

/* ----- CODESET ----- */

Title: Geologic and derivative materials maps of the Anchorage C-7 NE Quadrangle, Alaska

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Title: Geologic and derivative materials maps of the Anchorage C-7 NW Quadrangle, Alaska

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Title: Geologic and derivative materials maps of the Anchorage C-8 NE Quadrangle, Alaska

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Title: Geologic and derivative materials maps of the Anchorage C-7 NW Quadrangle, Alaska

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DESCRIPTION OF UNITS

UNCONSOLIDATED DEPOSITS

Fluvial Deposits

Qal - FLOODPLAIN ALLUVIUM - Elongate deposits of pebble-cobble gravel and sand with few to numerous boulders beneath modern floodplains and associated low terraces; crossbedded; surface smooth, except for local low scarps

Qaf - ALLUVIAL-FAN DEPOSITS - Fan-shaped, heterogeneous mixtures of pebble-cobble gravel with some sand and silt and few to numerous, subangular to rounded boulders, especially in proximal areas, which may include debris-flow deposits; thick to thin bedded; surface smooth, except for numerous shallow, interconnected channels

Qam - ALLUVIUM OF SMALL MEANDERING STREAMS - Complex mixtures of sand, silt, and organic material accumulated beneath floodplains of small meandering streams; moderately to well sorted; laminated to medium bedded, locally crossbedded; surface smooth, except for local low scarps

Colluvial Deposits

Qc - UNDIFFERENTIATED COLLUVIUM - Irregular, heterogeneous blankets, aprons, and fans of angular to subangular rock fragments, gravel, sand and silt up to estimated 3 m thick that are left on slopes, slope bases, or high-level surfaces by residual weathering and complex mass-movement processes, including rolling, sliding, flowing, gelifluction and frost action; includes greatly modified drift of ancient glaciations; locally washed by meltwater and slope runoff; medium to thick bedded; surface smooth, lobed, or terraced and generally reflects configuration of underlying bedrock surface.

Qca - SNOW-AVALANCHE DEPOSIT - Tongue-, fan-, and cone-shaped heterogeneous mixtures of angular rock fragments, gravel, sand, and silt deposited at the mouths of bedrock couloirs and gullies and on lower steep slopes by snow avalanches; surface typically covered by numerous boulders.

Qcd - DEBRIS-FLOW DEPOSITS - Tongue-shaped, heterogeneous mixtures of sand and silt with some gravel and few to numerous angular rock fragments and organic debris deposited at the mouths of gullies and on lower sloped by debris flows; surface lobed, discontinuously channeled, and covered by numerous subangular to subrounded boulders.

Qcf - UNDIFFERENTIATED COLLUVIUM AND ALLUVIUM - Fan-, and tongue-shaped and elongate heterogeneous mixtures of subangular rock fragments and pebble-cobble gravel with some sand and silt deposited in upper stream courses primarily by debris flows and brief, intense summer stream flows; surface smooth, except for local low scarps.

Qcg - ROCK-GLACIER DEPOSIT - Tongue- and bench-shaped, heterogeneous mixture of angular to subangular blocks of local bedrock and ice with trace to some gravel, sand, and silt at depth that accumulates on floors and lower walls of cirques by flow of rock glaciers derived from shrinking of former glaciers (ice cored) or from deposition and cementation of precipitation-derived ground ice (ice cemented); perennially frozen where active; surface furrowed, ridged concentrically, and pitted; covered with angular to subangular blocks.

Qcl - LANDSLIDE DEPOSIT - Oval to tongue-shaped heterogeneous mixtures of fractured bedrock, pebble-cobble gravel with trace to some sand and silt deposited by near-surface to deep flowing and sliding due to instability of failed bedrock and unconsolidated surficial deposits; surface slightly irregular and broken by arcuate ground cracks and low ridges

Qcp - PROTALUS-RAMPART DEPOSIT - Arcuate, steep-sided ridge of angular rock fragments of local bedrock with trace to some sand and silt deposited by bounding, rolling, and sliding of individual large clasts across surface of perennial snowbank.

Qcr - ROCK-FALL DEPOSIT - Irregular accumulation of large angular blocks of local bedrock derived by collapse of higher outcrop.

Qct - TALUS - Cone- and apron-shaped heterogeneous mixtures of angular rock fragments with trace to some gravel, sand, and silt deposited on steep bedrock slopes and at the mouths of steep bedrock couloirs by snow avalanches, free fall, tumbling, rolling, and sliding; surface steep, slightly irregular, and covered with numerous angular rock fragments, especially in distal zones.

Glacial Deposits

Qd4 - UNMODIFIED DRIFT OF ELMENDORF ADVANCE (NAPTOWNE GLACIATION) - Heterogeneous blanket of pebble-cobble gravel with some sand and trace to some silt and few to numerous subangular to subrounded boulders deposited directly from glacial ice; generally massively bedded; surface slightly irregular to irregular (knob and kettle topography)

Qd3 - UNMODIFIED DRIFT OF PRE-ELMENDORF ADVANCES (NAPTOWNE GLACIATION) - Heterogeneous blanket of pebble-cobble gravel with some sand and trace to some silt and few to numerous subangular to subrounded boulders deposited directly from glacial ice; generally massively bedded; surface slightly irregular to irregular (knob and kettle topography)

Qd2 - SLIGHTLY MODIFIED DRIFT OF PRE-NAPTOWNE GLACIATION - Heterogeneous blanket of pebble-cobble gravel with some sand and trace to some silt and few to numerous subangular to subrounded boulders deposited directly from glacial ice; generally massively bedded; surface slightly irregular to irregular (knob and kettle topography)

Qd1 - MODIFIED DRIFT OF PRE-NAPTOWNE GLACIATION - Heterogeneous blanket of pebble-cobble gravel with some sand and trace to some silt and few to numerous subangular to subrounded boulders deposited directly from glacial ice and slightly reworked by mass-movement processes; generally massively bedded; surface slightly irregular

Glaciofluvial Deposits

Qac3 - ABANDONED-CHANNEL DEPOSITS OF ELMENDORF ADVANCE (NAPTOWNE GLACIATION) - Elongate variable deposits in channels of former meltwater streams and subsequent underfit streams; composition ranges from slightly washed drift and colluviated alluvium in upland areas to well-sorted, clean pebble-cobble gravel and gravelly medium to coarse sand with rare to numerous boulders deposited in lowland; may include eolian sand in lowland; medium to thick bedded, locally crossbedded; surface smooth, except for low local scarps, to deeply pitted where large masses of stagnant glacial ice were buried

Qac2 - ABANDONED-CHANNEL DEPOSITS OF PRE-ELMENDORF ADVANCES (NAPTOWNE GLACIATION) - Elongate variable deposits in channels of former meltwater streams and subsequent underfit streams; composition ranges from slightly washed drift and colluviated alluvium in upland areas to well-sorted, clean pebble-cobble gravel and gravelly medium to coarse sand with rare to numerous boulders deposited in lowland; in lowland north of Deception Creek may include ice-marginal deposits, including fine-grained lacustrine deposits; thin to thick bedded, locally crossbedded; surface smooth, except for low local scarps

Qk3 - KAME-ESKER-CREVASSE FILL DEPOSITS OF ELMENDORF ADVANCE (NAPTOWNE GLACIATION) - Complex mixtures of sandy alluvium and heterogeneous till deposited in holes, tunnels, and open crevasses by debris-charged meltwater streams in stagnant glacial ice; well to poorly discontinuous, sinuous, bifurcated, steep-sided ridges (eskera) that are often associated with small, steep-sided hills (kames) and flat-topped ridges (crevasse fills)

Qk2 - KAME-ESKER DEPOSITS OF PRE-ELMENDORF ADVANCES (NAPTOWNE GLACIATION) - Complex mixtures of sandy alluvium and heterogeneous till deposited by debris-charged meltwater streams in holes and tunnels in stagnant glacial ice; well to poorly sorted; thin to thick bedded, locally crossbedded; surface is characterized by discontinuous, sinuous, bifurcated, steep-sided ridges (eskera) that are often associated with small, steep-sided hills (kames)

Paludal Deposits

Qs - UNDIFFERENTIATED SWAMP DEPOSITS - Elongate to blanket deposits of peat, organic silt, and organic sand accumulated as surface deposits in local basins, in former stream channels, and downslope from springs and seeps; saturated and locally frozen, locally ice rich; complexly bedded; surface smooth

Man-made Deposits

Qh - ARTIFICIAL FILL - Pebble-cobble gravel with trace to some sand and silt forming bases for major roads, railroads, and construction pads and piled in active or former gravel pits and open-pit mines; well to poorly sorted; surface smooth to irregular

BEDROCK

Bedded Rocks

Ttk - TYONEK FORMATION (Miocene) - Fluvial carbonaceous sandstone, siltstone, shale, and claystone (Magoon and others, 1976; Clardy, 1984)

Tar - ARKOSE RIDGE FORMATION (Paleocene and Eocene) - Fluvial feldspathic and biotitic sandstone, conglomerate, siltstone, and shale, locally containing abundant plant fossils; contains interlayered basalt flows in lower part of section; cobbles and pebbles are polymictic but rich in granitic lithologies in lower part of unit (Magoon and others, 1976; Clardy, 1984) and dominated by polymictic lithologies in upper part of section, which may correlate with Wishbone Formation (Winkler, 1992); pervasively and intensely sheared close to lower contact with underlying unit Jma, forming massive, fine-grained, chloritic rock with rare, highly sheared granitic clasts on Government Peak

Intrusive Rocks

Kum - SERPENTINIZED ULTRAMAFIC ROCKS (Late Cretaceous) - Intensely sheared medium greenish-gray to black serpentine-talc-chlorite serpentinite (Csejtey and others, 1978; Csejtey and Evarts, 1979; Silberman and others, 1978)

Jga - GABBRO (Middle Jurassic?) - Very coarse crystalline hornblende gabbro intruding pelitic schist on northeast ridge of Government Peak

Jqd - QUARTZ DIORITE (Middle Jurassic?) - Medium- to coarse-crystalline hornblende (+/- biotite) quartz diorite (Winkler, 1992)

Metamorphic Rocks

Jma - AMPHIBOLITE (Early and Middle Jurassic?) - Structurally complex amphibolite with lesser foliated quartz diorite and biotite-quartz-feldspar gneiss (Winkler, 1992)

Jps - PELITIC SCHIST (Jurassic?) - Medium-grained quartz-muscovite-albite-chlorite (+/- garnet-biotite +/- serpentine-actinolite) greenschist-facies pelitic schist probably retrograded from amphibolite-facies rocks; numerous quartz veins and stringers (Ray, 1954; Csejtey and Smith, 1975; Csejtey and others, 1978; Madden and others, 1987)

DESCRIPTION OF MATERIALS UNITS

BA - Well-indurated sedimentary rock - Conglomerate, sandstone, siltstone, and shale of Arkose Ridge Formation; thin to massively bedded; close to medium jointed

BF - Foliated metamorphic rock - Pelitic schist; fine to medium crystalline; close to medium jointed; susceptible to splitting by seasonal frost

BG - Granitic rock - Quartz diorite and gabbro intrusives; medium to very coarsely crystalline; generally coarsely jointed

BS - Serpentinite rock - Massive antigorite-rich serpentinite intrusive; fine grained; close to coarsely jointed; locally intensely sheared; soapstone pods along margins locally mined for ornamental stone

BU - Undifferentiated metamorphic rock - Gneiss and amphibolite of basement complex; fine to medium crystalline; generally medium jointed

BW - Weakly indurated sedimentary rock - Carbonaceous sandstone, siltstone, shale, and claystone of Tyonek Formation; thin to medium bedded; close to medium jointed

GS - Gravel and sand - Alluvium of floodplains and abandoned meltwater channels, and complex deposits of kames, eskers, and crevasse fills; estimated >80 percent clean sand and gravel, except locally may include estimated 15 to 25 percent fine-grained sediments and rare to numerous boulders, well to poorly sorted; estimated thickness 1 m to >6 m; bedding thickness thin to massive, locally crossbedded; thawed, except in active layer of seasonal freezing; generally uncemented, except locally well cemented by iron and manganese oxides deposited by groundwater; permeability excellent to moderate; surface drainage excellent to moderate; depth to water table moderate to deep; surface smooth to irregular

GM - Mixed coarse and fine materials - Alluvial-fan deposits, colluvium, glacial drift, and artificial fill; estimated 20 to 80 percent coarse, granular deposits with considerable oversized material; sorting good to poor, except locally well sorted where reworked by meltwater streams; estimated thickness 2 m to >6 m; medium to massively bedded; thawed, except in active layer of seasonal freezing; uncemented, but lodgement till commonly semiconsolidated by mass of overlying glacier, enabling molds to remain on free faces when clasts are removed; very low to moderate permeability; surface drainage moderate to poor; depth to water table moderate to deep; surface smooth to irregular

SM - Fine materials - Alluvium of small meandering streams; estimated >80 percent sand, silt, and clay; well to moderately sorted; estimated thickness 1 to 3 m; laminated to medium bedded; thawed, except in active layer of seasonal freezing; locally crossbedded; shallow water table; surface drainage poor to moderate; surface smooth, except for local low scarps

OR - Organic materials - Undifferentiated swamp deposits; estimated >50 percent peat, organic sand, or organic silt; sorting good to poor; thickness ranges from <1 m to > 6 m; thin to thick bedded; commonly frozen at depths > 0.7 m with high ice content; permeability good, except poor where frozen; surface drainage poor; shallow water table; surface smooth to hummocky