483001

COASTAL TRAVERSE

LYELL E.Z. EXPLORATIONS

57 – 151

000

483002

078, 079, 085
G 20.

13th March, 7

Regional Report - Coastal Traverse

Dates of Examination: 29th January to 2nd March, 1957; 5th March, to 11th March, 1957.

Party Leader: J. F. Gilfillan (Student)

Personnel Employed: C. C. Brooks (Student) and D. M. Watson (Bushman).

Man Days in the Field: 120

Location of Camps:

Base Camps:
- Fletcher Creek
- Mainwaring River
- Little Rocky River
- Giblin River
- Svenor Beach

Fly Camps:
- Lewis River
- Low Rocky Point
- Lawson Range
- Elliott Hill
- Mulcahy River
- Alec Rivulet

Transport and Supply: By helicopter; also by supply drop by Mr. L. L. Jones of Hobart from Auster aircraft at the Little Rocky River and at the Giblin River. Numerous fishing boats were on the coast when the weather was reasonable. Several of these offered assistance if required.

General Topography:

The coastline generally is very rugged and in places impassable without making extensive detours into the scrub.

North of Sassafras Creek the hinterland is dense rain forest extending back over low hills for some miles. South of Sassafras Creek

the button grass plains reach to within several hundred yards of the coast and then give way to low ti-tree scrub. The plains extend back for some miles rising abruptly to mountain ranges and small isolated hills such as Elliott Hill and Mulcahy Hill.

Occasionally large beaches are found, for example Giblin Beach and Mulcahy Beach, but these are not the general rule.

The Giblin, Mainwaring and Mulcahy Rivers have large salty estuaries and fresh water is not usually obtainable for some distance from the mouth.

The coastline moderates further south but high cliffs and steep narrow gorges are encountered occasionally.

Geology:

General

A feature of the whole area is the north-south trend of nearly all strikes and major shear directions. This is broadly shown by the folding and the schistosity.

It should be emphasized that the various groups and ages have been distinguished and differentiated entirely on lithological evidence. It is, therefore, quite possible that the schists and gneisses put into the Pre-Cambrian are, in fact, representatives of altered younger rocks.

Pre-Cambrian

The northern boundary of the Pre-Cambrian is taken to be somewhere between Sassafras Creek and Green Point. It is suggested that there is an unconformity between the Dundas Group and the Pre-Cambrian and that these two groups have both been affected by later folding. The resulting boundary is, therefore, an alternating series of beds of the two groups over a distance of about half a mile. Air photo interpretation should show this boundary more clearly.

Immediately south of Sassafras Creek there are highly contorted quartzites and schists of the types LE84, 85, 86 and 90. These show very varied degrees of contortion over short distances, e.g. LE 85 (a), (b) and (c); and variable composition. They are typically quartz-rich but may also be calcareous. These rocks usually contain small quantities of syngenetic (?) pyrite.

The schists from south of Sassafras Creek to the Lewis River are of the type LE90, 91 and 94. These are sheared siliceous schists composed largely of quartz and felspar.

North of the Lewis River the major shear direction varies about 10° either side of Magnetic North with dips generally to the west. Just south of the Lewis River the shearing is very well developed in three major directions - 355°/50W; 20°/80(?)W; 345°/20E.

Various siliceous schists continue until the Low Rocky Point granite is reached about 1½ miles north of Low Rocky Point.

The original bedding is not often discernable in these schists due to the prominence of the north-south shear. There are also zones of severe contortion in which the general picture is not visible. It would appear, however, that the general trend is for strikes at 350-360° and for westerly dips of about 80°.

Several dykes are found. These are typically fine-grained and lamprophyric of the type LE100. They are both concordant and discordant.

Some areas of schists are sericitic and in most cases these are associated with small quantities of pyrite, chalcopyrite and occasionally malachite. There are a few chloritic schists - one of these is the host rock at Pender's Prospect.

The Low Rocky Point granite outcrops along the coast from about 1½ miles north of Low Rocky Point to Diorite Creek. The age of the granite is unknown. It is seen to continue inland for some distance but may not be

directly connected with that seen on the Lewis River (see Report by K. C. Beck on Lewis River Area). It is composed of pink and white felspar in varying quantities with quartz and biotite. The biotite often shows alteration to chlorite.

The size of the crystals varies considerably from a coarse grained type such as LE107 to finer grained types such as LE110 (a) and (b). The rock becomes aplitic in places near Low Rocky Point.

There are several dykes within the granite. These occur in two main types - those of the lamprophyric type such as LE109, and a second type represented by a dyke about 10 feet wide found ½ mile west of Diorite Creek. This is porphyritic LE111.

The mass is typically unsheared but about ¼ mile west of Diorite Creek the N-S shear returns and increases in intensity until the Diorite Creek fault is reached. This causes, initially, the orientation of micas and the formation of indistinct felspar ovoids LE140. It finally results in an augen gneiss LE112.

East of the Diorite Creek fault are siliceous, bedded, metasediments with the N-S shear varying in dip from vertical to 75°W. After several hundred yards these change to blocky siliceous schists. There is also a little pyrite: LE113, 114, 115.

About 1 mile east of Diorite Creek there is a zone of sericitic schists with extensive limonite staining. The zone extends for ¼ to ½ a mile and contains a little pyrite and malachite at the surface. It begins with a chloritic schist containing pyrite LE117, then some quartzites with a little sericite LE118 and a quartz sericite schist with red and yellow limonite staining LE119. Further east are siliceous schists with azurite and malachite staining LE121,

also quartz biotite schists with pyrite in small quantities.

At the Little Rocky River, metaquartzites underlie the sand dunes. These are followed by a fine-grained, granitic rock, perhaps of metamorphic origin, but with the mineral composition of a hornblende biotite monzonite (Scott). This passes into a pink granite LE125. The same granite is also traversed for about ¾ - 1 mile by the Little Rocky River (called Granite Creek by T. B. Moore) starting half a mile from its mouth. In this area quartz and tourmaline are found, LE131, in surface floaters. About 1 mile south of the Little Rocky River, the granite becomes very sheared and develops into an augen gneiss which continues for about half a mile. After a faulted (?) boundary there is a zone of green, chloritic, felspathic schist LE127. This is found for nearly a quarter of a mile and then there is again granite.

Elliott Point is again quartzites. These contain crumpled zones but, in general, there is a rolling strike with a flat dip - about 10° - to the west. A little malachite staining was seen about 1 mile south of Elliott Point in the quartzites. A section of cliffs about 1 mile south of Elliott Point is formed by one of the few areas where easterly dips were observed. From here to the creek south of Elliott Hill there are quartzites and schists and, in places, slates. About 1½ miles north of the northern end of the Giblin Beach there is an area of strong shearing in the N-S direction, with a westerly dip of about 80°. Here there is an area of black calcareous schists similar to those seen north of Birthday Bay.

At the headland at the northern end of Giblin Beach, a belt of about 100 yards of garnet schists and then siliceous micaceous schists, LE138, are found.

Very contorted quartzites underlie the north end of Giblin Bay and probably the whole of the sand dunes on Giblin Beach.

Half a mile west of the Giblin River there is a rounded mass of

amphibolite (?) LE134. This is bounded by augen gneiss on the eastern side and on the west side there is a fine-grained border, LE134. The whole mass is surrounded by quartzites - N-S/20W. Immediately west of this there is a repetition of the garnet mica schist LE135 and the quartz-mica schist LE136 which was seen directly north across the bay. From here to the main point about 1½ miles south, there are quartzites and sheared siliceous sediments. The shear here is nearly vertical. The point itself is composed of an acid felspathic brecciated rock which may represent a lava or a dyke. A series of sharp bays on both sides of the point are thought to represent small north-south faults.

The coast now cuts back to the south-east and there is a repetition of rock types seen on the north side of the point.

Half a mile west of the Mulcahy River there is a prominent low scarp of about 25-30 ft. which can be traced through towards the Lawson Range. This may mark a major fault as it seems to mark the eastern limit of the heavily sheared schists and garnet mica rocks. This fault marks the western limit of the pure white quartzites which show large scale folding.

From here to the north end of Mulcahy Beach there are precipitous quartzite cliffs.

Inland, Mulcahy Hill is composed of quartzites as is also Isolated Hill and the western spur of Mt. Gaffney. The eastern part of Mt. Gaffney is composed of quartzitic schists. These are largely composed of quartz and felspar. In general there is no heavy shearing here.

The valley between Isolated Hill and the DeWitt Range looks to be of glacial origin.

Immediately south of Mulcahy Beach there is a coastal strip of a siliceous, poorly sorted conglomerate with boulders up to 2' in diameter. The mass is poorly jointed and has weathered smooth. Most of the pebbles are quartzite, either white or chocolate - but a few are cherty. They are

generally faceted and smooth which may point to a glacial origin. This rock was seen in several places inland, including many floaters near the mouth of the Little Rocky River. As these occurrences appear to be offset, it is suggested that there are a series of NW-SE faults parallel to the Elliott Hill fault (see later). Relative movement is of the order of 1 mile.

From the boundary of this conglomerate to the point at the north end of Svenor Bay, there are siliceous schists with garnets and mica. These include knotted schists.

The bedding generally strikes N-S with westerly dips varying from 35° to 75°. There are zones of shearing.

Near the creek 1½ miles south of the Alec Rivulet there is a zone of higher metamorphism in which there are granitic gneisses. About a quarter of a mile inland from here there is a mass of pyroxenite (?) LE146.

Near the northern point of Svenor Bay there is a boundary between the garnet mica schists and the quartzites. The latter are laminated and heavily contorted with isoclinal folds. These are interbedded with siliceous schists. General strike and dip is approximately N-S/80°W.

South of Svenor Beach, various quartzites and siliceous schists continue to the southern limit of the area. The point immediately south is cut by two lamprophyric dykes. Strikes are very variable with large drag folds probably associated with the major structure. There is a general swing of strike to E-W and this looks to be the nose of an anticline pitching south.

Green Island is contorted quartzites - the outer reef having N-S strike - dip about 50W.

Cambrian

Dundas Group. The northern limit of this report is at High Rocky Point. The geology of the coast north of this has been covered elsewhere.

The cliffs at High Rocky Point appear to contain at least three lava

flows. The uppermost flow, LE66, is a grey green, somewhat brecciated porphyritic lava. This forms the cliffs to the west and south-east. Lower, to the west, there are at least two more flows, LE67 and 68. These are hornblende andesite type.

The inter-relationship of these flows is not obvious. If they conform with the general trend they will be dipping steeply to the west. Actually they appear to be almost flat lying.

It is possibly evidence of uplift to note that behind the main point there is a semi-consolidated sandstone such as to suggest that the present point was once an island similar to those to be seen further out to sea.

Between the Urquhart River and Fletcher Creek there are rocks similar to those seen near the Wanderer River. They are felspar porphyry type lavas, with tuffs (?) and shales. Some of the shales are quite heavily sheared giving a cleavage about 30° to the west of the strike which, here, is about 330°. Some shales have a little syngenetic (?) pyrite associated with them. There are large quartz veins, some of which contain epidote.

About halfway between the Urquhart River and Fletcher Creek there is a small bay in which drag folds of the order of 15 feet are exposed in a grey calcareous shale.

There are also grey micaceous sandstones in this area which become more abundant to the south.

From Fletcher Creek to Cypress Creek the strike is generally N-S with dips 80E - V. The rocktypes are mainly micaceous sandstones and shales. There is one discordant dyke of the hornblende andesite type. Cypress Creek marks a fault plane running about NW-SE with apparent displacements to the west on the north side.

Just south of Cypress Creek there is a small anticline and syncline.

Near Flat Creek the strike swings from about 330° across magnetic North to 10°. Flat Creek also represents a NW-SE fault in which the apparent displacement is about 70 feet to the west on the north side. These are mainly sandstones and calcareous shales.

South of Flat Creek, the shearing becomes very intense and slates are produced. Shearing direction 320°/V. About ¾ mile south, a rounded point is a brecciated acid igneous rock - probably a lava - LE64. One mile south of this there are two parallel headlands. These are basaltic lava flows. The outer flow contains a little native copper and a thin film of malachite LE74.

From here to the Mainwaring River, there are slates and schists with N-S strikes and dips to the west of 70-80°. The shearing is strong, with a strike of about 320° and a dip to the SW varying between 70° and 85°.

South of the Mainwaring River the shearing stays at about 30° to the bedding. Dips are usually either vertical or steep to the west but 1½ miles south, they are seen to be easterly. Zones of severe contortion in the slates and schists obscure the structure in places, but there is one large syncline pitching north at 60° - see PI.

The shearing lessens in intensity near Sandy Point and more shaley rocks are found.

South of Abo Creek there are green chloritic schists with epidote. These continue to Green Point. Bedding is occasionally visible and appears to swing slightly east of north near Copper Creek. Many of the schists look like altered lavas, LE80, and they commonly have a little pyrite in small veins.

From Copper Creek south there are alternating chloritic schists and brown iron-stained schists. These become more epidotized and siliceous near Green Point. In the zone between Green Point and Sassafras Creek, these schists are more siliceous, very sheared and contorted. The strike of the beds is rarely

visible but appears to be slightly east of north. South of Sassafras Creek the Pre-Cambrian starts.

Structure

The Dundas is fairly tightly folded along approximately N-S axes. The size of the folds is of the order of one hundred feet. They are often asymmetrical and usually pitching. The shearing starts to develop south of Fletcher Creek and is found over almost the whole of the coast down to Port Davey.

The nature of the boundary between the Cambrian and Pre-Cambrian rocks is not clear. There is no direct evidence of major faulting at Sassafras Creek. The rocks of the two ages appear to be folded together over a short distance in the major structure, suggesting an unconformity.

The structure of the Pre-Cambrian may be divided into two main divisions: the major and minor structures.

The minor structures include extensive contortion and crumpling such as tight isoclinal folding and chevron folding. In general, these structures appear to bear little or no relation to the major structures. It is suggested that they represent a Pre-Cambrian orogeny. These folds may be only of the order of feet or inches in size.

The major structures, probably initiated in the Tabberabberan orogeny, have a magnitude of up to several miles. They are broad anticlines and synclines. Typical examples of these are the Lawson Range anticline, which can be traced north from Mulcahy Hill and may extend to the D'Aguilar Range; and the Isolated Hill anticline. It seems possible that the De Witt and Propsting Ranges together may form an anticline which could be the southerly continuation of the Mt. Lewis - Elliott Range anticline.

From about Nye Bay south, there appears to be a general tendency for the axes to swing to the south-east. This is further shown by a strong swing in the Kelly Basin area to the east-south-east.

Two major fault trends were observed: N-S and NW-SE. An example of the former is the Giblin Fault which separates the garnet mica schists from the quartzites. This runs from near the mouth of the Mulcahy River toward the Lawson Range. There are a series of similar faults west of this. At the north end of Svenor Bay, the same type of boundary is found running to the north. The latter type may be demonstrated by the Elliott Hill fault which has an apparent displacement of about ¼ mile to the west on the north side. It seems likely that there are a series of these NW-SE faults which have stepped the garnet mica rocks back to the south-east. One of these probably runs through Mulcahy Bay. Examples further north are seen at Flat Creek and Cypress Creek.

Low angle thrust faulting from the south-west was seen in two cliff sections on Mt. Gaffney. This fault was striking north-east and dipping at about 30° to the west. A similar type of fault may pass through the western side of Isolated Hill (see PIII). The relation of these faults to the other NE-SW faults is not known.

Mineralisation (C. C. Brooks)

One set of workings was noted, apparently Pender's prospect, located 1½ to 2 miles north of Low Rocky Point on the coast.

The structure was interpreted as a steeply dipping vein. Surface expression was a 6 - 9 ft. band of chloritic schist exposed over a length of 170 ft. The south end appeared to peter out at the water's edge, the

north end was lost under top-soil in dense ti-tree scrub.

The workings comprised one water-filled shaft of unknown depth (10+ ft.) and a shallow (6 ft.) pit - c.f. appended sketch. Two ore dumps, containing 3-5 tons of ore lie at grass.

Mineralisation consists chiefly of massive pyrite, containing a little chalcopyrite and some smears of secondary malachite - c.f. LE103, 104. The grade was guessed at 2%, maximum, for good hand-picked samples.

The prospect was estimated to be of little economic value as its geographical position is most unsuited to mine operation - access is hazardous by sea and impractical by land. Geological observations (low grade estimate, small surface indications, lack of associated outcrops or a leached or gossan zone) do nothing to bolster this estimation.

The outcrop requires sampling and assaying, but as the area is to be geophysically prospected by Canso method, this could be left until the geophysical results can be correlated.

One prospect was noted and has been named Diorite Creek Prospect. This is an indeterminate structure located ¼ mile east of Diorite Creek (which flows into Elliott Bay). Surface indication is a broad belt, 1000 ft. or more in width, of iron stained sericitic schists with small amounts of pyrite and chalcopyrite, in biotite-chlorite country rocks which, themselves, contain minor amounts of malachite and pyrite, c.f. LE116-122.

The extent and nature of this outcrop indicate chemical disturbance at depth, and possibly indicate a leached zone of mineralisation, although the lack of stockworks and normal gossan type limonites is a restraining factor.

As this area is scheduled to be flown by a geophysical prospecting team no further recommendation appears necessary at this stage.

Sporadic minor occurrences of pyrite, usually finely disseminated in schists, have been noted on the coast from Fletcher Creek to Mulcahy River.

012

Grain and crystal size was of the order of 0.5-1 m.m. but some malformed cubes of 5 m.m. side were found in a slate on Sandy Point, about 4 miles south of Mainwaring River.

In no area, however, were these occurrences estimated at more than 5% FeS over more than a few inches, except at Pender's Prospect, and hence they seem to be of no economic importance, c.f. LE81, 83, 93 and 139.

Although no copper mineralisation has been observed in these schists, several basic igneous bodies along the coast were seen to contain native copper and malachite, c.f. LE74, also Publication 17 Geology Dept. University of Tasmania, 1954, p.132.

Some quartzites were also seen to be malachite stained - LE133. Again, these appear to have no economic significance.

Other minerals noted in the area were tourmaline - a black variety found in quartz near Little Rocky River - LE131, and specular iron, LE109 - at Low Rocky Point.

General Conclusions:

It is unfortunate that aerial photographs were not available when this traverse was covered. When they are available, however, competent photo interpretation should do much to elucidate the structures - particularly of the Pre-Cambrian. It is hoped that this may also give some evidence of the nature of the Cambrian - Pre-Cambrian boundary at Sassafras Creek.

It is suggested that airborne geophysical work might be usefully carried out at Pender's Prospect and at the Diorite Creek Prospect. The former should be properly inspected, sampled and assayed at some convenient stage.

John F. Gilfillan

J. F. Gilfillan.

013

483015

AMG REFERENCE POINTS ADDED

80-V

80-V

80

FLETCHER CREEK
18" QUARTZ VEINS

SHALES

85-V

HORNBLENDE ANDESITE DYKE

MICACEOUS S.S. & SHALES

85-V

CALC. SHALE

?

S S

AMG370900E,
5258500N

85

LE 63

CYPRESS CK.

70

70

70

70

75-80

75

X

80

?

60

SS

BL. CALC. SHALE

SS

75

SLATES

?

?

?

FLAT CK.

LE 65

LE 64

80

BASALTIC LAVAS

LE 74

LE 75

LE 72

LE 73

RHEUBEN CREEK

80

70

SLATES & SCHISTS

85

75

80

LE 70

LE 71

60

QUARTZ VEINS & BLOWS

80

SLATES & SCHISTS

CAMP SITE

70-80

MAINWARING RIVER

75

SCHIST

AMG372550E,
5252400N

CONTORTED SLATES

70

60

65

80

LE 76

SLATE

SCHISTS

60

CONTORTED ZONE

70

75

60

VERY SHEARED

MAP
TAKEN FROM AERIAL PHOTOGRAPHS

ROCKY POINT

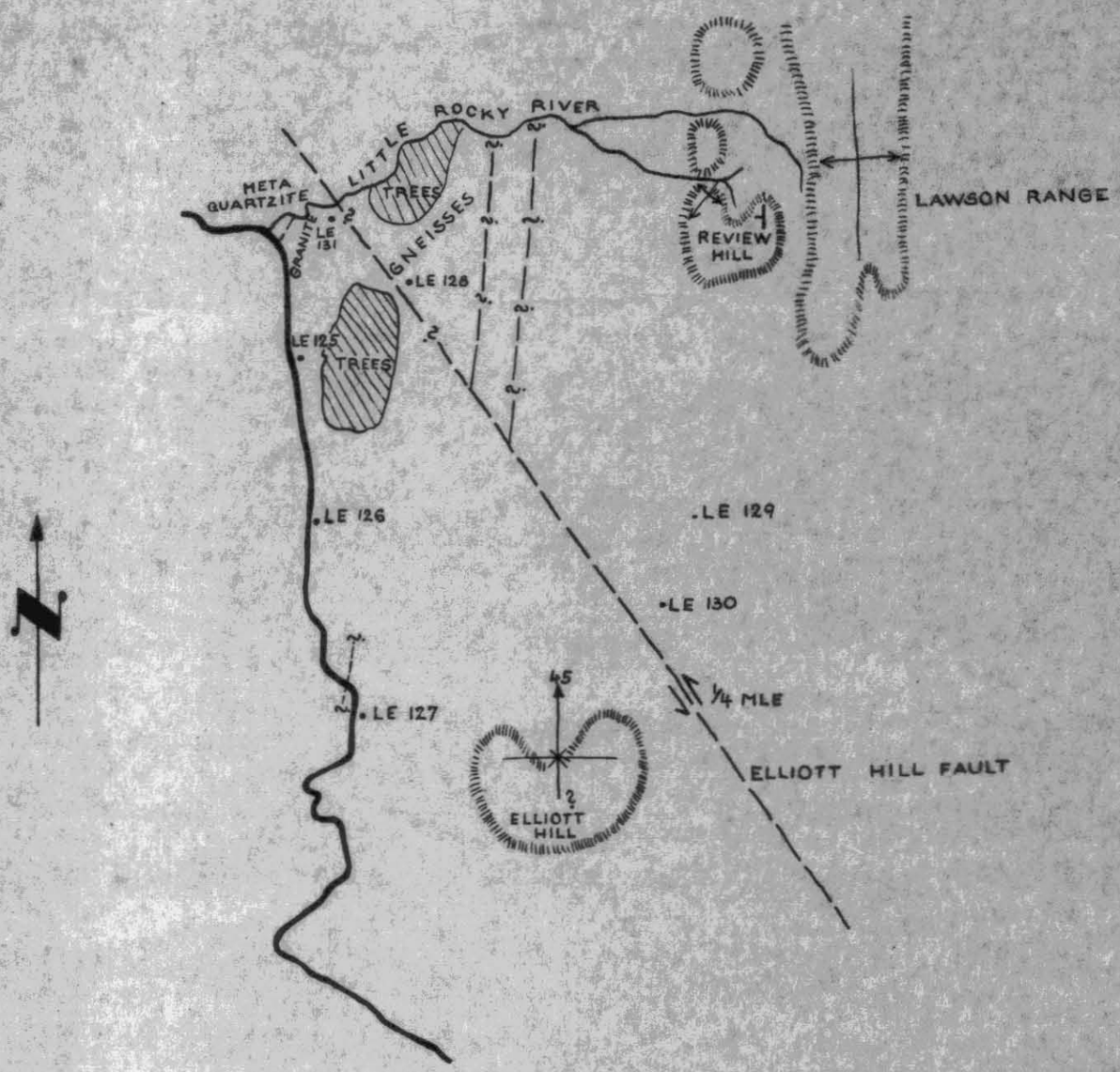
RUN 2 , 23529
RUN 3 , 23576
RUN 4 , 23580

SCALE:
30 CHAINS TO 1"

5 cm

PI

483016



SKETCH MAP
OF LITTLE ROCKY RIVER AREA

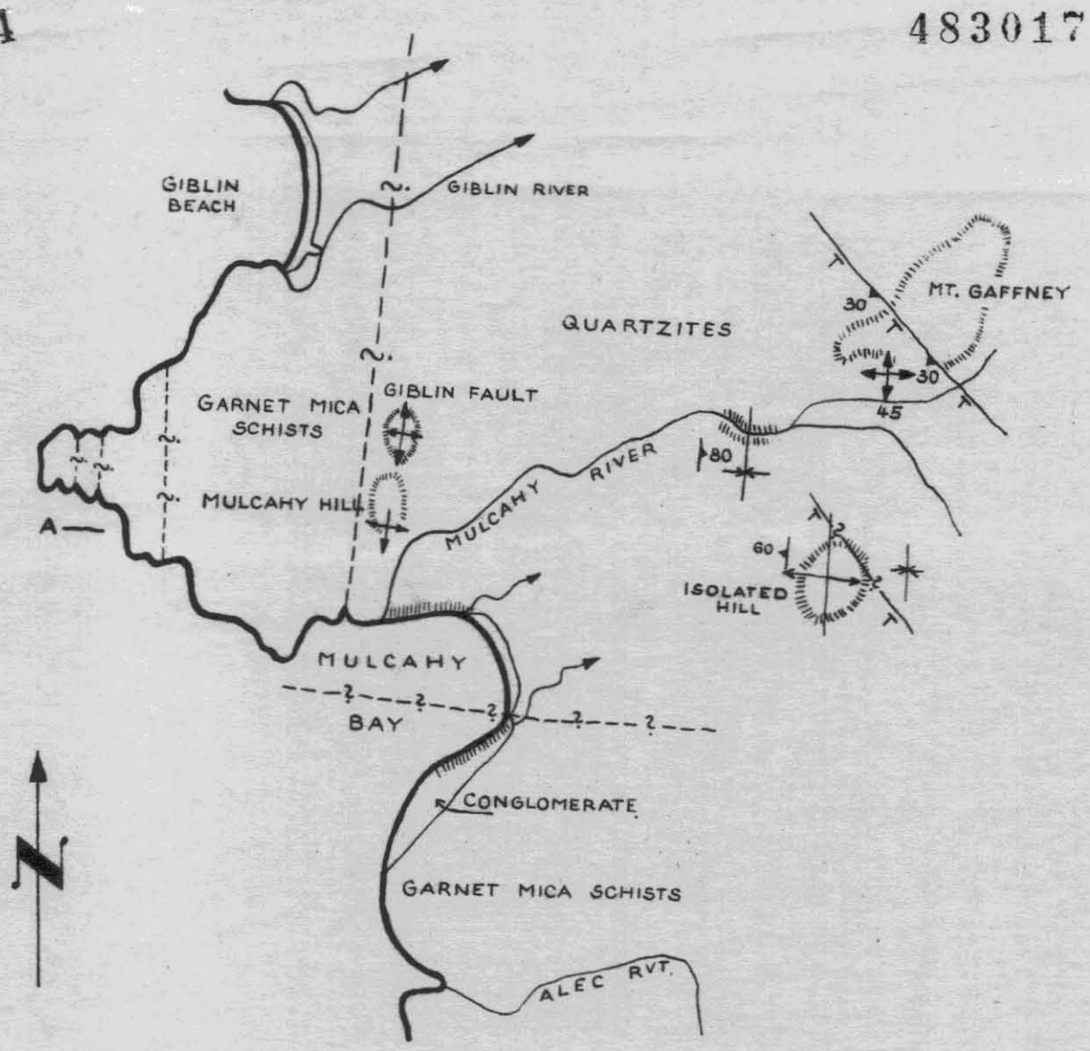
SCALE:
APPROX. 2" = 1 MILE

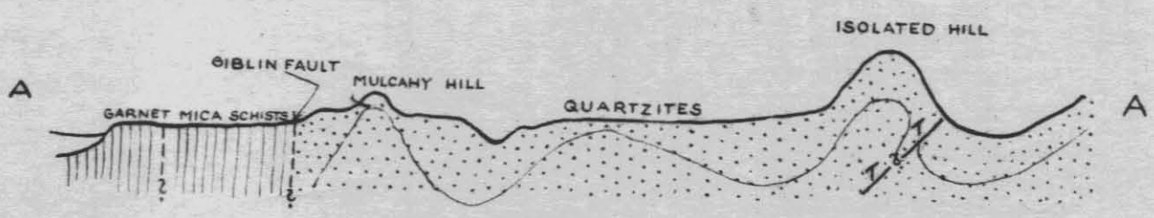
5 cm

PII

014

483017





REGIONAL SKETCH MAP AND SECTIONS OF MULCAHY RIVER AREA

SCALE:

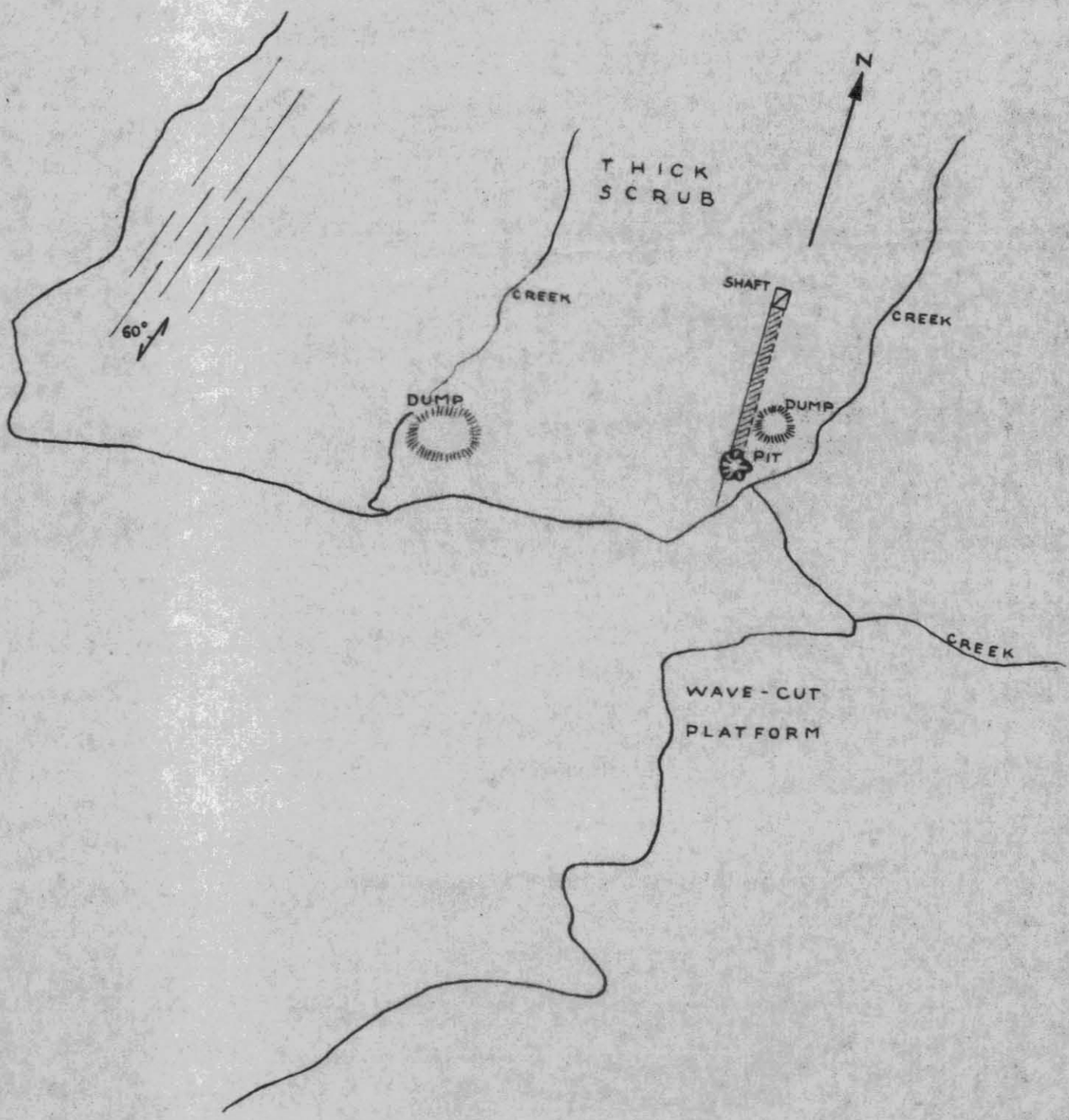
2 MILES TO 1" APPROX.

5 cm

P III

015

483018



PENDERS PROSPECT

SKETCH MAP

1½-2 MILES N OF LOW ROCKY POINT

0 100' 200'

APPROX. SCALE

5 cm

PIV