

Structure-section along line A-B  
VERTICAL SCALE IS TEN TIMES HORIZONTAL SCALE

GEOLOGICAL SERIES

SHEET 21 1/2 (East Half)

LEGEND

- CARBONIFEROUS**
- PENNSYLVANIAN**
- PICTOU GROUP (4-7)**
- 7A-7C** SUNBURY CREEK FORMATION: 7A, 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
- 6** HURLEY CREEK FORMATION: purple-red, locally green, sandstone, shale, and siltstone; reddish grey gritty sandstone and conglomerate
- 5** MINTO FORMATION (Upper Part): buff sandstone and pebbly sandstone, commonly carbonaceous and with iron sulphide concretions; light grey siltstone and shale; 5A, coal
- 4** MINTO FORMATION (Lower Part): grey-buff quartzose sandstone, pebbly sandstone, and conglomerate
- PENNSYLVANIAN OR (?) EARLIER**
- 3** PRE-PICTOU (?) (2,3) Mainly basalt to andesite: purple-grey, dense, locally porphyritic or amygdaloidal lava
- 2** NEWCASTLE CREEK FORMATION: brick-red boulder conglomerate; red shale and siltstone; tuff; some bentonite
- PRE-CARBONIFEROUS**
- 1** COAL CREEK FORMATION: green pyritic phyllite and foliated sandstone, with many quartz veins (in structure-section only)

- Area covered by sand and gravel
- Rock outcrop
- Bedding (inclined)
- Coal outcrop (natural or in prospect)
- Striped area
- Glacial striae
- Slope, adit (Note: shafts are too numerous to be shown)
- Bore-hole
- Approximate position of corner of provincial mining block

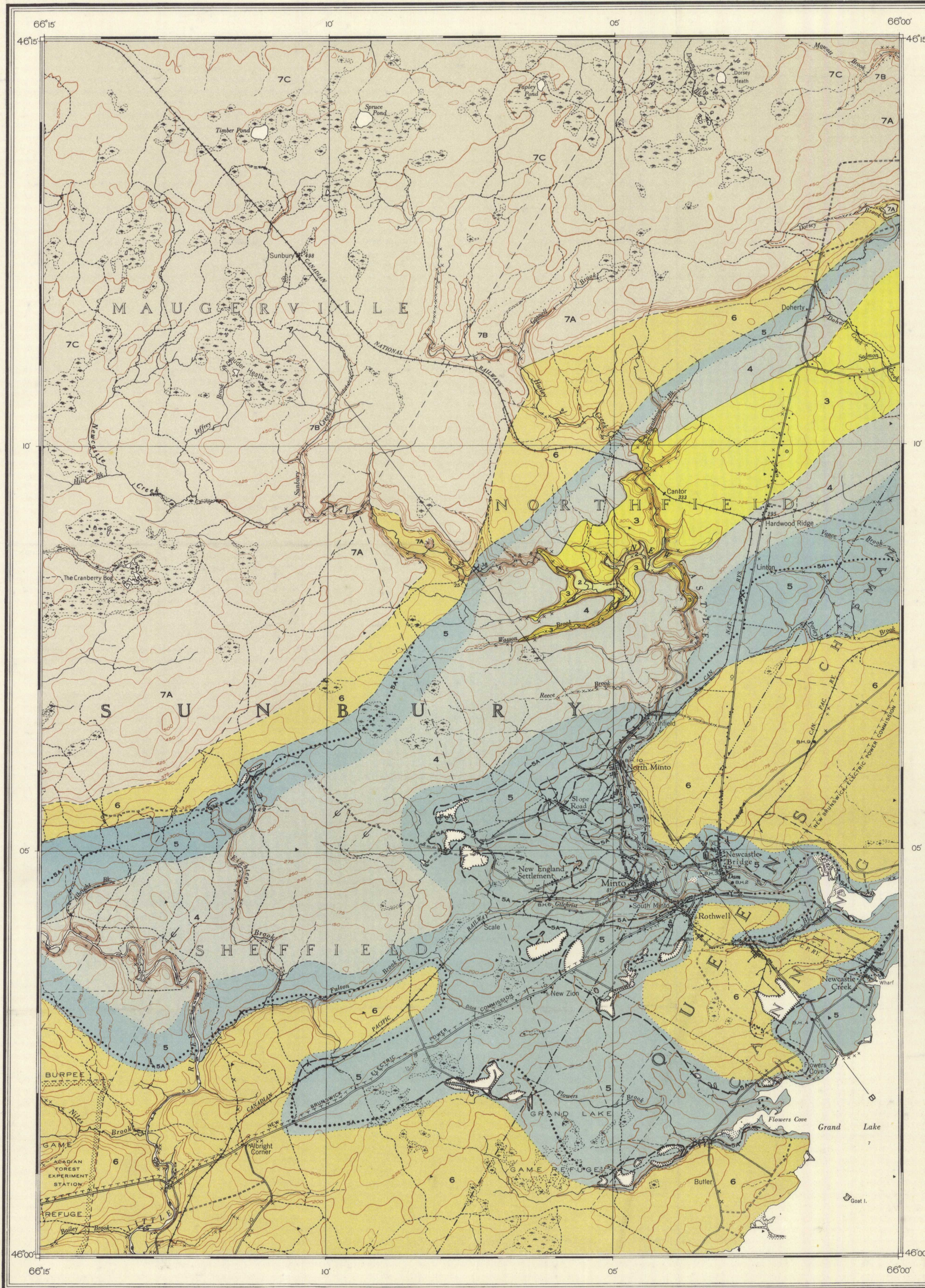
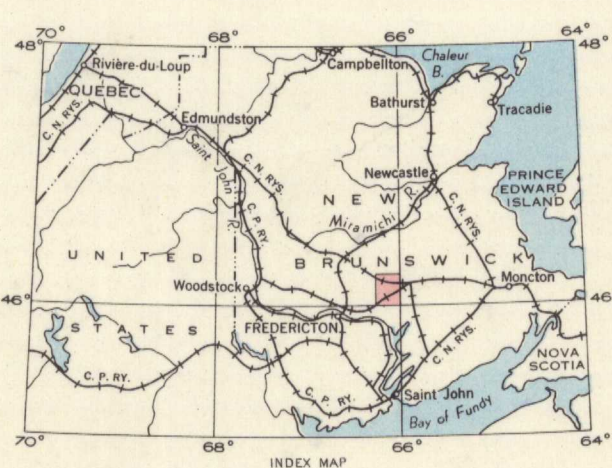
Geology by J.E. Muller, 1948

Cartography by the Geological Mapping Division, 1950

- Provincial highway
- Road and buildings
- Road not well travelled
- Trail
- Abandoned railway
- Power line
- Survey monument
- County boundary
- Parish boundary
- Forest Experiment Station boundary
- Game Refuge boundary
- Church
- School
- Post Office
- Sawmill
- Water tank
- Cemetery
- Intermittent stream
- Rapid
- Marsh
- Contours (interval 25 feet)
- Depression contour
- Height in feet above mean sea-level

Base map surveyed by the Topographical Survey, 1945 and 1947.  
Compiled by the Topographical Survey, 1949 from air photographs taken in 1944 and 1945 by the Royal Canadian Air Force

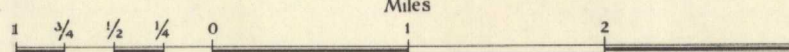
Approximate magnetic declination, 22° 1/2' West



PUBLISHED 1951, SUPERSEDES PUBLICATION NO. 2105, MINTO (EAST HALF)

MAP 1003A  
**MINTO**  
NEW BRUNSWICK

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



DESCRIPTIVE NOTES

The map-area is part of a low rolling plain, with small streams that have not been incised more than 150 feet below the general surface. Elevations range from sea-level in the southeast (Grand Lake) to 500 feet in the northwest. Although the Pennsylvanian formations are gently folded, their northeasterly trend 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 phyllites and foliated sandstones. It contains many quartz veins, which are up to 1 foot thick and generally parallel with the strike of enclosing strata. The formation has been encountered in several bore-holes near Minto at depths of from 200 to 350 feet. Good exposures occur on Coal Creek in the adjoining Chipman map-area, where the beds strike about north 60 degrees east and are vertical.

The NEWCASTLE CREEK formation (2) consists of coarse, brick-red conglomerate with boulders up to a foot in diameter, mainly of vein quartz, but including some of phyllite and other rocks. Apparently these were derived from the Coal Creek formation. This coarse conglomerate grades upward into a series of red, finer conglomerate, siltstone, shale, tuff, and fine volcanic breccias. One bed of bentonite, about 1 foot thick, was found. These volcanic rocks are exposed in a sharp bend of Newcastle Creek, about 200 feet downstream from the mouth of Hurley Creek.

Overlying the Newcastle Creek beds is a flow of purplish grey, dense, locally porphyritic, andesite to trachytic lava which forms steep cliffs on Newcastle and Hurley Creeks and on some of their tributaries. The flow is 80 feet thick on Hurley Creek, north of the railway trestle, but the base is not exposed. This thickness decreases to 30 feet in the southern outcrops on Newcastle Creek; in the bore-hole on the bank of this stream in North Minto (drilled in 1944) both conglomerate and lava were missing, as shown in Structure-section A-B. This wedging out may be due to limited original deposition, or it may indicate an unconformity and time-interval between these beds and the overlying late Pennsylvanian series.

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. At the contact with the underlying lava the rock may be partly carbonatized; this rock weathers to a dark brown, soft, crumbly material. In all the larger stream channels of the area the outcrops of the lower beds of the Minto formation occur characteristically in cliffs at the tops of the banks, below which the slopes are covered with sandstone slabs. Incised meanders are typically developed where they cross the coal seam in the lower part of the Sunbury Creek formation, which is lithologically similar.

The upper part of the MINTO formation (5) has no sharp boundary with the lower beds. The sandstones of this division are marked by the presence of marcesite or pyrite concretions, and stems of *Calamites* several feet long lie on the bedding planes. Good outcrops of these sandstones occur on the shore of Grand Lake and on Newcastle Creek. These beds grade upwards into grey, thin-bedded to massive siltstone and shales, with fine carbonaceous material or typical black coatings on the bedding planes. The one coal seam of the area (5A), with an average thickness of 18 inches, occurs in these shales. Well-preserved plants in the roof shales of the seam indicate a late Pennsylvanian (Pictou) age. The coal generally underlies by about a foot of soft, grey fire-clay. Near Minto, the coal occurs at 20 to 40 feet below the base of the overlying Hurley Creek formation; north of the Hardwood Ridge up to a series of sandstones may overlie the grey shales. In this latter area the coal seam is very thin or missing, 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 colored grit and conglomerate; the finer sediments occur only in the lower part. Many of the red sandstones contain fragments of green phyllites. Red is a less conspicuous colour in the conglomerates and grits, but these rocks can be distinguished from the Minto sandstones by the predominance of pebbles of metamorphic and igneous rocks and by the many pink grains of orthoclase or felsitic rock in the gritty material. In the Avon stripping, a gradual transition between grey Minto shales and red Hurley Creek beds can be observed, but for mapping purposes the boundary between the two formations is sufficiently sharp. The formation outcrops mainly in low, slumped banks along streams and in stream beds. The contact between the Hurley Creek shales and conglomerates is commonly a favourable horizon for springs.

The SUNBURY CREEK formation (7A-7C) consists of a sedimentary series very similar lithologically to the succession of lower and upper parts of the Minto formation and the succeeding Hurley Creek. It is insufficiently exposed to warrant anything but a tentative subdivision into lower, middle, and upper parts. The basal part (7A) has the lithological and topographic characteristics of the lower Minto beds. The middle part (7B) contains grey, rusty weathering, slightly limy sandstones in 1- to 2-inch slabs; grey, thin-bedded to massive siltstones; and grey shales. On Mowatt Brook, in the northwest corner of the adjoining Chipman map-area, a coal seam about 1 foot thick occurs in these shales. The upper part (7C) of the Sunbury Creek formation contains sandstones and conglomerates similar to those of the Hurley Creek formation. The conglomerates carry greenish grey shale and limy shale pebbles in several exposures. So far as known from few outcrops, the coal seam does not include red shales in the northern part of the map-area.

In the southern part of the adjoining Chipman area, the Sunbury Creek formation is overlain by extrusive rocks resembling the older lavas on Newcastle Creek, but commonly porphyritic and of more acidic composition.

The Pennsylvanian formations exhibit a very gentle undulating structure. Though 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 of the Pennsylvanian strata on an uneven surface, expressed by pre-Pennsylvanian folds with a general north 60 degrees east trend.

The Hardwood Ridge anticline is the most prominent structural feature of the area. The lava flow is exposed in its core, and stream channels reveal the coarse basal conglomerate underlying it. On its northern limb is a narrow belt where Minto and Hurley Creek formations have a relatively steep northwest dip, up to 30 degrees, suggesting a fault and/or abrupt thinning of the underlying lava flow. Farther northwest the basin deepens and, so far as known from few exposures, this area is underlain by the Sunbury Creek formation. A sharp flexure, with an average north 30 degrees west trend, was found in the coal seam in the area south of Minto. It may reflect some transverse fault in the subsurface formations.

Johns Map 1003A, Chipman

1003A  
S.L.G. Minto, N.B.  
A, Geol.  
Map 1003A

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1003A