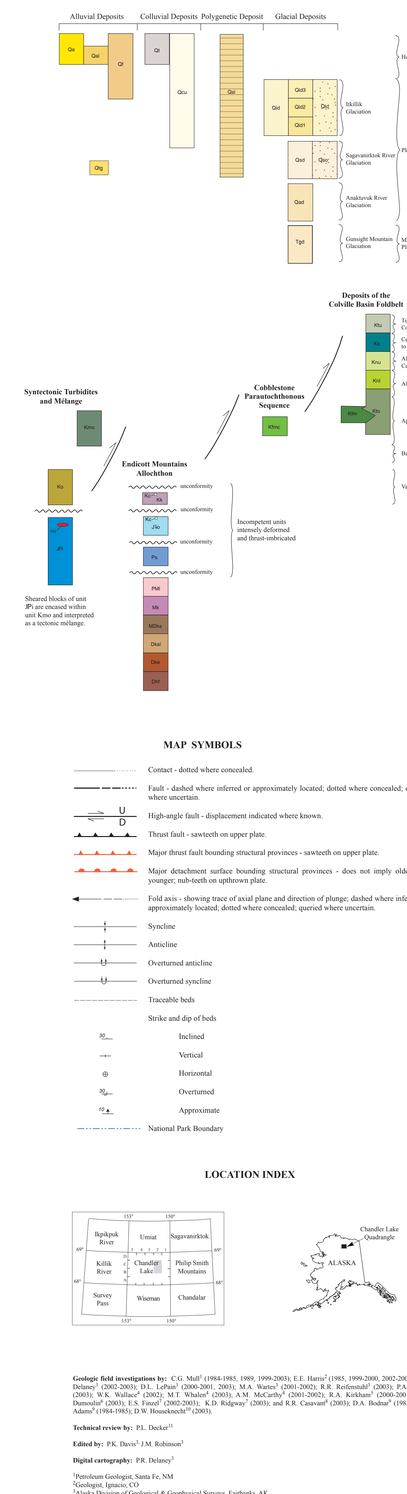
Base from U.S. Geological Survey
Chandler Lake B-2 and C-2 Quadrangles (1971).
Universal Transverse Mercator projection, zone 5.
1927 North American Datum

SCALE 1:63,360

CONTOUR INTERVAL
50 feet north of 68°30'
100 feet south of 68°30'

APPROXIMATE MEAN DECLINATION, 2008

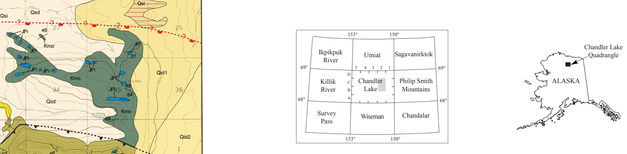
CORRELATION OF MAP UNITS



MAP SYMBOLS

- Contact - dotted where concealed.
- Fault - dashed where inferred or approximately located; dotted where concealed; queried where uncertain.
- High-angle fault - displacement indicated where known.
- Thrust fault - sawteeth on upper plate.
- Major thrust fault bounding structural provinces - sawteeth on upper plate.
- Major detachment surface bounding structural provinces - does not imply older over younger; nub-teeth on upthrown plate.
- Fold axis - showing trace of axial plane and direction of plunge; dashed where inferred or approximately located; dotted where concealed; queried where uncertain.
- Syncline
- Anticline
- Overturned anticline
- Overturned syncline
- Traceable beds
- Strike and dip of beds
  - Inclined
  - Vertical
  - Horizontal
  - Overturned
  - Approximate
- National Park Boundary

LOCATION INDEX



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This DGGS Preliminary Interpretive Report is a preliminary report of scientific research. It has received modest technical review but has not been reviewed for conformity to the final publication standards of DGGS.

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DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS

Surficial units modified from Hamilton, 1979

ALLUVIAL DEPOSITS

Qa — **Moreen Alluvium** (Holocene)—Modern channel and floodplain deposits; ranges from poorly sorted to moderately sorted, well stratified sand and gravel and includes silt and peat facies.

Qal — **Alluvium, undifferentiated** (Holocene)—Predominantly channel and floodplain deposits, as described above; mantled with up to 2 m of sand, silt, and peat; generally vegetated and stands 1–2 m above modern floodplains. At the south end of Shainin Lake unit may include lacustrine, deltaic, fluvial, and (or) eolian deposits.

Qtg — **Terrace Gravel** (Pleistocene)—Oxidized sandy gravel, containing residual erratic boulders, forming terraces 45–65 m above modern river levels. Caps erosion surfaces formed within the Anaktuvuk River drift sheets but beyond outer moraines and above outwash terraces of Sagavanirktok River age.

Qf — **Fan Deposits, undifferentiated** (Pleistocene to Holocene)—Steep alpine fans are angular rock debris at mouths of avalanche chutes and canyons. Active and inactive fan deposits are rock debris commonly with matrix of coarse, very poorly sorted, nonstratified to weakly stratified, subangular to subrounded, silty, sandy gravel. Deposit mapped at the south end of Shainin Lake is a fan-delta deposit consisting of gravel grading into deltaic and lacustrine facies.

COLLUVIAL DEPOSITS

Qt — **Talus Rubble** (Holocene)—Angular, unsorted, nonstratified rock debris forming cones and aprons along the base of steep bedrock slopes.

Qcu — **Solifluction and Other Colluvial Deposits, undifferentiated** (Pleistocene to Holocene)—Poorly sorted, nonstratified to weakly stratified, stony, sandy silt to organic silt, primarily of glacial origin, deposited by solifluction and/or colluvial processes. Solifluction deposits widespread on gentle and moderate slopes, form thin sheets over bedrock and aprons that thicken down slopes and accumulate up to several meters deep along slope bases. Unit bisected by colluvium deposited by alluvial processes and/or solifluction on steep slopes or in moderately steep gullies of ephemeral, tributary streams.

POLYGENETIC DEPOSIT

Qpi — **Ice-Rich Silt Deposits** (Pleistocene to Holocene)—Poorly stratified silt and organics up to several meters thick, derived from loess mixed with solifluction deposits. Abundant ice present as disseminated grains and as lenses and wedges. Fills poorly drained topographic depressions and valleys and exhibits numerous small thaw lakes on surface.

GLACIAL DEPOSITS

Ikkillik Glaciation

Qid — **Drift of Ikkillik Age, undifferentiated** (Pleistocene)—Unsorted to poorly sorted, generally nonstratified, compact, bouldery till. Mixed sand-to-clay matrix, with silt generally dominant; usually within mountain valleys and cannot be assigned to a specific Ikkillik moraine.

Qid3 — **Drift of Latest Ikkillik Readvance** (Pleistocene)—Till and ice-contact deposits, as described above; form arcuate to lobate deposits within valleys at mountain front.

Qid2 — **Drift of Ikkillik Phase II** (Pleistocene)—Till and ice-contact deposits, as described above; form narrow-crested (3–5 m) moraines.

Qid1 — **Drift of Ikkillik I Age** (Pleistocene)—Till and ice-contact deposits, as described above. Morphology irregular, but smoother than on features of Ikkillik II age; moraine crests 5–10 m wide; conspicuously channeled outwash trains.

Qfp — **Outwash of Ikkillik Advance** (Pleistocene)—Moderately well sorted, sandy gravel. Generally lacks loess or peat cover. Forms aprons and valley trains in front of, or marginal to, drift lobes of Ikkillik age.

Sagavanirktok River Glaciation

Qsd — **Drift of Sagavanirktok River Age** (Pleistocene)—Poorly sorted, nonstratified, bouldery till, ranging in composition from sandy, bouldery gravel to clayey, stony silt. Forms distinct but subdued end moraines and topography intermediate in character between drift of Ikkillik age and Anaktuvuk River age.

Qsfp — **Outwash of Last Sagavanirktok River Advance** (Pleistocene)—Moderately well sorted and stratified, sandy gravel forming outwash trains beyond the outer limits of the Sagavanirktok River drift sheet.

Anaktuvuk River Glaciation

Qad — **Drift of Anaktuvuk River Age** (Pleistocene)—Glacial deposits of unknown composition, overlain by continuous silt deposits; forms low, broad moramic ridges with gentle flanking slopes. Deeply dissected by thaw slumps, which may include outwash trains of Sagavanirktok River and Ikkillik age, and forms the oldest continuous drift sheets in the map area.

Gunsight Mountain Glaciation

Tgd — **Drift of Gunsight Mountain Age** (Tertiary)—Highly eroded glacial deposits of unknown composition, overlain by continuous cover of organic silt, and lacking primary relief. Associated with abundant erratics of Kanayut Conglomerate. Occurs beyond limits of Anaktuvuk River drift in northeastern map area.

BEDROCK UNITS

DEPOSITS OF THE COLVILLE BASIN FOLDBELT

Kbu — **Tuluvak Formation** (Turonian to Coniacian; revised nomenclature, Mull and others, 2003)—Sandstone and conglomerate exposed in low (2 m high) ridges in the northeast corner of map area and present on the western exposures of the May Creek syncline. Better exposures east of the map area form mesa-like uplands with locally resistant ledges or rounded benches of relatively resistant intervals up to 25 m thick. Sandstone, clean, well-sorted, fine to medium-grained, >95 percent well rounded quartz, friable, exhibits low-angle cross bedding, probably dominantly marine. East of the map area, in May Creek syncline, unit has low porosity and vitrinite reflectance commensurability. Conglomerate consists of conspicuously well-rounded, well-sorted, pea gravel to small pebble clasts of white quartz and black chert with no matrix, but with conspicuous drusy quartz on grain surfaces. Top of unit not exposed in map area. Lower part of Tuluvak consists of sandstone, siltstone, and interbedded shales exposed in bluffs on west bank of Nanushuk River, on south flank of May Creek syncline. Estimated thickness: 150 m.

Kmc — **Seabee Formation** (Cenomanian to Turonian; revised nomenclature, Mull and others, 2003)—Dominantly soft, organic-rich black shale, with bentonite interbeds and some thin silicified tuff beds, mostly tundra-covered in map area, exposed as slumped flowage, as is typical of the formation, and observed as white weathering patches in tundra-covered valleys; exposure on the southeast side of a lake bank in the northeast corner of the map area; upper 150 m above dikes (up to 60 m thick) west of the Kanayut River are the easternmost mapped exposures of these rocks. These mafic igneous rocks (unit rm) are believed to have intruded the lower Etivluk Group, which includes Innuitchuk Chert (JPi), of the Ipnavik River allochthon. We interpret this belt of the Okpikruak Formation, with the associated Innuitchuk Chert (JPi), to be of the Ipnavik River allochthon based on the presence of the mafic igneous rocks. A small outcrop of the Okpikruak Formation associated with Innuitchuk Chert at the mountain front east of Shainin Lake is possibly a small klippe of the Picnic Creek allochthon based on its position at the leading edge of the Endicott Mountain allochthon. Original stratigraphic thickness of the Innuitchuk Chert is unknown, probably <100 m.

ENDICOTT MOUNTAINS ALLOCHTHON

Kk — **Buchia Limestone and Coquina and Associated Shales** (Valanginian)—An important marker horizon informally called the coquinoid limestone; distinctive reddish-brown weathering, thin-bedded limestone coquina, composed entirely of highly compressed *Buchia sublaevis* pelecypods of Valanginian age, with thin interbeds and partings of dark gray to black fissile shale. Commonly structurally infolded and thickened within Blankenship Member of the underlying Otuk Formation and possibly the silty shale of the Kingak Shale. Underformed stratigraphic thickness unknown, but probably <2 m.

Kcu — **Undivided Cretaceous and Jurassic Rocks**—Dominantly dark gray to black silty shale and mudstone; associated with the limestone coquina (Kc) described above. This unit is interpreted in map area to possibly represent the lower part of the **Kingak Formation**, based on the silty composition of the shale, interbedded concretionary limey siltstone and mudstone nodules with rusty weathering, occasional horizontal and vertical burrows, and a silvery sheen on weathered surfaces. Unit is structurally contorted and poorly exposed on the east and west sides of the Kanayut River, near the leading edge of thrust sheets of the Endicott Mountains allochthon, and may also contain the **Blankenship Member** of **the Otuk Formation** as described below. The best exposure of the unit is on the west side of the Kanayut River in a small gully in the northeast corner of sec. 20, T12S, R5E. Exposed thickness: <20 m.

Kmo — **Otuk Formation** (Middle Triassic to lower Upper Jurassic)—Interbedded fossiliferous black chert, limestone, and organic-rich black sooty shale in five lithogenetic units, in ascending order: (1) a basal, poorly exposed shale member—black, organic, sooty, noncalcareous, pyritic shale and silty shale, distinctive white weathering precipitate and minor interbedded thin limestone beds and nodules with thin lamination (Middle Triassic); (2) chert member—black silicified mudstone and chert and rhythmically interbedded black, sooty, calcareous shale with some pelecypod coquinas, *Halobia sp.*, and subordinate thin black limestone beds (Middle and Upper Triassic); (3) limestone member—light-gray and yellowish-tan weathering banded limestone and silicified limestone, thin-bedded (5–20 cm), wispy laminations and wavy bedding with thinly interbedded black, sooty, calcareous shale, commonly with abundant pelecypods *Monotis sp.* and *Halobia sp.* (Upper Triassic); (4) Karen Creek Member—orange and tan weathering, dark gray, very-fine-grained quartzose sandstone to calcareous siltstone; commonly contains finely disseminated pyrite (Upper Triassic); and (5) Blankenship Member—organic-rich, black, sooty, shale and marl, minor thin-bedded siliceous mudstone, pelecypod *Otapiria tailleuri sp.* common (Lower and lower Upper Jurassic).

The unit is commonly intensely deformed in the map area, with exposures along both banks of Erratic Creek in 15- to 30-m-high bluffs and at the mountain front on a small north-flowing tributary of Welcome Creek where Bodnar (1984) measured partial sections of the limestone, Karen Creek, and Blankenship members, including the overlying coquinoid limestone, in relatively underformed, although discontinuous, blocks. The 1.75 m exposure of the Karen Creek Member on Welcome Creek is the westernmost known exposure of this unit. The Otuk is a condensed section deposited in an open-marine, middle neritic to inner bathyal environment distant from a source of clastic detritus (Bodnar, 1984). Regionally this unit constitutes an excellent hydrocarbon source horizon with 5 percent to >10 percent TOC. Top and base of unit are not exposed in map area; regionally disconformably overlain by Lower Cretaceous marine shales and coquinoid limestone beds. Regional total thickness: <100 m.

Ps — **Siksikpuk Formation** (Permian)—Four informal lithostratigraphic units have been recognized for this unit in the north-central Brooks Range (Siok, 1985) in ascending order: Unit (A) yellow-orange-weathering pyritic siltstone; Unit (B) gray to greenish-gray and maroon mottled mudstone and siltstone, containing nodules of barite and siderite; Unit (C) wispy-laminated, greenish-gray silicified mudstone or chert, a resistant unit; Unit (D) wispy-laminated, dark gray fissile shale and minor siltstone. The Siksikpuk is a transgressive unit, representing mostly suspension sedimentation in an inner to middle neritic environment (Siok, 1985). In the map area, exposures of the Siksikpuk Formation are nearly absent, or very poorly exposed, and appear to be limited to units A and B. Both the upper contact with the Otuk Formation and the basal contact with the Lisburne Group may be a disconformity. Both the Siksikpuk and the Otuk Formations act as detachment surfaces above the Lisburne Group and are commonly tectonically deformed and thickened at the mountain front. Regional thickness: <100 m. Age: Permian, based upon megafossil fauna (Patton, 1957).

PMl — **Lisburne Group** (Lower Mississippian, Osagean to Middle Pennsylvanian, Morrowan; as described by Dumoulin[8], written commun., 2003)—Dominantly massive, light- to dark-gray weathering, cliff-forming crinoidal limestone and dolomite (hatch pattern); in places contains abundant black chert nodules, lenses, and beds, and leached pinpoint to vuggy porosity filled with solid hydrocarbon. Distinctive sooty black phosphatic shale and limestone in upper part of unit; more so west of map area. The type section for both Wachsmuth Limestone and Alapah Limestone of the Lisburne Group is located southeast of Shainin Lake (Bowsher and Dutro, 1957) and is the most thoroughly studied section in the area. The formal subdivisions Alapah and Wachsmuth Limestone are difficult to recognize in regional mapping and are not differentiated on this map. Conodonts and foraminifers indicate that the lower 280 m of the section is Early Mississippian (mostly Osagean); remainder of the section is Late Mississippian (Meramecian and Chesterian).

Lower 480 m of section at Shainin Lake consists of extensive intervals of cross-bedded skeletal grainstone intercalated with thinner bedded cherty and (or) muddy limestone; these strata were deposited in and around a belt of skeletal sand. Much of the grainstone is dolomitized and contains effective porosities as high as 11 percent. Upper part of section is largely skeletal grainstone and lesser coralline boundstone that formed in a generally open-marine environment.

Youngest Lisburne strata recognized in map area are found at Erratic Creek, 8 km northeast of Shainin Lake, where conodonts of earliest Pennsylvanian (earliest Morrowan) age occur in crinoidal pack-grainstone ~5 m below the top of the Lisburne. Youngest Lisburne section documented in Chandler Lake Quadrangle is at Cobblestone Creek, 10 km east of map area; uppermost Lisburne here is bioclastic limestone that contains conodonts of Middle Pennsylvanian (late Morrowan) age. Uppermost Lisburne at Skimo Creek, west of map area, consists of ~40 m of dark shale, mudstone, and spiculitic limestone that appear to represent an extremely condensed section. Uppermost spiculitic limestone yielded conodonts of early Morrowan (early Early Pennsylvanian) age (A. Harris, written commun., 2004, 2005).

The Lisburne is exposed in a series of folded thrust sheets forming the northern flank of the Endicott Mountains. Lower contact with Kayak Shale; well exposed at Shainin Lake; is sharp but appears conformable. Upper contact with Siksikpuk Formation is also sharp; it appears conformable at Skimo Creek west of map area but may be disconformable in the eastern part of Chandler Lake Quadrangle (Siok, 1985). Thickness: >700 m.

Mk — **Kayak Shale** (Early Mississippian, Kinderhookian)—Bowsher and Dutro (1957) named the Kayak Shale for approximately 300 m of shale, quartzose sandstone, and argillaceous limestone exposed near the mountain front in an east-west-trending belt south of Shainin Lake. The type section, located in the map area, was designated in the saddle on the south side of Mt. Wachsmuth, where five informal members were recognized. The members include, in ascending order, a basal sandstone (38 m thick), a lower black shale unit (180 m thick), an argillaceous limestone unit (25 m thick), an upper black shale unit (43 m thick), and a red limestone unit (up to 5 m thick). The basal sandstone unit consists of light gray, brown-gray, and red-brown weathering fine- to medium-grained sandstone and minor interbedded dark gray to black silty shale and shale. Sandstone beds range from less than 1 cm to 25 cm thick, include plane-parallel lamination, planar-tabular and sigmoid-shaped cross stratification, and flaser bedding. Sandstone beds are sparsely to moderately bioturbated and trace fossils consisted of vertical, near-vertical, and bed oblique, downward tapering burrows backfilled with black and maroon mudstone (possibly *Cylindrichnus*?) of the *Skolithos* Ichnofacies. Sandstones are locally ferruginous. The lower black shale unit is very poorly exposed, but chips in float include fissile black shale and dark gray to black silty shale. Faint sub-millimeter lamination is visible in some silty shale chips. The argillaceous limestone unit consists of poorly exposed interbedded limestone and shale; limestone is dark-gray, very argillaceous, fine-grained, with scattered crinoidal debris; shale is dark to medium gray and very calcareous. The upper black shale unit is mostly black, fissile shale with thin lenticular beds of dark-gray, fine- to medium-grained, argillaceous limestone. The red limestone member is dark- to medium gray, medium- to coarse-grained, distinct reddish brown weathering, abundant brachiopods and fragments of gastropods, crinoids, bryozoans, and rugose corals. The Kayak Shale is a transgressive-regressive unit deposited in tide-influenced intertidal to shallow subtidal marine settings. The red limestone member is transitional with overlying Lisburne Group. Unit forms subdued slopes and commonly acts as detachment surface for Lisburne thrust sheets. Thickness approximately 300 m.

Kanayut Conglomerate (Bowsher and Dutro, 1957; Nilsen and Moore, 1984)—Named for a thick succession of predominantly nonmarine conglomerate, sandstone, and shale exposed south of the Brooks Range mountain front where type sections for each member were designated immediately southeast of Shainin Lake. The basal Ear Peak Member gradationally overlies the Hunt Fork Shale and the contact is placed at the base of the stratigraphically lowest unequivocal fining-upward succession of sandstone overlying thick phyllitic shale. The Shainin Lake Member gradationally overlies the Ear Peak Member. This contact is typically expressed by an abrupt change in slope from a distinct stair-step pattern in the Ear Peak Member to vertical or near-vertical cliffs in the Shainin Lake Member. This change in weathering profile between the Ear Peak–Shainin Lake members can readily be seen near ridgetops at the south edge of the map area. The Stuver Member gradationally overlies the Shainin Lake Member. Along valley margins the contact typically corresponds to a distinct upward decrease from steep to moderate slopes characterized by a prominent stair-step pattern. Along ridgetops, where changes in slope are not as obvious, the contact is arbitrarily placed at the base of the lowest siltstone–shale succession greater than 5 m thick. The Stuver Member is abruptly overlain by the basal sandstone unit of the Kayak Shale. The Stuver Member–Kayak Shale contact in the map area is typically present on the south side of prominent topographic saddles; saddles are bounded on their south sides by north-dipping cuestas developed in the uppermost sandstone beds of the Stuver Member.

MDku — **Stuver Member** (Upper Devonian to Lower Mississippian)—Light gray, light tan, and light to medium brown weathering, locally orange-brown weathering, pebble conglomerate and sandstone; brown, gray, maroon, green, and black weathering siltstone and shale. Lithologies are organized in prominent fining- and thinning-upward successions up to 30 m thick, expressed in outcrop as resistant benches of sandstone and minor conglomerate separated by recessive weathering successions of siltstone, silty shale, and shale forming a distinctive stair-step pattern. Sandstone benches are gradationally overlain by siltstone, silty shale, and shale with abundant thin interbeds of sandstone. Siltstones and silty shale are characterized by angular, blocky weathering textures and color mottling (gray, green, and maroon) suggestive of paleosols. Plant fragments are common in silty shale and shale. Sandstone and conglomerate near the base of fining-upward successions were deposited in suspended load to mixed-load meandering streams; silty shale and siltstone record deposition on alluvial floodplains that flanked stream channels. Common paleosols indicate that these flood plains were repeatedly exposed to surface weathering and pedogenic modification. The Stuver Member includes plant fossils of Late Devonian age throughout much of its thickness. Plant fossils of Early Mississippian age have been recovered from near the top of the unit (Nilsen and Moore, 1984). The overlying Kayak Shale includes marine megafossils and microfossils of Early Mississippian (late Kinderhookian) age, which is consistent with an Early Mississippian age for the uppermost Stuver Member. Thickness: approximately 220 m (Nilsen and Moore, 1984).

Dksl — **Skajuk Lake Member** (Upper Devonian)—Light gray, orange-brown, and, medium to dark red-brown weathering pebble conglomerate, pebbly sandstone, and sandstone; pebble conglomerate is the most abundant lithology, followed by pebbly sandstone, and sandstone; the member is nearly devoid of siltstone and shale. Shainin Lake Member typically weathers to form massive near-vertical to vertical cliffs. Pebble conglomerate is polymictic and clast-supported, though all gradations have been observed from clast-supported conglomerate to pebbly sandstone. Clasts are well-rounded and contain predominantly of chert, including black, dark gray, light gray, pistachio green, dark green, brown, and red varieties; sub-millimeter diameter tourmalan tests are commonly visible on moistened, fresh clast surfaces. Clasts of white vein quartz are common and medium gray quartzite clasts are a minor constituent. The maximum clast size in the map area is approximately 7 cm. Matrix between clasts is medium- to very coarse-grained, poorly to moderately sorted sandstone. Bed thickness ranges from a few decimeters to several meters, and most beds are laterally discontinuous. Conglomerates are typically massive or display crude horizontal stratification; planar-tangential cross stratification is present locally in sets up to 5 m thick. Lenses of pebbly medium- to very coarse-grained sandstone up to 2 m thick are common. Nilsen and Moore (1984) reported that the Shainin Lake Member coarsens upsection to the middle of the unit, and fines progressively upsection from there to the contact with the overlying Stuver Member. Pebble conglomerate and pebbly sandstone of the Shainin Lake Member record deposition in bedload-dominated, low-sinuosity, "braided" streams. No age-diagnostic fossils have been recovered from the Shainin Lake Member, but the age of the member is constrained by marine fossils of Late Devonian (Famennian) age from the underlying Ear Peak Member and by plant fossils of Late Devonian and Early Mississippian age from the overlying Stuver Member. Nilsen and Moore (1984) considered the Shainin Lake Member to be of Famennian age. Thickness is approximately 525 m at the type section just south of the map area (Nilsen and Moore, 1984).

Dkel — **Ear Peak Member** (Upper Devonian)—Medium brown, olive-brown and maroon weathering siltstone and silty shale; light tan-gray, light brown, orange-brown, and red-brown sandstone, pebbly sandstone, and sandy pebble conglomerate. Lithologies are organized in prominent fining-upward successions up to 25 m thick, expressed in outcrop as resistant benches of sandstone and conglomerate separated by poorly exposed recessive weathering silty shale, siltstone, and mudstone. Alternating resistant sandstone and recessive silty shale–siltstone successions create a distinctive stair-step weathering pattern. Sandstone benches are 2 m to 10 m thick and commonly include a basal pebbly sandstone or sandy pebble conglomerate; the grain size and scale of sedimentary structures decrease progressively upward in each bench. Plant fragments up to 25 cm long and 4 cm wide are common on sandstone bed surfaces. Carbonized plant rootlets and thin paleosols are common features near the top of the sandstone portions of fining-upward successions. Sandstone benches are gradationally overlain by silty shale, siltstone, and thin interbeds of very fine- to fine-grained sandstone. Siltstone and silty shale are predominantly brown to olive brown, but include distinctive lens-like accumulations of maroon siltstone; chips of silty shale and siltstone locally have a mottled olive-brown and maroon appearance. Sandstone interbeds up to 1 m thick are common. Small plant fragments are locally abundant in siltstone and larger plant fragments (up to 20 cm long) are common on sandstone bed surfaces. Blocky texture and color mottling suggestive of paleosols are common in silty shales and siltstone. Sandstone and conglomerate benches thicken progressively upward toward the contact with the Shainin Lake Member. Sandstone and conglomerate benches were deposited in suspended load and mixed-load meandering streams; silty shale and siltstone record deposition on alluvial floodplains that flanked stream channels. Paleosols indicate that these flood plains were repeatedly exposed to surface weathering and pedogenic modification. Stream channels in the Ear Peak Member fed delta lobes in the underlying wacke member of the Hunt Fork Shale. The Ear Peak Member includes plant fossils of Late Devonian age (Matsuy, 1962, in Nilsen and Moore, 1984); brachiopods of Late Devonian (Famennian) age have been recovered from marine beds approximately 150 m above the base of the member (Nilsen and Moore, 1984). The Ear Peak Member is approximately 500 m thick in the map area (Nilsen and Moore, 1984).

Dhf — **Hunt Fork Shale** (Chapman and others, 1964; Brogé and others, 1979) (Upper Devonian)—Named for a well-defined, thick (up to 1,400 m) succession of predominantly shale, locally metamorphosed to slate, in the central Brooks Range. The Hunt Fork Shale is divided into a lower shale member and an upper wacke member; only the wacke member is exposed in the map area. Predominantly poorly exposed light- to medium-gray and gray-green silty shale and siltstone; subordinate, but better exposed gray-tan, olive-tan, pink-tan, and red-brown weathering very fine- to coarse-grained sandstone, locally fossiliferous and conglomeratic with granule- and pebble-sized clasts of quartz, chert, and ironstone. Lithologies are organized in coarsening-upward successions up to 25 m thick; coarsening-upward successions stack vertically to form at least seven cycles in the map area. Silty shale, siltstone, and thin sandstone interbeds form the base of coarsening-upward successions and are typically poorly exposed and only seen in float; interbedded sandstones are a minor but conspicuous component near the base of coarsening-upward successions and consist of red-brown weathering, medium- to coarse-grained, moderately to poorly sorted with locally common to abundant disarticulated thick-walled brachiopods and thin-walled bivalves. The upper few meters to 15 m of coarsening-upward successions consist predominantly of thin- to thick-bedded, fine- to medium-grained sandstone and minor granule and pebble conglomerate. Vertical burrows up to 5 mm in diameter similar to the trace fossil *Skolithos* are locally present in some sandstone beds, but are never abundant or prominent, but help distinguish the wacke member from the overlying Kanayut Conglomerate. Coarsening-upward successions represent stacked delta lobes that were fed by fluvial systems in the Kanayut Conglomerate. The wacke member is gradationally overlain by the Ear Peak Member of the Kanayut Conglomerate. The wacke member is restricted to the south edge of the map area, where it lies in thrust fault contact above younger carbonates of the Mississippian–Pennsylvanian Lisburne Group. Thickness is 250 m to 300 m in the map area.

Ongoing mapping and structural and stratigraphic studies in the Siksikpuk River–Tiglukpuk Creek area (Poppليس et al., 2007) to the west have resulted in some revised structural and stratigraphic concepts that have not been fully evaluated in the Kanayut River map area. In addition, some differences in structural and stratigraphic interpretations between the Kanayut River area and the adjacent Cobblestone Creek–May Creek area (Mull and others, 2008) also remain to be reconciled.

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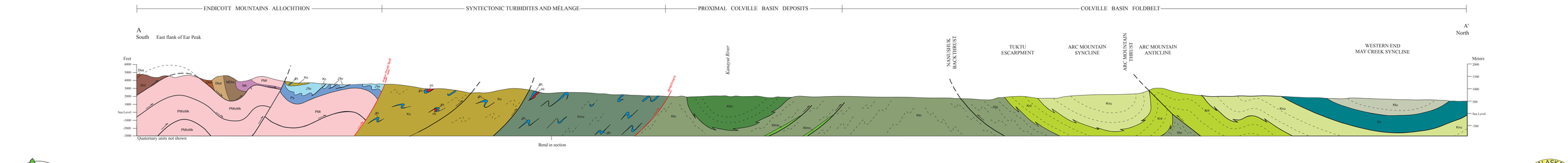
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