

DESCRIPTION OF MAP UNITS

Qh HOLOCENE DEPOSITS—Alluvial, glacial, lacustrine, swamp, landslide, and beach deposits

Qp QUATERNARY DEPOSITS—Alluvial fan, sand, and silt deposits and the marine Bootlegger Cove Clay

Qv QUATERNARY VOLCANIC ROCKS—Alluvial, glacial, dune sand, loess, terrace and pediment gravel, and reworked sand and silt deposits

Qv1 QUATERNARY VOLCANIC ROCKS—Greenstone with minor quartzite, chert, and phyllite

Qv2 QUATERNARY VOLCANIC ROCKS—Basalt, red beds, sandstone, shale, and limestone of Tindir Group

Qv3 QUATERNARY VOLCANIC ROCKS—In part covered by Tertiary sandstone and intruded by granitic rocks of Mesozoic and Tertiary age

CONTINENTAL DEPOSITS

Qv4 QUATERNARY VOLCANIC ROCKS—Chiefly andesitic flows and associated pyroclastic rocks on volcanoes in southern Alaska Range and on Augustine Island. Olivine basalt, containing abundant peridotite and granulite inclusions, in lava flows of Prindle volcano northeast of Tanana River

Qv5 QUATERNARY VOLCANIC ROCKS—Mainly andesite and basaltic andesite flows and subordinate pyroclastic rocks of Tertiary or Quaternary age northeast of Tanana River

Qv6 QUATERNARY VOLCANIC ROCKS—Andesitic lava, breccia, and tuff northeast of Tanana River; acidic lava flows, mostly rhyolite and trachyte with some andesite south of the central Alaska Range; basalt flows and associated pyroclastic rocks in Talkeetna Mountains; mafic and felsic flows, tuffs, and flow breccias in the southern Alaska Range; and lapilli and ash of Miocene or younger age west of Cook Inlet

Qv7 TERTIARY VOLCANIC ROCKS—Lava, tuff, breccia, pumice breccia, volcanic conglomerate, and tuffaceous sedimentary rocks

Qv8 LOWER TERTIARY OR UPPER CRETACEOUS VOLCANIC ROCKS—Rhyolitic and andesitic porphyritic flows, tuffs, and breccias in northwest part of map area

Qv9 TRIASSIC VOLCANIC ROCKS—Basaltic lava, commonly amygdaloidal, with local thin interbeds of volcaniclastic rocks, and local basalt conglomerate. Includes the Nikolai Greenstone and related rocks of Middle and (or) Late Triassic age

FELSIC ROCKS

Q10 TERTIARY GRANITIC ROCKS—Middle and late Tertiary quartz diorite to granite in the Alaska-Alutian Range batholith; optional to hypabyssal quartz monzonites and granites in the central Alaska Range; shallow-seated diorite, rhyodacite, granodiorite, and quartz diorite in the Wrangell Mountains; mainly rhyolite and trachyte in the Matanuska Valley; and granodiorite in the Gulf of Alaska area and eastern Dugosh Mountains

Q11 OLIGOCENE GRANITIC ROCKS—Quartz diorite, granodiorite, and quartz monzonite in the Prince William Sound area

Q12 TERTIARY AND CRETACEOUS GRANITIC ROCKS—Granodiorite to granite in the Alaska-Alutian Range batholith and quartz diorite and granodiorite in the Talkeetna batholith. Both are of Late Cretaceous and early Tertiary age

Q13 TERTIARY AND (OR) MESOZOIC GRANITIC ROCKS—Quartz monzonite, granodiorite, and quartz diorite with subordinate granite and diorite. Probably Mesozoic in age but may include rocks of Tertiary age

Q14 CRETACEOUS GRANITIC ROCKS—Granodiorite with subordinate granite, quartz monzonite, and diorite. Includes extensive igneous intrusions in the central Alaska Range

Q15 PALEOZOIC ROCKS—North of Chitina Valley fault, mainly marble, in places containing tremolite, with subordinate amphibolite. Includes parts of the Kaskawish Group (Devonian) of Canadian usage. Near Cantwell in south-central Alaska Range, limestone, slate, and conglomerate with some fossils of Devonian age. West of Chitina River, unfossiliferous argillite and graywacke, mildly metamorphosed. In north-east corner of map area, includes unmetamorphosed rocks of the Fannel Creek, Adams, Hillard, Road River, McCann Hill, and Nation River Formations

Q16 LOWER PALEOZOIC AND/OR PRECAMBRIAN VOLCANIC ROCKS—Greenstone with minor quartzite, chert, and phyllite

Q17 LOWER PALEOZOIC AND/OR PRECAMBRIAN VOLCANIC ROCKS—Basalt, red beds, sandstone, shale, and limestone of Tindir Group

Q18 LOWER PALEOZOIC AND/OR PRECAMBRIAN VOLCANIC ROCKS—In part covered by Tertiary sandstone and intruded by granitic rocks of Mesozoic and Tertiary age

CONTINENTAL DEPOSITS

Q19 Pliocene continental deposits—Pebble to boulder conglomerate and coarse sandstone, with interbedded mud-fluvial deposits, claystone, and local thin lignite beds. Includes Nenana Gravel

Q20 UPPER TERTIARY CONTINENTAL DEPOSITS—sandstone, siltstone, claystone, minor conglomerate and coal beds. Includes upper part of Kenai Group in Cook Inlet area and Nenana Gravel and related unmetamorphosed rocks in west-central Alaska Range. Includes rocks ranging in age from Oligocene(?) through Pliocene

Q21 MIDDLE TERTIARY CONTINENTAL DEPOSITS—sandstone, siltstone, shale, claystone, conglomerate, and coal beds. Includes the Sanctuary, Suntrana, Grubstake, and Lignite Creek Formations in the central Alaska Range and the Frederika Formation in the Wrangell Mountains

Q22 MIDDLE TERTIARY CONTINENTAL DEPOSITS—Sandstone, siltstone, conglomerate, claystone, and coal beds. Includes the Healy Creek Formation (Oligocene and Miocene) in the central Alaska Range; the Bakona Formation (Oligocene) in the west-central Alaska Range (McPhe, J. A., written commun., 1974); and the Tsadka Formation (Oligocene) in the Matanuska Valley

Q23 LOWER TERTIARY CONTINENTAL DEPOSITS—Claystone, siltstone, sandstone, conglomerate, and coal beds. Includes the Chickaloon and Wisdom Formations in the Matanuska Valley and equivalent rocks in the Cook Inlet area. Includes rocks ranging in age from Paleocene through Eocene

Q24 PALEOZOIC CONTINENTAL DEPOSITS—Conglomerate, arkose, sandstone, and shale. Consists of the Cantwell Formation in the central Alaska Range and the Arkoose Ridge Formation in the Matanuska Valley (McPhe, J. A., written commun., 1974)

Q25 TERTIARY AND UPPER CRETACEOUS CONTINENTAL DEPOSITS—Conglomerate, breccia, sandstone, mudstone, shale, tuffaceous rocks, and lignite. Includes rocks ranging from Late Cretaceous to Pliocene

Q26 UPPER CRETACEOUS CONTINENTAL DEPOSITS—Conglomerate, sandstone, tuffaceous sandstone, siltstone, shale, tuff, chert, and lignite

VOLCANIC ROCKS MAINLY SUBAERIAL

Q27 QUATERNARY VOLCANIC ROCKS—Chiefly andesitic flows and associated pyroclastic rocks on volcanoes in southern Alaska Range and on Augustine Island. Olivine basalt, containing abundant peridotite and granulite inclusions, in lava flows of Prindle volcano northeast of Tanana River

Q28 QUATERNARY AND TERTIARY VOLCANIC ROCKS—Mainly andesite and basaltic andesite flows and subordinate pyroclastic rocks of Tertiary or Quaternary age northeast of Tanana River

Q29 TERTIARY VOLCANIC ROCKS—Andesitic lava, breccia, and tuff northeast of Tanana River; acidic lava flows, mostly rhyolite and trachyte with some andesite south of the central Alaska Range; basalt flows and associated pyroclastic rocks in Talkeetna Mountains; mafic and felsic flows, tuffs, and flow breccias in the southern Alaska Range; and lapilli and ash of Miocene or younger age west of Cook Inlet

Q30 TERTIARY FELSIC VOLCANIC ROCKS—Lava, tuff, breccia, pumice breccia, volcanic conglomerate, and tuffaceous sedimentary rocks

Q31 LOWER TERTIARY OR UPPER CRETACEOUS VOLCANIC ROCKS—Rhyolitic and andesitic porphyritic flows, tuffs, and breccias in northwest part of map area

Q32 TRIASSIC VOLCANIC ROCKS—Basaltic lava, commonly amygdaloidal, with local thin interbeds of volcaniclastic rocks, and local basalt conglomerate. Includes the Nikolai Greenstone and related rocks of Middle and (or) Late Triassic age

FELSIC ROCKS

Q33 TERTIARY GRANITIC ROCKS—Middle and late Tertiary quartz diorite to granite in the Alaska-Alutian Range batholith; optional to hypabyssal quartz monzonites and granites in the central Alaska Range; shallow-seated diorite, rhyodacite, granodiorite, and quartz diorite in the Wrangell Mountains; mainly rhyolite and trachyte in the Matanuska Valley; and granodiorite in the Gulf of Alaska area and eastern Dugosh Mountains

Q34 OLIGOCENE GRANITIC ROCKS—Quartz diorite, granodiorite, and quartz monzonite in the Prince William Sound area

Q35 TERTIARY AND CRETACEOUS GRANITIC ROCKS—Granodiorite to granite in the Alaska-Alutian Range batholith and quartz diorite and granodiorite in the Talkeetna batholith. Both are of Late Cretaceous and early Tertiary age

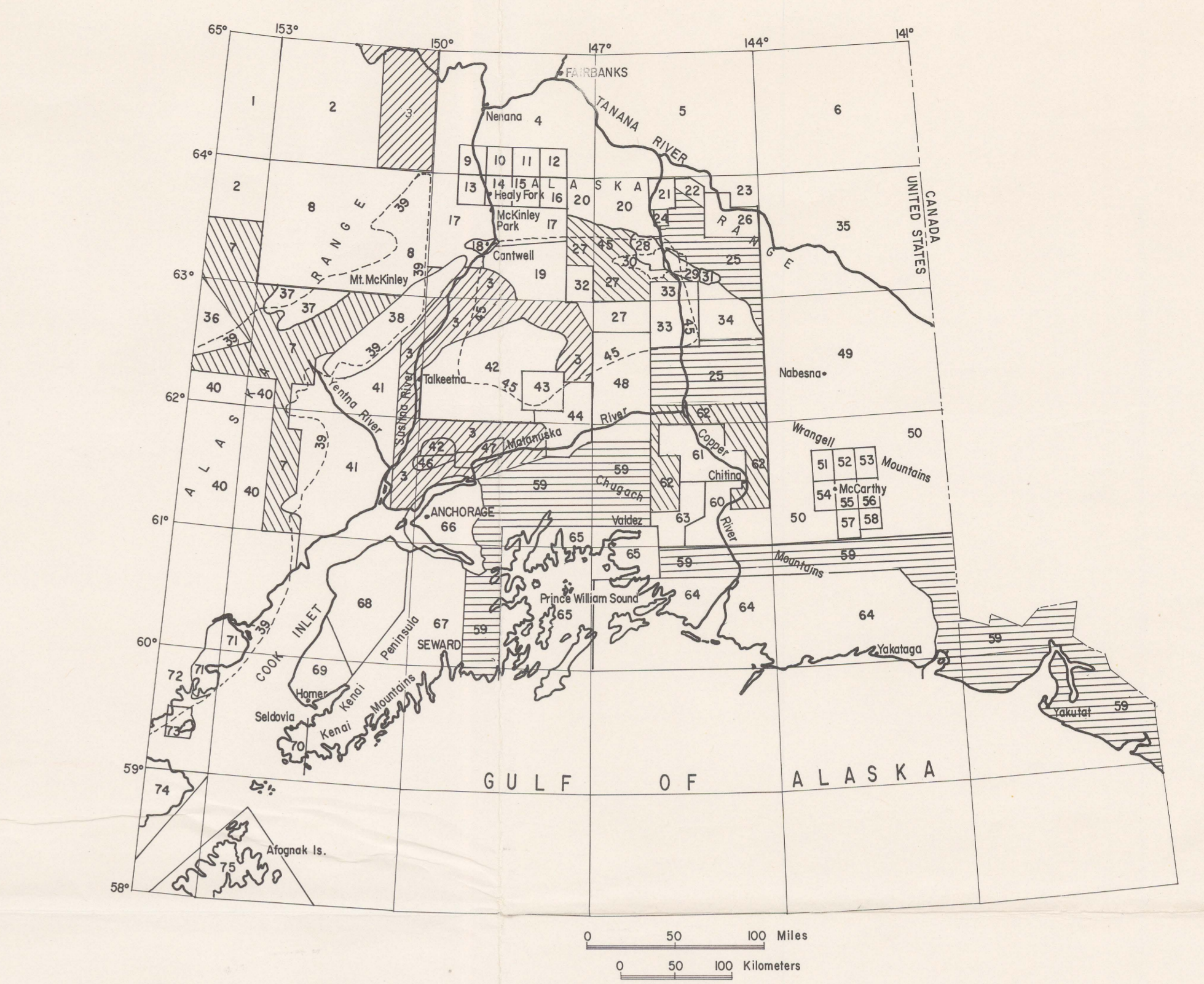
Q36 TERTIARY AND (OR) MESOZOIC GRANITIC ROCKS—Quartz monzonite, granodiorite, and quartz diorite with subordinate granite and diorite. Probably Mesozoic in age but may include rocks of Tertiary age

Q37 CRETACEOUS GRANITIC ROCKS—Granodiorite with subordinate granite, quartz monzonite, and diorite. Includes extensive igneous intrusions in the central Alaska Range

Q38 LOWER PALEOZOIC AND/OR PRECAMBRIAN VOLCANIC ROCKS—Greenstone with some metatrolite, metapetro, and interbedded phyllite of Devonian age and older

Q39 LOWER PALEOZOIC AND/OR PRECAMBRIAN VOLCANIC ROCKS—Basalt, red beds, sandstone, shale, and limestone of Tindir Group

Q40 LOWER PALEOZOIC AND/OR PRECAMBRIAN VOLCANIC ROCKS—In part covered by Tertiary sandstone and intruded by granitic rocks of Mesozoic and Tertiary age



SOURCES OF GEOLOGIC DATA

(Unless otherwise indicated, all publications are those of the U.S. Geological Survey)

- Misc. Geol. Inv. Map I-289, 1:250,000, 1969. Modified by R. M. Chapin.
- Bull. 647, pl. 2, 1:250,000, 1918. Modified by R. M. Chapin.
- Bull. 907, pls. 1, 2, and 3, 1940. Modified by R. M. Chapin and the compiler.
- Misc. Geol. Inv. Map I-465, 1:250,000, 1966. Modified by F. R. Meber and R. L. Forbes.
- F. R. Meber, unpublished compilation, 1:250,000.
- Misc. Field Studies Map MF-356, 1:250,000, 1972. Modified by H. L. Foster.
- Prof. Paper 70, pl. 9, 1:625,000, 1911. Modified by the compiler.
- Bull. 11098, pl. 1, 1:250,000, 1961.
- Geol. Quad. Map 60-811, 1:63,360, 1970.
- Geol. Quad. Map 60-812, 1:63,360, 1970.
- Geol. Quad. Map 60-809, 1:63,360, 1970.
- Geol. Quad. Map 60-808, 1:63,360, 1970.
- Geol. Quad. Map 60-807, 1:63,360, 1970.
- Geol. Quad. Map 60-806, 1:63,360, 1970.
- Geol. Quad. Map 60-805, 1:63,360, 1970.
- Geol. Quad. Map 60-804, 1:63,360, 1970.
- Prof. Paper 293, pl. 1, 1:250,000, 1968.
- Bull. 1039-D, pl. 11, 1:48,000, 1959.
- Bull. 608, pl. 2, 1:250,000, 1915. Modified by the compiler.
- Bull. 801, pl. 2, 1:250,000, 1912. Modified by the compiler.
- Misc. Geol. Inv. Map I-394, 1:63,360, 1964.
- Bull. 1181-H, pl. 1, 1:125,000, 1965.
- Interpolated by the compiler on the basis of the geology of surrounding areas and topography.
- Bull. 989-G, pl. 10, 1:63,360, 1965.
- Bull. 989-D, pl. 7, 1:250,000, 1964. Modified by the compiler.
- Bull. 1249, pl. 1, 1:63,360, 1964.
- Bull. 486, pl. 2, 1:250,000, 1912. Modified by the compiler.
- Geol. Soc. America Bull., v. 84, no. 3, p. 941, fig. 2, 1:316,000, 1973. Modified by the compiler.
- Geol. Soc. America Bull., v. 77, no. 6, p. 599, fig. 2, 1:103,000, 1966. Modified by the compiler.
- MESOZOIC MAFIC ROCKS—Gabbro with subordinate basalt and basaltic breccia; highly altered, age unknown but probably Mesozoic northeast of Tanana River. Gabbroic rocks along Denali fault and in central Alaska Range
- JURASSIC MAFIC ROCKS—Gabbroic rocks of Late Jurassic age
- JURASSIC MAFIC ROCKS—Gabbroic rocks of probable Pennsylvanian and Permian age. May include rocks of Triassic age
- TERTIARY ULTRAMAFIC ROCKS—Dunite and serpentine
- MESOZOIC ULTRAMAFIC ROCKS—Layered dunite complex in central Alaska Range
- MESOZOIC AND/OR PALEOZOIC ULTRAMAFIC ROCKS—Serpentinized peridotite
- PALEOZOIC ULTRAMAFIC ROCKS—Mainly ultramafic rocks with subordinate mafic rocks of probable Devonian age in northern part of map area east of Fairbanks. Peridotite, dunite, and pyroxenite of probable Paleozoic age northeast of Anchorage
- ULTRAMAFIC ROCKS OF UNCERTAIN AGE—Serpentinized dunite, peridotite, and minor pyroxenite north of Border Ranges fault; dunite at southern tip of Kenai Peninsula
- METAMORPHIC ROCKS
- LOWER MESOZOIC METAMORPHIC ROCKS—Small masses of metamorphosed sedimentary, volcanic, and igneous rocks, largely of pre-Cretaceous age, scattered throughout the Alutian Range batholith
- JURASSIC AND TRIASSIC METAMORPHIC ROCKS—Intercalated blueschist, greenschist, mica schist, impure marble, and subordinate metabasite of Late Triassic and Early Jurassic age at southern tip of Kenai Peninsula
- TRIASSIC AND PERMIAN METAMORPHIC ROCKS—Marble, quartzite, greenschist, chlorite schist, garnet schist, and subordinate gneiss in Alutian Range batholith; mainly of Late Triassic age
- MESOZOIC AND/OR PALEOZOIC METAMORPHIC ROCKS—Metaplutonic, metasedimentary, and metavolcanic rocks near Anchorage and amphibolite-facies schist along south side of Matanuska Valley
- LOWER PALEOZOIC METAMORPHIC ROCKS—Undifferentiated metasedimentary and metavolcanic rocks of Devonian age and older
- PALEOZOIC AND/OR PRECAMBRIAN METAMORPHIC ROCKS—Schist and gneiss of many different compositions, primarily of the greenschist and amphibolite facies, most of which were formerly included in the Birch Creek Schist

EXPLANATION AND SOURCES OF DATA FOR

PRELIMINARY GEOLOGIC MAP OF THE SOUTHEAST QUADRANT OF ALASKA

by
Helen M. Beikman
1974

Alaska (southeast) leaf 1:1,000,000. 1974. M(200) MF 612 Sheet 2 of 2. 11/1/74

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