



LEGEND

SOUTHERN PART OF MAP-AREA

DEVONIAN OR LATER
POST LOWER DEVONIAN
12 Dykes; 12a, diabase; 12b, gabbro; 12c, felsite (8b may be related to 12a)

DEVONIAN
MIDDLE DEVONIAN
11 11a, diabase and gabbro; 11b, contact metamorphic rocks, including rusty weathering carbonate and amphibolite (age of 11a uncertain)

LOWER OR MIDDLE DEVONIAN
10 Grey and grey-brown crossbedded sandstone, minor conglomerate; 10a, minor rhyolite

LOWER DEVONIAN (?)
9 Amygdaloidal basic volcanic rocks

LOWER DEVONIAN
8a, grey-green feldspathic argillite, siltstone, minor purple argillite, minor undifferentiated basic volcanic rocks, dykes and sills; 8b, andesitic and diabasic flows, dykes or sills; 8c, predominantly orange-pink fine-grained, even-grained rhyolite; 8d, dark brown and orange-pink rhyolite, tuff, breccia; minor dark grey-green fine-grained andesite; 8e, dark grey and green andesite, breccia, minor orange-pink rhyolite

SILURIAN

UPPER SILURIAN
7 Lithic gneissic assemblage: includes grey-green and maroon-purple conglomerate, grit, sandstone and siltstone; calcareous in part

UPPER SILURIAN (?)
6 Maroon, green, and grey argillite and siltstone, minor sandstone and conglomerate

MIDDLE OR UPPER SILURIAN
5a, blue-grey argillite; 5b, grey argillite; interbedded grey and grey-green sandstone, argillite and calcareous argillite, minor conglomerate, minor maroon and purple argillite; 5b, limestone and calcareous argillite

ORDOVICIAN (?)
4 Light grey meta-gabbro

ORDOVICIAN

MIDDLE ORDOVICIAN (?)
3 Sericite-quartz schist, chlorite-quartz schist, augen schist, phyllonite, may be metamorphosed equivalents of 1 and 2; may include some 1 and 2

2 Dark grey to black argillite, phyllite, and graphitic schist; maroon and green chert and argillite, phyllite and schist; diabase

1 Grey, finely laminated argillite, thin beds of quartzite

NORTHERN PART OF MAP-AREA

DEVONIAN OR LATER
POST LOWER DEVONIAN
21 Dykes; 21a, orthoclase porphyry; 21b, diabase (may be equivalent to 12a)

DEVONIAN
MIDDLE DEVONIAN (?)
20 Red-brown and grey-brown poorly sorted conglomerate and sandstone

LOWER DEVONIAN
19a, predominantly grey-green and red-brown amygdaloidal and porphyritic basic flows and pyroclastic rocks, minor interbedded sedimentary rocks; 19b, orange-pink fine-grained rhyolite

18 Grey-green finely laminated micaceous argillite and siltstone, calcareous in part; 18a, basic tuffs and flows interbedded with 18; 18b, columnar rhyolite flow

DALHOUSIE FORMATION

17a, predominantly grey-green and red-brown amygdaloidal and porphyritic basic flows and pyroclastic rocks, minor interbedded sedimentary rocks; 17b, orange-pink fine-grained rhyolite

16a, red-brown volcanic boulder conglomerate, sandstone, buff-weathering calcareous sandstone and bioclastic limestone; 16b, grey-green and grey (fagy) micaceous argillite and siltstone, grey-brown sandstone and argillite, calcareous in part (may include some 15)

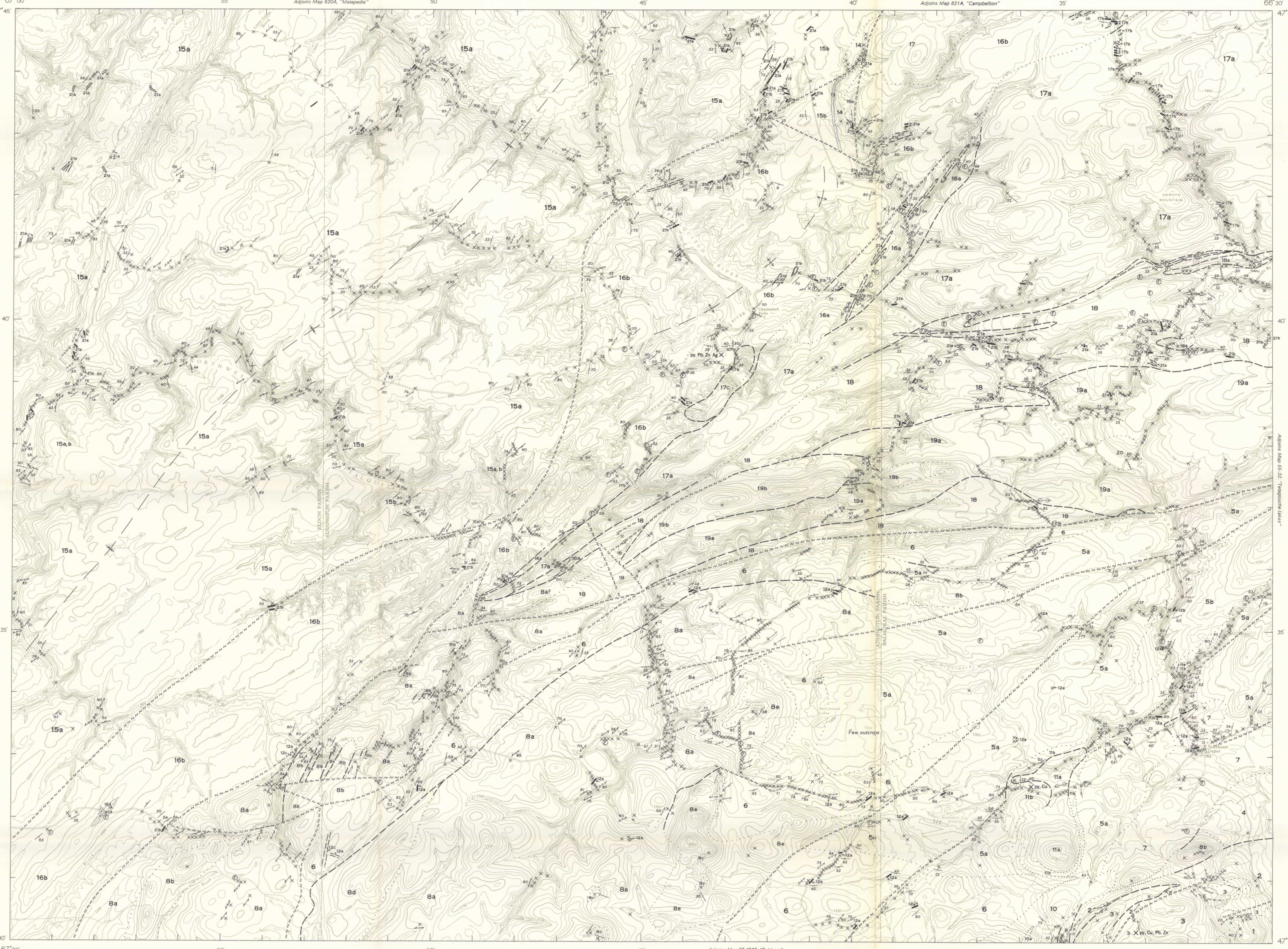
LOWER AND/OR MIDDLE SILURIAN

15a, blue-grey and grey argillite and calcareous argillite with thin beds of siltstone, sandstone, and quartzite; 15b, buff-weathering blue-grey dense, very fine-grained limestone and calcareous argillite with fine laminae of siltstone

14 Basic volcanic flows and pyroclastic rocks

ORDOVICIAN

MIDDLE OR UPPER ORDOVICIAN
13 Dark grey to black chert, graphitic schist



DESCRIPTIVE NOTES

The map-area lies within a belt of deformed Palaeozoic rocks that extends from eastern Maine to Chaleur Bay. It is easily accessible by private roads of the New Brunswick International Paper Company from Dalhousie and Campbellton, about 20 miles north of the map-area.
The map-area may be divided into several structural units. Highly deformed Ordovician rocks (1-4) of the Tetagouche Group outcrop in its south-eastern part. Folded Silurian (5-7) and Devonian rocks (8-11) outcrop to the north and west of the Tetagouche Group, but south of the fault that follows parts of Pat Brook, Ninemile Brook, Mulligan Gulch, Oxbow Brook, and Meadow Brook. This fault is an extension of the Rocky Brook - Millstream fault mapped to the east by Skinner¹. South-dipping Silurian and Devonian sedimentary and volcanic rocks (12-20) occur north of this fault, and overlie a thick(?) sequence of folded Ordovician and Silurian rocks (13-16), which occur in the southwestern part of the map-area. Because of the differences in lithology, fauna and styles of deformation north and south of this fault, it is desirable to divide the legend into two parts. All strata have been intruded by stocks, dykes, and sills of variable composition (4, 8b, 11, 12, 17b, 17c, 21).

Southern Part of Map-area
Bedding in sedimentary rocks of units 1 and 2 was observed only in a few places. This and other sedimentary structures have been obscured by shearing parallel to bedding and a younger cleavage at a high angle to bedding. Numerous quartz-muscovite laminae occur in these sheared rocks and have been displayed by the younger cleavage to form a phyllonitic rock with a pseudopyroclitic texture (3). The older shearing and younger cleavage are best developed on one or both sides of large faults, possibly shallow north-dipping thrusts, which are indicated on the map. Gradational changes between units 1 and 2 have been observed on a large hill, approximately 3 miles south of Southeast Depot. There, comparatively undeformed rocks of unit 1 occur approximately 1,000 feet south of the fault, phyllonitic rocks approximately 500 feet from the fault, and rocks resembling augen schists closer to the fault. Map-unit 4 may have been deformed by a similar fault. If this is the case, it is the only evidence for major faulting between the Tetagouche Group (1-4) and the Silurian rocks of map-unit 7.
Good exposures of unit 6 occur on Southeast Upsalquitch River between Meadow Brook and Murray Brook, and on the lower parts of Ramsay Brook. These rocks are mostly steeply dipping, and the internal stratigraphy of this map-unit is not fully understood. Calcareous and argillaceous sedimentary rocks (5b) containing corals were noted on Southeast Upsalquitch River, 3/4 mile north of the mouth of Ramsay Brook.
Multicoloured sedimentary rocks (6) are highly folded, except in the area near Budworm City Airstrip. No diagnostic fossils have been found within this unit, but it is interpreted as Upper Silurian. It may be in part equivalent to (7).
Map-unit 7 is best exposed on Southeast Upsalquitch River between Murray Brook and Southeast Depot. There, graded bedding, poor sorting, scouring, and cyclothemic repetition of beds containing coarse and fine detrital fragments can be observed. The abundance of ferruginous chert fragments suggests that much of the detritus was derived from the Tetagouche Group (1-4). Large pentamerid brachiopods and corals occur near Eighteenmile Brook, just east of the map-area.
Rocks of unit 8 are more highly deformed than strata of similar age in the northern part of the map-area (18-19). Fossils are less abundant, too, but brachiopods and crinoid debris have been found in a few localities. The rhyolite rocks (8d) may be small stocks, and some evidence of silicification was noted near the western margin of the small mass, approximately 10 miles southwest of McCormack Fire Tower.

Amygdaloidal basic volcanic rocks (9) resembling those of 19a outcrop on a road east and southeast of Third Portage Lake. Spherulitic rhyolite appears to be associated with these rocks, and occurs just south of the map-area. These flows are overlain by clastic sedimentary rocks (10), and a brachiopod from a drill-hole within this unit was identified by L. M. Camming of the Geological Survey as a Lower or Middle Devonian form.
A medium-grained diabase stock (11a) is best exposed on Ramsay Brook and on the New Brunswick International Paper Company road, 1 mile east of the bridge crossing Ramsay Brook. The gently dipping strata on the roof of, and near the northwest margin of this stock have been metamorphosed to a rusty weathering rock consisting of carbonate and amphibole (11b). Diabase and associated metamorphic rocks were noted in the core of a small anticline on Southeast Upsalquitch River, a few hundred feet south of the mouth of Murray Brook.
Diabase dykes (12a) are common in the southern part of the map-area, and gabbroic dykes (12b), which contain quartz-epidote veins, are most abundant in the area southwest of Budworm City Airstrip. Small veins of peridotite and chrysolite are associated with these dykes.

Northern Part of Map-area
Fragments of graptolite chert and graphitic schist (13) were found on the northwest slope of the ridge west of Pat Brook. Similar rocks were also observed on Little Popelogan Brook, and are overlain (?) by vesicular basic flows and pyroclastic rocks (14). The latter consists of angular to subangular fragments of volcanic material in a calcite matrix.
Well preserved sedimentary structures including minute crossbeds, flame structures, and fine silt laminae are characteristic of the calcareous and argillaceous strata of map-unit 15. The internal stratigraphy and structure are not fully understood, but the degree of deformation is most intense and cleavage best developed in the extreme northeastern part of the map-area.
The sedimentary rocks of map-unit 16 are mostly coarser grained than those of map-unit 15. Thin beds of conglomerate and sandstone are commonly associated with the argillaceous rocks of 16b, particularly in the area between Pat Brook and Ninemile Brook. Brachiopods are locally abundant within 16a, and a possible biostromal limestone was observed on Little Popelogan Brook, 1 1/4 miles northeast of Southeast Upsalquitch River.
Amygdaloidal and porphyritic andesitic flows are common within map-unit 17, but distinctive red, red-brown, and orange rhyolitic and trachytic rocks predominate. Laminated and spherulitic varieties of these siltite flows are common. There is some evidence of repetition of lithology by block faulting, but the complete stratigraphic succession has not been worked out. Numerous dykes (17b) cut both this unit and the Middle Silurian rocks (18). Swarms of these dykes occur in the area north of Norton Gulch, and many of them, including the aplite stock (17c) appear to be feeders for the rhyolitic and trachytic flows.
Lower Devonian rocks (18), which are probably equivalent to the Dalhousie Formation² (A. J. Boucot, personal communication), appear to overlie disconformably the volcanic rocks of unit 17. Lower Devonian brachiopods, corals, and trilobites are well preserved, and are particularly abundant near the base of this formation. Thin basic volcanic flows and related pyroclastic rocks (18a) are common, and are well exposed on Little Southeast Upsalquitch River and Jerry Ferguson Brook.
Amygdaloidal and porphyritic flows and related pyroclastic rocks predominate within map-unit 19, but thin beds of sandstone and conglomerate are common near the eastern part of the map-area. Rhyolite rocks (19b) outcrop on Jerry Ferguson Brook, and fragments are abundant on the high ridges nearby.
Thick felsite dykes (21a), including orthoclase-biotite porphyry, are abundant in the northern part of the map-area. They are very similar to dykes associated with the Silurian volcanic assemblage (17), but are in part much younger as they intrude Lower Devonian strata. Diabase dykes (21b) occur locally, and where exposures are limited, are difficult to distinguish from the flows of map-units 18 and 19.
A pyritic and base-metal deposit, approximately 2 miles east of Third Portage Lake, is being explored by New Jersey Zinc Exploration Co. (Canada) Ltd. Minor pyrite and chalcocyanite occurs in the metamorphic aureole of the diabase stock (11a). Some prospecting has been done near a small base-metal prospect on Northwest Upsalquitch River, approximately 1 mile southwest of Upsalquitch Forks. Some exploration work, including diamond drilling has been carried out in the Little Popelogan Brook area. One piece of massive pyrite was found, in float, approximately 1 1/2 miles south-southeast of the mouth of McDougall Brook. Although nothing of economic importance was observed within the volcanic rocks of map-unit 17, their tectonic setting and age of intrusion suggests the possibility of gold-silver mineralization³.

REFERENCES
¹Skinner, R.: Bathurst map-area, New Brunswick; Geol. Surv. Can., Preliminary Paper 53-29 (1935).
²Skinner, R.: Tetagouche map-area, New Brunswick; Geol. Surv. Can., Paper 55-22 (1955).
³Stims, W. A.: Geologic notes, Map M-6, Junction of Murray and Ramsay Brooks, Restigouche County, New Brunswick; N. B. Dept. Lands and Mines, Mines Branch, Paper 58-3 (1961).
⁴Anderson, F. D., et al.: Tobique map-area, New Brunswick; Geol. Surv. Can., Preliminary Paper 57-19 (1962).
⁵Toong, K. S.: Volcanic rocks of the Red Brook area, Restigouche County, New Brunswick; unpublished B.Sc. Thesis, Carleton University, Ottawa (1963).
⁶Alcock, F. J.: Geology of Chaleur Bay region; Geol. Surv. Can., Memoir 227 (1935).
⁷McCartney, W. D., and Potter, R. R.: Mineralization as related to structural deformation, igneous activity and sedimentation in folded geosynclines; Can. Min. J., vol. 83, No. 4, pp. 85-87 (1962).

Geology by R. R. Potter, 1962-63

Geological cartography by the Geological Survey of Canada, 1964

Base-map compiled and drawn by the Surveys and Mapping Branch, 1957 with revisions to roads by the Geological Survey of Canada, 1964

Approximate magnetic declination, 23° 07' West decreasing 2.8" annually

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MAP 14-1964
GEOLOGY
UPSALQUITCH FORKS
NEW BRUNSWICK

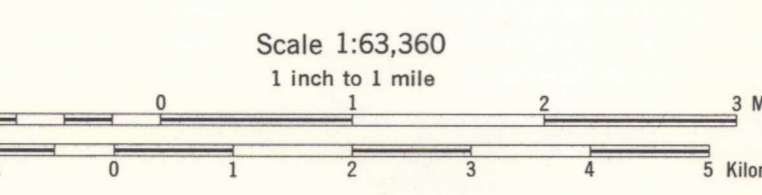


Table with symbols for geological features: Rock outcrop, Geological boundary, Bedding, Cleavage, Lamination, Fault, Joint, Anticline, Syncline, Glacial stria, Fossil locality, Mineral occurrence, Trench.

Table of Minerals: Copper (Cu), Silver (Ag), Lead (Pb), Zinc (Zn), Pyrite (py).

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Table with symbols for map features: Road, Cart track, Building, Parish boundary, Horizontal control point, Intermittent stream, Marsh, Contours, Height in feet above mean sea-level.