in the basin to compensate for the overdrafts. The discharge of various streams and canals and storage used in the Teton Basin is shown on Plates 23 and 24.

The continuing conversion to sprinklers, and ground water use, has enabled the basin as a whole to greatly stretch the available surface water supply.

Mr. Dee O'Brien, an employee of the Teton Pipeline Association, was deputized and furnished Mr. Wilson data on the pump diversions on a daily basis.

Mr. Reed Brower of Tetonia served as special deputy on the Leigh and Spring Creeks on an hourly basis for time actually spent. Considerable time is required to keep the headgates on these creeks regulated, and it is impossible for one man to look after the other streams in Teton Basin and still give the necessary attention to the streams in the vicinity of Tetonia. One-half of the cost of Mr. Brower's services, amounting to $407.20 was charged as a special item to the local users, and a similar amount was charged as general District No. 01 expense.

Water distribution on Teton Creek between Wyoming and Idaho users was on the basis of 1940 Wyoming Federal Court decree. Stored water diversions by Teton Basin users, through exchange for natural flow belonging to prior downstream rights, was on the basis of diverting 1.625 times the amount of replacement storage delivered to Lower Teton River at the St. Anthony gaging station, in accordance with an agreement reached by Upper and Lower users on the Teton River in 1949.

## SWAN VALLEY

Mr. Howard Hatfield served as deputy watermaster and also as watermaster on several canals. The local users were charged one-half of the cost, or $484.95, and the other one-half of the cost of his services was charged as a general expense to District No. 01.

Typical of all streams this year, Palisades and Rainey Creeks were very low and were unable to do much more than supply the early decrees. Only 160 acre-feet of storage was rented in the valley. Several wells and conversions to sprinkler systems eased the situation and crop losses were minimized.

## CLIMATOLOGICAL DATA

(Precipitation in inches for year ending September 30, 1977)

| Month | Alta | | Moran | | Jackson | | Afton | | Palisades | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Act. | Nor. | Act. | Nor. | Act. | Nor. | Act. | Nor. | Act. | Nor.** |
| Oct. | 1.58 | 1.47 | .53 | 1.40 | .34 | 1.06 | .55 | 1.44 | 1.29 | 1.41 |
| Nov. | 0 | 1.61 | .21 | 2.32 | .10 | 1.27 | .07 | 1.65 | .09 | 1.74 |
| Dec. | .54 | 1.75 | 1.44 | 2.69 | .28 | 1.65 | .16 | 1.65 | .24 | 1.66 |
| Jan. | 1.31 | 1.67 | 1.92 | 2.81 | .89 | 1.55 | .61 | 1.51 | 1.11 | 1.93 |
| Feb. | .54 | 1.40 | .55 | 2.10 | .15 | 1.08 | .44 | 1.38 | .75 | 1.63 |
| Mar. | 2.11 | 1.35 | 1.67 | 1.82 | .77 | 1.05 | .71 | 1.31 | .86 | 1.42 |
| Apr. | .49 | 1.67 | .64 | 1.72 | .19 | 1.09 | .12 | 1.60 | .31 | 1.78 |
| May | 4.29 | 2.35 | 2.80 | 2.03 | 3.22 | 1.51 | 2.46 | 2.05 | 3.35 | 1.83 |
| June | 2.28 | 2.76 | .74 | 1.85 | 1.16 | 1.84 | 2.41* | 2.41 | 1.05 | 2.28 |
| July | 1.67 | 1.00 | 1.72 | .88 | .70* | .70 | .92* | .92 | 1.91 | 0.99 |
| Aug. | 1.99 | 1.41 | 1.94 | 1.30 | 2.53 | 1.16 | 2.91 | 1.18 | 3.26 | 1.22 |
| Sept. | 2.26 | 1.54 | 1.35 | 1.46 | 1.07 | 1.26 | 1.57 | 1.37 | 1.24 | 1.78 |
| YEAR | 19.06 | 19.98 | 15.51 | 22.38 | 11.40* | 15.22 | 12.93* | 18.47 | 15.46 | 19.65 |

| Month | Ashton | | Idaho Falls FAA | | Pocatello | | Twin Falls 3SE | | Average 9 Stations | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Act. | Nor. | Act. | Nor. | Act. | Nor. | Act. | Nor. | Act. | Nor. |
| Oct. | .99 | 1.29 | 1.03 | .57 | 1.83 | .75 | .69 | .68 | .98 | 1.12 |
| Nov. | 0 | 1.86 | 0 | .75 | .01 | 1.05 | .15 | 1.06 | .07 | 1.48 |
| Dec. | .22 | 2.04 | .04 | .78 | .20 | .99 | 0 | 1.11 | .35 | 1.59 |
| Jan. | 1.70 | 1.85 | .70 | .66 | .70 | 1.05 | .32 | .97 | 1.03 | 1.56 |
| Feb. | .35 | 1.80 | .20 | .63 | .37 | .80 | .30 | .73 | .41 | 1.29 |
| Mar. | 1.13 | 1.30 | .49 | .54 | .79 | .94 | .29 | .81 | .98 | 1.20 |
| Apr. | .13 | 1.22 | .19 | .69 | .06 | 1.06 | .15 | .85 | .25 | 1.30 |
| May | 2.93 | 1.87 | 1.55 | 1.15 | 2.09 | 1.29 | 2.39 | 1.14 | 2.79 | 1.68 |
| June | 1.45 | 2.21 | 2.10 | 1.44 | .77 | 1.28 | .60 | 1.04 | 1.40* | 1.90 |
| July | 1.19 | 0.64 | .65 | .36 | .58 | .36 | .92 | .19 | 1.14 | .67 |
| Aug. | 1.02 | 1.04 | .82 | .62 | .32 | .62 | .36 | .38 | 1.68 | .99 |
| Sept. | 1.85 | 1.15 | .62 | .61 | .99 | .61 | .78 | .53 | 1.30 | 1.15 |
| YEAR | 12.96 | 18.27 | 8.43 | 8.64 | 8.71 | 10.80 | 6.95 | 9.49 | 12.38* | 15.91 |

*Partly estimated. Normal used for missing record.
**19 year average (U.S. Bureau of Reclamation averages).

On an average for the nine stations, the precipitation for the year ending September 30, 1977, was 78 percent of normal. November, December, February, and April were much below normal, with many stations reporting zero precipitation in November, and only about a fifth of normal the other three months. May, July, and August were above normal and timely rains at times during these months eased the drought conditions.

## WATER DISTRICT FUNDS

Water District No. 01 collects revenues for delivery of water to users in the District and disburses these funds for expenses incurred in the operation of the District's activities in accordance with Idaho Water Laws and Regulations. Billings to water users of Water District No. 01 rendered at the close of the 1977 water year totaled $119,937.44 for delivery of 3,269,413 24-hour second-feet of water.

As operating funds are collected from waterusers following the close of each water year, there is always a deficit of operating funds the latter part of each water year. The Watermaster was authorized by action of the water users in the annual meeting to borrow up to $80,000 as needed to meet operating expenses in the District.

When cash on hand derived from water users' payments substantially exceeds current operating needs, the surplus is invested in short term time certificates as authorized by Idaho State Law.

The Watermaster of Water District No. 01 serves on the rental storage committee and the Water District office keeps the records of water rentals and collects and disburses payments pertinent thereto.

## WATER DISTRICT NO. 01 OPERATING COSTS

### Costs incurred October 1, 1976 to September 30, 1977

| | | |
|---|---|---|
| **SALARIES** | | |
| Watermaster, assistant, and clerk | $38,120.00* | |
| Temporary summer employee | 1,188.95 | $39,308.95 |
| Hydrographers | 20,291.85 | |
| River Riders & deputies | 12,619.33 | |
| Gage Readers | 2,958.50 | 35,869.68 |
| **TRANSPORTATION** | 12,495.34 | 12,495.34 |
| **SUBSISTENCE** | 562.44 | 562.44 |
| **MISCELLANEOUS** | | |
| Postage and box rent | 597.50 | |
| Telephone and telemark | 1,093.03 | |
| Interest on borrowed money | 802.59 | |
| Watermaster's performance bond | 20.00 | |
| State insurance | 829.67 | |
| Social security | 2,021.02 | |
| Printing and binding Watermaster Rpt | 436.86 | |
| Copier cost and misc office expense | 1,003.83 | |
| Watermaster's milage & professional mg | 1,044.21 | |
| Construction and maintenance | 2,110.00 | |
| Misc. canal gaging supplies | 421.32 | |
| Storage space rental | 90.00 | 10,470.03 |
| **STREAMGAGING** | | |
| Water District share | 16,235.00** | 16,235.00 |
| **GROUNDWATER INVESTIGATIONS** | 2,210.00 | 2,210.00 |
| **COMMITTEE OF NINE** ($25 per day & exp.) | 2,786.00 | 2,786.00 |
| WATER DISTRICT NO.01 GENERAL AND SPECIAL EXPENSES INCURRED FOR YEAR ENDING SEPT. 30, 1977 | | $119,937.44 |

*Salaries for watermaster, assistant, and clerk are paid into Federal-State cooperative repay account to be used to pay that part of the U.S. Geological Survey employees salaries chargeable to the Water District function. Balance of salaries for these employees, as determined by Federal Civil Service and USGS regulations, are paid from non-water district funding sources.

**Proportionate share of streamgaging operations and maintenance paid into the Federal-State cooperative repay accoung with allowance for streamflow data collected by Water District hydrographers for use in the Federal-State cooperative program.