DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-373

RECONNAISSANCE GEOLOGIC MAP OF WEST-CENTRAL SNAKE RIVER PLAIN, IDAHO

By
Harold E. Malde, Howard A. Powers, and Charles H. Marshall

SCALE 1:125 000

2 1 0 2 4 6 MILES

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

1963

Base enlarged from Hailey and Twin Falls 1:250,000 scale maps. Base north of 43°00' has military grid lines; base south of 43°00' has township and range lines

APPROXIMATE MEAN DECLINATION, 1963

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—43330

Photogeology by C. H. Marshall, 1958–59; field completion by H. A. Powers, 1959, and H. E. Malde, 1961

EXPLANATION

Qal Qt Qd

Surficial material

Unconsolidated detritus conforming to present topography. Talus commonly present below rocky cliffs not shown.
Qal, *stream alluvium.*
Qls, *landslide debris.*
Qd, *flow sand*

Qmk

McKinney Basalt

Lava flow of porphyritic plagioclase-olivine basalt from McKinney Butte 4 miles northwest of Gooding. Terminates at less than 20 feet above Snake River near King Hill, where the thickness is about 30 feet

Qwg

Wendell Grade Basalt

Lava flow of olivine basalt from Notch Butte 4 miles west of Wendell. Overlies most landslide and talus debris younger than Malmen Gravel near Bliss-man where the flow thickness does not exceed 30 feet

Qt Qlo

Lava flows

Basalt conforming to present topography, largely unmodified by surficial deposits or by weathering. Some flows locally identified as older, Qlo, than adjacent flows

Qlm

Malm Gravel

Boulders, cobbles, and pebbles of basalt in matrix of basaltic sand arranged in giant cross-bedded units. Derived from erosion of basalt of various ages. Boulders commonly 3 feet in diameter, some as large as 10 feet. Overwhelmingly from Twin Falls, the gravel is confined to floor of present canyon, but it is found in terrace fill and on canyon uplands. Within the canyon, the gravel fills a constructional here and terraces that rise as high as 300 feet above the Snake River, generally downstream from canyon constrictions. Upstream, the gravel is separated from canyon walls by marginal troughs 30 to 150 feet deep. Terrace surfaces characteristically veneered with pavement of boulders ("melon patches")

EROSION OF CANYON-FILLING LAVA FLOWS

Qs

Bancroft Springs Basalt

Lava flow of porphyritic plagioclase-olivine basalt, probably from a source in the Bancroft Springs Butte 4 miles northeast of Gooding. Includes part of McKinney Basalt of Stearns (1936) and Blue Basalt of former usage. Surface moderately dissected, but largely covered with eolian material. Fills a canyon as deep as 500 feet discontinuously exposed from mouth of Malad River to Pasadena Valley. Base of the canyon fill is yellow loess

UNCONFORMABLE ON THOUSAND SPRINGS BASALT; RELATIONS TO SAND SPRINGS BASALT UNKNOWN

QSH

Sand Springs Basalt

Lava flow of olivine basalt from vent 10 miles northeast of Twin Falls. Undulating surface largely mantled by eolian sand and silt. Surface east of U.S. Highway 93 locally dissected by shallow, discontinuous stream channels. Fills a canyon as deep as 350 feet exposed at Blue Lakes 4 miles west of Twin Falls and near Thousand Springs

CANYON CUT TO PRESENT DEPTH

Qcg Qa

Crowsnest Gravel

Lithology very variable. Upstream from Hagerman, composed mostly of boulders and cobbles, but farther downstream has abundant quartzite pebbles and sand. Occupies terraces that range from 10 to 50 feet above the river near Hagerman, but as much as 300 feet above the river near Twin Falls. Ranges from 5 to 75 feet in thickness

Unnamed gravel

Pebble and cobble gravel along Brunesa and Big Wood Rivers. Generally about 15 feet thick, on terraces 10 feet above present streams

Qsr

Basalt of Snake River Group, undivided

Qth / Qtm

Thousand Springs Basalt

Lava flows of porphyritic plagioclase-olivine basalt and aphyric olivine basalt from several vents east of Hagerman. Includes Malad Basalt and Thousand Springs Basalt of Stearns (1936), as well as parts of Sand Springs Basalt as mapped by Stearns and others (1938). Generally mantled with alluvial and eolian silt, sand, and gravel, and silt as thick as 10 feet

Qtt, *lava flows that form canyon fill as thick as 75 feet near Thousand Springs, and undivided loess flows and gravel*

Qtm, *Malad Member; lava flows of porphyritic plagioclase-olivine basalt, capped locally with olivine basalt, from Gooding Butte. Fills a canyon as deep as near mouth of Malad Canyon*

UNCONFORMABLE ON MADISON BASALT; RELATIONS TO SUGAR BOWL GRAVEL UNKNOWN

Qvo

Sugar Bowl Gravel

Pebble gravel rich in quartzite and chert. Caps a terrace 100 feet deep at Box Canyon and 200 feet above Snake River between Pasadena Valley and Dollies Cove

TERRACE CUTTING

Qma

Madson Basalt

Lava flow of olivine basalt probably from a source in Madson Butte 4 miles northeast of Gooding. Extensively exposed from mouth of Malad River to Swiss Valley

PARTIAL ENTRENCHMENT OF SNAKE RIVER

Qr

Black Mesa Gravel

Gravel and sand as thick as 25 feet on Black Mesa and Wilson Mesa, 2 miles south of Bliss. Mesa surfaces 100 feet above south side of the Snake River and 350 feet higher. Gravel largely reworked from gravel beds of older formations. Capped by caliche layer about 1 foot thick

BROAD VALLEY EROSION

Qbv / Qbvo / Qtb

Brunesa Formation

Canyon fill of undeformed, unconsolidated detrital material and interbedded basaltic lava flows. Detrital material is largely deposits of gravel and basalt. Canyon fill sequence interrupted by several local disconformities caused by dissection of lava dams. Thickness of fill about 400 feet near Bliss

Qtb, *detrital material dominated by massive lake beds of white-weathering fine silt, clay, and diatomite in layers 10 feet or more thick; with minor amounts of alluvial silt and sand. Qtbo, detrital material dominated by iron-stained pebble and cobble gravel reworked as beach deposits from contiguous older gravels. Lake deposits rise to altitude of 3,500 feet and are overlain locally by as much as 100 feet of alluvial deposits of sand, clay, and gravel that rise nearly 300 feet higher*

Qct, *fan gravel, cobbly to pebbly. Deposits north of Snake River merge with detrital deposits of Qbv and Qtb. Deposits of Box Canyon fan debris south of Mountain Home consist largely of coarse sand derived from decayed granite. Deposits north of Camas Prairie merge with loess flows on valley floor. Deposits west of Grenmere are of uncertain age but are physiographically similar.*

Tmr

Rhyolite of Magic Reservoir

Rhyolite tuff, densely welded and rich in large phenocrysts of quartz and sanidine held in a pale purplish-gray aphanitic groundmass. Conspicuously broken by widely spaced columnar joints that control weathering and erosion. Weathered surfaces commonly stained reddish brown. Vent areas, indicated by dots, characterized by vertical and outward-dipping flow banding and by massive outcrops. At head of Magic Reservoir overlies a thick pumiceous lapilli-rich tuff, ash flows with thick glassy lower parts and pumiceous upper parts that weather yellow. At least 500 feet thick southeast of Magic Reservoir

Tiv

Idavada Volcanics

Silicic latite; chiefly thick layers of devitrified welded tuff, but includes some bedded nitric tuff and lava flows. Rhyolitic rocks occur in minor amounts, mainly as flows in the Bennett Hills, and as tuff with phenocrysts of sanidine, clinopyroxene, hypersthene, and magnetite, but with no quartz, sanidine, hornblende, or biotite. Includes granitic pebble and cobble gravel at base of Idavada Volcanics in the Bennett Hills. Thickness exceeds 2,000 feet at Bennett Mountain and 1,200 feet along upper Rock Creek southeast of Twin Falls.

PROLONGED EROSION AND WEATHERING

Tcv

Challis Volcanics

Tuffs and flows of variable lithology, ranging from rhyolite to andesite. Rhyolitic rocks mostly has phenocrysts of quartz, sanidine, and biotite. Andesite has phenocrysts of plagioclase and hornblende. Coarse-textured rocks weather to craggy outcrops. Fine-textured rocks weather to smooth, rolling slopes. Forms layered sequence, highly tilted and broken, along north side of Mount Bennett Hills and northeast of Magic Reservoir

MAJOR UNCONFORMITY

Kg

Granitic rocks of Idaho batholith

Included with rocks of Challis Volcanics along Camas Prairie, only prebasalt rocks along South Fork of Boise River

Contact

Dashed where approximately located; short dashed where inferred

Normal fault

Dashed where approximately located; dotted where concealed. Bar and ball on downthrown side

Strike and dip of beds

Barb indicates direction of dip estimated from a distance or from aerial photographs. Shown mainly in Idavada Volcanics where dips are generally less than 10°

Source of basaltic lava flow

REFERENCES CITED

Stearns, H. T., 1936, Origin of the large springs and their alcoves along the Snake River in southern Idaho: *Jour. Geology*, v. 44, no. 4, p. 429–450.

Stearns, H. T., Crandall, Lynn, and Steward, W. G., 1938, Geology and ground-water resources of the Snake River Plain in southeastern Idaho: U.S. Geol. Survey Water-Supply Paper 774, 268 p.

INDEX MAP OF SOUTHERN IDAHO SHOWING AREAS SURVEYED

Area mapped in detail at 1:48,000 or larger

Area mapped only at 1:125,000

Area of reconnaissance mapping on 15-minute quadrangles

Area of gravity survey
Maps released in open files, 1960–1962

Outline of geologic map

For sale by U. S. Geological Survey, price 75 cents