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PRELIMINARY GEOLOGICAL REPORT - BOND RANGE AREA, NORTHERN TASMANIA

E.L. 10/74 - BLACK BLUFF

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Hobart, July 1975

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PRELIMINARY GEOLOGICAL REPORT - BOND RANGE AREA, NORTHERN TASMANIA

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✓ ✓ ✓ ✓ A+B

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PRELIMINARY GEOLOGICAL REPORT - BOND RANGE AREA

ABSTRACT

Cambrian acid volcanic rocks of potential economic interest are exposed in the Bond Range and its western flanks, overlain by a thin cover of Ordovician quartzites. To the east they are covered by up to 400 ft. of flat-lying Tertiary basalt.

The major north-east tending Devonian structures - anticlines on the Bond Range and the Black Bluff Range and a syncline in the Vale of Belvoir - are cut off near the eastern edge of the Licence by a major structure, here called the Kauri Fault.

The Bond Range apparently represents the western edge of a Cambrian cone or cones of ash-fall tuffs, intruded by the parent magma (quartz-porphyry) and selectively silicified at the northern end of the range. Silicification is accompanied (?) by mineralisation of the surrounding rocks. On the southern end of the Bond Range and in "windows" within the quartzite west of Lake Lea rhyolites are interbedded with crystal tuffs and rhyolite complexes near the Iris Bridge may be associated with a granodiorite prophyry. The volcanics now exposed probably formed highs which influenced Ordovician sedimentation and Tabberabberan folding.

INTRODUCTION

The area in which mapping is now virtually completed is bounded by the Vale of Belvoir and the southern and eastern Licence boundaries. Most effort has been concentrated on the Cambrian rocks of the Bond Range, and their boundaries and internal stratigraphy have been carefully mapped. Distribution of other formations has been checked but the predominence of scree and alluvium obscures boundaries in many cases. Mapping by the Mines Department has been used as a guide, particularly in the basalt areas, but the present map of Cambrian rocks is more detailed and accurate than the 1966 work.

Mapping was recorded on 1:15,840 topographic field sheets with the aid of 1:50,000 black and white aerial photography and 1:15,840 enlargements.

This report is presented as a preliminary note, and some points may be modified by petrological studies.

STRATIGRAPHY

(a) Quaternary-Recent

The broad valleys of Fall River and its tributaries are filled with peat and swampy soils to depths of about three feet, with minor gravels at the base. Bedrock is seldom encountered. Well-rounded boulders of quartzites and slate, porphyry, dolerite and basalt up to ten feet across are scattered along the edges of the valleys. These boulders must have been transported by ice, and in particular the presence of dolerite ten miles from the nearest source (across rough topography) indicates glaciation of an extent not previously considered.

Modern siliceous breccias (silcrete) occur in two places, lying close to the Ordovician Cambrian contact. The breccias consist of rounded and angular quartzite boulders unevenly distributed in a fine crystalline silica matrix, unlike any breccia produced by normal sedimentation. In each case basalt lies a little to the east, and the breccias may be related to these flows.

(b) Tertiary

Tertiary basalt covers most of the area east of the Bond Range. The basalt consists of scattered yellowish olivine phenocrysts in a generally very fine groundmass. Textural variations include laminations (seen particularly on weathered surfaces) and very strong vesiculation. Vesicles are generally empty, though a few contain white zeolite (?) and carbonate. Vesicular basalts tend to outcrop on hill tops, and may represent the upper part of a single flow covering much of the area.

The basalt varies in thickness from a veneer of rounded boulders 5-20 ft. thick to at least 400 ft. thick east of the Fall -Lea junction. More than one flow may well exist in areas of maximum thickness, but no detailed mapping has been done.

The basalt is not mineralised.

(c) Ordovician

(i) Gordon Limestone

Limestone outcrops in the Vale of Belvoir between the cheese factory and the north end of Lake Lea and again in a tributary of the Lea River just west of the Kauri Fault. Several small limonite deposits have been reported near limestone-basalt contacts.

The limestone has not been studied for this report.

(ii) Owen correlates

All the siliceous rocks have been included as "Owen correlates" by the Mines Department, although the old name "Moina Sandstone" seems more reasonable for most of them in this area. Basal conglomerates do occur on the northwestern limb of the Bond Range anticline along the northern half of the range, where they are about 10 ft. thick, and consist of close-packed, well-rounded cobbles, mainly derived from Precambrian sources. A few fragments of Cambrian volcanics occur, and these are generally well cleaved. Disorientation of these boulders shows their cleavage to be pre-Ordovician.

On the Black Bluff Range west of Lake Lea the conglomerates reach 100 ft. thickness (e.g. on Prospect Mt.) and in places 10-15 ft. of breccia (equivalent to the "Jukes Breccia" of older stratigraphy) is developed on an uneven surface of Cambrian Volcanics. However it is a striking feature that in most places the basal Ordovician beds are massive pink sandstones (quartzites) in beds up to 4 ft. thick, many riddled with long vertical worm burrows filled with pale fine sand. Minor shales occur near the base in a few areas (e.g. under Bond Hill).

Quartzites predominate throughout the Bond Range sequence but north of the Kauri Fault rocks are more variable.

(d) Cambrian

The sequence on the Bond Range is:

top	volcanic siltstone
	medium- and coarse-grained tuffs
	rhyolite lava flows
intruded by	pink quartz-porphyry

(i) Volcanic Siltstone

This rock is dark grey and fine- to very fine-grained, with scattered small quartz porphyroblasts. It shows strong penetrative cleavage, with shiny sericite developed on schistocity surfaces. Original structures are obscured by the cleavage, but in outcrop this unit closely parallels the overlying conglomerate and the contact may be disconformable rather than uncomformable.

This unit may be a siltstone derived from volcanic material rather than a tuff, possibly deposited after volcanic activity ceased. It occurs only at the north-east end of the range on the western flank, where it outcrops consistently for two miles between Line D and the Kauri Fault.

(ii) The Volcanic Sequences in the Bond Range

Pyroclastic rocks and lava flows are now recognised to occur along the whole length of the Bond Range. Apart from two isolated rhyolite centres near the Iris Bridge they do not occur east of the range.

Lava flows

Lava flows are not recognised with certainty but much of the volcanic pile west and south of Bond Hill appears to be igneous rocks. They are rhyolites, or more correctly quartz-keratophyres, since the whole sequence probably belongs to the spilite suite. Quartz phenocrysts are the only macroscopic minerals, and they do not always occur. The lavas are pale yellow or greenish when fresh, with very fine feldspathic groundmasses of devitrified glass. Rhyolite exposed in the north end of the window between Lake Lea and Bond Hill has abundant quartz phenocrysts (2-3 mm.), a few feldspars visible in the groundmass and shows indistinct flow banding and rare autobrecciation - this one of the few places where evidence of origin is available. In the same area glassy aphyric and porphyritic rhyolites are interbedded with medium-grained tuffs and agglomerates, providing an unusually varied sequence.

No lava flows have been recognised on Bond Range north of Bond Peak, but fragments of yellow glassy rhyolite occur in some of the coarse tuffs. South of the Lake Lea track the Cambrian sequence expands and rhyolites are abundant.

Pyroclastics

Tuffs dominate the Cambrian succession on the north end of Bond Range. Characteristically, they are coarse-grained, with round quartz crystals 3-4 mm. across in a groundmass of crystal fragments and micaceous minerals (chlorite and sericite). Rhyolite occurs as rare inclusions 2-6 mm. long but other lithic fragments have not been recognised. One agglomerate relatively rich in rock fragments occurs in the window west of Bond Hill. Shearing and the recrystallisation of micaceous minerals makes it impossible to recognise any original glassy material.

Medium- and fine-grained tuffs are generally similar to the coarse-grained rocks, but round quartz crystals may be less abundant. Crystal tuffs rich in feldspar are uncommon. Very fine tuffs originally rich in glass occur south of Bond Hill.

Diagnostic textures in the tuffs are rare. In a few cases there is a suggestion of grading and in one instance banding parallel to bedding can be measured. From their general texture and the absence of any evidence for flow it is reasonably certain these pyroclastics are entirely ash-fall tuffs. Ash-flow rocks probably exist south of the Lake Lea track and north of the Kauri Fault but have yet to be mapped in detail.

Other Volcanics

In the two "windows" west of Lake Lea in the Black Bluff Range rhyolites predominate with minor tuffs. The rhyolites are pale yellow and very fine-grained (originally glassy) with small scattered quartz phenocrysts. In the southern "window" autobrecciation textures and flow banding provide good evidence of an igneous origin, and it is likely that more than one flow exists. Coarse crystal tuffs flank the rhyolite in the southern area and fine glassy tuffs occur in the northern "window". Mapping in the "windows" is incomplete.

South of the old V.D.L. track fine glassy rocks, both tuffs and lavas, are common. No detailed mapping has been done on this area, which is south of the Licence boundary.

(iii) Igneous Intrusive

Quartz-Porphyry

Cambrian exposures east of the Bond Range are dominated by massive pink quartz-porphyry. The freshest outcrops are on the old V.D.L. track at the head of the Iris River, but there is remarkably little variation between these and the northernmost exposures near the Kauri Fault. The porphyry forms massive rounded pink outcrops in which phenocrysts of quartz are quite characteristic - they are large (3-5 mm.) and rounded, often with radial cracks, and are glassy clear. Pyroxene remnants form idioblastic laths 2-4 mm. long and shadowy pale green feldspars are seen in some specimens. Chlorite occurs as patches 1-2 mm. across, with a few up to 1.5 cm. containing pyrite. In more altered rocks six-sided cyrstals of micaceous chlorite are the dominant ferromagnesian mineral. Angular white feldspar crystals and rounded patches of coarse feldspar and/or carbonate up to 1.2 cm. across are not abundant but are characteristic of the porphyry.

The groundmass is always pink or creamy and very fine-grained, with a waxy appearance due to abundant sericite.

Textural variations over the whole six miles of exposure are slight, and there is little doubt the porphyry is a single shallow sub-volcanic intrusion. The tuffs are derived by explosive volcanism from magma of the same composition as the porphyry, which is likely to represent the last pulse of magmatic activity in the volcanic cycle. There is no evidence that the porphyry ever reached the surface.

At the north end of Bond Range the central porphyry intrusions are roughly parallel with mapped boundaries in the tuffs, but contacts are not exposed. On Tuff Saddle a very irregular contact between tuff and porphyry is well exposed. The porphyry transgresses the tuff cleavage (which is apparently close to the bedding) and tuff is included in the porphyry. This contact is good evidence for intrusion of tuff by porphyry. No alteration occurs, and none is expected, since the two rocks are similar in composition.

Granodiorite Porphyry

This distinctive rock type is known only from boulders, but it appears to underly the basalt north of the camp towards Fall River. Fragments also occur in the quarry near the Iris Bridge.

Fresh specimens are pale grey, with scattered large quartz phenocrysts, small cloudy feldspar patches, black needles of hornblende (?) and scattered pyrite cyrstals in a fine crystalline groundmass. Composition is likely to be granodiorite.

Geographically at least this porphyry is related to the rhyolite complexes near the Iris, which are quite different from the volanics of the Bond Range and their associated pink porphyries.

STRUCTURE

The dominating structural elements are the Lea Syncline, forming the Vale of Belvoir (underlain by Gordon Limestone) and the flanking anticlinal structures of Bond Range and Black Bluff Range. These northeast-tending structures are terminated against the Kauri Fault, north of which Lower Ordovician quartzites extend from Black Bluff almost to the Iris River, with NNW-tending faults apparently controlling the structure.

Cambrian rocks are exposed along anticlinal crests, and in the Bond Range are covered by a thin skin of quartzites, perhaps only 100 ft. thick on the western flank. The Cambrian structures have been interpreted in the past as tectonic domes (aligned undulations in the anticlinal crests) but current mapping suggests the whole Tabberabberan structure is influenced by the shape of the pre-Ordovician terrain. It seems likely that the Bond Range may represent a number of Cambrian cinder cones (or the western flank of a single large one) which have been extensively intruded during the last phase of volcanism. The intrusion is expected to be close to the original volcanic centre or centres and to have represented a high at the time of Ordovician sedimentation. The tuffs were cleaved before the Ordovician, but tectonism may have been rather localised and irregularities in the Cambrian surface may have contributed

significantly to the unconformity. This is particularly evident in the Black Bluff Range west and south of Lake Lea where basal breccias and conglomerates vary from 100+ ft. thickness to nil over short strike distances.

It is surprising that no movement has occurred along the Cambrian-Ordovician contact (which is well exposed in a number of places) although Tabberabberan folding must have caused extensive strike slip in the uncleaved quartzites while movement in Cambrian was taken up along essentially vertical cleavage planes which pre-date the unconformity.

Further evidence for the persistence of Cambrian highs which may represent volcanic centres is provided by the rhyolite-breccia complex near the Iris Bridge. These rocks were emergent during Tertiary volcanism, when basalt flowed round them, and at present form small rugged peaks 150 ft. above the plain.

ECONOMIC GEOLOGY

Interest has been concentrated on the Cambrian rocks of the Bond Range, and it has been found that the porphyries mapped by the Mines Department intrude pyroclastic rocks of similar composition and which may have originally formed the western flank of a volcanic cone or cones. The pyroclastics are generally coarse-grained, with a penetrative pre-Ordovician cleavage, a situation potentially favourable for base metal deposition.

Geological interest has centered on the northern end of the range, between the northernmost peak and the Lea River. In this area a series of northeast-striking coarse and medium tuffs are intruded by porphyry and show striking selective silicification. Rocks surrounding the siliceous pods contain hematite and pyrite, and an adit driven into a quartz reef on the southeast side produced small amounts of chalcopyrite and bornite.

Alteration

Seven separate lenses of strong silicification have been mapped and sampled, and surrounding rocks sampled for assay. The lenses outcrop as rugged spines, surrounded by low lying unaltered tuffs.

Silicification is most intense near the Lea River, where the spine consists of very fine yellow silica with a streaky texture, probably indicating replacement of a tuff. On the western side of the spine fine grey tuffs contain small flat lenses of specularite and have patchy green staining. Further west pyritic porphyry contains quartz reefs (apparently unmineralised) while on the eastern side grey tuffs are flanked by porphyry with a quartz reef containing pyrite, chalcopyrite and bornite.

Towards the tope of the range silicification is less intense, and traces of original textures, such as quartz porphyroblasts, are visible in the massive silica. Some outcrops show coarse sheared fragments (?) with interstitial finer schists and masses of creamy silica. Quartz veins are uncommon. Unaltered quartz crystals and rare rhyolite fragments are evidence that the silicified rocks were originally tuffs. In some cases at least, coarse tuff lying between finer beds has been selectively silicified, and there is a sharp lateral cut off of alteration. It is uncertain whether silicification is confined to originally lenticular tuff bodies or just dies out along strike - the former appears to be the case.

The only mineralisation within the spines is specularite and specks of an unidentified blue mineral. Flanking rocks near the river consistently contain pyrite and hematite.

Quartz reefs, which occur within porphyries in the area of interest, and also on the eastern flanks of the range, may be an alternative expression of the silicification. Mineralisation of a reef is only seen at the adit.

SUMMARY

Geological mapping of the Bond Range and the area east to the Iris River is now complete. Tuffs which are the host rocks to a major porphyry intrusion are potential economic targets and surface mineralisation has been observed around lenses of intensely silicified tuffs at the north end of the range.

OPEN FILE
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UNION OIL DEVELOPMENT CORPORATION

GEOPHYSICAL SURVEYS ON TASMANIAN E.L. 9/74 AND E.L. 10/74

DECEMBER 1974 through APRIL 1975

During a period from December 1974 to April 1975, geophysical surveys of Union's two Tasmanian Exploration Licence Blocks E.L. 9/74 (Birch Inlet) and E.L. 10/74 (Black Bluff) were conducted. These took the form of induced polarization surveys on both blocks and an airborne electromagnetic survey over the southern portion of the Birch Inlet block. The I.P. surveys on each of the licence blocks are herein described. The electromagnetic survey at Birch Inlet is separately described in Geoex' "Report on the Combined Helicopter Borne Magnetic and Electromagnetic Survey in the Mount Lee Area of Western Tasmania for Union Oil Development Corporation".

E.L. 10/74 - Black Bluff

Fourteen line kilometers of pole-dipole induced polarization data were obtained on six lines across the main Cambrian volcanic belt east of Lake Lee. These lines are spaced at approximate mile intervals. The lines are not set on a grid pattern, but they basically traverse across strike.

The predominant potential spacing used was 100 meters, while the search depths (na spacings) were 100 and 200 meters. Shallower, more closely spaced, arrays were twice employed in areas of interest defined by the regular arrays.

Time domain, two second pulse, transmission was achieved with a C.G.G. transmitter and monitered with a Scintrex I.P.R. 8. receiver. Currents rarely exceeded two amperes, and often were much under one ampere, leading to some signal-to-noise inadequacies. Data presentation is therefore from the first decay curve window.

Background chargeabilities are low, in the 5 to 10 millivolt/volt range. "Anomalous" features greater than 15 millivolts/volt are noted in several locations.

1. "Owen Anomalies" - Shallowly derived anomalies are noted on the western extremities of Lines F, E, and A. These features have high apparent resistivity and direct correlation with outcropping Owen Conglomerate, starting at its contact with the Cambrian volcanics. Penetration from Owen Conglomerate into the Cambrian volcanic rock occurs on the dip slopes surveyed, as shown by the lower values of chargeability and resistivity of the deeper search depth data. Different lithologic background is an indicated source of these features.

2. Line D - Station 12 Vicinity Anomaly - A broad, shallowly derived anomaly reaching to depth is indicated. The source is a body of some 300 meter width probably having 400 ohm-meter resistivity and 25 millivolt/volt true chargeability, imposing limitations on its potential for possessing large sulphide percentages.

3. Line C - Station 15+50 Anomaly - A thin, dikelike source is indicated. The feature bears a nebulous resistivity low, and may well represent sulphide or graphitic occurrence. Its indicated thickness is around 150 meters. A button grass swamp completely masks the geologic expression of the area. This is the writer's favorite anomaly of all those defined by I.P. work on Union's two Tasmanian Licence Blocks.

4. Line C - Station 32+00 Anomaly - A feature of weaker, but similar nature, to that of Station 15+50 on this line. A dikelike source may be indicated. Not a great target due to low amplitude.

Apparent resistivities vary markedly over the area. The lowest observed values are less than 100 ohm-meters to the east near the Tertiary basalt, and the highest values are in excess of 2000 ohm-meters to the west over Owen Conglomerate or in presumed Cambrian rocks. Profile stacking shows some line-to-line section similarity not easily noted in the pseudosection data.

E.L. 9/74 - Birch Inlet

Twenty-one line kilometers of gradient induced polarization data were obtained on nine lines over the Cambrian Lucas Volcanic section of the Birch Inlet block. Lines were spaced at 800 meter intervals on a grid whose baseline parallelled the strike of the volcanic belt.

Current electrode separation of 2.5 kilometers allowed survey of three lines from one spread, with two such spreads employed to overlap the width of the volcanic section. This was possible due to the high signal of 1000 ohm-meter resistivity environment. The potential dipole spacing was 50 meters.

Time domain, two second pulses, were achieved with a Scintrex transmitter and monitered with Scintrex I.P.R.-7 and I.P.R.-8 receivers, calibrated to each other on the third window of the I.P.R.-8 decay curve. Data thus presented is in the I.P.R.-8 terminology and scale millivolts/volt.

Background chargeabilities range from 5 to 20 millivolts/volt. Many of the fluctuations observable in the profiles are probably due to lithologic background variations, rather than significant sulphide accumulations. A few stronger relative chargeability highs are evident.

1. Thirkell Anomalies

#3	L-176N	15+25 W
#4	L-160N	14+75 W
#5	L-160N	13+25 W
#6	L-144N	15+25 W
#7	L-144N	14+25 W

These are stronger chargeability features, some of which (4, 5 and 7) have associated conductivity highs (resistivity lows). Anomaly #6 apparently lies at the Thirkell-Owen contact; the others are internal to the Thirkell Group.

2. Thirkell-Lucas Contact Anomalies

#1 L-192N 14+00 W

#2 L-184N 14+25 W

These chargeability highs are significantly above local background. Anomaly #2 has higher conductivity. Significant distortion of the resistivity values may be occurring this close to the current electrode, and therefore, the data of Line 192 is particularly suspect.

3. Lucas Volcanics Anomalies

#11 L-160N 0+50 W

#12 L-176N 7+75 W

#13 L-192N 6+25 E

#14 L-192N 10+25 E

#15 L-184N 9+75 E

#16 L-184N 12+25 E

#17 L-144N 10+25 W

#18 L-144N 11+75 W

#19 L-136N 10+25 W - 11+25 W

#20 L-128N 8+25 W - 9+25 W

#21 L-136N 5+75 E

With the exception of #11, these are weak anomalies, any or all of which may be lithologic in derivation. Anomalies 13 and 15; 14 and 16; and 17, 18, 19 and 20 may be related as grouped. Anomaly 11 has a strong associated resistivity high. Strong conductivity correlation is lacking for the other anomalies.

4. Lucas or D'Aguilar Anomaly 22

A strong chargeability feature is inferred from the data at the end (16+25 E) of Line 136 N, down at the bottom of a rain forest choked valley. This is in the area of Lucas Volcanics as best may be inferred from the absence of a typical D'Aguilar ridge. However, the feature resembles that seen over the D'Aguilar outcrops. Being near the current electrode, the resistivity data are suspect.

5. *D'Aguilar Anomalies*

#8	L-184N	16+00 E
#9	L-168N	19+00 E
#10	L-160N	19+25 E

These are broad, higher amplitude, features near the last stations surveyed. Distortion may create the greater width, or these may be broader bodies. Resistivity data are useless here.

Apparent resistivities are high throughout the area. Values of 1000 ohm-meters are common on the Lucas Volcanics. Thirkell and Owen (?) resistivities appear generally higher. Distorted resisitivity values undoubtedly occur near the ends of the survey lines, because the array was pushed to its limit.

Blair Salisbury

June 25, 1975

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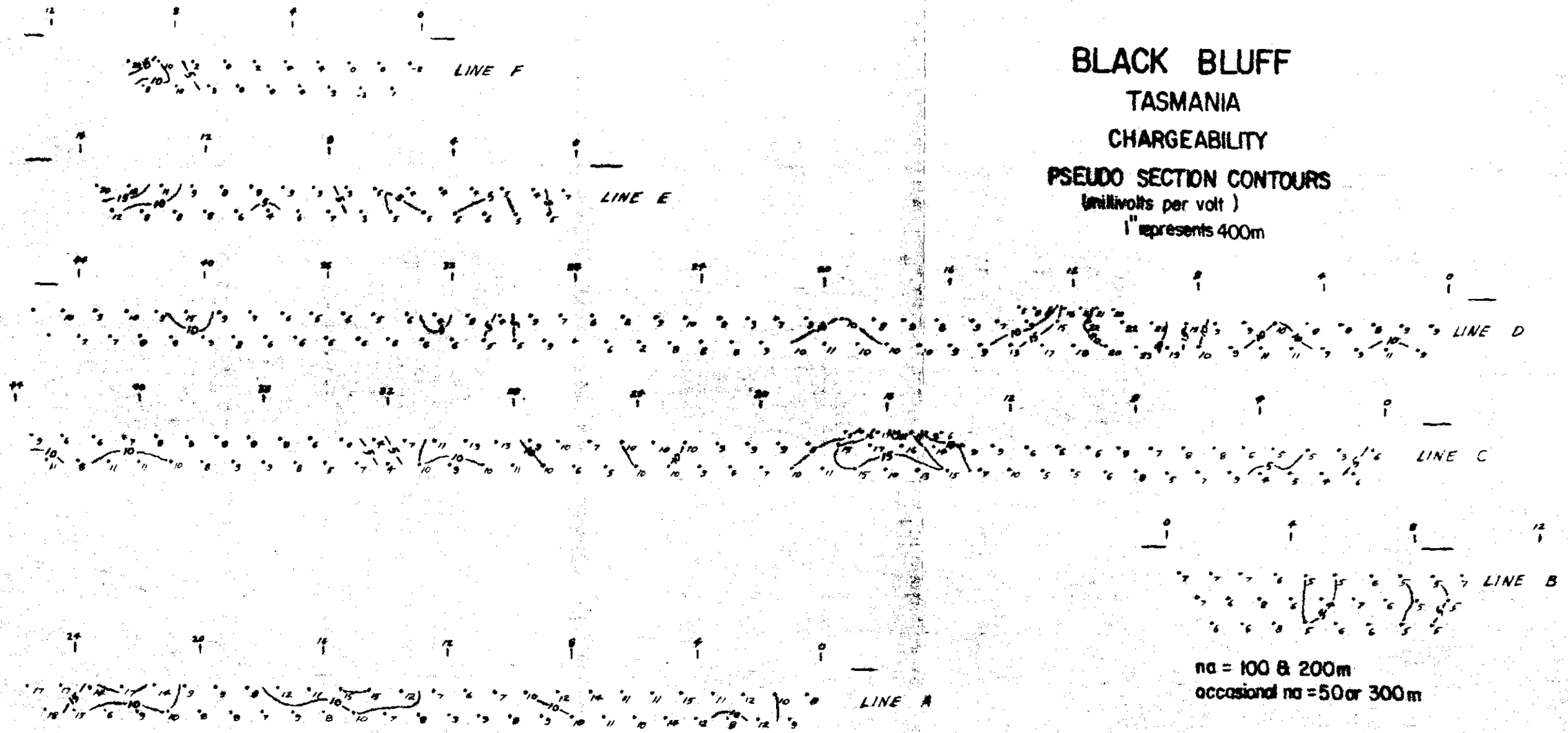
TASMANIA

CHARGEABILITY

PSEUDO SECTION CONTOURS

(millivolts per volt)

1" represents 400m



na = 100 & 200m

occasional na = 50 or 300m

5 cm

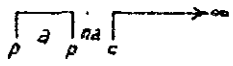
018

521018

Stn. No: 24 20 16 12 8 4 0

APPARENT RESISTIVITY (Ω m)

Ω m
5000
1000
500



a = 100 m
X n = 2
O n = 1

mv/v
40

CHARGEABILITY (mv/v)

20
0

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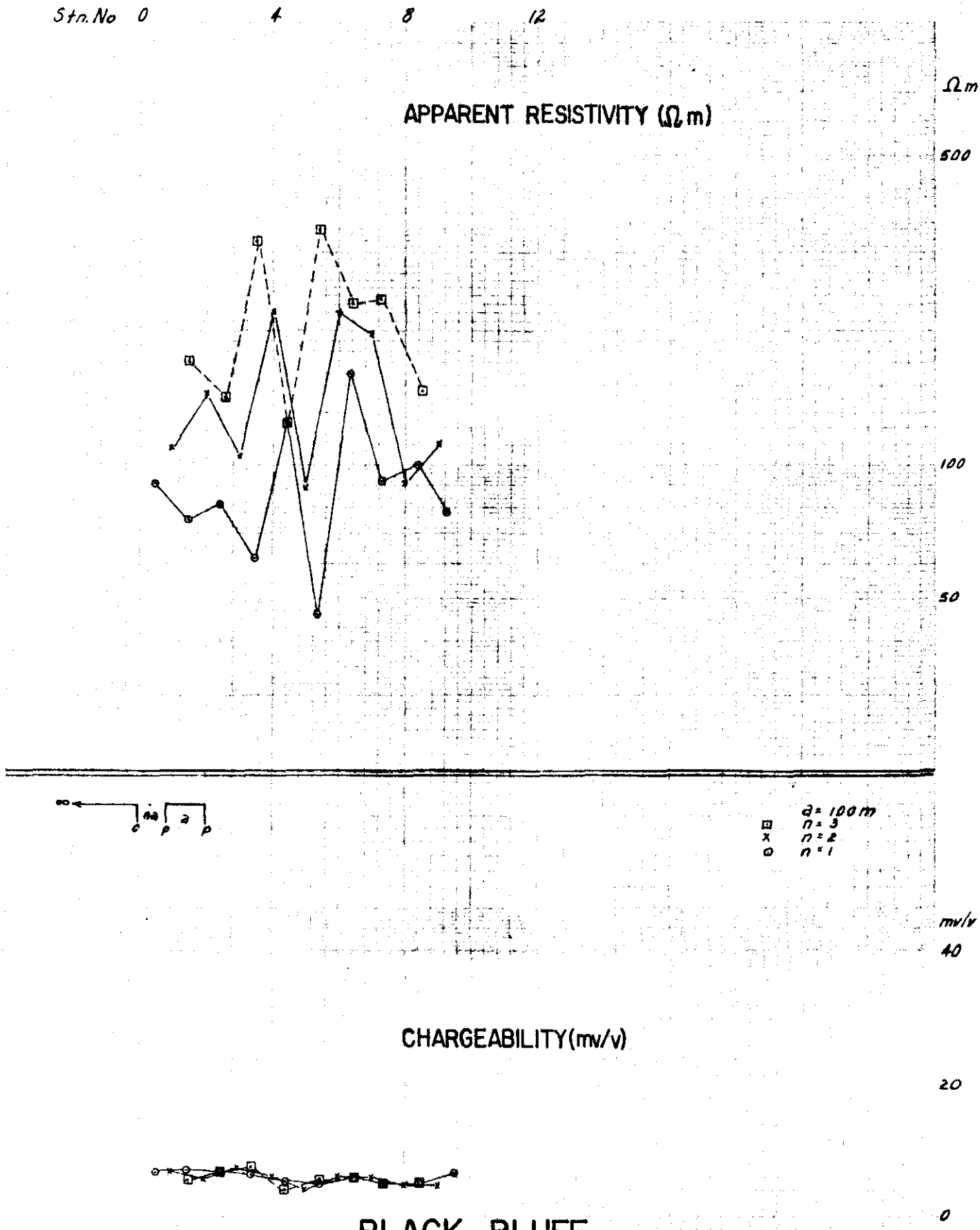
TASMANIA

1" = 400m Line A

5 cm

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1"=400m Line8

5 cm

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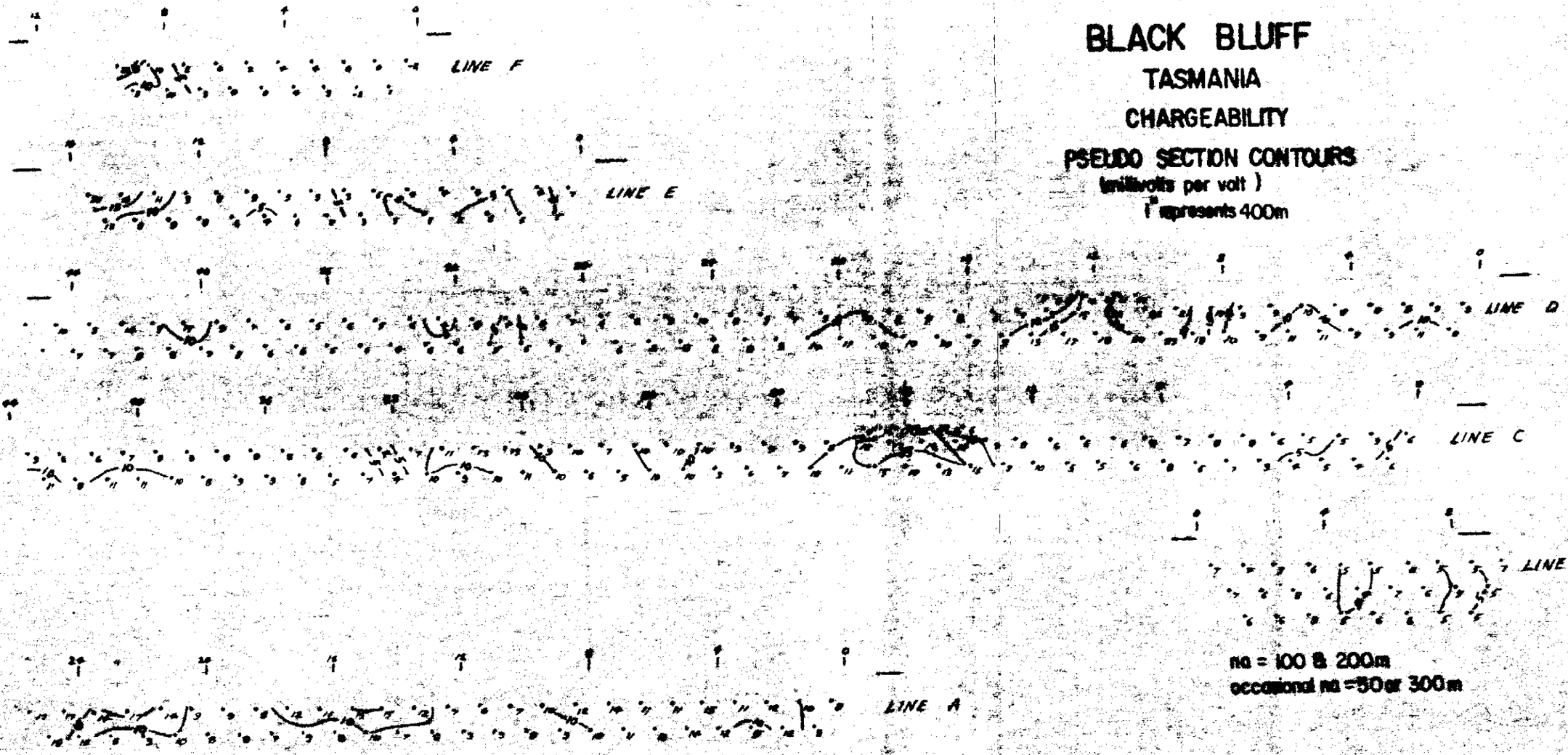
TASMANIA

CHARGEABILITY

PSEUDO SECTION CONTOURS

(millivolts per volt)

1" represents 400m



na = 100 & 200m

occasional na = 50 or 300m

5 cm

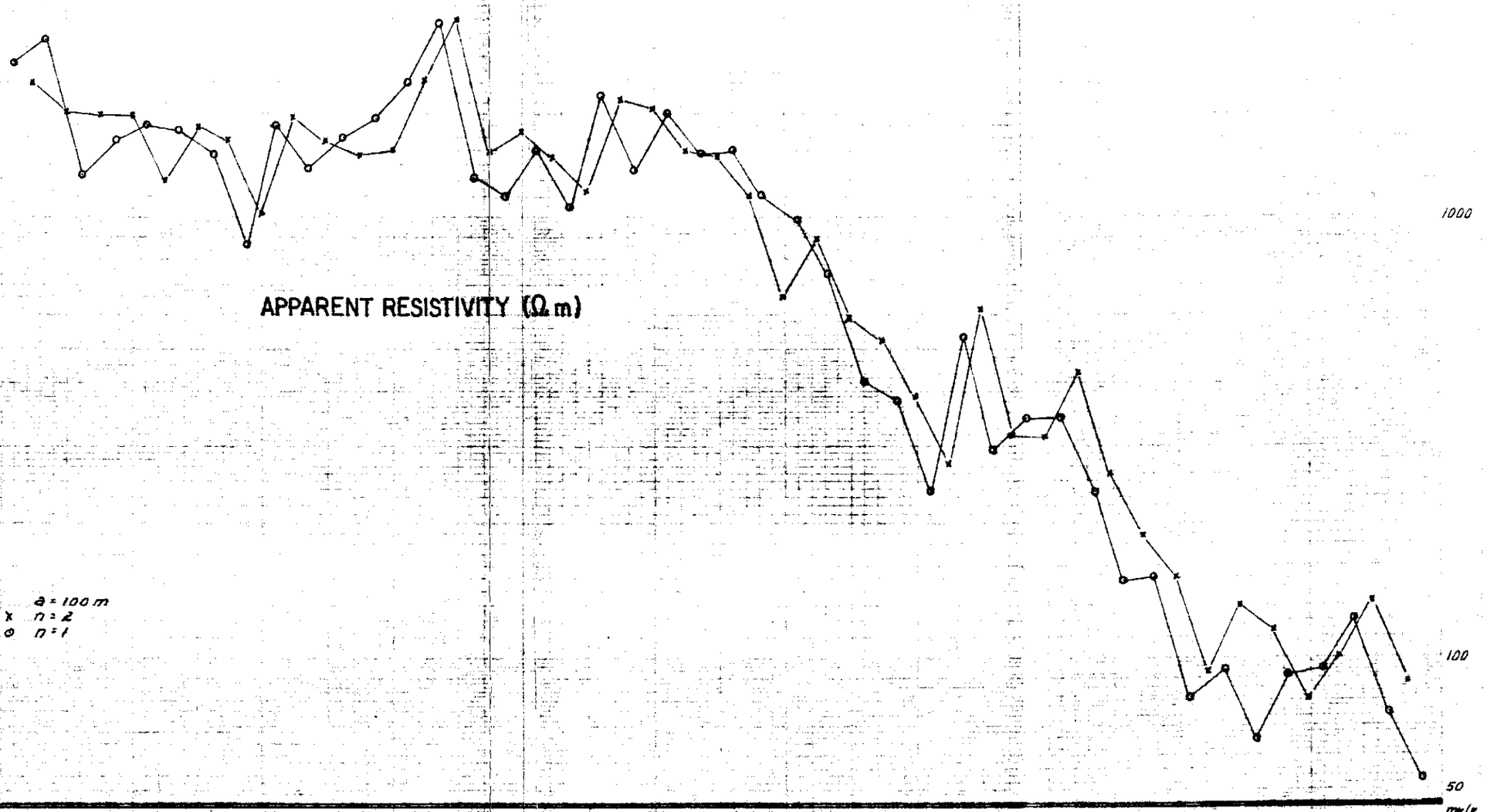
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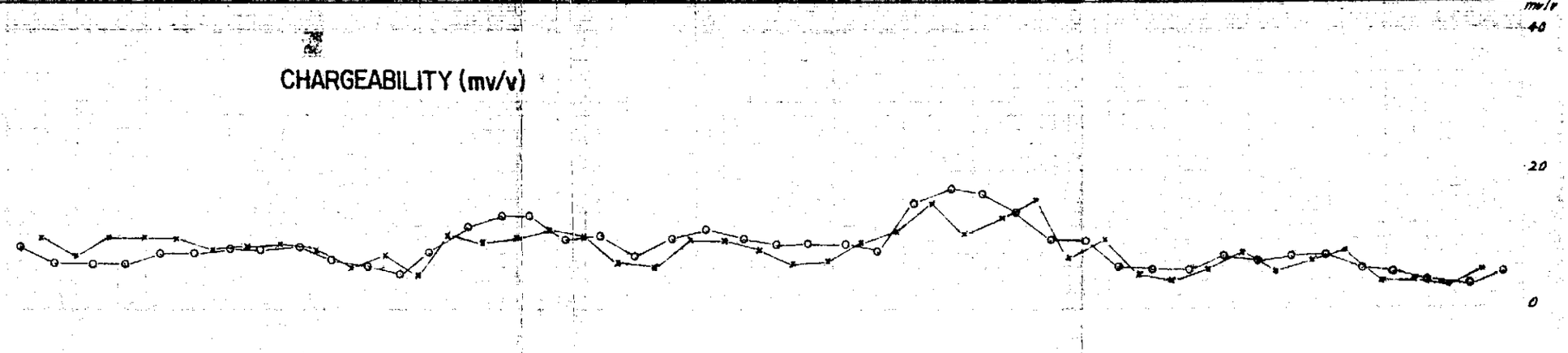
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TASMANIA

1"=400m Line C





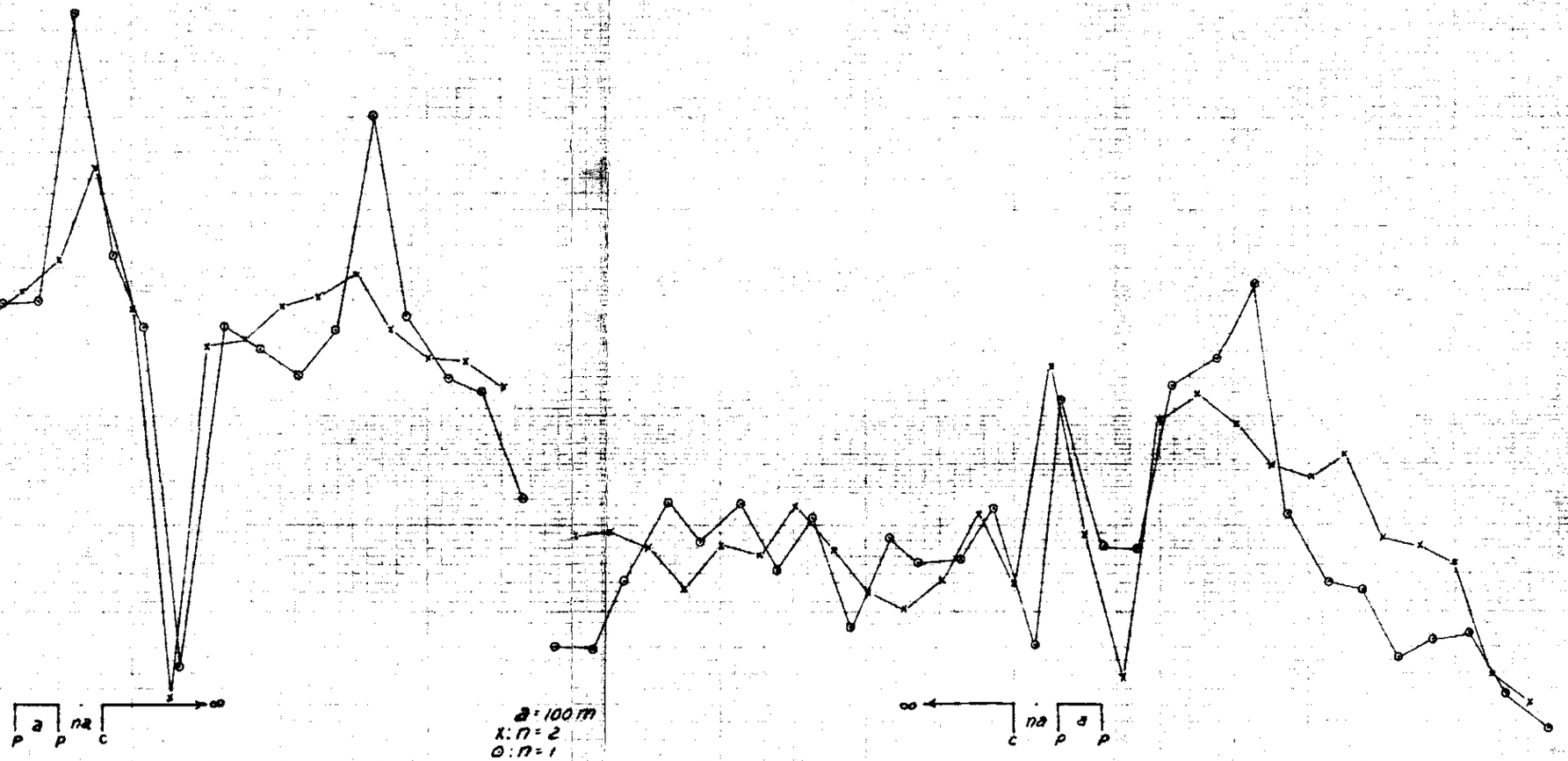
021

521022 13-1048

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APPARENT RESISTIVITY (Ω m)

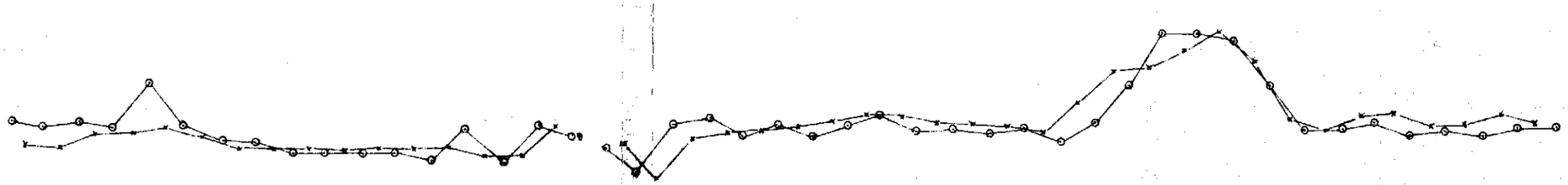
Ω m
5000
1000
500
1000



40

CHARGEABILITY (mv/v)

20
0



BLACK BLUFF

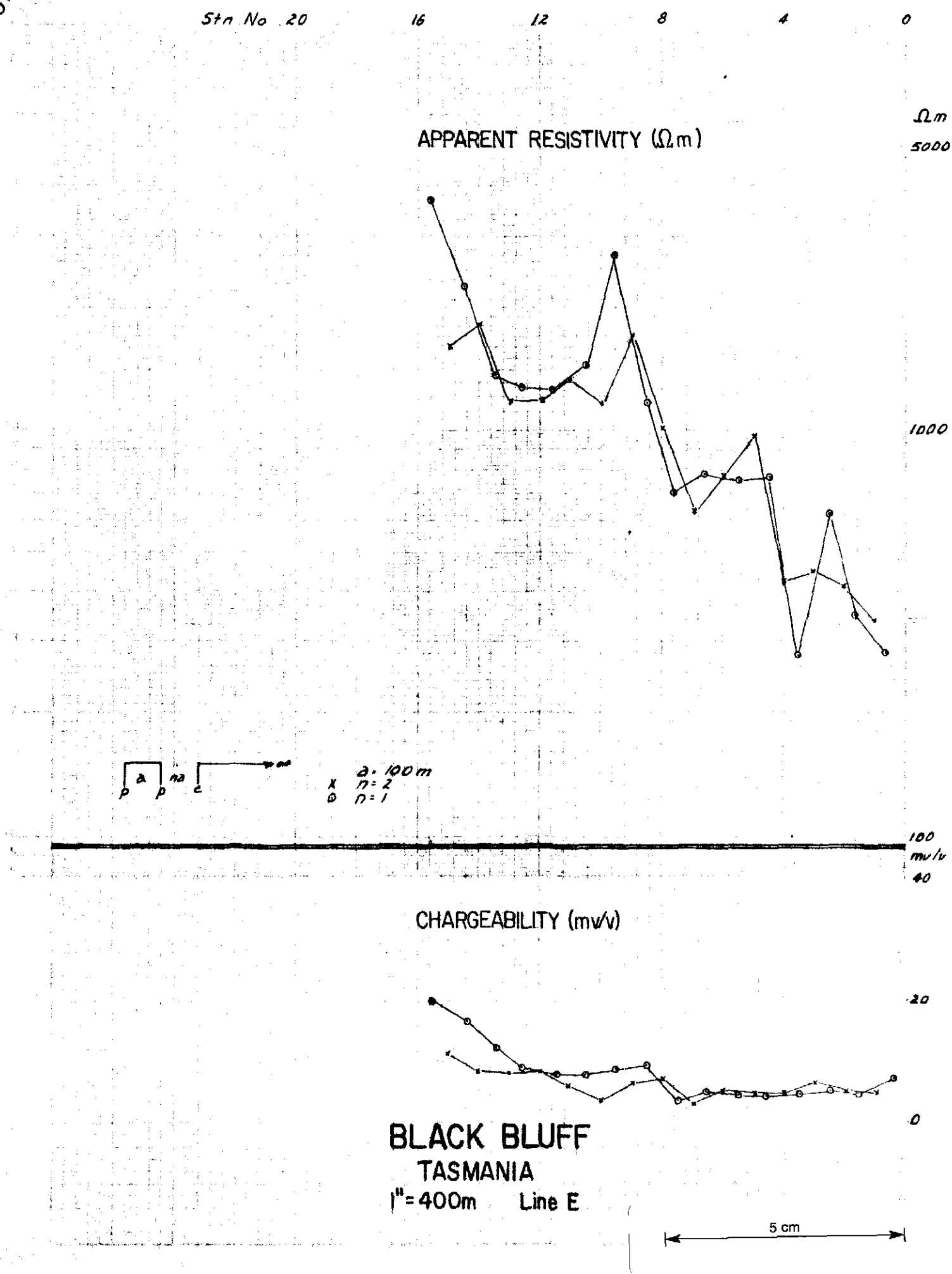
TASMANIA

1"=400m | LineD

5 cm

022

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Stn No 20
16
12
8
4
0
APPARENT RESISTIVITY (Ωm)
Ωm
5000
1000
a = 100 m
n = 2
n = 1
100
mv/v
40
CHARGEABILITY (mv/v)
20
0
BLACK BLUFF
TASMANIA
1"=400m
Line E
5 cm

023

Stn No.16 12 8 4 0

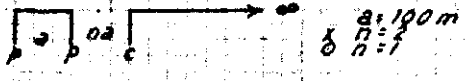
Ωm

APPARENT RESISTIVITY (Ωm)

5000

1000

500



mv/v

40

CHARGEABILITY (mv/v)

20

0

BLACK BLUFF

TASMANIA

1" = 400m Line F

5 cm

U.D.D.C.

GEOLOGY OF THE BOND RANGE

TASMANIA

Mapping by E.Corbett with acknowledgement to Mines Dept 1"=1mi Mackintosh sheet

Mapped: Jan-Mar '75 Plan No 424 Drafted: P.M.S. Mar '75

Ammended June '75

0 25 50 75 1 mile

R.F.1: 15,840

5 cm

75-1098

The geology to the north west of Bond Range has been taken from the Mackintosh 1:63,360 geological plan (first edition 1966). Slight modifications were made where the geology is known to differ from that printed on the Macintosh sheet.

J.L. McGregor-Dawson.

Scale approx. 1: 158,400

RELIABILITY DIAGRAM

Area covered by field traverses

Remaining geology taken from Mackintosh 1:63,360 Geology plan

Geology of the unmapped area taken from the Burnie 1:250,000 geology plan (First edition 1973.)

Scale 1: 100,000

Undifferentiated Cambrian Presumed to be Mt Read Volcanics

Ordovician Owen Conglomerate & Sandstone

Tertiary Basalt

Black Bluff

Mount Cattley

Area covered by this 1:15,840 Geology map

Boundary of E.L. 10/74

LEGEND

2	Qa Alluvium, glacial debris, swamp soils	48 46	fg cg Ash fall tuffs
7	Qts Talus deposits of sandstone & conglomerate	51	sil Silicious alteration
10	Tb Basalt	50	Egk Pink quartz porphyry (qtz keratophyre)
15	Og Gordon limestone	52	Efp White feldspar porphyry (known from bldrs only)
21	Oos Owen Sandstone		Geological boundary
20	Ooc Owen Conglomerate		Geological boundary, position uncertain
41	Euv Undifferentiated Mt Read volcanics		Foliation
43	Etp Tuffaceous phyllite	45°	Bedding
52	Er Rhyolites		Direction of fold plunge
61	Ero Rhyolite agglomerate		Fault
54	Ert Rhyolite & glassy tuffs		

CATTLEY PLAIN

BLACK BLUFF

VALE OF BELVOIR

BOND RANGE

LAKE LEA

KAUR

PAUL

LEA RIVER

FALL PLAIN

FALLS

IRIS R

MIDDLESEX PLAINS

WILMOT

Bare Mt.

Prospect Mt.

Rocky Mt.

Bonds Hill

Quarts reef

Lake Lea Track

Sunshine Ck

Cradle R.

Boundary of Exploration Licence 10/74

map 1

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PRELIMINARY COPY ONLY

75-1098

U.O.D.C.

BLACK BLUFF

TASMANIA

HUMIC SAMPLE RESULTS

Date: June 75 Scale: 1: 15,840 Plan No 445

5 cm

KEY

Sample location • Cu / Pb / Zn p.p.m.

LAKE LEA

Map 2

PRELIMINARY COPY ONLY

521026 002

Map 3
5210277 003
75-1098

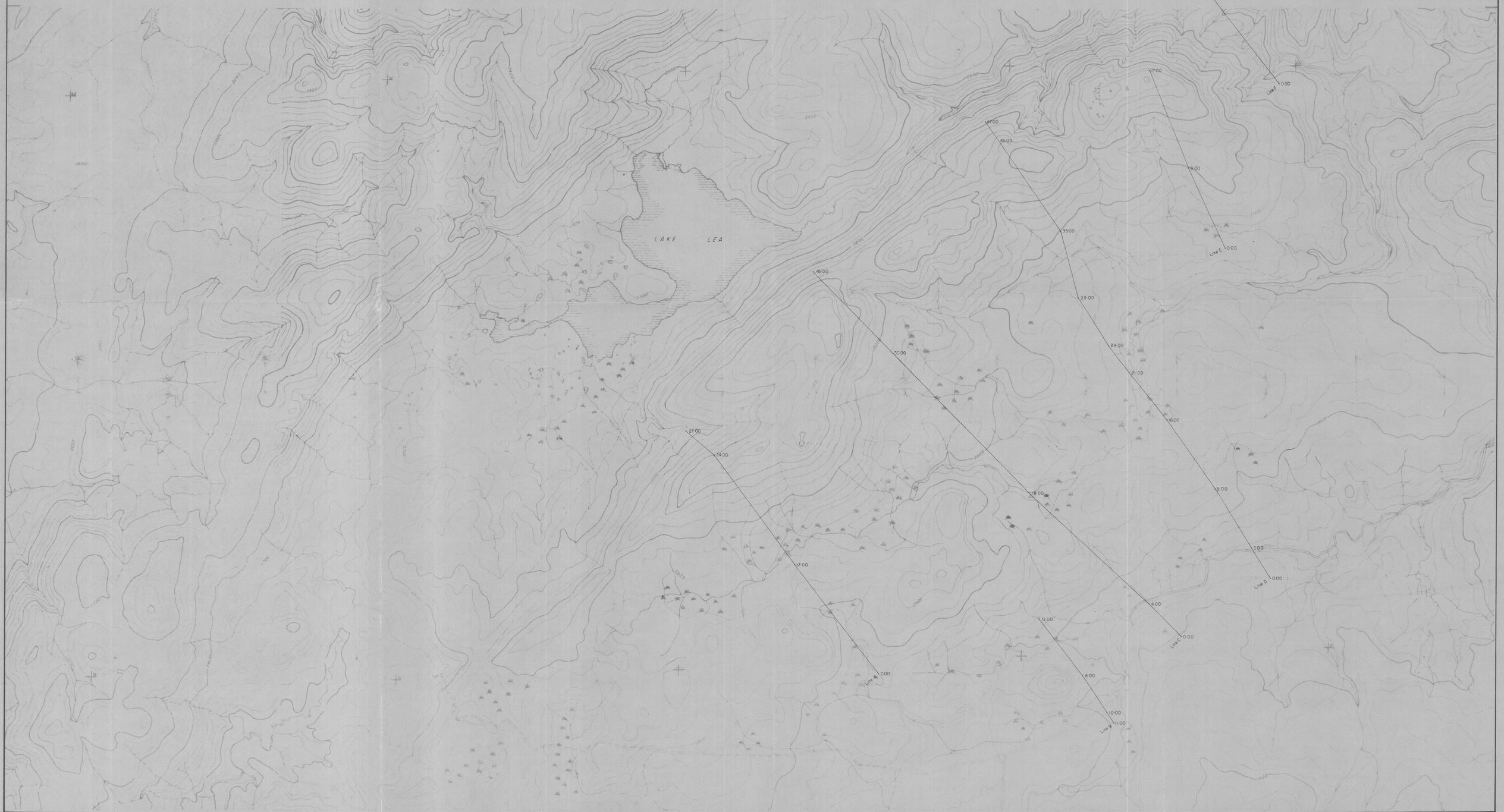
U O D C

BLACK BLUFF

TASMANIA

Scale 1:15840

5 cm



75-1098

U.O.D.C

BLACK BLUFF

TASMANIA

SOIL SAMPLE RESULTS

Date June 75 Scale 1:15,840 Plan No 447

0 25 50 75 1 mile
0 400 800 1200 1600 metres

5 cm

KEY

Sample location Cu Pb Zn ppm

LAKE LEA

Map 4

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521028 004

75-1098

U. O. D. C.

BLACK BLUFF

TASMANIA

ROCK CHIP SAMPLE RESULTS

Date June '75 Scale 1:5,840 Plan No 448

0 25 50 75 100 miles
0 400 800 1200 1600 metres

5 cm

Sample No	Cu	Pb	Zn
S 866	2	5	10
7	2	5	8
8	2	5	5
9	2	18	8
70	2	12	12
1	2	8	5
2	2	5	5
3	2	8	55
4	5	5	32
5	RS	28	270
6	2	5	5
7	5	5	18
8	2	12	8
9	6	20	100
80	6	5	28
1	20	220	440
2	2	5	75
3	5	12	360
4	15	45	95
5	10	28	95
6	12	10	170
7	2	5	60
8	2	10	2
9	2	5	5
90	2	5	8
1	30	10	10
2	2	5	5

N.B. TS = Thin section

Sample No	
S 901	
2	
3	TS
4	TS
5	
6	
7	
8	TS
9	
10	
1	TS
2	TS
3	
4	TS
5	
6	
7	TS
8	
9	
20	TS
1	TS
2	TS
3	TS
4	
5	
6	TS
7	
8	
9	TS
30	
1	TS
2	
3	
4	TS
5	
6	TS
7	
8	
9	
40	

Sample No		
S 941		
2	TS	
3	TS	
4	TS	
5	TS	
6	TS	
7	TS	
8		
9		
50	TS	
1		
2		
3		
4		
5	TS	
6		
7	TS	
8	TS	
9		
60		
1		
2		
3		
4	TS	
5	TS	
6		
7	TS	
8		
9		
70		
1		
2		
3		
4		
5		
6		
7	TS	
8		
9		
80		

Sample No	
S 981	
2	TS
3	
4	
5	TS
6	
7	TS
8	
9	
90	
NS	
92	TS
3	
4	TS
5	TS
6	
7	TS
8	TS
9	
1000	TS
1	TS
2	
3	
4	
5	TS
6	TS
7	
S1007	

LAKE LEA

Map 5

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521029 005

75-1098

U.O.D.C

BLACK BLUFF

TASMANIA

STREAM SEDIMENT SAMPLE RESULTS

Date: June 75 Scale 1: 5,840 Plan No. 446

5 cm

KEY

Sample Number $\begin{matrix}Cu\\Pb\\Zn\end{matrix}$ ppm

LAKE LEA

Map 6

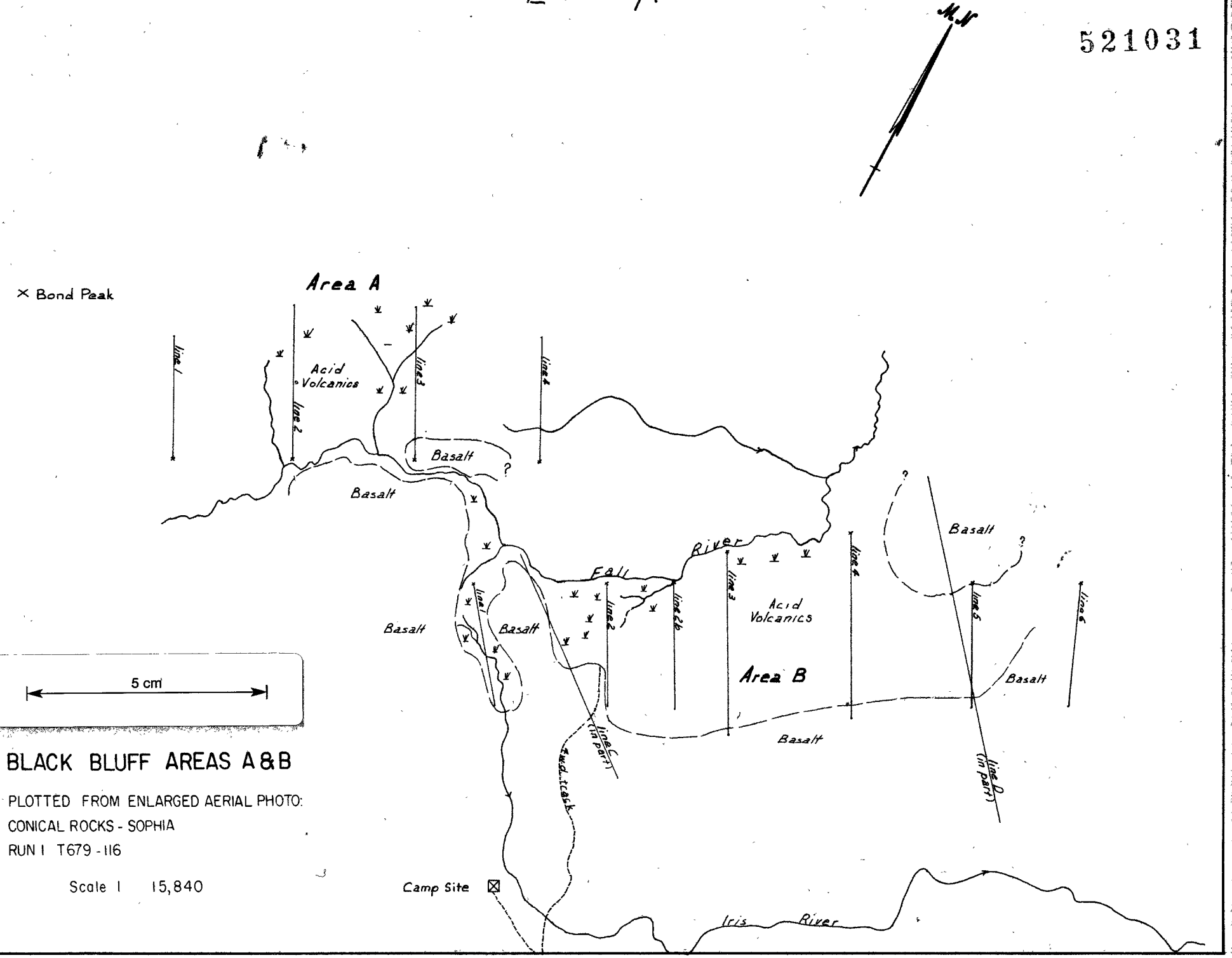
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521030 006

E.L. 10/74

75-1098

521031

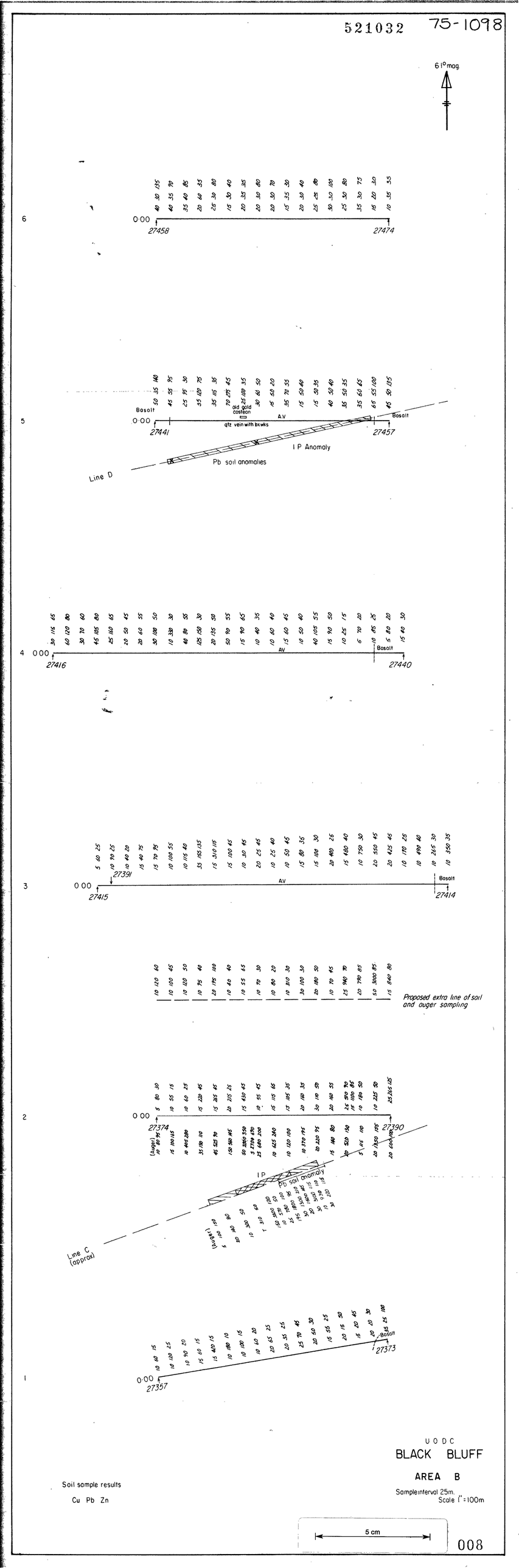


BLACK BLUFF AREAS A & B

PLOTTED FROM ENLARGED AERIAL PHOTO:
CONICAL ROCKS - SOPHIA
RUN 1 T679 - 116

Scale 1 15,840

521032 75-1098



U O D C

BLACK BLUFF

AREA B

Sample interval 25m.
Scale 1" = 100m

Soil sample results

Cu Pb Zn

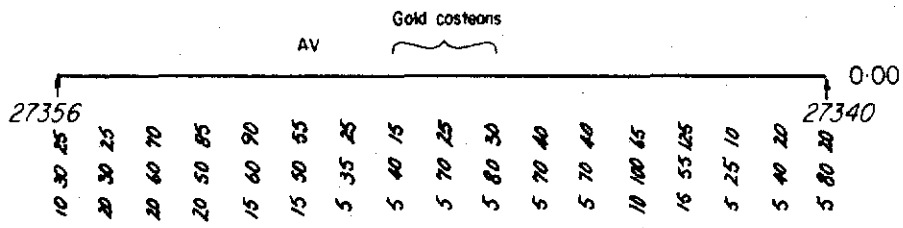
5 cm

E.L. 10/74

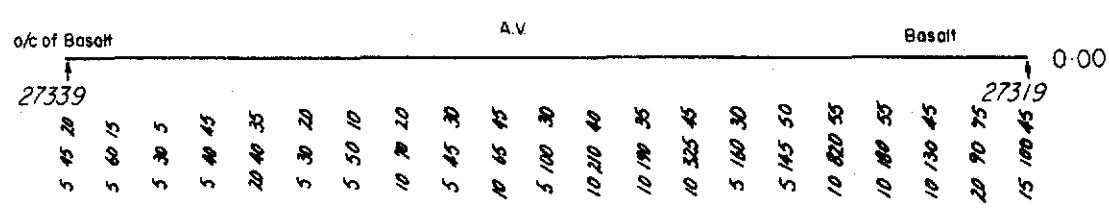
75-1098

5210 33

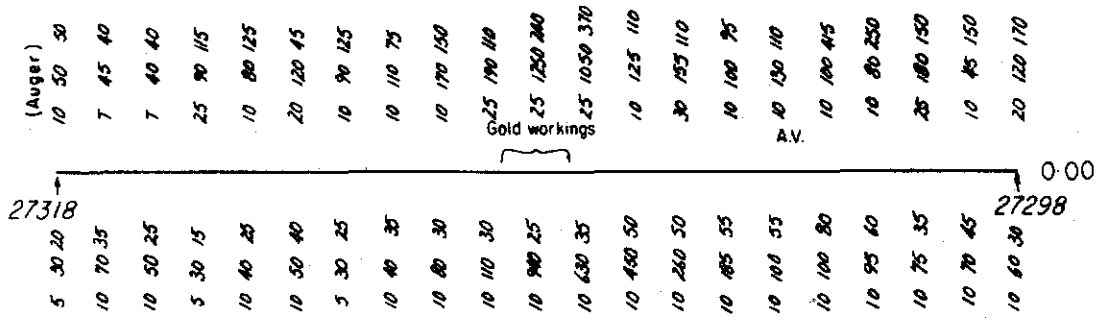
61° mag



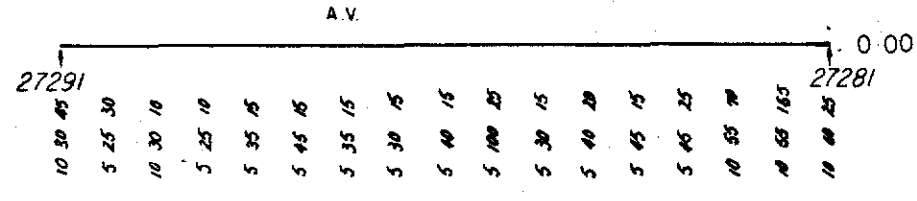
4



3



2



1

Soil sample results

Cu Pb Zn

5 cm

U.O.D.C.

BLACK BLUFF

AREA A

Sample interval 25m

Scale 1" = 100m

007