

LEGEND

- MISSISSIPPIAN**
HORTON GROUP
5a, grey, micaceous conglomerate, sandstone, and shale; 5b, pink, arkosic conglomerate, sandstone; minor shale; 5c, greyish red, limy siltstone, argillite; minor sandstone; may be pre-Horton
- DEVONIAN OR EARLIER**
Rhyolite porphyry and andesite; minor agglomerate; tuff and intercalated red siltstone and argillite
- Gabbro dykes
- Hornblende syenite; minor syenite gneiss
- 1a, crystalline limestone and mica schist; 1b, hornblende schist

- Bedding (horizontal, inclined, overturned, upper side of bed unknown) + / / /
Foliation (inclined) / / /
Lineation (direction and plunge of linear hornblende crystals) / / /
Anticlinal axis (arrow indicates direction of plunge) + + +
Synclinal axis (arrow indicates direction of plunge) - - -
Fault (defined, approximate, assumed; solid circle indicates downthrow side; arrows indicate relative movement) ~ ~ ~
Fossil locality @
Mineral occurrence x Cu

MINERAL OCCURRENCES
Copper Cu Pyrite Py
Zinc Zn

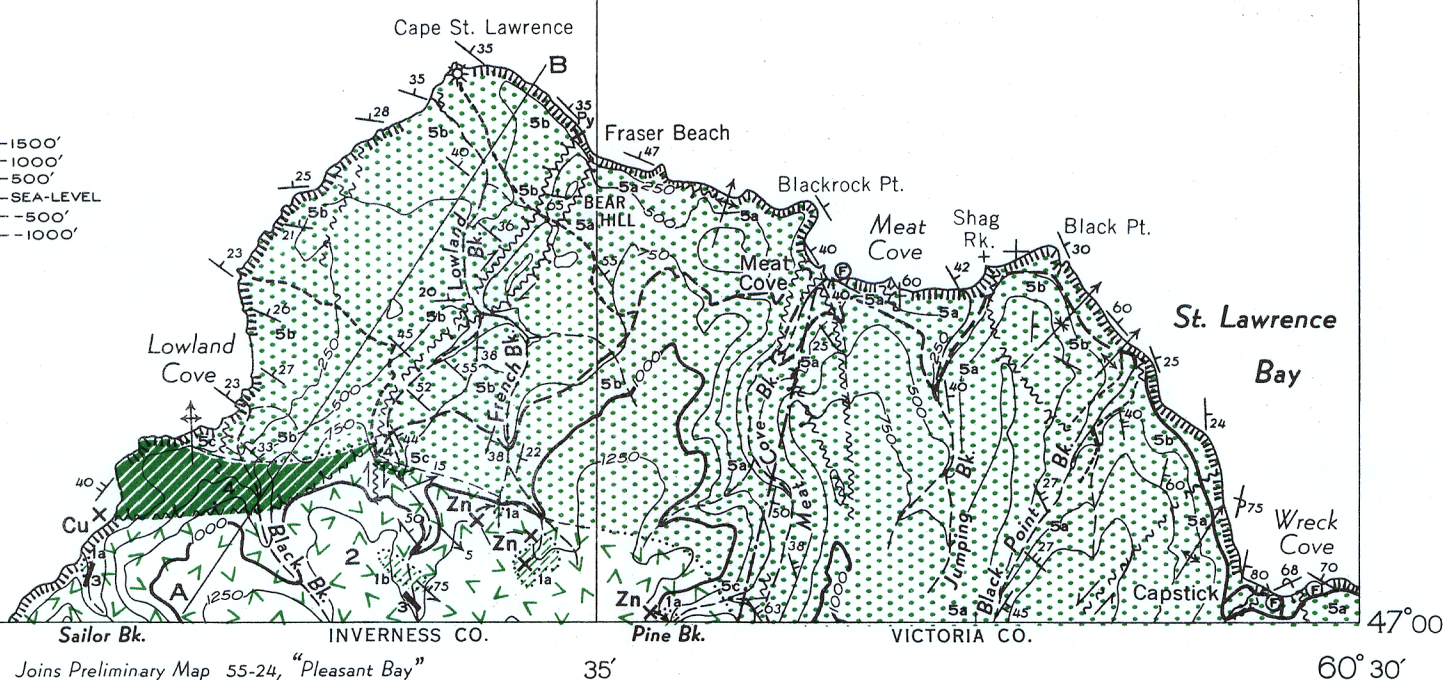
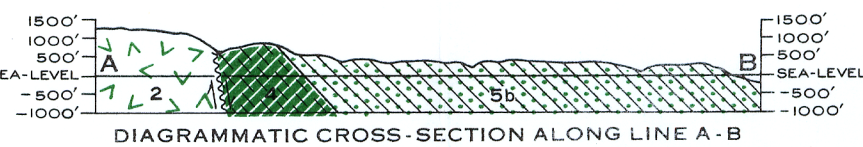
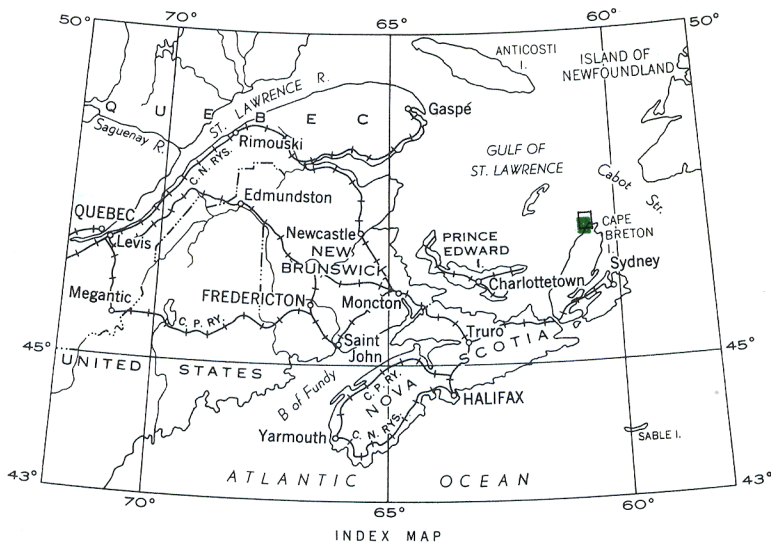
Geology by E. R. W. Neale, 1954

- Road ———
Trail - - - - -
Lighthouse *
County boundary ———+———
Stream (intermittent) ~ ~ ~
Cliff |||||
Contours (interval 250 feet) 1000

Approximate magnetic declination, 26° 42' West

Cartography by the Geological Cartography Unit, 1956

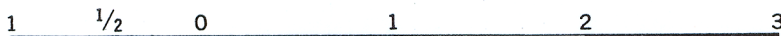
Air photographs covering this map-area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario



PRELIMINARY MAP 55-22

CAPE ST. LAWRENCE
INVERNESS AND VICTORIA COUNTIES
CAPE BRETON ISLAND
NOVA SCOTIA

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



DESCRIPTIVE NOTES

The map-area is at the northwest extremity of a deeply dissected plateau or tableland, the Cape Breton Highlands. A remnant of this tableland, west of Meat Cove Brook in the south-central part of the area, has an average elevation of 1,400 feet and a maximum elevation of 1,500 feet. It is underlain by resistant crystalline rocks. From this tableland remnant, the land surface slopes seaward and terminates in steep sea-cliffs. Most of this sloping land surface is underlain by easily eroded sedimentary rocks. In general, it has been carved into a rugged terrain by north-flowing streams that occupy V-shaped valleys. However, that part of the area between Lowland Cove and Cape St. Lawrence, west of Bear Hill ridge, has a less rugged aspect and may appropriately be called a 'hummocky lowland'.

Coarse glacial till, a few tens of feet thick, covers parts of the sloping land surface between Lowland Cove and Capstick. Thin fluvial deposits at Capstick and in the valley of Meat Cove Brook were probably formed by aggrading, proglacial streams. These are the only evidences of Pleistocene glaciation within the area.

Eighty per cent of the map-area is underlain by Early Mississippian sedimentary rocks of the Horton group(5). The remaining 20 per cent is underlain by pre-Horton metamorphic(1), intrusive(2,3) and extrusive (4) rocks that are tentatively classified as Devonian or earlier.

The oldest rocks(1a, 1b) occur as large inclusions within the intrusive syenitic rocks(2) that underlie the southwest part of the area. The crystalline limestone is a medium- to coarse-grained, grey-green, mottled rock. It consists chiefly of pale grey calcite with minor dark grey calcite euhedra and 10 to 25 per cent green serpentine and pyroxene. Mica schist, probably derived from shale, is intercalated with the crystalline limestone. It is a grey to pale brown rock that consists chiefly of quartz, plagioclase, muscovite and biotite. Hornblende schist(1b), possibly derived from basic volcanic rocks, is dark grey, fine to medium grained, and consists essentially of hornblende and plagioclase.

The intrusive syenite(2) is typically a greyish brown, medium- to coarse-grained, massive rock. It consists chiefly of reddish brown potash feldspar with 10 to 15 per cent dark green, partly chloritized hornblende. Locally the hornblende crystals are aligned and cause strong lineation in the syenite. A gneissic facies of the syenite consists of alternating hornblende and feldspathic bands. In general it has a higher dark mineral content than the massive syenite. Field evidence suggests that the dark bands represent relict bedding or layering of intruded country rock.

Thin gabbroic dykes(3), exposed in the valleys of Sailor and Lowland Brooks, cut syenite(2) and older rocks(1). The Lowland Brook dyke is about 25 feet thick and the larger of the two.

A group of relatively unaltered volcanic rocks(4), about 2,000 feet in maximum thickness, occurs as a belt-like body that extends from the coast south of Lowland Cove 1½ miles eastward to Lowland Brook where it is cut off by the Bear Hill fault. Along its south margin, this volcanic belt is down-faulted against adjacent syenitic rocks(2). East of the Bear Hill fault, rhyolitic members of the group apparently lie with angular unconformity on syenitic rocks. Agglomerate and tuff are dominant in the southern, basal part of the volcanic belt. The tuffs include both maroon, massive varieties and maroon to grey, banded varieties. Thin interbeds of laminated, red to maroon siltstone and argillite occur within these pyroclastic rocks. Porphyritic rhyolite, which overlies the pyroclastic rocks, contains phenocrysts of reddish orange potash feldspar (anorthoclase?) and clear to smoky quartz in an aphanitic, greyish red groundmass. Andesite outcrops in the northern part of the belt, at the top of the volcanic sequence. It is a dark grey rock in which plagioclase laths up to 1 mm. in length are recognizable in an aphanitic groundmass. Vesicular and amygdaloidal layers are common in the andesite.

The Lower Mississippian Horton group(5) lies disconformably and, locally, with minor angular unconformity on the volcanic rocks(4). Parts of three Horton formations are recognized. The lowermost(5c) includes greyish red siltstone, argillite, and sandstone, with an estimated thickness of 250 feet, that outcrop along the south shore of Lowland Cove and in the valleys of Lowland and Pine Brooks. These rocks are tentatively considered basal Horton group. However, they are more indurated than typical Horton rocks and resemble sedimentary rocks within the volcanic group(4), and may belong to a pre-Horton group.

Except in the three places mentioned above, pink arkosic conglomerate, sandstone, and minor shale(5b) form the basal part of the Horton group. Between Lowland Cove and Cape St. Lawrence, this formation has a minimum thickness of 5,400 feet. The conglomerate contains pebbles and boulders of all the older rocks of the area(1-4) together with fragments of granitic and pegmatitic rocks like those exposed in the adjacent area to the south. Rhyolitic fragments are common in conglomerate west of Bear Hill ridge but rare or absent east of this ridge. The arkosic sandstone consists chiefly of angular to subangular fragments of clear quartz and pink feldspar in a siliceous matrix. Intercalated shale beds are commonly pink to maroon, but in the upper part of the formation north of Cape St. Lawrence lighthouse beds of dark grey and black shale are common.

The youngest Horton formation in this area consists of grey to black, micaceous conglomerate, sandstone, and shale. Lithologically, it resembles the Albert formation of the Horton group in New Brunswick. All the rocks are characterized by abundant muscovite and biotite. The conglomerate and sandstone contain subangular to subrounded fragments of clear to milky quartz. Plant fragments are common in the sandstone and shale. This formation has a minimum thickness of about 1,500 feet, measured between faults near the mouth of Jumping Brook, but its true thickness is probably several times this amount.

The rocks of this area have undergone two periods of deformation. The first involved folding, metamorphism, and intrusion of the oldest sedimentary and volcanic rocks(1) in pre-Mississippian time. The second involved folding of the Horton group(5), and possibly the volcanic rocks (4), about northeast-trending axes in post-Mississippian time. Thrusting from the southeast accompanied folding and in one locality, 1,000 feet east of the mouth of Jumping Brook, has brought arkosic rocks(5b) of the Horton group into contact with younger grey sandstones and shales (5a) of the same group. Most of the faults mapped in the area are steeply dipping normal and reverse faults that are related to a period of large scale block faulting that followed post-Mississippian folding and thrusting. West of Lowland Brook, the volcanic rocks(4) and the Horton group (5) owe their preservation to down-faulting related to this period of block faulting. East of Lowland Brook, the linear contact between Horton and older rocks(1-3) is suggestive of similar faulting, although no direct evidence was obtained. A steeply dipping fault zone that extends south-westward from Bear Hill is probably also related to the period of block faulting. The west side moved upward and northward relative to the east side. Bear Hill ridge is an upthrust slice within the fault zone.

Zinc deposits occur near the headwaters of French Brook and in the valley of Pine Brook. The zinc mineral is sphalerite, which, with pyrite and silicates, forms a contact metasomatic replacement of crystalline limestone(1a). Selected specimens of the mineralized limestone contain over 30 per cent sphalerite. The deposits have been prospected and drilled by Cape Breton Metals Limited. This company's major prospect, on the east-central branch of French Brook, is at present being explored by an adit.

Neale, E.R.W.: Pleasant Bay Map-area, Nova Scotia; Geol. Surv., Canada, Paper 55-24, 1956.

PRELIMINARY MAP 55-22

CAPE ST. LAWRENCE

NOVA SCOTIA

SHEET 11 $\frac{N}{2}$ (East Half)