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GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

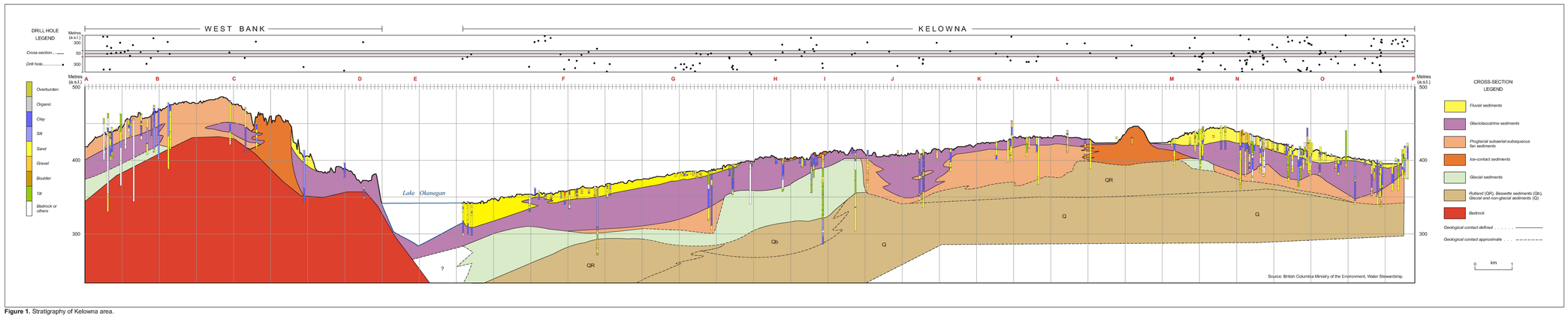
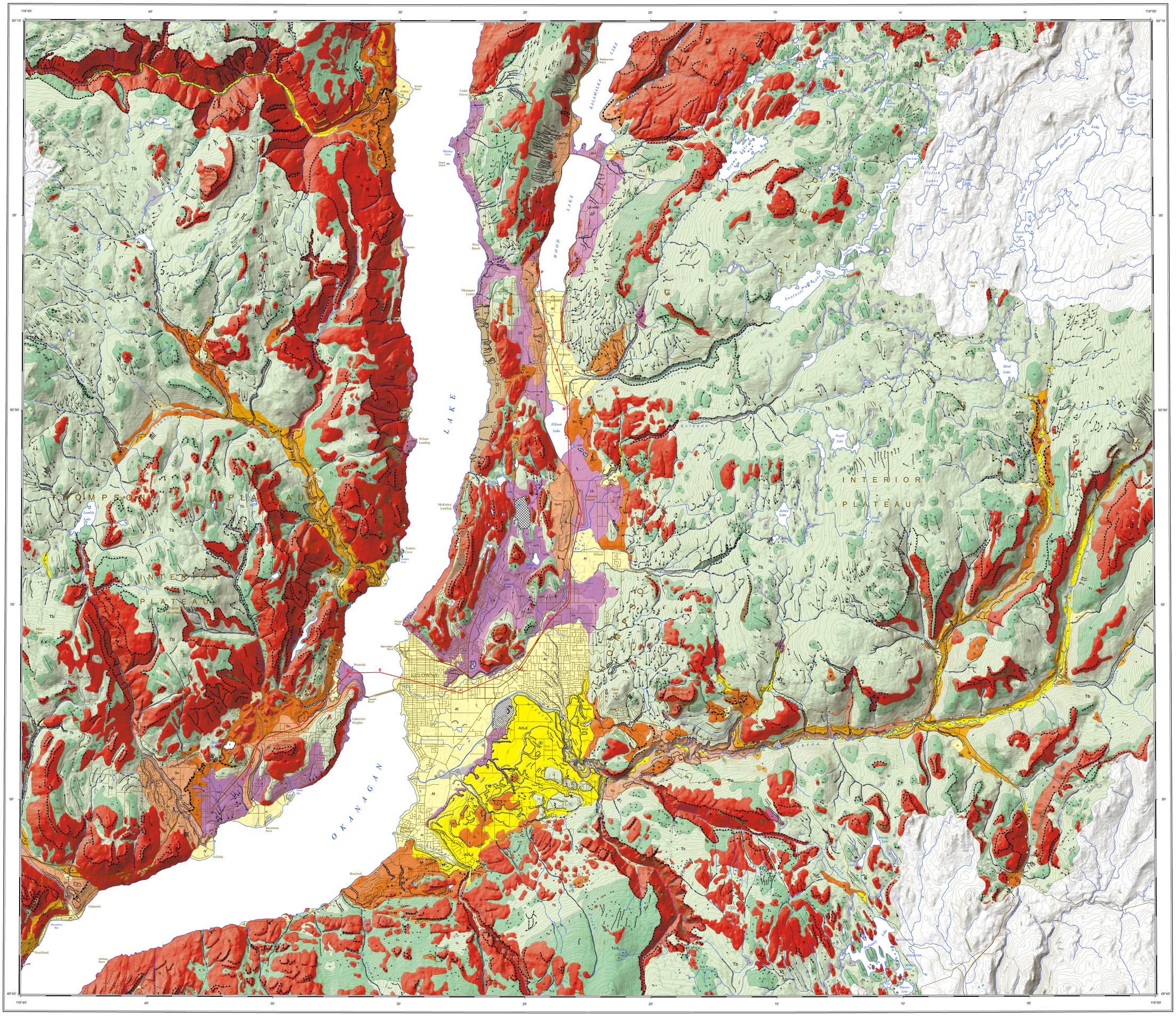



**Figure 1.** Stratigraphy of Kelowna area.




## LEGEND

*NOTE: In areas where the surficial cover forms a complex pattern and the sub-units cannot be mapped individually, the area is coloured according to the dominant unit and labeled with a dot separating sub-units (e.g. Tv.b). Where buried sub-units are known, or suspected, areas are coloured according to the overlaying unit and labeled in the following manner: (Ol/Ap).*

**QUATERNARY**
**SURFICIAL DEPOSITS**

**POST-GLACIAL**

**O** — ***Organic sediments:*** *muck, mucky peat, marl and peat, from 0.3 to 3 m thick. Accumulations of organic material are commonly found in shallow closed depressions or on gently sloping, poorly drained surfaces. They can be thin on underlying material (O/Ap).*

**Co** — ***Scree deposits:*** *angular stones, rubble up to 10 m thick; forming talus cones, fans or apron and gravity accumulations at the foot of rock escarpments; includes high proportions of local bedrock fragments.*

***FLUVIAL SEDIMENTS:*** *sediments deposited along modern fluvial systems and during their incision into earlier Quaternary sediments.*

**Ap** — ***Fluvial floodplain sediments:*** *sand, gravely sand, gravel, silts and organic debris; from 0.5 to 3 m thick; occurs as flat surfaces close to river levels, prone to seasonal flooding.*

**Al** — ***Fluvial terrace sediments:*** *sand, gravely sand, gravel and organic debris; from 0.5 to 15 m thick; forming terraces a few metres above river level entrenched in former Quaternary formations.*

**Af** — ***Alluvial fan sediments:*** *poorly sorted gravel, sand, silt and clay; these subaerial deposits, found throughout the area, occur mainly as fan-shaped forms where creeks or streams debouch on lakes or at the toe of slopes where creeks or streams debouch on flat valley floor. Fan sediments could have been transported from far away or can reflect local provenance.*

**FRASER GLACIATION**

***GLACIOLACUSTRINE SEDIMENTS:*** *sediments deposited and/or reworked in proglacial Lake Penticton.*

**Lv** — ***Littoral, sublittoral sediments:*** *silt, clay and sand, normally graded; can contain ripple laminated units; from 0.3 to 1 m thick; sediments could be discontinuous, interspersed with rock outcrop or forming a thin layer on underlying deposits (Lv/Tb,v).*

**Lb** — ***Littoral, sublittoral sediments:*** *sand, silt, clayey silt, laminated to massive or roughly stratified and well sorted; from 0.3 to 6 m thick; sediments are usually continuous, some underlying topography could be visible (Lb/Gl, Lb/Tb).*

**La** — ***Deep water sediments:*** *silt and clay, silty-clayey rhythmites, varves; from 0.5 to 8 m thick, typically undeformed, parallel stratified, laminated and thick enough to mask underlying topography. Sediments usually deposited in more than 50 m of water. In higher grounds, underlying topography could be visible. (La/Tb).*

**Ld** — ***Deltaic sediments:*** *sand, coarse sand and gravelly sand; from 1 to 10 m thick; deposited by streams entering former ice-contact glacial lakes dammed in tributary valleys by ice and sediments located in trunk valleys; forming flat surfaces generally marked by abandoned channels.*

***GLACIOFLUVIAL SEDIMENTS:*** *stratified sediments deposited by meltwater in contact or in proximity of the glacier. Units under the lacustrine limit, have generally been reworked by waves and currents generated along former*

**Gl** — ***Glaciofluvial terrace sediments:*** *sand and gravel, stratified to massive; up to 6 m thick in sections; occurs as flat terraces located above the alluvial terrace sediments and generally associated with large meltwater conduits.*

**Gb** — ***Glaciofluvial blanket sediments:*** *sand and gravel, and diamicton stratified to massive; sediment cover is continuous; thickness usually over 2 m, can include small eskers (Ge) sediments.*

**Go** — ***Subaerial proglacial outwash fan sediments:*** *sand, sandy gravel and boulders; from 1 to 10 m thick; forming benches and fans with flat to undulating surfaces marked by sinuous shallow paleochannels and terraces, specifically located at the mouth or within important rivers on the West Bank and Mission Creek, underlying rock topography can be visible (Go/R).*

**Gx** — ***Ice contact sediments:*** *sand and gravel, boulders, may contain some diamicton layers, up to 12 m thick; forming eskers, kames, kames terraces and morainic accumulations; surface generally hummocky, locally punctuated with kettles and marked by abrupt slopes along Lake Okanagan; underlying till topography can be visible (Gx/Tb).*

***GLACIAL SEDIMENTS:*** *diamicton, deposited directly by the glacier, consists of a heterogeneous mixture of particles of boulder, cobble, pebble, sand, silt and clay. Its size and composition reflects the lithology of the bedrock over which the ice has passed. In the Kelowna area, granitic rocks tend to produce a more gravelly sandy till compared to Tertiary bedrock resulting in a more clay-rich till.*

**Tb** — ***Continuous till cover (blanket):*** *diamicton comprising bodgement and ablation facies; thickness generally over 1 m; this unit is mainly located in intermediate to low-relief areas but can also be found on the valley floor and sidewalls of Mission Creek.*

**Tv** — ***Discontinuous till cover (veneer):*** *diamicton comprising mainly ablation facies; less than 1 m thick; with surfaces generally punctuated by rock outcrops; underlying rock structure may be locally visible on aerial photos. This unit is mainly located on higher relief areas, specifically in the high relief area south of Kelowna. In certain places, underlying rock topography could be visible (Tv/R).*

**PRE-FRASER GLACIATION**

**Q** — ***GLACIAL AND NON-GLACIAL SEDIMENTS:*** *older unconsolidated sediments; sand, silt, gravel and till deposited prior to the last ice advance (generally overlain by Fraser and younger deposits). Sediments are found in sections that can be up to 100 m high or to a depth of 1 km (geophysics survey).*

**PRE-QUATERNARY**

*Rock outcrop and rock with a thin layer of unconsolidated material.*

**R** — ***BEDROCK:*** *Proterozoic volcanic rocks, Paleozoic mudstone, siltstone, shale and fine clastic sedimentary rocks; Mesozoic granodioritic intrusive rocks and Cenozoic basaltic volcanic rocks.*

*Geological boundary (approximate)*
*Watershed limit*
*Gravel or sand pit (big, small)*
*Quarry (big, small)*
*Landfill*
*Landslide*
*Gullying*
*Meltwater channel (direction of flow known, unknown)*
*Ravine*
*Terrace*
*Kame*
*Beach ridge*
*Kettle (large, small)*
*Esker (direction of flow known, unknown)*
*Moraine ridge*
*Ice-contact blockage*
*Crag-and-tail*
*Drumlin*
*Glacial fluting (streamlined parallel to glacial flow)*
*Glacial striae (direction of flow known, unknown)*
*Relative chronology of striated surfaces (1 = older movement)*
*Escarpment in unconsolidated material and rock*
*Rock escarpment*
*Glacial cirque and rock escarpment*
*Rock drumlin*
*Lineation controlled by the rock structure*
*Isolated rock outcrop*
*Field observation sites*
*Cross-section location* A — B

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*Geology by S.J. Paradis and C. Deblonde, 2007*

*Airphoto interpretation by S.J. Paradis, 2008*

*Compilation of geology was onto 1:40 000 orthorectified airphoto mosaic by M. Boutin, INRS Eau, Terre et Environnement, 2008*

*Digital cartography by N. Côté, Data Dissemination Division (DDD)*

OPEN FILE 6146

SURFICIAL GEOLOGY

**KELOWNA**

BRITISH COLUMBIA

Scale 1:50 000/Échelle 1/50 000

kilometres 1 0 1 2 3 4 kilomètres

Universal Transverse Mercator Projection
North American Datum 1983
© Her Majesty the Queen in Right of Canada 2009
Projection transverse universelle de Mercator
Système de référence géodésique nord-américain, 1983
© Sa Majesté la Reine du chef du Canada 2009

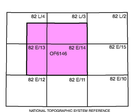
*Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada*

*Digital base map from data compiled by Geomatics Canada, modified by DDD*

*Shaded relief image prepared by DDD, derived from the digital elevation model supplied by GeoBase*
*Illumination: azimuth 315°, altitude 45°, vertical factor 1x*

*Magnetic declination 2009, 17°08' E, decreasing 12.9' annually*

*Elevations in metres above mean sea level, except in the NW quadrant (NTS 82 L/4) where elevations are in feet*

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2009

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