DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I–1947–D

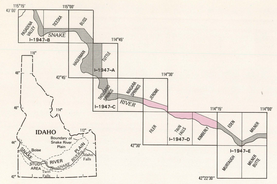



Figure 1. Index map showing study area in the Snake River canyon, location of this report and other published U.S. Geological Survey Miscellaneous Investigations Series Maps (I), and names of U.S. Geological Survey 7.5-minute quadrangle maps.

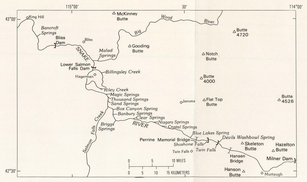



Figure 2. Map showing major springs and geographic features in the study area and vicinity.

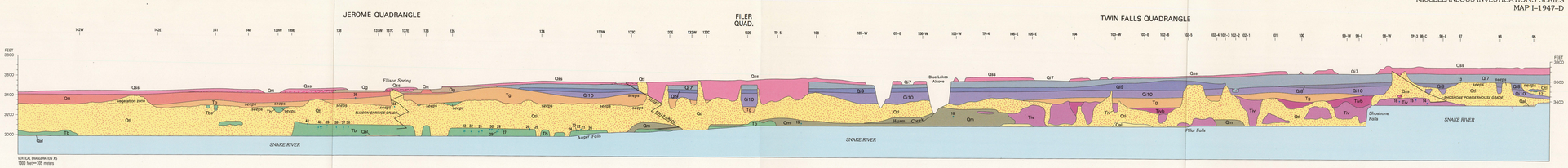
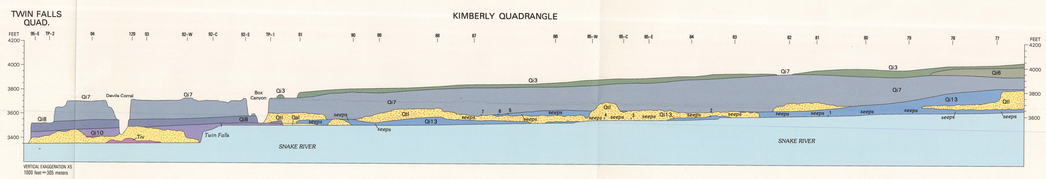
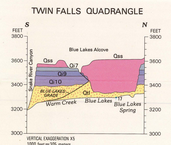
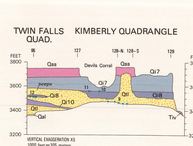



Figure 3. Ellison Spring. Spring 34 emerges from talus at the same altitude as the top of the Banbury Basalt. Seeps at a similar altitude emerge from the contact between Banbury Basalt and Glenns Ferry Formation (dashed line) throughout this part of the Snake River canyon. Water from Ellison Spring is inferred to be from the Thousand Springs Basalt that fills an ancestral Snake River canyon immediately north of the present canyon. A small "window" of canyon-filling Thousand Springs Basalt pillow lavas can be seen in the road-cut above Ellison Spring. The rock bench just above river level at lower left of photograph is Banbury Basalt. Number corresponds to spring location number.







Base from U.S. Geological Survey, Filer, Jerome, and Kimberly, 1978, and Twin Falls, 1954
10,000-foot grid based on Idaho coordinate system, central zone.

Geology mapped by Covington, 1976, 1978; profile geology mapped by Covington and Weaver, 1981
Manuscript approved for publication
December 16, 1988

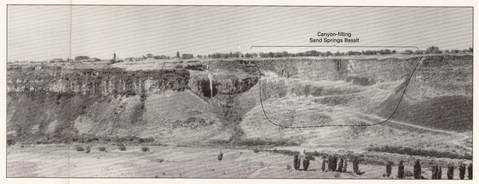



Figure 4. Canyon-filling Sand Springs Basalt. Massive flows of canyon-filling basalt form cliff above road-cut at right-center of photograph. Dashed line indicates approximate location of ancestral Snake River canyon incised into basalt flows of the Idaho Group. Water fall at center of photograph is irrigation water being returned to Snake River.

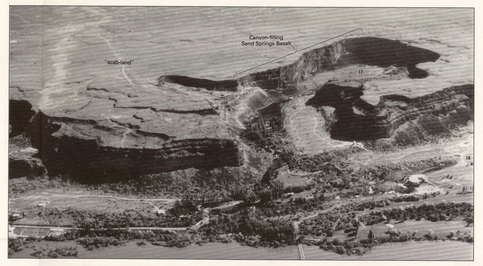



Figure 5. Blue Lakes alcove. Alcove and the surrounding "scab-land" topography on the upland plain were formed by flood waters resulting from the catastrophic overflow of Pleistocene Lake Bonneville (Malde, 1968). The floor of this alcove, from which Blue Lakes Spring (spring location 17) emerges, is now covered with gravels (Melon Gravel) resulting from the flood. Fortuitously Blue Lakes alcove was excavated across part of an ancestral Snake River canyon now filled with massive Sand Springs Basalt. Numbers correspond to spring locations numbers.


Figure 6. Shoshone Falls. Shoshone Falls is the result of the Snake River flowing over a cliff in the very resistant Idavada Volcanics that floor the canyon along this part of the river. Peculiar topography called "scab-land," resulting from the catastrophic overflow of Pleistocene Lake Bonneville (Malde, 1968), can be seen within the canyon at right-center of the photograph and on the upland plain at both top and bottom of the photograph. Part of a former canyon, incised into basalts of the Idaho Group and now filled with Sand Springs Basalt pillow lavas, can be seen in the road cut at upper left of photograph. Numbers correspond to spring location numbers.

Table 1. *Data chart for springs in the Kimberly, Twin Falls, and Jerome quadrangles, Idaho*

[Spring names change through time and ownership. The name used in this report are, to the best of our knowledge, those in current usage. "+" indicates altitude was estimated from topographic map. No estimates were made for spring flows greater than (>) 10 ft³/s. Measured discharges from previous investigations. Leaders (——) indicate no data]

| Spring location no. | Spring name | Map unit from which spring emerges | Aquifer | Altitude in feet | Estimated discharge in ft³/s | Measured discharge in ft³/s | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Kimberly quadrangle | | | | |
| 1 | Unnamed | Basalt member thirteen | Basalt member seven (?) | 3,609 | 0.25 | ——— | Spring emerges from rubble near contact with Tertiary rocks; flow may be local. |
| 2 | Unnamed | Basalt member thirteen | Basalt member seven (?) | 3,601 | 0.10 | ——— | Spring emerges near contact with talus. Recharge may be local. |
| 3 | Unnamed | Talus deposit | Basalt member seven (?) | 3,580 | 0.10 | ——— | Recharge may be local. |
| 4 | Unnamed | Talus deposit | Basalt member seven (?) | 3,581 | 0.10 | ——— | Recharge may be local. |
| 5 | Unnamed | Basalt member seven | Basalt member seven | 3,612 | 0.10 | ——— | Spring emerges at contact with basalt member thirteen. Recharge may be local. |
| 6 | Unnamed | Basalt member seven | Basalt member seven | 3,604 | 0.10 | ——— | Spring emerges at contact with basalt member thirteen. Recharge may be local. |
| 7 | Unnamed | Basalt member seven | Basalt member seven | 3,600± | 0.10 | ——— | Spring emerges at contact with talus. Recharge may be local. |
| 8 | Devils Washboard Spring | Basalt member seven | Basalt member seven | 3,998 | >10.0 | 120.5 | Numerous springs emerge from cooling joints and flow break. Recharge may be local. Also known as Vineyard Springs. |
| 9 | Devils Corral Springs | Talus deposit | Basalt member seven | 3,451–3,475 | >10.0 | 146.7 | Springs emerge from talus and small lake. |
| 10 | Devils Corral Springs | Basalt member seven | Basalt member seven | 3,556 | 1.0 | Cumulative discharge 18.01 | Springs emerge from contact with basalt member eight. |
| 11 | Devils Corral Springs | Basalt member seven | Basalt member seven | 3,560 | 3.5 | | |
| | | | Twin Falls quadrangle | | | | |
| 12 | Unnamed | Basalt member eight | Sand Springs (?) Basalt | 3,509 | 1.0 | ——— | Four springs emerge at contact with talus. |
| 13 | Unnamed | Basalt member seven | Sand Springs (?) Basalt | 3,581 | 2.0 | 12.5 | Spring emerges at contact with talus. |
| 14 | Unnamed | Idavada Volcanics | Sand Springs Basalt | 3,270± | 1.0 | | |
| 15 | Unnamed | Idavada Volcanics | Sand Springs Basalt | 3,400± | 1.0 | Cumulative discharge 14.66 | Spring emerges from colluvium near contact with talus. |
| 16 | Unnamed | Idavada Volcanics | Sand Springs Basalt | 3,400± | 1.5 | | |
| 17 | Blue Lakes Spring | Melon Gravel | Sand Springs Basalt | 3,294 | >10.0 | 1312.0 | Springs emerge from alcove floor into Blue Lakes Country Club. Also known as Blue Lakes Spring. |
| 18 | Unnamed | Melon Gravel | Sand Springs (?) Basalt | 3,320± | 2.0 | ——— | Spring near Blue Lakes Country Club. |
| 19 | Warm Creek Spring | Melon Gravel | Sand Springs (?) Basalt | 3,141 | 10.0 | 715.3 | Spring emerges at contact with Banbury Basalt. Also known as Sandstone Spring. |
| | | | Jerome quadrangle | | | | |
| 20 | Unnamed | Tuloe deposit | Thousand Springs Basalt | 3,083 | 0.10 | ——— | Spring emerges at contact with Banbury Basalt. |
| 21 | Unnamed | Tuloe deposit | Thousand Springs Basalt | 3,085 | 0.10 | ——— | Spring emerges at contact with Banbury Basalt. |
| 22 | Unnamed | Tuloe deposit | Thousand Springs Basalt | 3,059 | 0.10 | ——— | Spring emerges at contact with Banbury Basalt. |
| 23 | Unnamed | Tuloe deposit | Thousand Springs Basalt | 3,060 | 0.25 | ——— | Spring emerges at contact with Banbury Basalt. |
| 24 | Unnamed | Tuloe deposit | Thousand Springs Basalt | 3,063 | 0.25 | ——— | Spring emerges at contact with Banbury Basalt. |
| 25 | Unnamed | Tuloe deposit | Thousand Springs Basalt | 3,074± | 0.01 | ——— | Spring emerges from contact with Banbury Basalt. |
| 26 | Unnamed | Tuloe deposit | Thousand Springs Basalt | 3,070± | 0.01 | ——— | Spring emerges from contact with Banbury Basalt. |
| 27 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,062 | 0.10 | ——— | Spring emerges from colluvium near contact with talus. |
| 28 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,062 | 0.10 | ——— | Spring emerges from colluvium near contact with talus. |
| 29 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,045 | 0.25 | ——— | Spring emerges from colluvium near contact with talus. |
| 30 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,066 | 0.50 | ——— | Three springs emerge from colluvium near contact with talus. |
| 31 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,044 | 0.50 | ——— | Spring emerges from colluvium. |
| 32 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,041 | 0.25 | ——— | Spring emerges from colluvium. |
| 33 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,043 | 0.50 | ——— | Two springs emerge from colluvium. |
| 34 | Ellison Spring | Tuloe deposit | Thousand Springs Basalt | 3,291 | 1.00 | 72.1 | Spring emerges at altitude inferred to be top of Banbury Basalt. Also known as Tuloe Spring. |
| 35 | Unnamed | Thousand Springs Basalt | Thousand Springs Basalt | 3,375 | 0.10 | ——— | Spring emerges at contact with Glenns Ferry Formation. |
| 36 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,086 | 0.25 | ——— | Spring emerges from colluvium near contact with talus. |
| 37 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,081 | 0.25 | ——— | Spring emerges from colluvium near contact with talus. |
| 38 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,079 | 0.25 | ——— | Spring emerges from colluvium near contact with talus. |
| 39 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,097 | 0.25 | ——— | Spring emerges from colluvium near contact with talus. |
| 40 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,089–3,093 | 0.75 | ——— | Three springs emerge from colluvium. |
| 41 | Unnamed | Banbury Basalt | Thousand Springs Basalt | 3,117 | 0.50 | ——— | Spring emerges from colluvium. |

[1]U.S. Geological Survey (1982).
[2]U.S. Geological Survey (1974).

## CORRELATION OF MAP UNITS




## DESCRIPTION OF MAP UNITS

**Qal** **Stream alluvium (Holocene)**—Unconsolidated clay, silt, and sand along Snake River

**Qtl** **Talus (Holocene)**—Unconsolidated deposits of unsorted, generally angular material of various sizes along canyon walls

**Qm** **Snake River Group (Holocene and Pleistocene)**—Uppermost lava flows not present in map area

**Qm** **Melon Gravel (upper Pleistocene)**—Unconsolidated pebbles, cobbles, and boulders of locally derived basalt in a matrix of basaltic sand deposited in low areas on the upland plain northeast of Twin Falls and in shards and bars along Snake River canyon floor as a result of catastrophic overflow of Lake Bonneville

**Qas** **Sand Springs Basalt (upper Pleistocene)**—Flows of dark-gray, olivine-rich, pahoehoe basalt from vent at Butte 4526, located 23 mi northeast of Twin Falls. Canyon-filling deposits occur at profile control locations TP-5, 132C, and between 133E and 133C; and at Blue Lakes alcove. Pillow lava facies shown by pattern

**Qg** **Gravel (upper Pleistocene)**—Principally silicic volcanic pebbles and cobbles in a coarse sand matrix

**Qrt** **Thousand Springs Basalt (upper Pleistocene)**—Flows of dark-gray, olivine basalt, from vent at Flat Top Butte, located 12 mi north of Twin Falls

**Idaho Group (Pleistocene, Pliocene, and Miocene)**

**Q13** **Basalt member three (Pleistocene?)**—Flows of gray, olivine-rich pahoehoe basalt from vent at Skeleton Butte, located 12 mi east of Twin Falls

**Q6** **Basalt member six (Pleistocene?)**—Flows of gray, coarsely granular, porphyritic pahoehoe basalt from an unknown source vent

**Q7** **Basalt member seven (Pleistocene?)**—Flows of gray pahoehoe basalt from vent at Hansen Butte, located 13 mi southeast of Twin Falls. Flow texture varies from vesicular, plagioclase-olivine poor to dense, plagioclase-olivine rich. Very thick, massive flows in the Kimberly quadrangle suggest canyon-filling episode. Pillow lava facies shown by pattern

**Q8** **Basalt member eight (Pleistocene?)**—Flows of light-gray, dense, porphyritic plagioclase-olivine basalt from an unknown source vent

**Q13** **Basalt member thirteen (Pleistocene?)**—Flows of gray, olivine-rich basalt from an unknown source vent. Basalt contains sparse plagioclase phenocrysts that occur in clusters with olivine, and sparse pyroxene phenocrysts

**Q9** **Basalt member nine (Pleistocene?)**—Flows of massive, light-gray, plagioclase-olivine basalt from an unknown source vent

**Q10** **Basalt member ten (Pleistocene?)**—Flows of light-gray, plagioclase-olivine basalt from an unknown source vent

**Tg** **Glenns Ferry Formation (Pliocene)**—Sheetlike flows of light-gray, olivine basalt from source vents south and west of the Snake River canyon. Locally contains plagioclase phenocrysts as long as 4 mm

**Tb** **Banbury Basalt (Miocene)**

**Tbs** **Basalt flows undifferentiated**—Flows of dark-gray and dark-brown olivine basalt, commonly altered to greenish-brown basaltic saprolite containing spheroids of fresh rock

**Sedimentary deposits**—Brown to greenish-brown sand and pebble gravel generally deposited as lenticular channel fill. May locally include fine-colored silt and clay deposits. Shown on profile only

**Idavada Volcanics (Miocene)**

**Tiv** **Ash-flow tuff undifferentiated**—Ash-flow tuffs of rhyolitic composition, densely welded and generally devitrified. Locally contains thin phenocryst-rich vitrophyre at top

**Tivb** **Moonstone Ash-flow member**—Mud-flow breccia composed of subangular rhyolite gravel in a vitric sand and clay matrix. Fills low areas on upper surface of ash-flow tuffs

— — — **Contact**—Dashed between different facies of same unit; dotted when concealed by windblown silt and sand

**Spring location**—Number corresponds to spring location number in table 1

**Profile-control location**—Corresponds to numbers across top of profile

**Location where geologic section was measured using an alidade**

**Location where geologic section was constructed from geologic map**

**Photograph location**—Approximate camera location and orientation, dashed lines indicate approximate edges of photograph

## INTRODUCTION

The Snake River Plain is a broad, arcuate region of low relief that extends more than 300 mi across southern Idaho. The Snake River enters the plain near Idaho Falls and flows westward along the southern margin of the eastern Snake River Plain (fig. 1), a position mainly determined by the basaltic lava flows that erupted near the axis of the plain. The highly productive Snake River Plain aquifer north of the Snake River underlies most of the eastern plain. The aquifer is composed of basaltic rocks that are interbedded with fluvial and lacustrine sedimentary rocks. The top of the aquifer (water table) is typically less than 500 ft below the land surface but is deeper than 1,000 ft in a few areas. The Snake River has excavated a canyon into the nearly flat lying basaltic and sedimentary rocks of the eastern Snake River Plain between Milner Dam and King Hill (fig. 2), a distance of almost 90 mi. For much of this length the canyon intersects the Snake River Plain aquifer, which discharges from the northern canyon wall as springs of variable size, spacing, and altitude. Geologic controls on springs are of importance because nearly 60 percent of the aquifer's discharge occurs as spring flow along this reach of the canyon. This report is one of several that describes the geologic occurrence of springs along the northern wall of the Snake River canyon from Milner Dam to King Hill.

To understand the local geologic controls on springs, the Water Resources Division of the U.S. Geological Survey initiated a geologic mapping project as part of their Snake River Plain Regional Aquifer Systems Analysis Program. Objectives of the project were (1) to prepare a geologic map of a strip of land immediately north of the Snake River canyon, (2) to map the geology of the north canyon wall in profile, (3) to locate spring occurrences along the north side of the Snake River between Milner Dam and King Hill, and (4) to estimate spring discharge from the north wall of the canyon.

## PREVIOUS INVESTIGATIONS

Since the early 1900's, several investigations have been conducted in order to evaluate the geologic and hydrologic conditions of the eastern Snake River Plain (Russell, 1902; Stearns and others, 1938; Mundorff and others, 1964; and Whitehead, 1986), and to assess the impact of springs on the flow of the Snake River (Bond, 1903; Crandall, 1919; Nace and others, 1958; and Thomas, 1969). The geologic and hydrologic investigations were primarily concerned with determining how the geology and structure of the Snake River Plain limit the extent of the regional aquifer, the direction of ground-water flow, and the quantity of water in the aquifer. Investigations by Malde and Powers (1962, 1972), Malde (1971, 1982), and Covington (1976; unpub. data, 1979) provide the geologic framework used in the present study.

Prior to 1950 the flow of only a few of the larger springs along this reach of the Snake River had been measured annually. In April 1950, the U.S. Geological Survey began annual measurements of major springs along the Snake River from Milner Dam to King Hill in order to determine variations in total spring discharge for that reach of the Snake River. Permanent gaging stations were established on the largest springs at Box Canyon Spring, Blue Lakes Spring, Box Canyon Spring, and Riley Creek (fig. 2).

## MAPPING METHODS OF PRESENT STUDY

Mapping was conducted by standard planetable and alidade methods with the exception of determination of horizontal distance. The near-vertical nature and relative inaccessibility of the north canyon wall made stadia determination of horizontal distance impractical, thus horizontal distances were measured directly from topographic maps. The horizontal mapping scale was 1:12,000; profiles were constructed with 5 times vertical exaggeration. Stratigraphic sections were measured at selected sites (profile-control locations) along the north canyon wall using the alidade, and geologic contacts were drawn between the measured sections to produce a geologic map. The location and spacing of the measured sections were determined by geologic complexity, visibility and access, and irregularities of the canyon wall. Geologic information between the center line of the river and the canyon wall, combined with information from measured sections, was projected onto a vertical plane drawn between measured sections to produce the geologic profile. Because the geology of the canyon wall is of primary importance, the line of the profile parallels, as close as possible, the canyon wall. In some places this meant projecting data from behind the line of the profile. Profile-control location points are locations where the line of the profile changes direction as well as locations where stratigraphic sections have been measured. Spring locations and altitudes were also determined by alidade methods, plotted on the geologic maps, and projected onto the profiles. In a few places, where the use of a planetable and alidade was not practical, geologic information was projected onto the profile from existing geologic maps. Springs that could not be seen with the alidade were plotted by inspection on the geologic map and then projected onto the profile. Spring locations are numbered consecutively in downstream order beginning with number 1. No field measurements of spring discharges were made during this study. Discharges of springs were visually estimated in the field during mapping by comparing the appearance of a spring with one of known discharge. No estimates were made for spring discharges in excess of 10 ft³/s (cubic feet per second) or less than 0.01 ft³/s. All measured spring discharges are from previous investigations.

## GEOLOGIC FRAMEWORK

East of King Hill, the Snake River Plain is an area of low topographic relief marked by scattered volcanic vents that rise a few hundred feet above the surrounding plain. The surface of the plain is dominated by late Cenozoic basaltic lava flows and interbedded fluvial and lacustrine sedimentary rocks of the Snake River Group. These late Cenozoic rocks were deposited unconformably on middle Cenozoic basalt flows and fluvial and lacustrine sedimentary rocks of the Idaho Group and on tuffs of the Idavada Volcanics. Several basalts of the Snake River Group are known to have filled ancestral canyons of the Snake River in the region west of Milner Dam, diverting the river progressively farther south along the margins of successive canyon-filling lava flows (Malde, 1971).

Basalt flowing into a canyon first dams the river and forms a temporary lake. As lava continues to flow into the canyon, dense subaerial lavas are deposited downstream. Pillow lavas are commonly deposited in basalt impounded upstream as pillow lavas and basaltic sands to the highest level of the temporary lake. As subsequent basalt flows spread across the area, the pillow lavas are capped by dense lava, and the river is diverted. Pillow lavas and basaltic sands resulting from subsequent deposition of basaltic lava are generally unsorted, coarse grained, poorly indurated, and have extremely high porosity and hydraulic conductivity. Interconnection of numerous canyons resulting from this cut-and-fill process has created a framework for an aquifer with extremely high transmissivity and storage capacity.

Geologic mapping and examination of exposures on the northern wall of the Snake River canyon have established the proximity of most springs with an ancestral canyon-filling unit. Inspection of the spring locations indicate that most springs discharge from pillow lavas and (or) basaltic sands associated with a former canyon-filling episode.

Although ancestral canyon-filling deposits play the most significant role in the location of springs along the present canyon, several other factors related to the late Cenozoic history of the Snake River are also important. These factors include the distribution of the Banbury Basalt, the Glenns Ferry Formation, flood debris, and talus deposits. The top of the Banbury Basalt relative to other more permeable rock units, defines the lower limit of spring emergence along the present canyon. Sedimentary rocks of the Glenns Ferry Formation create irregular zones of low hydraulic conductivity within the aquifer and where present along the Snake River have a local influence on spring locations. Flood debris (Melon Gravel) deposited by the Bonneville Flood (Malde, 1968) covers much of the canyon floor throughout the study area and its open-work texture allows easy movement of spring water across the canyon floor to emerge just above river level. Talus deposits along the canyon wall conceal the top of the water table. Water moves downward through the talus and emerges near the base as a spring. No evidence for fault control of spring locations was found along the present canyon in the study area.

## ANCESTRAL CANYON-FILLING DEPOSITS

### Basalt member seven of the Idaho Group

Basalt member seven of the Idaho Group spread north and west from its source vent at Hansen Butte, located 13 mi southeast of Twin Falls. The great thickness of these flows, in excess of 300 ft at profile-control location 82, and associated pillow lava deposits at profile-control location 102–2, suggest the damming of a river and subsequent filling of its canyon. At present this is inferred to have been a tributary stream entering the main ancestral Snake River from the south. Devils Washbowl Spring (spring location 8; fig. 7) emerges from this basalt flow as do a large number of seeps throughout the Kimberly quadrangle.

### Thousand Springs Basalt

The Thousand Springs Basalt spread mainly southward and westward from its source vent at Flat Top Butte, located 12 mi north of Twin Falls. The flows from Flat Top Butte are associated with a major canyon-filling episode that deposited pillow lavas and massive columnar basalt of unknown thickness in an ancestral canyon of the Snake River. These canyon-filling deposits extend from the area north of Twin Falls westward nearly to Hagerman, a distance of more than 25 mi. Outcrop relations at Thousand Springs (Covington and Weaver, 1990) and in the Tuttle quadrangle to the north (Covington and Weaver, 1990) indicate that an ancestral canyon with a minimum depth of 120 ft was incised into the sediments and lavas of the Banbury Formation in this area.

Initially a basalt dam formed across the ancestral Snake River in the area north of Twin Falls and massive columnar basalt began to fill the canyon downstream. These flows attain a maximum exposed thickness of 110 ft at profile-control location 142E near the southern edge of the map area. This area, from profile-control location 137C (fig. 3) to the western edge of the map area, is inferred to be a window in the upper part of the ancestral canyon filled by the Thousand Springs Basalt. Eventually the main ancestral Snake River canyon was completely filled with basalt and the flows spread southward and westward across somewhat older lavas and sediments of the Banbury and Glenns Ferry Formations, displacing the ancestral Snake River a short distance southward.

### Sand Springs Basalt

The Sand Springs Basalt spread mainly southward and westward from its source vent at Butte 4526, located 23 mi northeast of Twin Falls. These flows are associated with a major canyon-filling episode and can be traced to a location north of Hagerman, a distance of more than 36 mi from the source vents. A basalt dam was formed across the ancestral Snake River somewhere northeast of Twin Falls, and the basalt proceeded to fill the canyon downstream.

It appears that the main ancestral Snake River canyon, downstream from the initial basalt dam contained little water throughout the filling process. Outcrops of massive columnar Sand Springs Basalt filling the main ancestral Snake River canyon occur at Blue Lakes alcove (fig. 5) and at profile-control locations 132C and 133E (fig. 4). These outcrops indicate that the canyon filled by the Sand Springs Basalt was greater than 250 ft in depth. A tributary canyon entering the main ancestral Snake River canyon from the southeast at a location just west of Shoshone Falls was dammed, causing a lake to form. Pillow lavas were deposited in this lake canyon to an altitude of 3,660 ft. Springs at Devils Corral (spring location 9) and near Shoshone Falls (spring locations 14, 15, and 16; fig. 6) discharge from pillow lavas of the Sand Springs Basalt. After filling the canyon, the lava spread southward and westward across the older lavas of the Idaho Group, displacing the ancestral Snake River to its present location.

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Figure 7. Devils Washbowl Spring. Spring location 8 emerges from cooling joints and flow breaks in basalt member seven of the Idaho Group at the head of Box Canyon and flows into Vineyard Lake (center). Box Canyon was excavated by flood waters resulting from the catastrophic overflow of Pleistocene Lake Bonneville (Malde, 1968). A small canyon now filled with Sand Springs Basalt pillow lavas can be seen at left-center of photograph. Number corresponds to spring location number.

# GEOLOGIC MAP AND PROFILES OF THE NORTH WALL OF THE SNAKE RIVER CANYON, JEROME, FILER, TWIN FALLS, AND KIMBERLY QUADRANGLES, IDAHO

By

H. R. Covington and J. N. Weaver

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