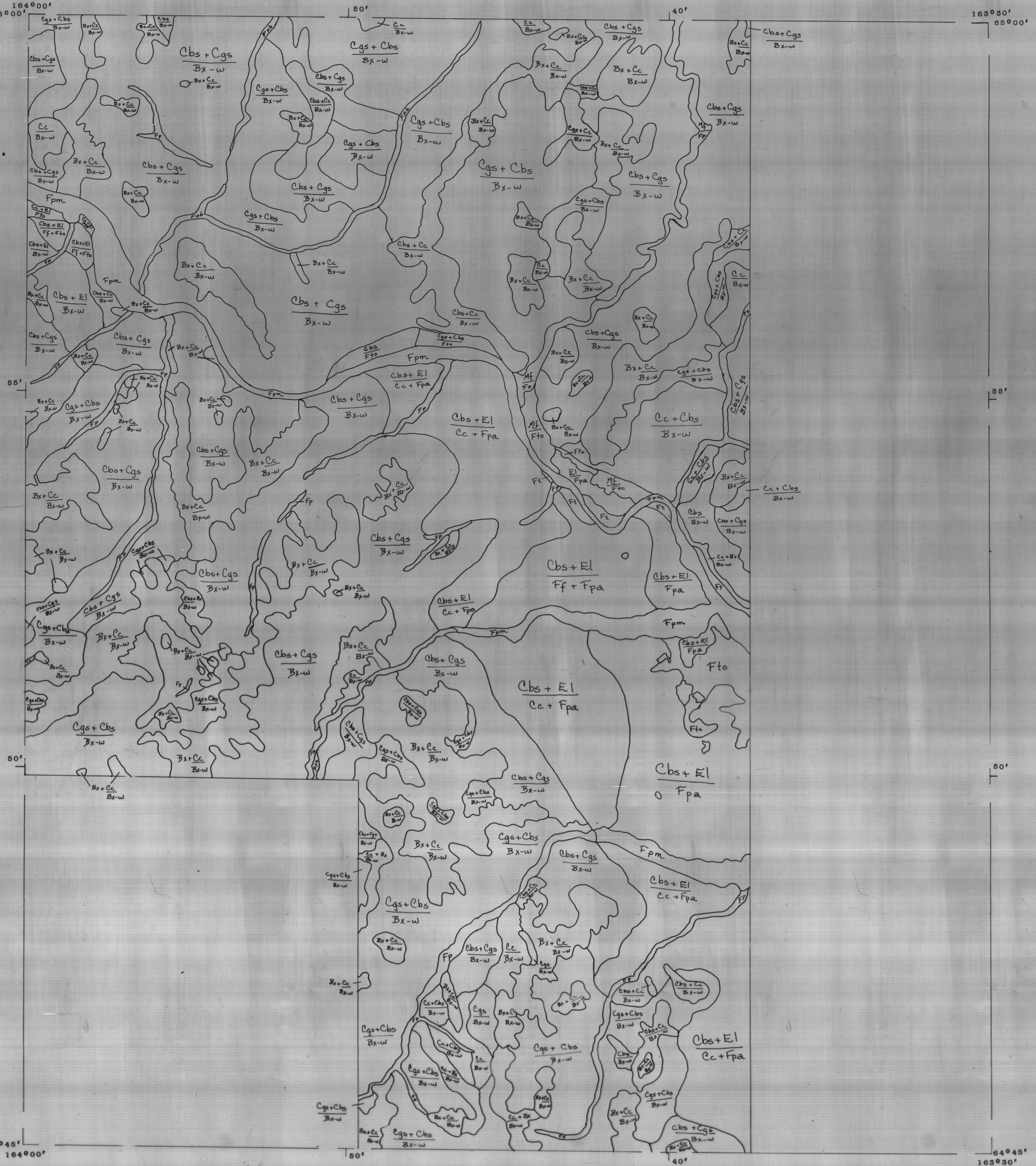

DESCRIPTION OF TERRAIN UNIT TYPES, SYMBOLS, AND MAPPING METHODS

This map is based on landform analysis by air photo interpretation of color infrared aerial photography. Landforms are elements of the landscape formed by a single geologic process or a combination of associated processes. Landforms have identifiable visual characterisitics that include topography, vegetation, permafrost indicators, and drainage patterns. Each landform also has characteristic constituent materials with a recurrent range of geotechnical properties. Landforms were mapped from the ground surface to a depth of about 10 m (30 ft). Each landform is labeled with a 1 to 4 letter code. The upper case letter indicates the genesis of the deposit, for example F for Fluvial (stream or river) deposits; the lower case letters indicate specific landforms in each genetic group, for example Ft for Fluvial terrace deposits and Fpm for Fluvial meander flood-plain deposits.

Terrain units may be composed of one or more landforms. Several different kinds of terrain units are possible, depending on the spatial arrangement of these landforms. All of the following types occur within the project area. Simple terrain units consist of only one landform (e.g. meander flood-plain deposits, Fpm). Layered terrain units consist of one landform overlying another (e.g. basin colluvium and slopewash deposits overlying frost rived and weathered bedrock, Cbs/Bx-w). Mosaic terrain units consist of two or more landforms each of which comprises more than 20 percent of the area. However, because of complex distribution patterns or mapping resolution, the landforms cannot be separated. A plus "+" symbol is used with the dominant landform listed first (e.g. abandoned flood-plain deposits plus fluvial terrace deposits, Fpa + Ft). Complex terrain units consist of three or more landforms in various arrangements indicating both layered and mosaic aspects (e.g. basin colluvium and slopewash deposits plus gelisolifluction deposits overlying frost rived and weather bedrock, Cbs + Cgs/Bx-w; or gelisolifluction deposits overlying a veneer of older glacial till deposits which in turn overlies frost rived and weathered bedrock, Cgs/Gto-v/Bx-w).

DESCRIPTION OF MAP TERRAIN UNITS

BEDROCK

Bx — Bedrock, undifferentiated. Includes "in-place" igneous, metamorphic and sedimentary rock lithologies. Bedrock may be exposed as outcrops or covered by soil and other unconsolidated surficial materials.

Bx-w — Bedrock, frost rived, and weathered. Includes frost-riven, weathered, and decomposed rock lithologies mentioned above. Bedrock usually underlies mineral soil or other unconsolidated surficial materials.

FLUVIAL DEPOSITS

These are sedimentary deposits consisting of unconsolidated, sorted, and stratified clay, silt, sand, gravel, pebble, cobble, and boulder size clasts that have been transported by, suspended in, or laid down by a stream or river.

Ff — Alluvial fan deposits. Gently sloping cone-shaped deposits of sand, gravel, and minor silt alluvium that forms where a stream issues from a narrow mountain valley upon a plain or broad valley, or where a tributary stream is near or at its junction with the main stream, or wherever a constriction in a valley abruptly ceases or the gradient of a stream suddenly decreases; it is steepest and coarsest near the mouth of the valley where its apex points upstream, and it slopes gently and convexly outward with gradually decreasing gradient and particle size.

Fp — Flood-plain deposits. Sand, gravel, and minor silt and clay alluvium deposited by high (flooding) stream or river water that was spread out over a flood-plain. These deposits are usually thickest and coarsest near the stream or river banks, and thinner and finer away from the banks. When the precise flood-plain type is not apparent due to mapping scale and resolution, and the relative size of the flood-plain is in question, then this terrain unit is used.

Fpb — Braided flood-plain deposits. Sand, gravel, and minor pebbles, cobbles, boulders, clay, and silt alluvium deposited in and along a stream or river with an interlacing or tangled network of several small branching or reuniting shallow channels that are separated from each other by branch islands or channel bars, resembling in plan the strands of a complex braid. Braided flood plains are the result of a stream or river possessing a much higher sediment load

Fpm — Meander flood-plain deposits. Interstratified sand, gravel, and silt depoisted in and along mature, well developed, s-shaped, freely meandering river and stream channel margins. The deposits are successively and laterally accreted, thus forming channel and point bars. The laterally accreted deposits commonly display scroll bar and swale topography. Bankfull silt deposits overlie and cap the channel deposits. The scroll bar and swale topography usually has thin silt overlying the bars or ridges and thick silt deposits within the swales.

Fpa — Abandoned flood-plain deposits. Includes braided and meandering flood-plain silt, sand, and gravel deposits that are overlain by silt mixed with organic matter and peat. Deposits are covered by swampy bogs and grass, muskeg tussocks, or low deciduous and coniferous vegetation. These deposits are characteristic of mature flood-plains and are no longer part of the active flood-plain. An abandoned flood-plain would be flooded very infrequently.

Ft — Fluvial terrace. Former, elevated, braided, and meandering flood-plain silt, sand, and gravel deposits. Deposits are long, narrow, relatively level or gently inclined and bounded along one edge by a steeper descending slope which terminates on the active flood-plain, along the other edge by a steeper ascending slope. Terrace desposits are not flood prone.

Fto — Old fluvial terrace deposits. Old, higher elevated, braided, and meandering flood-plain silt, sand, and gravel deposits. Deposits are long, narrow, relatively level or gently inclined and bounded along one edge by a steeper, descending slope which terminates on the active flood-plain or lower terrace, and along the other edge by a steeper, ascending slope. Old terraces are commonly dissected and covered with tundra tussocks, deciduous or coniferous vegetation. Old terrace deposits are not flood prone.

COLLUVIAL/MASS WASTING DEPOSITS

Cbs — Basin colluvium and slopewash deposits. Loose, mixed, heterogeneous and incoherent mass of fine to coarse soil material, alluvium, and/or rock fragments. Can include retransported glacial deposits, terrace alluvium, eolian and lacustrine deposits, and fines winnowed from coarse material on upper slopes. Sand and silt-size material mixed with organic matters occurs along low gradient piedmont slopes, at the base of gentle slopes or hillsides, and valley bottoms. Sediments are moved downslope by both gravity and unconcentrated surface runoff. Deposits are derived from slow, continuous downslope creep and flow of saturated silt and fine sand, plus rainwash, sheet and rill wash, and spring sapping. Deposits are usually perenially frozen.

Cc — Coarse colluvial deposits. Loose, heterogeneous, fine-to-coarse soil material that is mixed with angular frost-riven rock fragments. Colluvium occurs on steep upper slopes and on relatively flat upland surfaces. Colluvium on slopes usually has undergone significant downslope transport by creep and is usually coarser due to sapping and winnowing of fine-grained interstitial silt and sand. Colluvium on upland surfaces usually shows little or no downslope movement, thus the material ranges from fine to coarse depending upon the underlying bedrock lithology, intensity of frost action, and other weathering processes.

Cgs — Gelisolifluction deposits. Water-logged soil and other unsorted and saturated surficial material ranging from silt to gravel that is slowly flowing from higher to lower ground. Deposits can show crude stratification parallel to the slope. This is a type of solifluction associated with seasonally-frozen ground and permafrost, and although similar to soil creep, gelisolifluction is more rapid depending on moisture content, grain size, and gradient. Gelisolifluction occurs mainly at moisture values approximating or exceeding the Atterberg Liquid Limit (i.e. values at which soils have little if any shear strength). Moisture is provided by rain, thawing snow, and melting ground ice; permafrost prevents the downward migration of the moisture. Silt is more prevalent than clay size particles and tends to remain wet longer than coarse-grain sizes. Silt is particularly subject to flow because it lácks cohesion and slakes readily, thus requiring less moisture than clay for flow. Gelisolifluction processes mainly form lobe, bench, and sheet-like deposits.

EOLIAN DEPOSITS

El — Loess deposits. Wind deposited silt. Loess is a homogeneous, unstratified, loose deposit consisting primarily of silt. Deposits frequently display well-developed parting. Deposits blanket almost the entire project area. Loess is wind blown dust derived from unconsolidated glaciofluvial deposits.

MISCELLANEOUS DEPOSITS

O — Organic deposits. Decaying vegetable matter, humus, muck, and peat intermixed with varying amounts of clay and silt. Swamps, bogs, marshes, muskegs, and upland tussock tundra all contain organic deposits. These deposits frequently occur in association with other lowland deposits.

Mf — Man-made fill deposits. Man-made deposits of natural earth materials (e.g., rock, soil, gravel) and waste materials (e.g., mining dredge tailings). Fill is used to insulate and prevent thawing of underlying permafrost for road, building, and airport construction, as well as to raise the surface of low-lying land, such as an embankment to fill a hollow or ravine in road construction.

Wp — Water, pond/lake

STATE OF ALASKA
Department of Natural Resources
Division of Geological & Geophysical Surveys
P.O. Box 772116
Eagle River, Alaska 99577

A.D.G.G.S.
ENGINEERING

N

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

SOLOMON (D-4) QUADRANGLE ENGINEERING GEOLOGY

by

K. Krause

1985

QUADRANGLE LOCATION

SOLOMON (D-4), ALASKA

This report is a preliminary publication of DGGS. The author is solely responsible for its content and will appreciate candid comments on the accuracy of the data as well as suggestions to improve the report.