COLUMNAR SECTION OF THE SIKSIKPUK FORMATION, ATIGUN GORGE, PHILIP SMITH MOUNTAINS (B-4) QUADRANGLE, NORTHCENTRAL BROOKS RANGE, ALASKA

LAT 68°27'35" N., LONG 149°16'18" W.

EXPLANATION

ROCK TYPES

- Siltstone — Metasiltstone
- Silty shale — Silty slate
- Shale — Slate
- Limestone
- Dolostone
- Silty dolostone
- Siliceous shale — Siliceous slate
- Chert

MINERALS

- B Barite
- Calcite
- Dolomite
- Pyrite
- Q Quartz
- S Siderite

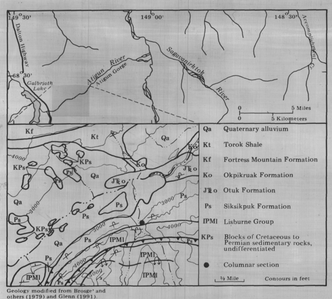
STRUCTURES

- Ripple lamination
- Wispy lamination
- Concretion or nodule — May be combined with other symbols
- Vein — May be combined with other symbols
- Fault — Arrows indicate direction of relative movement

FOSSILS

- Brachiopod
- Bryozoan
- Conodont
- Echinoderm
- Foraminifera
- Gastropod
- Ostracode
- Radiolarian
- *Zoophycos*
- Burrow

STRIKE N.80°E.; DIP 60°S., overturned
VERTICAL SCALE 1 INCH = 4 METERS



Geologic modified from Brosgé and others (1979) and Glenn (1991).

SERIES	STAGE	GROUP	FORMATION	INFORMAL LITHOSTRATIGRAPHIC UNIT	THICKNESS, IN METERS	LITHOLOGY	SAMPLE NUMBER	FOSSILS	DESCRIPTION
Upper Permian	Guadalupian	Etivluk	Siksikpuk	D	130–120		84AKA21-1 85AKA21-2 84AKA21-2 84AKA21-3 85AKA21-12	P?	SLIGHTLY METAMORPHOSED SHALE, mostly dark-gray to black, grading to green gray and maroon brown toward top; dark-gray to black shale weathers silver to orange brown. Unit contains flecks of phosphate clasts, pyrite nodules to 10 cm diam, and a metallic yellow- to red-brown-weathering siderite bed (15 to 20 cm thick); barite and quartz late veins. Toward base, shale is cherty. Bedding is obscured by slaty cleavage, but 0.5-cm-diam burrows are preserved. Conodont(?) and foraminiferal(?) fragments were observed in thin section. Shale forms spiky, fissile to platy talus. Unit is overlain at thrust contact by orange-brown- to red-brown-weathering calcareous siltstone and silty carbonate of basal Siksikpuk succession
				C	120–100		85AKA21-22 84AKA21-4 85AKA21-32	P? *Neogondolella* cf. *N.phosphoriensis* (Youngquist, Hawley, and Miller) *Neogondolella* sp.	SLIGHTLY METAMORPHOSED SILICEOUS SHALE, dark-brown-black, weathering white and black gray; barite lines fractures. Beds average 10 to 15 cm thick and are cleaved. Conodont fragments and recrystallized radiolarians(?) were observed in thin section. Unit forms slabby talus. Contact with overlying shale is probably gradational
				B_2	100–75		85AKA21-60 84AKA21-5 84AKA21-6	P?	SLIGHTLY METAMORPHOSED SHALE, medium gray-green- and maroon-brown-mottled at base, darkening upsection to black; dolomitic and rarely silty; contains metallic maroon brown- and green-brown-weathering siderite lenses (20 cm wide by 2 m long) and beds (10 cm thick), which are crosscut by barite veins and rosettes. Bedding is obscured by slaty cleavage, but burrows to 0.5 cm diam are preserved. Permian (probably early Guadalupian) conodont *Neogondolella* was recovered from top of unit (A.G. Harris, written commun., 1986); foraminifera and radiolarians were observed in thin sections of siderite bed. Shale is partly covered by tundra or rubble, which forms spiky plates to slabs. Conodont alteration index (CAI), determined from recovered conodonts, equals 2 or 3 (A.G. Harris, written commun., 1986), indicating host rock reached anywhere from 60 to 200 °C. Unit B_2 grades(?) into overlying unit C
				B_1	75–55		85AKA21-70 85AKA21-78	P?	SLIGHTLY METAMORPHOSED SILTY SHALE PUNCTUATED BY SILTSTONE. Silty shale is medium gray, weathering maroon brown and gray green. Forms soil horizons. Siltstone is light to medium gray, orange-brown to maroon-brown weathering, and partly dolomitic and calcareous; contains pyrite nodules to 20 cm long by 10 cm wide, barite crystals, and traces of glauconite and phosphate. Beds are burrowed with forms to 1.5 cm diam and contain an Early Permian faunal assemblage, including several genera of brachiopods; the faunal assemblage differs from that of the type Siksikpuk Formation (J.T. Dutro, Jr., written commun., 1985). The top siltstone bed has been reworked by the trace fossil *Zoophycos*. Bedding is crosscut by spaced cleavage and calcite veins. Siltstone breaks with hackly fracture into slabby talus. Top of unit is covered but probably grades into overlying unit B_2
Lower Permian	Leonardian(?)				55–15				
	Wolfcampian			A	15–0		84AKA21-7 84AKA21-8 84AKA21-9 85AKA21-127 84AKA21-10 84AKA21-11 84AKA21-12 84AKA21-13 84AKA21-14 85AKA21-129 84AKA21-15 85AKA21-131 84AKA21-16 84AKA21-17 85AKA21-133 84AKA21-18	*Martinia* sp. (large) and *Tomiopsis*(?) sp. (float) *Striapurollus* (*Euomphalus*) *alaskensis* Yochelson and Dutro (float) *Anidanthus* sp. and *Afresnoitella*? sp. (float) *Anidanthus* sp. and *Linoutella*? sp. *Striapurollus* (*Euomphalus*) *alaskensis* Yochelson and Dutro *Striapurollus* (*Euomphalus*) *alaskensis* Yochelson and Dutro *Striapurollus* (*Euomphalus*) *alaskensis* Yochelson and Dutro *Krotovia*? sp.	SLIGHTLY METAMORPHOSED INTERBEDDED SILTSTONE, DOLOSTONE, AND SILTY SHALE. Siltstone is light to dark gray, orange- to red-brown and black weathering, dolomitic and calcareous; contains pyrite nodules to 5 cm diam and traces of glauconite. Beds average 15 to 20 cm thick and are horizontally burrowed (forms reach 1 cm diam) and wispy laminated throughout, partly graded, and rarely ripple laminated at top Dolostone is medium to dark gray, tan- to red-brown weathering, calcareous, partly cherty, and, near top of unit, silty. Contains pyrite nodules to 20 cm long by 5 cm wide. Beds range from 5 to 70 cm thick and are also horizontally burrowed (forms reach 1.5 cm diam) and wispy laminated throughout and occasionally ripple laminated at top. Siltstone and dolostone beds appear to form three thickening-upward packages, each 2 m thick, which are coincident with rhythmic increase in carbonate content. Each package is separated at sharp contact overlain by silty shale Silty shale throughout unit A is dark gray, green-gray and orange-brown weathering, pyritic, partly calcareous, and rarely siliceous. Occurs in 20- to 40-cm intervals that form clay horizons and as 2- to 5-cm partings between coarser beds An Early Permian faunal assemblage, including gastropod *Striapurollus* (*Euomphalus*) *alaskensis* Yochelson and Dutro and brachiopods *Anidanthus* sp. and *Linoutella*(?) sp., is present in siltstone and dolostone beds but differs from that of type area of Siksikpuk Formation (J.T. Dutro, Jr., written commun., 1985). In few instances, fossils are concentrated toward base of bed. Rare ostracodes and few echinoderms were observed in thin section of dolostone. Trace fossil *Zoophycos* is present throughout most of unit. Contact with overlying unit B_1 is gradational ECHINODERM-BRACHIOPOD-BRYOZOAN WACKESTONE (SPARSE BIOMICRITE), dark-gray, tan-weathering, glauconite-bearing, pyritic. Fossils consist primarily of bryozoans with lesser brachiopods and echinoderms (probably crinoids); one brachiopod may be *Krotovia* sp. of Early Pennsylvanian age (J.T. Dutro, Jr., written commun., 1985). Unit is burrowed and veined with calcite. Contact with overlying Siksikpuk Formation is sharp
Lower Pennsylvanian	Lisburne	Wahoo Limestone							

Section measured with Jacob's staff by K.E. Adams and E.E. Harris, August 1984.