Washington Department of Natural Resources
Division of Geology and Earth Resources

Open File Report OF 79-7
This report is preliminary and has not been formally edited or reviewed

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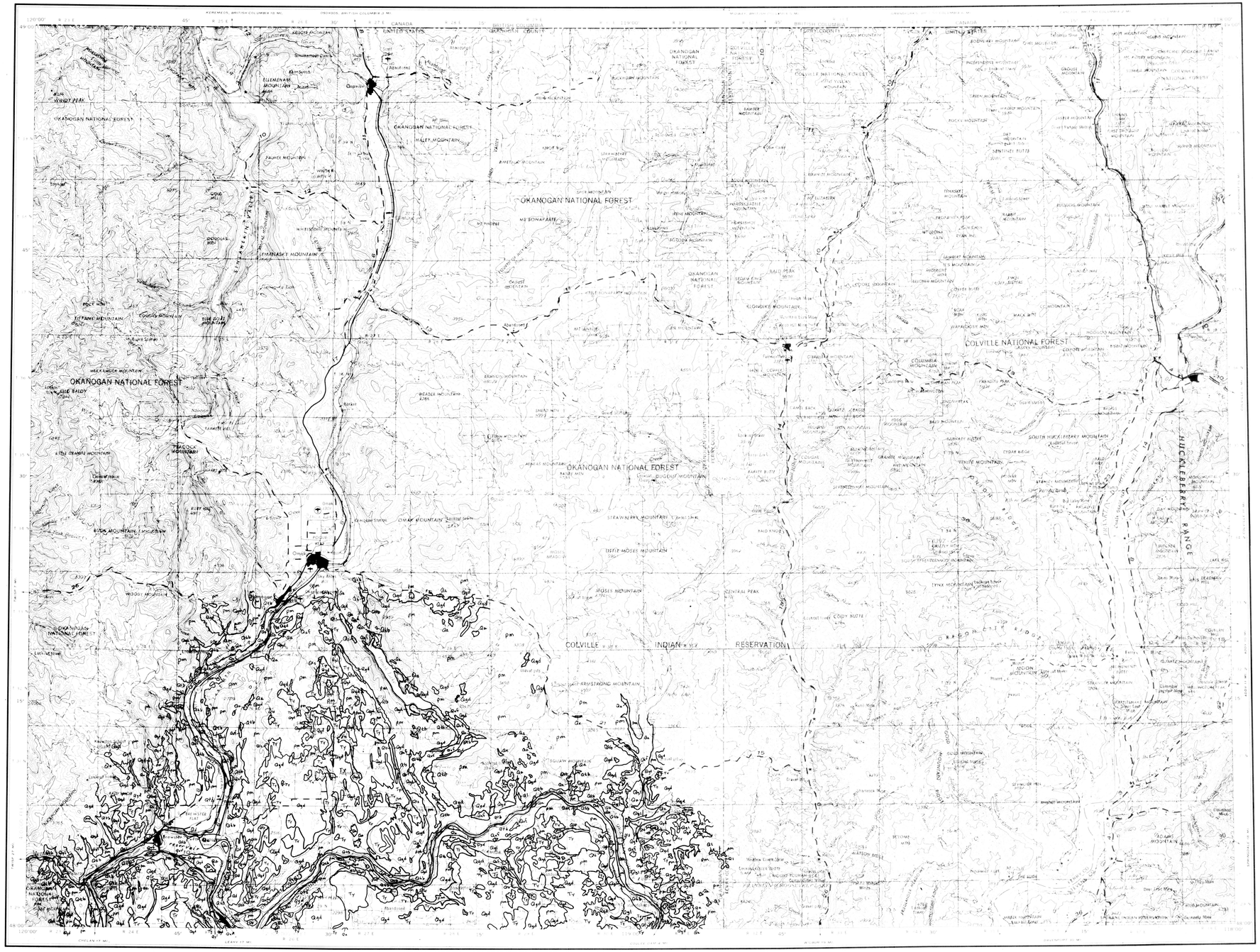


Base from U.S. Topographic 1:250,000 series
Okanogan Quad, 1954

Edited, reviewed, and adjusted to 1:250,000 scale topographic base map by Kurt L. Othberg

N 21° MN

SURFICIAL GEOLOGIC MAP OF THE OKANOGAN QUAD, WASHINGTON

by

Larry G. Hanson

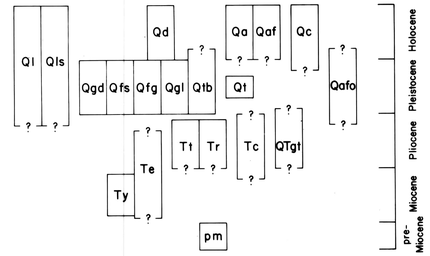
1979

SCALE
0 5 10 Miles
0 5 10 15 Kilometers

Contour Interval 200 Feet

Geology mapped in 1978-1979

Correlation of Map Units



DESCRIPTION OF UNITS

Qd DUNE SAND - Active and stabilized dunes of predimonately fine to medium sand; mostly quartz and basalt grains reworked from older sedimentary deposits.

Qa ALLUVIUM - Primarily stream deposits of silt, sand, and gravel in floodplains, terraces, and valley bottoms. Includes local lacustrine, paludal, and eolian deposits in depressions.

Qaf ALLUVIAL FAN DEPOSITS - Primarily unconsolidated sand and gravel. Surface is relatively undissected and exhibits little or no petrocalcic soil development (caliche).

Qc COLLUVIUM- Primarily angular to subangular basaltic debris accumulated at the base of steep slopes and cliffs. Includes talus and talus cones formed by active and inactive rockfall.

Qls LANDSLIDE DEPOSITS - Unstratified and poorly-sorted clay, silt, sand and gravel deposited by rotational and translational slides and flows.

Ql LOESS - Loess deposits consisting of eolian silt and fine sand up to 75 meters in thickness. Generally not mapped where less than approximately 2 meters thick. Locally contains multiple petrocalcic horizons and tephra beds.

Qafo OLDER ALLUVIAL FAN DEPOSITS - Primarily semi-consolidated gravel or fanglomerate. Surface of fans are dissected and capped by well-developed petrocalcic soils (caliche).

Qfs CATASTROPHIC FLOOD SLACK-WATER SEDIMENTS - Rhythmically bedded and graded silt, sand, and gravel deposited by lower-energy slack waters of catastrophic floods and(or) surges of catastrophic floods. Includes the Touchet beds.

Qfg CATASTROPHIC FLOOD GRAVELS - Predominantly coarse gravel and sand deposited by higher-energy waters of catastrophic floods.

Qtb TERRACE AND BAR DEPOSITS, UNDIFFERENTIATED - Glaciofluvial, fluvial, and ice-contact stratified silt, sand, and gravel deposits of various lithologies in terraces and bars in the valleys of the Columbia, Okanogan, and Spokane Rivers and tributaries. Includes deposits of the Great Terrace.

Qgl GLACIOLACUSTRINE TERRACE DEPOSITS - Silt, sand, and gravel deposited in glacial lakes that formed along the Columbia, Okanogan, and Spokane Rivers and their tributaries. Includes deposits of the Nespelem Terrace. Surface of the terraces may exhibit local modification by fluvial and catastrophic floodwaters.

Qgd GLACIAL DEPOSITS - Till, outwash, and ice-contact stratified deposits in morsines, till plains, and melt-water channels and terraces.

Qt TIETON ANDESITE - Andesitic flow of the lower Naches River drainage.

QTgt GRAVEL OF TERRACE REMNANTS - Gravel and coarse sand in remnants of high fluvial terraces and alluvial fans within the Yakima River drainage basin. Includes the Cowiche gravel. Age uncertain, but may be in part correlative with Thorp Gravel, Ellensburg Formation, Ringold Formation, and gravels of ancestral Columbia River (Tc).

Tt THORP GRAVEL - Fluvial (?) gravel in dissected high terraces and alluvial fans in the Kittitas Valley. Probably correlative with the upper Ringold Formation.

Tr RINGOLD FORMATION - Fluvial and lacustrine clay, silt, sand, conglomerate and fanglomerate of diverse composition. Includes a cap of thick, well-developed petrocalcic soil (caliche). May be correlative with the uppermost Ellensburg Formation.

Tc GRAVEL OF ANCESTRAL COLUMBIA RIVER - Predominantly well-rounded pebble gravel. Columbia River provenance indicated by a dominance of quartzite pebbles.

Te ELLENSBURG FORMATION - Primarily weakly lithified fluvial and laharic deposits. Base undefined. Mapped only where they overlie the Yakima Basalt SubGroup. Dominated by dacitic, andesitic, and pumiceous clasts.

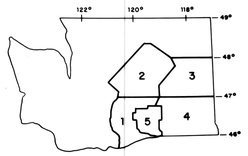
Ty YAKIMA BASALT SUBGROUP - Lava flows of the Saddle Mountains, Wanapum, and Grande Ronde Basalt Formations. Includes sedimentary interbeds of the Ellensburg and Latah Formations, local colluvium, caliche, and widespread thin loess.

pm PRE-MIOCENE ROCKS, UNDIFFERENTIATED - Primarily Precambrian through Mesozoic metamorphic and plutonic rocks, and early tertiary sedimentary and volcanic rocks.

Contact

Map unit symbols, correlations, and descriptions compiled by Kurt L. Othberg, James G. Rigby, and Glennda McLucas

Geologic Mapping of Late Cenozoic Sediments, Columbia Basin, Washington



Geologic mapping, 1978-79, by N.P. Campbell (area 1); L.G. Hanson (area 2); C.P. Kiver, D.F. Stradling, and J.G. Rigby (area 3); G. D. Webster (area 4); and J.T. Lillie (area 5). The geology of the north central Walla Walla Quadrangle, and the south central Ritzville Quadrangle was field checked, simplified, and generalized from Grolier and Bingham (1971). The geology of the southeastern portion of the Wenatchee Quadrangle was field checked, simplified, and generalized from Tabor and others (1977).

Grolier, M.J.; Bingham, J.W., 1971, Geologic map and sections of parts of Grant, Adams and Franklin Counties, Washington: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-589, 6 sheets, scale, 1:62,500.

Tabor, R.W.; and others, 1977, Preliminary geologic map of the Wenatchee 1:100,00 Quadrangle, Washington: U.S. Geological Survey Open-file Report 77-531, 24 p.