

DESCRIPTIVE NOTES

The Chipman area is low lying with rolling hills and small streams that have not been incised more than 150 feet below the general surface. Elevations range from sea-level in the southwest (Grand Lake) to 400 feet in the north-west. Although the Pennsylvanian formations are gently folded, their trend, north 60 degrees east, is clearly expressed in the general direction of peninsulas and inlets of Grand Lake and of some low ridges of harder sandstone.

The COAL CREEK formation (1) is a complex of folded, dark green phyllite and foliated sandstone. It contains many quartz veins, which are up to 1 foot thick and generally parallel with the strike of enclosing strata. These beds are well exposed within the map-area on a 3-mile stretch of Coal Creek and some of its tributaries. They strike generally about north 60 degrees east and are vertical. Close to the exposure of their contact with the Pennsylvanian they are cut by a dyke of pinkish grey orthoclase porphyry.

The NEWCASTLE CREEK formation (2) is much thinner in the Chipman area than in the adjoining Minto area, and does not carry any large quartz boulders as in the type locality. On Salmon River, 1½ miles downstream from Chipman, beds of angular quartz-conglomerate with fragments up to 1 inch in diameter are the lowest beds exposed. The matrix of the conglomerate contains some microscopic sheets of volcanic glass. This rock grades into soft, crumbly sandstone, overlain by 8 feet of greenish grey chert with indistinct columnar jointing. A thin section of the chert shows that it consists mainly of sharp, angular, quartz fragments. Part of this section, about 15 feet of strata, is probably of volcanic origin. The lava flow (3) overlying the Newcastle Formation in the Hardwood Ridge area is missing in this part of Chipman area and the chert bed is directly overlain by sandstone of the Minto formation.

However, the northeast tip of the Hardwood Ridge lava extends into the northwestern part of the area, as indicated by the occurrence of many loose fragments and by anomalies observed with a magnetometer. On Coal Creek both the Newcastle Creek formation and the lava flow are missing and the Coal Creek pre-Carboniferous schist is directly overlain by green sandstone and red-brown shale, probably representing the basal part of the Minto formation.

The lower part of the MINTO formation (4) consists of grey, fine and coarse sandstone and conglomerate, of which the main constituents are rounded pebbles of quartz and quartzite. Crossbedding is conspicuous in many places, and commonly obscures the real dip of the strata, which is nearly flat. Outcrops of the lower beds of the Minto formation occur characteristically in cliffs at the top of the stream banks, below which the slopes are covered with sandstone slabs. The formation is well exposed on Salmon River, near Iron Board Cove.

The upper part of the MINTO formation (5) has no sharp boundary with the lower beds. The sandstone of this division is marked by the presence of massive or pyrite concretions. Stems of Calamites several feet long lie on the bedding planes. Good outcrops of this sandstone occur on the shore of Grand Lake. The sandstone grades upwards into grey, thin-bedded to massive siltstone and shale, with fine carbonaceous material forming typical black coatings on the bedding planes. The only workable coal seam in the area (5a) occurs in these shales. Well-preserved plants in the roof shales of the seam indicate a late Pennsylvanian (Pictou) age. The coal is generally underlain by about a foot of soft, grey fireclay. Near Minto the coal occurs 20 to 40 feet below the base of the overlying Hurley Creek formation, and this is also the common relation in the Chipman area. In the north part of the area the coal seam is very thin or absent, and distinction between upper and lower parts of the Minto formation becomes difficult.

The Hurley Creek formation (6) consists of purplish red, or locally light green, shale, siltstone, and sandstone, and lighter coloured grit and conglomerate; the finer sediments occur only in the lower part. Much of the red sandstone contains fragments of green phyllite. Red is a less conspicuous colour in the conglomerates and grits, but these rocks can be distinguished from the Minto sandstone by the predominance of pebbles of metamorphic and igneous rocks, and by the many pink grains of orthoclase or feldspar rock in the gritty material. Good exposures of the formation may be seen in the shale pit of the Chipman back shed, on North Salmon Creek, and on the shore of Grand Lake.

The SUNBURY CREEK formation (7a-7c) consists of a sedimentary series that recapitulates the lithology of the Minto and Hurley Creek formations. It is insufficiently exposed to warrant anything but a tentative subdivision into lower, middle, and upper parts. In the northwest corner of the area the basal part (7A) is lithologically and topographically similar to the lower Minto beds. The middle part (7B) contains grey, slightly lumpy sandstone in 1- to 2-inch slabs, showing a sharply delimited rusty rim of even width. Grey, thin-bedded to massive siltstone and grey shale also occur, and on Mount Brook a coal seam about 1 foot thick has been encountered in two places. The upper part of the Sunbury Creek formation (7c) contains sandstone and conglomerate similar to that of the Hurley Creek formation. The conglomerates carry greenish grey shale pebbles in several exposures. So far as is known from the few outcrops, the formation does not include red shale in the north part of the map-area.

In the southern part of the area the formation contains trachytic lava flows (8), and possibly some associated dykes. In the hand specimen they resemble the older lava on Newcastle Creek, but they are commonly porphyritic, and of more acidic composition. These rocks are associated with red shale and sandstone. One flow outcropping on the highway near the bridge over Cumberland Creek may mark the boundary between the Hurley Creek and Sunbury Creek formations. A higher flow occurs as a cap on Cumberland hill and is probably the youngest rock in the area. Poor exposures of trachytic scoria, occurring south of this hill, may represent a dyke.

All the strata in the area with the exception of the Coal Creek formation exhibit a very gently undulating structure. Although it is commonly difficult or impossible to obtain accurate attitudes of the beds, the distribution of formations in the map-area shows an unmistakable structural pattern with a general strike of north 60 degrees east. It may be caused by slight folding in Pennsylvanian or later time, or it may be due to deposition on an uneven surface, expressed by pre-Pennsylvanian folds with a general north 60 degrees east trend.

The Hardwood Ridge anticline of the Minto area plunges northeastward and may continue parallel to Salmon River. Erosion of the Coal Creek anticline, also trending north 60 degrees east, is responsible for the exposure of the pre-Carboniferous strata and the coal occurrences along the creek of that name. The topographic expression of its extension to the southwest is a depression occupied by an arm of Grand Lake. Between these two gentle anticlines is another uplift, area along Salmon River, where Newcastle Corriet and lower Minto beds are exposed. It is noticeable that the culminations of these three structures have an east-west linear arrangement, possibly indicating another structural trend. South of the Coal Creek anticline is a syncline and the volcanic flow on top of Cumberland hill roughly indicates its axis.

LEGEND

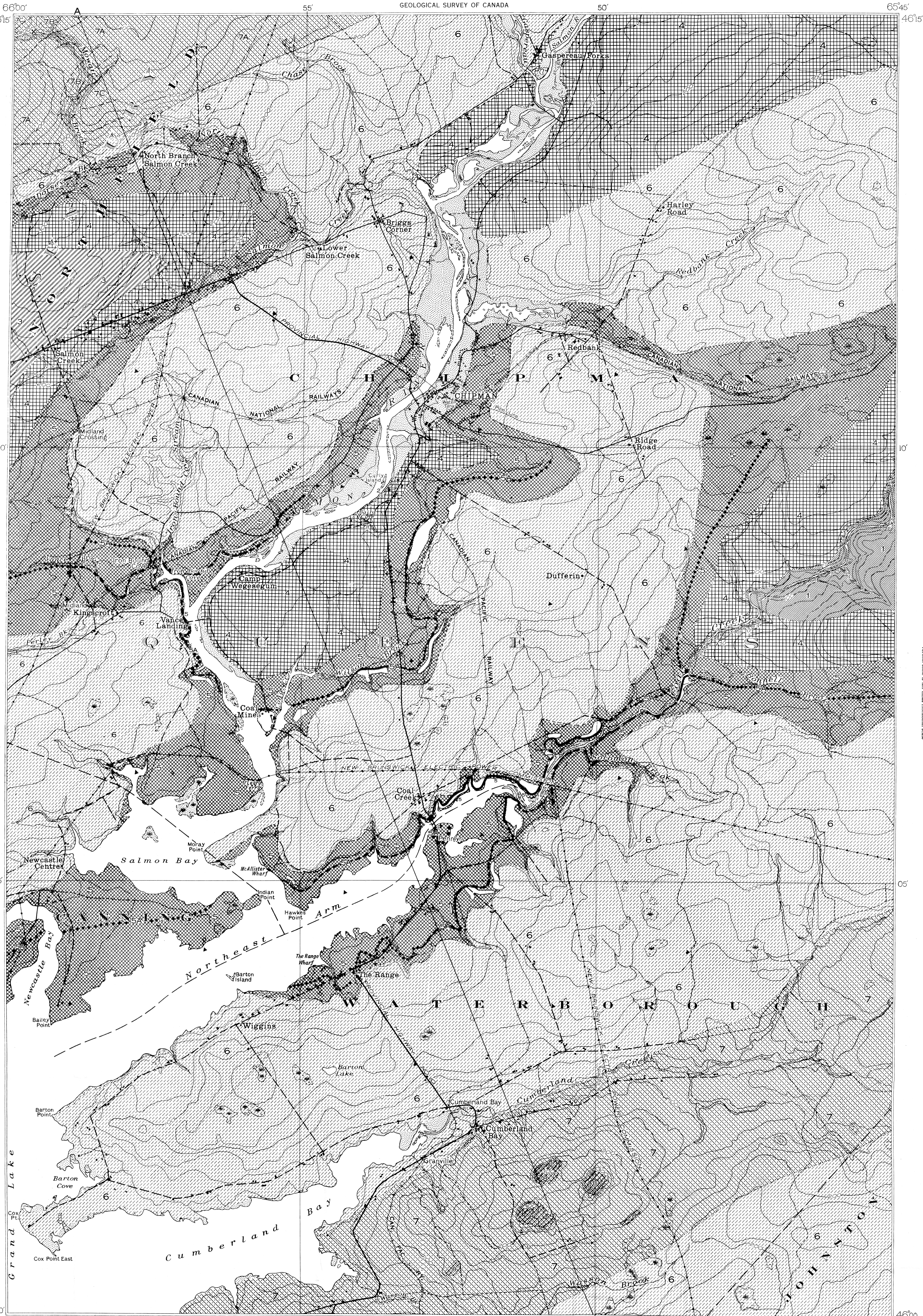
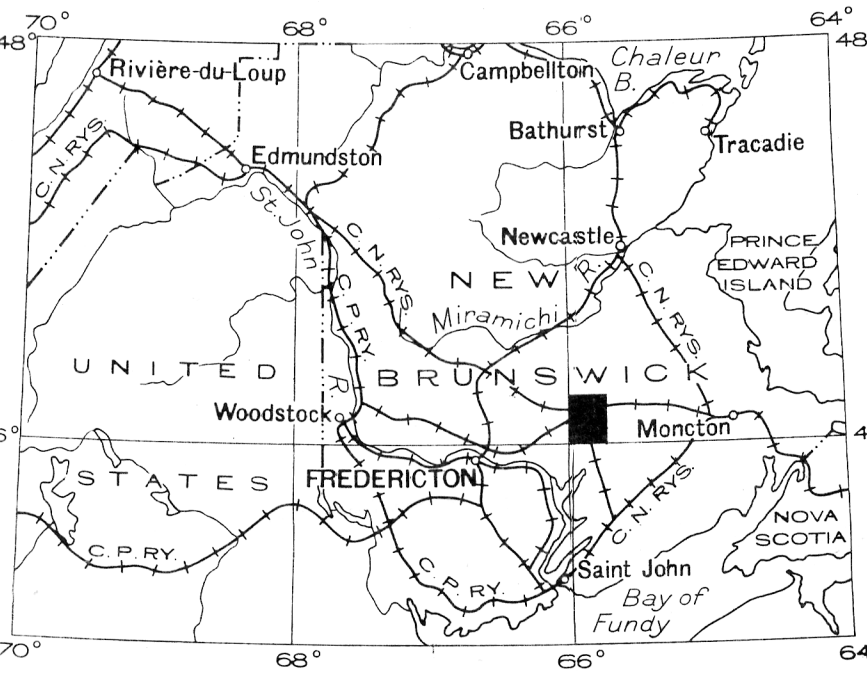
- CARBONIFEROUS**
- PENNSYLVANIAN**
- PEITICOCAN GROUP (4a,b)**
- SUNBURY CREEK FORMATION (7a, 7b, 7c)** grey sandstone and quartz conglomerate; 7b, grey, brown weathering sandstone; grey, commonly carbonaceous, siltstone and shale; coal; 7c, pinkish-grey to green sandstone, pebbly sandstone, and conglomerate; B, purple-red trachyte, in many places porphyritic
- HURLEY CREEK FORMATION (6)** purple-red, locally green, sandstone, shale, and siltstone; reddish-grey gritty sandstone and conglomerate
- MINTO FORMATION (Upper Part)** buff sandstone and pebbly sandstone, commonly carbonaceous, and with iron sulphide concretions; light grey siltstone and shale; 5a, coal
- MINTO FORMATION (Lower Part)** grey buff quartzite sandstone, pebbly sandstone, and conglomerate
- HOPEWELL GROUP (7) (2, 3)** Andesite to trachyte lava, purple-grey dense, locally porphyritic or amygdaloidal
- NEWCASTLE CREEK FORMATION (2)** quartz conglomerate, sandstone, chert, purple-red shale
- PRECARBONIFEROUS**
- COAL CREEK FORMATION (1)** green pyritic phyllite and foliated sandstone, with many quartz veins

- Areas covered by sand and gravel
- Rock outcrop
- Bedding (inclined, vertical)
- Coal outcrop (natural or in prospect)
- Slope (Note: Slopes are too numerous to be shown)
- Stripped area
- Approximate position of corner of provincial mining block
- Bore hole

Geology by J. E. Muller, 1948.

Cartography by Geological Mapping Division, 1949.
Base-map surveyed by Topographical Survey, 1945.

Approximate Magnetic Declination, 22°55' West.



PRELIMINARY MAP 49-21A
(GEOLOGICAL MAP)
CHIPMAN
QUEENS AND SUNBURY COUNTIES
NEW BRUNSWICK
Scale 31,680 or 1 Inch to ½ Mile
2 Miles

STRUCTURE—SECTION ALONG LINE A-B

Vertical scale is 100 times horizontal scale

Sheet 42

Sheet 43

Sheet 44

Sheet 45