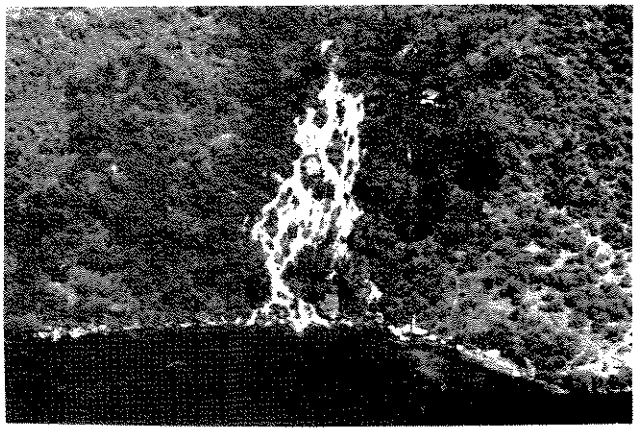
RECORD OF NORTH-SIDE SPRINGS AND OTHER INFLOW TO THE SNAKE RIVER BETWEEN MILNER AND KING HILL, IDAHO 1948-1967



WATER INFORMATION BULLETIN NO. 6
IDAHO DEPARTMENT OF RECLAMATION
AUGUST 1968

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RECORDS OF NORTH-SIDE SPRINGS AND OTHER INFLOW TO SNAKE RIVER BETWEEN MILNER AND KING HILL, IDAHO, 1948-67

By

C. A. Thomas

United States Geological Survey

Prepared by the United States Geological Survey

in Cooperation with

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R. Keith Higginson

State Reclamation Engineer

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CONTENTS

CONTENTS

ILLUSTRATIONS

INTRODUCTION

Inflow to Snake River between the main-stem gaging stations at Milner (No. 13-0880) and at King Hill (No. 13-1545), less the flow of the Big Wood River, averaged 7,400 cfs (cubic feet per second) during the water years 1910-66. Of this gain, an estimated average of 5,900 cfs (4.3 million acre-feet per year) issued from the scores of springs along the north bank of the river while about 1,500 cfs was contributed by all south-side sources and by surface waste from the north side. The group of springs along the north bank includes 11 of the 65 springs in the United States that have an average discharge in excess of 100 cfs. The spring flow is discharge from the Snake Plain aquifer, which contains a large ground-water body underlying the Snake River Plain to the north and east of the study reach. The aquifer is recharged by seepage from surface streams flowing onto the Plain from the mountains to the north, seepage from Snake River and tributaries from Ashton to below Milner, precipitation directly on the Plain, and infiltration from irrigation on the Plain.

The expanding economies of Idaho and other adjoining states continue to intensify the competition for the use of water downstream as well as upstream from the springs. The flow of the Snake River presently furnishes energy for more than a score of hydroelectric powerplants between Milner and the Pacific Ocean. Large acreages in new projects below King Hill receive water by pumping directly from the river. Applications for additional diversions which total more than the average flow of Snake River at Weiser during the irrigation season are on file with the Idaho Department of Reclamation.

Because these and other uses are dependent on flow in the Snake River, impact on the aquifer discharge (springs) should be evaluated carefully when considering alterations of the supply at any point upstream on the system. Continual collection of spring records and analysis of spring-flow characteristics will provide information needed for appraisal of the water resources of the upper Snake River basin, planning for optimum utilization, and management of the supply.

Beginning with 1950, records for the north-side springs have been published in the annual series of reports on surface-water discharge. The main purpose of this report is to bring together into one volume all records collected from 1948 to 1967. It complements a report by Nace and others (1958) which compiled all earlier records. A further purpose of this report is to comment generally on flow that enters the river in this reach from other than the north-side springs.

All discharge measurements and determinations of discharge compiled herein were made by the Geological Survey in cooperation with the Idaho Department of Reclamation and the U.S. Bureau of Reclamation.

The spring measuring sites reported and discussed are shown on figure 1. Each site is identified with a number in downstream order in conformance with the system used in the annual surface-water reports. Each number is identified with a spring name or a verbal description of its measuring site. Those numbers bearing a prefix "M" denote a site where miscellaneous measurements were made; those without the prefix are stations where a continuous record was obtained.

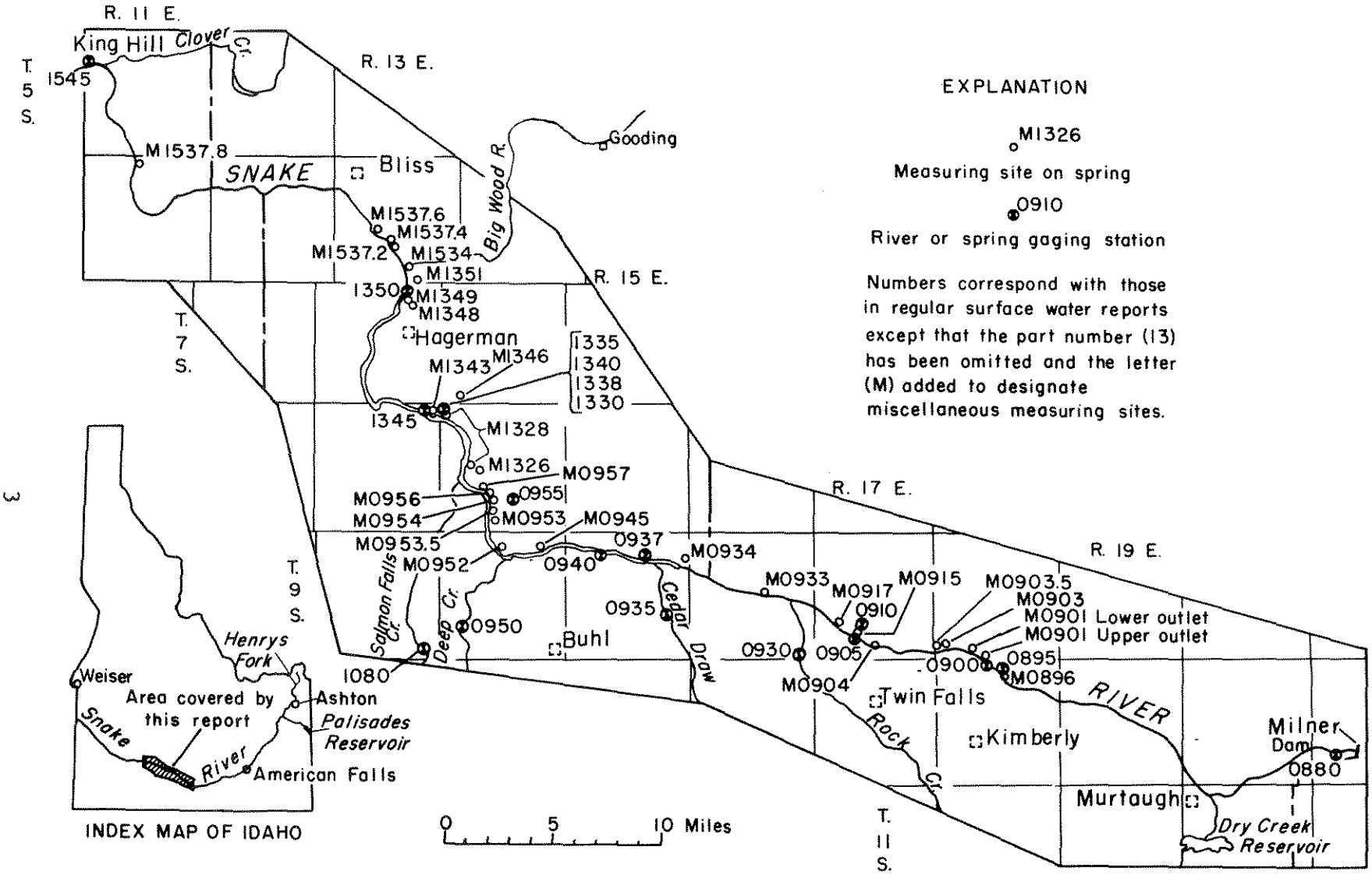


FIGURE 1.-- Map showing location of gaging stations and measuring sites.

FACTORS AFFECTING SPRING DISCHARGE AND OTHER INFLOW TO THE SNAKE RIVER

Significant modifications in water management have altered the recharge to and thus the spring discharge from the Snake Plain aquifer. Further utilization of the supply will cause other changes in the future. Through the years, construction of dams has added to the quantity of usable surface storage. Reservoirs on the Snake River and its tributaries above Milner now (1967) impound about 4.7 million acre-feet of water, and about 0.5 million acre-feet more is stored on tributaries between Milner and King Hill. As a result, diversions onto the Snake River Plain for irrigation have increased, and, consequently, recharge from this source has increased.

Storage began in Palisades Reservoir (capacity, 1.4 million acre-feet) in 1956. Since 1961, winter flows in the canals above Milner gage (No. 13-0880) have been sharply curtailed. As a result, canals divert water for shorter periods each year, more water is stored upstream, and the pattern of aquifer recharge is altered. The net effect of this change is to increase total diversions and thus the recharge, and to shorten the period of recharge.

To illustrate the relationship between recharge and inflow to Snake River between Milner and King Hill, a recharge index was derived which included measured flows in (1) canals diverting from the main stem of Snake River below Neeley and above Shelley, (2) canals diverting from Henrys Fork and tributaries, (3) streams on the north side from Mud Lake basin to Big Wood River, and (4) streams on the south side downstream from American Falls.

Before combining the elements of recharge, the flows were adjusted somewhat arbitrarily because there is a lag in time between a recognizable recharge event and a corresponding inflow to the study reach. The lag time would vary with the distance of the recharge event from the study reach. Consequently, the figures used for elements of recharge above Shelley are averages for the current year and the preceding year. The figures for elements below American Falls are the averages for the 12 months from July of the previous year until June of the current year. So adjusted, there is a definite relationship between the recharge index and the inflow to the river reach as shown on figure 2.

A recharge index for the Snake River Plain below American Falls, including canal diversions and discharge onto the Plain below American Falls from tributaries, unadjusted for time lag, is shown on figure 3.

Beginning in about 1946, ground water has been pumped to irrigate new farmland on the Snake River Plain. Since then, withdrawals by pumping have increased significantly and are expected to continue to increase in the future. Even though diversion of surface water for irrigation in the tributary valleys north of the Plain has not changed materially since about 1920, pumping of ground water for irrigation in these valleys has increased rapidly in recent years. For these reasons and possibly because of climatological variations, discharge from the springs has declined during the past 10 years (fig. 2).

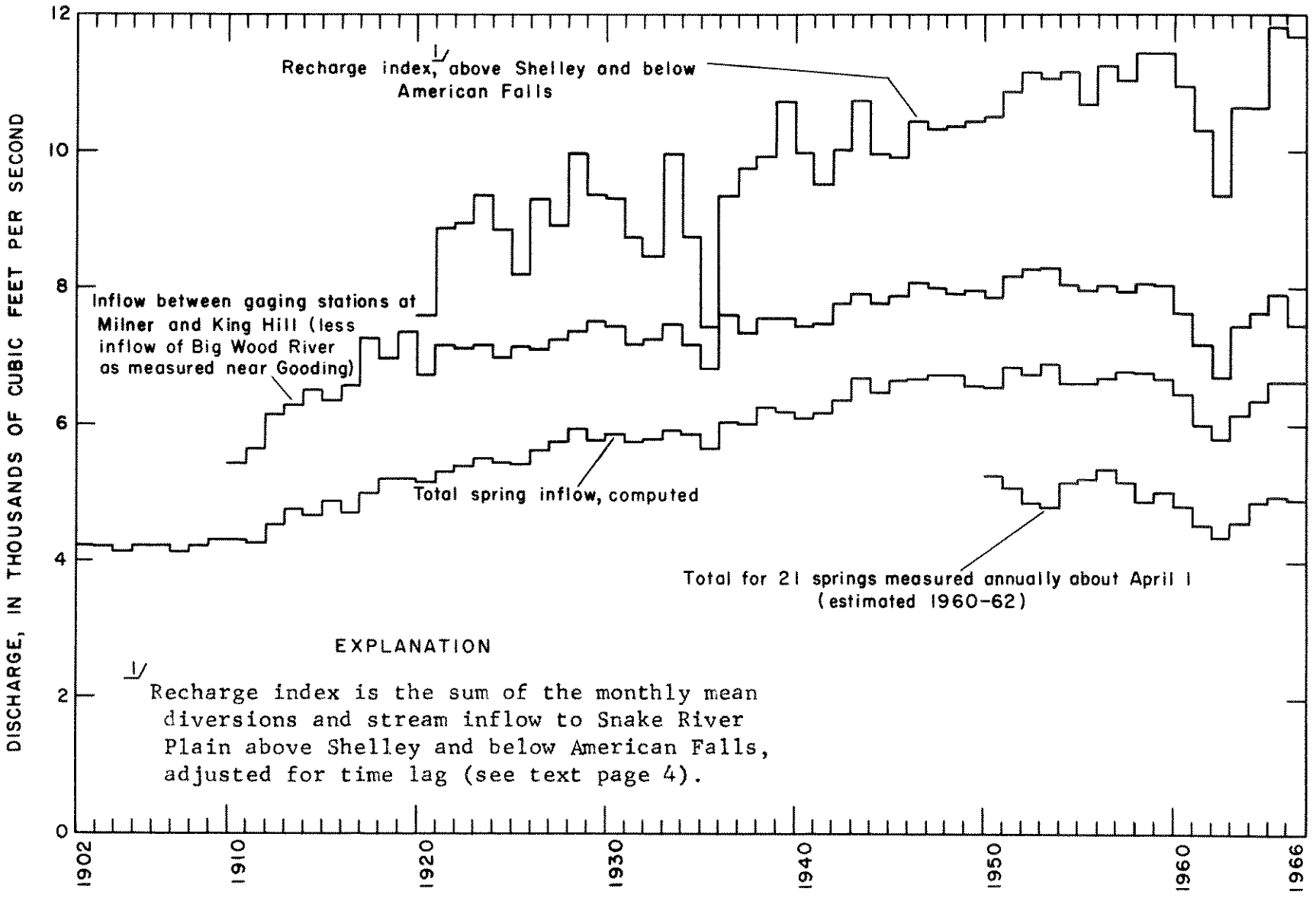
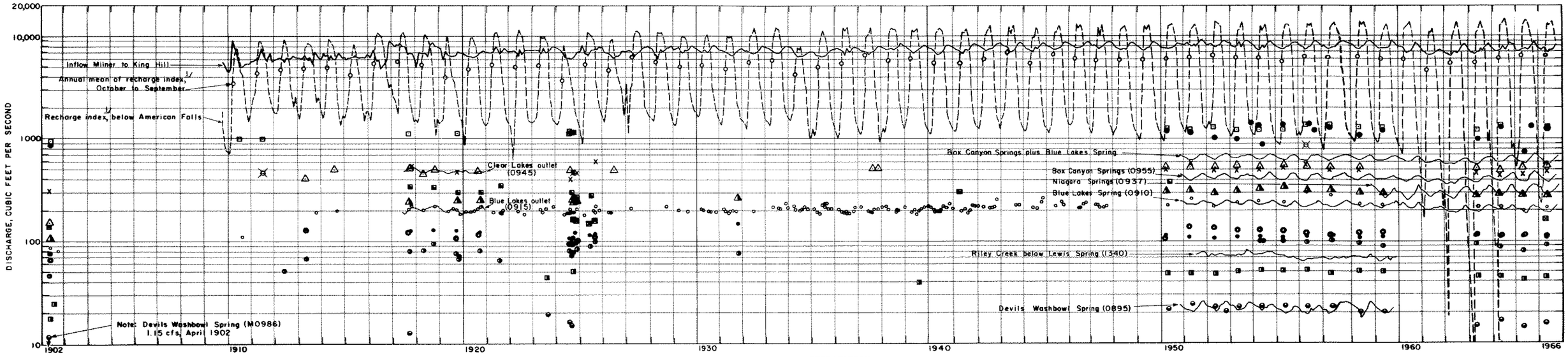


FIGURE 2.-- Graphs showing the annual mean inflow between Milner and King Hill, total spring flow from the north side, total flow in the measured springs, and the recharge index for the Snake River Plain.



EXPLANATION

M0896 Devils Washbowl Spring at mouth	M0934 Crystal Springs	M0952 Briggs Creek	M0956 Box Canyon Springs at mouth	M1343 Riley Creek at mouth
M0901 Devils Corral Spring	0937 Niagara Springs at gaging station site	M0953 Banbury Springs	M1326 Sand Springs	M1534 Malad Springs
0915 Blue Lakes Outlet	0945 Clear Lakes Outlet	0955 Box Canyon Springs at gaging station site	M1328 Total Thousand Springs group	

1/ Recharge index is the sum of the monthly mean diversions and stream inflow to Snake River below American Falls, unadjusted for time lag (see text page 5).

Numbers correspond with those in regular surface water reports except that the part number (13) has been omitted and the letter (M) added to designate miscellaneous measuring sites.

FIGURE 3.--Hydrographs of selected, measured spring flows along the north bank of Snake River between Milner and King Hill, total inflow in the reach, and the recharge index below American Falls.

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RECORDS AVAILABLE

Records of the discharge of the major, individual springs range from a few miscellaneous measurements to many years of continuous records. Nace and others (1958) compiled records of spring flows for the period 1899 to 1947. From 1909 to date, the main-stem stations at Milner (No. 13-0880) and at King Hill (No. 13-1545) have provided overall definition of spring flow. Excluding inflow from the Big Wood River, less than one-fourth of the inflow between these gages, which are 94 miles apart, comes from sources other than the north-side springs. Between Milner and King Hill, several main-stem stations provide data helpful in evaluating spring discharge. These stations are located near Kimberly (No. 13-0900), near Twin Falls (No. 13-0905), near Buhl (No. 13-0940), near Hagerman (No. 13-1345), and below Lower Salmon Falls, near Hagerman (No. 13-1350). Inflows between these main-stem stations are summarized on the hydrographs on figure 4. Nearly all the north-side springs enter in a 50-mile reach between the gage near Kimberly and the mouth of the Big Wood River (fig. 1).

In 1950, four gaging stations were established to record fluctuations of discharge on what are believed to be representative springs (Nace and others, 1958, p. 7). For various reasons, it has not been possible to maintain all four stations since 1950. Only the stations Blue Lakes Spring near Twin Falls (No. 13-0910) and Box Canyon Springs near Wendell (No. 13-0955) have operated through the entire period. The station on Devils Washbowl Spring near Kimberly (No. 13-0895) was discontinued in September 1957. The gage on Riley Creek (No. 13-1330) was started in March 1950, but was discontinued in June 1951 because of unstable rating conditions and unmeasurable

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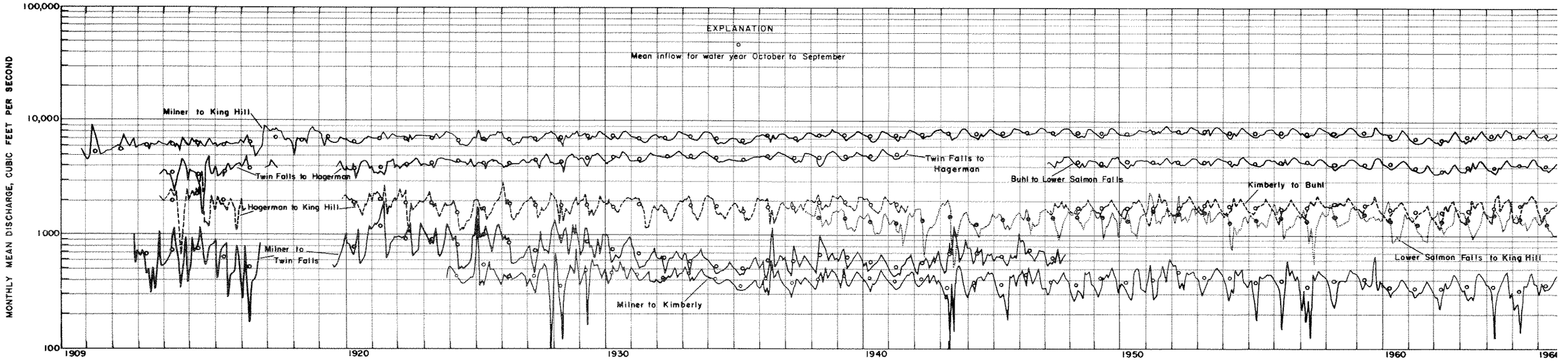

FIGURE 4.--Hydrographs of inflow between main stem gaging stations on Snake River in the reach from Milner to King Hill.

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diversions. It was replaced by a station designated Riley Creek below Lewis Spring (No. 13-1340) and a supplemental gaging station on Brailsford ditch (No. 13-1335). The records of Riley Creek flow were less reliable than desired and were discontinued December 31, 1959. In order to maintain reasonable coverage on the springs, a gaging station was established on Niagara Springs (No. 13-0937) in October 1958, and it has operated continuously to date. Continuous records are now being obtained at three of the 34 sites measured and reported herein.

In addition to the continuous-record stations, measurements of the flow of 20 of the principal springs plus two of the spring channels below the continuous-recorder sites have been made once each year in late March or early April for the years 1950-59 and 1963-67. The flow usually increases along the course of the spring outflow channels; hence, it has been necessary to measure at the same section each time. Thus, even though the total flow of each spring may not be measured, the measurements made each year can be compared with those made previously, and progressive changes in flow can be detected.

Only one measurement was made at each of seven sites during the period 1950-66. Of these, five were at springs not otherwise measured during the period. The other two were at points near the mouth of spring outflow channels on which the regular measuring sites were farther upstream.

Results of stream gaging at sites on the larger springs where repetitive measurements or continuous records of discharge were obtained are shown on the hydrographs on figure 3.

Spring data in this report are also included in the annual reports and water-supply papers listed below and published by the U.S. Geological Survey which contain all available miscellaneous measurements and records of daily discharge.

Surface-water supply of the United States, Part 13, Snake River basin, 1950 to 1960, inclusive

Water year	WSP No.	Pages	Water year	WSP No.	Pages
1950	1183	80,81,83,108,244 245	1956	1447	70,72,77,103,104, 253-255
1951	1217	68,70,73,99-101, 250,251	1957	1517	71,73,78,104,105, 251-253
1952	1247	69,71,74,100,101, 251,252	1958	1567	72,74,79,106,107, 262-264
1953	1287	64,66,69,96,97, 248,249	1959	1637	69,71,73,75,103,105, 254,260,262,263
1954	1347	80,87,90,115,116, 287-289	1960	1717	71,73,75
1955	1397	68,70,73,98,99, 303,305			

Surface water records of Idaho, 1961-64

Water year	Pages	Water year	Pages
1961	127, 129, 131	1963	132, 134, 136
1962	128, 130, 132	1964	126,128,130,270,271

Water resources data for Idaho, 1965-67

Water year	Pages	Water year	Pages
1965	127, 129, 131, 274-276	1967	137,139,141,293-294, 298-299
1966	133,135,137,279-280,282		

In addition, monthly and yearly mean discharges, acre-feet, maxima, minima, and other data, are summarized for years prior to 1951 and for 1951-60 in two compilation reports as follows:

Compilation of records of surface waters of the United States through September 1950, part 13, Snake River basin: U.S. Geological Survey Water-Supply Paper 1317, p. 166, 170, 175, 224.

Compilation of records of surface waters of the United States, October 1950 to September 1960, part 13, Snake River basin: U.S. Geological Survey Water-Supply Paper 1737, p. 78, 80, 82, 85, 111, 112.

EVALUATION OF THE RECORDS

The determinations of the actual flow of the springs were complicated by three conditions: (1) The rough channels reduced the accuracy of the current-meter measurements and, at times, vegetation and backwater affected the stage-discharge relations; (2) diversions for irrigation and inflow of irrigation waste water affected the measured discharge at some sites; and (3) measurements prior to 1950 were not always made at the same sites; therefore, channel gains and losses were introduced.

Statements by Nace and others (1958, p. 9, 10) are repeated here to emphasize the difficulties:

"Most of the direct measurements of discharge were made carefully and were as accurate as channel conditions and other factors allowed. Channel conditions were so poor in many of the measured sections, however, that high accuracy was difficult or impossible to attain. Channels through blocky basalt talus are rough and difficult to measure. Several measured sections are so low in the valley that backwater from the Snake River during periods of high runoff or artificial regulation interferes with the measurements. Aquatic vegetation, which is abundant in some channels, interferes with the operation of current meters and affects the relations of stage to discharge at recording-gage installations.

"Measuring problems at some of the springs are so complicated by irrigation diversions that accurate measurements are impossible during the irrigation season. Waste irrigation water is discharged into several of the spring channels at places where access to the waste channels is extremely difficult. The once-yearly measurements that have been made since 1949 are made in March and April, before irrigation begins, and when diversions and influx of waste water are at a minimum.

"Early records did not describe accurately the locations of measured sections; subsequent workers chose different locations but applied the same descriptions, or used different descriptions for the same sections. Therefore, successive measurements, which supposedly represent a single spring at a single measured section, are commonly not comparable and do not indicate correctly changes in the discharge."

Since 1950, this difficulty was kept to a minimum by using staked measuring sections or by measuring as near to these sections as practicable. However, the relation between these sections and those in use prior to 1950 is uncertain in some instances.

Wherever possible, the records of spring flow listed in this report have been adjusted so that the irrigation waste flow is not included.

UNMEASURED SPRING FLOW

The flow of many of the springs on the north bank of the Snake River is not directly measurable because the flow moves largely through talus, heavy vegetation, or broken rock. Several individual springs are submerged in the Snake River and cannot be measured directly. For example, because it enters in the present streambed of the Snake River, Blue Springs (No. M13-0957) has not been measured since Upper Salmon Falls Dam was raised. Local observers have reported the presence of another large spring discharging in the Snake River streambed just below the mouth of Big Wood River. Several other significant springs were not measured directly because of inaccessibility or other physical difficulties. Sometimes, inflow from such springs can be approximated by measuring the river flow above and below the point of entry. However, determinations of inflow by this method are

inaccurate when river flows are large. Small, unavoidable errors in the river measurements cause a disproportionately large error in the computed inflow. However, the data do indicate that during the period 1950-67 the estimated total spring flow from the north bank averaged about 130 percent of the total of the measured springs. During that period, the unmeasured springs had an average flow of about 1,600 cfs.

SOUTH-SIDE INFLOW TO SNAKE RIVER

In September 1958 and March and August 1959, the U.S. Geological Survey measured the accessible surface waste water and spring flow entering Snake River from the south side between Milner and King Hill. The results of these three sets of measurements showed about 1,650 cfs, 1,160 cfs, and 1,280 cfs, respectively, entering from the south side. On the basis of field inspection and flow data, it is estimated that an additional 150 cfs enters the river from the south side. This includes seeps, small springs, and unmeasured wastes. The total discharge from the south side averaged about 19 percent as much as the total north-side spring flow at corresponding times. All the inflow to the Snake River between Milner and Kimberly was considered to be supplied from the south side and was included in the south-side totals noted above. These totals include the small flow from Devils Washbowl Spring (No. 13-0895) entering Snake River from the north side.

About two-thirds of the total waste water from the south side is in the channels of Rock Creek, Cedar Draw, Deep Creek, and lower Salmon Falls Creek or enters the Snake River in the reach of the gage between Milner and Kimberly. Continuous records of flows were obtained for Rock Creek for more than 24 years and for about 3 years on each of the other three streams.

Characteristics of the south-side flows can be judged reasonably well from these records. Discharges in the individual channels varied radically, but the pattern of the variations of the composite south-side inflow smooths considerably and conforms roughly with that of the north-side spring flow. (See hydrograph of total flow from five sources on figure 5.) Although details of the inflow from the south side are not within the scope of this report, they are summarized graphically on figure 5.

NORTH-SIDE INFLOW TO SNAKE RIVER

Streams and Surface Waste

Big Wood River and Clover Creek are the only surface streams whose channels flow directly into the Snake River from the north bank in the Milner-King Hill reach. Natural runoff into Snake River from Big Wood River has been gaged for long periods near Gooding. Since this flow is sometimes rather large and is unrelated to the other inflow in the study reach, it has been subtracted from the figures of total inflow between Milner and King Hill as computed in this report. Flow in Clover Creek is rather small, averaging about 30 cfs, and has been gaged only intermittently. It has been disregarded since it is believed to be insignificant in quantity compared with other segments of the inflow.

Evaluation of measurements made of surface waste from irrigation at the time of the spring measurements and of reports of the North Side Canal Co., Ltd., indicates the total north-side surface waste to average about 100 cfs.

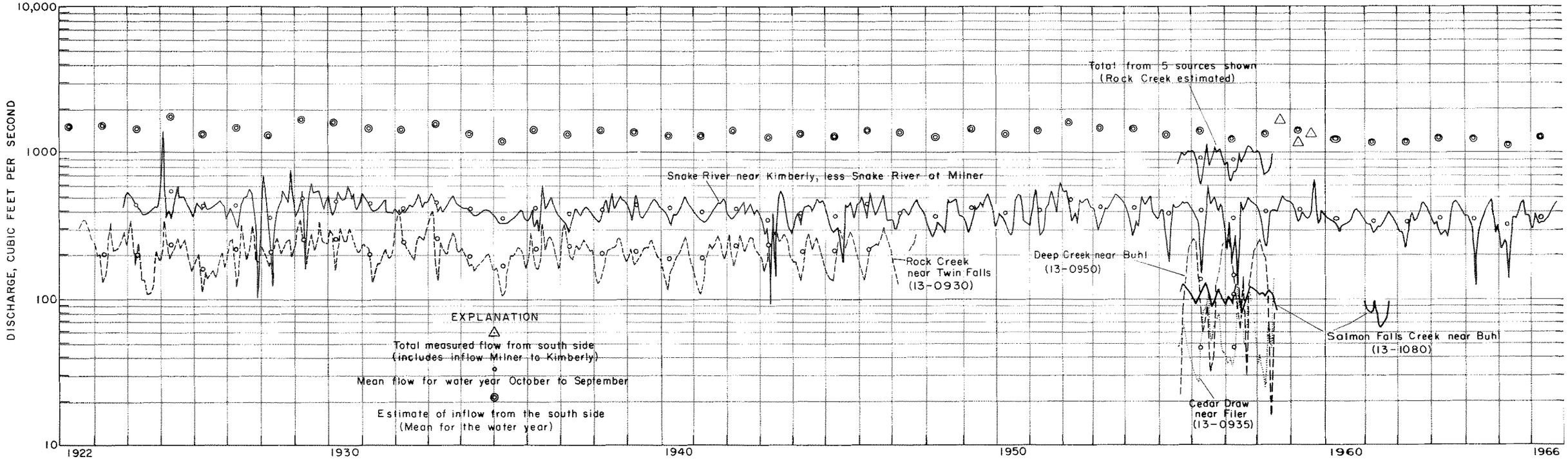

FIGURE 5.--Hydrographs of inflows to the Snake River from the south bank between Milner and King Hill.

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Records of Spring Discharge

On the following pages, a short description of each north-side spring, including location, records available, altitude of the measuring section, physical features of the spring and outlet channel, general notes regarding water use, involvement with surface wastes, and other items useful in interpreting the records, accompanies each table of measured discharges. A latitude-longitude and a section-township-range location is given for all continuous-record stations, but only a section-township-range location is given for the miscellaneous-measurement stations. For the continuous-record gaging stations, figures of monthly and yearly mean discharge are compiled. Daily figures for these stations are published in the annual series of surface-water reports.

Physical features of the springs and details of their location are shown on the 7½-minute topographic quadrangle maps of the U.S. Geological Survey (not made a part of this report) and by Nace and others (1958, pls. 1, 2, and 3).

13-0895. Devils Washbowl Spring near Kimberly, Idaho

Location.--Lat 42°35'22", long 114°20'46", in NE¼NE¼ sec.4, T.10 S., R.18 E., 400 ft downstream from Devils Washbowl Spring, 0.3 mile upstream from mouth which is at river mile 618.5, half a mile upstream from Twin Falls of Snake River, and 3½ miles north of Kimberly.

Records available.--Continuous record April 1950 to September 1959.

Gage.--Water-stage recorder. Altitude of gage is 3,530 ft (from topographic map).

Physical features.--Water issues from a sheer, basalt wall in a lateral branch of a large alcove. Water feeds a small lake and empties into the Snake River through a channel half a mile long. Small springs and surface flow enter channel between gaging station and river.

Average discharge.--9 years, 22.1 cfs (16,000 acre-ft per year).

Extremes.--1950-59: Maximum daily discharge, 27.5 cfs Oct. 3, 4, 1951; minimum daily, 17.5 cfs May 3-5, 11, May 25 to June 2, June 5-8, 1958.

Remarks.--Flow in the spring channel is augmented by variable quantities of irrigation waste water flowing over the rimrocks and by occasional runoff from snowmelt. Irrigation waste was estimated 10-12 times yearly during the period of continuous record and is reported in annual water-supply papers for those years. Flow at the station is from the principal spring outlet. See Devils Washbowl Spring at mouth (No. M13-0896) for measurements of total spring flow adjusted for surface inflow.

13-0895. Devils Washbowl Spring near Kimberly, Idaho

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	-	-	-	-	-	-	19.4	19.0	21.4	22.6	23.8	23.8	-
1951	24.1	23.4	22.0	21.8	21.4	21.1	21.0	20.1	21.5	22.2	23.1	25.4	22.3
1952	25.5	24.2	22.5	22.7	21.6	22.0	21.7	20.7	21.9	22.1	24.3	24.5	22.8
1953	25.7	25.8	23.0	23.2	22.8	21.3	20.8	21.6	21.2	21.4	22.6	24.8	22.8
1954	25.2	24.9	23.7	23.0	22.8	22.1	21.8	20.7	22.4	22.0	23.6	23.8	23.0
1955	24.1	23.5	22.1	21.7	21.7	21.9	19.9	19.1	19.2	20.5	20.7	22.9	21.4
1956	22.7	22.5	21.6	19.9	20.2	19.5	18.9	19.6	21.1	20.5	21.2	22.8	20.9
1957	23.4	22.0	20.7	21.0	20.8	19.1	19.3	20.0	21.6	25.0	24.7	25.5	21.9
1958	25.2	25.1	24.3	23.9	23.1	21.2	19.4	17.8	18.7	21.0	22.2	25.2	22.3
1959	24.6	23.0	21.6	21.2	20.5	20.2	21.2	20.3	19.4	19.3	20.7	22.2	21.2

M13-0896. Devils Washbowl Spring at mouth, near Kimberly, Idaho

Location.--Lat 42°35'18", long 114°20'45", in NE¼NE¼ sec.4, T.10 S., R.18 E., at old abandoned powerplant, below tributary entering from right bank, about 300 feet downstream from gaging station 13-0895, about a quarter of a mile above entry to right bank of Snake River, half a mile upstream from the Twin Falls, 1.1 miles upstream from Devils Corral Spring, upper outlet, 3½ miles north of Kimberly, and 619.0 miles upstream from mouth of Snake River.

Records available.--1902, 1917, 1923-24, 1950-59, 1963-67: Measurements were made once or twice yearly at nearby sites; results prior to 1950 are summarized in WSP 1463.

Altitude.--3,529 ft (from topographic map).

Physical features.--Water from the principal outlet issues from a sheer basalt wall in a lateral branch of a large alcove. Water feeds a small lake and empties into Snake River through a channel one-half mile long. Inflow from small springs and surface irrigation waste enter main channel above measuring section.

Remarks.--Discharges shown herein are measurements of flow at the site adjusted for surface inflow. Previous measurements apparently were not always adjusted. Water is not used prior to reaching Snake River.

Discharge measured at the site during the years 1950-67, adjusted for surface inflow

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-15-50	22.3	4-4-55	23.7	3-25-63	15.0
3-20-51	25.6	4-2-56	23.1	4- 6-64	16.9
4- 9-52	23.6	4-2-57	23.2	3-29-65	14.5
4- 6-53	23.3	4-1-58	20.2	4- 7-66	15.8
3-30-54	23.9	4-9-59	20.4	3-23-67	14.0

M13-0901. Devils Corral Springs near Kimberly, Idaho

Location.--Upper outlet is in SE¼SE¼ sec.32, T.9 S., R.18 E., 100 ft above point where flow cascades into right bank of Snake River, at river mile 617.1, about 2 miles above Shoshone Falls and powerplant, and 4 miles north of Kimberly. Lower outlet enters right bank of Snake River about three-quarters of a mile downstream from upper outlet and measurements were made an eighth of a mile above the mouth.

Records available.--In 1902, two measurements of both upper and lower outlets were made; in 1923, the upper outlet was measured twice and the lower outlet was measured once; in 1924, the upper outlet was measured twice; in 1939, the upper outlet was measured once; in 1950-59, 1963-67, both outlets were measured once each year. Results prior to 1950 are summarized in WSP 1463.

Altitude.--About 3,400 ft (from topographic map).

Physical features.--Water issues from basalt beneath the talus in a long, deep spring alcove. Two adjacent groups of springs discharge into the Snake River by separate channels called upper and lower outlets.

Remarks.--Discharge measurements shown herein do not include underflow that bypasses the measuring section through the talus. None of the flow is used prior to reaching the Snake River.

M13-0901. Devils Corral Springs near Kimberly, Idaho--Continued

Discharge measured at the site during the years 1950-67

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
		upper outlet			
3-15-50	41.8	4-4-55	42.7	3-25-63	38.4
3-20-51	40.6	4-2-56	44.2	4- 6-64	37.9
4- 9-52	39.7	4-2-57	40.6	3-29-65	35.3
4- 6-53	41.8	4-8-58	42.5	4- 7-66	37.9
3-30-54	44.3	4-9-59	41.0	3-20-67	41.3
		lower outlet			
3-16-50	7.99	4-4-55	8.30	3-25-63	7.24
3-20-51	8.51	4-3-56	7.77	4- 6-64	7.39
4-10-52	8.18	4-2-57	7.57	3-29-65	6.87
4- 8-53	8.15	4-2-58	8.27	4- 7-66	7.78
3- 3-54	8.50	4-9-59	8.43	3-20-67	7.26

M13-0903. Unnamed Spring No. 1 above Shoshone Falls powerplant, near Twin Falls, Idaho

Location.--In SW¼NE¼ sec.31, T.9 S., R.18 E., near mouth on right bank of the Snake River, at river mile 615.5, half a mile above Shoshone Falls and powerplant, and 4 miles northeast of Twin Falls.

Records available.--1950-59, 1963-67: One measurement each year.

Altitude.--About 3,380 ft (from topographic map).

Physical features.--Several springs emerge from the foot of a basalt-talus slope in a small alcove and flow in one channel to the river.

Remarks.--Discharges shown are results of current-meter measurements. Location of measurement points vary slightly because of backwater from the Snake River.

Discharge measured at the site during the years 1950-67

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-17-50	1.87	4-5-55	1.94	3-25-63	1.74
3-19-51	1.87	4-3-56	1.68	4- 6-64	1.84
4-10-52	1.63	4-2-57	1.70	3-29-65	1.39
4- 8-53	2.56	4-1-58	1.70	4- 7-66	1.70
3-29-54	2.15	4-9-59	2.00	3-20-67	1.77

M13-0903.5 Unnamed Spring No. 2 above Shoshone Falls powerplant, near Twin Falls, Idaho

Location.--In NW¼SW¼ sec.31, T.9 S., R.18 E., 100 ft above entry to right bank of Snake River, at river mile 615.2, just above Shoshone Falls and powerplant, and 4 miles northeast of Twin Falls.

Records available.--1923, one measurement (see WSP 1463, p. 23); 1950-59, 1963-67: One measurement each year.

Altitude.--About 3,380 ft (from topographic map).

Physical features.--Water flows from base of a basalt-talus slope at the foot of the canyon wall. After passing through fish ponds and a small manmade lake, the water flows through a concrete gate structure into the Snake River.

Remarks.--Discharges shown herein are computed using the observed head and a sharp-crested weir formula. Some leakage bypasses the section by flowing directly through a fill into the river and, therefore, is not measurable. Flow is passed through a fish hatchery before entering the Snake River.

Discharge measured at the site during the years 1950-67

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-17-50	4.49	4- 4-55	6.05	3-25-63	5.05
3-19-51	5.12	4- 3-56	5.29	4- 6-64	3.94
4-10-52	5.50	5-16-57	5.66	3-29-65	a6.62
4- 6-53	4.48	4- 1-58	5.06	4- 7-66	4.3
3-29-54	4.98	4- 9-59	4.29	3-20-67	b5.0

a Pond upstream had been drained; no unmeasured leakage upstream; discharge past measuring section higher than other measurements.

b Estimate.

M13-0904. Unnamed Spring No. 3 below Rim to Rim Bridge, near Twin Falls, Idaho

Location.--In SE¼SW¼NW¼ sec.34, T.9 S., R.17 E., 75 ft above entry to right bank of Snake River, at river mile 611.6, a quarter of a mile downstream from Rim to Rim Bridge (Perrine Memorial Bridge), 1 mile upstream from Blue Lakes Outlet, and 2.7 miles north of Twin Falls.

Records available.--1950-59, 1963-67: One discharge measurement each year.

Altitude.--3,140 ft (from topographic map).

Physical features.--Springs discharge from foot of vertical basalt walls into two small lakes, from which marshy channel carries flow about a quarter of a mile to the Snake River.

Remarks.--Discharges are results of current-meter measurements. Diversion by pumping upstream from the larger of the two lakes for irrigating golf course is usually not flowing when spring is measured.

Discharge measured at the site during the years 1950-67

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-19-50	1.11	4- 5-55	1.35	4- 6-64	b1.0
3-20-51	1.34	4- 3-56	.82	3-30-65	b1.0
4-10-52	a .85	4- 2-57	.87	4- 7-66	b1.0
4- 7-53	1.44	4- 1-58	a1.32	3-20-67	b1.0
3-29-54	1.04	3-28-63	ab1.0		

a Sprinklers diverting water upstream.

b Estimated.

13-0910. Blue Lakes Spring near Twin Falls, Idaho

Location.--In NW¼SE¼ sec.28, T.9 S., R.17 E., on left bank at outlet of upper Blue Lake, 0.6 mile above outlet entry to right bank of Snake River, 1.2 miles northwest of Perrine Memorial Bridge, 3½ miles north of Twin Falls, and 610.8 miles upstream from mouth of Snake River.

Records available.--April 1950 to September 1967.

Gage.--Water-stage recorder. Altitude of gage is 3,300 ft (from topographic map).

Physical features.--Water issues through basalt and talus in bottom of alcove canyon in many places and feeds twin lakes which in turn discharge into Snake River through a channel about one-half mile long. Considerable flow through talus at and below gage. Springs are at an elevation about 160 ft above normal river level.

Average discharge.--17 years (1950-67), 218 cfs (157,800 acre-feet per year).

Extremes.--1950-67: Maximum daily discharge, 256 cfs Nov. 10, 11, 1951, Oct. 24 to Nov. 13, 1952, Sept. 29, 30, 1953; Oct. 23, 24, 1957; minimum daily, 178 cfs May 30 to June 6, 1965.

Remarks.--Flow at station is discharge from upper lake only. For measurements of flow of Blue Lakes Spring at outlet to Snake River see p. 33. Diversion below lower lake for fish propagation.

13-0910. Blue Lakes Spring near Twin Falls, Idaho

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	-	-	-	-	-	-	215	215	209	220	231	243	-
1951	245	242	243	235	226	229	230	227	224	223	236	242	234
1952	245	249	240	237	232	224	218	215	216	224	233	239	231
1953	252	251	239	232	235	235	231	226	223	228	240	249	237
1954	250	248	241	232	227	227	225	226	229	231	233	238	234
1955	245	240	235	228	224	218	217	211	211	221	226	239	226
1956	248	239	227	218	219	219	217	212	216	226	231	236	226
1957	242	239	226	221	222	217	213	213	213	214	227	238	224
1958	247	244	235	233	229	224	214	209	211	220	223	234	227
1959	231	223	214	214	207	205	217	221	223	220	229	232	220
1960	228	243	229	218	235	233	221	210	203	204	204	222	221
1961	236	230	216	205	198	198	197	201	207	207	205	211	209
1962	215	207	197	192	189	191	188	184	189	197	199	210	197
1963	221	210	198	193	190	194	189	188	191	200	211	221	200
1964	226	224	217	209	205	200	202	205	199	203	210	213	209
1965	221	219	205	200	202	202	190	182	187	211	213	221	204
1966	229	226	214	200	194	191	190	186	192	204	214	220	205
1967	220	215	205	197	191	190	190	188	194	206	219	232	204

M13-0915. Blue Lakes Outlet near Twin Falls, Idaho

Location.--In SW¼SW¼ sec.28, T.9 S., R.17 E., at point of entry to the right bank of Snake River, at river mile 610.3, and 4 miles north of Twin Falls.

Records available.--1902, 1910, 1913-14, 1917-47: One to ten discharge measurements each year, daily discharge from nonrecording gage available May 20, 1917, to Dec. 25, 1920 (see tabulation in WSP 1463); 1950-59, 1963-67: One discharge measurement each year.

Altitude.--About 3,175 ft (from topographic map).

Physical features.--Water issues through basalt and talus in bottom of alcove canyon in many places and feeds twin lakes which in turn discharge into the Snake River through a channel about a half a mile long. A considerable quantity of the flow is through talus below the upper lake. Springs are at an elevation about 160 ft above normal river level.

Remarks.--Discharges shown herein are the sums of flows measured in two channels at the entry to Snake River and flow in a diversion upstream for fish propagation. Diversion to fish rearing ponds has varied at times of measurements from 13.6 cfs in 1955 to 139 cfs in 1967. The diversion flows from the fish ponds into the river.

Discharge measured at the site during the years 1950-67, adjusted for diversion

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-17-50	221	4- 5-55	237	3-28-63	215
3-30-51	258	4- 3-56	305	4- 9-64	213
4-10-52	241	4- 3-57	272	3-30-65	195
4- 7-53	238	4- 1-58	224	4- 7-66	211
3-29-54	243	3-26-59	226	3-21-67	216

M13-0917. Warm Creek near Twin Falls, Idaho
(Published as Warm Springs prior to 1950 and Sunnybrook Springs, 1950-51)

Location.--In NW¼NW¼ sec.29, T.9 S., R.17 E., 0.6 mile above point of entry to right bank of Snake River, 1.5 miles northwest of Blue Lakes Outlet, 4.6 miles northwest of Twin Falls, and 609.1 miles upstream from mouth of Snake River.

Records available.--1902, 1917, 1950-59, 1963-67: One discharge measurement each year (see WSP 1463 for tabulation prior to 1950).

Altitude.--3,120 ft (from topographic map).

Physical features.--Water issues from basalt at foot of talus slope and flows about 1 mile northwestward along valley floor to Snake River.

Remarks.--Discharges shown herein represent flow at Warm Springs and are results of discharge measurements. Surface flow entering channel from fish ponds above measuring section is measured and deducted to give net flow from springs. No use is made of water between source and the Snake River. Some seepage may enter from fish ponds above measuring section.

Discharge measured at the site during the years 1950-67, adjusted for surface flow from fish ponds

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-18-50	27.1	4- 5-55	15.5	3-28-63	a16.2
3-21-51	24.2	4- 3-56	15.1	4- 9-64	11.1
4-11-52	16.8	4- 3-57	14.3	3-30-65	13.6
4- 7-53	14.2	4- 1-58	13.8	4- 7-66	a16.7
3-29-54	13.9	3-26-59	12.9	3-24-67	a23.0

a May be high as a result of additional seepage from new fish ponds upstream.

M13-0933. Ellisons Springs (upper outlet) near Jerome, Idaho
(Published previously as Trail Springs)

Location.--In NE¼ sec.22, T.9 S., R.16 E., on bench near top of talus slope on right bank of Snake River, 1.2 miles downstream from Rock Creek, 6.4 miles southwest of Jerome, 7.2 miles northwest of Twin Falls, and 605.7 miles upstream from mouth of Snake River.

Records available.--1950-59, 1963-67: One discharge measurement each year.

Altitude,-3,120 ft (from topographic map).

Physical features.--Water issues from basalt near the top of a talus slope in a small alcove in the canyon wall and is collected in a small irrigation diversion channel or cascades down the slope into the river. Several springs enter below measuring sections, but the principal group of springs is included.

Remarks.--Discharges shown herein are results of discharge measurements adjusted for flow used downstream for irrigation. Measurements collected in this vicinity prior to 1950 are indefinite in regards to location and the name of the spring (see WSP 1463, p. 31).

Discharge measured at the site during the years 1950-67, adjusted for diversion

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-20-50	2.60	4- 5-55	2.80	3-28-63	2.50
3-22-51	2.53	4-10-56	2.79	4- 9-64	1.79
4-16-52	2.74	4- 9-57	2.70	3-30-65	2.19
4- 8-53	3.24	4- 4-58	2.30	4- 8-66	1.76
4- 3-54	2.52	4- 6-59	2.45	3-24-67	1.74

M13-0934. Crystal Springs near Filer, Idaho

Location.--A series of springs along a 0.6 mile reach of the right bank of Snake River, between river miles 600.3 and 600.9, extending from the NE¼SE¼ to SW¼NW¼ sec.12, T.9 S., R.15 E., 1 mile upstream from Cedar Draw and Niagara Springs, and 7 miles north of Filer.

Records available.--1902, 1917, 1919, 1924-25, 1931: One to four measurements each year; 1950-59, 1963-67: One measurement each year. (See WSP 1463 for tabulation prior to 1950).

Altitude.--2,980 ft (from topographic map).

Physical features.--Water issues from basalt and talus at foot of the canyon wall from scores of outlets and enters the Snake River either through outlets from fish ponds or small lakes or by cascading down the talus slopes into the river.

Remarks.--Discharges shown are the sums of measurements and estimates in several channels and are believed to represent the total surface flow of the entire group of springs. Water is used extensively for fish propagation before reaching the river.

Discharge measured at the site during the years 1950-67

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-21-23-50	507	4-5-55	517	3-27-63	452
3-22-51	575	4-5-56	548	4- 8-64	432
4-14,15-52	495	4-4-57	488	3-30-65	441
4-7,9-53	487	4-3-58	496	4- 6-66	475
3-30-54	495	4-7-59	478	3-21-67	455

13-0937. Niagara Springs near Buhl, Idaho

Location.--Lat 42°39'46", long 114°40'24", in NE¼SW¼NW¼ sec.11, T.9 S., R.15 E., in spring outlet channel 120 ft upstream from mouth, at river mile 599.1, 880 ft downstream from source, and 6 miles northeast of Buhl.

Records available.--1902, 1917-20, 1931, 1950-58, 1963-67: One measurement each year and three measurements in 1924; continuous record Oct. 1, 1958, to Sept. 30, 1967. Results prior to 1950 are summarized in WSP 1463.

Gage.--Water-stage recorder. Altitude of gage is 3,000 ft (from topographic map). October 1958 to July 26, 1966, at site 180 ft upstream at datum 3.19 ft higher.

Altitude.--Upper spring, 3,210 ft; outlet, 2,980 ft (from topographic map).

Physical features.--Water issues from several openings in the talus slope and combines to cascade down the talus and fall over several basalt drops as it flows to the Snake River.

Average discharge.--9 years (1958-67), 264 cfs (191,100 acre-ft per year).

Extremes.--1958-67: Maximum daily discharge, 355 cfs (estimated) Oct. 1-10, 1958; minimum daily, 198 cfs May 24, 25, June 4-6, 1964.

Remarks.--Discharges prior to Oct. 1, 1958, are the sum of measurements of the outlet to the river and the upstream diversions. Mean monthly discharge for water years 1959-67 is flow at the outlet adjusted by adding the diversions between the springs and the gage. Diversions estimated on the basis of discharge measurements and the recorder chart for the outlet; diversions used for irrigation and for fish hatcheries.

13-0937. Niagara Springs near Buhl, Idaho

Date	Discharge (cfs)	Date	Discharge (cfs)
3-24-50	303	4-11-55	334
3-26-51	313	4- 4-56	294
4-15-52	296	4- 3-57	304
4- 9-53	309	4- 3-58	295
4- 1-54	321		

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	369	350	342	329	315	306	298	301	310	321	337	350	327
1960	355	336	320	316	303	291	283	284	309	329	322	344	316
1961	349	334	312	299	287	281	263	262	280	284	290	300	295
1962	293	286	282	276	267	261	251	258	272	297	317	329	284
1963	337	332	313	294	286	273	268	272	287	307	311	330	301
1964	346	336	317	297	283	287	281	275	280	299	323	343	306
1965	352	334	310	295	289	276	276	273	307	328	342	355	312
1966	353	342	321	338	294	283	278	278	297	305	310	335	309
1967	354	330	315	302	290	286	283	288	303	313	329	347	312

Note.--Figures are the total flow of the springs computed by adding estimated diversions to the flow past the gage.

M13-0945. Clear Lakes Outlet near Buhl, Idaho

Location.--In SW¼SW¼SE¼ sec.2, and NW¼NE¼ sec.11, T.9 S., R.14 E., at Clear Lakes plant of Idaho Power Co., just above entry to right bank of Snake River, 4½ miles north of Buhl, and at river mile 593.2.

Records available.--1902, 1913-14, 1917-20, 1926-27, 1937, 1950-59, 1963-67: One or two measurements each year; continuous discharge record available June 6, 1917, to November 27, 1920 (see WSP 1463 for tabulation of data prior to 1950).

Altitude.--2,930 ft at outlet; 3,080 ft at highest spring (from topographic map).

Physical features.--Water emerges from numerous openings in a section of about half a mile along the foot of the basalt canyon wall and flows or percolates into Clear Lakes. Part of the flow is diverted for irrigation and fish propagation. Most of the flow is discharged through the Idaho Power Co. powerplant just before entering Snake River.

Remarks.--Discharges shown herein are the sums of discharges of the outlet and diversions and represent the surface flow of the entire group of springs.

Discharge measured at the site during the years 1950-67, adjusted for diversions

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-24-50	529	4-11-55	535	3-29-63	506
3-26-51	533	4- 5-56	527	4- 9-64	486
4-15-52	528	4- 4-57	513	3-31-65	515
4- 9-53	541	4- 4-58	506	4- 6-66	535
4- 5-54	528	4- 8-59	514	3-23-67	512

M13-0952. Briggs Creek near Buhl, Idaho

Location.--In NW¼SE¼ sec.4, T.9 S., R.14 E., 500 ft above entry to right bank of Snake River, 0.8 mile below springs, 6 miles northwest of Buhl, and at river mile 590.6.

Records available.--1902, 1913, 1917-20, 1924-25, 1931: Measurements made once to four times yearly at nearby locations (results are summarized in WSP 1463); 1950-59, 1963-67: One measurement yearly.

Altitude.--2,885 ft at mouth; 3,035 ft at upper spring (from topographic map).

Physical features.--Water emerges in many springs from basalt near the foot of a talus slope and flows as Briggs Creek 0.8 mile to the Snake River.

Remarks.--One small irrigation ditch diverts near the head of the creek. No other use is made of the water between the source and the Snake River. Discharges shown herein are results of discharge measurements adjusted to include measured flow in the diversion.

Discharge measured at the site during the years 1950-67, adjusted for diversion

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-25-50	115	4-8-55	106	3-27-63	111
3-28-51	109	4-6-56	111	4- 8-64	110
4-19-52	106	4-5-57	113	4- 2-65	110
4-13-53	110	4-7-58	105	4- 4-66	110
4- 6-54	109	4-7-59	110	3-23-67	111

M13-0953. Banbury Springs near Buhl, Idaho

Location.--In SE¼NW¼ sec.33, T.8 S., R.14 E., at footbridge at outlet on right bank of Snake River, 7 miles northwest of Buhl, and at river mile 589.4.

Records available.--1902, 1913, 1917-20, 1925: One measurement yearly; four measurements in 1924 (results are summarized in WSP 1463); 1950-59, 1963-67: One measurement a year.

Altitude.--2,880 ft at mouth; 3,090 ft at upper spring (from topographic map).

Physical features.--Water emerges from numerous openings in a 1,000 ft reach alongthe basalt in the talus slope at the foot of the canyon wall and flows into a large catchment pool and thence through a short channel to the Snake River.

Remarks.--A diversion upstream carries water across Snake River for irrigation. Waste water from irrigation on the lower Snake River plains enters the springs over the rimrock during the irrigation season. Discharges listed herein are the discharge measurements adjusted for the irrigation waste and flow in the diversion.

Discharge measured at the site during the years 1950-67, adjusted for surface waste and diversion

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-30-50	107	4-8-55	127	3-27-63	115
3-28-51	138	4-6-56	118	4- 8-64	112
4-16-52	133	4-5-57	97.6	3-31-65	113
4-13-53	127	4-7-58	120	4- 4-66	111
4- 6-54	128	4-7-59	123	3-22-67	123

M13-953.5. Unnamed Spring between Banbury and Blind Canyon Springs near Buhl, Idaho

Location.--In SE¼SW¼ sec.28, T.8 S., R.14 E., at mouth on right bank of Snake River, 870 ft below springs, 2,100 ft downstream from mouth of Banbury Springs, 7½ miles northwest of Buhl, and at river mile 589.0.

Records available.--1950-59, 1963-67: One measurement each year.

Altitude.--2,880 ft at mouth; 3,130 ft at springs (from topographic map).

Physical features.--Water emerges from the foot of a basalt cliff and flows in a single channel over a talus slope to the Snake River.

Remarks.--No use made of water between the springs and the entry to the Snake River. Discharges shown are results of current-meter measurements.

Discharge measured at the site during the years 1950-67

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-28-50	4.17	4-8-55	4.86	3-27-63	3.70
3-28-51	5.85	4-6-56	5.10	4- 8-64	4.15
4-16-52	6.10	4-5-57	4.75	3-31-65	4.30
4-13-53	4.96	4-7-58	5.78	4- 4-66	3.76
4- 6-54	4.48	4-7-59	4.72	3-22-67	4.30

M13-0954. Blind Canyon Spring near Buhl, Idaho

Location.--In SE¼NW¼ sec.28, T.8 S., R.14 E., at outlet on right bank of Snake River, 1,300 ft upstream from Box Canyon Springs outlet, 8 miles northwest of Buhl, and at river mile 588.5.

Records available.--1902, 1917, 1919, 1950-59, 1963-67: One measurement each year (see WSP 1463 for tabulation prior to 1950).

Altitude.--2,880 ft at mouth, 3,090 ft at upper spring (from topographic map).

Physical features.--Springs discharge from basalt through talus along the walls of an alcove canyon, and flow in one channel about one-half mile to the Snake River. Waste from irrigation on the lower Snake River plains enters the springs area over the rimrock much of the time.

Remarks.--No use is made of water between the springs and the entry to the Snake River. Discharges shown herein are results of measurements at the mouth adjusted for surface waste entering the springs from the rim.

Discharge measured at the site during the years 1950-67, adjusted for surface inflow

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-28-50	a21.1	4-8-55	b15.1	3-27-63	10.1
3-28-51	b10.4	4-6-56	12.7	4- 8-64	11.2
4-22-52	b13.9	4-5-57	11.5	3-31-65	8.1
4-13-53	b13.1	4-7-58	11.8	4- 4-66	10.9
4- 6-54	b16.4	4-7-59	b14.7	3-22-67	10.8

a Measurement of inflow from rim made two days later. Discharge may be in error.

b Inflow from rim is a sizable part of total flow. Discharge may be in error.

13-0955. Box Canyon Springs near Wendell, Idaho

Location.--NW¼ sec.27, T.8 S., R.14 E., on left bank, 150 ft downstream from waterfall, half a mile upstream from the mouth, three-quarters of a mile downstream from the principal source, 7½ miles southwest of Wendell, and 588.8 miles upstream from mouth of the Snake River.

Records available.--April 1950 to September 1967. Measurements made at various sites along the creek and summarized in WSP 1463 are probably not equivalent because of inflow and seepage losses.

Gage.--Water-stage recorder. Altitude of gage is 2,950 ft; altitude of highest spring, 3,100 ft (from topograhpic map).

Average discharge.--17 years, 409 cfs (296,100 acre-ft per year).

Extremes.--1950-67: Maximum daily discharge, 483 cfs Oct. 9, 14, 15, 18, 19, 1965; minimum daily, 346 cfs Jan. 10, 1962.

Physical features.--The main spring emerges at the foot of a cliff at the head of a deep, narrow alcove canyon; many other springs and seeps enter the outflow channel above and below the gage.

Remarks.--No regulation or surface diversion above station. Discharge affected by variable surface waste from irrigation canals or drains over the rimrocks, joining the spring discharge above the station. Waste flow over rimrocks estimated about 10 times each year.

13-0955. Box Canyon Springs near Wendell, Idaho

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	-	-	-	-	-	-	383	383	411	416	435	461	-
1951	450	438	428	410	402	388	378	388	409	415	432	446	415
1952	452	452	433	425	416	412	397	404	429	433	446	459	430
1953	454	442	424	408	405	403	396	407	429	421	432	449	423
1954	447	436	429	432	408	400	393	399	415	428	443	464	425
1955	451	428	415	406	398	393	390	389	407	425	436	447	415
1956	449	435	412	401	393	380	377	397	428	440	439	449	417
1957	454	430	417	408	398	394	383	393	411	418	430	441	415
1958	451	432	416	407	403	394	384	394	412	420	426	447	416
1959	448	423	400	395	408	404	399	393	396	409	420	432	410
1960	424	408	416	405	393	382	373	376	386	390	409	425	399
1961	435	427	416	391	375	371	370	374	384	381	389	393	392
1962	381	368	356	353	374	373	359	355	375	386	405	410	374
1963	418	414	394	378	375	366	360	368	400	419	417	422	394
1964	430	424	403	393	382	383	378	373	390	406	427	448	403
1965	456	437	416	400	390	383	372	371	394	415	449	472	413
1966	479	457	427	410	394	383	373	369	383	404	429	442	413
1967	443	418	398	386	368	358	352	364	384	398	416	426	393

M13-0956. Box Canyon Springs at mouth, near Wendell, Idaho

Location.--In NE¼NW¼ sec.28, T.8 S., R.14 E., at mouth on right bank of Snake River, half a mile downstream from gaging station 13-0955, 7¾ miles southwest of Wendell, and at river mile 588.3.

Records available.--1902: Flow estimated twice; 1911, 1956: Flow measured once yearly. Other measurements made upstream at variable distances and flows are not equivalent (results prior to 1950 are summarized in WSP 1463).

Altitude.--2,880 ft at mouth, 3100 ft at upper spring (from topographic map).

Physical features.--Main spring emerges at foot of cliff at head of deep, narrow alcove canyon; many other springs and seeps enter creek in the 1¼ miles to the Snake River.

Remarks.--No use is made of the water before it enters the Snake River. Discharge is the result of a current-meter measurement.

Date - 4- 6-56 Discharge - 852 cfs

M13-1326. Sand Springs Creek near Hagerman, Idaho

Location.--In SE¼ sec.17, T.8 S., R.14 E., 75 ft upstream from Berkowitz house, half a mile above mouth on right bank of Snake River, 7 miles southeast of Hagerman, and 586.5 miles upstream from mouth of Snake River.

Records available.--1902, 1912-13, 1917-21, 1924-25, 1931, 1954-59, 1963-67: From one to several measurements each year (records prior to 1931 summarized in WSP 1463).

Altitude.--3,115 ft at measuring section, 3,150 ft at upper spring (from topographic map).

Physical features.--Water emerges from basalt at foot of low bluff near top of canyon rim and forms Sand Springs Creek which flows about 1½ miles to the Snake River. Some waste water from irrigation on lower Snake River plains enters springs area over rimrock during irrigation seasons.

Remarks.--Several diversions for irrigation above measuring section. Flow shown herein is adjusted for surface inflow and diversions and represents total spring discharge. Idaho Power Company has diverted a substantial part of the flow since 1921 for use in the development of power at Thousand Springs powerplant.

Discharge measured at the site during the years 1954-67, adjusted for surface inflow and diversions

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
4- 5-54	99.0	4- 8-57	97.8	4- 7-64	86.6
5-13-54	99.8	4- 2-58	94.0	4- 1-65	79.5
4- 6-55	96.6	4-10-59	88.9	4- 5-66	93.6
4-10-56	95.5	3-26-63	92.8	3-24-67	77.9
8-21-56	114				

M13-1328. Thousand Springs near Hagerman, Idaho

Location.--The Thousand Springs group enter the Snake River from the right bank between measuring sections 2.9 miles apart, the upper one near the north line of sec.20, T.8 S., R.14 E., 0.6 mile downstream from Salmon Falls Creek, and the lower one about 300 feet upstream from the west line of sec.6, T.8 S., R.14 E., about 0.2 mile upstream from Riley Creek, and about 6 miles southwest of Hagerman.

Records available.--1950-59, 1963-67: One measurement each year (measurements listed in WSP 1463 at various sites in this vicinity are *not equivalent to this series*).

Altitude.--About 2,875 ft at outlet to Snake River (from topographic map); altitude of highest tributary spring about 3,160 ft.

Physical features.--Water issues from basalt cliffs in many openings and is collected in a flume for diversion to Thousand Springs powerplant for power production. The Thousand Springs flow has been augmented by a sizable diversion from Sand Springs since 1921.

The multitude of individual spring outlets make direct measurements of total inflow impractical. Spring inflow is assumed to be the difference between measurements on Snake River above and below the springs area. This incremental flow includes some surface waste and flow of Sand Springs.

Remarks.--The flow that can be reasonably intercepted from the springs area and Sand Springs is collected and used for development of power. Surface waste is measured or estimated and deducted from the difference between the river measurements.

Discharge measured at the site during the years 1950-67, adjusted for surface inflow

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-29-50	1,190	4- 6-55	1,360	3-26-63	995
3-23-51	1,140	4- 9-56	1,330	4- 7-64	1,290
4-17-52	1,000	8-20-56	1,190	4- 1-65	750
4-10-53	968	4- 8-57	1,270	8-17-65	1,300
11-19-53	1,430	4- 2-58	1,060	4- 5-66	*1,260
3-31-54	1,320	4-10-59	1,220	3-22-67	1,360
5-13-54	875				

* Not corrected for stage change.

13-1330. Riley Creek Springs near Hagerman, Idaho

Location.--Lat 42°45'40", long 114°51'30", in SW¼NE¼ sec.6, T.8 S., R.14 E., on right bank 50 ft upstream from junction with Lewis Spring, 300 ft downstream from U.S. Fish Hatchery, about 2 miles upstream from entry to right bank of Snake River, and 4.3 miles southeast of Hagerman. Riley Creek enters Snake River 1.5 miles upstream from upper Salmon Falls Dam of Idaho Power Co.

Records available.--March 1950 to June 1951. Measurements in vicinity prior to 1950 are summarized in WSP 1463.

Gage.--Water-stage recorder. Altitude of gage is 2,960 ft (from topographic map).

Physical features.--Springs issue from several openings along the base of a basalt cliff along the canyon wall. Some Riley Creek and Lewis Spring water comingles above the station through the fish hatchery. Identification of flows of historic diversions into and out of Riley Creek is difficult because of changes of names and locations through the years and because of changes in diversions.

Extremes.--1950-51: Maximum daily discharge, 42 cfs many days during January, February, March, May, June, 1951; minimum daily, 29 cfs Mar. 1-15, 1950.

Remarks.--Several channels enter Riley Creek above and below the several measuring sections. Changes have occurred as fish hatcheries and irrigation projects have been developed. Amount of Lewis Spring water passing station increased beginning Nov. 21, 1950. Numerous and varying diversions and return flows, both upstream and downstream, as well as inconsistent names for the diversions, make comparison with other recorded flows for either earlier or later dates than those listed herein both involved and uncertain.

13-1330. Riley Creek Springs near Hagerman, Idaho

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	-	-	-	-	-	29.5	30.0	31.2	30.3	30.5	30.2	31.0	-
1951	30.2	32.3	39.1	39.3	41.4	41.6	38.9	41.2	-	-	-	-	-

13-1335. Brailsford ditch near Hagerman, Idaho

Location.--Lat 42°46'00", long 114°51'50", in N½NW¼ sec.6, T.8 S., R.14 E., on left bank 250 ft upstream from road bridge, 0.5 mile downstream from point of diversion at Lewis Spring, and 3.8 miles (revised) southeast of Hagerman.

Records available.--June 1951 to December 1959 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 3,000 ft (from topographic map); altitude of highest headwater spring about 3,100 ft.

Average discharge.--8 years (1951-59), 8.18 cfs (5,920 acre-ft per year).

Extremes.--1951-59: Maximum daily discharge, 16 cfs June 23-26, July 19-26, 30, Aug. 19, 20, 1951; no flow at times during March, April, September, and October 1952.

Physical features.--Flow regulated at head of ditch 0.5 mile upstream from gage. Earth-lined canal collects flow from Lewis Spring and other small openings in basalt cliffs and delivers flow to benchlands for irrigation.

Remarks.--Flow at this station plus flow at Riley Creek below Lewis Spring gives total flow from Riley and Lewis Springs plus intervening inflow. Flow of Lewis Springs alternates between Riley Creek and Brailsford ditch depending on demands downstream.

13-1335. Brailsford ditch near Hagerman, Idaho

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	14.8	14.6	13.6	13.8	
1952	7.94	6.22	5.31	4.79	4.13	0.10	5.14	10.1	11.3	11.7	10.6	7.03	
1953	5.82	1.93	1.82	2.25	2.88	2.12	10.5	13.7	12.3	12.2	12.4	12.3	
1954	7.67	1.07	.75	.70	.74	.94	7.68	13.4	12.3	11.1	12.7	13.7	
1955	6.89	2.51	2.56	2.40	3.28	4.25	9.25	12.5	13.3	12.1	10.8	8.83	
1956	8.23	8.21	4.89	2.53	2.50	4.09	7.60	11.4	9.15	13.1	13.0	12.5	
1957	9.28	6.36	6.16	8.23	8.21	7.89	8.19	11.7	11.8	10.2	12.3	10.6	
1958	8.92	10.5	8.97	6.49	5.64	5.50	9.05	11.6	11.7	11.9	13.2	10.5	
1959	9.81	9.21	8.35	8.56	7.50	2.63	9.84	10.6	11.5	13.7	11.8	11.6	
1960	4.28	2.27	2.20	-	-	-	-	-	-	-	-	-	

M13-1338. Combination of Riley Creek below Lewis Creek and Brailsford ditch, near Hagerman, Idaho

Location.--Gaged in SW¼NE¼ sec.6, T.8 S., R.14 E., 100 feet below small unnamed spring outlet on right bank, 300 feet downstream from Lewis Spring, about 2 miles upstream from entry to right bank of Snake River, and 4.2 miles southeast of Hagerman. Riley Creek enters Snake River 1.5 miles upstream from Upper Salmon Falls Dam of Idaho Power Co.

Records available.--1950-59, 1963-67: One measurement each year. Measurements in vicinity prior to 1950 are summarized in WSP 1463.

Altitude.--2,880 ft (from topographic map).

Physical features.--Springs issue from several openings along the base of a basalt cliff along the canyon wall. Some discharge to Snake River through Riley Creek channel and others flow to Brailsford ditch. Since about Aug. 30, 1957, water has been diverted from Bickel Spring to Riley Creek above measuring site. Identification of flows of historic diversions into and out of Riley Creek is difficult because of changes of names and locations through the years.

Remarks.--Measurements include flow in Riley Creek and Brailsford ditch. Location of measuring section has not changed during period 1950-67, but flow has been diverted from Bickel Spring to Riley Creek above the measuring site since about Aug. 30, 1957. Numerous and varying diversions and return flows both upstream and downstream, as well as inconsistent names for the diversions, make comparison between measurements both involved and uncertain.

Discharge measured at the sites during the years 1950-67

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-31-50	66.6	4-12-55	59.6	3-28-63	58.8
3-27-51	63.0	4-10-56	70.4	4- 7-64	64.6
4-18-52	54.8	4- 9-57	69.2	4- 2-65	61.3
4-11-53	64.5	4- 8-58	73.4	4- 5-66	63.4
4- 3-54	63.5	3-27-59	61.8	3-24-67	61.3

13-1340. Riley Creek below Lewis Spring, near Hagerman, Idaho

Location (revised).--Lat 42°45'50", long 114°51'30", in SE¼NW¼ sec.6, T.8 S., R.14 E., on left bank 560 ft downstream from Lewis Spring, an eighth of a mile downstream from U.S. Fish Hatchery, about 2 miles upstream from entry to right bank of Snake River, and 4.1 miles southeast of Hagerman. Riley Creek enters Snake River 1.5 miles upstream from Upper Salmon Falls Dam of Idaho Power Co.

Records available.--June 1951 to December 1959 (discontinued). Measurements in vicinity prior to 1950 are summarized in WSP 1463.

Gage.--Water-stage recorder. Altitude of gage is 2,955 ft (from topographic map). Prior to June 17, 1955, at site 1,200 ft downstream at different datum. Altitude of highest headwater spring about 3,100 ft.

Average discharge.--8 years (1951-59), 62.2 cfs (45,030 acre-ft per year).

Extremes.--1951-59: Maximum daily discharge, 78 cfs Nov. 14, 15, 20-23, 1953; minimum daily, 49 cfs July 28, 1959.

Physical features.--Springs issue from several openings along the base of a basalt cliff along the canyon wall. Some discharge to Snake River through Riley Creek channel and others flow to Brailsford ditch. Since about Aug. 30, 1957, water has been diverted from Bickel Spring to Riley Creek above measuring site. Identification of flows of historic diversions into and out of Riley Creek is difficult because of changes of names and locations through the years and because of changes in diversions.

Remarks.--Flow at this station plus flow of Brailsford ditch gives total flow from Riley and Lewis Spring plus intervening inflow. Many springs and seeps enter the creek as it proceeds downstream. There is evidence that inflow between the site used prior to June 17, 1955, and the site used thereafter could have been large enough to make the records non-equivalent. Because of poor measuring conditions near the lower site, the difference is difficult to measure.

13-1340. Riley Creek below Lewis Spring, near Hagerman, Idaho

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951										59.5	60.9	62.7	
1952	70.9	71.6	68.1	64.3	68.3	75.0	66.3	61.7	62.3	62.6	62.5	64.7	66.5
1953	66.5	70.0	70.4	69.5	68.1	67.6	61.9	59.9	60.2	59.4	60.7	68.3	65.2
1954	70.8	76.8	72.4	71.3	71.7	71.9	65.7	61.1	62.7	65.8	65.1	63.0	68.2
1955	70.6	73.3	70.2	69.0	68.1	65.5	60.9	56.3	53.1	54.5	58.0	60.7	63.3
1956	58.6	58.5	60.7	61.1	60.8	61.2	59.1	56.0	55.6	51.6	53.8	53.2	57.5
1957	56.6	61.0	62.2	59.2	57.2	57.6	59.5	56.6	54.8	56.4	55.7	59.9	58.0
1958	56.9	59.5	62.0	64.0	64.6	64.3	61.3	56.4	56.1	56.1	53.3	64.1	59.9
1959	60.7	61.3	60.3	54.2	54.5	59.9	55.0	56.6	56.9	48.8	52.0	56.9	56.4
1960	64.8	64.8	67.5	-	-	-	-	-	-	-	-	-	-

M13-1343. Riley Creek at mouth, near Hagerman, Idaho

Location.--Lat 42°45'47", long 114°52'27", in SW¼NE¼ sec.1, T.8 S., R.13 E., 0.3 mile downstream from State Fish Hatchery, 0.5 mile upstream from mouth, and 4 miles south of Hagerman. Riley Creek enters Snake River 1.5 miles upstream from Upper Salmon Falls Dam of Idaho Power Co.

Records available.--1902, 1924, 1925, 1967: One to three times yearly.

Altitude.--Measuring site 2,930 ft (from topographic map).

Physical features.--Outflow channel from springs which issue from several openings along the base of a basalt cliff along the canyon wall. Since Aug. 30, 1957, water has been diverted from Bickel Spring to Riley Creek near source. Some discharge into Brailsford ditch which is a combination of flow from Lewis Spring, and openings in basalt cliffs. Flow of Lewis Spring and flow from openings in basalt cliffs alternates between Riley Creek through hatchery and Brailsford ditch depending on demands downstream. Identification of flows of historic diversions into and out of Riley Creek is difficult because of changes of names and locations through the years. Several channels enter Riley Creek above and below the several measuring sections. Changes have occurred as fish hatcheries and irrigation projects have been developed.

Remarks.--Flow at this site plus Brailsford ditch, Big Bend ditch, Tucker siphon, and inflow just below measuring section gives total flow from Riley and Lewis Springs plus intervening inflow.

Date - 4-14-67 Discharge - 181 cfs

M13-1346. Billingsley Creek near Hagerman, Idaho

Location.--Gaged near west line of sec.32, T.7 S., R.14 E., at F. W. Bean farm 570 ft downstream from spring at head, 3¾ miles southeast of Hagerman, and about 7½ miles above mouth. Billingsley Creek enters Snake River about 1 mile upstream from Lower Salmon Falls Dam of Idaho Power Co.

Records available.--1950-59, 1963-67: One measurement each year.

Altitude.--Measuring site, 3,060 ft; upper spring, 3,150 ft (from topographic map).

Physical features.--Outflow channel from springs on benchland and below private fish ponds. Water issues from basalt cliffs near rimrock.

Remarks.--Diversions for irrigation from channel above section. Records shown herein are adjusted to include all diversions and represent total outflow of springs at this point. Flow is passed through numerous fish ponds above section.

Discharge measured at the site during the years 1950-67

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
3-27-50	46.7	4- 7-55	45.2	3-26-63	36.7
3-27-51	46.3	4-10-56	48.8	4- 7-64	35.1
4-18-52	45.3	4- 5-57	46.9	4- 1-65	42.0
4-11-53	51.2	4- 4-58	46.2	4- 5-66	45.0
4- 3-54	47.3	3-27-59	47.6	3-24-67	35.2

M13-1348. Billingsley Creek near mouth, near Hagerman, Idaho

Location.--Gaged in SW¼NE¼ sec.11, T.7 S., R.13 E., 0.6 mile upstream from entry to right bank of Snake River, and 1.5 miles north of Hagerman. Billingsley Creek enters Snake River about 1 mile upstream from Lower Salmon Falls Dam of Idaho Power Co.

Records available.--1956-59, 1963-67: One measurement each year.

Altitude.--2,920 ft (from topographic map).

Physical features.--Creek is a natural collecting channel for many springs along a 5-mile reach of the right bank cliffs of Snake River. Stream then meanders through a small swampy area and then crosses a broad alluvium bench of meadow land to enter Snake River near Hagerman.

Remarks.--Many diversions above section not returned to stream. No attempt was made to compile diversions in order to adjust flow to natural conditions.

Discharge measured at the site during the years 1956-67

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
4- 5-56	212	3-27-59	205	4- 2-65	161
4- 9-57	172	3-30-63	159	4- 8-66	153
3-31-58	217	4-10-64	198	3-24-67	199

M13-1349. Lower White Spring near Hagerman, Idaho

(Formerly published as "Spring (no name)")

Location.--In sec.2, T.7 S., R.13 E., 635 ft above gaging station on Snake River below Lower Salmon Falls, near Hagerman (13-1350), at river mile 572.5.

Records available.--1962: One measurement.

Altitude.--Measuring site, 2,750 ft (from topographic map).

Physical features.--Section of rubble, boulders and heavy brush at mouth of channel. Spring issues from basalt bluff on right bank of Snake River between elevation of road and Snake River.

Remarks.--Discharge is result of current-meter measurement. No use made of water between spring and Snake River.

Date - 8-14-62 Discharge - 18.7 cfs

M13-1351. Birch Creek near Hagerman, Idaho

Location.--In SE¼SE¼ sec.34, T.6 S., R.13 E., just downstream from fork, half a mile upstream from entry to right bank of Snake River, three-fourths of a mile south of Malad River, 2½ miles north of Hagerman, at mile 572.5 from mouth of Snake River.

Records available.--1950-59, 1963-67: One measurement each year.

Altitude.--Measuring site, 2,870 ft; highest spring, 3,000 ft (from topographic map).

Physical features.--Section of rubble and gravel at mouth of forked canyon at base of basalt bluff on right bank of Snake River. Springs issue from basalt bluff to form creek. Some surface waste flows over rimrock to enter basin at times; there was none at time of measurements.

Remarks.--Diversions for irrigation bypass measuring section. Records shown herein adjusted to include diversions and represent total outflow of creek.

Discharge measured at the site during the years 1950-67, adjusted for diversions

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
4- 1-50	9.48	4- 7-55	8.76	3-30-63	8.70
3-27-51	9.85	4-10-56	12.2	4-10-64	9.27
4-18-52	8.62	4- 9-57	9.82	4- 2-65	9.69
4-11-53	10.6	4- 8-58	9.32	4- 8-66	8.66
4- 2-54	10.1	3-27-59	8.90	3-24-67	9.98

M13-1534. Malad Springs near Hagerman, Idaho

Location.--Springs head in SE¼ sec.25, T.6 S., R.13 E., and continue to accumulate and supplement Big Wood River to the mouth where it enters the right bank of Snake River at river mile 571.2, in NW¼ sec.34, T.6 S., R.13 E., 3 miles north of Hagerman.

Records available.--1899, 1910-11, 1913, 1917, 1919, 1924, 1950-59, 1963-64, 1966-67: One or more sets of measurements each year for use in computing spring discharge (see tabulation in WSP 1463 for measurements prior to 1950).

Altitude.--Springs are between altitudes 2,900 and 3,100 ft (from topographic map).

Physical features.--Water issues directly from basalt in and near the floor of a deep canyon. Discharge from numerous openings above Big Wood River is visible, but much of the discharge occurs along the floor of the river channel and is apparent only as gain in flow in the reach, which extends about 2.5 miles above the mouth.

Remarks.--Almost the entire flow is diverted about 1 mile above mouth of Big Wood River for irrigation and power development. King Hill Irrigation Co. has an assigned right of 300 cfs; the power company, the remainder of the flow. Results shown herein are adjusted for diversion and surface inflow to approximate the total spring flow. In this report, usage conforms with the latest decision of the Board of Geographic Names, dated January through April 1960. According to this decision, the name Big Wood River applies to the entire reach of channel to Snake River, and Malad Springs discharge into Big Wood River (Nace and others, 1959, p. 14).

Discharge measured at the site during the years 1950-67, adjusted for surface inflow and diversion

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
4- 1-50	1,260	4- 2-54	1,210	4- 6-59	1,270
10-26-50	1,270	4- 7-55	1,210	3-29-63	1,220
3-29-51	1,240	7-25-56	1,360	6- 2-64	1,250
4-21-52	1,300	4- 1-57	1,350	5- 6-66	1,230
4-14-53	1,230	3-31-58	1,270	3- 8-67	1,220
11-21-53	1,260				

M13-1537.2 Unnamed Spring No. 1 near Bliss, Idaho

Location.--In NW¼NE¼ sec.28, T.6 S., R.13 E., 100 ft upstream from mouth, at river mile 569.7, and 3¾ miles southeast of Bliss.

Records available.--1967: One measurement.

Altitude.--Measuring site 2,750 ft (from topographic map).

Physical features.--Measuring site is below confluence of two channels. Left-hand fork emerges from beneath several ponds. Right-hand fork discharges from base of a basalt slope. Flow cascades into Snake River on the right bank.

Remarks.--Discharge is the result of a current-meter measurement.

Date - 4-14-67 Discharge - 10.3 cfs

M13-1537.4 Unnamed Spring No. 2 at Snake River Pottery, near Bliss, Idaho

Location.--In SW¼SE¼ sec.21, T.6 S., R.13 E., 250 ft upstream from mouth, at river mile 569.4, 3½ miles southeast of Bliss.

Records available.--1967: One measurement.

Altitude.--Measurement site 2,755 ft (from topographic map).

Physical features.--Flow emerges from two ponds into a channel which discharges into Snake River on the right bank.

Remarks.--Discharge is the result of a current-meter measurement.

Date - 4-14-67 Discharge - 7.88 cfs

M13-1537.6 Unnamed Spring No.3 near Bliss, Idaho

Location.--In SE¼NE¼ sec.20, T.6 S., R.13 E., 635 ft upstream from mouth, at river mile 568.2, 2¾ miles south of Bliss.

Records available.--1967: One measurement.

Altitude.--Measurement site 2,735 ft (from topographic map).

Physical features.--Water issues in a meadow, forming a channel about half a mile long on a plateau before cascading into Snake River on the right bank.

Remarks.--Discharge is the result of a current-meter measurement.

Date - 4-14-67 Discharge - 14.5 cfs

M13-1537.8 Bancroft Springs near King Hill, Idaho

Location.--In SE¼NW¼ sec.4, T.6 S., R.11 E., at outlets on right bank of Snake River, at river mile 552.8, 5½ miles southeast of King Hill.

Records available.--1966: One measurement.

Altitude.--2,525 ft (from topographic map).

Physical features.--Springs discharge from basalt in several openings near river's edge and enter right bank of Snake River in four short channels. Some flow through rocks is unmeasurable.

Remarks.--No use is made of water between springs and entry to Snake River.

Date - 1-3-66 Discharge - 17.0 cfs

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