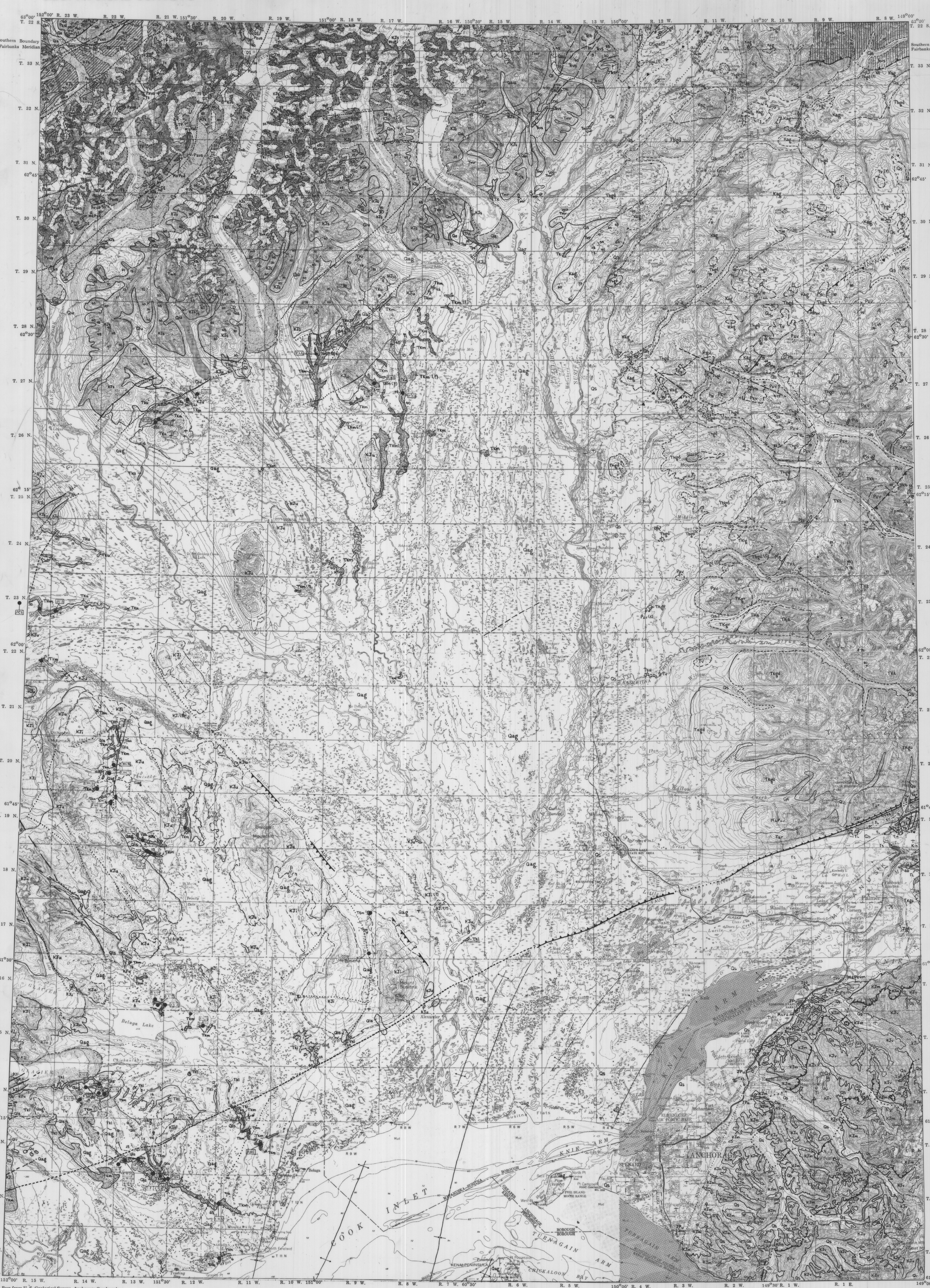
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

ALASKA OPEN-FILE REPORT AOF 142

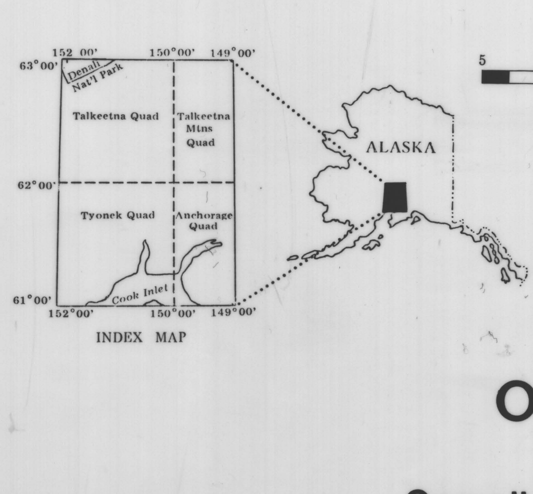
PLATE 1 OF 4



Base from U.S. Geological Survey Anchorage Quadrangle, Alaska (1962, rev. 1979); Talkeetna Quadrangle, Alaska (1958, rev. 1967); Talkeetna Mountains Quadrangle, Alaska (1954, rev. 1977); Tyonek Quadrangle, Alaska (1958, rev. 1974)

Coal-locality descriptions obtained during 1981 fieldwork by Roy D. Merritt and Jonathan Sperber.

This is a preliminary publication of the Alaska Division of Geological and Geophysical Surveys and as such has not received final editing and review. The author will appreciate candid comments on the accuracy of the data, and welcome suggestions that will improve the report.



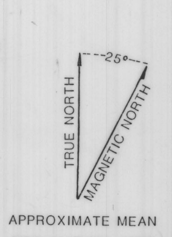
SCALE 1:250,000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

CONTOUR INTERVAL 200 FEET

DATUM IS MEAN SEA LEVEL (TALKEETNA, TALKEETNA MTNS QUADRANGLES); MEAN LOWER LOW WATER (TYONEK, ANCHORAGE QUADRANGLES)



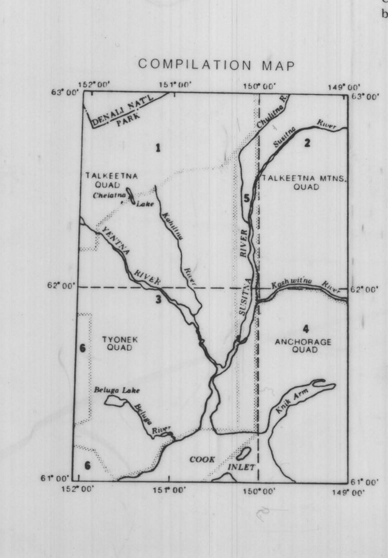
APPROXIMATE MEAN DECLINATION, 1958

BEDROCK GEOLOGY AND STRUCTURE MAP OF THE SUSITNA LOWLAND

Compiled by R.D. Merritt, G.R. Eakins, and J.G. Clough

1982

COMPILATION MAP



COMPILATION SOURCES

1 Reed, B.L., and Nelson, S.W., 1980, Geologic map of the Talkeetna Quadrangle, Alaska: U.S. Geological Survey Miscellaneous Investigations Series Map I-1174.

2 Csejtey, Béla, Jr., Nelson, W.H., Jones, D.L., Silberling, N.J., Dean, R.M., Morris, M.S., Lanphere, M.A., Smith, J.G., and Silberman, M.L., 1978, Reconnaissance geologic map and geochronology, Talkeetna Mountains Quadrangle, northern part of Anchorage Quadrangle, and southwest corner of Healy Quadrangle: U.S. Geological Survey Open-file Report 78-558A.

3 Barnes, F.F., 1966, Geologic map of Beluga-Yentna region, Alaska, *in* Geology and coal resources of the Beluga-Yentna region, Alaska: U.S. Geological Survey Bulletin 1202-C, 54 p.

4 Magoon, L.B., Adkison, W.L., and Egbert, R.M., 1976, Map showing geology, wildcat wells, Tertiary plant-fossil localities, K-Ar age dates and petroleum operations, Cook Inlet area, Alaska: U.S. Geological Survey Miscellaneous Investigations Series Map I-1019.

5 Adapted and compiled, and geologic units projected, from Barnes (1966), Csejtey and others (1978), and Magoon and others (1976).

6 Adapted and compiled, and geologic units projected, from Barnes (1966) and Magoon and others (1976).

EXPLANATION

CORRELATION OF MAP UNITS

SURFICIAL DEPOSITS AND SEDIMENTARY ROCKS

SURFICIAL DEPOSITS: Qs, Qag, Qu

Alluvial and Mass-Wasting Deposits: Qls, Ql, Qau, Qr

Glacial Deposits: Qa, Qn, Qk, Qe — Holocene and Pleistocene

SEDIMENTARY ROCKS: Tsu

- Tps — Pliocene
- TK — Pliocene and Miocene
- Tku, Tkm, Tkl — Pliocene, Miocene, and Oligocene (?)
- Tts, Ttc — Miocene
- Tt — Oligocene
- Tw — Eocene
- Tar, Tc — Paleocene
- Km — Upper to Lower Cretaceous
- Kag — Lower Cretaceous
- KJs (north of Denali fault) — Lower Cretaceous and Jurassic (?)
- KJs — Cretaceous and Lower Jurassic
- Jta — Upper to Lower Jurassic
- JtK — Lower Jurassic
- JRsv — Jurassic and Triassic
- Rvs, Rlb — Triassic
- Pzus — Carboniferous and Devonian
- Dl — Upper and Middle Devonian
- DSga — Middle Devonian to Silurian (?)
- Pzsl

METASEDIMENTARY AND METAMORPHIC ROCKS

- KJv — Cretaceous and Jurassic (?)
- KJm, KJu — Cretaceous and (or) Jurassic
- Rvs — Upper Triassic
- JPu — Jurassic and (or) Permian
- MzPzs
- Pls — Lower Permian and Pennsylvanian (?)
- Pzsv

PLUTONIC AND HYPABYSSAL ROCKS

- Tf — middle Tertiary
- Tm, Tmr, Tmk — lower Tertiary
- Tcp
- Thgd, Tbgd — Eocene-Paleocene
- TKgd — Tertiary and Cretaceous
- TKt, TKa — Lower Paleocene and Cretaceous
- TKgr, TKlg — Tertiary and (or) Cretaceous
- Jgd — Middle Jurassic
- Jpmu — Upper to Lower Jurassic
- MzPzd, MzPzg, MzPzm, MzPzum

VOLCANIC AND SHALLOW INTRUSIVE ROCKS

- Ti — Oligocene
- Tv — Miocene-Paleocene
- TKi — lower Tertiary and (or) Upper Cretaceous
- KJi — Cretaceous and (or) Jurassic
- Pzv — Lower Permian and Pennsylvanian (?)

QUATERNARY; TERTIARY; TERTIARY AND (OR) CRETACEOUS; CRETACEOUS; CRETACEOUS AND (OR) JURASSIC; JURASSIC; JURASSIC AND TRIASSIC; TRIASSIC; MESOZOIC AND (OR) PALEOZOIC; PERMIAN AND PENNSYLVANIAN (?); CARBONIFEROUS AND DEVONIAN; DEVONIAN; DEVONIAN TO SILURIAN (?); LOWER PALEOZOIC

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS

Qs, Qag, Qu — Undifferentiated till, outwash, alluvial, and colluvial deposits. Qs and Qag may include beach deposits. Qu includes deposits of the Naptowne Glaciation

Alluvial and Mass-wasting Deposits

Qls — Landslide deposits; mainly slumped beds of Kenai Formation

Ql — Young and old landslide deposits

Qau — Alluvium, undivided

Qr — Active and recently active rock glaciers and associated talus aprons

Glacial Deposits

Qa — Drift of Alaskan Glaciation

Qn — Drift of Naptowne Glaciation

Qk — Drift of Knik Glaciation

Qe — Drift of Eklutna Glaciation

SEDIMENTARY ROCKS

Tsu — Sedimentary rocks, undifferentiated; conglomerate, sandstone, claystone, and lignitic coal

Tps — Sterling(?) Formation

TK — Kenai Group, undivided

Tku, Tkm, Tkl — 'Kenai Formation,' now part of Kenai Group; sandstone, siltstone, claystone, and coal in middle member (Tkm); mostly pebbly sandstone and conglomerate in upper (Tku) and lower (Tkl) members

Tts — Tyonek(?) Formation; sandstone member

Ttc — Tyonek(?) Formation; conglomerate member

Tt — Tsadaka Formation; conglomerate, sandstone, and siltstone

Tw — Wishbone Formation; conglomerate, sandstone and siltstone

Tar — Arkose Ridge Formation; arkose, conglomerate, and shale

Tc — Chickaloon Formation; claystone, siltstone, sandstone, coal, and conglomerate

Km — Matanuska Formation; siltstone, sandstone, and conglomerate

Kag — Argillite and lithic graywacke

KJs — Undivided marine sedimentary rocks north of Denali fault; chiefly gray to black phyllite, argillite, graywacke, and siltstone

KJs — Undivided marine sedimentary rocks south of Denali fault; lithic graywacke, phyllite, and shale with local lenses of quartz-chert conglomerate

Jta — Crystal tuff, argillite, chert, graywacke, and limestone

Jtk — Talkeetna Formation; volcanic breccia, tuff, agglomerate, and aphanitic lava flows

JRsv — Sedimentary and volcanic rocks of allochthonous Chulitna sequence; argillite, radiolarian chert, siltstone, impure micritic limestone, and minor pillow basalt

Rvs — Volcanic and sedimentary rocks of Chulitna sequence; volcaniclastic rocks including tuffaceous shale and quartz-pebble conglomerate with a tuffaceous matrix

Rlb — Limestone and basalt of Chulitna sequence

Pzus — Undivided sedimentary rocks; depositionally and structurally complex unit, chiefly marine flyschoid sedimentary rocks

Dl — Limestone; predominantly micrites and reefoid, biostromal beds

DSga — Graywacke, argillite, and shale

Pzsl — Shale and limestone

METASEDIMENTARY AND METAMORPHIC ROCKS

KJv — Valdez(?) Group; metagraywacke, metasiltstone, and argillite; locally phyllitic

KJm — McHugh Complex; weakly metamorphosed siltstone, graywacke, arkose, and conglomeratic sandstone; greenstone (mostly basaltic), metachert, and argillite

KJu — Undifferentiated metasedimentary rocks; mainly slate and graywacke, locally includes volcanic and intrusive rocks

Rvs — Metabasalt and slate in northwestern Talkeetna Mountains

JPu — Metamorphic rocks, undivided

MzPzs — Schist at Willow Creek

Pls — Marble within unit Pzv

Pzsv — Quartzite, semischist, and metavolcanic rocks

PLUTONIC AND HYPABYSSAL ROCKS

Tf — Foraker pluton; biotite and hornblende granodiorite

Tm — McKinley pluton; biotite granite

Tmr — Ruth pluton; biotite granite

Tmk — Kahiltna pluton; biotite and biotite-muscovite granite and granodiorite

Tcp — Composite plutons, peridotite granite

Thgd — Biotite-hornblende granodiorite

Tbgd — Biotite granodiorite

TKgd — Granodiorite, quartz diorite, and diorite

TKt — Tonalite

TKa — Adamellite

TKgr — Granitic rocks, undivided

TKlg — Leucogabbro

Jgd — Quartz diorite, diorite, and granodiorite

Jpmu — Plutonic and metamorphic rocks, undifferentiated

MzPzd — Dunite and serpentinite

MzPzg, MzPzm — Gabbroic rocks

MzPzum — Ultramafic rocks; peridotite, dunite, and pyroxenite

VOLCANIC AND SHALLOW INTRUSIVE ROCKS

Ti — Intrusive rocks; dikes, sills, and stocklike masses of felsic to mafic composition

Tv — Volcanic rocks; basaltic lava, tuff, and breccia; may include Quaternary volcanic rocks

TKi — Intrusive rocks, undivided; intermediate altered porphyry dikes in unit KJs

KJi — Intrusive rocks; many granitic rocks with a few small bodies of fine-grained, in part porphyritic rocks, including basalt plug on Beluga Mountain

Pzv — Basaltic to andesitic metavolcanogenic rocks

GEOLOGIC MAP SYMBOLS

Contact--Dashed where approximately located

Fault--Dashed where inferred, dotted where concealed. U, upthrown side; D, down-thrown side. Arrows indicate relative lateral movements

Thrust fault--Dashed where inferred, dotted where concealed; sawteeth on upper plate; queried where probable

Anticline--Showing axial trace; dashed where approximately located

Syncline--Showing axial trace and direction of plunge; dashed where approximately located

Strike and dip of beds
- Horizontal
- Inclined
- Overturned
- Vertical

Strike and dip of beds based on distant observation

Strike and dip of fracture cleavage
- Inclined
- Vertical

Strike and dip of slaty or axial-plane cleavage
- Inclined
- Vertical
- Horizontal

Strike and dip of shear planes, metamorphic foliation, or schistosity

Strike and dip of igneous-flow foliation
- Inclined
- Vertical

Strike and dip of foliation showing horizontal lineation

Bearing and plunge of lineation

Strike and dip of joints
- Inclined
- Vertical

Trend of lineation in plane of foliation

PA2 Coal locale; see Appendixes A and B

Glacier