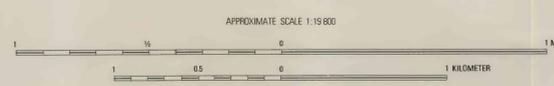
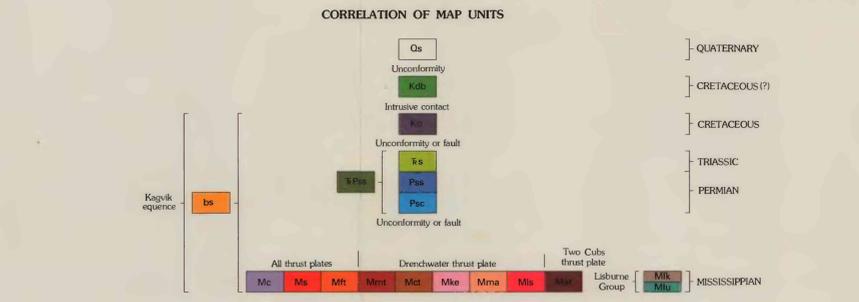


Drainage features plotted from U.S. Geological Survey aerial photographs, series BAR-346, 1945



Geology by W. J. Nettekrog, G. R. Winkler, C. Hale, I. Ellerstick, M. Churkin, and C. Mayfield, 1977



**DESCRIPTION OF MAP UNITS**

**Qs** SURFICIAL DEPOSITS (Quaternary)—Undifferentiated alluvium, colluvium, glacial deposits, talus, and gravel.

**Kdb** DIABASE (Cretaceous?)—Mafic sills and dikes forming bold outcrops and prominent rubble piles. Most outcrops are several meters to several tens of meters thick. Weathers dark brown, with dark-gray to black fresh surfaces. Major minerals: olivine, plagioclase, and pyroxene. Average grain size 0.5 to 1 mm. Diabasic texture. In places, unit grades into fine-grained olivine gabbro. Occurs only in Gas Drum and Spike Camp thrust plates.

**Ks** OKPIKRUAK FORMATION (Cretaceous)—Litic sandstone, siltstone, and mudstone. Occurs as strongly deformed and partly fault bounded units several tens to several hundreds of meters thick. Sandstone and siltstone weathers dark brown, mudstone weathers dark gray to black. Major clasts in the sandstone are plagioclase, dark chert, quartz, and unidentified lithic fragments. Coarse-bedded *Buchia* and plant fragments occur along partings. Abundant cleavage, lenses formed from disrupted isoclinal folds. A unit of sheared mudstone occurs between the Spike Camp and Gas Drum thrust plates. Occurs only in the Mother Bear, Spike Camp, and Gas Drum thrust plates.

**Ko** KOGRUK FORMATION (Upper and Lower Mississippian)—Light- to medium-gray crinoidal limestone and calcareous shale. Several tens of meters thick; thick bedded (Tailleur and others, 1966). Occurs only in the Two Cubs thrust plate.

**Ks** SHUBLIK FORMATION (Triassic)—Predominantly medium-bedded chert, with lesser amounts of black paper shale and thin limestone. Chert weathers gray and yellow, with distinctive mottled green surfaces. Fresh surfaces are medium gray. Contains abundant *Monotis* on limestone partings. Commonly thinner than 50 m. Intensely folded and faulted. Occurs only in the Mother Bear, Spike Camp, and Gas Drum thrust plates.

**Tps** SHUBLIK AND SIKSIPUK FORMATIONS, UNDIVIDED (Triassic and Permian)—Undifferentiated chert.

**CHERT, SHALE, TUFF, KERATOPHYRE, AND MINOR LIMESTONE (Mississippian)**—Was designated "dark facies of Lisburne Group," by Tailleur, Kent, and Reiser (1966). Specific units restricted to certain thrust plates. See correlation of map units. Original stratigraphic position of following units unknown.

**Mc** Black medium-bedded chert—Approximately 100 m thick (Tailleur and others, 1966). Locally forms extensive outcrops, with many folds and faults. Partially recrystallized to fine-grained quartzite along Drenchwater Creek. Weathers dark gray locally. Locally contains galena, sphalerite, and pyrite.

**Ms** Black shale—Approximately 100 m thick (Tailleur and others, 1966). Intensely faulted and sheared. Locally contains galena, sphalerite, and barite in veins and concretions.

**Mt** Fine-grained felsic tuff—Maximum thickness, 80 m. Weathers bright rust, with light-gray fresh surfaces. Contains sparse microphenocrysts of biotite and feldspar, angular fragments of black chert, and disseminated pyrite.

**Mm** Medium-grained felsic tuff—As much as 250 m thick. Weathers light brown, with light-gray fresh surfaces. Locally grades into calcareous sandstone. Contains abundant medium-grained feldspar phenocrysts in a fine-grained matrix, and sparse fine-grained biotite phenocrysts.

**Mk** Coarse-grained felsic tuff—As much as 200 m thick. Weathers medium gray, with green-gray fresh surfaces. Contains abundant coarse-grained feldspar phenocrysts in a fine-grained matrix, sparse biotite phenocrysts, and minor amounts of calcite cement.

**Mke** Keratophyre—As much as 80 m thick. Medium gray. Contains coarse-grained feldspar and fine-grained biotite phenocrysts in a fine-grained matrix. Occurs as sills or flows adjacent to felsic tuff. Radiometric age of 319 m.y. by K-Ar method on biotite (Tailleur and others, 1966).

**Mma** Mafic tuff—Mottled dark-green to light-gray tuff.

**Mms** Crinoidal and coralline limestone—Light- to medium-gray, as thick as 35 m. Grades downward into fine-grained felsic tuff.

**Mi** MEDIUM-GRAINED PYROXENE ANDESITE AND FINE-GRAINED ANDESITIC TUFF—Occurs only in Two Cubs thrust plate. Pyroxene andesite weathers dark brown, with black fresh surfaces. Andesitic tuff weathers medium brown, with pale-olive-gray fresh surfaces. Mainly massive calcareous crystalline tuff, with sparse pyroxene and plagioclase phenocrysts. Locally, unit consists of alternating sills, flows, and tuff. Radiometric age of 330 m.y. by K-Ar method on biotite.

**bs** Undifferentiated black shale of the Okpikruak, Shublik, and Siksipuk Formations and the Mississippian unit.

**CONTACTS AND STRUCTURES**

— Contact—Approximately located; dotted where concealed

- - - Fault—Dashed where approximately located; dotted where concealed

-▲-▲- Thrust fault—Dashed where approximately located; dotted where concealed. Sawtooth on upper plate

↗ ↘ Overturned anticline—Showing trace of axial surface, direction of dip of limbs, and plunge. Dashed where approximately located; dotted where concealed

↗ ↘ Overturned syncline—Showing trace of axial surface, direction of dip of limbs, and plunge. Dashed where approximately located; dotted where concealed

↗ ↘ Strike and dip of beds

↗ ↘ Inclined

↗ ↘ Vertical

↗ ↘ Strike and dip of cleavage

↗ ↘ Inclined

↗ ↘ Vertical

••••• Sulfide and sulfate mineral localities

• Pb Galena

• Zn Sphalerite

• Ba Barite

••••• Iron stain from weathered sulfide minerals

••••• Fossil localities

• M *Monotis*

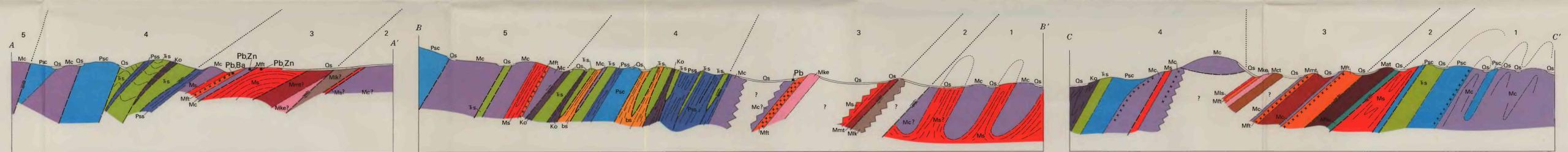
• B *Buchia*

• F Corals, brachiopods, trilobites, and bryozoans

○ 99 Center of aerial photograph with BAR-346 series number

**THRUST PLATES**

1—Mother Bear 2—Two Cubs 3—Drenchwater 4—Spike Camp 5—Gas Drum



STRATIFORM ZINC-LEAD DEPOSITS IN THE DRENCHWATER CREEK AREA, HOWARD PASS QUADRANGLE, NORTHWESTERN BROOKS RANGE, ALASKA