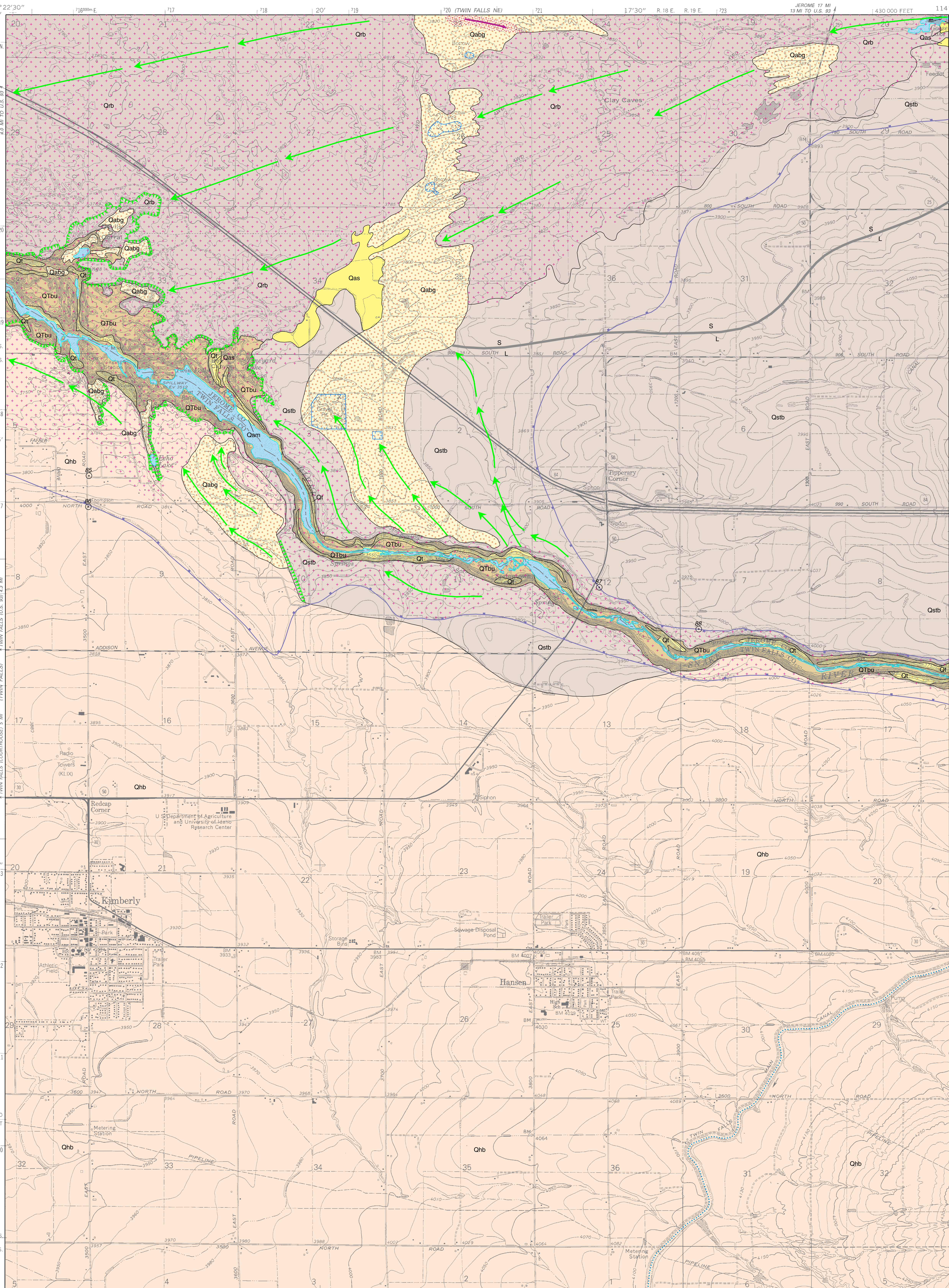
Geologic Map of the Kimberly Quadrangle, Jerome and Twin Falls Counties, Idaho

Kurt L. Othberg and Roy M. Breckenridge

2004



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

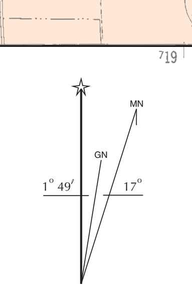
Topography by photogrammetric methods from aerial photographs taken 1962. Information shown has been updated from aerial photographs taken 1987-1988 and field checked. Map edited 1992.

1927 North American Datum.

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

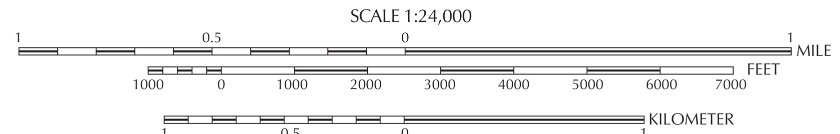
1000-meter Universal Transverse Mercator grid ticks, zone 11.

National geodetic vertical datum of 1929.



UTM Grid and 1992 Magnetic North Declination at Center of Map

SCALE 1:24,000



Contour interval 10 feet

QUADRANGLE LOCATION

Field work conducted 2002.

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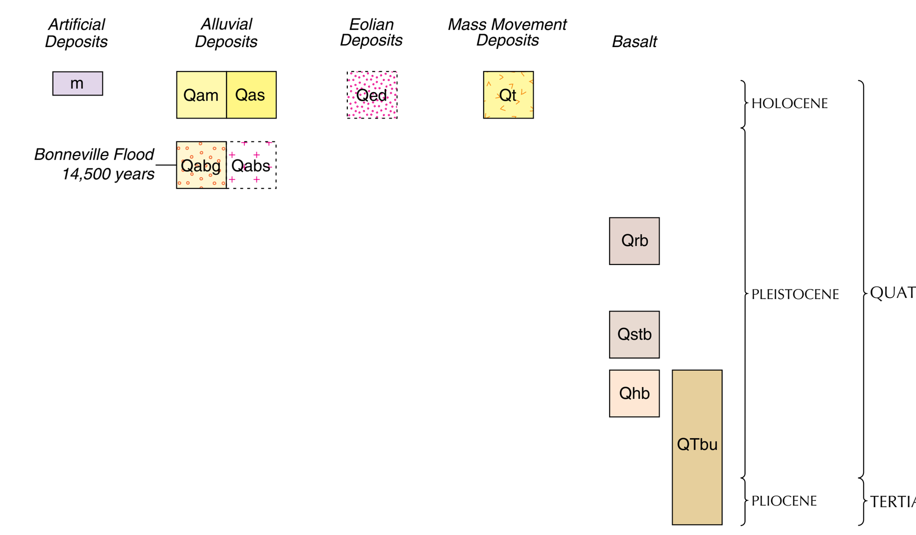
Digital cartography by B. Benjamin E. Studer and Jane S. Freed at the Idaho Geological Survey's Digital Mapping Lab.

Map version 2-4-2004.

CORRELATION OF MAP UNITS



INTRODUCTION

The geologic map of the Kimberly quadrangle identifies both the bedrock and surficial geologic units found at the surface and in the shallow subsurface. The information is directed at a broad range of specialists concerned with land development and its consequences as population increases place greater demands on the region's natural resources. Knowledge of the geology in the area is important to understanding soil development, slope stability, groundwater movement and recharge, and geotechnical factors important in construction design and waste management. The information depicted at this scale furnishes a useful overview of the area's geology but is not a substitute for site-specific evaluations.

The Kimberly quadrangle is located near the center of the Snake River Plain, a large arcuate, lava-filled depression crossing southern Idaho. The incised Snake River Canyon cuts west-northwest across the quadrangle and is centered between the gentle slopes of three shield volcanoes, Skeleton Butte and Hansen Butte (vents in the adjoining Eden quadrangle), and "Rocky Butte" (vent in the Eden NE quadrangle). The land's morphology is primarily formed by basalt flows of the shield volcanoes (Malde and Powers, 1962; Malde and others, 1963; Covington, 1976; Williams and others, 1990; and Covington and others, 1990). See Covington and Weaver (1990) for details on the geology of the north wall of the Snake River canyon. Much of the basalt surface is mantled by loess in which the cultivated soils formed (Baldwin, 1925; Poulson and Thompson, 1927; Lewis and Fosberg, 1982; Scott, 1982; Ames, 1998). Approximately 14,500 years ago the Bonneville Flood filled and overtopped the Snake River Canyon. Upstream near Burley, flood waters were partially diverted northward and flowed through the Eden channel and entered the Kimberly quadrangle from the northeast at Goose Lake (O'Connor, 1993). In the northwest part of the quadrangle the diverted water rejoined the canyon flood waters, and formed a complex of cataracts and potholes. Across the north part of the quadrangle, the Bonneville Flood stripped soils from the basalt of Rocky Butte, formed basin and butte topography, and deposited flood gravels.

DESCRIPTION OF MAP UNITS

ARTIFICIAL DEPOSITS

m — **Made ground (Holocene)**—Artificial fills composed of excavated, transported, and emplaced construction materials typically derived locally.

ALLUVIAL DEPOSITS

Qam — **Alluvium of mainstreams (Holocene)**—Channel and flood-plain deposits of the Snake River. Stratified silt, sand, and gravel of small bars.

Qas — **Alluvium of sidestreams (Holocene)**—Stratified silt and sand in underfit stream drainages located in upland north of Snake River Canyon.

Bonneville Flood

Qabg — **Sand and gravel in giant flood bars (Pleistocene)**—Boulders, cobbles, and pebbles of basalt in a matrix of basaltic sand. Forms streamlined gravel deposits near confluence of flood waters that emerged from Eden channel and Snake River Canyon. Also, forms localized bars downstream of cataracts. Similar to Melon Gravel (Malde and Powers, 1962; Malde and others, 1963; and Covington and Weaver, 1990), but restricted to Bonneville Flood constructional forms and deposits.

Qabs — **Scabland of flood pathways (Pleistocene)**—Flood-scoured basalt surface. Loess stripped, basin and butte topography is common. Unit adapted from Scott (1982) and O'Connor (1993). Character of scoured surface ranges from areas of original basalt morphology stripped of pre-flood loess and soils, to areas where the original basalt surface has been plucked, gouged, and molded. Includes patchy sheets and bars of thin sand and gravel that are not mapped at this scale. Some areas include pavements or strings of boulders transported by flood traction forces or that are lags from erosion by lower-energy regime during late stages of the flood.

EOLIAN DEPOSITS

Qed — **Dune sand (Holocene)**—Thin, stratified fine sand of stabilized wind dunes. Shown only where identified on aerial photographs.

MASS MOVEMENT DEPOSITS

Qt — **Talus of Snake River canyon walls (Holocene)**—Angular pebble-, cobble-, and boulder-sized fragments of basalt that have broken off nearly vertical rock walls and accumulated below. Deposits are characterized by a steeply sloping surface that is at or near the angle of repose. Prominent deposits are shown. Thin, discontinuous talus is included in basalt unit.

VOLCANIC ROCKS

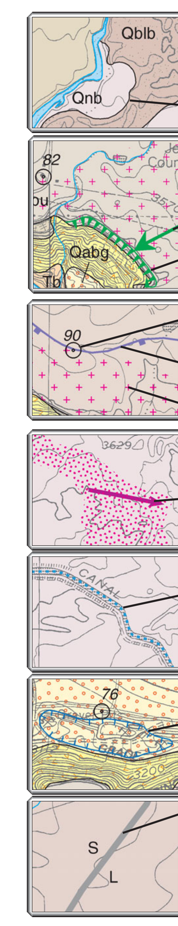
Qrb — **Basalt of Rocky Butte (Pleistocene)**—Unweathered, medium gray plagioclase-olivine basalt. Remanent magnetic polarity is normal, as determined in the field and through laboratory analysis. Erupted from a shield volcano located 22 miles northeast of the city of Twin Falls in the Eden NE topographic quadrangle, which shows a permanent horizontal-control mark labeled "Rocky" at 4526 feet on the south rim of the vent (Sec. 14, T. 8 S., R. 20 E.). Equivalent to Sand Springs Basalt of Malde and Powers (1962), Malde and others (1963), Covington (1976), and Covington and Weaver (1990). Covington and Weaver (1990) called source volcano "Butte 4526." In the Kimberly quadrangle, entire unit was scoured by Bonneville Flood (*Qabs*) and is 90 percent outcrop.

Qstb — **Basalt of Skeleton Butte (Pleistocene)**—Gray, olivine-rich pahoehoe basalt from vent at Skeleton Butte (Covington and others, 1990) located 7.5 miles northeast of Kimberly (in the adjoining Eden quadrangle). Mapped as basalt member 3 (*Qi3*) by Covington and others (1990). Surface drainage is moderately well developed, vent lacks a crater, and basalt is almost entirely mantled with loess. The westward topographic slope, however, reflects the original morphology of the shield volcano. Loess thickness ranges 3-25 feet (Lewis and Fosberg, 1982; Ames, 1998). Loess is thinnest on the steeper slopes of the vent and within the extent of the Bonneville Flood (see *Symbols*). Thickest loess may include a younger deposit with weak soil development and an underlying older loess with a thick caliche (duripan) horizon (Baldwin, 1925; Ames, 1998).

Qhb — **Basalt of Hansen Butte (Pleistocene)**—Gray, dense, pahoehoe basalt erupted from Hansen Butte vents 4 miles southeast of Hansen in the adjoining Eden quadrangle. Petrography described by Williams and others (1990). Normal magnetic polarity reported by Williams and others (1990). Mapped as basalt member 7 (*Qi7*) by Covington and others (1990) north of the Snake River. Surface drainage is moderately well developed and the basalt is entirely mantled with loess. The topographic slope, however, reflects the original morphology of the shield volcano. Loess thickness ranges 5-50 feet (Lewis and Fosberg, 1982; Ames, 1998). Loess is thinnest on the steeper slopes of the vent (southeast corner of the quadrangle) and within the extent of the Bonneville Flood (see symbols). Thickest loess may include a younger deposit with weak soil development and an underlying older loess with a thick caliche (duripan) horizon (Baldwin, 1925; Ames, 1998).

QTbu — **Older basalt flows and rhyolite, undivided (Quaternary and Tertiary)**—Includes basalt flows *Qi6*, *Qi7*, *Qi8*, *Qi10*, *Qi13*, and rhyolite *Tiv* of Covington and Weaver (1990) north of the Snake River. Unit similar to *Qbu* of Williams

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.

Bonneville Flood flow direction.

Relict cataracts of Bonneville Flood.

Location of reported evidence for maximum stage of Bonneville Flood (O'Connor, 1993).

Approximate extent of Bonneville Flood at maximum stage.

Flood-scoured basalt surface (see *Qabs* description).

Trend of dune field. Arrow points in the downwind direction.

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

Gravel pit that exposes a map unit.

Indistinct, gradational transition zone between sandy eolian surface deposits and silty eolian surface deposits. The transition zone is close to the pre-agriculture morphological change from dunes to blanket deposits of dust. Based on 2002 field evidence and soil surveys (Poulson and Thompson, 1927; Ames, 1998). The transition zone was primarily based on a general distribution of loose, fine-sand soils and more compact loam to silt-loam soils. The sand to silt transition was chosen where generally the amount of silt begins to exceed 50% and sand tends to be less than 50%. In soils with little clay, typical of eolian deposits,

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