430276

Memorandum to S. Emory Bentley, of the firm of Walsh & Bentley, 406 First National Bank Building, New Bedford, Massachusetts

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from Merle F. Bancroft, Geologist,
Wolfville, Nova Scotia

On September 22, 1949, I had a visit from Mr. Everett McCullough and his father, Frank B. McCullough, who delivered your letter of Sept. 10th, requesting information respecting the copper prospect on the McCullough farm at Tatamagouche, Colchester County, Nova Scotia.

Fortunately, I had been on the ground, made some notes, and collected a few samples from the tunnel and dump on August 17, 1944. At the time the late Ernest S. McCullough showed me over the property. Following that examination I reported to Dr. Alan E. Cameron, whom you mention and who was then Deputy Minister of Mines for Nova Scotia, that the McCullough prospect was one of the best examples I had seen of nodular chalcocite (copper glance). The mineral is well distributed through strata seven and a half feet in thickness. The deposit is exposed on the north brow of the ravine on Woodlock Brook, so as to make the footwall of the mineralized zone within 12 feet of the grass roots of an adjacent open field, with favorable slope on which to work a bull dozer effectively, the ravine affording good dumping ground. By this means it would be possible to surface strip or lay bare the mineralized band for some distance at no great expense. The old prospect adit tunnel ran in a direction north 45 degrees west, reported, by the McCulloughs, to have been driven about 50 feet, is now mostly blocked through caving. During 1929 someone cleared it out and timbered it so that it was possible, in 1944, to enter and examine the ore seam for 15 feet in from the portal. The size of the dump at the tunnel would seem to confirm the suggestion that it had been driven about 50 feet. In the years since the work was done no doubt many good samples of ore have been culled off the dump and from the tunnel.

My notes indicate gray shale at the bottom of the tunnel succeeded by 2 feet of conglomerate, containing gray limestone pebbles up to 1 inch in diameter, nodules of chalcocite and much chalcocite in the matrix, that binds the pebbles of the conglomerate.

Gray sandstone and shale lie above the conglomerate and red sandstone in the roof, all showing at least moderate amounts of nodular chalcocite, distributed from floor to roof of the tunnel, which is 7½ feet above the floor. The property shows better than average thickness of ore seam when compared with other showings of the Cumberland-Pictou lowland.

The copper bearing beds belong to the Pictou series, (Upper Pennsylvanian in age) which occupies regionally a wide syncline, the axis of which stands about 2½ miles to the north of the McCullough prospect. South of the synclinal axis the beds dip northerly at low angles of 6 to 15 degrees. The attached map 854A shows the exact position of the adit tunnel on Woodlock Brook, 1 mile southeast of Tatamagouche station and one-quarter mile back from the motor road and coast of Tatamagouche River estuary. The adit tunnel is fully 20 feet above the brook and about 50 feet above sea level and in a very accessible spot. Copper bearing seams occur on both limbs of the syncline.

I feel the McCullough property merits attention first by way of surface trenching or stripping to determine what further underground exploration is warranted.

In the memoranda, my object has been to convey to you a fair idea of what I saw on the ground.

Respectfully submitted,

"Merle F. Bancroft"

M. F. Bancroft.

Oct. 4th, 1949

Form E. 300-7-49

430276

ORIGIN

PROVINCE OF NOVA SCOTIA

NOVA SCOTIA TECHNICAL COLLEGE
SCIENCE SERVICE

HALIFAX, N. S., August 4, 1950.

Department of Mines

Att: Mr. J. P. Messervey - Halifax, N. S.

The samples of Copper Ore

from McCullough Property, Tatamagouche, N.S and marked M. F. Bancroft
Woodlock Brook

show by analysis the following proportions of the elements or constituents as listed:

Sample No. 1

Channel 2"-3" wide 33" long on face of copper bearing shales

Copper = 4.2%

Sample No. 2

Stratigraphically above continuation of Sample #1 across copper bearing thinly bedded arenaceous shale length of channel 17"

Copper = 2.0%

M. F. Bancroft.

430276

COPPER

TATAMAGOUCHE

Tracts 50 + 71
Ref Map 11E 11C

TO: DEPUTY MINISTER OF MINES

FROM: INSPECTOR OF MINES

On September 21, I inspected the work that has been done this summer on the copper prospect at Tatamagouche which is held under P. L. No. 4141 by Mr. Everett McCullough, New Bedford, Mass.

The prospect is situated on the north side of Woodlock Brook on the farm of Mr. Frank McCullough, the father of the licensee, and is about one mile southeast of Tatamagouche station and one-quarter mile southwest of the highway on the west side of the Tatamagouche River.

The deposit was explored quite a few years ago by means of an adit, reportedly 50 feet in length. Part of the adit was still open in 1944 when it was examined by Professor M. F. Bancroft. His findings at that time are incorporated in a report on the occurrence which he made in 1949.

The copper occurs as chalcocite in grey shales. The copper bearing shales are approximately 6 feet in thickness and are overlain, where exposed, by 3 feet of barren shales and sandstones and 6 feet of overburden. The shales are underlain by 4 feet of blue clay which rests upon a red sandstone. According to Mr. McCullough, Sr., channel samples of the six foot section of shale indicate a copper content of 2.6% and the clay reportedly carried 3% copper.

An open cut has been bulldozed more or less along the line of the old adit and the floor of the cut is about 7 feet below the adit floor. The cut approximates 12 feet in width and is about 100 feet in length. A sketch showing the plan and section of the open cut is attached to this report.

The geological structure here is somewhat disturbed and different strikes and dips can be obtained in different parts of the cut. However it would appear that the strike is generally just east of North (Mag.) with the dip averaging about 13° to the southeast.

Four test holes have been drilled with a spring pole drilling rig to depths 20 and 25 feet, one about 100 feet to the north and the others up to 125 feet from the north face of the open pit. A trace of copper was found in the sludge from one of these holes but the drilling produced no conclusive results.

Prospect work commenced on June 20th and Mr. McCullough, Sr and an assistant worked spasmodically throughout the summer, utilizing a bulldozer for a total of 24 hours. It is probable that no more work will be done this year on the prospect.

Mr. McCullough stated that a total of $500.00 had been paid out during the season for wages and bulldozer rental. I would therefore recommend that the licensee be credited with 125 man days work.

E. J. Cole.

Halifax, N. S.,
September 28, 1950.

OK
M.
mcg.

SKETCH - COPPER PROSPECT
TATAMAGOUCHE, N.S.

430276

COPPER

TATAMAGOUCHE

TO: DEPUTY MINISTER OF MINES

FROM: INSPECTOR OF MINES

I visited Tatamagouche on May 9th to check upon the work being done by Barymin Company Limited upon the McCullough copper prospect (Ref. map 11 E 11 C, tract 71, claim B).

The main work to date has consisted of the bulldozing of two extensive trenches as shown on the attached sketch.

The copper bearing strata of the deposit consists of shale and the upper section of an underlying blue clay seam. The shale is overlain by up to 12' of sandstone.

The eastern trench has not yet reached the ore zone. The western trench has exposed this horizon and the shale and blue clay are being sampled at 10' horizontal intervals.

The copper bearing strata which had an approximate thickness of 6' in the 1950 excavation is seemingly rapidly thinning out to the west and northwest. The east wall of the western trench shows a maximum total thickness of $4\frac{1}{2}$' of shale and blue clay while the west wall of the same 12' wide trench shows no shale and a maximum thickness of 9 inches of blue clay.

The northern part of this trench, as of the date of inspection, also indicated a decrease in the thickness of the ore zone to the northwest of the 1950 exposure as in this part of the trench there is no shale and only 18 inches of blue clay in evidence.

The overlying sandstone as previously uncovered was quite thinly bedded but is becoming increasingly massive

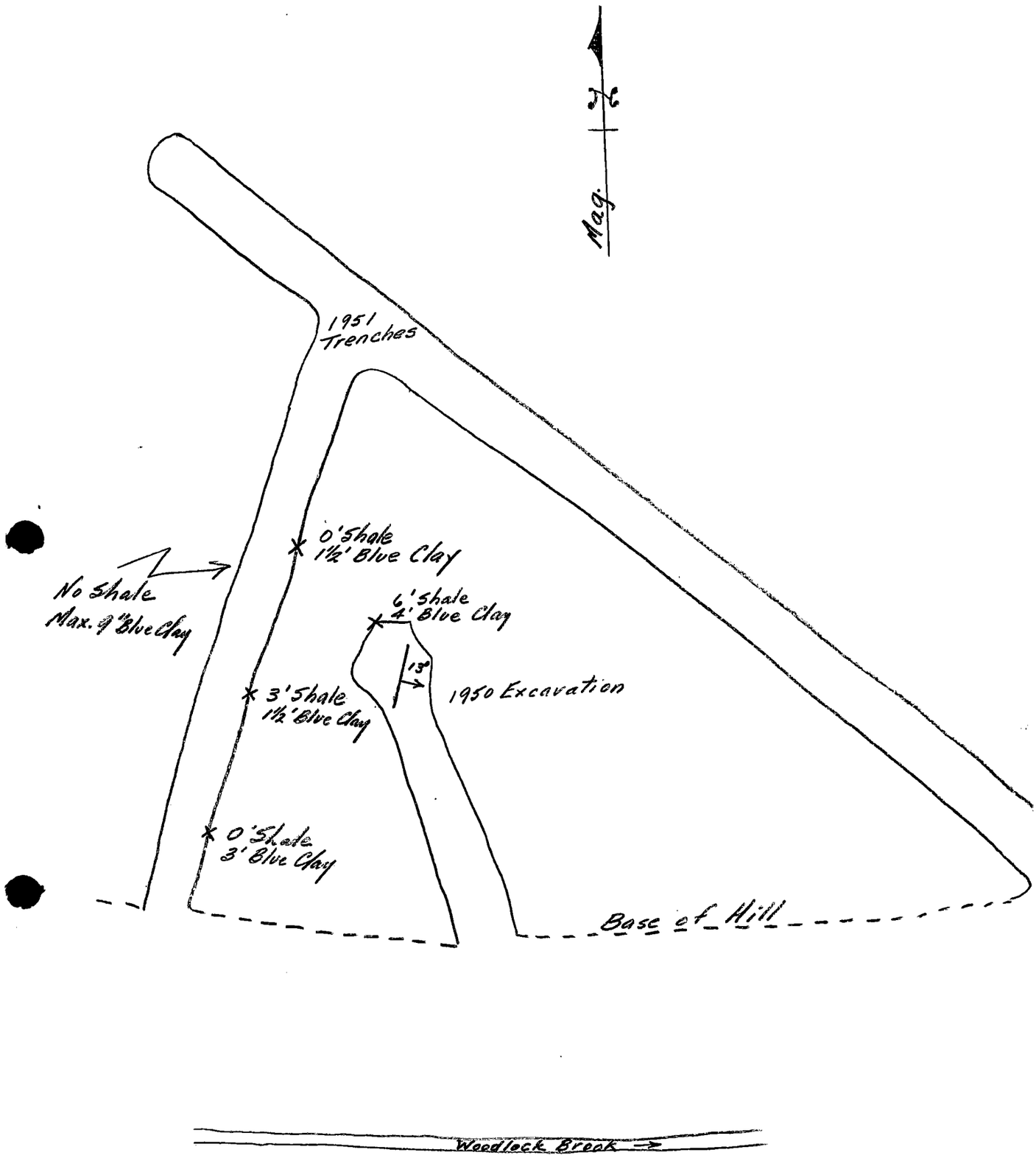
towards the north where the ore zone is thinning out. A barren red clay of unknown thickness underlies the blue clay in the trench.

Test pits to the south across Woodlock Brook and another to the northwest of the trenching uncovered only a red shale. As this would presumably underlie the the red clay it would indicate the absence of any ore zone at these points.

The trenches on the date of inspection were up to 14' in depth. The bulldozer is able to move all the rock encountered with the exception of the more massive sandstone. It is necessary to first loosen this up by blasting after which it can be readily handled by the bulldozer.

E. J. Cole.

Halifax, N. S.,
May 11, 1951.



SKETCH

COPPER PROSPECT

TATAMAGOUCHE, N.S.

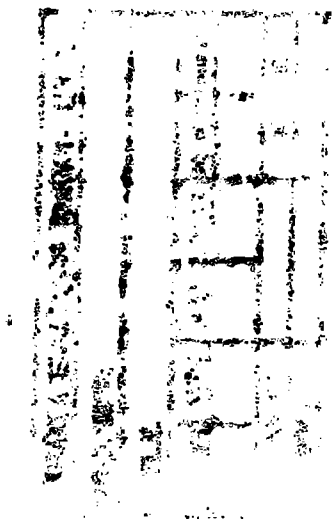
APPROX. SCALE - 1" = 30'

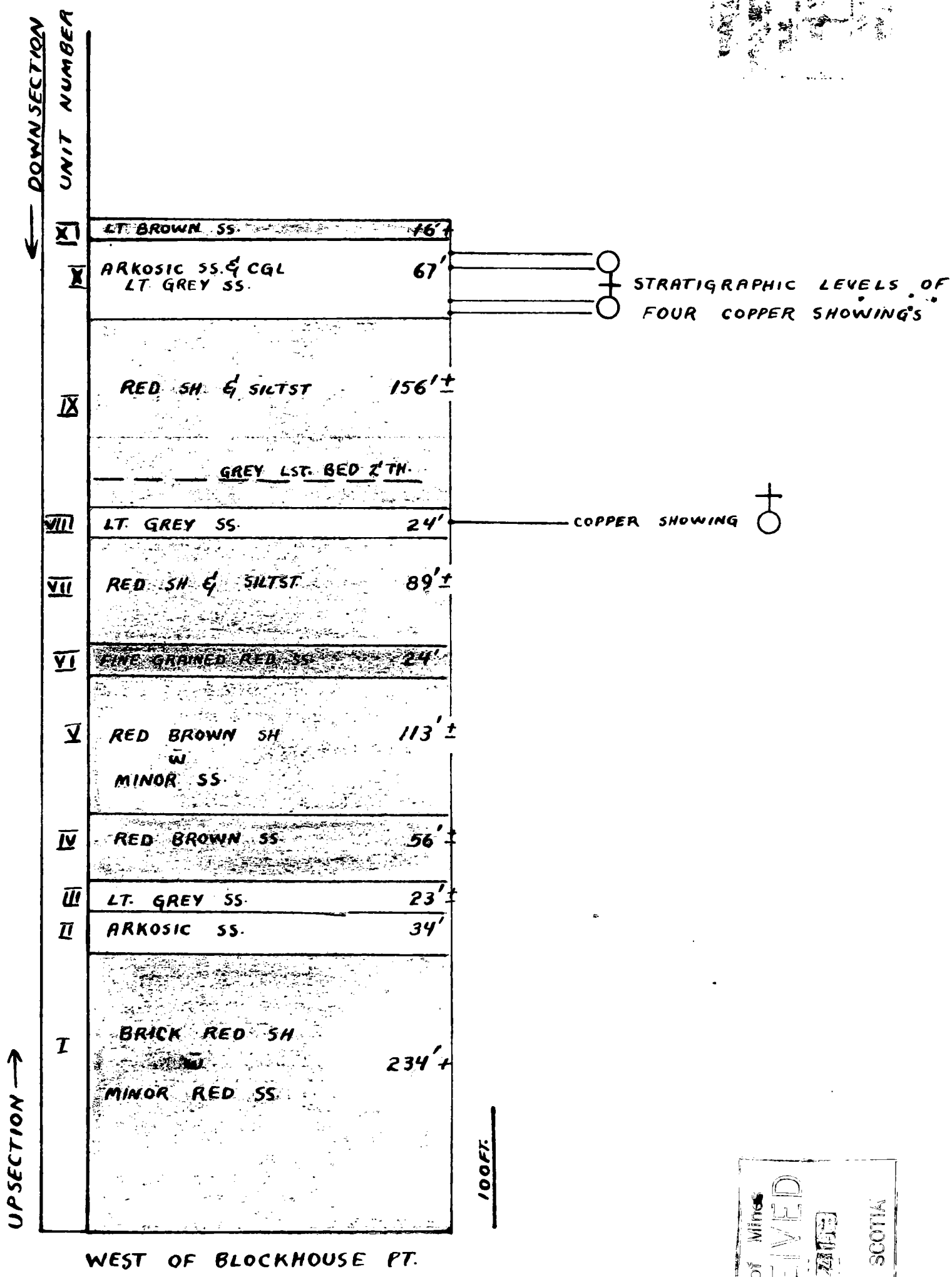
MAY 11 - 1951

E.J.C.

STRIP LOG - BLOCKHOUSE POINT

STRATIGRAPHIC SECTION





WEST OF BLOCKHOUSE PT.

SCALE 1" = 100'

STRATIGRAPHIC THICKNESSES

COPPER DEPOSITS, WENTWORTH DISTRICT

*M. F. Bancroft**

It is noteworthy that the initial steps taken in Canada toward mining high-grade copper ores for export brought attention to the north shore regions of Cumberland, Colchester and Pictou counties of Nova Scotia. Some of the early settlers in this section of the country had found places where they could gather masses and nodules of heavy sulphides from surface and near surface diggings and sort out what they called "lowland copper", sending it to the smelters abroad in casks. This "lowland copper" ore could be readily sorted to contain a high percentage of grey-copper glance (chalcocite Cu_2S). When the General Mining Association, a London firm, obtained mine and mineral concessions on the mainland of Nova Scotia in 1827 they had copper mining in Pictou County on their agenda. The copper localities given favourable mention as productive of small lots of ore, include Caribou river in Pictou County, Tatamagouche district, in Colchester County, Upper Pugwash, Maccan and Wallace river in Cumberland County. The last ore to be shipped from the region was mined on Black brook near Waugh river, Colchester County, in 1908. In that year 240 tons of ore were exported from the Black brook property to the United States, this ore yielding 28,000 pounds of copper.

In June, 1943, at the request of the Nova Scotia Department of Mines, the writer established a survey camp at Wentworth station, Cumberland County, with a view to examining some of the early copper discoveries of the district. In this work, deposits selected as worthy of further attention were mapped in detail to show the lay of the land, probable extent of mineralized areas and also any mining developments at each locality.

Mining Status

The methods of the placer prospector searching for ore and tracing float-copper ore to its source proved quite successful at many points on the Cumberland - Pictou lowland. Chalcocite-pyrite fragments long released from parent ledges show little sign

* Professor of Geology at Acadia University, Wolfville, N. S.

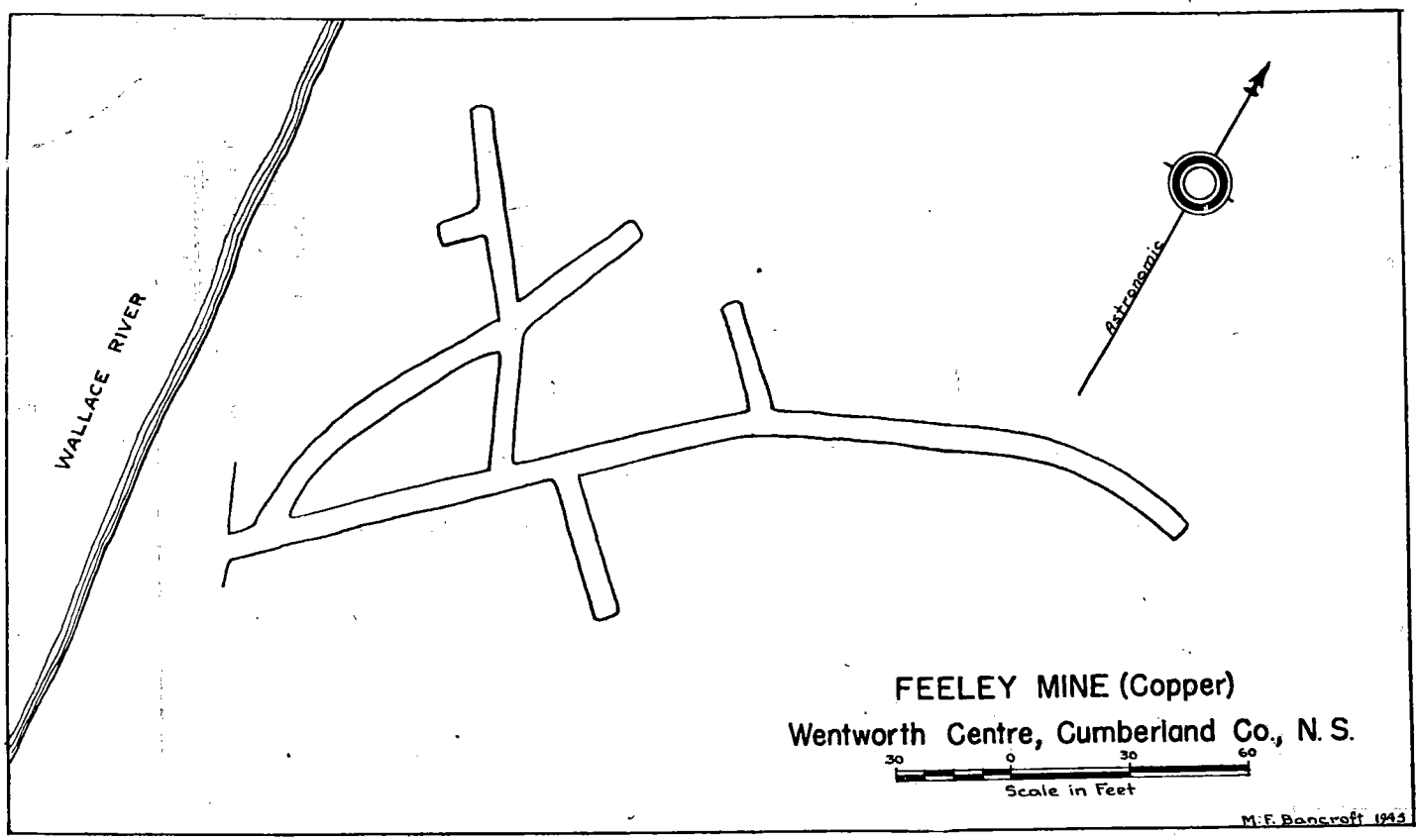
Reprint from Annual Report on Mines, Province of Nova Scotia, 1943.

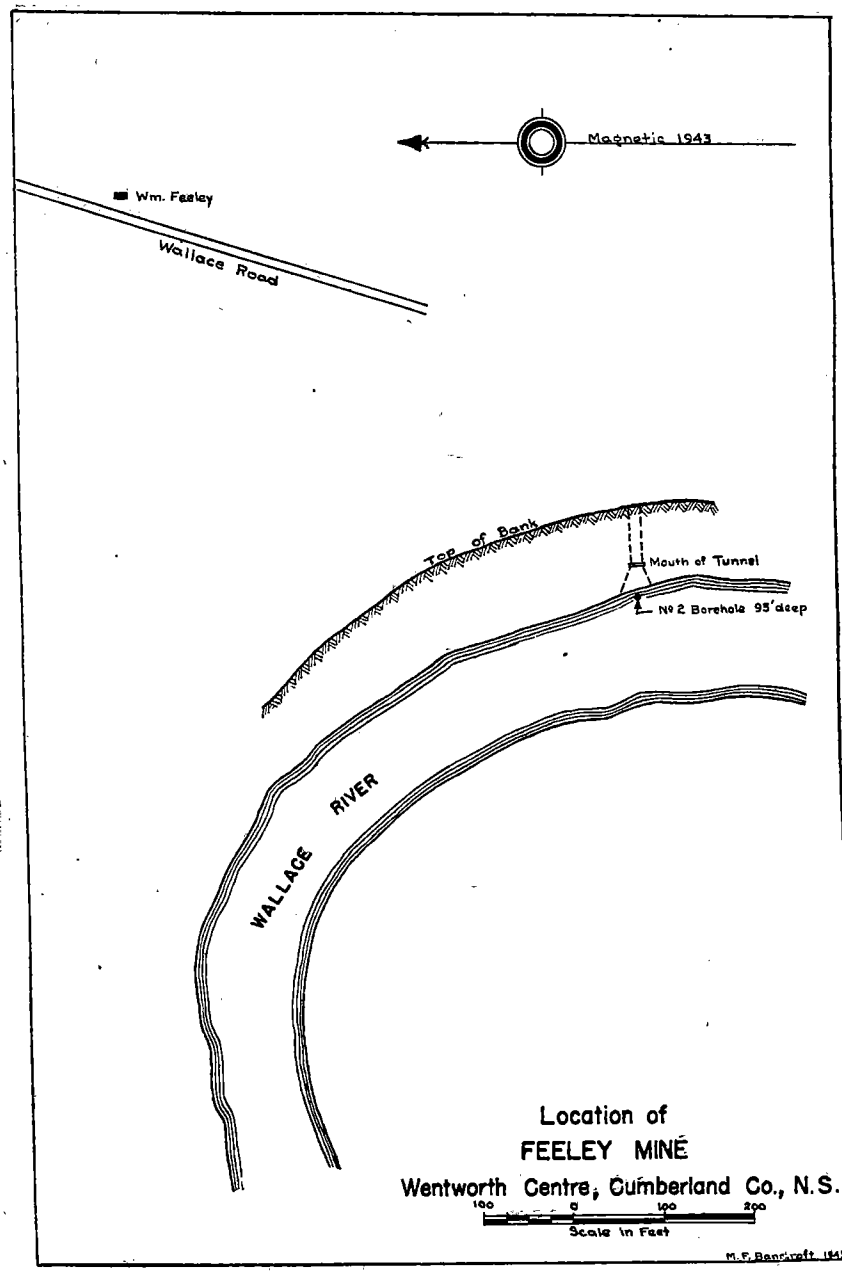
of alteration, other than a veneer or surface staining of green carbonate, which helps to identify them in river gravels and in washing them from surface soils. The opportunity for small scale production of high grade ores from surface soils, has not been fully explored here.

Bed rock mining for copper has been meagre. In some places there has been lucrative scalping of ore off outcrops. A slope 300 feet long, dipping at an angle of 15 degrees, and a drift east of 40 feet at a distance of 200 feet down the slope, put the copper prospect at Black brook, near Waugh river, Colchester County, in a class by itself on account of development and ore produced. Compared to the latter development, other copper prospects in the three counties show only marginal approaches to anything that might be called systematic work. Single shafts less than 90 feet deep, in flat lying strata, are reported to have cut copper-bearing beds two to five feet in thickness, but these shafts are not accessible now. A few locations permitted the driving of adit tunnels, yet where this was done the tunnels are short as though the operators' chief objective had been to get under cover instead of trying to prove up the lateral extent of an ore body.

Topography

The Cumberland - Pictou lowland region lying north of the Cobequid mountains covers an area of about 2,000 square miles. The wearing down of this land surface was apparently accomplished by river systems that headed on upland divides essentially where they are now. Rivers, like the Wallace, flow north across well-defined folded structure, while their tributary valleys tend to follow rock structure, giving rise to broad ridges, more or less rounded and drift covered. Glaciation had little effect on the topography of this landscape. The lowlands rise from a few feet above sea-level along the Wallace river to 200 feet above sea-level. The ridges of the lowland are usually less than 350 feet above sea-level though one near Springhill reaches an altitude of 510 feet. The district is well supplied with good motor roads and large tracts have been carefully mapped.


WALLACE RIVER
Astronomic
FEELEY MINE (Copper)
Wentworth Centre, Cumberland Co., N. S.
30 0 30 60
Scale in Feet
M.F. Bancroft 1943


Magnetic 1943
Wm. Feeley
Wallace Road
Top of Bank
Mouth of Tunnel
No 2 Borehole 95' deep
WALLACE RIVER
Location of
FEELEY MINE
Wentworth Centre, Cumberland Co., N.S.
100 0 100 200
Scale in Feet
M.F. Bancroft 1943

Geology

Table of Formations:

Upper Pennsylvanian.	Pictou series 7,000 feet thick. Red sandstone, shale and conglomerate; some grey sandstone and shale. (Copper bearing seams.)
Middle Pennsylvanian.	Cumberland series 7,000 feet thick. In upper part grey sandstone (some with grit lenses) and shale; red shale and sandstone; coal seams. Lower part: red conglomerate and grit, some red shale and sandstone.
Lower Pennsylvanian.	Boss Point formation: grey to red, interbedded sandstone and shale (thin coal and copper-bearing seams). Claremont formation: red conglomerate and grit, some sandstone and shale.
Upper Mississippian.	Middleborough formation: red sandstone, shale and grit. Windsor series 3,000 + feet. Red shale, gypsum, limestone, grey shale and calcareous shale.
Pre-Carboniferous.	Sedimentary and volcanic rocks intruded by granite, diorite, etc.

This table of formations follows closely the legend shown on Map 409 A, 1938, Oxford sheet (east half), Geological Survey of Canada, except for the insertion of thin coal and copper-bearing seams low in the Boss Point formation and also of copper-bearing seams in the Pictou series. All of the Pennsylvanian formations indicated in this table are regarded as non-marine in origin.

The old bottom land surfaces that were undergoing erosion and on which the Lower Pennsylvanian sediments found lodgement are to some extent exposed in Cumberland County, notably in the Cobequid mountains and in a long narrow belt which, north of Springhill, strikes across country between Cumberland basin on the west and Malagash point on the east. This narrow belt displays some of the Windsor series, while southward in the Cobequid mountain region there are small areas of the Windsor and large areas of the pre-Carboniferous formations.

Sources of Copper Minerals

A metallogenetic epoch followed the mountain building and batholithic invasion that took place in this region during Middle Devonian time. Some of the pre-Carboniferous rocks like those in

the Cobequids carry sulphides in shear zones and the fact that it is impossible to assign any more definite age than pre-Claremont to some of the local igneous intrusives has interest in that a bore-hole put down 1,980 feet at Scotsburn, Pictou County, encountered volcanic flows interbedded with sandstones and shales of the Upper Horton formation, which is of Lower Mississippian age. The presence of copper-bearing beds in the Boss Point formation and in the Pictou series is clearly a matter that has to do with conditions of sedimentation at the time these beds were deposited.

Sedimentation

The Lower Pennsylvanian sediments were drawn directly from pre-Carboniferous rocks and from formations that had formed in this region throughout the long time which elapsed following the Middle Devonian mountain building, when Horton series was followed by Windsor series. However, the Pennsylvanian period was not far advanced before crustal unrest changed the situation through uplift and erosional unconformities resulted. Then the early formations of the period through erosion contributed in turn to the building up of the later beds, a process which accounts for some of the litholigic monotony seen in the group as a whole. No less than five unconformities occur locally in the Pennsylvanian succession.

Intermittent sedimentation is very generally shown in the Pennsylvanian formations, for sandstones alternate with shales and locally give way to conglomerates in the upper as well as the lower part of the system. The development of extensive peat bogs and swamps shown in the coal seams of the Cumberland series and the more local mixed deposition of plant remains and copper minerals in swamps and shallow water basins that were subject to river overflow, all point to intermittent deposition.

Local conditions, with rivers issuing from regions rich in gypsum or fed by brooks affected by pyrite, would make for more sulphate than carbonate waters in the rivers quite independent of the climatic influences which otherwise seem to rule in this matter. The fact that grey sandstones and grey shales so often contain the disseminated sulphides and that these beds are overlain and underlain by red beds, makes it apparent that an arid or semi-arid

climate of considerable uniformity prevailed even while the grey beds were being deposited.

Structural Geology

The Pennsylvanian strata are involved in folds, which trend east-northeast across the Cumberland lowland. On the Wallace river in the vicinity of Wentworth, there is an open syncline nine miles wide, which pitches to the east at a low angle with the result that the beds of the Pictou and Cumberland series nose up toward the west in a regular manner. The Boss Point formation below the Cumberland series is exposed on both the north and south limbs of the Wentworth syncline. The breadth of outcrop for the Boss Point formation on each of the limbs is about one mile, though the dips of the beds on the north limb are around 70 to 80 degrees south, those along the south limb are 35 to 40 degrees north. The beds of the Pictou series occupy a belt about six miles wide in the central part of the syncline and spread out flatly or in undulating manner, unconformably overlying the Cumberland series.

Faulting is probably prevalent along the folded structures of the lowland but is difficult to prove for lack of outcrops. Some transverse faults have been recognized and mapped.

The Copper Deposits

The copper deposits consist chiefly of sulphide minerals chalcocite and pyrite plus traces of chalcopyrite and some alteration product, notably malachite. They are of the following types:

Pennsylvanian in age—

1. Disseminated chalcocite deposits
   (a) Bedded copper deposits, which were laid down in shallow water bodies and swamps, along old river valleys and subjected to river overflow. Incrusted copper-bearing residues in shale.
   (b) Marginal copper deposits, formed by percolating groundwater about basins of sulphide deposition. Concretions chiefly in sandstone.

Tertiary or later in age—

2. Detrital surface concentrations of copper ores

Derived from the weathering and erosion of both bedded and marginal copper-bearing strata. Includes residual, eluvial, alluvial and placer concentrations of masses, nodules and flakes of mixed chalcocite and pyrite.

The disseminated copper-bearing deposits of Pennsylvanian age found in this region are the products of precipitation from muddy waters which found their way into swampy areas or shallow water basins. Fragments of ore with the appearance of cracked charcoal are common in the fine, thinly bedded sandstones that were laid down in quiet waters. In these places, stubby roots of trees, apparently in the position where they grew became incrusted with sulphides and were also preserved through being replaced by chalcocite. Furthermore, detailed stratigraphic sections worked out in Pictou and Colchester counties by Hugh Fletcher include a few copper-bearing seams and also thin beds, rich in plant remains, offering no trace of copper.

It is safe to imply that the sites of copper deposition were limited to definite locations and what is known of these copper-bearing beds, as they have been brought to the surface in later folding, points to a limited distribution of them among more continuous, yet largely barren strata.

No strong surface showings of copper ore beds were found that would warrant the work necessary in systematic sampling. One reason is that the thin, soft, ore-bearing beds are often encased between hard sandstones in outcrop, and another is that where mining has been done the surface showings are often depleted to the point where it is difficult to find anything in the vicinity that looks like ore in place.

Palmer Mine†

The Palmer mine is on the north side of the west branch of Wallace river and two and a half miles from Wentworth Centre. Reference Map 11 E 12 D, Tract 44, Claim C, Department of Mines, Halifax, N. S. As a copper prospect it is of interest in that its chief development partially opened up a bed of copper-bearing

† References: Messervey, J. P., Copper in Nova Scotia, Pamphlet No. 7, 1929, pages 22, 23, 25, 26.

shale, rich in plant remains and fossils; it belongs to the Pictou series.

There is no surface showing of ore in place apart from a little copper stain. Along the river bank a grey sandstone bed about six inches wide outcrops resting on red gritty sandstones and above it are red shales with a thin layer of grey shale coming in between it and the grey sandstone at the western end of the outcrop. A slope, now caved in, was started at this point about the year 1898, following the discovery of rich chalcocite float along the west branch of the Wallace river in this vicinity. Apparently the grey copper-bearing shale increased rapidly in thickness down the dip of the beds, which at the surface is about 15 degrees north, and the working was soon altogether in shale. Local men, who worked in the Palmer mine, appear to have been quite impressed with the manner in which the ore was distributed in crumpled laminae or crusts through the dark shales. Some of the shale was hauled to Westchester station and a large pile of it still remains where it was dumped on the south side of the river. The early operators culled out all solid fragments of chalcocite in mining the shale, while the treatment of the latter as an ore apparently presented difficulties which they could not surmount.

Wentworth Centre

A company known as the Munro-Thompson Ore Reduction Company started the construction in 1902 of a leaching plant to handle copper ores from a number of prospects in the vicinity of Wentworth Centre, Cumberland County. The plant, now non-existent, consisted of two units of four tanks each, arranged in series, one above the other. One roaster was built and a smelter building was under construction in 1903, when the company changed its name to the Cumberland Copper Company. Their chief source of ore was a deposit located on the Wallace river at a point a mile north of Wentworth Centre on the farm of John Feeley. Reference Map 11 E 12 D, tract 51, claim K, Department of Mines, Halifax, N. S.

The Feeley farm is underlaid by red beds of the Pictou series. The original surface showing of ore at altitude 90 feet on the Wallace river was a flat lying bed of finely laminated grey sand-

stone darkened by abundant plant remains and carrying in its upper part bunches or shots of chalcocite ore in the form of concretionary nodules and pseudomorphs after wood. The breadth of outcrop of the ore bed on the river channel was 180 feet and the width of the river about 110 feet.

At the east side of the river-bed outcrop a shallow pit had been sunk to get through the ore-bed, and from the bottom of the pit a tunnel had been driven into the firm sandstone beds at the base of a cliff, 60 feet in height. By the latter part of August the river was low enough to permit the pumping out of the old workings, which were examined by J. P. Messervey, Inspector of Mines, and A. E. Flynn of the Nova Scotia Technical College.

The tunnel had been driven in an easterly direction and terminated at a point 257 feet from the portal along a line running north 60 degrees east from the portal. The fine grained thin sandstone copper-bearing layer was 20 inches thick at the portal and formed the upper part of a grey sandstone bed four feet in thickness. The ore layer was found to continue along the roof of the tunnel showing variable mineralization for about 100 feet and though the grey sandstone persisted the upper thinly bedded copper-bearing layer vanished at a distance of 145 feet from the portal. At this point the grey sandstone gave place to cross-bedded barren red sandstones. The side drifts off the main tunnel had, without exception, been driven beyond and off the margins of the ore layer.

Examination of these workings proved that the extension of the ore bed eastward from the river outcrop had definite limits, showing only marginal ore. Mr. Flynn took a sample from some high grade streaks of ore at a point 90 feet from the tunnel portal and on assay reported four per cent copper.

As to the chances of following up the prospecting in other directions from the former river showing, it would seem that something could be done to the south on both the east and west sides of the river, for the formations here have an average dip of north five degrees. A flat interval lies west of the river and has a cover of gravel and sand to a depth of about 12 feet.

Some years ago two bore holes 175 feet apart were put down on this location. Both holes cut similar alternating sandstone and shale beds but no signs of copper-bearing strata, other than the one exposed in the river bed. Each drill hole struck a strong artesian well overflow at a depth of about 95 feet. The drill hole in front of the tunnel portal was 95 feet deep and the other on the west bank of the river 152 feet.

Tatamagouche District

A considerable amount of small scale copper mining has been done on French and Waugh rivers in the Tatamagouche district, Colchester County, particularly along the south limb of the syncline, which here as in the Wentworth district, involves the Pictou series. In the Tatamagouche district the surface showings of ore are meagre and underground workings inaccessible. However, one property on French river, about five miles from Tatamagouche, was selected for mapping as an example which has and may yet offer possibilities in small scale production of ore from surface soils and from beds that lie at a low angle, and which can be reached by shallow pits.

This copper prospect lies west from the Oliver school house (Reference map 11 E 11 C, tract 45, claim A, Department of Mines, Halifax, N. S.), where cliffs 50 feet high rise on the west side of the French river, facing an interval on the east side. Prospecting has been done on both sides of the river. The only ore that can be seen in place is in the rocks of the cliffs. Concretionary nodules of ore and pseudomorphs after wood occur here in conglomerate and in a fine grained laminated sandstone bed six to eight inches thick, which rests on the conglomerate and is overlaid by grey sandstone.

The accounts of the early developments on this property are well summarized in reference contained in "Copper in Nova Scotia".** Remnants of an old dam, built on a small stream coming into the river on the west side and north of the cliffs, mark the site to which surface soils were formerly carried and washed

** References: Messervey, J. P., Copper in Nova Scotia, Pamphlet No. 7, 1929, pages 10, 11, 12, 17, 24, 27, 28.

to obtain ore and in fact most of the ore on this property was recovered in that way. Chalcocite-pyrite ore was also removed from the grey sandstone bed where it strikes across the river. The grey sandstone bed appears to thicken for a small grindstone quarry is found to the south of the copper diggings to the east of the river.

Maccan River District

The Springhill map† shows near its north boundary a belt of the Boss Point formation in which mining for copper has been done, and where grey sandstones dip 34 to 37 degrees south on the south limb of the Minudie anticline. An account of this property is given in the Fletcher report noted above.

Conclusions

In certain parts of Europe and North America strata are found which contain copper ores, chiefly chalcocite, probably deposited from solution of pre-existing ore in the sediments or adjoining rock formations. Bedded copper deposits of Permian age occur over wide areas in Central Germany and for centuries have made for good mining. The widespread Carboniferous strata of Nova Scotia and New Brunswick present somewhat analagous beds and structures, the mining value of which remains to be determined.

This report emphasizes the fact that the Wallace river syncline, first outlined by Hugh Fletcher, presents possibilities favourable to the prospecting for cupriferous beds. Field work has not yielded information on the possible extension of cupriferous deposits worked in the past. It has been shown, however, that, locally, certain horizons in the cupriferous beds contain copper bearing seams in which the concentration of copper is sufficiently high to warrant the assumption that systematic investigation might outline deposits of economic significance.

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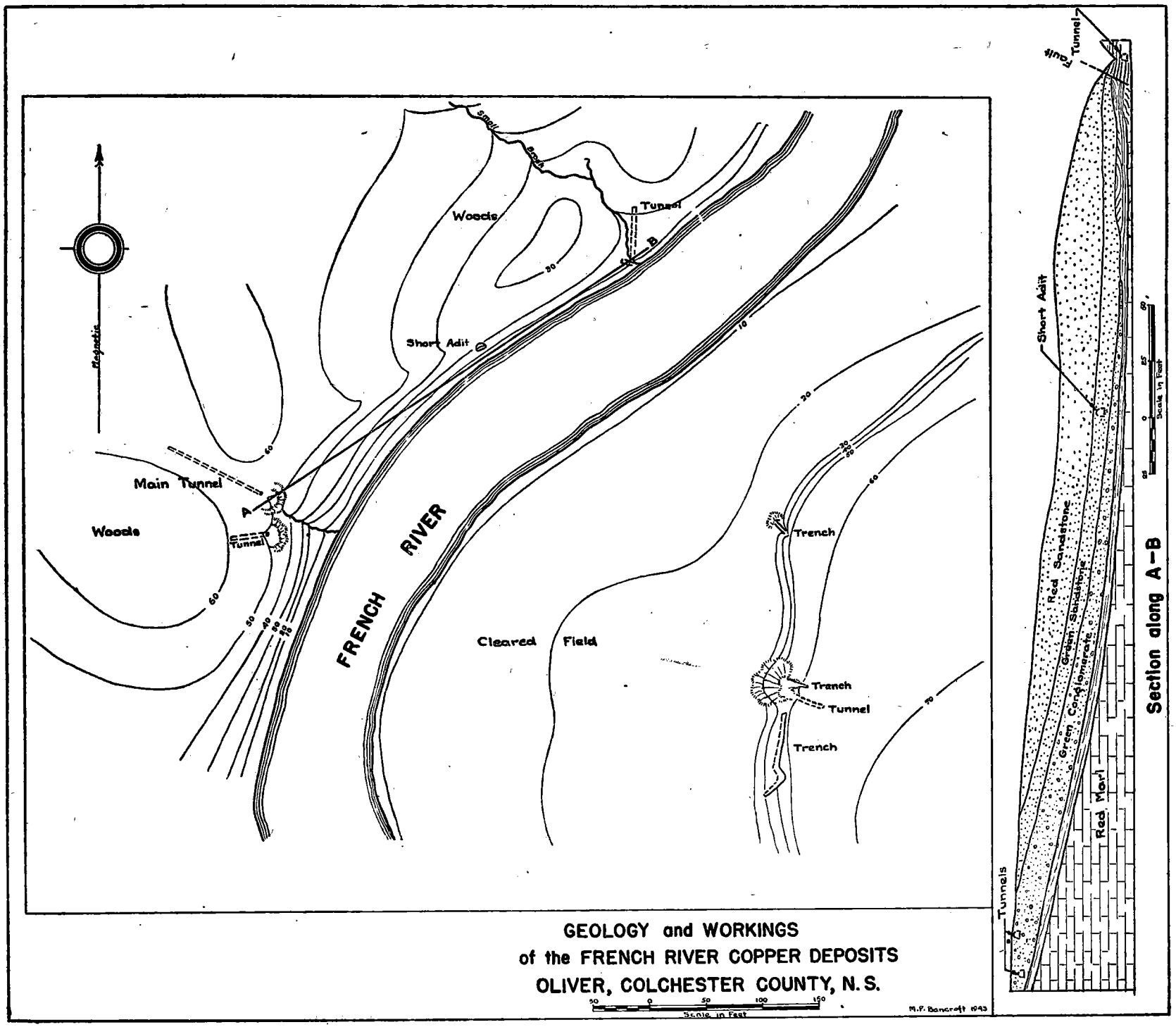
† References: Map 337A, 1938, Springhill sheet. Fletcher, Hugh, Geol. Surv. Canada Annual Report Vol. 10, 1897, p101A.

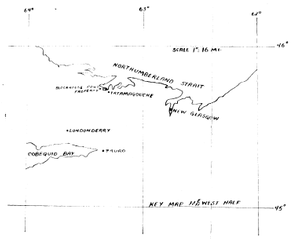

Magnetic
Small Brook
Woods
Tunnel
B
Short Adit
Main Tunnel
A
Woods
Tunnel
FRENCH RIVER
Cleared Field
Trench
Trench
Tunnel
Trench
Tunnels
Short Adit
Red Sandstone
Green Sandstone
Green Conglomerate
Red Marl
Section along A–B
Scale in Feet
GEOLOGY and WORKINGS
of the FRENCH RIVER COPPER DEPOSITS
OLIVER, COLCHESTER COUNTY, N. S.
Scale in Feet
M.F. Bancroft 1943

LEGEND

NORANDA EXPLORATION COMPANY LTD.,

BLOCKHOUSE POINT PROPERTY
TATAMAGOUCHE, NOVA SCOTIA

GEOLOGY & GEOCHEMISTRY



SCALE 1" = 400'

COPPER SHOWING — CHALCOCITE, MALACHITE OR AZURITE

GEOLOGIC BOUNDARY

LT. GREY ARKOSIC SS. ROCK UNIT

TRACE OF AXIS OF SYNCLINE

STRIKE & DIP OF BEDDING

SOIL LINES WITH VALUES (Cu) IN P.P.M.

SILT SAMPLE LOCATION - VALUES (Cu) IN P.P.M.

CLAIM BOUNDARY

CLAIM BOUNDARY AND TRACT NUMBER.
TRACT 48

SWAMP

C.N. RAILWAY LINE

MAIN HIGHWAY

TRACT 102

TRACT 101

TRACT 100

BLOCKHOUSE POINT

TATAMAGOUCHE BAY

SWAMP

DRIFT COVERED AREA

SWAMP

BLOCKHOUSE BR.

L96W L80W L64W L56W L48W L40W L32W L16W L0+00

TRACT 91

TRACT 92

TRACT 93

C.N. RAILWAY LINE

TRACE OF AXIAL PLANE OF TATAMAGOUCHE SYNCLINE

FRENCH RIVER

TO TATAMAGOUCHE

TRACT 78

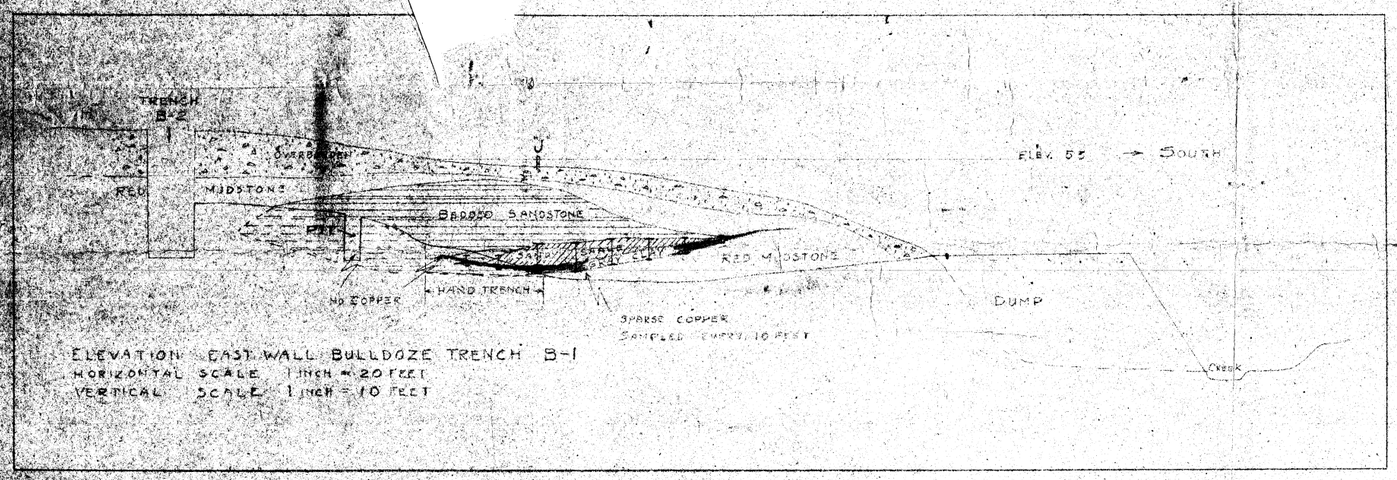
TRACT 77

TRACT 76

TRACT 75

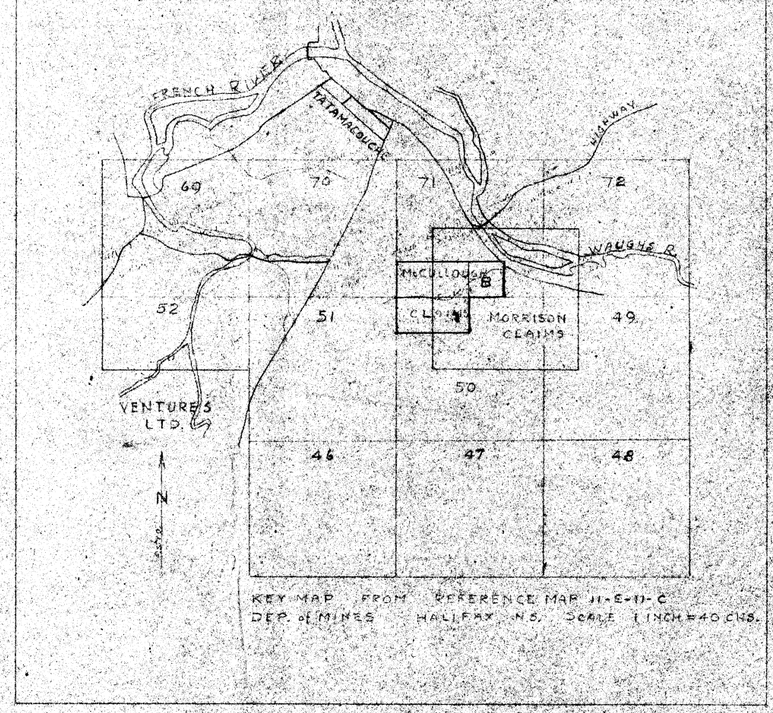
D.R. MAC DONALD

MAY, 1963



ELEVATION EAST WALL BULLDOZE TRENCH B-1
HORIZONTAL SCALE 1 INCH = 20 FEET
VERTICAL SCALE 1 INCH = 10 FEET

CLAIM B TRACT 71



KEY MAP FROM REFERENCE MAP 11-E-11-C
DEP. of MINES HALIFAX N.S. SCALE 1 INCH = 40 CHS.

TRACT 71 TRACT 72
TRACT 50 TRACT 49

— PLAN —
McCULLOUGH — OPTION
CANADIAN INDUSTRIAL MINERALS LTD.
TATAMAGOUCHE — NOVA SCOTIA
MAY 1951 SCALE 1 INCH = 100 FEET

Copper

48278