Geologic Map of the Lucky Peak Quadrangle, Ada County, Idaho

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Contents

Introduction ......................................................................................................................... 1

Description of Map Units .................................................................................................. 2

QA Alluvium of active streams .......................................................................................... 2

QT Talus deposits ............................................................................................................. 2

QLs Landslide deposits ..................................................................................................... 2

Qbg Gravel of the Boise terrace ....................................................................................... 2

Qhs Sandy alluvium of Highland Valley and adjacent areas ........................................... 2

Qmb Basalt of Mores Creek ............................................................................................. 3

Qwg Gravel of Whitney terrace ......................................................................................... 3

Qgg Gravel of Gowen terrace ......................................................................................... 3

Qgb Basalt of Gowen Terrace ......................................................................................... 4

Qfg Alluvial fan gravels .................................................................................................. 4

QLb Basalt of Lucky Peak ............................................................................................... 4

Qfb Basalt of Fivemile Creek ......................................................................................... 5

QTg Tenmile Gravel ......................................................................................................... 6

TF Alluvial fan deposits .................................................................................................. 7

Tt Sandy stream and lake deposits of the Terteling Springs Formation ....................... 7

Tbv Basalt volcanic assemblage ...................................................................................... 7

Tbt Tuff and volcaniclastic sediments ........................................................................... 8

Tbp Basalt of Picket Pin Canyon .................................................................................... 8

g Granitic rocks of the Idaho batholith ......................................................................... 8

References ...................................................................................................................... 8

Table

Table 1. Potassium-argon ages based on whole rock analyses of Quaternary basalts within or near the Lucky Peak quadrangle ......................................................... 5
INTRODUCTION

This map is one of several geologic maps for the region covered by the Boise 15' x 20' quadrangle. Until now, no geologic maps at this scale had been produced for the area. County Report 3, Geology and Mineral Resources of Ada and Canyon Counties (Savage, 1958), contains a countywide geologic map that includes the area of the Lucky Peak 7 1/2-minute quadrangle. Although the 1958 report still provides useful information, this new, larger scale map gives a further interpretation of the geology and furnishes the detail needed for understanding the region’s land, water, and mineral resources.

Key quadrangles near Boise were chosen for this major geologic mapping program undertaken to unravel the stratigraphy, chronology, and geologic history of the fastest growing region in the state. With financial assistance of the U.S. Geological Survey’s COGEOMAP Program, the Idaho Geological Survey has conducted since 1986 detailed mapping of nine 7 1/2-minute quadrangles. The Geologic Map of the Lucky Peak Quadrangle, Ada County, Idaho is among the first published maps from that project. The long-term goal of the program is to compile and publish two regional geologic maps at 1:100,000 scale. These smaller scale maps will represent both detailed and reconnaissance mapping of sixty-four 7 1/2-minute quadrangles. The more-detailed geologic maps, such as this one, will be released in the Technical Report series.

This report consists of two parts, a geologic map and an expanded description of map units in accompanying text. The geologic map can be read alone. The map’s legend briefly describes the rock units in addition to providing a correlation diagram and an explanation of symbols. The accompanying text contains further information about physical properties, age-dating, associated features, and other details about the units.

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DESCRIPTION OF MAP UNITS

Qa  Alluvium of active streams

LITHOLOGY AND TEXTURE.  Sandy pebble and cobble gravel.  Granitic rocks and porphyritic felsites dominate the lithologies of the gravel clasts; 5-10 percent of the clasts consist of gray unweathered basalt.

SOURCE.  Mostly channel alluvium of the Boise River; includes minor sidestream deposits.  Most transported clasts came from the Idaho batholith and associated felsic rocks of the central Idaho mountains.  Basalt clasts came from Pleistocene basalt flows in the Boise River drainage basin.

THICKNESS.  Well logs suggest an average gravel thickness of about 8 meters (26 feet) overlying much older, finer grained sediments.

SURFACE SOILS.  Soils developed in these young deposits exhibit little or no A or B horizons.  Typical soils include the Notus series and unvegetated riverwash (Collett, 1980).  In vegetated areas gravel lies within 1/3 meter (1 foot) of the surface.

AGE.  Late Holocene.  Virtually no gravels have been deposited by the Boise River since construction of the dams in the twentieth century.

Qt  Talus deposits

LITHOLOGY AND TEXTURE.  Very coarse gravel consisting of angular boulders and cobbles of basalt.

SOURCE.  Rock-fall and rock-slide colluvium deposited at the base of lava bluffs and ledges.

THICKNESS.  Highly variable due to the tapering shape of talus.  Larger deposits may range from 1 to 25 meters thick.

AGE.  Chiefly Holocene; some buried portions may be Pleistocene.

Qls  Landslide deposits

LITHOLOGY AND TEXTURE.  Highly variable rock and soil masses varying from transported coherent blocks to unsorted, unstratified colluvium.  Units mapped include scar area at the head of the landslide.

SOURCE.  Derived from slumps, slides, and debris flows.  Most landslides identified represent slope failures within basaltic tuff (Tbt) and within the surface soils of the granitic rocks.

Qbg  Gravel of the Boise terrace

LITHOLOGY AND TEXTURE.  Sandy pebble and cobble gravel.  Granitic rocks and porphyritic felsites dominate the lithologies of the gravel clasts; 5-10 percent of the clasts consist of gray unweathered basalt.

SOURCE.  Mostly channel alluvium of the former Boise River deposited on the river-cut surface of the first terrace above the modern Boise River.  In the Lucky Peak quadrangle the Boise terrace is about 3 meters (10 feet) above the present floodplain.  Most transported clasts came from the Idaho batholith and associated felsic rocks of the central Idaho mountains.  Basalt clasts came from Pleistocene basalt flows in the Boise River drainage basin.

THICKNESS.  The gravel deposit is up to 14 meters (45 feet) thick.  It overlies weakly consolidated Tertiary-age sands, silts, and claystones cut into by the former Boise River during valley deepening.

SURFACE SOILS.  Soils developed in the Boise terrace have weakly to moderately developed clayey and calcic B horizons.  Typical soils include the Bram and Bissell series (Collett, 1980).  Gravel may be found at about 1 meter (3 feet).

AGE.  Late Pleistocene.  The Boise terrace is the lowest well-defined alluvial surface above the present floodplain of the Boise River.  This geomorphic position and the soil characteristics found in the surface of the terrace's gravel-fill both suggest correlation with the time of the most recent glaciation in the mountains, i.e., late Pinedale Glaciation.  This appears corroborated west of Caldwell where this terrace was blanketed by slackwater sediments from the Bonneville Flood about 14,000-15,000 years ago (Scott and others, 1982).

Qhs  Sandy alluvium of Highland Valley and adjacent areas

LITHOLOGY AND TEXTURE.  Medium to coarse sand in a silty matrix.  The mineralogy of the sand in-
cludes quartz, feldspar, mica grains in amounts similar to the granitic rocks, and grus from which the sand was eroded.

SOURCE. Mostly alluvium of local streams draining hills and mountains near Highland Valley.

AGE. Includes Holocene alluvium but most of the sand probably was deposited during greater runoff conditions in the Pleistocene (Pierce and Scott, 1982).

Qmb Basalt of Mores Creek

LITHOLOGY AND TEXTURE. Dark gray olivine basalt. Hand samples appear fine grained and contain abundant microphenocrysts of plagioclase and common microphenocrysts of olivine.

SOURCE. Lava flow from unknown vent in the drainage of Mores Creek, a tributary of the Boise River.

LOCATION. Forms a terrace at the confluence of Mores Creek and the Boise River (see adjacent Arrowrock Dam quadrangle). This terrace extends 0.4 mile into the Lucky Peak quadrangle. Tentatively identified in ledges and normally submerged in the two reservoirs as far downstream as the Discovery Picnic Area.

THICKNESS. Minimum of 6 meters (20 feet) thick where exposed.

AGE. Late Pleistocene. K/Ar date is 0.107±0.012 Ma (see Table 1). Previous K/Ar date of 0.44±0.20 Ma is listed by Howard and others (1982) who also report a normal paleomagnetic polarity for the basalt of Mores Creek. These results are consistent with the Brunhes Normal Polarity Chron (present to 0.730 Ma) (Mankinen and Dalymply, 1979; Berggren and others, 1985).

Qgg Gravel of Gowen terrace

LITHOLOGY AND TEXTURE. Sandy pebble and cobble gravel. Granitic rocks and porphyritic felsites dominate the lithologies of the gravel clasts. In the Lucky Peak quadrangle, the basalt of Gowen terrace (Qgb) mostly buries the surface of this alluvial terrace. Approximately 4 meters (13 feet) of the upper part of the terrace consists of a relatively unweathered gravel that includes a minor (5-10 percent) but distinctive component of unweathered basalt clasts. Although of similar texture, gravel below that level is more weathered and lacks the distinctive basalt clasts and is therefore probably Tennmile Gravel, QTtg.

SOURCE. Mostly channel alluvium of the former Boise River deposited on the river-cut surface of the second terrace above the modern floodplain. In the Lucky Peak quadrangle this terrace is 24-30 meters (80-100 feet) above the present floodplain. Most transported clasts came from the Idaho batholith and associated felsic rocks of the central Idaho mountains.

THICKNESS. The gravel fill underlying the terrace is about 15-24 meters (50-80 feet) thick. It overlies weakly consolidated Tertiary-age sands, silts, and claystones incised by the former Boise River during valley deepening.

SURFACE SOILS. Soils in the Whitney terrace primarily formed in loess. The soils have clayey and calcic B horizons and locally have weak duripan (caliche) characteristics, at about 1 meter in depth, that may extend into the gravel. Typical soils include the Power and Purdam series (Collett, 1980).

AGE. Late to middle Pleistocene. By tracing the Whitney terrace upstream into the Boise River canyon, its geomorphic position can be shown to be higher than that of the basalt of Mores Creek (Qmb). Whitney terrace is, therefore, older than the basalt of Mores Creek, i.e., greater than 0.107 Ma.
fan. Most transported clasts came from the Idaho batholith and associated felsic rocks of the central Idaho mountains. Basaltic clasts came from Pleistocene basalt flows in the Boise River drainage basin.

LOCATION. Mapped on the northeast side of the Boise River only (sec. 34, T. 3 N., R. 3 E.).

THICKNESS. The gravel fill marking the level of the Gowen terrace is about 4 meters (13 feet) thick. It immediately overlays the Tenmile Gravel incised by the former Boise River during valley deepening.

AGE. Middle Pleistocene. About the same age as the basalt of Gowen terrace (Qgb) which has a K/Ar date of 0.572±0.210 Ma (see Table 1).

Qgb Basalt of Gowen terrace.

LITHOLOGY AND TEXTURE. Medium gray olivine basalt. Hand samples and thin sections show sparse phenocrysts of olivine up to 3 millimeters in diameter. Four flows defined by highly vesicular zones at the tops and bottoms form a package of basalt in the canyon. This package of basalt thins to two flows at the west edge of the map. Loess 1-2 meters thick discontinuously covers the surface of the basalt.

SOURCE. Probably originated in Smith Prairie and flowed down the Boise River canyon and spread onto the active alluvial surface (now the Gowen terrace). The gravel of Gowen terrace (Qgg) is nearly completely buried by this basalt in the Lucky Peak quadrangle.

THICKNESS. Maximum of 61 meters (200 feet) in the canyon; minimum of 24 meters (80 feet) on the Gowen terrace along the west edge of the map.

SURFACE SOILS. Soils in the Gowen terrace primarily formed in loess. The soils have clayey B horizons and platy duripans (caliche) 0.5-1 meter thick. Duripans are found at about 1 meter in depth, and some of their white calcic properties extend into the gravel. The typical soil is the Eliza series (Collett, 1980).

STRATIGRAPHY. Although Howard and others (1982) tentatively correlated these lavas with the Steamboat Rock Basalt, a local name is retained here. Both units have similar morphology and lithology. However, the K/Ar date of 1.8±0.3 Ma for Steamboat Rock Basalt differs greatly from the K/Ar results for the basalt of Gowen terrace. The basalt of Gowen terrace exhibits normal magnetic polarity based on laboratory palaeomagnetic measurements.

AGE. Middle Pleistocene. K/Ar date is 0.572±0.210 Ma (see Table 1). The normal magnetic polarity is consistent with an age less than 0.730 Ma (boundary between the Brunhes Normal and Matuyama Reverse Polarity Chrons (Mankinen and Dalrymple, 1979; Berggren and others, 1985).

Qfg Alluvial fan gravels

LITHOLOGY AND TEXTURE. Sandy pebble and cobble gravel where local streams formed alluvial fans of reworked Tenmile Gravel (Qtg). Sand and granule gravel near Lucky Peak Reservoir where local streams formed alluvial fans of debris eroded from the granite of the Idaho batholith (g). Loess 1-2 meters thick discontinuously covers Pleistocene-age alluvial fans.

SOURCE. Ephemeral debris flows and high-energy stream deposits forming alluvial fans at the base of steep slopes. These processes probably were most active during periods of greater runoff in the Pleistocene (Pierce and Scott, 1982).

SURFACE SOILS. Soils on undissected surfaces of Pleistocene-age alluvial fans formed in both the thin loess and in the upper part of the fan gravel. The soils have clayey and calcic B horizons. Typical soils include the Ada and Brent series (Collett, 1980). Small circular mounds (2-4 meters in diameter) consisting of thicker horizons of surface soil form a patterned ground which may have developed during Pleistocene periglacial conditions (Malde, 1964). The patterned ground normally is perceivable on aerial photographs only. Dry stream valleys eroded into the fans form a relief of up to 12 meters (40 feet).

AGE. Unit includes Holocene deposits, but most of the alluvial fans probably formed during the Pleistocene (Pierce and Scott, 1982).

Qgb Basalt of Lucky Peak.

LITHOLOGY AND TEXTURE. Dark gray to black aphyric, very fine-grained basalt. Consists of a single thick lava flow displaying a distinctive lower columnar-jointed column and an upper hackly jointed entablature. Its upper surface is largely buried by alluvial fan deposits (Qfg).
SOURCE. Howard and others (1982) believe the lava originated along the South Fork of the Boise River near Smith Prairie. Evidence of alluvial gravels underlying the lava suggest it flowed down the Boise River valley and inundated both the active alluvial plain and a low terrace.

LOCATION. Howard and others (1982) named the basalt of Lucky Peak for the thick lava flow that forms the northeast canyon wall just downstream from Lucky Peak Dam.

THICKNESS. Consists of a single flow approximately 37 meters (120 feet) thick.

STRATIGRAPHY. The basalt of Lucky Peak buries two former surfaces consisting of thin, relatively unweathered alluvial gravel deposits: (1) a more extensive buried terrace at about 2,980 feet in elevation that was probably the active floodplain when buried by the Lucky Peak lava, and (2) a secondary buried terrace at about 3,040 feet elevation that, although not within the active floodplain, was nevertheless also buried by the thick basalt of Lucky Peak. The gravel of these terraces contains 5-10 percent unweathered basalt clasts and is 3-6 meters (10-20 feet) thick. These younger gravels overlie the more weathered Tenmile Gravel and probably represent channel deposits on river-cut surfaces. Based on the position of terraces buried by lavas, the basalt of Lucky Peak is older than the basalt of Gowen terrace, but younger than the basalt of Fivemile Creek.

AGE. Probably early to middle Pleistocene. Samples of this basalt may yield anomalously old K/Ar dates (see Table 1). Laboratory analyses indicate a normal paleomagnetic polarity for the basalt of Lucky Peak. The normal polarity and stratigraphic position suggest an age of between 0.572 Ma (K/Ar date on basalt of Gowen terrace) and 0.730 Ma (boundary between the Brunhes Normal and Matuyama Reverse Polarity Chrons (Mankinen and Dalrymple, 1979; Berggren and others, 1985). Howard and others (1982) describe another lava unit, the basalt of Long Gulch, which has normal magnetic polarity and stratigraphic relationships similar to the basalt of Lucky Peak. The K/Ar date of 0.68±0.25 Ma for basalt of Long Gulch is considered too young by Howard and others (1982) but appears to fit the stratigraphy within the Lucky Peak quadrangle.

Qfb Basalt of Fivemile Creek.

LITHOLOGY AND TEXTURE. Medium gray olivine basalt. Thin sections show a cumulophytic texture of a few small interlocking olivine grains. The basalt of Fivemile Creek underlies the highest surface of the lavas in the Boise River canyon. There, it is a single flow with columnar jointing and one observed lava tube oriented N. 35° E. (located in NE1/4 sec. 10, T. 2 N., R. 3 E.). Loess 1-2 meters thick discontinuously covers the basalt.

Table 1. Potassium-argon ages based on whole rock analyses of Quaternary basalts within or near the Lucky Peak quadrangle (Berkeley Geochronology Center, Institute of Human Origins, Berkeley, California).

<table>
<thead>
<tr>
<th>Unit, Location</th>
<th>K/Ar Number</th>
<th>Sample Number</th>
<th>K+ (%)</th>
<th>Weight (grams)</th>
<th>40Ar± (mol/gm)</th>
<th>40Ar± (%)</th>
<th>Age ± 1σ (Ma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basalt of Mores Creek (Qmb)</td>
<td>5838B-2</td>
<td>MC-1</td>
<td>1.397</td>
<td>6.56930</td>
<td>2.588x10-13</td>
<td>9.0</td>
<td>0.107±0.012²</td>
</tr>
<tr>
<td>Basalt of Gowen Terrace (Qgb)</td>
<td>5937-1</td>
<td>GT-4</td>
<td>0.945</td>
<td>7.01441</td>
<td>9.569x10-13</td>
<td>8.3</td>
<td>0.572±0.210</td>
</tr>
<tr>
<td>Basalt of Lucky Peak (Qfb)</td>
<td>5963-1</td>
<td>LP-4</td>
<td>0.490</td>
<td>7.65444</td>
<td>1.160x10-12</td>
<td>3.7</td>
<td>1.364±0.210²</td>
</tr>
<tr>
<td>Basalt of Fivemile Creek (Qfb)</td>
<td>5934-1</td>
<td>30-3</td>
<td>0.532</td>
<td>4.22554</td>
<td>8.987x10-13</td>
<td>11.2</td>
<td>0.974±0.130</td>
</tr>
</tbody>
</table>

¹Radiogenic component.
²Previous K/Ar date of 0.44±0.20 Ma reported by Howard and others (1982).
³Age considered too old based on stratigraphy. Previous K/Ar date of 2.1±0.5 Ma reported by Howard and others (1982).

Decay constants: λe + λe⁻¹ = 0.581x10⁻¹⁰ yr⁻¹; λβ = 4.962x10⁻¹⁰ yr⁻¹; λ = 5.543x10⁻¹ yr⁻¹; and 40K/Ktotal = 1.167x10⁻³
SOURCE. One or more lava flows likely erupted from a small vent near the headwaters of Fivemile Creek (NW1/4 sec. 21, T. 2 N., R. 3 E.). It is the only Pleistocene basalt with a nearby source and probably was never confined within a canyon as were the similarly aged lavas erupted at Smiths Prairie which flowed down the Boise River. In one exposure, the basalt of Fivemile Creek rests on an alluvial gravel deposit with unweathered basalt clasts at 3,040 feet elevation.

THICKNESS. About 55 meters (180 feet) in the NE1/4 sec. 10, T. 2 N., R. 3 E.

SURFACE SOILS. Soils on this surface developed in both loess and basalt. A well-defined stream drainage eroded into the surface of the basalt forms a relief of about 18 meters (60 feet). Soils formed in thick loess are found on the least eroded areas. The most widespread soil has a very clayey B horizon and a thick duripan (calcite) up to 1 meter thick. Duripans are found at about 0.5-1 meter in depth, and their white calcic properties extend into the upper part of the basalt. The typical soil in the Lucky Peak quadrangle is the Chilcott series (Collett, 1980). Small circular mounds (2-4 meters in diameter), consisting of thicker horizons of surface soil, form a patterned ground that may have developed during Pleistocene periglacial conditions (Malde, 1964). The patterned ground normally is perceivable on aerial photographs only.

STRATIGRAPHY. Based on the position of terraces buried by lavas, the basalt of Fivemile Creek is older than the basalt of Lucky Peak but younger than Tennmile Gavel (rests on a terrace cut into Tennmile Gavel). Laboratory analyses indicate a normal paleomagnetic polarity for the basalt of Fivemile Creek.

AGE. Early Pleistocene. Sample from the adjacent Boise South quadrangle (NE1/4 sec. 1, T. 2 N., R. 2 E.) has a K/Ar date of 0.974±0.130 Ma (see Table 1).

QTtg Tennmile Gavel

LITHOLOGY AND TEXTURE. Sandy pebble and cobble gravel. Contains numerous lenses and discontinuous beds of sand. Lithologies of gravel clasts are dominated by granitic rocks and porphyritic felsites that came from the central Idaho mountains. Exposures in the Lucky Peak quadrangle demonstrate a relatively uniform yellow-orange color and, based on counts of gravel clasts, a degree of weathering in which about half of the gravel clasts have lost their induration. Virtually all granitic clasts with abundant biotite crumble upon removal from the outcrop.

SOURCE. Mostly channel alluvium deposited in a thick fill where the former Boise River exited the foothills and flowed into the basin.

LOCATION. Remnants of Tennmile Gavel now form the long, high east-west ridge, informally known as Tennmile ridge, located south of the Boise River and the city of Boise. Tennmile ridge represents the inverted topography of an ancient river bottom.

THICKNESS. Data from field studies and logs of deep water wells suggest that the Tennmile Gravel in this quadrangle is the remnant of a large deposit of range front gravel. The thicker end, deposited against the mountain front, abruptly thins as it crosses the range-front fault zone and laps against the mountains. The highest elevation observed for Tennmile Gravel is about 4,124 feet on both sides of the river; at which places the unit ranges from 24 to 47 meters (79-154 feet) in thickness. Exposures and a well log for the area just west of the Lydle Gulch fault (taken here to be the best local trace of the range-front fault) suggest a maximum continuous section of Tennmile Gravel of about 152 meters (500 feet).

SURFACE SOILS. Soils on Tennmile ridge formed in thin loess and gravel. The original landform and deposit have been eroded into valleys and broad interfluves. The more eroded lower slopes have soils younger than those on the higher interfluves. In the Lucky Peak quadrangle, lower slopes have dry calcic soils with moderately developed clayey B horizons (for example, the Tennmile series). Soils at higher elevations typically are in the Ada series which are wetter and have strongly developed clayey B horizons (Collett, 1980). The upper part of the gravel contains a highly oxidized, partly cemented zone. Circular mounds 4-6 meters in diameter, consisting of thicker horizons of surface soil, form a patterned ground which may have developed during Pleistocene periglacial conditions (Malde, 1964). These features are especially apparent at higher elevations on Tennmile ridge. The eroded stream valleys in Tennmile ridge are mostly dry today. These valleys are the source of gravel redeposited onto the adjacent alluvial fans (QTg). Both mostly formed during periods of greater runoff in the Pleistocene (Pierce and Scott, 1982).

FORMAL NAME. Tennmile Gravel was named by Savage (1958). Wood and Anderson (1981) restricted the definition of Tennmile Gravel and identified it in remnant high surfaces as far west as the Snake River.
STRATIGRAPHY. The base of the gravel, where recorded near the mountain front, rests on brown basaltic sediments and tuff of the basalt volcanic assemblage (Tbv). This basal surface slopes toward the present Boise River where Tenmile Gravel is exposed as low as 2,840 feet elevation. The Tenmile Gravel appears to fill a preexisting valley, and the minimum depth of fill is the difference between the highest elevation (4,124 feet) and this lowest exposure (2,840 feet), or about 1,284 feet. The gravel deposit thins, interfingers with, and is replaced by finer sediments to the west and northwest.

AGE. Stratigraphy, degree of weathering, surface morphology, and soil characteristics suggest a Pliocene age for the Tenmile Gravel mapped in the Lucky Peak quadrangle. Othberg (1986) suggests that the Tenmile Gravel is time-transgressive and represents gravelly river facies deposited over considerable time near the mountain front. Furthermore, the Tenmile Gravel's most extensive westward progradation probably happened in response to late Pliocene climatic change and occurred at about the same time that the drainage of the western Snake River Plain was captured through Hells Canyon (Othberg, 1987). An "upper," less-weathered part of the Tenmile Gravel, mapped west of the Lucky Peak quadrangle only, is probably early Pleistocene in age.

Tf Alluvial fan deposits

LITHOLOGY AND TEXTURE. Composed of poorly sorted, silty and sandy gravels with subangular cobbles and boulders in crudely stratified layers and lenses; commonly oxidized to a red brown color.

SOURCE. Remnants of alluvial fans. Probably deposited by debris flows and ephemeral streams that issued from the foothills. Original deposits now mostly removed by erosion.

LOCATION. These gravels cap high hills near exposures of granitic rocks and extend as hill-capping deposits down to the lower-elevation hills bordering the plain where they may be indistinguishable from Quaternary colluvium.

THICKNESS. Unit thickness is highly variable but is as much as 61 meters (200 feet) thick.

STRATIGRAPHY AND AGE. May correlate with the upper part of the Pliocene (?) Pierce Gulch Formation in the adjacent Boise South and Boise North quadrangles or with part of the Tenmile Gravel (Tgt).

Tt Sandy stream and lake deposits of the Terteling Springs Formation

LITHOLOGY AND TEXTURE. Weakly consolidated sand with minor gravel and claystone lenses. The formation is an assemblage of several lithofacies that grade one into another both laterally and vertically.

SOURCE. The formation consists of sediments and sedimentary rocks representing lake or lake-shore environments of deposition. Gallegos and others (1987) discuss possible depositional environments and diagenesis and describe several exposures of this formation within the adjacent Boise North and Boise South quadrangles.

LOCATION. Found in the vicinity of Squaw Creek and Warm Springs Creek in the northwest corner of the Lucky Peak quadrangle.

FORMAL NAME. Spencer H. Wood and Willis L. Burnham (personal communication) named the Terteling Springs Formation during recent mapping in the adjacent Boise South and Boise North quadrangles. Previously, these sediments and sedimentary rocks were called "sediments of the lower Idaho Group" by Wood and Burnham (1983) and were included in the "Idaho Formation" by Savage (1958).

STRATIGRAPHY AND AGE. Possibly correlative with the Pliocene Glenns Ferry Formation.

Tbv Basalt volcanic assemblage

LITHOLOGY AND TEXTURE. This unit contains several undifferentiated lithologies: (1) thin subaerial lava flows, (2) thin subaqueous and other water-affected subaerial lava flows, and (3) tuff and volcaniclastic sediments (Tbt where differentiated). Lateral continuity seen only in tuff and volcaniclastic sediments.

LOCATION AND THICKNESS. The southwest end of Lucky Peak Dam is founded on the lava flows of this assemblage. Lava is thickest there at about 73 meters (240 feet). Overlying tuff and volcaniclastic sediments probably are thickest at about 61 meters (200 feet) just south of the dam. The assemblage thins along strike.
Tbt  Tuff and volcaniclastic sediments

LITHOLOGY AND TEXTURE. Brown tuff and volcaniclastic sediments of basaltic composition dominantly, but with minor layers of arkosic sand, pumice, and rhyolitic ash. Representative descriptions follow: (1) dark olive gray hard tuff with conspicuous angular dark brown basaltic glass fragments (tuff is thin bedded with beds 0.5-1 cm thick); (2) pale olive clayey lithic tuff with angular particles of arkosic sand; (3) pale yellowish brown volcaniclastic mudstone with 2-20 millimeter-sized clasts of pumice; (4) olive brown and reddish brown cross-bedded sandstone with basaltic and arkosic grains. The lower part of this unit contains a 2.5-meter-thick layer of light-gray silicic volcanic ash.

THICKNESS. As much as 107 meters (350 feet) thick in the vicinity of Picket Pin and Warm Springs Creeks in the northwestern corner of the Lucky Peak quadrangle.

Tbp  Basalt of Picket Pin Canyon

LITHOLOGY AND TEXTURE. Lava flow with a cumulophyric texture of distinctive rosettes of white plagioclase.

LOCATION AND SOURCE. Present physiographic position suggests an inverted topography of a canyon-filling lava that may have erupted locally within the ancestral Picket Pin canyon (northwest corner of the Lucky Peak quadrangle).

THICKNESS. Maximum thickness is 9 meters (30 feet).

Granitic rocks of the Idaho batholith

LITHOLOGY AND TEXTURE. Light gray, medium- to coarse-grained crystalline, equigranular to porphyritic biotite granite and granodiorite. Includes pegmatite zones and dikes of rhyolite and basalt.

REFERENCES


_____, 1988, Changeover from basin-filling to incision in the western Snake River Plain: Geological Society of America Abstracts with Programs, v. 20, no. 6, p. 461.


