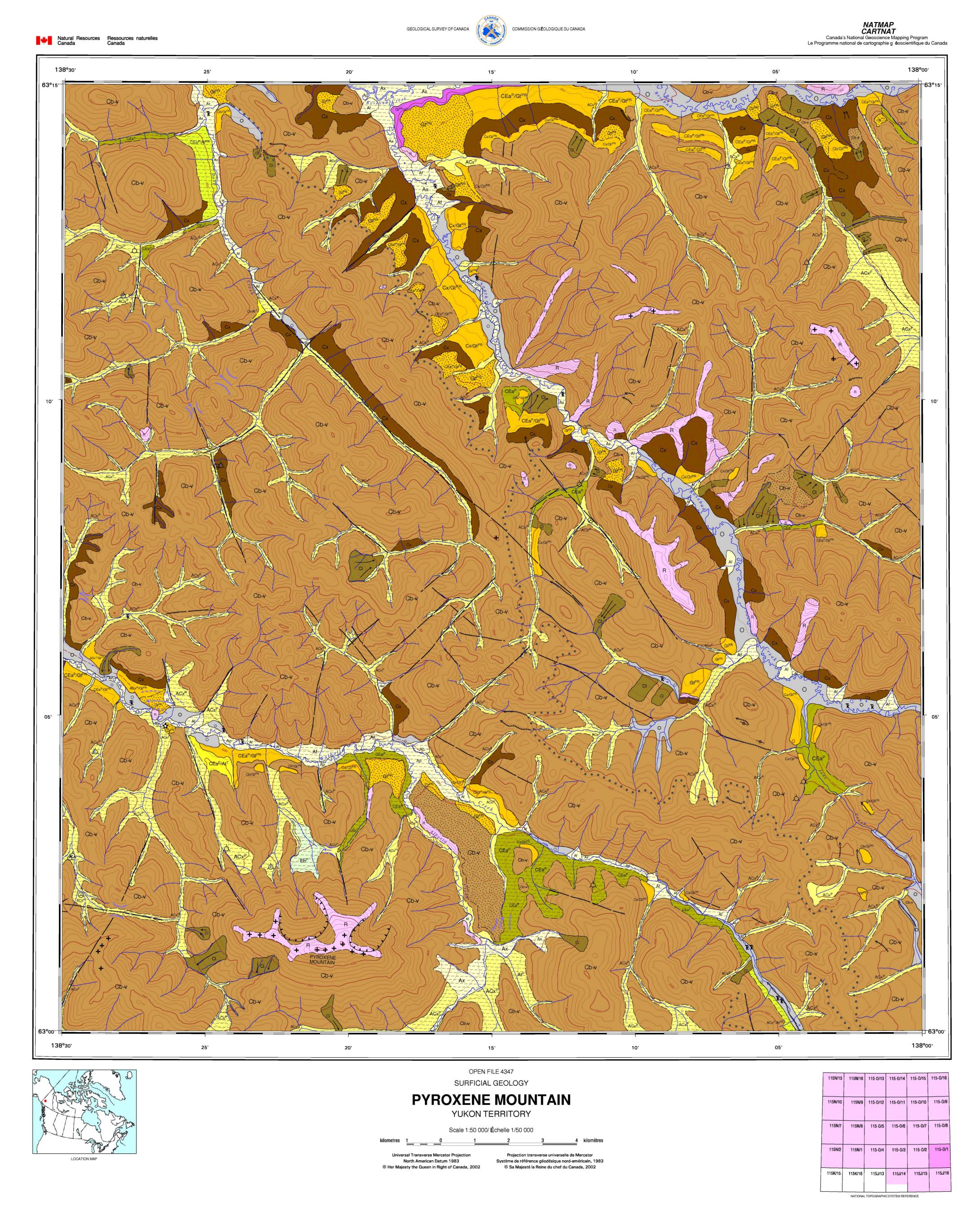




resedimented eolian sediments **DESCRIPTIVE NOTES** The physiography of the Pyroxene Mountain map area is characterized by steep-sided valleys incised up to 750 m into a formerly rolling erosional surface of early to middle Tertiary age know as the Yukon Plateaus (Mathews 1986). Whether within or beyond glacial limits, long periods of weathering and colluviation have resulted in slopes that are covered by thick colluvium and underlying bedrock partly weathered or oxidized to depths of 5 m or more. Natural bedrock exposures usually are confined to tors along ridges lines or along stream cut banks. Drainage patterns are dominantly rectangular and reflect northeast-southwest and southeast-northwest structural controls or lithologic contrasts which influence the orientation and spacing of stream courses. Major drainage patterns were largely established when olivine basalt was erupted from sources in the Rosebud Creek basin upstream of the map area ca. 2.69 Ma (Huscroft et al. 2001). The flows filled the valley to depths of 30 m. One or more times during the late Pliocene and early Pleistocene, the digitate margin of a Cordilleran Ice Sheet partly inundated parts of the map area. In Yukon, these glaciations, which predate the middle Pleistocene Reid Glaciation, are collectively called pre-Reid glaciations (Hughes et al. 1989; Duk-Rodkin et al. 2001). Drift, predominantly gravel, underlies terraces along Rosebud, Grand Valley, and Jane creeks. These terraces rise to 200 m above adjacent valley floors (Bostock 1966; Jackson et al. 2001). Drift deposits contain clasts of chert, chert-pebble conglomerate and unmetamorphosed quartz arenite. These lithologies are not found in local drainage basins but have sources more than a hundred kilometres to the east. The terraces mark the former courses of meltwater streams that followed margins of glaciers descending Rosebud and Grand Valley creeks from a lobe of a Cordillera Ice Sheet lying to the east in the Yukon River valley. On level, well-drained sites reddish fossil soils have developed within the upper one to two metres of terrace gravels. These are marked by disaggregation and partial or total weathering to clay of micaceous and feldspar-rich clasts as well as the development of clay skins around clasts. These soils developed during one or more warm and moist interglacial climate during the early or middle Pleistocene. These have been called the Wounded Moose soil (Tarnocai and Schweger, 1991; Tarnocai and Smith, 1989). Glacier ice also flowed west from Yukon valley into the upper reaches of the Walhalla Creek basin. Rare clasts of chert and chert-pebble conglomerate are found in stream and terrace gravel along Walhalla Creek. The downstream limit of this ice is unclear and the subject of continuing investigation. In addition to incursion by a Cordilleran Ice Sheet, amphitheatre-like headwaters of streams descending the north side of Pyroxene Mountain (elevations between about 1100 to 1300 m) could be degraded cirques last active during pre-Reid glaciations. Cirques within the same elevation ranges and aspects have been documented to the northeast and southeast in central Yukon (Vernon and Hughes 1966; Jackson 2000). Following glaciation, at least 12 m of stream incision has taken place in the area of the confluence of Grand Valley and Rosebud creeks. At least that amount has taken place along Walhalla Creek. Whether this incision is due in part to the glacially induced reversal of Stewart River to its present southwesterly flow (Templeman-Kluit 1980, Duk-Rodkin et al. 2001) is not known. Whatever the cause, incision caused the capture of the headwaters of Alberta Creek along the eastern margin of Pyroxene Mountain. The narrow canyon that Alberta Creek presently follows replaced a wider valley, which marks its old course, 1 km to the east. Fluvial terraces and most valley margins are partly or completely overlain by complexes of colluvial and alluvial fans and resedimented eolian silt and organic sediments (commonly called muck). Eolian silt was deposited by winds originating from adjacent ice sheets which mantled Yukon many times during the last several Continuous permafrost occurs along the bases of north facing slopes and the bottoms of most steep sided valleys. Patterned ground, segregated ice bodies and open system pingos are common in these areas, particularly within resedimented loess and organic deposits. Thermokarst collapse is common in areas of floodplains covered by organic sediments. 1966: Notes on glaciation in central Yukon Territory, Geological Survey of Canada Paper 65-86, 18p. Duk-Rodkin, A., Barendregt, R.W., White, J.M. and Singhroy, V.H. 2001: Geologic evolution of the Yukon River: implications for placer gold; Quaternary International, v. 82 p. Yukon Territory (Quaternary stratigraphy and history, Cordilleran Ice Sheet); in Chapter 1 of Quaternary geology of Canada and Greenland, R.J. Fulton (ed.); Geological Survey of Canada, Geology of Canada no. 1(also Geological Society of America, The Geology of North America, v. K-1). Huscroft, C.A., Jackson, L.E., Jr., Barendregt, R.W. and Villeneuve, M. 2001: Constraints on ages of pre-McConnell glaciations based on new paleomagnetic investigations and Ar-Ar dating of basalt and basaltic hyaloclastite in west central Yukon, Canada. 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LEGEND

Note: Map units listed below occur within one metre of the surface. Where organic or eolian sediments < 1 m thick overlie these, a pattern is overlaid upon the map unit. Along some valleys, colluvial or alluvial sediments > 1 m thick overlie older alluvial gravels that could contain placer gold. In order to accentuate these potentially exploitable deposits, a compound map unit is presented, e.g., Cx/AtT. This means that colluvial complex sediments overlie alluvial terrace sediments thought to be late Tertiary in age. This legend is part of a larger regional study hence coloured boxes indicate units that appear on this map. In addition, not all symbols in the legend are represented on this map.

HOLOCENE

Made Land: placer mines, roads, and airstrip ORGANIC DEPOSITS: peat and organic silt formed predominantly by the accumulation of vegetative material in bogs, fens, and swamps situated on valley

bottoms; permafrost is commonly encountered within 1 m of the surface. Thermokarst

Organic Blanket: undivided; thickness > 1 m to 5 m

collapse is common.

Organic Veneer: blanket bog generally < 1 m thick

ALLUVIAL DEPOSITS: gravel to silt size sediments, well stratified, deposited by

Floodplain Sediments: gravel, cobble to pebble; massive to well stratified, capped by sand and silt; flat lying; includes lacustrine and organic deposits in abandoned channels and backswamp areas; subject to periodic inundation and reworking by floods; thickness 1 to 5 m

Alluvial Fan Sediments: gravel, sand, silt, and diamicton, massive to well stratified; sediments form fan-shaped landforms or complexes of coalesced fan-shape landform at the confluence of tributary streams; may be subject to flooding accompanied by sudden stream migration and inundation; thickness up to 10 m

Alluvial Sediments Complex: sediments forming floodplains, fans, and terraces as above that cannot be subdivided at this map scale HOLOCENE AND PLEISTOCENE (UNDIVIDED) COLLUVIAL DEPOSITS: stony diamicton resulting from the physical and chemical

morainal sediments within the limits of pre-Reid ice-cover and reworked eolian sediments; colluvial deposits are products of formation and reworking over a significant part of the Pleistocene and Holocene epochs Colluvial Blanket and Veneer Sediments: diamicton, stony with a sandy matrix; massive to poorly stratified; colluviated blankets generally conform to underlying

breakdown of bedrock and subsequent reworking and transportation by creep,

bedrock and exceed 1 m in thickness; veneers are < 1 m in thickness and are

andslide Sediments: silt loam to boulders, poorly sorted to unsorted; massive; clasts

limits of glaciation; the unit commonly occurs along the lower slopes of valley margins

solifluction, and landsliding; colluvial deposits may contain reworked glaciofluvial and

commonly discontinuous over bedrock Colluvial Apron Sediments: bouldery diamicton and bouldery sandy gravel, poorly Ca sorted; massive; sediments form a wedge-like slope-toe complex of small steep debris

are subangular to angular and are locally derived; thickness varies greatly olluvial Complex Sediments: areas of intergrading colluvial and alluvial sediments which are too complex to subdivide at the scale of mapping; unit may include colluvial and alluvial fan, colluvial blanket, landslide sediments and colluviated drift within the

up to 5 m or more in the thickest part of the apron

Colluvial/Eolian Apron (muck): primary deposits of eolian fine sand and silt resedimented and interstratified with organic silt, and detritus, alluvial fan gravel and sand and variable amounts of stony colluvial diamicton; forms aprons along valley bottoms through resedimentation of eolian sediments from valley sides to valley floor, commonly preserved on north-facing slopes; thickness 1 to 20 m; commonly contains segregated bodies of ice and buried ice wedges MIDDLE TO LATE PLEISTOCENE (UNDIVIDED)

ALLUVIAL DEPOSITS: gravel and sand deposited by streams that were not fed by glacial meltwater; sediments may have experienced several cycles of alluviation and erosion, but are now inactive due to burial or fluvial incision; basal gravels within these sediments commonly contain placer gold Alluvial Terrace Sediments: gravel, cobble to pebble with a sandy matrix; massive to

well stratified; capped by sand and silt; sediments are of flood plain origin now isolated from flooding by stream incision; thickness 1 m to 10 m Alluvial Fan Sediments: single fans or aprons of coalesced fans formed of gravel and sand, poorly to moderately sorted, now isolated from water and debris floods due to fluvial incision; sediments disturbed by cryoturbation; thickness up to 10 m

Alluvial Complex Sediments: silt, sand and gravel, poorly to moderately sorted; thin to thick bedded, interstratified with colluvial diamicton; sediments underlie the floors and margins of narrow upland valleys and grade laterally up slope into colluvial blankets; sediments may represent several depositional cycles; thickness may exceed 10 m in mid-valley locations EOLIAN DEPOSITS: well sorted medium sand to silt initially transported and deposited by wind action during glaciations and commonly resedimented through fluvial and

colluvial processes; deposits of very fine sand and coarse silt < 1 m thick are

Eolian Blanket: fine sand and silt, well sorted; massive; may form crescent-shape and linear dunes and featureless or gently undulating inter-dune eolian plains; thickness 1 Eolian Veneer: thin deposits of very fine sand and coarse silt distributed

distributed discontinuously throughout low lying areas

discontinuously throughout low lying areas, thickness < 1 m LATE PLEISTOCENE - McCONNELL GLACIATION GLACIOFLUVIAL DEPOSITS: gravel and sand deposited by streams flowing away

Glaciofluvial Terrace Sediments: gravel and sand, unweathered, forming one or more MIDDLE PLEISTOCENE - REID GLACIATION

GLACIOFLUVIAL DEPOSITS: gravel and sand deposited by streams flowing away from glacial ice; deposits display moderate soil development with signs of cryoturbation; soil thickness < 0.5 m Glaciofluvial Terrace Sediments: gravel and sand, moderately weathered, forming one

from glacial ice; deposits display poor soil development with rare cryoturbation

Geology by L.E. Jackson, Jr. (1999, 2000, 2001), P. Rotheisler (2002)

Co-ordinated through the auspices of the Ancient Pacific Margin NATMAP

Digital cartography K. Shimamura, Terrain Sciences Division

Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Digital base map from data compiled by Geomatics Canada, modified by Terrain Sciences Division

Magnetic declination 2002, 26°27' E, decreasing 19.0' annually

Contour interval 100 feet

Elevations in feet above mean sea level

LATE PLIOCENE TO MIDDLE PLEISTOCENE - pre-Reid GLACIATIONS (UNDIVIDED) GLACIOLACUSTRINE DEPOSITS: well stratified sand, silt, clay, deposited in lakes ponded by glacial ice

Glaciolacustrine Undivided: sand, silt, and clay; undifferentiated at this scale of

GLACIOFLUVIAL DEPOSITS: gravel and sand deposited by streams flowing away from glacial ice in meltwater channels and outwash plains; massive to well stratified. Surface soils may extend to 2 m depth with well developed clay skins on clasts, frequent signs of cryoturbation (ice wedge pseudomorph and sand wedges), and strong chemical weathering

Glaciofluvial Terrace Sediments: gravel and sand, deeply weathered; incised into flights of terraces; thickness 1 to > 5 m

> MORAINAL DEPOSITS (TILL): glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice; surface soils may extend to 2 m depth with well developed clay skins on clasts, frequent signs of cryoturbation (ice wedge pseudomorph and sand wedges), and strong chemical weathering

Till Blanket: diamicton, stony, silty-sand matrix; massive; conforms to underlying topography, thickness > 1 m; extensively colluviated on slopes

Till Veneer: diamicton, stony, silty-sand matrix; massive; discontinuous and may contain extensive areas of thin (< 1 m) colluvium

> ALLUVIAL DEPOSITS: Gravel and sand deposited by streams that were not fed by glacial meltwater; sediments may have experienced several cycles of alluviation and erosion, but are now inactive due to burial or fluvial incision; basal gravels within these sediments commonly contain placer gold

Alluvial Terrace Sediments: sandy pebble and cobble gravel deposited by streams

having a fluvial source but graded to the margins of pre-Reid glaciers or glacial

cryoturbation (ice wedge pseudomorph and sand wedges), and strong chemical

drainage; thickness 1 to 5 m UNDIFFERENTIATED DRIFT: diamicton, gravel, sand, silt and clay deposited from glacial ice, glacial streams, and glacially damned lakes; extensive weathering, poor exposure and permafrost make differentiation into component glacial sediments difficult; thicknesses commonly exceed 10 m and mask underlying bedrock topography; commonly colluviated and intergraded with colluvium; surface soils may extend to 2 m depth with well developed clay skins on clasts, frequent signs of

Drift: flat to gently sloping

Drift Modified by Landsliding: drift translated along failure plains into irregular steps and sub parallel scarps

Fluvially Incised Drift: formerly extensive areas of drift incised by closely spaced stream LATE PLIOCENE

Basalt: columnar alkaline olivine basalt and flow breccia; erosional remnants of formerly valley filling flows underlying terraces along lower Rosebud Creek; thickness

PLIOCENE AND LATE MIOCENE ALLUVIAL DEPOSITS: preglacial gravel and sand; highly dissected and deeply

Pediment and Bajada Sediments: inclined fluvial surfaces which are found at a

midslope position in unglaciated drainage systems; usually thinner than 5 m; formed as a result of limited agradation of stream gravel and significant colluviation; composed of thin, poorly sorted gravel that contains both locally derived subangular stream gravel deposits and angular bedrock fragments

High Level Terrace Sediments (includes White Channel Gravel and equivalent sediments): weathered pebble to cobble gravel > 1 m thick; surface soils may extend to 2 m depth with well developed clay skins on clasts, frequent signs of cryoturbation (ice wedge pseudomorph and sand wedges), and strong chemical weathering; terraces above the 500 m contour may be remnant features from the southward-flowing paleo-Yukon drainage system

Bedrock: schist, gneiss, ultramafics, granodiorite, monzonite, marble, and basalt; includes areas of thin colluvial cover, blockfields, and sorted stone polygons in alpine

SYMBOLS

Geologic contact; defined, approximate, inferred . . Open system pingo, collapsed open system pingo Landslide movement direction in bedrock and colluvium Scarps created by widespread landslide movement in drift Terrace scarp (ticks on sloped side) Degraded Cirque: active during pre-Reid Glaciations . Degraded Arete: active during pre-Reid Glaciations Meltwater channel: flow direction, unknown flow direction Meltwater channel: large All time (pre-Reid) glacial limit; defined, inferred Landform Streamlined by glacial ice Stratigraphic section Radiocarbon date in years (lab no.) . Ar-Ar radiometric age on basalt Lineaments (fault, fracture, joint system) defined by linear drainage courses, aligned gaps in ridges, or aligned breaks in bedrock slopes . Abandoned valley: paleoflow defined Abandoned valley: paleoflow undefined Paleoflow, suspected buried valley .

> OPEN FILE Open files are products that have not gone through the GSC formal DOSSIER PUBLIC es dossiers publics sont s produits qui n'ont MISSION G ÉOLOGIQUE DU CANADA pas étésoumis au 2002

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