CANADA

DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY

LEGEND

CENOZOIC

TERTIARY

MIOCENE OR LATER

13 — *Valley basalt: mainly vesicular basalt*

MIOCENE OR EARLIER

KAMLOOPS GROUP

11, 12 — *11. Rhyolite, andesite, and basalt: associated tuffs, breccias and agglomerates. May include some younger basalts*
12. TRANQUILLE BEDS: conglomerate, sandstone, shale, tuff; thin coal seams

10 — *COLDWATER BEDS: conglomerate, sandstone, shale, and coal; 10a, similar to 10, but may include younger beds*

MESOZOIC OR CENOZOIC

CRETACEOUS OR TERTIARY

9 — *COPPER CREEK INTRUSIONS: granite, granodiorite, granite porphyry*

8 — *Andesite, basalt; picrite, agglomerate, breccia, and tuff; minor conglomerate and sandstone*

7 — *Conglomerate, sandstone, and shale*

MESOZOIC

CRETACEOUS

LOWER CRETACEOUS

KINGSVALE GROUP

6 — *Rhyolite, andesite, and basalt; associated tuffs, breccias, and agglomerates; arkose, conglomerate*

SPENCE BRIDGE GROUP

5 — *Hard, reddish lava*

JURASSIC AND(?) LATER

4 — *COAST INTRUSIONS: granite, granodiorite, gabbro; 4a, Iron Mask batholith; syenite, monzonite, diorite, gabbro; 4b, pyroxenite and peridotite. Probably not all of the same age, and may be in part post-Lower Cretaceous*

TRIASSIC

UPPER TRIASSIC

NICOLA GROUP

3 — *Greenstone; andesite, basalt; agglomerate, breccia, tuff; minor argillite, limestone, and conglomerate*

PALÆOZOIC

CARBONIFEROUS AND PERMIAN

CACHE CREEK GROUP (?)

2 — *Greenstone, generally slightly sheared. May include some Triassic rocks (3)*

1, 1A — *Argillite, quartzite, hornstone, limestone, sheared conglomerate, breccia, greenstone, and serpentine; 1A, limestone*

A — *Chlorite schist, quartz-mica schist, amphibolite, and granitic intrusions; commonly gneissic and largely of Palæozoic age*

Heavily drift-covered area

Fault

Synclinal axis

Fossil locality (F)

Mineral occurrence ×

SYMBOLS FOR METALS

Silver	Ag
Gold	Au
Copper	Cu
Iron	Fe
Mercury	Hg
Lead	Pb
Tungsten	W

Road

Road (not well travelled)

Trail

Post Office

Forestry lookout

Land District boundary

Limit of Railway belt

Indian Reserve boundary

Intermittent lake and stream

Marsh

Sand bar

Contours (interval 500 feet)

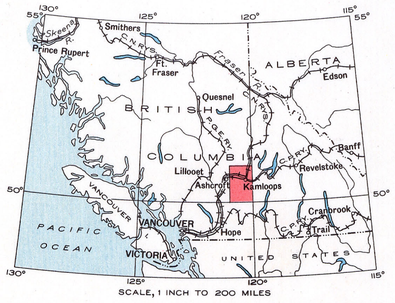
Depression contour

Height in feet above mean sea-level 3768'

Geology by W.E. Cockfield, 1939, 1940, 1941, 1943.

For Mineral Localities, see Map 887A, "Nicola"

Base-map compiled by the Topographical Survey, 1937, from information obtained from published Federal Government maps. Cartography by the Drafting and Reproducing Division, 1946.



121°00′ 45′ 30′ 15′ 120°00′ — 51°00′ — 45′ — 30′ — 15′ — 50°00′

Joins Map 888A, "Princeton."

PUBLISHED, 1947

MAP 886A

NICOLA

KAMLOOPS AND YALE DISTRICTS

BRITISH COLUMBIA

Scale, ~~1/253440~~ or 1 Inch to 4 Miles

Miles 4 0 4 8 12

Approximate magnetic declination, 24°30′ to 27° East.

DESCRIPTIVE NOTES

The map-area lies east of Cascade Mountains within the belt of Interior Plateaux, and the topographic features comprise broad upland areas separated by deeply cut valleys. Thompson River and its main tributaries, the North and South Thompson, and Nicola River occupy the master valleys. A considerable part of the area consists of the open, sage-brush country characteristic of the "dry belt" of British Columbia. Forest growth on the lower slopes of the hills consists of widely spaced trees forming open, park-like areas. On the upper and northern slopes forest growth is dense, and large amounts of windfall in places render travel difficult.

A group of foliated rocks (A) is shown separately on the map. They are believed to be largely of Palæozoic age, but Triassic members may be present, and the assemblage also includes much granitic material.

The Palæozoic rocks of the Cache Creek group (1,2) comprise formations of both Carboniferous and Permian age, but are so greatly deformed that their succession could not be determined. The more prominent bands of limestone (1A) were mapped separately in the hope that they would serve as horizon markers, but were found in many instances to occur as single, discontinuous masses or pods. In the northeastern part of the area greenstones are prominent and have been mapped separately (2). They are fine- to medium-grained, altered, generally sheared rocks, and are believed to be interbedded with Palæozoic sedimentary strata, but the possibility of some of them being intrusive is not precluded.

The Triassic period is represented by the Nicola group (3), which here consists largely of volcanic rocks (greenstone). These vary from fine-grained or nearly aphanitic to coarsely porphyritic types. They are predominantly green, but also occur in various shades of purple, red, brown, or grey, and include some with a dark or nearly black groundmass. The rocks are chiefly andesites, but include basaltic types as well as feldspar porphyries with phenocrysts ranging from minute size to half an inch in length. Much breccia and tuff is associated with the lavas. The latter are partly altered to chlorite, epidote, and calcite, and boundaries of individual flows are generally difficult to detect. Minor amounts of sedimentary rocks are associated with the volcanic members and have provided marine fossils of Upper Triassic age. Limestone is the most abundant type, but argillite and conglomerate occur sparingly. The limestone bands generally consist of a series of lenses rather than continuous beds.

Many plutonic rocks are included with the Coast intrusions (4). They are invariably intrusive into Triassic rocks (3) with which they come in contact, but were not found cutting the Lower Cretaceous rocks (6). They are considered to be largely Jurassic, but younger members may be present. The rocks are mostly medium-to coarse-grained granodiorites or quartz diorites, but locally include more acidic or more basic types. The common ferromagnesian minerals are biotite and hornblende. Of special interest is the Iron Mask batholith (4a), which contains copper deposits and veins of magnetite. The plutonic mass west of Guichon Creek also serves as host rock to a number of copper deposits.

Rocks correlated with the Spence Bridge group (5) were identified only at one locality in the extreme southwest part of the area, where they are continuous with similar rocks occurring in the Princeton map-area to the south.

The rocks of the Kingsvale group (6) are co-extensive with considerable areas of similar rocks to the south and west, some of which carry fossil plants. They show a wide range of colours, red, green, purple, buff, brown, grey, white, and black, and possess many characters similar to the Kamloops volcanic rocks, though feldspar porphyries are much more common. The agglomerates carry boulders of the granitic rocks of the region.

Small bodies of Copper Creek intrusions (9) appear along Carabine and Criss Creeks cutting both sedimentary and volcanic rocks (7,8). The latter are of either Cretaceous or Tertiary age, but no fossil evidence was obtained on which to base an age determination.

The Kamloops group includes a considerable thickness of volcanic and sedimentary rocks (10, 11, 12). The Coldwater beds (10) occur at the base of the group and in places appear to underlie the volcanic rocks unconformably. They contain, so far as is known, no intercalated flows or tuffaceous material, and probably antedate the period of vulcanism. However, fossil evidence shows no distinction in age between these and the Tranquille beds. They consist of conglomerate, sandstone, and shale, with commercial coal seams. The volcanic rocks (11) are chiefly dense, fine-grained, basaltic lavas. They exhibit a wide range of colours and are intercalated with considerable thicknesses of breccias and agglomerate. Interbedded with these volcanic rocks and grading upwards into the agglomerates are the Tranquille beds (12). These consist of conglomerate, shale, sandstone, and tuff, with thin coal seams.

Flat-lying basalts (13) are found along benches in some of the valleys and are probably the most recent consolidated rocks of the area.

Pleistocene and Recent deposits cover much of the bedrock. These are thickest in the valleys, but long, drift-covered slopes with few outcrops characterize many of the hills. The larger valleys are lined in many places with marginal terraces of sand, gravel, and clay. Terraces of white silt are prominent in the valley of South Thompson River, but also occur elsewhere in the area.

Data on the structure of the Triassic rocks are scanty, but those obtained appear to indicate that in the southern part of the map-area the folds have northerly trending axes. The emplacement of some of the plutonic rocks is also along a general northerly direction and is at variance with the general northwesterly regional trend. In the vicinity of Kamloops Lake, however, the folds appear to strike northwest, a trend that is followed by the Iron Mask batholith.

The Kingsvale rocks have in general a gentle dip southwestward, but locally are highly disturbed.

The Coldwater beds are not well exposed, but appear to occur in open folds, except near the margins of the basins where dips approach the vertical. At the western margin of the Merritt coal basin the beds form a series of sharp folds with the axes striking northwest and plunging southeast. The Tertiary lavas have in general gentle dips, and some of the flows are nearly horizontal.

The mineral deposits of the map-area represent a number of diverse types and have provided several productive mines, but the total production is small in comparison with nearby districts.

Placer gold deposits have been mined, generally on a small scale and with low returns, on the lower reaches of Tranquille River and Jamieson and Criss Creeks, and along Thompson River below Deadman River.

Vein deposits containing gold and silver, with lead, zinc, and copper minerals, occur in the Triassic greenstones at Stump Lake, and similar veins occur with replacement deposits in the greenstones and limestones of Swakum Mountain. Much work has been done on the Stump Lake deposits, which were among the early lode discoveries of the province, and shipments of ore and concentrates have been made. The veins are commonly less than 2 feet wide, but have been followed for long distances.

Quartz veins are numerous in Palæozoic sedimentary rocks of the northeastern part of the area, and in small bodies of granitic rocks that cut them. They have been explored chiefly for their gold and silver content, but production to date has been small.

Copper deposits have been discovered at many places in the plutonic rocks west of Guichon Creek. The copper minerals occur as veins and in shattered zones associated in many places with molybdenite and in some with tourmaline. Copper deposits are also abundant in and around the Iron Mask batholith, where they occur as veins, impregnations in the country rock, and as stockworks. Only a few carry important gold values. A pronounced alteration of the rock to pink albite and epidote is common near the deposits, but very little quartz is present. Veins of magnetite and apatite also occur with the Iron Mask batholith.

Many veins and disseminations of copper minerals have been found in the rocks of the Nicola group.

Mercury showings are widely scattered in the northwest corner of the map-area from near Tunkwa Lake to Criss Creek. They occur in the rocks of the Nicola group and in Cretaceous or Tertiary sedimentary and volcanic rocks. The cinnabar is associated mainly with veins and stringers of dolomite, but some occur with chalcedonic quartz replacing the rock. The production from these deposits is less than 150 flasks, made chiefly prior to 1900.

The ore contains a variety of industrial mineral deposits, from among which a limited production of gypsum, sodium sulphate, and sodium carbonate has been made.

Coal has been mined for many years at Merritt from a basin of Tertiary sedimentary rocks, and is known to occur with similar strata on Quilchena Creek.