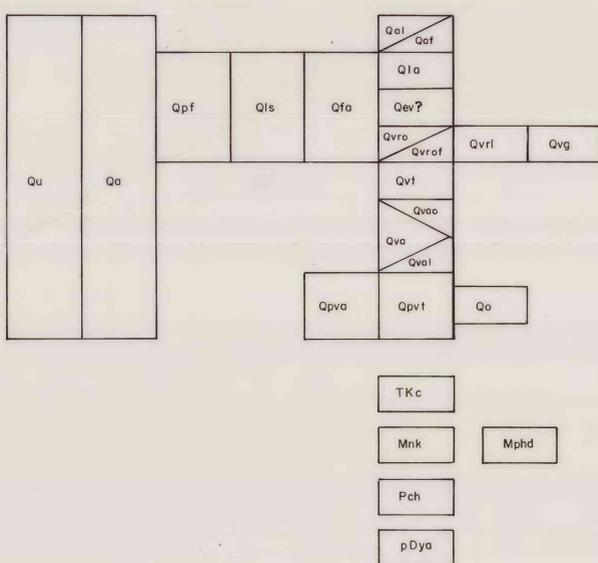


MAP SHOWING SURFICIAL GEOLOGY OF PARTS OF THE LOWER SKAGIT AND BAKER VALLEYS, NORTH CASCADES, WASHINGTON

by Paul L. Heller  
1979

Geology by P.L. Heller (1976-1978)

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qal - RECENT ALLUVIUM (Holocene) - Stratified sand and gravel with minor silt.

Qaf - ALLUVIAL FAN DEPOSITS (Holocene) - Sand and gravel with minor silt.

Qpf - PYROCLASTIC FLOW DEPOSIT (late Fraser or early Holocene) - Poorly sorted, non-stratified sand to boulder gravel with a cemented, oxidized matrix.

Qls - LANDSLIDE DEPOSIT (late Fraser or early Holocene) - Very poorly sorted, non-stratified, fine sand to boulder gravel. Contains abundant angular to sub-angular clasts.

Qfa - ALLUVIAL DEPOSITS (late Fraser to early Holocene) - Stratified, moderately to well sorted sand and gravel, minor silt. Deposited by the Skagit River (?) and its tributaries.

Qla - LACUSTRINE DEPOSITS (late Fraser to early Holocene) - Stratified silt, clay, and peat, found in abandoned channels.

Qev? - GLACIOMARINE(?) DRIFT (Everson Interstade?) - Brown, stoney silt and clay, though stratified in upper part is generally massive, containing a sandy diamicton lense. May be glaciolacustrine in origin and pre-Vashon in age.

Qvro - RECESSONAL OUTWASH (Vashon Stade) - Stratified, moderately to well sorted sand to cobble gravel with minor silt.

Qvraf - RECESSONAL OUTWASH FAN DEPOSITS (Vashon Stade) - Stratified, north-dipping sand, gravel and flowfills with ice-contact structures seen in the southern-most exposures.

Qvrl - RECESSONAL GLACIOLACUSTRINE DEPOSITS (Vashon Stade) - Brown to grey, silt and clay with few stones, generally massive though stratified in parts.

Qvg - ALLUVIAL DEPOSITS (Vashon Stade) - Stratified, moderately sorted sand to boulder gravel, mostly of Baker (and Skagit) river origin with very minor outwash, deposited against stagnant ice blocks.

Qvt - TILL (Vashon Stade) - Non-stratified, non-sorted, blue-gray clay to boulder gravel, locally clay or sand rich. Commonly up to two meters of loose, oxidized, sandy diamicton (ablation till?) buries the more compact, blue-gray till.

Qva - UNDIFFERENTIATED GLACIER ADVANCE DEPOSITS (Vashon Stade) - Clay, silt, sand and gravel and possibly flowfill deposits.

Qvao - ADVANCE OUTWASH (Vashon Stade) - Sorted, stratified sand with gravel, minor silt beds and flowfill deposits.

Qval - GLACIOLACUSTRINE DEPOSITS (Vashon Stade) - Blue-gray, stratified silt and clay with minor stones. Deposited in ice dammed lake during Vashon glacier advance up the Skagit Valley.

Qpva - ALLUVIAL DEPOSITS (pre-Vashon Stade) - Stratified, sorted, silt, sand and gravel.

Qpvt - TILL(?) (pre-Vashon Stade) - Blue gray clay, silt, sand and pebble to cobble gravel. Common stones of Baker Valley provenance, many weathered. Maybe Evans Creek age till, possibly a mud flow deposit.

Qo - LACUSTRINE (AND FLUVIAL?) DEPOSITS (Olympia non-glacial interval) - Brown to grey silt, with a sand and gravel interbed.

Qa - ALLUVIAL DEPOSITS (Quaternary) - Stratified silt, sand and gravel.

Qu - UNDIFFERENTIATED DEPOSITS (Quaternary) - Any glacial or non-glacial, unconsolidated deposit.

TKc - CHUCKANUT FM. (Upper Cretaceous? to Paleocene, McLellan, 1927) - Arkosic sandstone, extent from Misch (1977).

Mnk - NOCKSACK GROUP (Mesozoic, Misch, 1966) - Sedimentary (and volcanic?) rocks, extent from Misch (1966, 1977) and present mapping.

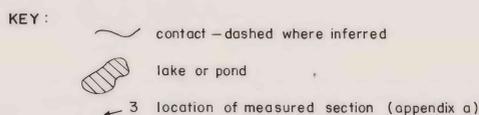
Mphd - PHYLLITE (Mesozoic) - Grey to black, commonly graphitic with quartz vein fillings. Darrington Phyllite of Misch (1966), extent from Misch (1977) and present mapping.

Pch - CHILLIWACK GROUP (Paleozoic, Daly, 1912, Misch, 1966) - Metamorphosed sedimentary and volcanic rocks, extent from Misch (1977) and present mapping.

pDya - YELLOW ASTER COMPLEX (pre-Devonian, Misch, 1966) - Metaplutonic (gabbro?), extent from Misch (1977) and present mapping.

REFERENCES CITED

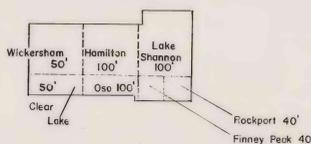
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This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.



USGS QUADRANGLES IN STUDY AREA AND CONTOUR INTERVAL



1 : 62,500

