CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

GEOLOGICAL SERIES

SHEET 92 L/7

LEGEND

JURASSIC AND/OR CRETACEOUS
UPPER JURASSIC AND/OR LOWER CRETACEOUS
COAST INTRUSIONS

4 5 — **4.** *Quartz monzonite, granodiorite, quartz diorite, diorite, gabbro; minor aplite and micropegmatite*
5. *Micropegmatite sills*

TRIASSIC AND (?) JURASSIC
UPPER TRIASSIC AND (?) LATER
BONANZA GROUP

3 — *Andesitic lavas, agglomerates, tuffs, and breccias; basaltic, trachytic, and dacitic lavas; minor intercalated limestone; 400 to 500 feet composed of thin-bedded argillite, tuffaceous argillite, impure limestone, and quartzite at base; numerous, thin, intercalated andesitic lavas and associated pyroclastic rocks*

TRIASSIC
UPPER TRIASSIC

2 — *QUATSINO FORMATION: crystalline limestone; minor volcanic rocks*

UPPER TRIASSIC AND (?) EARLIER
KARMUTSEN GROUP

1 — *Basaltic and andesitic lavas, agglomerates, breccias, and tuffs; minor intercalated limestone*

Heavily drift-covered area
Bedding (horizontal, inclined, vertical)
Fault (arrow indicates direction of dip)
Anticlinal axis
Synclinal axis
Glacial striæ
Adit x2
Mineral prospect

LIST OF MINERAL PROSPECTS

1 Nimpkish copper group (copper)
2 Smith group (lead, zinc, copper)
3 Klaanch magnetite deposit (iron)

Geology by H.C.Gunning, 1929, 1931
Descriptive notes by J.W.Hoadley, 1952

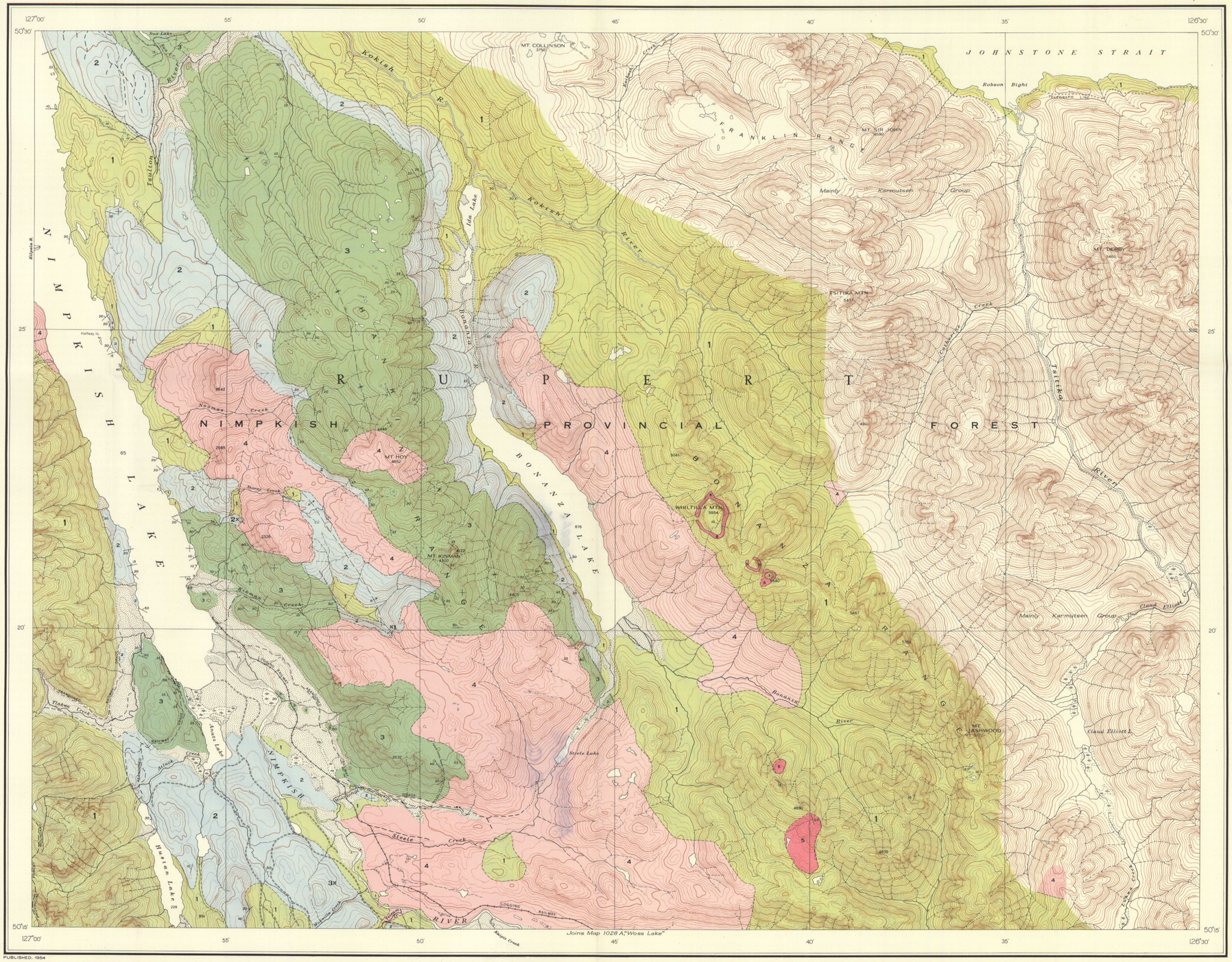
Cartography by the Geological Cartography Division, 1953

Logging road
Trail
Building
Telegraph line
Logging railway
Abandoned railway grade
Provincial forest boundary
Intermittent stream
Marsh
Shoal, sand, or gravel
Contours (interval 100 feet)
Height in feet above mean sea-level 2632

Base-map compiled and drawn by the Surveys and Mapping Branch

Air photographs covering this map-area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

Approximate magnetic declination, 24°22' East



PUBLISHED, 1954

MAP 1029A

NIMPKISH

VANCOUVER ISLAND
BRITISH COLUMBIA

Scale: One Inch to One Mile = 1/63,360

Miles 1 ¾ ½ ¼ 0 1 2 3

DESCRIPTIVE NOTES

The map-area occupies part of northern Vancouver Island, and includes several moderately high mountainous ridges separated by wide valleys, two of which are occupied by large lakes. In general, the topography is more subdued than in the adjoining Woss Lake map-area to the south. The valleys and lower slopes of the hills are for the most part completely timbered, and in many places the underbrush is exceedingly thick, making travel very arduous.

The Karmutsen group (1) consists of a great thickness of basaltic and andesitic lava flows, agglomerates, breccias, and tuffs, with minor intercalated sedimentary strata. With the exception of the tuffs, the volcanic rocks are generally massive and dark green or black, and are characteristically amygdaloidal. Much of the group has undergone regional metamorphism: where the rocks are well removed from intrusive bodies, the principal changes have been due to induration, some recrystallization, chloritization, and epidotization, but in the immediate vicinity of intrusions the processes of dynamic and thermal metamorphism have resulted in complete obliteration of most of the original textures.

The Karmutsen group is conformably overlain by the Quatsino formation (2), which consists of crystalline limestone intercalated with minor, thin volcanic flows. It varies in thickness from about 1,000 feet, as measured on the steep slopes west of Bonanza Lake, to about 200 feet in the vicinity of Beaver Cove, on the coast just north of the map-area. The limestone is fine to coarsely crystalline, and varies in colour from pure white to black. Towards the base, it tends to be exceedingly fine grained, and grey and brownish or buff types are characteristic. Midway of the formation the predominant colours are white and grey, but towards the top they change to dark grey or black, due to the presence more or less carbonaceous matter. In places where the limestone has been cut by Coast intrusions, it has been much altered, and in part has been converted to a variety of contact metamorphic silicate minerals. Some of these metamorphic zones contain varying amounts of magnetite and of copper, lead, and zinc sulphides. Elsewhere little alteration was noted beyond simple recrystallization.

The Quatsino formation is conformably overlain by rocks of the Bonanza group (3). The lower 400 to 500 feet of the group consists of thin-bedded argillite, tuffaceous argillite, impure limestone, quartzite, and numerous, thin, intercalated andesitic lava flows. Above this lower, predominantly sedimentary part, the rocks of the group consist of a great thickness of andesitic lavas, agglomerates, tuffs, and breccias, with lesser amounts of basaltic, trachytic, and dacitic lavas and minor intercalated lenses of limestone. The top of the group has nowhere been recognized either in this or nearby map-areas. In general, the rocks are much altered by induration and regional metamorphism so that original textures are largely obliterated.

Primary structures within this conformable series of volcanic and sedimentary rocks (1-3), which in earlier accounts has been generally referred to the widespread Vancouver group, have been largely preserved, and the strata occupy large open folds striking about north 40 degrees west. In the vicinity of major intrusions, however, fracturing and folding of the strata are more intense, the volcanic rocks having yielded to the deformational stresses largely by fracture and the less competent sedimentary strata mainly by folding and flowage.

Fossils found in the sedimentary part of the Bonanza group include the diagnostic species *Monotis subcircularis*, thus establishing the age of this part of the group as late Upper Triassic. No diagnostic fossils have been found in the rocks of the Quatsino formation or in those of the Karmutsen group, but in Zeballos map-area Upper Triassic fossils have been found in upper members of the Karmutsen group. It would, therefore, seem probable that much, if not all, of the entire series of pre-batholithic sedimentary and volcanic rocks in this and adjoining map-areas is Upper Triassic in age.

The Coast intrusions (4-5) provide a variety of rock types, the commonest being quartz monzonite, granodiorite, and quartz diorite. A pronounced northwest trend of the masses, more or less parallel with the strike of the intruded rocks, may be noted, and for the most part they exhibit intrusive contacts. Basic border phases containing a high percentage of included material are common except where the intruded rocks are Quatsino limestone.

The Coast intrusions are cut by basic dykes, which follow prominent joint fractures in the granitic rocks.

The valley floors and lower slopes of some of the mountains are largely covered with a superficial mantle consisting mainly of river deposits, glacial drift, and fluvioglacial sediments.

The showings on the Nimpkish copper group consist of a large number of rich sulphide masses that occur as irregular replacement bodies in the limestone west of Kinman Creek. They occupy a belt some 400 feet wide and 3,000 feet long adjoining the contact of the granodiorite. Chalcopyrite is the principal ore mineral, but is usually accompanied by varying amounts of pyrite, pyrrhotite, sphalerite, and, in some places, molybdenite. Gangue minerals include magnetite, garnet, epidote, calcite, quartz, actinolite, chlorite, and sericite. These bodies vary in size from mere stringers to solid masses 10 or 15 feet wide, and many of them are composed almost entirely of chalcopyrite. In others, sphalerite is found intimately mixed with the chalcopyrite or occurs in relatively pure masses. The showings were discovered in 1928, and The Consolidated Mining and Smelting Company of Canada, Limited, did extensive exploratory work on them during 1929 and 1930. Since then no recorded work has been done on the property.

Two principal types of mineral deposits occur on the property known as the Smith group, namely: (a) deposits in the limestone or overlying volcanic rocks at or near the contact of the quartz diorite, and (b) a lead-zinc-copper replacement body in the limestone. Those of the first type are typical contact metamorphic deposits, very similar to, but smaller than, those occurring on the Nimpkish Copper group. The deposit of the second type consists of a replacement body composed of silicate and sulphide minerals that follows the contact of the Quatsino limestone with the underlying basic volcanic rocks. This mineralized zone strikes northwest, dips about 35 degrees southwest, and has a maximum thickness, including silicate minerals, of about 34 feet. Within it, near the top, a band of nearly solid sulphides, varying in thickness from 4 to 8 feet, has been exposed by open-pits at intervals for about 170 feet. Galena and sphalerite predominate towards the southeast end, and chalcopyrite is more abundant towards the northwest where, as a whole, the mineralization is lower grade.

The Klaanch magnetite deposit was discovered about 1900, and although Crown granted and held for a long time, has never been thoroughly explored. It consists of a zone of magnetite, with minor amounts of silicate minerals, pyrite, and chalcopyrite, and lies at the contact of limestone and basic volcanic rocks. Magnetite occurs as disseminations in the volcanic rocks, and as fairly pure replacement bodies up to 10 or more feet in width at several places on the property.

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