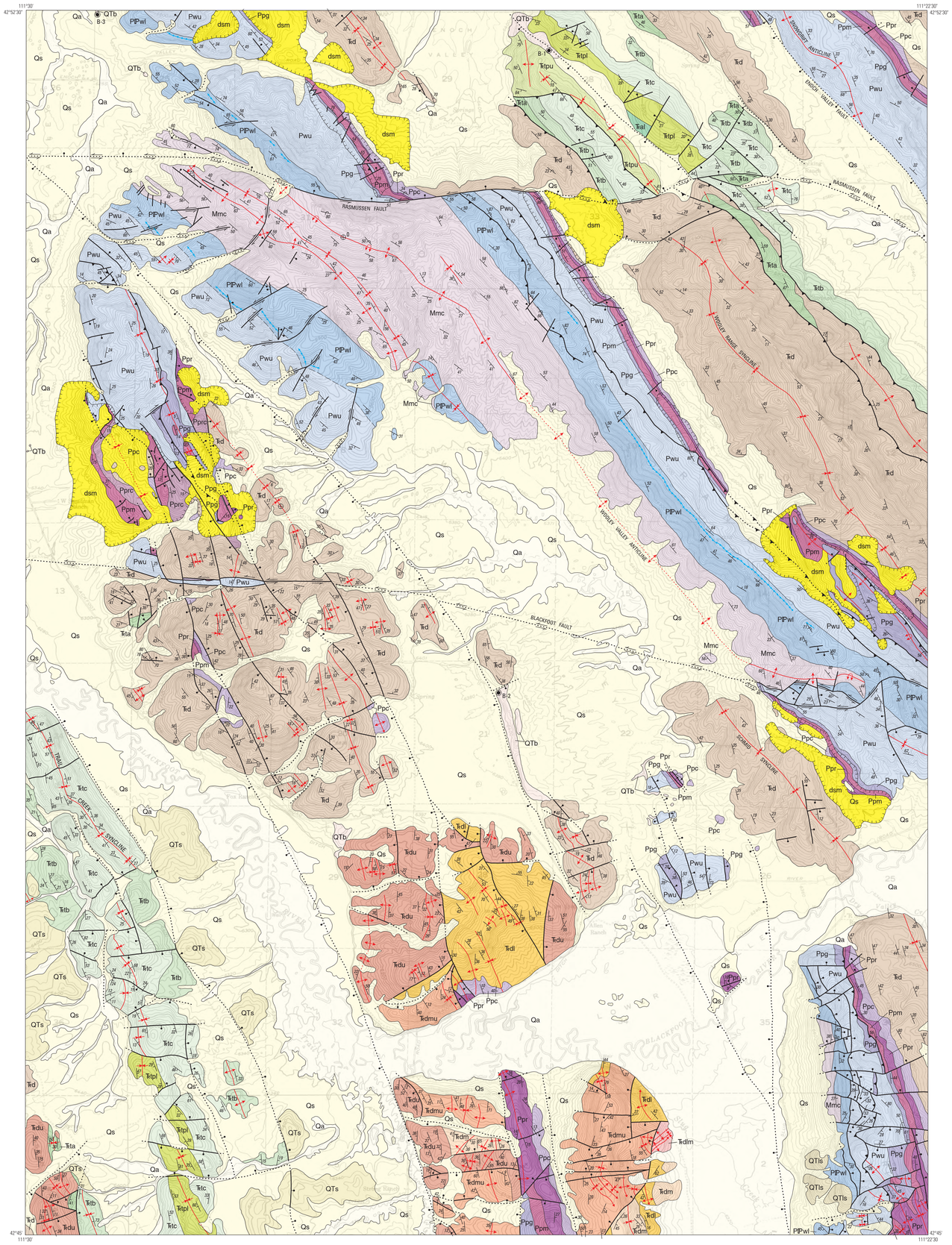
U.S. Department of the Interior
U.S. Geological Survey

Scientific Investigations Map 3215
Pamphlet accompanies map



Base from U.S. Geological Survey
1:24,000 Lower Valley, 1984
Transverse Mercator
UTM 1927
Zone 12

SCALE 1:24,000

1 .5 0 1 MILE

1 .5 0 1 KILOMETER

APPROXIMATE MEAN DECLINATION, 2018

IDAHO
MAP LOCATION

Geology mapped in 1979 and 1980 by H. Peter Oberlindacher, R. David Hovland, and Susan T. Miller and compiled in 1998 by James G. Evans.
GIS database and digital cartography by Robert J. Miller and Barry C. Moring.
Edited by Claire Landowski; digital cartographic production by Donna L. Knifong
Manuscript approved for publication May 5, 2012

CORRELATION OF MAP UNITS

dsm, Qa	Holocene		QUATERNARY
Qs	Holocene and Pleistocene		QUATERNARY
Unconformity			
QTb, QTs, QTls	Pleistocene or Pliocene		QUATERNARY AND (OR) TERTIARY
Unconformity			
Trtpu, Trtpl, Trtc, Trtb, Trta	Lower Triassic	Tkal	TRIASSIC
Trd, Trdu, Trdmu, Trdm, Trdlm, Trdl			
Unconformity			
Ppc, Ppr, Ppm	Lower Permian	Pprc	PERMIAN
Unconformity			
Ppg			
Unconformity			
Pwu			
Unconformity			
PPwl	Lower Permian and Middle Pennsylvanian		PERMIAN AND PENNSYLVANIAN
Unconformity			
Mmc	Upper Mississippian		MISSISSIPPIAN

DESCRIPTION OF MAP UNITS

dsm Disturbed surface, as of field mapping in 1979 and 1980; may include open pits, waste disposal areas, and mining facilities; where dsm overlaps with disturbed surface as of 1984 photorevision, dsm is generally less extensive, and faults, contacts, and structures are commonly concealed, except in open pits that have not been backfilled

Qa **Alluvium (Holocene)**—Unconsolidated, poorly sorted gravel, sand, silt, and clay

Qs **Surficial deposits (Holocene and Pleistocene)**—Undifferentiated older alluvium and hillwash

QTb **Basalt (Pleistocene or Pliocene)**—Dark gray crystalline vesicular olivine basalt; sample B-1 was dated at 2.1 ± 0.9 Ma; sample B-2 was dated at 2.2 ± 1.0 Ma, sample B-3 was dated at 1.6 ± 0.7 Ma (Teledyne Isotopes, written commun., 1981, see table 1)

QTs **Sedimentary deposits (Quaternary and (or) Tertiary)**

QTls **Landslide deposits (Quaternary and (or) Tertiary)**

Thaynes Formation (Lower Triassic)
Portneuf Limestone Member

Trtpu **Upper part**—Yellowish-beige to reddish-brown sandstone and blue-gray limestone; local crossbedding and dolomitization of sandstone; limestone locally contains gray chert nodules; about 107 m thick, top not exposed

Trtpl **Lower part**—Gray limestone, generally cliff-forming; minor very fine-grained sandstone and siltstone; about 153 m thick

Trtc **Member C**—Olive to brown siltstone containing dark-gray limestone nodules in upper part; interbedded with yellowish-brown sandstone and limestone near top; gray to black fissile siltstone and minor dark-gray limestone in lower part; about 213 m thick

Trtb **Member B**—Yellowish-brown calcareous platy siltstone and minor nodular gray limestone; about 183 m thick

Trta **Member A**—Dark-gray to black silty limestone; *Meekoceras* ammonite zone at base; about 168 m thick

Ankarch Formation (Lower Triassic)

Tkal **Lanes Tongue**—Reddish-brown to red sandstone and siltstone; 60 m thick; top not exposed; where present, separates upper and lower parts of the Portneuf Limestone Member of the Thaynes Formation

Trd **Dinwoody Formation (Lower Triassic)**—Consists mainly of interbedded siltstone, limestone, and subordinate sandstone. The true thickness of the Dinwoody Formation in the quadrangle cannot be determined because of poor exposure and structural complications. Cross-sectional data yield a thickness of about 519–610 meters. The Dinwoody Formation is mapped as undifferentiated except in the southern part of the quadrangle, where it is divided into five informal units:

Trdu **Upper part**—Brownish-gray limestone and siltstone

Trdmu **Middle and upper parts**—Undifferentiated

Trdm **Middle part**—Blocky-weathering olive-gray to brownish-gray siltstone and minor very fine-grained sandstone and limestone

Trdlm **Lower and middle parts**—Undifferentiated

Trdl **Lower part**—Olive-gray shaly siltstone and minor silty limestone

Phosphoria Formation (lower Permian)

Ppc **Cherty shale member**—Dark-gray to grayish brown cherty siltstone and mudstone and minor phosphatic siltstone and phosphatic mudstone; 48 m thick

Pprc **Rex Chert and cherty shale members**—Undifferentiated

Ppr **Rex Chert Member**—Gray to bluish-gray chert, locally light gray to white; minor argillaceous chert; ledge forming; 10–12 m thick

Ppm **Meade Peak Phosphatic Shale Member**—Dark-brown phosphorite, siltstone, mudstone and minor limestone and sandstone; phosphorite concentrated in upper and lower parts of member; swale-forming; rarely exposed; about 40–50 m thick

Park City Formation (lower Permian)

Ppg **Grandeur Tongue**—Light-gray to brownish-gray dolomite and minor siltstone, chert, and phosphatic chert; ledge-forming

Wells Formation (Permian and Pennsylvanian)

Pwu **Upper member (lower Permian)**—Brownish-gray to reddish-brown quartzose sandstone and quartzite and dark- to light-gray dolomite beds, lenses, and nodules; quartzose sandstone and quartzite are locally crossbedded; about 520 m thick

PPwl **Lower member (lower Permian and Middle Pennsylvanian)**—Gray limestone and quartzite and siltstone; limestone locally cherty and sandy; 293 to 316 m thick

Phosphatic marker bed—In upper part of lower member of Wells Formation; a 0.5- to 1.2-m-thick phosphorite and phosphatic silty mudstone bed occurs 33 m below top of formation

Chesterfield Range Group (Upper Mississippian)

Mmc **Monroe Canyon Limestone**—Dark gray limestone and minor siltstone and sandstone; locally dolomitic; contains large horn corals and brachiopods near top of formation; at least 281 m thick; base not exposed

EXPLANATION OF MAP SYMBOLS

Disturbed surface, as 1984 photorevision; present topography differs from that shown on map; faults, contacts, and structures originally mapped in disturbed surface areas may be concealed, or removed, or their locations may be altered as a result of subsequent mining activity; open pits, where present, are large elongate trenches that follow the locus of the Meade Peak Phosphatic Shale Member of the Phosphoria Formation; may include dsm

Contact—Dotted where concealed; dashed where approximate

Fault—Dotted where concealed

Normal fault—Ball and bar on downthrown side

Strike-slip fault—Arrows indicate relative horizontal movement

Thrust fault—Sawteeth on upper plate

Generic fault—Unknown or unspecified orientation

Fold—Showing trace of axial surface; dotted where concealed

Anticline—Showing crestline and direction of plunge

Syncline—Showing troughline and direction of plunge

Overturned anticline—Showing crestline and direction of plunge

Overturned syncline—Showing troughline and direction of plunge

43 **Strike and dip of bedding**

50 **Strike and dip of overturned bedding**

Horizontal bedding

B-2 **Sample location for K-Ar determination (see table 1)**

Table 1. Potassium-argon age determination.[1]

Sample number	K-Ar age	Description, unit
B-1	2.1 ± 0.9 Ma	basalt, QTb
B-2	2.2 ± 1.0 Ma	basalt, QTb
B-3	1.6 ± 0.7 Ma	basalt, QTb

[1] By Teledyne Isotopes Inc., Westwood, New Jersey, 1981

Geologic Map of the Lower Valley Quadrangle, Caribou County, Idaho

By

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2018

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