

GENERALIZED DESCRIPTION OF MAP UNITS IN FAIRBANKS AND BIG DELTA QUADRANGLES, ALASKA

Map Unit (Listed by age)	Name	Description	Distribution and Thickness	Terrane and Natural Slopes	Drainage and Permeability	Permafrost	Susceptibility to Frost Action	Remarks
Qco	Colluvium	Heterogeneous mixture of silt, sand, & rock fragments; rock fragments locally make up 75% of deposit; more commonly silt & sand are dominant.	North of Fairbanks; may be up to 10' thick.	Moderate to steep slopes.	Permeability varies from poor in silt to good in colluvium consisting chiefly of rock fragments; drainage generally good.	Depth to permafrost varies from 2' to 3' on north slopes to more than 6' on south slopes.	Silt & sand - moderate to high Rock fragments -	Subject to maximum probable earthquake of magnitude 7.5.
Qg	Reworked Creek Gravels	Placer mine dredge tailings, sub-angular to rounded pebbles to boulders, mostly quartz, gneiss, schist, & mafic rocks.	Exposed as placer mine dredge tailings in valley of upper Goldstream Creek & Engineer Creek; 3 to 250' thick.	Steep, imbricate, parabolic symmetrical gravel piles forming rough terrane with some undrained depressions; leveled in areas where gravel removed for road fill.	Material loose, porous, & slightly compacted; excellent drainage & permeability.	No permafrost	Low	"
Qs	Dune Sand	Light yellowish brown, well-sorted, fine to medium grained rounded sand, made up largely of white quartz, some dark rock fragments; overlain by windblown loess.	Sand dunes in reentrants in hills north of Shaw Creek, cliff head dunes bordering Tanana River edge of Shaw Creek Flats & dunes bordering west side of Delta River near Big Delta; 1 to 200 plus' thick.	Irregular topography, undrained depressions & blow-outs, local relief as much as 200' north of Shaw Creek; elsewhere dunes 10 to 20' high, 100 to 500' long, & 50 to 100' wide.	Permeability excellent, drainage good in thick sand deposits; drainage becomes poorer toward edge of deposits.	Permafrost present in places near margins of deposits at depth of about 20'; low ice content; permafrost absent elsewhere.	Clean sand - very low.	"
Qa	Fine Alluvium	Stratified silt & sand of heterogeneous composition, medium light gray to brownish gray; rare fine gravel.	Restricted to material deposited locally, in smaller valleys, by reworking of wash from loess & colluvial-covered hillsides & material from silt-choked valleys; 1 to 20' thick.	Low relief, smooth slopes, usually bordering & underlying sluggish, meandering streams; most streams have steep, silty banks.	Poor drainage & fair permeability; subject to local flooding.	Depth to permafrost 1' to 4'; ground ice may be present.	Moderate.	"
Qac	Coarse Alluvium	Well stratified unconsolidated sand, pebbles, cobbles, & boulders of variable composition; in Fairbanks area may be covered by 1 to 20' of alluvial silt; contains swale & scough deposits consisting of poorly stratified lenses & layers of fairly well-sorted stream-laid silt & silty sand, composed mostly of angular to subrounded grains of quartz, mica, & feldspar, 10 to 30% clay & some organic material.	Present in active floodplain of all major streams; thickness in most places unknown, but may be up to 200' near bedrock hills & approximately 700' thick near Tanana River.	Flat plain with meandering streams & complex network of shallow swales; local relief 2' to 8'.	Drainage excellent & permeability high except locally in silt or where perennially frozen; infiltration of stream flow into the floodplain occurs throughout the year; subject to flooding; local peat-silt bogs have very poor drainage.	Depth to permafrost 2' to 4' in older parts of floodplain & more than 4' on inside meander curves near river. Depth to permafrost 25' to 40' in some cleared areas; permafrost absent in many areas, especially beneath lakes, rivers, & creeks; active layer 2-8' thick; permafrost discontinuous, unfrozen lenses, layers, & vertical zones; low ground ice content, mostly interstitial; water table 10 to 15' where permafrost absent or deep; in mountains, coarse material mostly unfrozen.	Sand & gravel - low Silt - moderate to high	"
Qab	Old Floodplain Alluvium	Material of essentially the same composition as in unit Qac above, but with more continuous alluvial & eolian silt cover; in many places supports a dense vegetation with large trees.	Found in many places bordering active floodplain of the major rivers; thickness that of active floodplain plus 10 to 30'.	Flat plain with abandoned, meandering, often organic silt-filled stream channels, shallows, & swales; may be separated from active floodplain by low terrace scarp.	Drainage excellent & permeability high except locally in silt or where perennially frozen; subject to infrequent flooding.	Same as unit Qac above; possibly a larger amount of ground ice, proportional to a more extensive silt cover.	"	"
Qt	Terrace Deposits	Well stratified unconsolidated, well sorted sand & gravel with some cobbles of variable composition; 1 to 4' loess cover, thickest on hill-side of terrace.	Bench gravels, south of Salcha River, northeast of Harding Lake, probably derived from both Tanana & Salcha Rivers; separated from river floodplains by a 15 to 30' terrace scarp; thickness 15' to 50'.	Flat terrace, low swales, & obscure abandoned channels.	Drainage excellent & permeability high except locally in silt or where perennially frozen.	Gravels generally well-drained & unfrozen; silt mantle, particularly in swales may be frozen.	"	"
Qsu	Perennially Frozen Silt	Massive, homogeneous, unconsolidated well-sorted silt, less than 10% clay; grains angular, consisting mostly of quartz, feldspar, & mica, locally cemented by iron oxide; deposit contains organic material especially in valley bottoms; color buff to brown to gray, locally mottled by organic matter & iron staining.	Widespread on hill slopes & creek valley bottoms from Big Delta northward; thickness 3' to about 300'.	Very gently sloping alluvial fans & colluvial slopes; broad alluviated creek valley bottoms with small lakes.	Impermeable substratum of permafrost, especially in valley bottoms, creates poor drainage; marshy & undrained in summer; clearing produces quagmire in valley bottoms; permeability low to moderate.	Depth to permafrost 1' to 4' on lower slopes & creek valley bottoms; 5' to 20' near contact with loess; active layer 1' to 4' thick; permafrost 3 to at least 16' thick; pinches out up slopes, continuous except under lakes & near contact with loess; ground ice abundant as horizontal sheets, vertical sheets, wedges, & saucer-shaped & irregular masses 1' to 50' in diameter; much ice arranged in polygonal network; depth to ice masses 5' to 25'; water table below permafrost; temperature of permafrost averages 31° to 32°F.	High.	"
Ql	Loess	Massive homogeneous, unconsolidated, eolian silt on upper slopes & hill-tops; well sorted, less than 10% clay; grains angular, consist mostly of quartz, feldspar, & mica; locally cemented by iron oxide; locally calcareous; color buff to tan gray when dry, brown when wet; locally mottled by iron staining & carbonaceous material.	Widespread on hill slopes east of Tanana River from Big Delta northward; thickness ranges from 3' on upper hill slopes to a maximum of 200' on middle slopes & low hill-tops; not mapped on most hill-tops & upper slopes where it exists as a veneer less than 3' thick.	Gently rolling hill slopes & low rounded hills; old, slightly subdued parallel gullies & ridges at right angles to contours characteristic of most upper slopes.	Good surface drainage; lateral permeability poor to fair; vertical permeability good.	Permafrost absent on tops of hills, & largely absent on well-drained south-facing slopes; sporadic ground ice in north-facing slopes & poorly drained areas.	Moderate to low; locally high if drainage poor.	"
Qo	Glaciofluvial Deposits	Moderately well stratified layers & lenses of well-sorted, poorly to moderately well-sorted unconsolidated light yellowish brown silty or sandy gravel with lenses of well-sorted sand, cobbles & boulders of heterogeneous origin, 1/2 to 30" in diameter; locally mantled by organic rich silt & peat 2' to 10' thick.	Outwash plains extending from end moraines; gravel is more than 300' thick at Fort Greely, just south of the map area.	Broad, gently sloping, 1/2 smooth gravel plain.	Few or no streams on this unit; excellent to good surface drainage & permeability except locally where perennially frozen.	Permafrost 3' to 5' beneath silt cover & probably more than 25' elsewhere.	Moderate to low.	"
Qgn	Glacial & Non-glacial Stream Deposits	Well-stratified layers & lenses of unconsolidated silt, sand, & gravel; gravel moderately to well rounded light yellowish brown to gray, largely of granitic origin; sand fine to coarse grained, yellowish brown; locally covered with organic rich silt or eolian sand.	Low terraces along the Delta River; thickness unknown; loess & organic silt cover 2' to 10'.	Gently undulating surfaces approximately parallel to stream gradient, or moderate to gentle piedmont slopes, channeled.	Good to fair surface drainage, locally poor in frozen bogs.	Permafrost at approximately 3' where silt cover is thick; elsewhere deeper than 20'; low ice content except in bogs.	Gravel - low Silt - high	"
Qgo	Older Glacial Moraines	Coarse, unstratified, poorly sorted unconsolidated yellowish gray to grayish brown sandy till with angular to well-rounded particles, 1" to 12" in diameter, of variable resistant rock types; includes sandy to gravelly stratified drift as lenses, kames or channel fillings; some silt cover.	Narrow crescentic belts 1 to 3 miles wide and 20 to 30 miles long extending south from the Tanana River; thickness from 10' to 100'.	Gently rolling knob & swale topography with shallow ponds; slopes 1 to 20%.	Partially developed drainage system, excellent to good surface drainage; locally poor in swales, bogs, & areas where perennially frozen.	Permafrost 3' to 4' in swales & muskeg-covered slopes, probably 25' deep on dry slopes & knobs; ice content low to high.	Moderate.	"
gri	Granitic & Intermediate Intrusive Rocks	Quartz monzonite, granodiorite, quartz diorite, some monzonite & diorite.	Plutons near Gilmore Dome & between Moore & French Creeks; outcrops near Fort Wainwright, Bonner Creek, & Tenderfoot Creek.	In the upland, forms moderately high, rounded hills.	Excellent surface drainage; poor to excellent permeability.	Permafrost is probably present.	Thick grassy slopes - low.	"
me	Mafic & Intermediate Extrusive Rocks	Basalt, andesite, dacite, greenstones; a few sedimentary rocks included.	Four outcrops north & east of Fort Wainwright; thickness unknown.	Forms low, flat or gently rolling surfaces.	Excellent surface drainage; poor permeability.	"	Low	"
gfn	Greenschist Facies Rocks	Phyllite, calcareous phyllite, slate, argillite, chert, fine-grained dark quartzite, rare metavolcanics.	Present in Chena River valley near Eielson Air Force Base; thickness in excess of 10,000'.	Forms low rounded hills which are higher & more resistant near Eielson because of hornfelsing.	Good to excellent surface drainage, low permeability.	Permafrost is probably present, but deep on warm south-facing slopes.	Frost heaving low Weathered rock-moderate.	"
gef	Greenschist Epidote-Amphibolite Facies Rocks	Quartzite, muscovite, & biotite schist amphibolite, marble & gneiss.	North of Fairbanks & north of Richardson; thickness possibly in tens of thousands of feet.	Forms moderately high rolling hills.	Good to excellent surface drainage; joints, faults, fracture cleavage, & foliation result in poor to good permeability; upper weathered layer 1' to more than 50' thick has low permeability.	Permafrost is probably present but deep on warm south-facing slopes; low ice content.	"	"
gmf	Mylonitic Rocks	Retrograded (greenschist facies), sheared augen gneiss, quartzite & mica schist, phyllonite.	Found as a broad band south-east of Eielson Air Force Base; thickness in thousands of feet.	"	"	"	"	"
af	Amphibolite Facies Rocks	Quartzite, garnetiferous quartz biotite schist, amphibolite, rare marble; becomes gneissic toward south-east.	From Little Salcha River south, in vicinity of Donnelly Dome; thickness possibly in tens of thousands of feet.	"	"	"	"	Solifluction lobes present in weathered surface materials; subject to maximum probable earthquake of magnitude 7.5.
gn	Gneissic Rocks	Quartz-feldspar-biotite gneiss, augen gneiss, may represent orthogneiss intruding unit af above.	From Salcha River south to Tanana River; thickness probably in thousands of feet.	May form highest hills, generally topped by altiplanation terraces; also forms high rolling hills.	Excellent surface drainage, fair permeability.	Permafrost is probably present.	"	Stone stripes, rock rings, solifluction lobes present; subject to maximum probable earthquake of magnitude 7.5.

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

