DESCRIPTION OF MAP UNITS
(abbreviated from Kelley, 1988)

Qal **QUATERNARY ALLUVIUM (Holocene)**--Unconsolidated debris, including boulders, gravel, sand, silt, clay and humic materials. See Hamilton (1979) for detailed map and descriptions of Quaternary deposits

Qd **QUATERNARY DEPOSITS (Quaternary)**--Undifferentiated unconsolidated deposits, including glacial drift, outwash, and high-level terraces. See Hamilton (1979) for detailed map and descriptions of Quaternary deposits

Ks **SEABEE FORMATION (Upper Cretaceous)**--Medium-gray shale; bentonitic, clayey, laminated siltstone interbeds, and limestone concretions. Includes dark-gray to black organic shale, clayey limestone concretions, and marine fossils

Knc **NIAKOGON TONGUE OF THE CHANDLER FORMATION (Upper Cretaceous)**--Sandstone, siltstone, and mudstone. Sandstones appear buff to yellow and weather brown to red, sometimes showing heavy iron-oxide staining, fine-to coarse-grained, limonite cemented locally, including iron concretions locally, and includes beds of conglomeratic sandstone. Grayish-green bentonite beds occur in upper part of tongue

Kck **KILLIK TONGUE OF THE CHANDLER FORMATION (Lower Cretaceous)**--Sandstone, conglomerate, siltstone, shale, and coal. Greenish-gray to medium-gray sandstone and conglomerate; medium- to fine-grained and characteristically cross bedded

Ktg **GRANDSTAND FORMATION (Lower Cretaceous)**--Grayish-green to greenish-gray sandstone, medium- to fine-grained, shaly in part, locally includes conglomerate beds. Siltstone and mudstone make up a small part of the formation

Kft **FORTRESS MOUNTAIN FORMATION (Lower Cretaceous)**--Greenish-gray turbidite sandstone; fine- to coarse-grained and granular, mostly fine- to medium-grained with very coarse grained sandy to granular conglomerate

Kto **TOROK FORMATION (Lower Cretaceous)**--Shale, mudstone, siltstone, and sandstone. Bluish-gray, dark-greenish gray to dark-gray shale, mudstone, and clayey siltstone. Sandstone light- to medium-gray, very fine- to coarse-grained, silty and shaly, conglomeratic in part. Distinctive Fe-stained and granule- to small pebble-bearing shale, mudstone, siltstone. Pebbly strata are deeply Fe-stained with goethite coatings giving some beds a metallic appearance. Iron-stained and pebbly units include ironstone lenses. Formation also includes some thin beds of fissile, carbonaceous shale

Kcs Cobblestone sandstone Unit (Lower Cretaceous) Informal lithostratigraphic name used by Kelley (1988) for Lower Cretaceous sandstone that forms the lower part of Torok Formation. Submarine gravity flow deposits, mostly turbidities, that underlie the dark-gray shale of the Torok Formation

COQUINOID LIMESTONE (Lower Cretaceous)--Brownish-gray and reddish-brown-weathering beds comprising bivalves, typically Buchia sublaevis, algae, and shell hash

KJu, sh, sd, and cgl **CRETACEOUS AND UPPER JURASSIC STRATA UNDIVIDED**--Unit includes at least four facies: 1) sandstone (sd) shale (sh), 2) conglomerate (cgl), 3) tuffaceous and sandstone, and 4) volcaniclastic breccia; the four facies are considered to be endmembers of a continuum of rock types. The sandstone and shale unit (u) make up the bulk of the unit.

Sandstone and shale Greenish-gray sandstone; mostly medium- to fine-grained sand in a chloritic matrix. Conglomeratic in part; includes siltstone, mudstone, and shale

Conglomerate Framework supported conglomerate composed of well rounded to subangular granules and small pebbles

Tuffaceous sandstone Grayish-green tuffaceous sandstone; fine- to coarse-grained, very chloritic, contains relict glass shards in thin section. Tuffaceous sandstone is interbedded with greenish-gray to medium-gray siltstone and shale

Volcaniclastic breccia Grayish-green breccia and graywacke; composed mostly of granule to pebble-sized rock fragments in grayish-green matrix. Matrix material typically a dense felted mass of chlorite. Volcanic rock fragments are mostly chloritized aphanatic rock fragments

Ji **MAFIC IGNEOUS ROCKS (Jurassic)**--Dark greenish to gray mafic igneous rocks; mostly fine-grained and equigranular, but both porphyritic and diabasic textures have been observed

Jto **OTUK FORMATION (Lower Jurassic and Triassic)**--Shale, chert, and limestone. Dark-gray to black shale, carbonaceous, locally phosphatic. Dark-gray to black chert and silicified micritic limestone

Ts **SHUBLIK FORMATION (Triassic)**--Shale and impure limestone. Mostly dark-gray shale, calcareous in part, phosphatic in part, grades to calcareous shale. Locally includes ferruginous-weathering shale and mudstone

JTos **OTUK AND SHUBLIK FORMATIONS UNDIFFERENTIATED (Jurassic(?) and Triassic)**--Shale, limestone, and chert. Dark-gray shale, locally phosphatic in part, grades locally to calcareous shale and inçludes Pectin coquina. Yellowish-gray-weathering chert; grades to silicified limestone and mudstone. Unit transitional between Shublik and Otuk Formations

TPc **CHERT (Triassic and Permian)**--Medium-gray to greenish-gray radiolarian ribbon chert; very finely laminated in part, locally obscurely graded, evenly parallel bedded

Ps **SIKSIKPUK FORMATION (Permian)**--Mostly shale and mudstone with smaller amounts of impure limestone. Medium-gray to black and dark-greenish-gray shale and mudstone; fissile and calcareous in part, includes sooty mudstone; includes prominent barite nodules with radiating crystal structure and barite veins. Limestone makes up a small part of the section

Ml **ALAPAH and WACHSMUTH LIMESTONES of the LISBURNE GROUP (Mississippian)**--Mostly light-brownish-gray packstones and wackestones composed of bioclastic framework clasts and interstitial lime mud; locally dolomitized. Dark-gray chert occurs as nodules and nodular form beds

mlg **MELANGE**--Includes blocks of Triassic and Permian ribbon chert, mafic igneous rocks, Cretaceous and Jurassic sandstone, coquinoid limestone, and probably marble in a thoroughly sheared and disrupted matrix of greenish-gray and olive-gray shale and mudstone. The matrix and sandstone blocks are indistinguishable from broken formation consisting of strata elsewhere assigned to Cretaceous and Upper Jurassic strata (KJu)

Mk **KAYAK SHALE (Mississippian)**--Predominately shale with interbedded bioclastic limestone and finely crystalline limestone. Dark-gray to grayish-black carbonaceous shale. Shale grades to mudstone and siltstone. Reddish- and yellowish-brown weathering bioclastic limestone beds. Argillaceous dark-gray to black limestone, fine-grained, crystalline and carbonaceous

MDks **STUVER MEMBER of the KANAYUT CONGLOMERATE (Mississippian(?) and Upper Devonian)**--Sandstone, siltstone, conglomerate, and shale. Iron-stained sandstone, very fine-grained to coarse-grained and commonly cross bedded. Dark-gray to greenish-black shale and argillaceous siltstone; micaceous, very silty, sandy, and grades to silty sandstone

Dks **SHAININ LAKE MEMBER of the KANAYUT CONGLOMERATE (Upper Devonian)**--Conglomerate and sandstone. Conglomerate makes up to half of the Shainin Lake Member. The conglomerate is principally framework-supported and comprised of generally well rounded pebbles and cobbles. The matrix consists of granules of quartz- and chert-rich sandstone. Conglomerate is typically silica cemented. Sandstone beds are commonly cross bedded, moderately to poorly sorted, conglomeratic in part, and includes pebble trains. Includes reddish-brown, greenish-gray, and dark-gray to grayish-black, silty, sandy shale, siltstone, and argillaceous sandstone in varying amounts

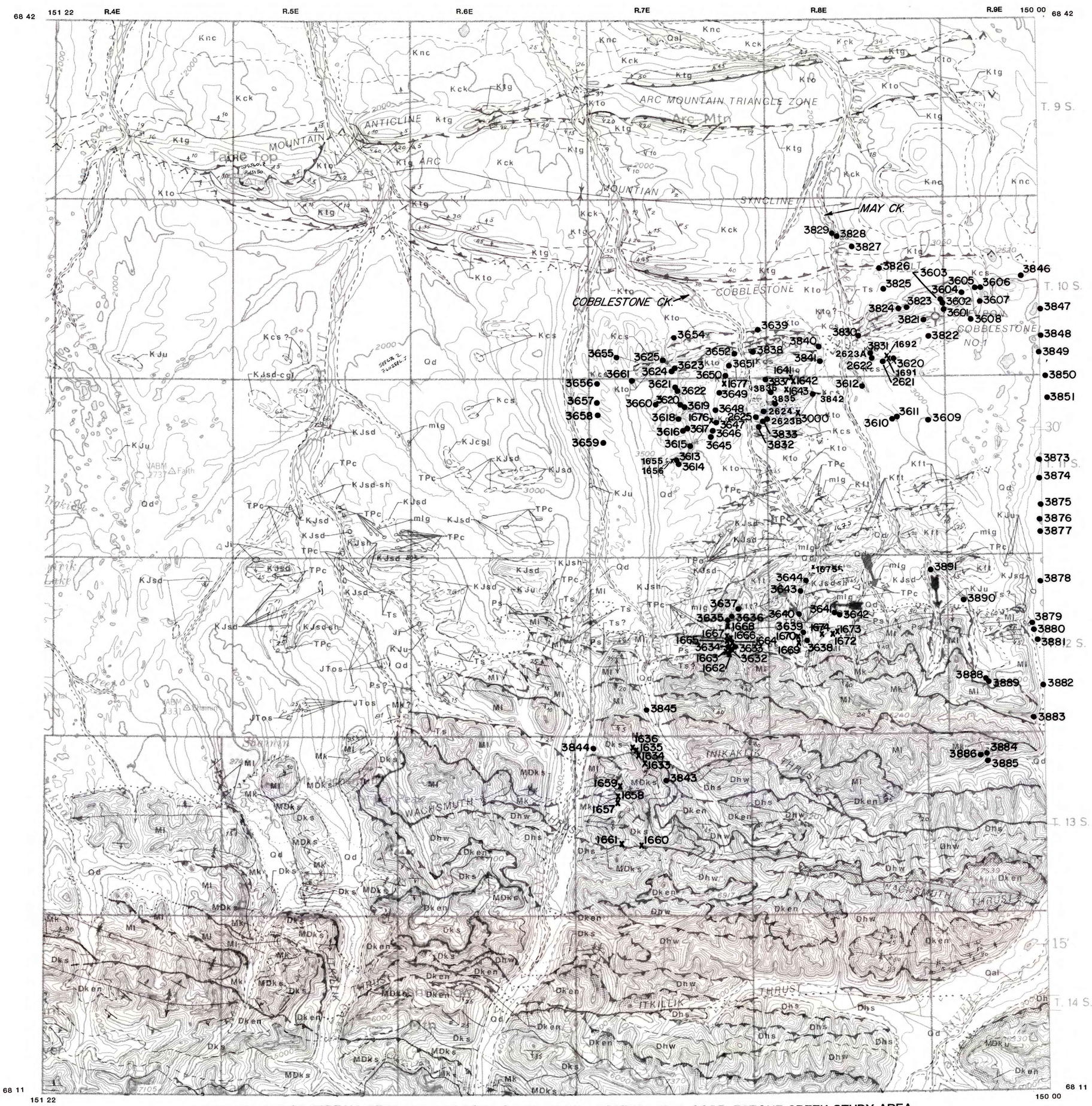
MDku **UPPER PART of the KANAYUT CONGLOMERATE (Mississippian? and Devonian)**--Sandstone, conglomerate, and shale. Light-brownish-ray, reddish brown, and light-olive-gray sandstone; iron-stained, cross bedded, very fine- to very coarse-grained, conglomeratic in part. Conglomerate is framework supported. Sandstone and conglomerate occur in fining upward sequences. Shale is dark-gray, carbonaceous locally, very silty, sandy, and iron-stained in part

DKen **EAR PEAK MEMBER of the KANAYUT CONGLOMERATE and NOATAK SANDSTONE (Upper Devonian)**--Sandstone, shale and conglomerate. Reddish-brown to brownish-gray sandstone; iron-stained, cemented with iron oxide, silica, and carbonate, predominately cross bedded. Reddish-brown and dark-gray shale; very silty, sandy in part, ferruginous in part. Conglomerate; framework supported, granule to pebble, and composed of chert, quartz, and silicic rock fragments. Much of the formation appears transitional to the Noatak Sandstone

Dhw **WACKE MEMBER of the HUNT FORK SHALE (Upper Devonian)**--Siltstone, mudstone, and sandstone. Greenish-gray, brownish-gray, olive-gray, and medium-dark-gray siltstone and mudstone with many manganiferous films on weathered surfaces. Siltstone is very shaly and mudstone grades to siltstone. Olive-gray sandstone; fine- to medium-grained, locally conglomeratic. The wacke member may locally interfinger with the overlying Noatak Sandstone

Dhs **SHALE MEMBER of the HUNT FORK SHALE (Upper Devonian)**--Mudstone, shale, and sandstone. Medium- to medium-dark-gray mudstone and shale, very silty, fissile, grades to siltstone, and slate. The shale member is partially metamorphosed; bedding and cleavage surfaces have a micaceous or phyllitic scheen and are graditional to slate and argillite

Dh **HUNT FORK SHALE (Devonian)**--Comprised wacke and shale members, undifferentiated; mostly shale and sandstone. Medium-dark-gray and olive-gray shale; includes argillite with poorly developed cleavage, grades to slate, poorly developed phyllitic sheen on partings, and includes sandstone partings and interbeds. Grayish-green and greenish-gray sandstone; mostly fine- to medium-grained, micaceous, ripple cross bedded in part, locally graded bedded in part



LOCALITY MAP OF STREAM-SEDIMENT AND ROCK SAMPLES COLLECTEDIN 1986, COBBLESTONE CREEK STUDY AREA, CHANDLER LAKE QUADRANGLE, ALASKA

Base from U.S.Geological Survey
Chandler Lake 1:250,000 quadrangle,
1956 with limited revisions, 1983

1959 magnetic declination at south edge of sheet ranges from 27° to 29° east

Geologic base from Kelley (1988)

This map is preliminary and has not been edited or reviewed for conformity with U. S. Geological Survey editorial standards.

By

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1989

BAR SCALE
0 .5 1 2 3 4 5 MILES

SCALE : 1" (2.54 cm.) = 1.56 Miles
(2.516 km)