CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

SHEET 11 $\frac{K}{16}$ (West Half)

LEGEND

CENOZOIC

QUATERNARY

9 — *Beach and bar sand and gravel*

PALÆOZOIC

MISSISSIPPIAN AND/OR PENNSYLVANIAN

CANSO GROUP

8 — *Maroon to grey shale, sandstone, conglomerate*

MISSISSIPPIAN

WINDSOR GROUP

6 — *Gypsum, limestone, sandy limestone; minor red to grey sandstone, siltstone, conglomerate*

7 — *Micaceous sandstone; graphitic shale and schist; probably equivalent to Horton group*

HORTON GROUP

5 — *Grey micaceous sandstone, conglomerate, shale; locally arkosic*

PRECAMBRIAN(?)

DEVONIAN OR EARLIER

4 — *Gabbro dykes*

3a, 3b — **3a**, *granite with numerous biotitic, chloritic, and hornblendic inclusions;* **3b**, *composite gneiss*

2a-2c — **2a**, *pink biotite-muscovite granite and pegmatite;* **2b**, *pegmatite predominant;* **2c**, *granodiorite*

1a, 1b — **1a**, *crystalline limestone;* **1b**, *hornblende schist*

Bedding (horizontal, inclined, upper side of beds unknown)
Foliation and schistosity (inclined, vertical)
Fault (approximate, assumed, solid circle indicates downthrow side)
Anticlinal axis (arrow indicates direction of plunge)
Synclinal axis (arrow indicates direction of plunge)
Glacial striæ
Fossil locality Ⓕ
Quarry
Mineral occurrence ×Cu

MINERAL OCCURRENCES

Copper . . . . . Cu *Lead* . . . . . Pb
Gypsum . . . . . Gyp *Pyrite* . . . . . Py

Geology by E. R. W. Neale, 1954

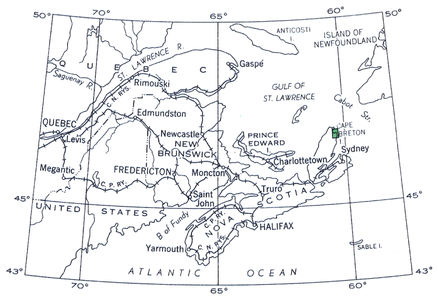
Main highway
Other roads
Trail
Park boundary
Stream, position approximate
Contours (interval 250 feet)

Approximate magnetic declination, 26° 49′ West

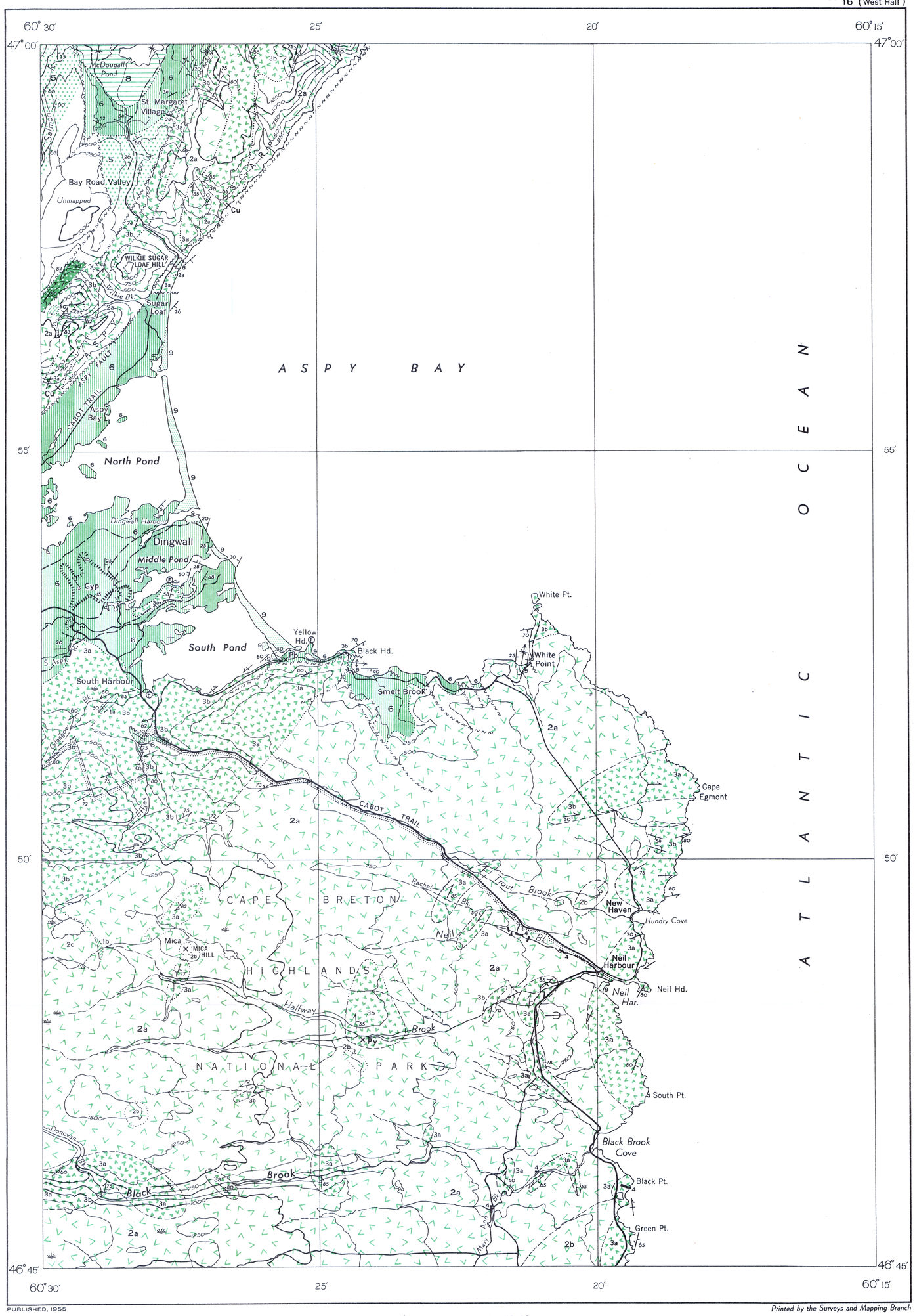
Cartography by the Geological Cartography Unit, 1955

Geographical names subject to revision

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



INDEX MAP



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DESCRIPTIVE NOTES

The area is characterized by highlands underlain by resistant crystalline rocks, and by lowlands underlain by easily eroded sedimentary rocks. The former constitute the northeastern fringe of a deeply dissected upland or tableland, which is known as the "Cape Breton Highlands".

In the southwestern part of the area, remnants of this upland have an average elevation of 1,400 feet. From such remnants the land surface slopes uniformly eastward to the Atlantic coast and, locally, northward to Aspy Bay. The region at the head of Aspy Bay is a lowland, characterized by karst topography. Northwestward, this lowland terminates abruptly against a remarkably straight fault-line scarp, the Aspy Scarp, which is here the southeastern edge of part of the upland. Stream dissection of this edge of the upland has formed erosional mountains of which Wilkie Sugar Loaf Hill is the most prominent example. In the northwest corner of the area, west of the Aspy Scarp, downfaulted sedimentary rocks constitute a lowland in the vicinity of McDougall Pond.

The map-area was glaciated during parts of the Pleistocene epoch. Stoss-and-lee forms and glacial striae prove that the ice moved from west to east. A mantle of coarse till, up to 10 feet thick, covers part of the highland areas. Stratified drift occurs in parts of the lowland areas and in some of the larger stream valleys. The glacial deposits are being reworked by streams and ocean waves and currents in the present geomorphic cycle.

The area is underlain chiefly by igneous and metamorphic rocks that, for lack of more precise data, are classified as Devonian or earlier. The oldest of these rocks are crystalline limestone (1a) and biotitic, chloritic, and hornblendic schist and gneiss (1b), both of which units have been derived from the metamorphism of sedimentary and volcanic rocks. Of these rocks, only a few scattered outcrops can be mapped separately, the rest have been intruded and altered by granitic rocks and pegmatite (2) and form mixed rocks (3). The intrusive granite (2a) is a pink, massive rock that consists essentially of microcline, sodic plagioclase, and quartz, with 2 to 10 per cent muscovite and biotite. Near the Aspy fault-line scarp, the granite has a cataclastic texture and, locally, green chlorite is the chief accessory mineral. Pegmatite (2b) is common within the granite and is mapped separately where it constitutes the dominant rock type. A grey, slightly foliated, granodioritic facies is also mapped separately (2c).

Where bands and sills of the granitic rocks (2) have intruded (or replaced) the country rock parallel with its foliation, the product is a pink and grey, banded composite gneiss (3b). Elsewhere in these mixed rocks (3a), the older sedimentary rocks occur both as small, angular inclusions and large, alined slabs within the granitic rocks. Large potash feldspar porphyroblasts have developed in many of the inclusions. Biotitic and hornblendic inclusions, locally garnetiferous, are common east of the Aspy Scarp, whereas west of it chloritic inclusions are common.

Thin gabbroic dykes (4) cut all rock units described above.

Mississippian sedimentary rocks (5-8) are preserved as down-faulted blocks along the south shore and at the head of Aspy Bay, and near Salmon River and McDougall Pond in the northwest part of the area. Near South Aspy River, they lie with angular unconformity on the igneous and metamorphic rocks (1-4).

The sandstone and conglomerate of the Horton group (5) contain subrounded to subangular fragments of white to pale grey quartz, and both they and the shale are characterized by abundant detrital flakes of muscovite and biotite. Carbonatized plant fragments are common. These grey clastic rocks are probably upper members of the Horton group. An arkosic facies, which outcrops at White Point and along Salmon River, contains subangular to angular fragments of pink feldspar and granite. This facies probably represents the lower parts of the Horton group as similar arkosic rocks constitute the base of the group 6 miles northwest of the map-area.

Windsor strata (6) overlie Horton beds in the central and northern parts of the map-area. At the head of Aspy Bay, these rocks consist chiefly of gently dipping beds of white to pale grey gypsum and anhydrite that are underlain by medium grey, fossiliferous limestone. Contortion and faulting are common locally in these rocks, particularly on the headland between Middle and South Ponds. Northwest of this disturbed zone, the minimum thickness of the gypsum and limestone beds is 400 feet. Along the south coast of Aspy Bay, downfaulted blocks of Windsor strata consist of light grey to buff limestone; grey, sandy (micaceous) limestone; and red to grey sandstone and siltstone. The buff limestone contains abundant specimens of typical Windsor brachiopods, for example ***Productus (Linoproductus) lyelli*** de Verneuil and ***Productus (Diaphragmus) tenuicostiformis*** Beede. The sandstone and siltstone are cut by numerous veins of pink and white gypsum. In the northwest corner of the area, scattered outcrops of thin-bedded limestone, edgewise conglomerate, and shaly siltstone are tentatively mapped as Windsor strata on the basis of their lithology. Within the map-area, known Horton-Windsor contacts are either faults or are obscured by drift.

Sheared micaceous sandstone and graphitic shale and schist in Wilkie Brook Valley are mapped as undivided Mississippian (7). These rocks are probably members of the Horton group that have undergone dynamic metamorphism associated with faulting They could possibly have a younger age.

Non-marine shale, sandstone, and siltstone of the Canso group (8) probably underlie a drift-covered area near McDougall Pond. These rocks are exposed along the shore of St. Lawrence Bay, a few hundred feet north of the map-area. They lie conformably on the Windsor group and apparently occupy the trough of a complex, downfaulted synclinal structure.

The rocks of this area have undergone two periods of deformation. The first involved complex folding, metamorphism, and intrusion of the oldest sedimentary and volcanic rocks (1) in some pre-Mississippian time. The second period involved folding of the Mississippian rocks (5-8) along north-trending axes in post-Mississippian time. Block-faulting on a large scale followed this second deformation and the folded Mississippian rocks were downdropped into the crystalline basement rocks (1-4). All the faults mapped are steeply dipping, normal and reverse faults that belong to this period of block-faulting. Minimum vertical displacement along one of them, the Aspy Fault, is over 2,000 feet.

Gypsum was quarried at Dingwall by the National Gypsum Company and its predecessors from 1933 until October 1954 when operations were discontinued due to an unsatisfactory anhydrite-gypsum ratio. During this period, 9,500,000 tons of gypsum were quarried and shipped by boat from Dingwall Harbour.

A muscovite deposit occurs in pegmatite (2b) at Mica Hill, 6 miles west of Neil Harbour. The deposit has been explored at intervals over the past 75 years and has been described by Hayes.[1] It does not appear to be of economic interest.

Small amounts of galena and traces of pyrite occur in massive limestone and limy conglomerate of the Windsor group (7) near Yellow Head. This deposit has been explored by test pits and is of no economic value. Small lenses and stringers of chalcopyrite occur in chlorite schist (3a) exposed in old prospect pits near the base of Aspy Scarp, ¾ mile northwest of Aspy Bay village. Traces of chalcopyrite, azurite, and malachite occur in composite gneiss (3b) at the mouth of a small stream 1 mile northeast of Sugar Loaf village. Neither of these copper occurrences is important in itself, but both suggest that the crystalline rocks near the Aspy Scarp merit further prospecting.

[1]Hayes, A.O.: Investigations in Nova Scotia; Geol. Surv., Canada, Sum. Rept. 1917, pt. F, p. 32.

PRELIMINARY MAP 55-13

DINGWALL

VICTORIA COUNTY
CAPE BRETON ISLAND

NOVA SCOTIA

Scale: One Inch to One Mile = $\frac{1}{63,360}$

Miles

1 ½ 0 1 2 3

PRELIMINARY MAP 55-13
DINGWALL
NOVA SCOTIA
SHEET 11 $\frac{K}{16}$ (West Half)

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