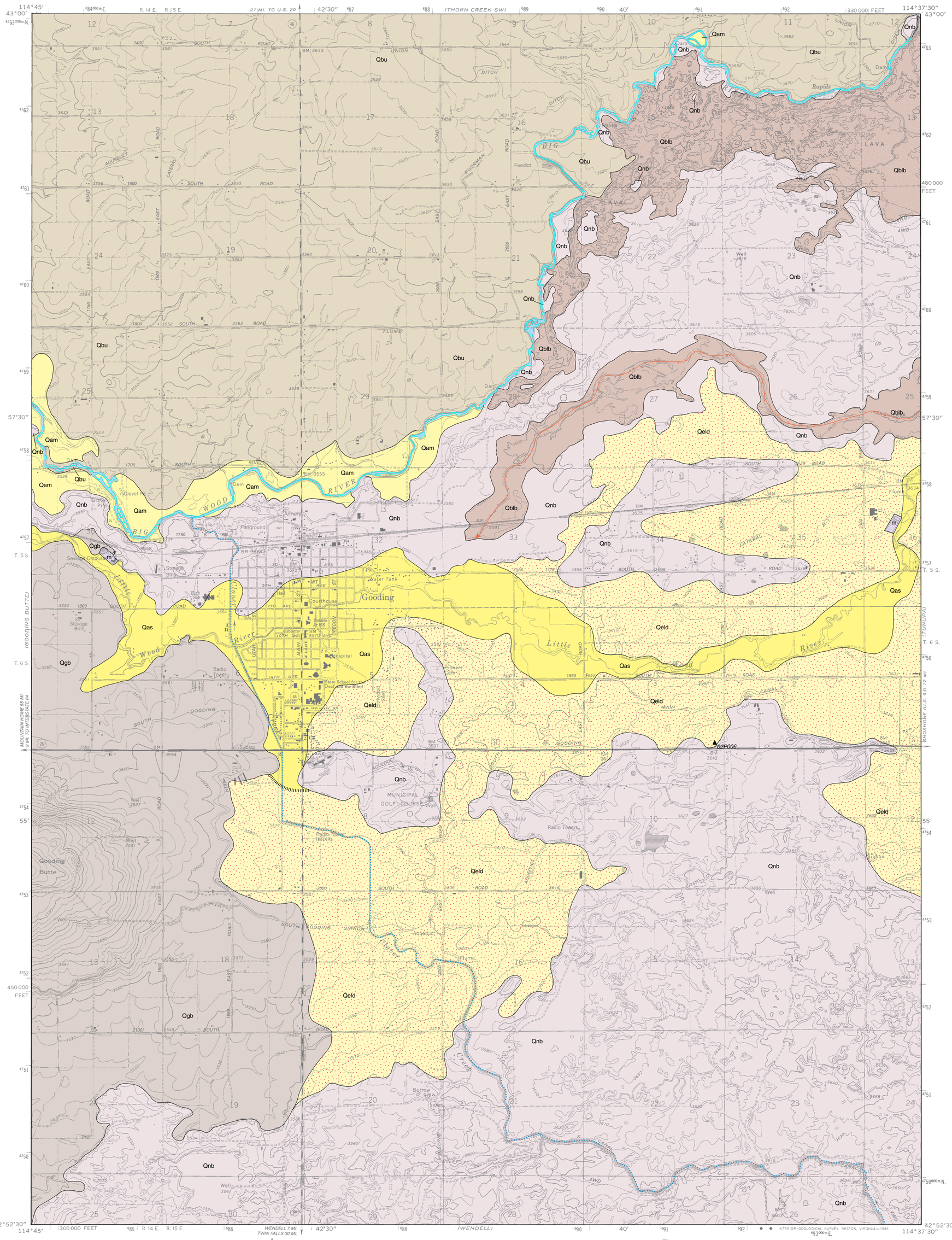
GEOLOGIC MAP OF THE GOODING QUADRANGLE, GOODING COUNTY, IDAHO

John D. Kauffman and Kurt L. Othberg

2004



Base map scanned from USGS film-positive base, 1992.

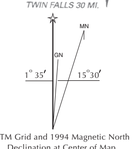
Topography by photogrammetric methods from aerial photographs taken 1969. Information shown has been updated from aerial photographs taken 1987 and field checked. Map edited 1992.

1927 North American Datum.

Projection and 10,000-foot grid ticks based on Idaho coordinate system, west zone.

1000-meter Universal Transverse Mercator grid ticks, zone 11.

National geodetic vertical datum of 1929.



UTM Grid and 1994 Magnetic North Declination at Center of Map

SCALE 1:24,000

1 0.5 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0.5 0 1 KILOMETER

Contour interval 10 feet

QUADRANGLE LOCATION

Field work conducted 2002

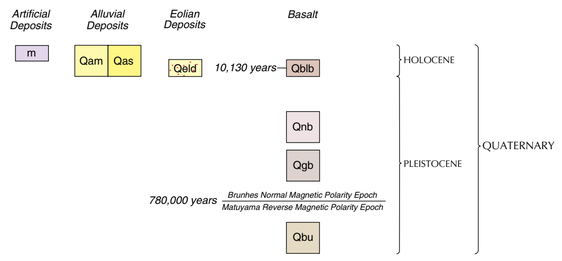
This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program

Digital cartography by B. Benjamin E. Studer and Jane S. Freed at the Idaho Geological Survey's Digital Mapping and GIS Lab

Map version 2-4-2004

Disclaimer: This Digital Web Map is an informal report and may be revised and formally published at a later time. Its content and format may not conform to agency standards.

CORRELATION OF MAP UNITS



INTRODUCTION

The geologic map of the Gooding quadrangle identifies both the bedrock and surficial geologic units. It shows the geographic distribution of rock types at the surface and in the shallow subsurface. The Gooding quadrangle lies near the center of the Snake River Plain, a large arcuate, lava-filled depression crossing southern Idaho. Pleistocene basalt flows from shield volcanoes, such as Gooding Butte, form the land surface. The older basalt flows are mantled with alluvium and wind-blown sand and silt which form the soils that are cultivated. The youngest basalt flow forms the rugged lava land in the northeast part of the quadrangle. The geologic units in the area control soil development, groundwater movement and recharge, and geotechnical factors important in construction design and waste management. Land uses in the area include irrigated agriculture, rural and urban residential development, industrial and commercial enterprises, and dairy farms with confined animal feeding operations. The Snake River Plain aquifer underlies the area and discharges to the west of the Gooding quadrangle as springs in the Snake River Canyon.

Earlier geologic mapping by Malde and others (1963) was reviewed, and field checking of their map was combined with new field investigations in 2002 of both bedrock and surficial geology. Exposures of the geology were examined and selectively sampled. Aerial photographs were studied to aid in identifying boundaries between map units through photogeologic mapping of landforms. In most areas map-unit boundaries (contacts) are approximate. Contacts are inferred where lack of exposures and poorly defined landforms prevent greater mapping precision. The information depicted at this scale furnishes a useful overview of the area's geology but is not a substitute for site-specific evaluations.

DESCRIPTION OF MAP UNITS

ARTIFICIAL DEPOSITS

m **Made ground (Holocene)**—Artificial fills composed of excavated, transported, and emplaced construction materials typically derived locally. Primarily areas modified for settling ponds.

ALLUVIAL DEPOSITS

Qam **Alluvium of mainstreams (Holocene and Pleistocene)**—Channel and flood-plain deposits of the Big Wood River. Channel deposits primarily stratified sand and pebble gravel; coarser gravel present in thicker deposits. Flood-plain deposits primarily stratified sand and silt. Where channel is shallow basalt outcrop is common. Thickness 1-10 feet.

Qas **Alluvium of sidestreams (Holocene)**—Channel and flood-plain deposits of the Little Wood River. Little Wood River was diverted to the south side of basalt of Black Butte and in west Gooding the river forms a narrow channel between basalt of Notch Butte and basalt of Gooding Butte. Where the river works its way across the surface of basalt of Notch Butte, the gradient is low and the deposits primarily are flood-plain silt and clay. In west Gooding the gradient steepens and channel sand and gravel are present.

EOLIAN DEPOSITS

Qeld **Loess and dune sand, undifferentiated (Holocene and Pleistocene)**—Wind-blown silt and sand. Typical textures are fine sand, fine silty fine sand, and sandy silt. Generally 6-10 feet thick and buries original basalt flow surface. Less than 6 feet thick over basalt pressure ridges. Rock outcrops are rare.

BASALT

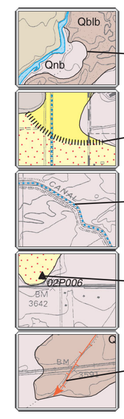
Qblb **Basalt of Black Butte (Holocene)**—Fine-grained, dark gray, glassy basalt with common to abundant olivine as individual grains and clots up to 1-2 mm, and abundant small plagioclase crystals 0.5-1 mm that give the basalt a sparkly character in sunlight; diktytaxitic and vesicular; vesicles circular to irregular and tubular. Minor carbonate lining some voids. Remanent magnetic polarity is normal, as determined in the field with a fluxgate magnetometer. Source is Black Butte to northeast near Magic Reservoir. Possibly several flow units or lobes. Youthful surface characterized by very irregular topography of pressure ridges and collapse features with little to no loess or other surficial deposits; vegetation restricted to sagebrush and scattered grass. Equivalent to *Ql* (Lava flows) of Malde and others (1963) and Shoshone flow of Kuntz and others (1986) who reported a radiocarbon age of 10,130 ± 350 years B.P. from charred sediment at base of the lava flow.

Qnb **Basalt of Notch Butte (Pleistocene)**—Fine-grained, dark gray basalt, with common to abundant olivine as individual grains and clots up to 1-2 mm, and abundant small plagioclase crystals 0.5-1 mm that give the basalt a sparkly character in sunlight; a few scattered clusters of plagioclase and olivine 2-3 mm, and scattered plagioclase phenocrysts 1-2 mm. Moderately to very vesicular and diktytaxitic. Similar in hand specimen to basalt of Black Butte but not as glassy. Carbonate lining and filling in voids slightly more common than in basalt of Black Butte. Remanent magnetic polarity is normal, as determined in the field and through laboratory analysis. Erupted from the Notch Butte shield volcano located 3 miles south of Shoshone. Equivalent to *Qwg*, Wendell Grade Basalt of Malde and others (1963). Many lava-flow features, like pressure ridges, are exposed and 30-75 percent of the surface is outcrop except where thicker sand and silt (*Qeld*) obscure the rough character of the original basalt surface. Stream drainage is not developed to poorly developed. Surface topography is, however, not as youthful in appearance as basalt of Black Butte. Discontinuous loess (silt and fine sand) is thin and primarily accumulated in swales and depressions. Loess ranges 1-10 feet thick; commonly 1-3 feet thick. Soil caliche (duripan) is generally limited to thin soil horizons and coatings on the basalt surface at the base of the soil, but may be thicker in some low areas. Small, discontinuous areas are cultivatable, but most of area generally unfit for cultivation.

Qgb **Basalt of Gooding Butte (Pleistocene)**—Fine-grained basalt with scattered to abundant plagioclase phenocrysts up to 1 cm in length, and plagioclase-olivine intergrowths up to 1 cm in diameter; olivine olive-greenish-brown in color; olivine grains mostly clustered; diktytaxitic and vesicular; vesicles small and circular to large and irregular. Common carbonate filling and coating in voids. Remanent magnetic polarity is normal, as determined in the field with a fluxgate magnetometer. Source is Gooding Butte, approximately two miles southwest of Gooding. Equivalent to *Qtm* (Thousand Springs Basalt, Malad Member) of Malde and others (1963). Surface topography is subdued; outcrops uncommon. Away from the butte, a mantle of loess nearly completely covers original basalt surface. Stream drainage is moderately developed. Loess ranges 3-25 feet thick. Soil caliche (duripan) is commonly well developed within the soil profile (Youngs and others, 1929; Johnson, 2002) and at the soil-basalt contact, but the thickness of caliche is highly variable. Most of the land is cultivatable.

Qbu **Basalt flows, undivided (Pleistocene)**—Fine- to medium-grained, medium to dark gray basalt with common plagioclase phenocrysts 1-3 mm; olivine mostly as individual grains in groundmass or small scattered clusters; diktytaxitic and vesicular. Some carbonate coating and filling in voids. Remanent magnetic polarity is reverse, as determined in the field with a fluxgate magnetometer nine miles north of Gooding. Undetermined source or sources to north. Poorly exposed on the Gooding quadrangle. Equivalent to *Qbb* (Bruneau Formation, basaltic lava flows) of Malde and others (1963). Surface topography is subdued; outcrops uncommon. A mantle of loess nearly completely covers original basalt surface. Stream drainage is moderately developed. Loess ranges 3-25 feet thick. Soil caliche (duripan) is commonly well developed within the soil profile (Youngs and others, 1929; Johnson, 2002) and at the soil-basalt contact, but the thickness of caliche is highly variable. Most of the land is cultivatable.

SYMBOLS



Contact: Line showing the approximate boundary between one map unit and another. The location accuracy of an approximate contact is more than 80 feet on the ground.

Gradational contact between alluvium and eolian deposits.

Canal: Trace of major irrigation canal zone that includes area of excavation and side-casted fill. Zone of disturbance ranges 50-300 feet wide.

Sample site for paleomagnetic analysis.

Lava tube or channel: Relict course of lava that flowed within a relatively narrow tube. Forms a channel where the roof of the tube collapsed.

REFERENCES

Johnson, M.E., 2002, Soil survey of Wood River area, Idaho, Gooding County and parts of Blaine, Lincoln, and Minidoka counties: U.S. Department of Agriculture, Natural Resources Conservation Service, 797 pages, online at http://www.or.nrcs.usda.gov/soil/mo/mo_reports_id.htm.

Kuntz, M.A., E.C. Spiker, Meyer Rubin, D.E. Champion, and R.H. Lefebvre, 1986, Radiocarbon studies of latest Pleistocene and Holocene lava flows of the Snake River Plain, Idaho: data, lessons, interpretations: Quaternary Research, v. 25, p. 163-176.

Malde, H.E., H.A. Powers, and C.H. Marshall, 1963, Reconnaissance geologic map of west-central Snake River Plain, Idaho: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-373.

Youngs, F.O., Glenn Trail, and B.L. Young, 1929, Soil survey of the Gooding area, Idaho: U.S. Department of Agriculture, Bureau of Chemistry and Soils, series 1929, no. 10, 30 pages, 1 plate.

Published and sold by the Idaho Geological Survey
University of Idaho, Moscow, Idaho 83844-3014