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AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

**MICROFILMED**

REPORT  
ON THE  
GEOLOGICAL RECONNAISSANCE AND  
STREAM SEDIMENT SAMPLING PROGRAMME  
NORTH-WEST TASMANIA

BY

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ABSTRACT

During late January 1972, a stream sediment sampling and geological reconnaissance programme was commenced in the far north-west of Tasmania. Extensive Upper Precambrian to Lower Cambrian dolomites and dolomitic sediments occur in the area. These rocks are of similar aspect to the sequence of dolomitic and limey sediments occurring on King Island, some sixty miles to the north-west. Large scheelite orebodies exist on King Island in these rocks.

The programme was basically a tungsten search, samples being collected and milled to a rough concentrate form. Analyses for copper, lead, zinc, molybdenum, tin and chrome were performed on a routine basis. Initial results were not encouraging, as the granite necessary to supply mineralizing fluids, was not found outcropping in the district. To protect ground pending further investigation it was decided to cover the ground with an Exploration Licence (Plate I). An area of 365 square miles was applied for covering all the major dolomite areas. Exploration Licence 6/72 was issued on May 22, 1972 for a six-month period.

The initial programme is now completed. This report deals as briefly as is possible with the regional geology of the area and deals at some length with the results of the programme. From this initial work, several recommendations concerning the retention of the ground and future work programmes have been made.

INTRODUCTION

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Several Exploration Licences are held in the far north-west of Tasmania, the largest of these being an area of 110 square miles held in the Montagu area, over an extensive dolomite outcrop. As a result of preliminary work it was decided to peg all available ground in which dolomite was known to occur. The Exploration Licence of 365 square miles pegged by Australia and New Zealand Exploration Company was granted on May 22, 1972. The main aim of pegging this ground was to protect the dolomitic areas pending results of the sampling programme.

During the course of the programme, a great deal of time was spent in the investigation and sampling of these areas of dolomite or dolomitic sediments, as they were considered as favourable host rocks for tungsten mineralization. Large sections of the area could not be effectively sampled due to the dolomites being covered by swamps.

The geology of the area is essentially a sequence of Precambrian and Cambrian rocks masked in places by Tertiary basalts, gravels, paludal deposits and wind blown sands.

Sediment sampling in the region was generally disappointing, particularly as regards tungsten values. Both tungsten and molybdenum values were generally very low, the majority being <2ppm. High values were obtained for zinc, chrome and tin. These high values are attributed to the presence of chromite and cassiterite in the recent gravels and sands. Some high values were obtained for copper and lead. These have been discussed in a later section.

At least half of the north-western area investigated is covered by thick rain forest. Access within this area however, is generally good, with the roads tending to keep to the ridges. This means tracks must be found through the scrub (often horizontal) to the creeks. This was generally a time consuming job and often meant that only one or two samples were taken in a day. In the areas of farmland the other extreme was met with. Cultivation over the last twenty or thirty years has caused the creeks to silt up, mostly from the rich red muds derived from the basalt plateau. In these creeks it was often very difficult to find either outcrop and/or a suitable place to take sediment samples.

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LOCATION

The area being investigated comprises the major part of the far north-west corner of Tasmania, north of the Arthur River. The area held by Australia and New Zealand Exploration Company covers 365 square miles of this area. Its northern or coastal section is well developed into many small dairy and beef properties. The southern portion is particularly rugged and covered by eucalypt rain forest.

The north-west is fairly well served by roads, particularly the farm land. Good secondary gravel all-weather roads serve some of the forest areas. Smithton, the largest town in the district, is connected by the Bass Highway, to Burnie, some sixty miles distant along the north coast. From Smithton, the west coast at Marrawah, is some thirty miles and the Arthur River to the south is also thirty miles.

### VEGETATION

Four major distinct vegetation types occur in the far north-west. Two of these are rain forest types whilst the other two are heathy plains, both of which have been extensively developed into good farm land.

The rain forest can be divided into two types. The deep valleys and the major part of the swamp land is covered by myrtle forest containing myrtle, celery top pine, blackwood, musk, minor string bark eucalypt and heavy secondary growth. A unique local scrub type occurs in these areas; "horizontal scrub". This forms either a secondary forest floor up to fifteen feet above the actual ground surface or in places it consists of horizontal lying scrub and bowra vine forming an impenetrable wall.

Higher up in these valleys and along the ridges the rain forest changes into a more open type with stringy bark eucalypt, minor myrtle and pine with a fairly open forest floor.

On the higher ridges, hills, coastal plains and some low lying swamps open areas of heathy button grass plains occur. These generally form over alluvial or alluvial gravel and sand deposits, or on coastal dunes. Many of the coastal plains and swamps are covered by extensive heathy plains and ti-tree swamps. It is these latter two areas, and only some of the forest areas, that have been developed for farming country.

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PHYSIOGRAPHY

The physiographic features of the north-west coast have been described by previous authors, in particular Edwards (1941). Edwards recognised two major divisions, the extensive low level coastal plains which merge inland into a series of large swamps and coastal hills. A further division occurs along the Arthur River behind the coastal hills. This is an area of strongly dissected rugged hilly country.

The Arthur River drains an extensive area of country in particular the southern side of the ranges that back the coastal hills. The rivers and small streams draining south into the Arthur River are controlled largely by regional geological structure. The Arthur River itself and some of its larger tributaries namely the Frankland, Rapid and Little Rapid Rivers are consequent streams and are controlled by original land surface tilt. All these rivers are entrenched in deep valleys but have well developed mature features, particularly the Arthur, Frankland and Rapid Rivers.

North of this range country lies a border of low coastal hills and long ridges, the latter running at right angles to the coast line and separating the swamp country. These hills and ridges would have been coastal islands when the Tertiary and Quaternary sea levels were high. These hills are well drained by short fairly well entrenched streams which either terminate in the swamp country, or form the tributaries of the larger rivers flowing north to the sea.

Lying between the coastal hills and the coastal dunes are a series of four swamps namely the Welcome, Montagu, Brittons and Mowbray. They are filled with a sequence of Tertiary and Quaternary sediments of both terrestrial and marine origins, and are drained respectively by the Welcome River, Montagu River and Duck River into the waters of Duck Bay to the north. These inland swamps represent bay head estuarine deposits, whilst the broad swampy coastal plain to the near north, represents the bay mouth marine environment.

The coastal plains are fringed on the coast by a series of low dunes. In the west around Marrawah these dunes cover an extensive area and occur some distance inland. In the north around Montagu the dunes are lower and less extensive, the coast being very swampy with little development of sandy beaches.

In the eastern portion of the area applied for around Forest and Mengha, the edge of an extensive basalt capped plateau is encountered. This plateau stretches south towards the Arthur River but stops short of it. It masks broad areas of Precambrian and Cambrian sediments in the Lileah, Trowutta and Nabageena districts.

The physiography of the north-west is by no means simple, as an inter-related set of divisions exist representing a varied set of conditions of formation. The dominant features are the deep valley of the Arthur River and its associated drainage basin. To the north of this lies the broad coastal basin drained by a series of mature and well developed streams. Rock is best exposed in the Arthur River basin whilst the extensive swamp deposits mask most of the bedrock north of the ranges. This has had a great deal of control over the programme of sampling undertaken.

LEASE TENURE

Several Exploration Licences and Special Prospecting Licences are held in the far north-western area. These are summarized as follows:

Montagu Area - E.L. 4/71 - L.L. Lewis - 110 square miles  
Held on behalf of Nickelton Mining over a dolomite area.

Edith Creek Area - E.L. 45/70 - R.B. Ling - 24 square miles  
Local farmer, lease covers known iron deposits.

Smithton-Redpa-Forest - E.L. 6/72 - Australia and New Zealand  
Exploration Company - 365 square miles  
Covers most of the known dolomite areas.

Arthur River - S.P.L. 108 - P. Verbaan - 5 square miles  
Held on behalf of Minops Limited for alluvial tin.

Balfour Area - E.L. 16/68 - A.C.I. Operations - 162 square miles  
Drilling is at present underway on the old Balfour copper district. It  
would appear that good intersections have been made.

Meunna Area - E.L. 8/69 - Tasminex N.L. - 49 square miles  
This area is the subject of a previous report.

Meunna Area - E.L. 43/70 - Minerals Holdings Australia Pty Limited and  
Tomic Exploration Pty Limited - 63 square miles  
Area of highly sheared Precambrian sediments with known copper/gold  
mineralization at the Victory Mine.

Parrawe Area - E.L. 42/70 - Nebo Exploration Pty Limited - 154 square  
miles  
Very rugged area in which the geology is virtually unknown. Precambrian and  
Cambrian sediments and some granites are known.

Considering the large area involved, there are not a large number of  
licences held. Those held however are generally large being 100 plus square  
miles in area. Only three companies are at present working their ground, these  
being A.C.I. Operations, Australia and New Zealand Exploration Company and  
Nickelton Mines. Little work has been done on the other areas in the last  
twelve months.

GENERAL GEOLOGY

The far north-west of Tasmania has basically a basement of Precambrian and Cambrian sediments. These are masked over a great part of the area by extensive eluvial and alluvial gravels, sands, clays and peats of terrestrial and marine origin. In some of the higher country, the older rocks are masked by a thick covering of Tertiary basalt forming a marked plateau.

Precambrian

The Precambrian rocks of the far north-west fall into two distinct divisions. These divisions, the "Older" and "Younger" Precambrian, outcrop, or form the basement of the north-west. The "Older" group is generally restricted to the eastern border of the area around Preolenna and West Takone. The "Younger" group outcrops from the Lyons River to the west coast.

Most authors give the Smithton Dolomite a Cambrian age but there are some that consider it to be Precambrian. In this report I have considered it to be of Upper Precambrian age (after Longman and Matthews 1962), since it conformably overlies the Precambrian Bryant Hill Quartzite and is in turn disconformably overlain by two Cambrian dolomitic breccias and cherts.

"Older" Precambrian

The "Older" Precambrian Keith Beds do not outcrop within Exploration licence 6/72 but are seen to the south-east in the area held by Tasminex N.L. (See previous report). The beds consist in the main of a highly deformed sequence of schistose rocks and quartzites with a total thickness in the order of several thousand feet. They consist of a series of phyllites, phyllitic shales and quartzites, quartzites and muscovite, chlorite and quartz-biotite schists. Schistosity and deformation are often intense and chevron folding is quite common.

The Victory Mine, a copper-gold mine now closed, is situated on the east bank of the Arthur River near Takone West, in sediments of this age.

Basic dykes were not observed during field work but are known to outcrop well south of the area under consideration. Several large dyke-like bodies lying parallel to regional strike, are known in the Rapid and Little Rapid Rivers.

"Younger" Precambrian

The "Younger" Precambrian sequence can be divided into six separate units and one phase of basic dyke intrusion. The Smithton Dolomite is considered to be one of the units.

The Neasy Formation is the oldest unit and conformably and gradationally overlies the Keith Beds. It is restricted in outcrop to an area lying between the Lyons and Holder Rivers. The formation consists of a sequence of shales, slates and quartzites with a total thickness of 5,000 to 10,000 feet. Little major folding is yet mapped in this Formation. The sequence appears to be dipping to the west at approximately 50° with dips shallowing to the west. Deformation is not so marked in this Formation, although slaty cleavage is quite common in some areas. Many of the quartzites, especially where they are thinly bedded, exhibit current bedding and ripple marking.

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The Green Siltstone and Quartzite unit consists of a sequence of plus 5,000 feet of impure quartzites, laminated argillites and siltstones conformably overlying the Neasy Formation. All have a distinctive fracture cleavage and often exhibit intraformational slumping, festoon current bedding, sole marking, siltstone pellets and pyrite nodules. This sequence outcrops extensively in the south-west around the Frankland River, and to a limited extent, in the Rapid and Lawson River areas. It forms part of the "Undifferentiated" sequence of Precambrian sediments which are as yet to be subdivided. These sediments occur in the Rapid and Arthur River areas along the eastern boundary of the Exploration Licence.

The Black Siltstone unit conformably overlies the Green Siltstones and Quartzites of the previous unit. It consists of 1,000 feet of strongly contorted, massive to thinly bedded, black and dark grey siltstone which are well exposed in the Tayatea Bridge cutting and on the Trowutta-Tayatea road. A marked feature of the unit is the presence of bands of euhedral pyrite crystals, often up to one half an inch in thickness, occurring as infillings along bedding planes. Ripple marks and rare sole marks also occur. Impure bands of quartzite are reported to occur (Longman and Matthews, 1962) towards the top of the unit, these however were not observed during field work.

The Siltstone, Greywacke and Quartzite unit conformably overlies the Black Siltstone and consists of 2,000 feet of interbedded greywacke, white to grey quartzite and massive, pale cream to grey siltstone. These rocks outcrop extensively in the Salmon River - Dunns Plains area (Plate IIB). Sedimentary structures are very common in these rocks. The greywackes commonly exhibit intraformational slumping and festoon current bedding, whilst the quartzites are often current-bedded and ripple-marked.

Specimen AL/2 (See Appendix 3) was collected from this unit at the Salmon River bridge near the contact of the unit with the Smithton Dolomite. The specimen is a strongly brecciated calcareous sediment, that may have undergone minor recrystallization.

This unit appears in places to grade into the Bryant Hill Quartzite and from field studies may even occur at the expense of the Bryant Hill Quartzites.

The type locality for the Bryant Hill unit is at Bryant Hill, a few miles east of the town of Smithton. It has, however, a widely distributed outcrop, occurring in the north and north-east of the area, as well as in the far south-west around the Frankland River. This unit is considered to be equivalent to the "White Quartzite" and "Grey-green Quartzite" stages of Nye, Finucane and Blake (1932).

It consists of plus 2,000 feet of well sorted quartzite bands with minor lenses of quartz-conglomerate. The rock is often exceedingly pure and has been looked at by some companies from the point of view of a viable metallurgical quartzite mining operation. Current bedding and ripple marking are quite common in this rock.

This unit and the unconformably overlying Smithton Dolomite are part of the Upper Precambrian to Lower Cambrian Dundas Group. The exact stratigraphic position of these rocks is still open to conjecture.

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The Smithton Dolomite is the most important unit in the sequence, as it is considered to be a potentially favourable host rock for tungsten and base metal mineralization. It is very widely distributed throughout the area (Plates IIA-D) although it is often masked by swamp deposits. Previous workers have subdivided this unit into a series of stages and sub-stages. For the purpose of this report, these stages have been grouped into one unit, the Smithton Dolomite.

The unit consists of 1,200 to 2,000 feet of grey to cream-white dolomite and blue-grey chert with minor bands of sheared carbonaceous siltstone, oolitic limestone and black and white cherts. In places the rock exhibits strong recrystallization, particularly in the southern half of the area along the Arthur River. The thickness of the unit varies greatly from east to west, thinning eastwards. The unit is conformable with the siltstone, greywacke and quartzite unit in the Arthur River area and overlies the Bryant Hill Quartzite in the north. This suggests an unconformity at the base of the dolomite, although no angular discordance can be observed. If an unconformity exists, the Smithton Dolomite would then appear to represent a transition between the Upper Precambrian and Lower Cambrian.

In places, the dolomite and limestone are strongly silicified and are usually also strongly contorted in these areas. On the Trowutta-Tayatea road a distinctive strongly silicified oolitic limestone member occurs in conjunction with unaltered limestone and chert beds. Where silicification has occurred, it is not uncommon to find a great deal of deformation and brecciation. In the vicinity of Smithton, the type locality, the rock is particularly pure and is mined for agricultural purposes.

Generally the rock does not appear to be a favourable host for mineralization. It should be remembered, however, that the dolomite does not outcrop markedly as do the other rocks of the sequence. Large areas are covered by swamp deposits or by rain forest and the tracing of outcrop in the deep valleys is by no means a simple job. This means then that large areas of the dolomite have not been observed but that its weathering products have been sampled.

### Cambrian

The Cambrian rocks have been subdivided into three distinct and relatively thin units. Their outcrop is generally restricted to the central and central-north sections of the Exploration Licence area. The best exposures are in the Smithton district, where the volcanics and sediments occur as a faulted block against the Smithton Dolomite.

The Dolomite Breccia unit disconformably overlies the Smithton Dolomite and varies in thickness from 20 to plus 100 feet. It consists of angular and rounded fragments of dolomite and chert set in a dolomitic matrix. This rock closely resembles the so called tillite exposures on the east coast of King Island.

The unit composed of siltstones and greywackes is conformable with, and grades out of, the Dolomitic Breccia. The unit is approximately 500 feet in thickness and consists of dolomitic siltstone, banded black and grey siltstones, massive to thinly bedded blue or green-grey greywacke and interbedded red greywacke and siltstone. Again this unit exhibits many similarities to the sedimentary sequence overlying the tillites on King Island.

The unit composed of basalt, tuff and greywacke varies in thickness from 700 to plus 1,000 feet, and conformably overlies the siltstone and greywacke unit. The basal portion of the unit consists of a massive basic volcanic which is overlain by fine tuff and greywacke. This in turn is overlain by a coarse tuff and volcanic breccia. Only limited areas of this unit have been examined, but once again this unit has many similarities to the volcanics exposed on the south-east and east coast of King Island.

### Tertiary

Rocks of Tertiary age occurring in the north-west area can be divided into two major divisions, the volcanics and the sediments. The sedimentary sequence can be further subdivided into terrestrial and marine deposits. Much of the coastal plains country and portion of the Welcome Swamp still remain as undifferentiated Tertiary or Quaternary material and as such are shown on maps as areas Q-T (Plates IIA-D).

The limestones are the oldest of the Tertiary sediments and generally occupy low lying areas and frequently extend below sea level. Limited outcrops of fossiliferous limestone occur at Marrawah, Redpa, Montagu River and the Marcus River. The limestone is generally fairly pure, although sandy variations are known to occur. It is buff, yellow to grey in colour and contains a distinctive marine fauna.

It is generally flat lying, lying unconformably on Precambrian and Cambrian sediments, whilst itself is unconformably overlain by basalts and Quaternary marine and freshwater gravels and sands. From fossil evidence the age of the limestone is placed at Upper Oligocene to Lower Miocene.

The basalts cover an extensive area east of Smithton and occur in the west at Montagu, Marrawah, Brittons Swamps, Redpa and Christmas Hills. Several distinctive varieties occur due to the extrusion into varying environments. Tuffs, pillow lavas, breccias, entrail basalts and massive basalts are the major variation.

Terrestrial deposits occur in the Irishtown and Lileah areas as freshwater peat and siltstone paludal deposits in hollows in the basalt plateau or between the basalt flows.

### Quaternary

The Quaternary, like the Tertiary, can be divided into a distinctive series of subdivisions. These subdivisions are as follows:

Soils	{	Residual
		Alluvial
Coastal	{	Beach Sands
		Dune Sands

High level gravels  
Swamp deposits - marine, littoral

In the Smithton area four distinctive swamp deposits have been developed. The Welcome, Montagu, Brittons and Mowbray Swamps are all marine or littoral deposits of Quaternary age. These swamps are notable for the appreciable quantities of cassiterite and chromite contained in the gravels.

The residual and alluvial soils mask a large portion of the countryside and are in the main derived from the underlying bedrock. In many places these are rich volcanic soils, in others a poorer soil type derived from the Precambrian and Cambrian sediments.

Extensive beach and dune sands occur along the major part of the coast, from Detention River in the east, to Marrawah in the west. The development of these sands is more pronounced in the west where they extend up to two miles inland.

The high level gravels occur in the ranges bordering the Arthur River. They appear to be remnant river gravels from their well rounded gravel constituents. Fragments appear locally derived and include quartzite and dolomite. Again the cassiterite and chromite content is high.

### Igneous Rocks

Three groups of igneous rocks occur in the area; the Cambrian volcanics, Tertiary basalts and dolerites. The first two rock types have been discussed in some detail previously.

Immediately west of South Forest, an outcrop of highly weathered doleritic rock occurs. Gulline (1959) states that this has the appearance of a Jurassic dolerite, but it is more likely to be a similar rock to that which forms "The Nut" at Stanley. The South Forest rock is said to contain native copper.

At Stanley a vertically sided hill "The Nut" rises some 460' above sea level. This hill is in actual fact a steep sided laccolith composed of analcite-olivine dolerite.

Pebbles and boulders of red-pink granite were picked up on a road at Montagu. The outcrop from which this material came is as yet unknown. This ground is held by L.L. Lewis as E.L. 4/71. The granite was forwarded for analysis and comparison of zircons with those from previously studied sediment samples.

STRUCTURE

The structure of the north-west is dominated by folding and major faulting. The structure is masked, however, by the extensive areas of swampy ground, regional trends being obtained from the limited exposures in the southern half of the area.

Folding

Two distinct areas of folding exist. West of the large Roger River Fault, fold axes trend north-west south-east and to the east of this fault trends are north-east, south-west. Some folding with trends to the north-west south-east does occur in this eastern block. Folds are generally open and of several orders of magnitude. The first order folds are superimposed on the primary folds and have wavelengths of the order of two miles. The interaction of the several fold systems have given rise to several elongated basins and domes.

Due to the poor outcrop over a large part of the area an exact picture is difficult to determine; folding does however appear asymmetrical. It would appear that the major folds were probably initiated during the Precambrian and remained fairly shallow during the Cambrian depositional period. More intense folding occurred during subsequent orogenic movements.

Faulting

Faulting is generally obscured and is only clearly visible where gross movement has occurred and fault movement can be determined. Three distinct major strike faults occur in the district. One occurs in the Deep Creek valley west of South Forest; the other on the north-west of the Montagu Swamp and the last on the eastern boundary of the Mowbray Swamp. Minor faults occur throughout the area and are often accompanied by slickensiding, drag slips and crush zones.

General trends although obscure are north-east south-west, with some faulting trends lying north-west south-east, the latter mainly in the east. As the larger faults are not mineralized and topography is influenced by them they are considered to be Tertiary in age.

Other features such as schistosity and local deformation are quite pronounced in the "Older" Precambrian basement rocks, in particular the Keith Beds. The "Younger" Precambrian and Cambrian rocks exhibit limited axial plane cleavage and schistosity.

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To determine the possibility of tungsten mineralization in the area, a stream sediment sampling programme was undertaken. Particular interest was taken in streams draining areas of dolomite or dolomitic and calcareous sediments.

Sampling Procedure

It was decided that since the programme was to be based around a search for tungsten, conventional sediment sampling techniques could not be used. Instead, sediment samples were panned down to a heavy mineral concentrate form. These concentrates were examined under U-V light to test for the presence of scheelite or other fluorescent minerals. The sediment samples were given the prefix NRK and forwarded for analyses. A few rock chip or rock samples were collected and either forwarded for analyses or for petrographic analysis. These samples were given the prefix AL.

Analytical Procedure

Sediment samples were forwarded to McPhar Geophysics for analysis. It was decided to analyse for the base metals, copper, lead and zinc and for tin, tungsten and molybdenum. The latter group are indicative of either a granitic environment or a contact metasomatic-metamorphic environment. Initial test work indicated the presence of appreciable quantities of chromium in the samples; it was decided on the basis of this to analyse for chrome.

Copper, lead and zinc were determined by A.A.S. techniques following  $\text{HClO}_4$  leach for two hours on a 0.25 gm sample. Molybdenum and tungsten were determined by the Dithiol method and tin by the Gallein method. Some difficulty was encountered with the chrome analyses due to the high chromite content in some samples. Chrome analyses were performed either by X.R.F. or by A.A.S. following a potassium pyrosulphate fusion on 0.1 gm of the sample.

Results and Discussion of Results

Calculation of threshold and background has been kept as simple as possible, although some complexities in graphing do occur. Frequency, cumulative total and percentage cumulative total were calculated after deciding the appropriate ranges for analytical values. These results were then plotted as parts per million (ppm) versus percentage cumulative total on three cycle semi-logarithmic graph paper. This enabled threshold and background to be established for each element.

- (i) Tungsten: Assay results for tungsten were generally very low and some difficulty was encountered in calculating threshold and background values. Plotting indicated the possible presence of two distinct sets of values, the higher set being marked by a stronger divergence. This upper zone gave a threshold value of 98 ppm and background of 82 ppm. A minor divergence was noticed lower in the plot, shown as a dotted line in the appended graph. This divergence gave a threshold of 29 ppm and a background of 13 ppm.

Considering first the higher threshold value of 98 ppm. Only four anomalous values exist, being from samples obtained from the Arthur River south of Edith Creek. These values are however not considered significant as this river drains a large area and values may represent

any number of widespread environments. It is interesting to note the presence of minerals typical of a contact metasomatic-hydrothermal type deposit in these samples (See Appendix 4 for description of sample A.R. Conc.).

If we consider the second divergence we find two distinct groups of anomalous results. One group coincides with that described in the previous paragraph. The other group of samples, two of which are anomalous, come from a completely different environment. These samples NRK/64 and NRK/77 were collected near Trowutta (Plate IIIA). Samples NRK/66 and NRK/67 are higher than background and also occur in this area. The geology of the area is illustrated on Plate IIC). Further follow-up work along the dolomites in this area may be justified on the basis of these results.

The double points of divergence give the impression that two zones of tungsten values exist. This appears correct; the first group with high threshold values representing a broad highly variable environment and the second group a more restricted environment of limited geological rock type. On the basis of this the Trowutta samples appear to be of more significance. It must be remembered however, that no scheelite was observed in these samples even though they appear anomalous. This latter group of samples were taken from areas of dolomite or Cambrian sediments with known outcrops of ironstone.

- (ii) Molybdenum: Like tungsten the values obtained from molybdenum were low and generally disappointing. Little difficulty was had in plotting results as there is virtually no spread of values. Plotting indicated a background of 2 ppm and threshold of 4 ppm. Results are not considered significant as only fourteen values are anomalous. Several factors however, should be considered. Of these fourteen, ten samples have values of only 5 ppm, one point above background, and their corresponding tungsten values are all below background. A few anomalous values of 10 ppm occur but all are widely spread samples NRK/14, 15 and 16 may have some significance as all occur in the one area south of Roger River. Other high values NRK/74 and NRK/26 are very widely spread. The former is from south-east of Trowutta in a black shale area rich in pyrite and the latter from Salmon River.

As molybdenum values are widely spread and do not have corresponding high tungsten values they must be looked at with some suspicion. It must be remembered however, that molybdenum is one of the most mobile elements and a value of only 10 ppm, six points above the threshold value may be significant in this environment. Further work to substantiate this would be required.

- (iii) Tin: The spread of tin values is particularly wide varying from 24.2% to values of 45 ppm. Graphing indicates that as for tungsten, a double zone of deviation is present. The reason for this double zonation appears once again to be due to the collection of samples from two or three distinct and separate geological environments. The lower deviation gives a threshold value of 530 ppm and background 75 ppm, whilst the upper deviation gives corresponding values of 2700 ppm and 1200 ppm.

The bulk of the tin analyses are anomalous, based on the lower threshold of 530 ppm. This is however an invalid assumption if one considers the particular area of collection and the environment, many samples being

taken from gravels known to be rich in cassiterite. In the light of these facts many of the results lose significance.

Samples with plus 1% values were all collected from the Arthur River, and like tungsten, represent a wide spread of geological environments. Cassiterite is quite common in these samples. (Appendix 4 - description of sample A.R. Conc.). The remainder of the samples represent two distinct environments. The lower values below 530 ppm generally represent samples collected in an area from Roger River to east of Trowutta. This is predominantly an area of black shale, siltstone and dolomite. The second environment with slightly higher values is typified by samples obtained in the Salmon River area. Large areas of Tertiary and Quaternary gravels containing cassiterite and chromite occur in this area. The higher values are attributed to cassiterite derived from these gravels (Appendix 4 - description of sample T.C. No. 2).

- (iv) Copper: Analytical values for copper were more normal and gave a straight-forward plot on the graph. A threshold of 82 ppm and background of 47 ppm were obtained. The values have a fairly even distribution throughout the area, except once again for samples obtained from the Arthur River. These samples exhibited the usually high anomalous values. The nearest known copper prospect is at Takone West, upstream from this area, although pyrite and possibly some chalcopyrite, do however occur locally as veins in black shales.

Samples NRK/55 and 63 were both anomalous for no apparent reason. Other samples taken in the near vicinity of these gave low values. These may again be attributed to veinlets of pyrite and chalcopyrite.

- (v) Lead: Lead behaves almost exactly the same as does copper, having a conventional graphical plot and an even distribution throughout the area. Threshold value was set at 58 ppm whilst background was 28 ppm. Lead gave a slightly higher number of anomalous results.

The results can be divided into three distinct groups. As usual the samples taken from the Arthur River gave exceptionally high anomalous values. Two other groupings occur. One group comprising samples NRK/30, 39, 43 and 55 were collected from streams draining dolomitic areas in the Salmon River area. Samples NRK/63, 64 and 70 were obtained from a similar environment in the Trowutta area. One sample of particular interest was NRK/45 obtained from the Duck River near Smithton again in a dolomitic area. This sample had an anomalous value of 60 ppm and when checked by collection and analysis of a conventional sediment sample gave a higher than background result of 40 ppm.

The cause of the larger number of anomalous lead values is at this time a little obscure, however one fact does come to light. This is that nearly all samples are derived from a stream draining the Smithton Dolomite. It may be that the dolomite has a high background count of lead.

- (vi) Zinc: Values obtained for zinc can on first appearances be described as rather spectacular. On the graphical plot two zones of deviation can be observed. The first gives a threshold of 160 ppm and background of 72 ppm whilst the second gives corresponding values of 640 ppm and 450 ppm.

018

Distribution of results throughout the area also tends to indicate a geographical zonation of results. The apparently high values for zinc should be viewed however in the following way. If one looks at the appended analytical results it becomes apparent that high zinc values nearly always correspond to high chrome values. This is, however, not always so. The general correlation of high zinc values with high chrome content could be that the chromite contains appreciable quantities of zinc. Goldschmidt notes that chromite from olivine rocks may contain zinc in excess of 1% or a 46.5:1 theoretical Cr:Zn ratio.

The second set of values must exist giving rise to the second deviation in the graph. This second set is probably masked by the first high group making their detailed detection difficult. In the light of the apparent relationship to chrome of high zinc values, these results should be viewed with some suspicion.

- (vii) Chrome: Chrome values are all exceptionally high, in fact just over half the samples have values of plus 1% Cr. It should be remembered however, that sediment samples were concentrated before analysis so that chrome values have little significance as far as indicators go. The graphical plot gave a threshold value of 19000 ppm and a background of 3300 ppm.

High chrome analyses can be directly attributed to the chromite present in the alluvial gravels that mask a large area of the country sampled. These gravels have shed large quantities of chromite into the streams where it has been reconcentrated. (Appendix 4 - description of sample T.C. No. 2). High zinc analyses are attributed to zinc tied up in the lattice ~~and~~ the chromite.

#### Rock Samples

Samples AL1 and AL3 of ironstones were forwarded for spectrographic analysis. Samples AL2 and AL5 were forwarded for petrographic study, descriptions being appended.

In Samples AL1 "faint traces" of Cu, W, Ni, Cr and Co occur, whilst in AL3 some "trace" of Zn and a "faint trace" of Cr and W were noted. These results are not really significant when the derivation of the samples is considered. Sample AL1 appears to be a gossannous rock, collected in Faheys Lane at Irishtown. This rock appears to be a gossan derived from a pyritic limestone and chert breccia. AL3 is a lateritic rock, collected near the Salmon River bridge. Samples AL2 and AL5 were forwarded for petrographic analysis, descriptions of these two rocks are appended.

INTERPRETATION OF RESULTS

It is very difficult to form any definite impressions concerning the results of the testing programme to date. Considering the sediment samples taken, anomalous values occur in all the elements for which analyses were made.

In the case of tungsten several areas worthy of further limited sampling work occur. These are in the Trowutta district and are based on values of 30 ppm which is by no means high considering that samples were concentrated and did not contain visible scheelite.

Molybdenum was overall disappointing, although the element is particularly mobile in all except reducing conditions. In this area, ground water movement is high whilst Ph is neutral. This would give a high mobility to molybdenum. The area around samples NRK/16, 17 and 18 is worthy of further investigation.

Tin values are particularly anomalous, but like chrome, can be fairly easily traced to cassiterite being shed into the streams from alluvial gravels.

Copper and lead give some anomalous values. Copper highs can usually be traced to areas of known pyritic black shales. It would appear then, that copper is derived directly from any pyrite present in samples of which there is often an abundance. Lead is a little more complex, as it can not be directly attributed to this type of derivation. From the spread of anomalous lead values, it would appear that either the Smithton Dolomite has a high lead background, or small quartz veinlets carrying galena or sphalerite occur in the area. The latter is however not likely, considering the nature of the country.

Zinc and chrome analyses appear intimately related. It would appear from comparing assays of zinc and chrome that a high chrome value gives a corresponding high zinc value. This would seem to indicate that the chromite present contains appreciable quantities of zinc. The high chrome analyses are derived from chromite shedding into the streams from an alluvial gravel common in the area.

Analyses of rock chips do not appear to indicate anything of interest. Of interest however, is the description of the granite specimen. The actual outcrop of this rock has as yet not been found and some doubt exists as to the origin of this material. Granite occurs on several islands lying off the coast to the north-west and it is possible that this material may have been physically transported to Montagu from one of these.

020

ECONOMIC GEOLOGY

Several known mineral occurrences exist in the north-west area.

Perhaps the most significant of these are the copper prospects. At Takone West, a copper-gold lode was mined for many years. This lease, the "Victory Mine", is now abandoned. The mine was situated in the Upper Precambrian Keith Beds on the east bank of the Arthur River. Nearby at Folly Hill, on E.L. 8/69 held by Tasminex N.L., a small copper prospect has been costeamed and diamond drilled. Results were very disappointing. A small test pit was sunk on a copper trace near the Salmon River somewhere below NRK/26 sample locality. A brief search was made for this pit but regrowth over the years has obscured the locality. At Balfour, south of the Arthur River, A.C.I. Holdings is presently drilling a large copper lode and appear to have blocked out considerable reserves.

In the swamps at Montagu and the Welcome River and in alluvial gravels at Hawkes and Lovells creek near Salmon River, appreciable quantities of chromite and cassiterite are known to occur. Several companies and private individuals have looked at these areas in some detail with the view to developing a viable mining operation. The nature of the country (thickly forested or swampy) and the borderline concentrations of the minerals have ruled out development of these deposits. Not a great deal of logical test work has been undertaken on the gravels and they may carry economic quantities of heavy mineral.

At Folly Hill on E.L. 8/69, a similar gravel to those at Salmon River carries small quantities of gold. This area was worked for a time but proved uneconomic.

Several deposits of iron are known to occur in the north-west. On E.L. 8/70 held by R.B. Ling at Trowutta, several deposits of "ironstone" have been reported. These have not as yet been inspected. On the Nelson River south of the Arthur River, a large deposit of high grade magnetite is known to occur. Again this deposit has not been inspected.

At Coutts Rocks on the west coast south of Marrawah, small veins of sphalerite and galena are reported but are not considered of economic significance.

The extensive areas of coastal sand dunes have been tested by a number of companies over the years. To date only one area appears to have any potential. This section of dune sand lies between Marrawah and Mount Cameron on the west coast. A limited tonnage of cassiterite, rutile and zircon is available from this deposit. It is currently under an Exploration Licence application.

The only other material of interest and currently being mined is dolomite for agricultural purposes. This material has however limited application and is not considered economic.

CONCLUSIONS

- 021
- (i) Anomalous values for W, Mo, Cu and Pb occur throughout the area and are of enough significance to justify further limited work.
  - (ii) The general geological environment has a sequence of rocks of a potential host rock type for base metal mineralization. It is doubtful, however, that an environment suitable for the formation of a tungsten and/or a molybdenum orebody exists in the north-west.
  - (iii) More refined techniques will have to be used if further work is to be carried out. Swamps mask a great deal of the area and hinder the taking of samples. An efficient and economic bedrock sampling method would be needed to overcome the difficulty of sampling.
  - (iv) A critical look be taken at the technique of taking sediment samples of the concentrate type, as false anomalous values appear to be obtained for minerals other than tungsten.
  - (v) Large areas of Quaternary and Tertiary sand and gravel containing chromite, cassiterite and rutile occur throughout the area. These may be worthy of follow-up.
  - (vi) Areas of interest containing limestone, dolomite, and iron deposits occur on adjoining leases and are of sufficient interest for approaches to be made to the tenants to obtain "Permission to enter" rights.

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023

760024

APPENDIX 1GEOCHEMICAL RESULTS

<u>Sample Description</u>	<u>W ppm</u>	<u>Mo ppm</u>	<u>Sn ppm</u>
NRK/ 1	80	2	2.55%
/ 2	15	10	4980
/ 3	100	2	3.80%
/ 4	60	2	1.86%
/ 5	2	5	550
/ 6	<2	5	210
/ 7	<2	5	260
/ 8	5	5	2020
/ 9	<2	5	830
/10	100	2	3.00%
/11	90	2	1.65%
/12	150	2	2.45%
/13	100	2	24.2%
/14	<2	5	170
/15	<2	5	180
/16	<2	10	170
/17	<2	<2	110
/18	<2	2	240
/19	<2	5	470
/20	<2	2	60
/21	<2	2	40
/22	<2	2	330
/23	<2	<2	530
/24	<2	2	90
/25	<2	2	420
/26	<2	10	2000
/27	<2	5	1660
/28	<2	5	20
/29	<2	2	20
/30	<2	<2	80
/31	2	<2	60
/32	<2	<2	10
/33	<2	<2	90
/34	<2	<2	100
/35	<2	<2	1830
/36	<2	<2	290
/37	<2	<2	2180
/38	<2	<2	25
/39	<2	<2	20
/40	<2	2	60
/41	<2	<2	2030
/42	<2	<2	60
/43	<2	<2	930
/44	<2	<2	25
/45	<2	<2	10
/46	<2	<2	720
/47	<2	<2	5
/48	<2	<2	660
/49	<2	<2	1180
/50	<2	<2	840

024

760025

<u>Sample Description</u>	<u>W ppm</u>	<u>Mo ppm</u>	<u>Sn ppm</u>
NRK/51	< 2	< 2	1800
/52	< 2	< 2	280
/53	< 2	< 2	1840
/54	< 2	< 2	20
/55	< 2	2	< 5
/56	< 2	2	5
/57	< 2	< 2	< 5
/58	< 2	< 2	< 5
/59	2	< 2	2300
/60	5	< 2	1570
/61	10	< 2	1.08%
/62	< 2	< 2	40
/63	10	< 2	230
/64	30	< 2	50
/65	< 2	< 2	< 20
/66	15	< 2	< 20
/67	20	< 2	< 5
/68	< 2	< 2	< 5
/69	2	< 2	200
/70	< 2	< 2	20
/71	< 2	< 2	< 5
/72	< 2	< 2	< 5
/73	2	< 2	10
/74	< 2	10	< 5
/75	< 2	< 2	< 5
/76	5	< 2	410
/77	30	< 2	30
/78	< 2	< 2	< 20
/79	< 2	< 2	< 5
/80	< 2	< 2	< 5
/81	2	< 2	< 20
/82	2	2	< 20
/83	5	< 2	< 5
/84	5	< 2	70
/85	< 2	< 2	5
/86	2	< 2	20
/87	2	< 2	< 5
/88	2	5	< 5
/89	2	5	< 5
/90	2	< 2	< 5
/91	< 2	< 2	< 5
/92	5	< 2	< 5
/93	< 2	< 2	80
/94	< 2	< 2	5

025

760026

GEOCHEMICAL RESULTS

<u>Sample Description</u>	<u>Cu ppm</u>	<u>Pb ppm</u>	<u>Zn ppm</u>	<u>Cr ppm</u>
NRK/ 1	530	390	690	3600
/ 2	160	100	220	13000
/ 3	620	480	590	940
/ 4	600	450	610	890
/ 5	50	20	110	7000
/ 6	55	<20	110	6600
/ 7	55	<20	100	16000
/ 8	25	<20	65	19000
/ 9	55	20	160	4000
/10	640	520	930	4200
/11	620	440	680	1000
/12	730	550	850	2500
/13	720	720	2900	7900
/14	60	20	130	17000
/15	50	<20	110	7900
/16	80	<20	120	2900
/17	65	20	110	4000
/18	65	50	150	1200
/19	65	<20	110	2500
/20	60	<20	120	1300
/21	80	<20	110	6600
/22	15	<20	60	5000
/23	35	<20	620	250000
/24	15	<20	180	4.3%
/25	15	20	1200	26.7%
/26	15	20	1200	30.3%
/27	20	20	1400	28.2%
/28	15	20	1300	33.4%
/29	10	20	1100	33.1%
/30	10	75	35	2.27%
/31	20	40	90	2.57%
/32	5	50	15	480
/33	5	40	30	1.13%
/34	10	25	60	1.83%
/35	10	50	150	7.17%
/36	10	30	40	1.79%
/37	10	55	510	24.6%
/38	10	40	540	24.1%
/39	10	60	650	24.8%
/40	15	55	770	31.6%
/41	10	55	500	23.0%
/42	35	55	470	19.6%
/43	25	60	510	22.4%
/44	70	25	40	9500
/45	20	60	300	11.8%
/46	15	45	620	27.2%
/47	15	40	180	8.07%
/48	20	40	420	18.8%
/49	15	40	330	14.8%
/50	10	50	350	12.4%
/51	15	45	570	24.7%
/52	15	30	20	0.81%
/53	15	40	380	18.3%

026

Sample  
Description

<u>Sample</u> <u>Description</u>	<u>Cu ppm</u>	<u>Pb ppm</u>	<u>Zn ppm</u>	<u>Cr ppm</u>
NRK/54	10	40	30	810
/55	90	60	90	1.29%
/56	55	40	610	26.1%
/57	10	50	480	30.0%
/58	5	30	15	510
/59	15	50	640	65000
/60	15	40	440	62000
/61	90	110	530	40000
/62	10	30	30	2400
/63	100	60	65	2600
/64	70	400	670	42000
/65	40	40	480	39000
/66	35	40	870	45000
/67	40	20	65	3800
/68	20	50	20	3500
/69	30	30	340	16000
/70	20	300	150	5200
/71	25	80	20	120
/72	75	20	5	55
/73	10	20	5	340
/74	230	50	80	190
/75	20	<20	15	450
/76	20	30	580	48000
/77	30	30	190	5800
/78	65	20	130	5200
/79	10	<20	5	120
/80	5	<20	10	600
/81	55	20	260	17000
/82	25	20	140	6600
/83	10	20	35	700
/84	30	20	25	350
/85	35	25	25	3100
/86	20	<20	30	1300
/87	60	20	95	4300
/88	55	50	110	1100
/89	50	25	120	6600
/90	50	40	110	940
/91	30	45	35	2500
/92	30	11000	45	7100
/93	35	190	400	170000
/94	40	20	30	400

0.27

760028

APPENDIX 2

CALCULATION OF THRESHOLD AND BACKGROUND

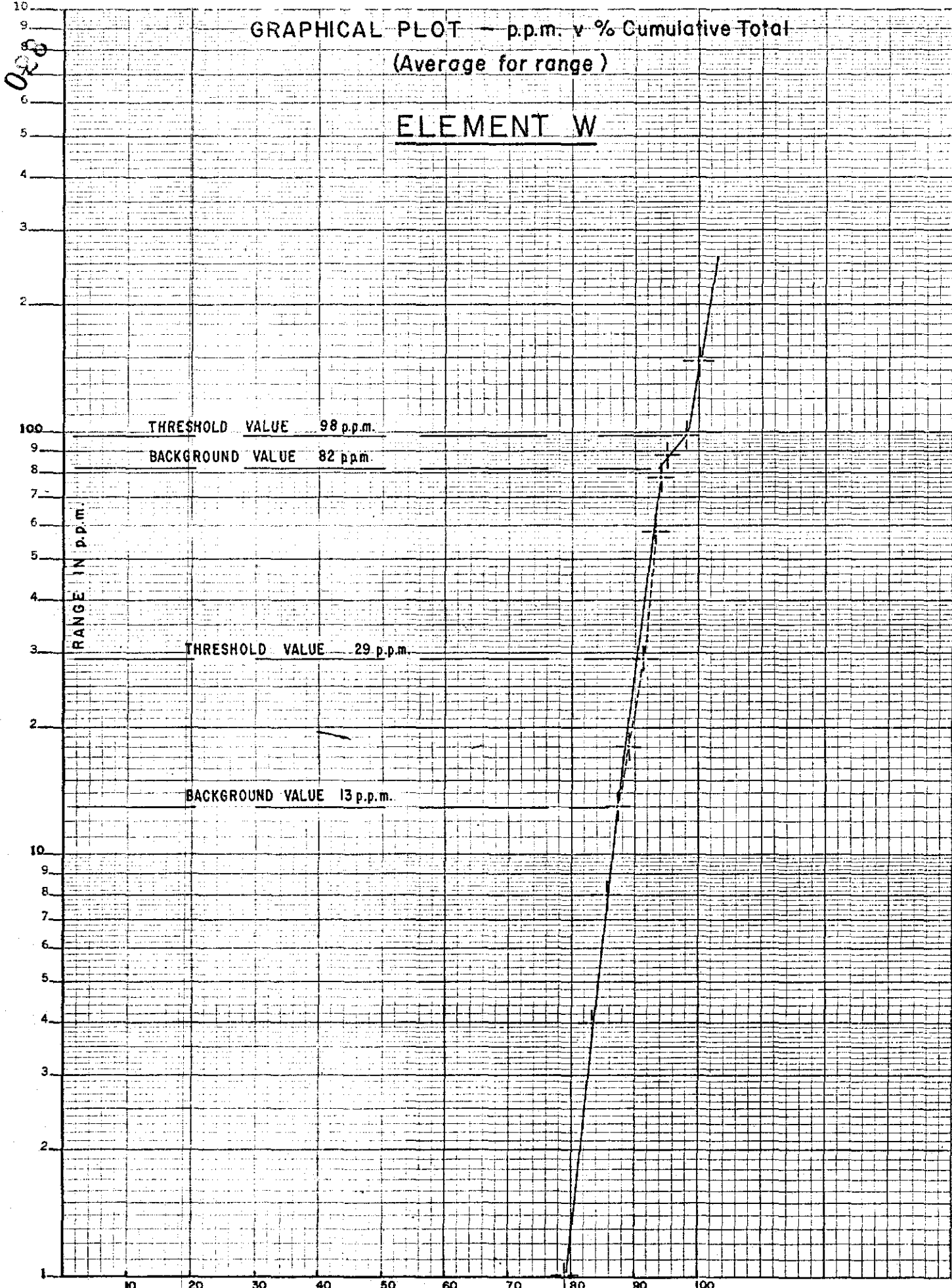
ELEMENT W

<u>ppm Range</u>	<u>Frequency</u>	<u>Cumulative Total</u>	<u>% Cumulative Total</u>
0- 2	65	65	78.4
3- 5	4	69	83.2
6- 10	2	71	85.5
11- 15	2	73	87.9
16- 20	1	74	89.1
26- 30	2	76	91.6
56- 60	1	77	92.8
76- 80	1	78	94.0
86- 90	1	79	95.3
96-100	3	82	98.8
146-150	1	83	100.0

Frequency interval 4 ppm

GRAPHICAL PLOT — p.p.m. v % Cumulative Total  
(Average for range)

ELEMENT W



% CUMULATIVE TOTAL

760029

CALCULATION OF THRESHOLD AND BACKGROUNDELEMENT Mo

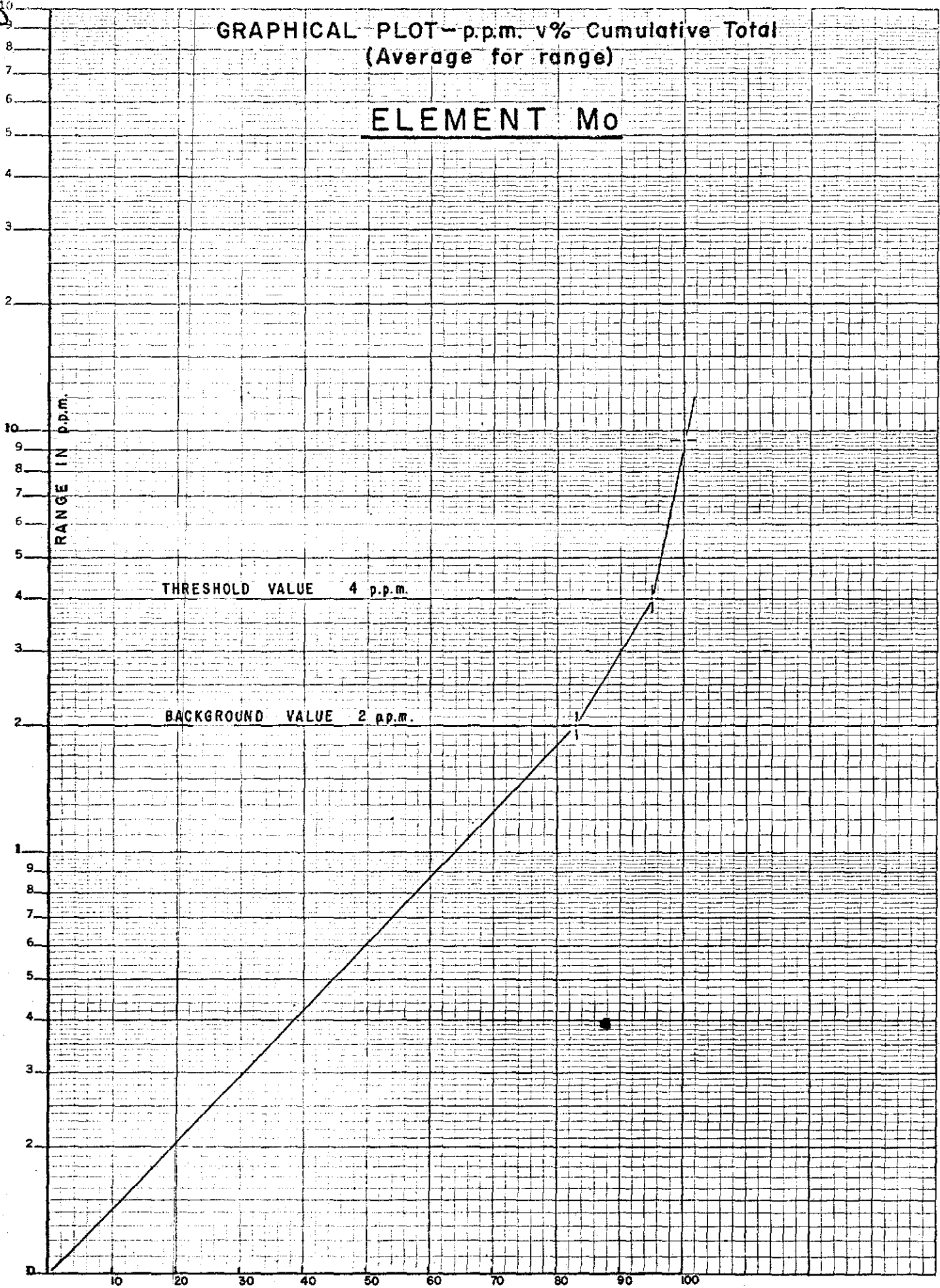
<u>ppm Range</u>	<u>Frequency</u>	<u>Cumulative Total</u>	<u>% Cumulative Total</u>
0- 2	69	69	83.2
3- 5	10	79	75.3
6- 8	-	-	-
9-10	4	83	100

Frequency Interval 2 ppm

030

GRAPHICAL PLOT - p.p.m. v% Cumulative Total  
(Average for range)

ELEMENT Mo



% CUMULATIVE TOTAL

760031

CALCULATION OF THRESHOLD AND BACKGROUNDELEMENT Sn

<u>ppm</u> <u>Range</u>	<u>Frequency</u>	<u>Cumulative</u> <u>Total</u>	<u>%</u> <u>Cumulative</u> <u>Total</u>
0- 10	17	17	20.5
10- 20	10	27	32.5
20- 30	3	30	36.2
30- 40	2	32	38.6
40- 50	1	33	39.8
50- 60	4	37	44.6
60- 70	-	-	-
70- 80	1	38	45.8
80- 90	2	40	48.2
90- 100	1	41	49.5
100- 200	5	46	55.5
200- 300	6	52	62.8
300- 600	6	58	70.0
600- 900	4	62	74.7
900-1200	2	64	77.0
1200-1600	1	65	78.4
1600-2000	5	70	84.3
2000-3000	4	74	89.2
3000-7000	1	75	90.5
7000-1.5%	1	76	91.6
1.5%-2.5%	3	79	95.2
2.5%-3.5%	2	81	97.5
3.5%-4.5%	1	82	98.9
24.2%	1	83	100.0

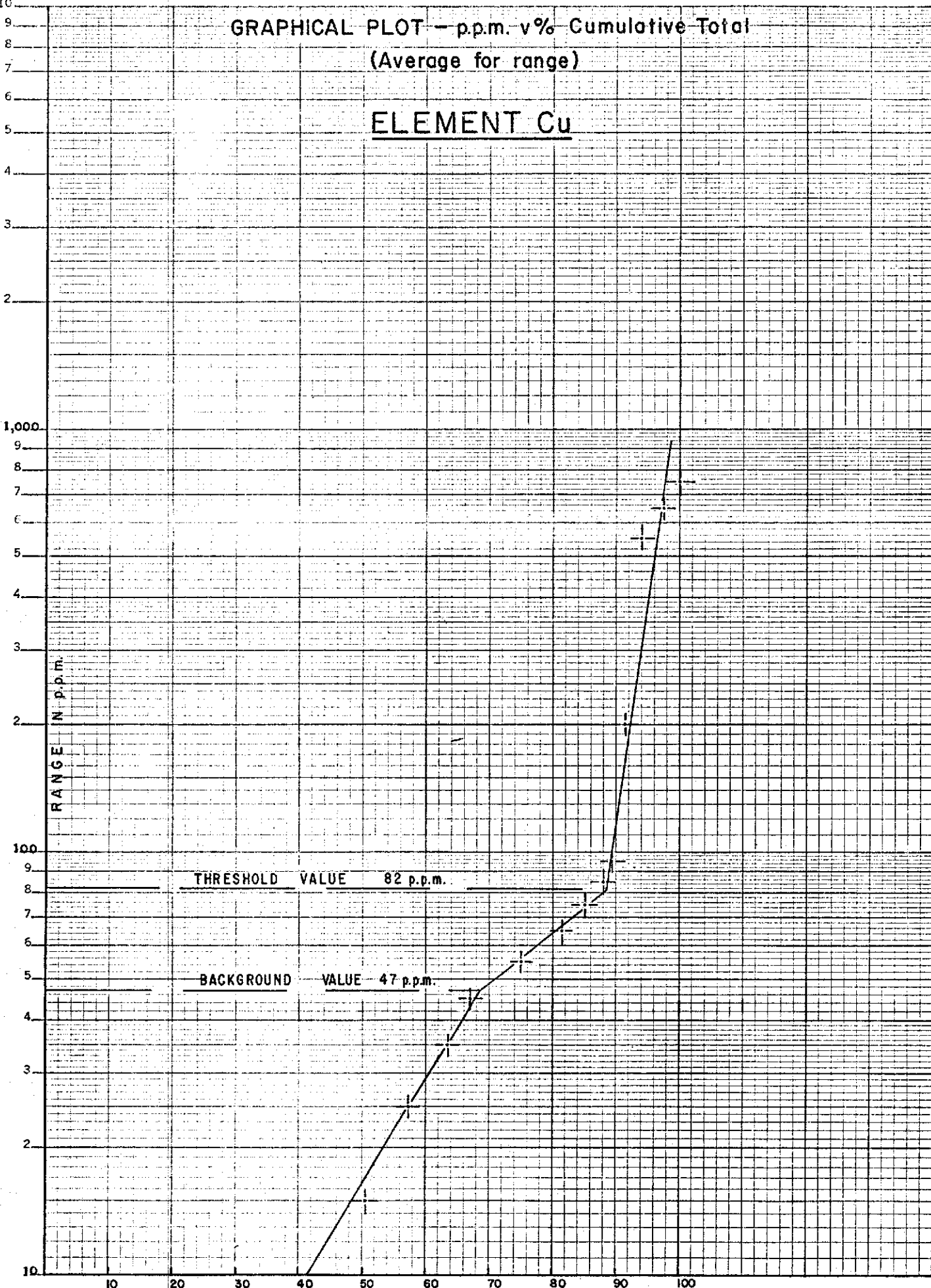
CALCULATION OF THRESHOLD AND BACKGROUNDELEMENT Cu

<u>ppm Range</u>	<u>Frequency</u>	<u>Cumulative Total</u>	<u>% Cumulative Total</u>
0- 10	20	20	24.1
11- 20	22	42	50.6
21- 30	6	48	57.8
31- 40	5	53	63.8
41- 50	2	55	66.4
51- 60	7	62	74.7
61- 70	6	68	81.9
71- 80	3	71	85.5
81- 90	2	73	88.0
91-100	1	74	89.2
150-250	2	76	91.6
500-600	2	78	94.0
600-700	3	81	97.7
700-800	2	83	100.0

033

GRAPHICAL PLOT -- p.p.m. v% Cumulative Total  
(Average for range)

ELEMENT Cu



% CUMULATIVE TOTAL

760034

034

760035

CALCULATION OF THRESHOLD AND BACKGROUNDELEMENT Pb

<u>ppm</u> <u>Range</u>	<u>Frequency</u>	<u>Cumulative</u> <u>Total</u>	<u>%</u> <u>Cumulative</u> <u>Total</u>
0- 20	30	30	36.2
21- 25	2	32	38.6
26- 30	7	39	47.0
31- 35	-	-	-
36- 40	12	51	61.5
41- 45	2	53	63.9
46- 50	8	61	73.5
51- 55	4	65	78.4
56- 60	5	70	84.4
61- 80	2	72	86.8
81-100	1	73	88.0
101-120	1	74	89.2
121-300	1	75	90.5
301-400	2	77	92.9
401-500	3	80	96.4
501-600	2	82	98.8
720	1	83	100.0

GRAPHICAL PLOT - p.p.m. v % Cumulative Total  
(Average for range)

ELEMENT Pb

10  
9  
8  
7  
6  
5  
4  
3  
2  
1,000  
9  
8  
7  
6  
5  
4  
3  
2  
100  
9  
8  
7  
6  
5  
4  
3  
2  
10

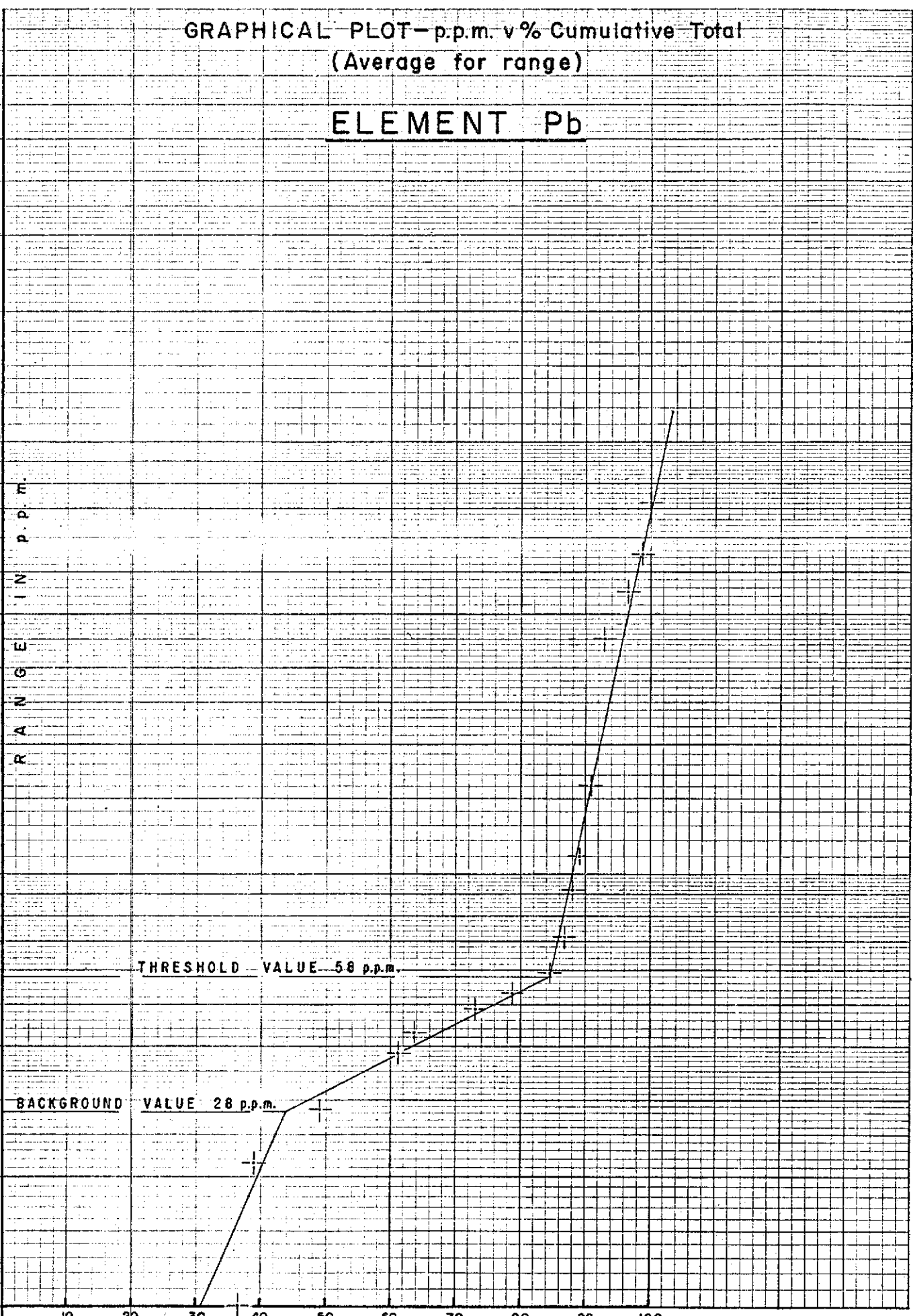
RANGE IN P.P.M.

THRESHOLD VALUE 58 p.p.m.  
BACKGROUND VALUE 28 p.p.m.



% CUMULATIVE TOTAL

760036



036

760037

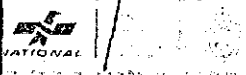
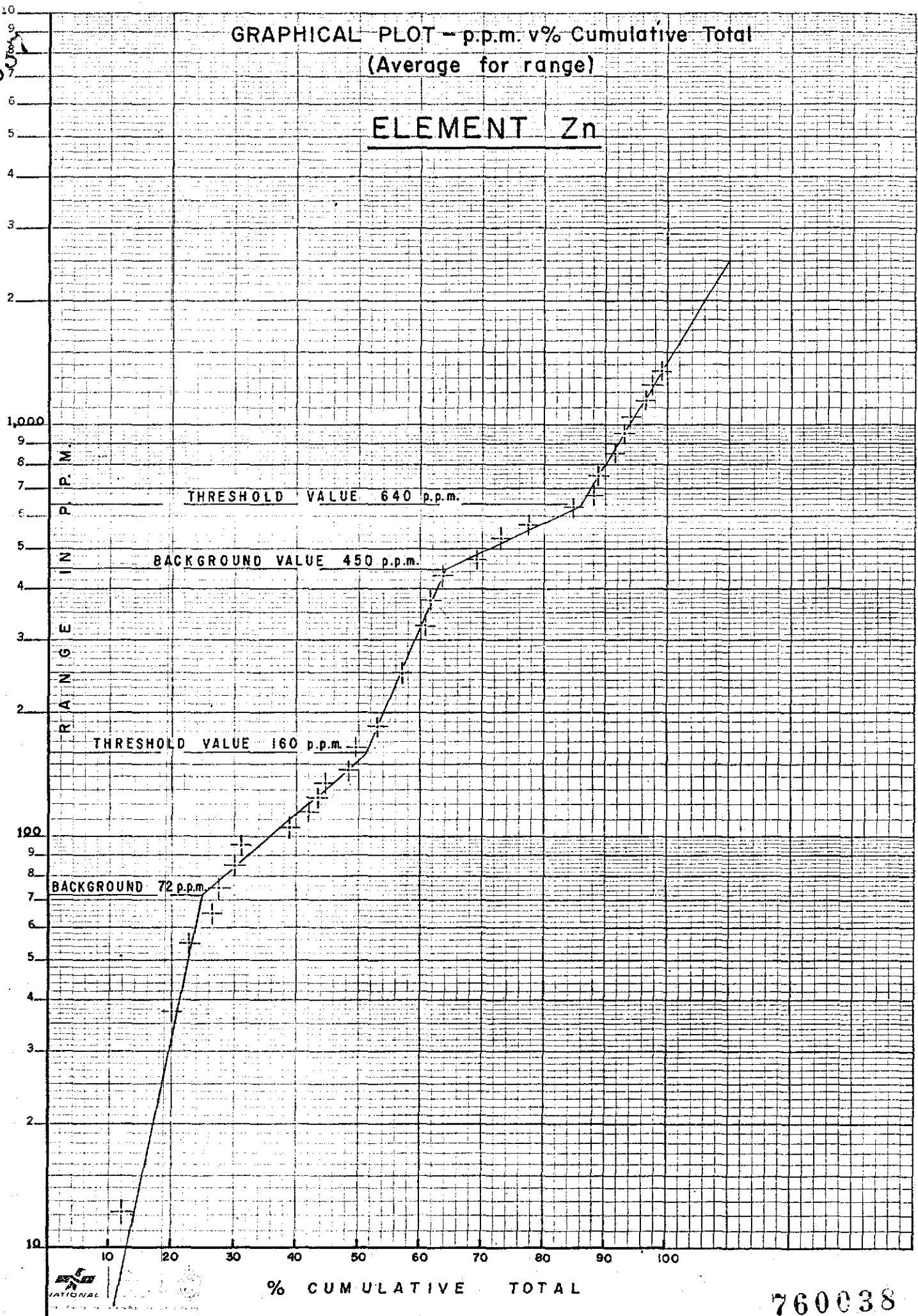
CALCULATION OF THRESHOLD AND BACKGROUND

ELEMENT Zn

<u>ppm</u> <u>Range</u>	<u>Frequency</u>	<u>Cumulative</u> <u>Total</u>	<u>%</u> <u>Cumulative</u> <u>Total</u>
0- 25	10	10	12.0
25- 50	7	17	20.0
50- 60	2	19	22.9
60- 70	3	22	26.5
70- 80	1	23	27.7
80- 90	2	25	30.0
90- 100	1	26	31.4
100- 110	6	32	38.6
110- 120	2	34	41.0
120- 130	2	36	43.4
130- 140	1	37	44.6
140- 150	3	40	48.2
150- 175	1	41	49.4
175- 200	3	44	53.0
200- 300	3	47	56.6
300- 350	3	50	60.5
350- 400	1	51	61.5
400- 450	2	53	63.9
450- 500	4	57	68.6
500- 550	4	61	73.5
550- 600	3	64	77.2
600- 650	6	70	84.4
650- 700	3	73	88.0
700- 800	1	74	89.2
800- 900	2	76	91.6
900-1000	1	77	92.8
1000-1100	1	78	94.0
1100-1200	2	80	96.5
1200-1300	1	81	97.5
1300-1400	1	82	99.0
2900	1	83	100.0

GRAPHICAL PLOT - p.p.m. v% Cumulative Total  
(Average for range)

ELEMENT Zn



% CUMULATIVE TOTAL

760038

CALCULATION OF THRESHOLD AND BACKGROUNDELEMENT Cr

<u>ppm Range</u>	<u>Frequency</u>	<u>Cumulative Total</u>	<u>% Cumulative Total</u>
0- 500	7	7	8.4
500-1000	7	14	16.9
1000-1500	2	16	19.3
1500-2000	-	-	-
2000-3000	5	21	25.3
3000-4000	5	26	31.4
4000-5000	2	28	33.8
5000-6000	3	31	37.4
6000-7000	4	35	42.2
7000-8000	2	37	44.6
8000-9000	1	38	45.8
9000-10000-1%	1	39	47.0
1.00-1.25	1	40	48.2
1.25-1.50	2	42	50.6
1.50-1.75	4	46	55.4
1.75-2.00	3	49	59.0
2.00-3.00	2	51	61.5
3.00-4.00	2	53	64.0
4.00-5.00	4	57	68.7
5.00-10.00	4	61	73.5
10.00-15.00	3	64	77.2
15.00-20.00	3	67	80.7
20.00-25.00	7	74	89.2
25.00-30.00	5	79	95.4
30.00-35.00	4	83	100.0

PETROGRAPHIC ANALYSISSPECIMEN AL2

BY

Central Mineralogical Services Pty Limited

The sample is "dark grey and predominantly fine-grained in the hand specimen, showing apparent large fragments of angular to rounded and irregular shapes set in a fine-grained matrix. Some areas of the rock are almost devoid of them. The rock reacts with effervescence to cold dilute hydrochloric acid, indicating the presence of abundant calcite. Some of the larger fragments are augen-like and tend to be aligned in a foliation.

In thin section under the microscope, the rock is seen to consist of variably distributed, predominantly rounded to irregularly shaped, calcareous rock fragments set in a predominantly very fine-grained apparently fragmental (but possibly partly recrystallized) matrix consisting mainly of carbonate (of silt size or finer, generally with some angular fine sand-size fragments), together with some fine aggregates and local folia of pale chlorite, scattered small angular grains of quartz, a few silty shale fragments, and rare large (and more common smaller) fragments of chert, some of which appear to have been partly replaced by carbonate. Thin wavy folia of (?) carbonaceous material are common in the fine-grained matrix, being concentrated locally, especially around and between some of the larger rock fragments. These folia, together with the alignment of some of the more elongate large rock fragments, give the rock a relatively poor foliation. The large carbonate rock fragments mainly are fine-grained. Some are massive and finely granular; others show laminated (?) algal structures, and still others contain more coarsely crystalline calcite. The rock appears to be a strongly brecciated calcareous sediment with minor impurities, that may have undergone minor recrystallization.

Estimated mineral proportions and grain sizes are:-

	<u>Mode (Vol. %)</u>		<u>Grain Sizes (mm)</u>	
Carbonate	Larger Fragments	25	0.1 - 7.0	(Average 2.0)
	Matrix	70	0.01 - 0.1	(Average 0.03)
Quartz and chert		3	0.01 - 3.0	(Average 0.05)
Opaque grains		1	0.02 - 0.25	(Average 0.1)
Chlorite (patches)		1	0.02 - 0.3	(Average 0.05)

040

760041

PETROGRAPHIC ANALYSISSPECIMEN AL5BYCentral Mineralogical Services Pty LimitedDescription:

## a) Hand Specimen:

A coarse-grained, pink granite.

## b) Microscopic:

This rock is a pink granite in which the dominant constituents are:

Quartz	20%
Perthite	55 to 60%
Plagioclase (An <sub>10-15</sub> )	10 to 15%
Biotite (Altered to Chlorite)	7 to 10%
Opagues	3%
Accessories	

The textures are typically hypidiomorphic granular and grain sizes average 2 to 2.5 mm. The perthitic orthoclase is heavily clouded with hematite dusty discolouration (giving the pink colour to the mineral), while the plagioclase feldspar is partly altered to epidote, sericite, chlorite and dusty kaolinite.

Magnetic opaques are invariably related to the medium-grained chloritized biotite flakes and accessory zircon (very common), apatite, epidote. Very minor chloritized hornblende can be recognised because of the secondary epidote inclusions (and relict cleavages), whereas the biotite has been replaced by chlorite and minor (?) sphene.

Sixteen euhedral zircons present in a heavy mineral concentrate prepared from the sample have average length to breadth ratios of 2.5:1. Of these, six contained tiny inclusions in the form of opaques, negative crystals and bubbles. Traces of metamict zircon were noted in thin section and occasionally zircon grains have a very pale yellow colour. Very pale pink fluorescence is a feature of the zircon in this sample.

Comparison with TC2 (Report C.M.S. 72/2/24:) (Also appended).

A re-examination of this earlier sample showed that only one-tenth of the zircons were euhedral, but of seven grains measured the length to breadth ratios were similar to the granite zircons (2.75:1).

Inclusions of opaques and negative crystals were noted in many euhedral grains, but none were characteristic enough to be directly compared with the granite zircon inclusions. The hyacinth varieties were rounded, but the pink fluorescent varieties were identified as being sub-rounded.

No euhedral zircons were identified in the "A.R. Conc." Some fluorescence was however traced to topaz grains as well as zircon grains.

I.F. Scott. M.Sc.

ROCK CHIP ANALYSESQUALITATIVE SPECTROGRAPHIC ANALYSIS

<u>Sample No:</u>	<u>Major</u>	<u>Minor</u>	<u>Heavy Trace (0.1 to 1%)</u>	<u>Trace (0.01 to 0.1%)</u>	<u>Faint Trace (0.001 to 0.01%)</u>	<u>Very Faint Trace (0.00001 to 0.001%)</u>
AL 1	Fe, Si	-	Al, P,	Mg, Ti, Mn	Ca, Na, Zn, Cu, W, Cr, Ni, Co	B, K, Li, Ag, Sn, Pb, Mo, V, Be, Bi
AL 2				Petrographic Analysis		
AL 3	Fe	Si	P, Al, Mg	Mn, Zn, Ti, Ca	Cr, W, As, Na, B	Cr, Ni, V, Mo, Be, Ge, Cu, Ag, K
AL 4						
AL 5				Petrographic Analysis		

042

760043

## APPENDIX 4

MINERALOGY OF PANNED HEAVY MINERAL CONCENTRATES

T.C. No 2 - From Lovells Creek on Salmon River road  
 A.R. Conc. - Combined concentrate from the Arthur River

	<u>Zircon</u>	<u>Rutile</u>	<u>Cassiterite</u>	<u>Opagues</u>	<u>Quartz</u>	<u>Others</u>
T.C. No. 2	15-20%	2%	1-2%	50%	30%	Topaz and
A.R. Conc.	< 5	< 2%	(?) 5-7%	50%	10-15%	tourmaline

COMMENTS:Sample T.C. No. 2

a) Two generations of zircon - one is fresh and euhedral, the second is well rounded. Accessory metamict zircons are present. Hyacinth varieties are also present.

A number of fluorescent grains were extracted from the sample and all were zircon. Grain sizes are usually less than 0.25 mm.

b) Quartz is well rounded. Many grains are coarser than 0.25 mm.

c) Opagues are sometimes well rounded and often coarser than 0.33 mm.

d) Rutile is often very dark in colour. A trace of anatase is present.

e) Cassiterite is commonly bright orange to amber in colour and occurs in angular to sub-angular grains. Grain sizes vary from coarse to fine.

f) It is possible that a zircon-rutile-cassiterite concentrate could be upgraded simply by screening eg. at 60 mesh.

g) Tin assays are recommended.

h) Opagues (in P.S. 8497) include chromite (mainly) and minor ilmenite, leucoxene and magnetite.

Sample A.R. Combined Conc.

a) Once again it is zircon which fluoresces. Most zircons are well rounded i.e. one generation. Some hyacinth grains were noted.

b) Pink garnet and subhedral to euhedral topaz are more important. The implications are that the source is granitic or related to granite and associated pneumatolytic-hydrothermal alteration.

c) Cassiterite is more "normal" in colour i.e. browns to colourless. Iron staining on it and other grains often makes identification difficult. Grain sizes range from fine to coarse. Screening may not cause any particular concentration.

043

d) Tourmaline is often a characteristic pale blue-green in colour and may occur in fine aggregates.

e) Tin assays are recommended.

f) Opaques in P.S. 8498 include secondary goethite (dominantly), minor ilmenite, chromite, traces of pyrite, leucoxene and magnetite.

I.F. SCOTT. M.Sc.

1139

GRAPHICAL PLOT - p.p.m. v% Cumulative Total  
(Average for range)

ELEMENT Sn

1,000,000

100,000

10,000

1,000

100

E  
L  
E  
M  
E  
N  
T  
S

BACKGROUND VALUE 75 p.p.m.

THRESHOLD VALUE 530 p.p.m.

BACKGROUND VALUE 1200 p.p.m.

THRESHOLD VALUE 2700 p.p.m.

10

20

30

40

50

60

70

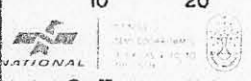
80

90

100

% CUMULATIVE TOTAL

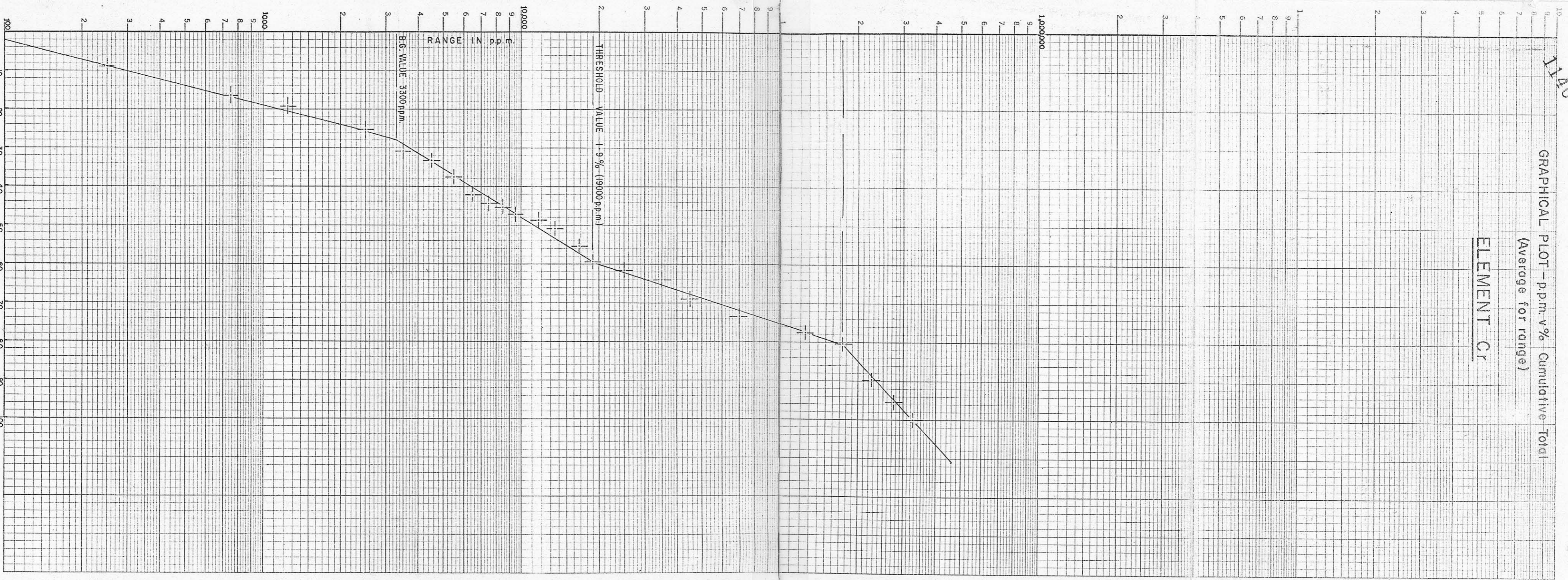
260045

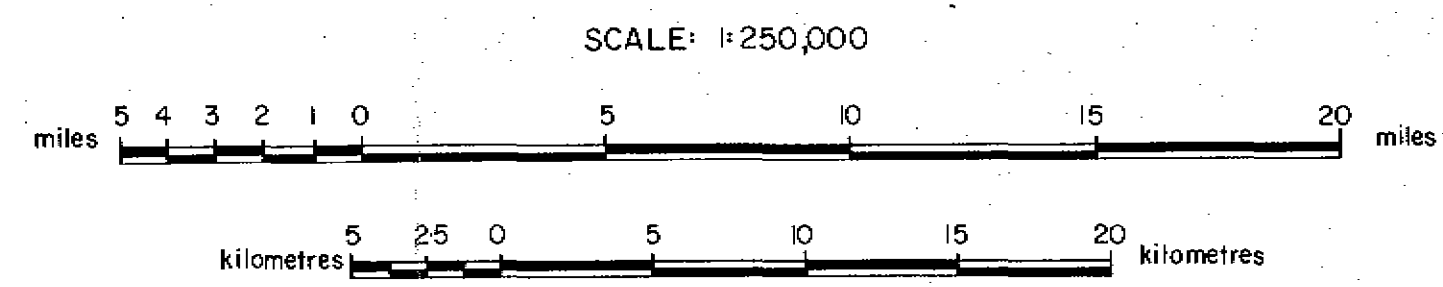
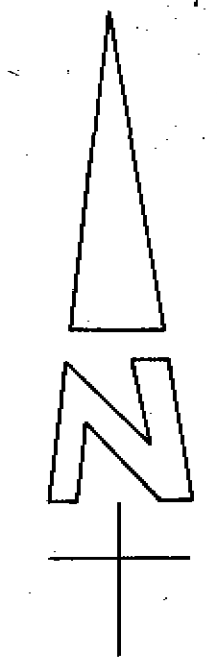
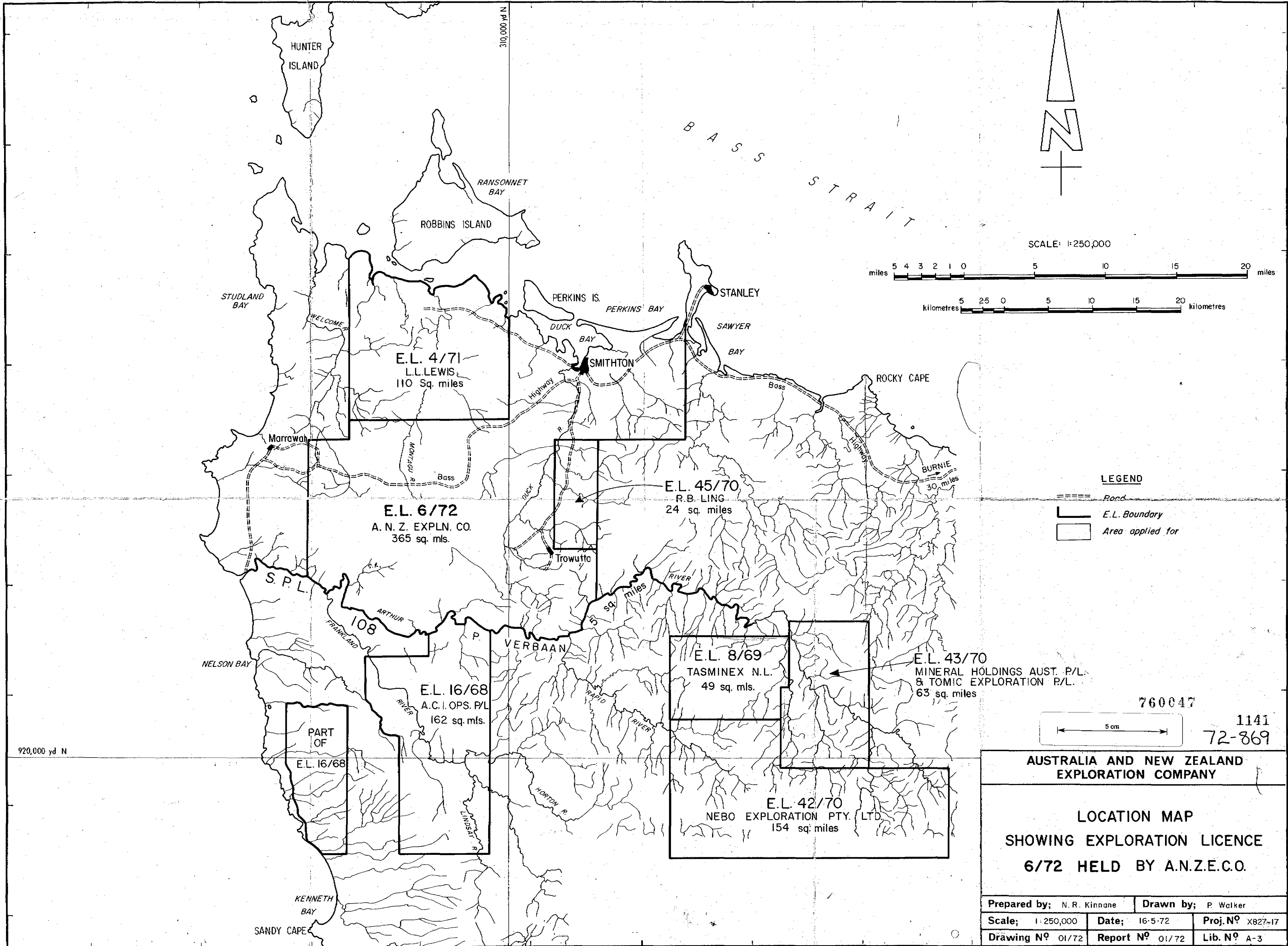


1140

GRAPHICAL PLOT - p.p.m. v% Cumulative Total  
(Average for range)

ELEMENT Cr





**LEGEND**

- Road
- E.L. Boundary
- Area applied for

760047

1141

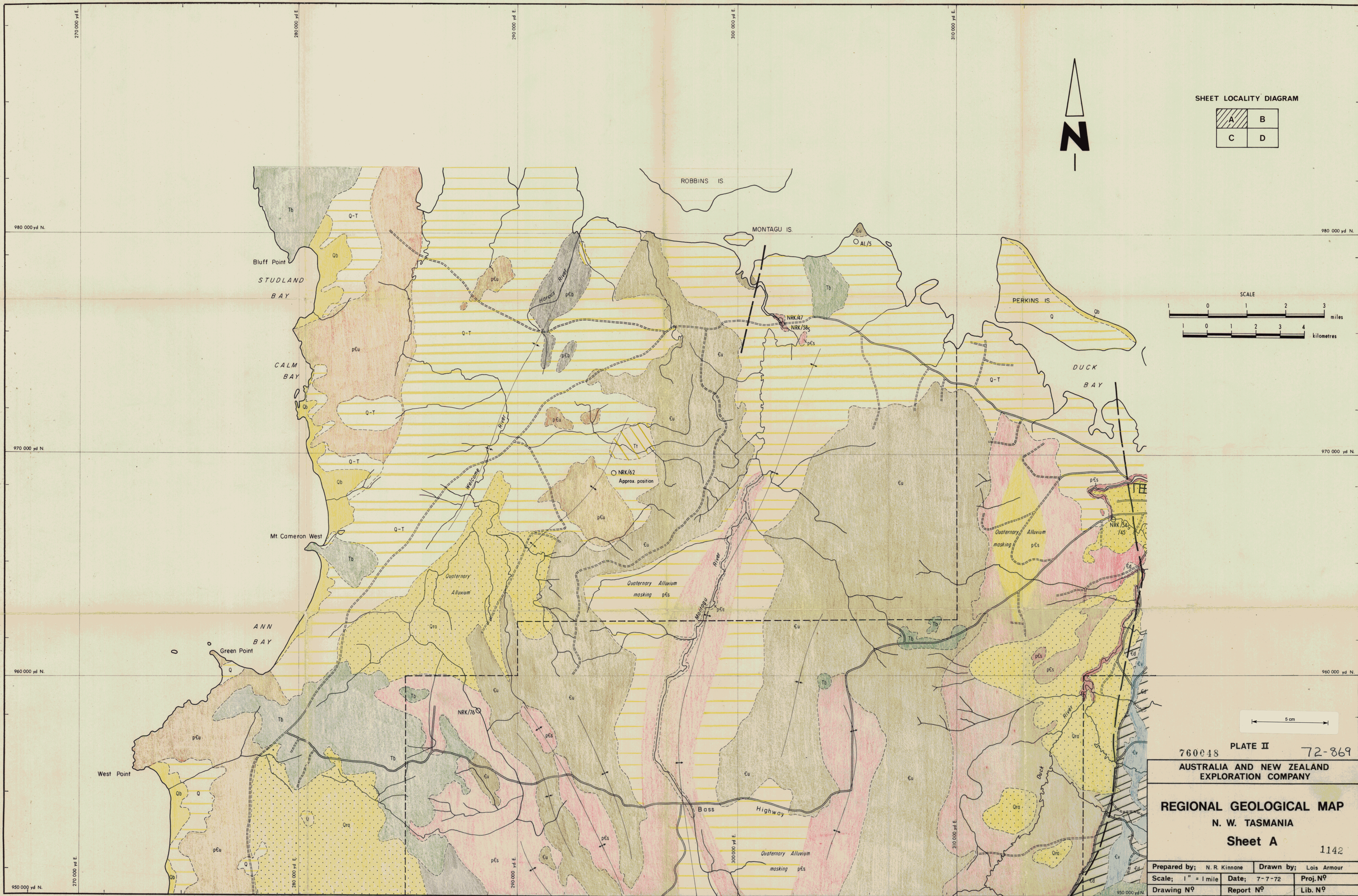
72-869

5 cm

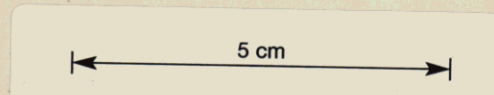
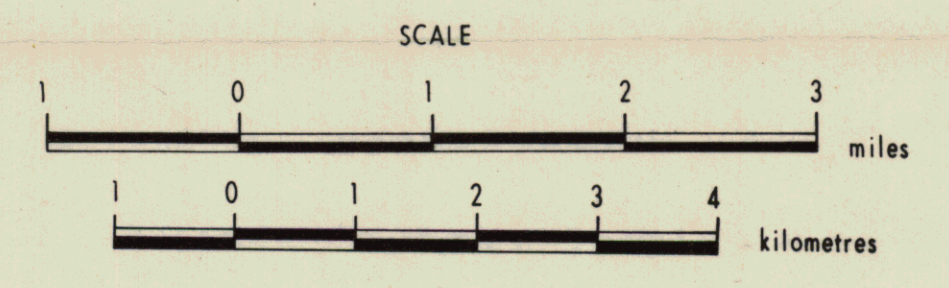
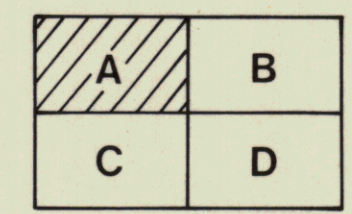
**AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY**

**LOCATION MAP**  
**SHOWING EXPLORATION LICENCE**  
**6/72 HELD BY A.N.Z.E.C.O.**

Prepared by; N.R. Kinnane	Drawn by; P. Walker
Scale; 1:250,000	Date; 16.5.72
Drawing N <sup>o</sup> 01/72	Proj. N <sup>o</sup> X827-17
Report N <sup>o</sup> 01/72	Lib. N <sup>o</sup> A-3



SHEET LOCALITY DIAGRAM

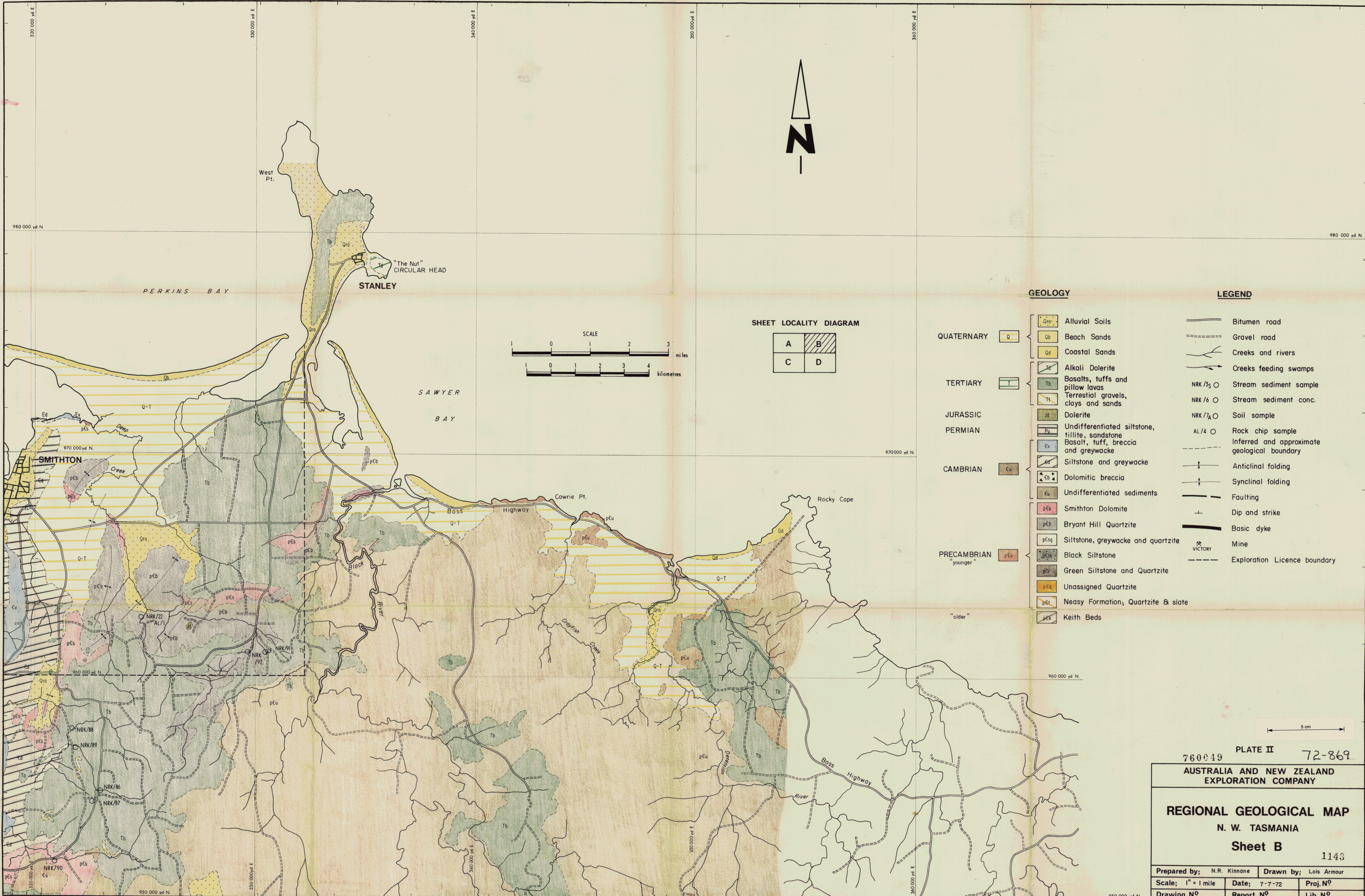


760048 PLATE II 72-869

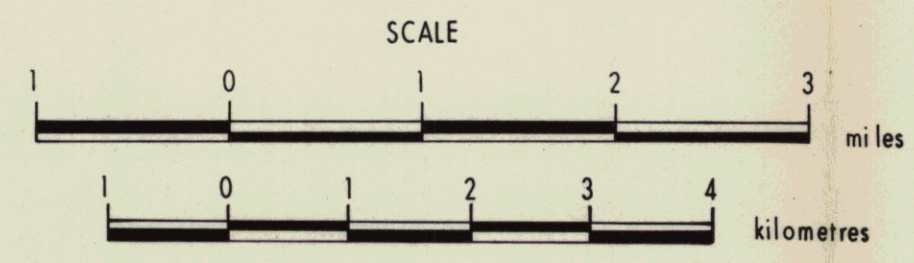
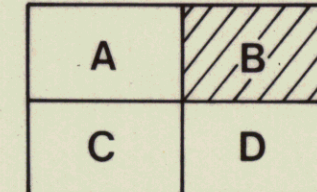
AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

**REGIONAL GEOLOGICAL MAP**  
**N. W. TASMANIA**  
**Sheet A** 1142

Prepared by: N. R. Kinnane	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing N <sup>o</sup>	Report N <sup>o</sup>
	Lib. N <sup>o</sup>



SHEET LOCALITY DIAGRAM



**GEOLOGY**

- |             |    |      |  |
|-------------|----|------|--|
| QUATERNARY  | Q  | Qa   | Alluvial Soils                                 |
|             |    | Qb   | Beach Sands                                    |
|             |    | Qc   | Coastal Sands                                  |
| TERTIARY    | T  | Ta   | Alkali Dolerite                                |
|             |    | Tb   | Basalts, tuffs and pillow lavas                |
|             |    | Tc   | Terrestrial gravels, clays and sands           |
| JURASSIC    | J  | Jd   | Dolerite                                       |
| PERMIAN     | P  | Pu   | Undifferentiated siltstone, tillite, sandstone |
|             |    | Pv   | Basalt, tuff, breccia and greywacke            |
| CAMBRIAN    | C  | Ca   | Siltstone and greywacke                        |
|             |    | Cb   | Dolomitic breccia                              |
|             |    | Cu   | Undifferentiated sediments                     |
| PRECAMBRIAN | PC | PCs  | Smithton Dolomite                              |
| "younger"   |    | PCb  | Bryant Hill Quartzite                          |
|             |    | PCsq | Siltstone, greywacke and quartzite             |
|             |    | PCst | Black Siltstone                                |
|             |    | PCr  | Green Siltstone and Quartzite                  |
|             |    | PCq  | Unassigned Quartzite                           |
|             |    | PCt  | Neasy Formation, Quartzite & slate             |
|             |    | PCk  | Keith Beds                                     |
|             |    |      | "older"  |

**LEGEND**

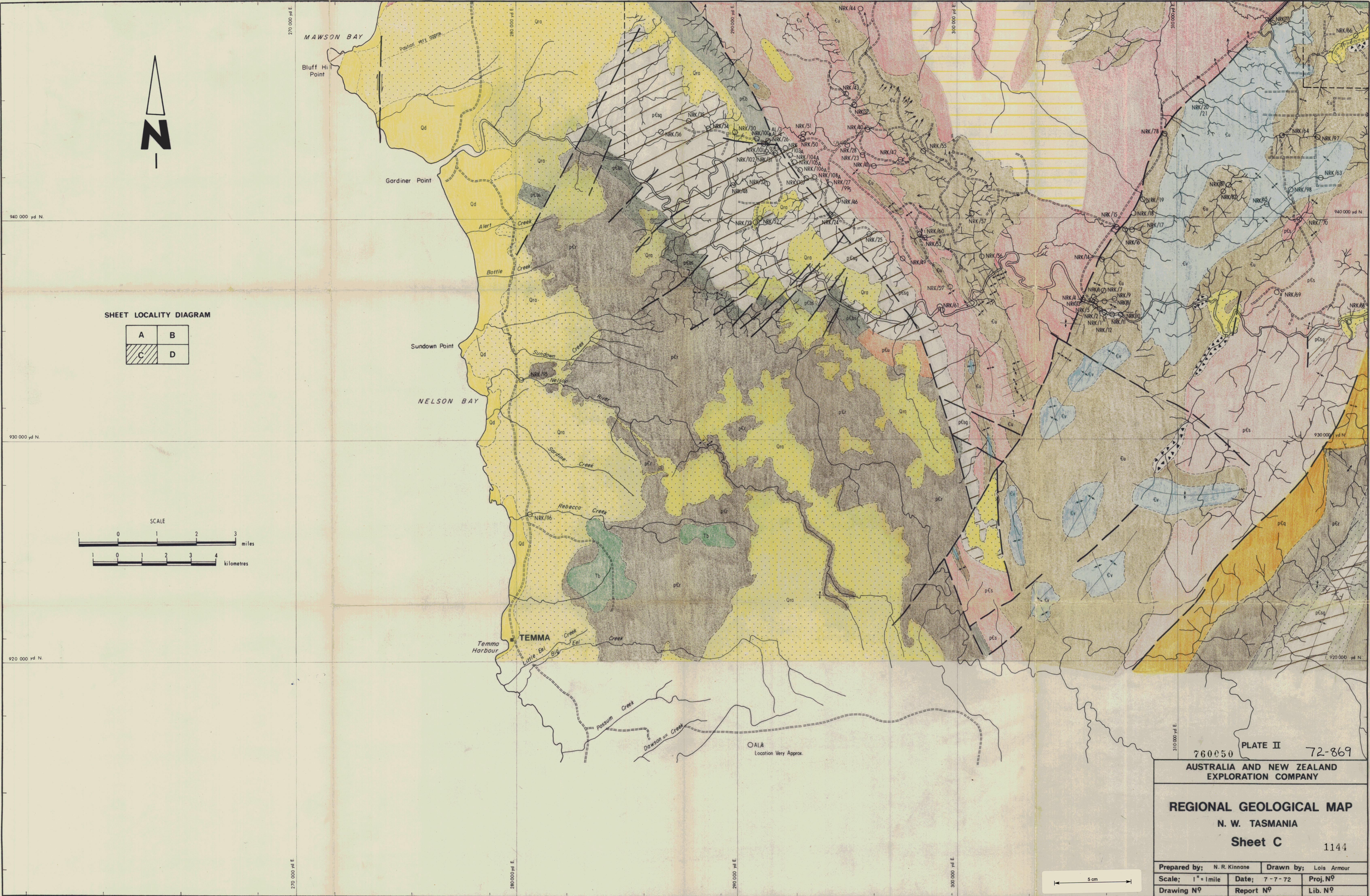
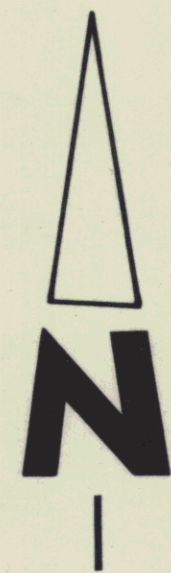
- Bitumen road
- - - Gravel road
- ~ ~ ~ Creeks and rivers
- ~ ~ ~ Creeks feeding swamps
- NRK/35 O Stream sediment sample
- NRK/6 O Stream sediment conc.
- NRK/7A O Soil sample
- AL/4 O Rock chip sample
- - - Inferred and approximate geological boundary
- ↕ Anticlinal folding
- ↕ Synclinal folding
- Faulting
- Dip and strike
- Basic dyke
- VICTORY Mine
- - - Exploration Licence boundary

760049 PLATE II 72-869

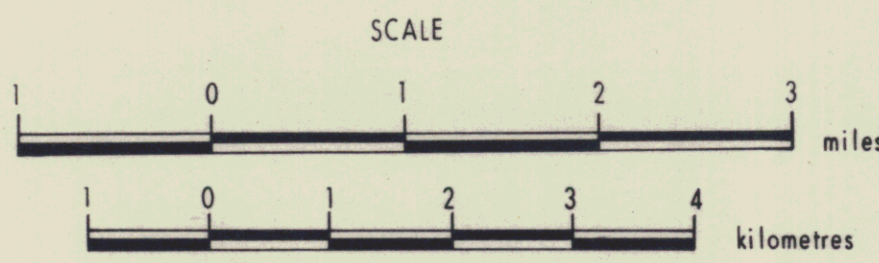
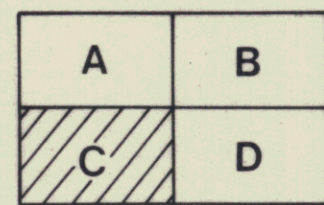
AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

**REGIONAL GEOLOGICAL MAP**  
N. W. TASMANIA  
**Sheet B** 1143

Prepared by; N.R. Kinnone	Drawn by; Lois Armour
Scale; 1" = 1 mile	Date; 7-7-72
Drawing N <sup>o</sup>	Report N <sup>o</sup>
	Lib. N <sup>o</sup>



SHEET LOCALITY DIAGRAM

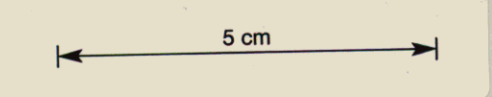


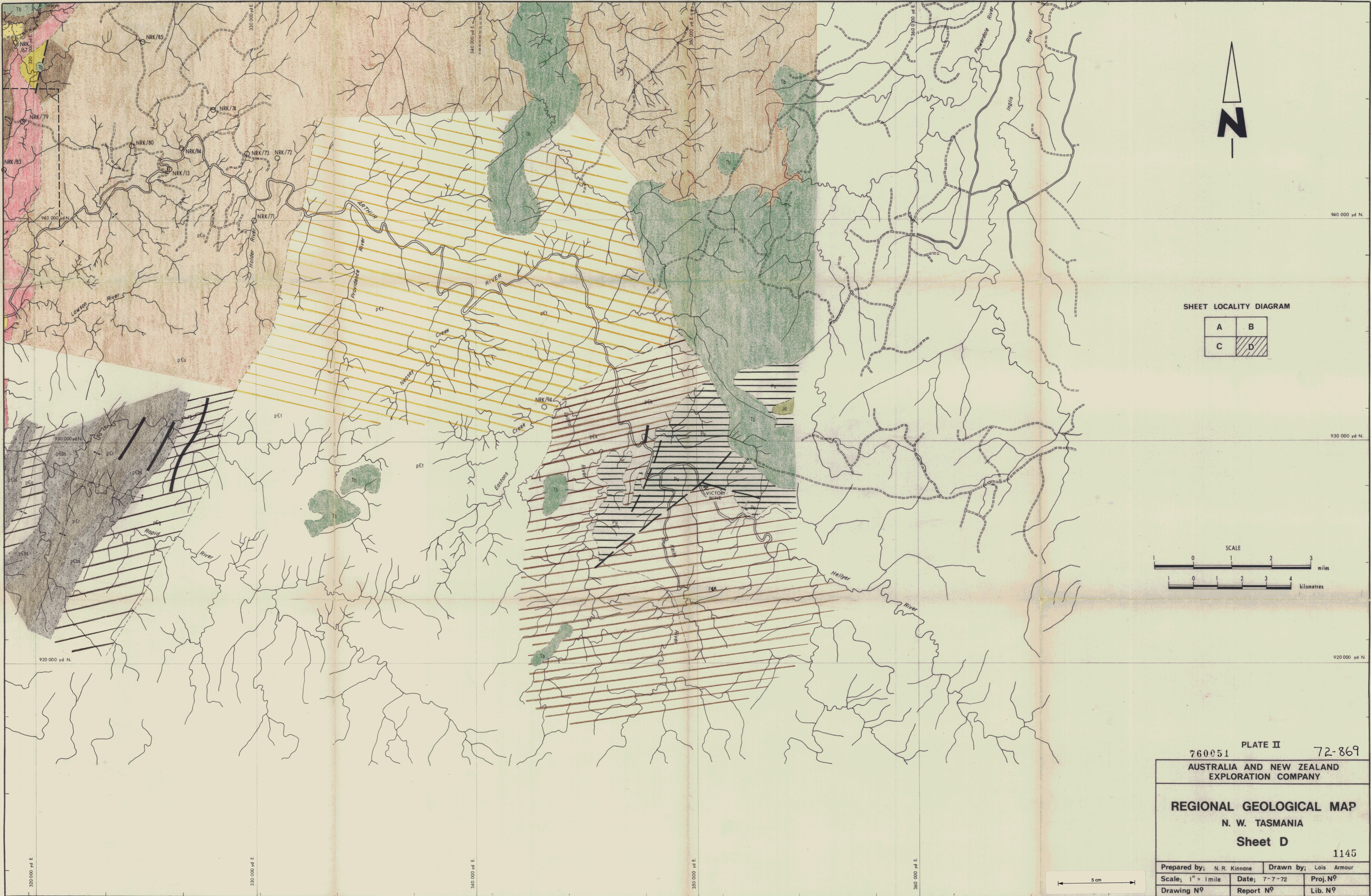
760050 PLATE II 72-869

AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

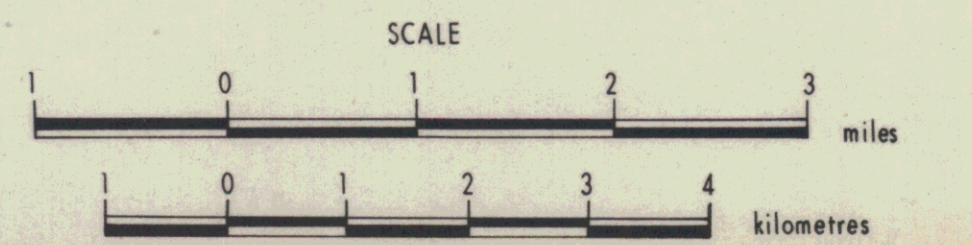
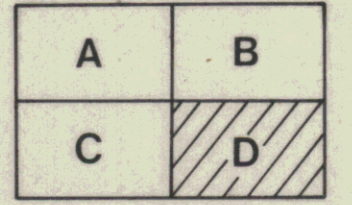
REGIONAL GEOLOGICAL MAP  
N. W. TASMANIA  
Sheet C 1144

Prepared by; N. R. Kinnone	Drawn by; Lois Armour
Scale; 1" = 1 mile	Date; 7-7-72
Drawing N <sup>o</sup>	Proj. N <sup>o</sup>
Report N <sup>o</sup>	Lib. N <sup>o</sup>





SHEET LOCALITY DIAGRAM



760051 PLATE II 72-869

AUSTRALIA AND NEW ZEALAND  
EXPLORATION COMPANY

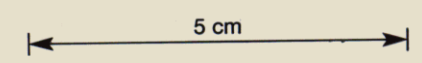
REGIONAL GEOLOGICAL MAP

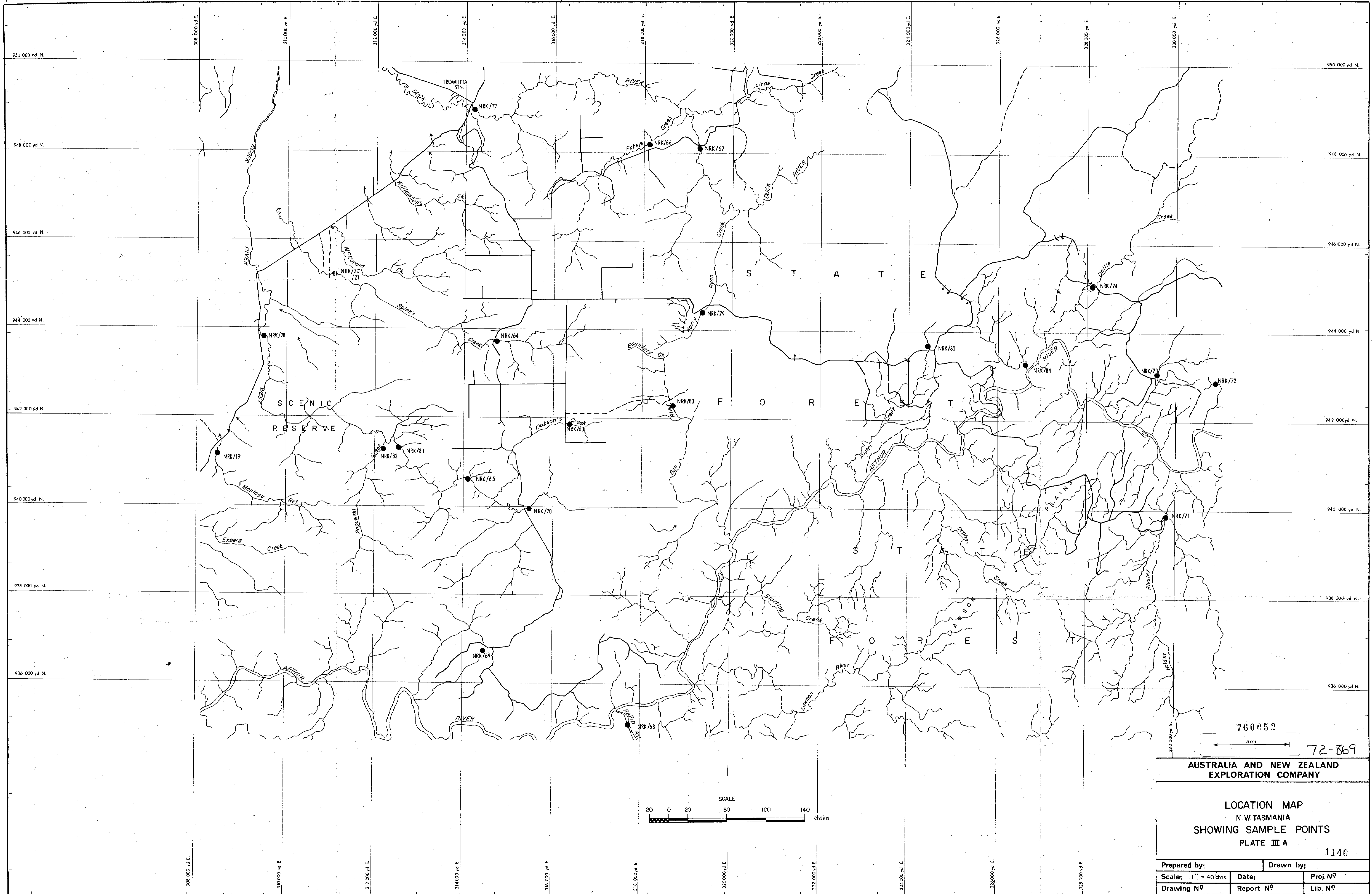
N. W. TASMANIA

Sheet D

1145

Prepared by: N. R. Kinnane	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing N <sup>o</sup>	Report N <sup>o</sup>
	Lib. N <sup>o</sup>





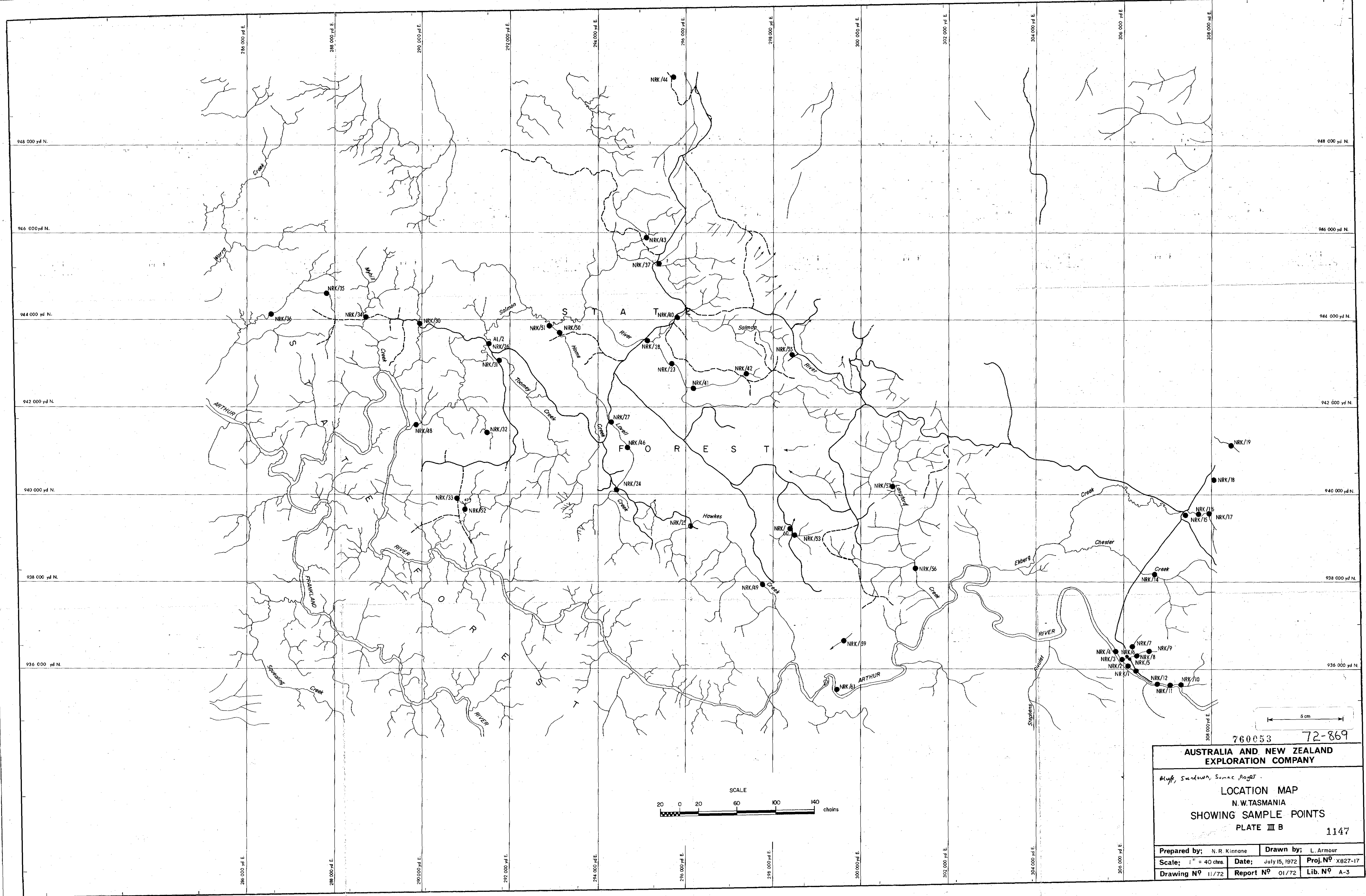
76052  
5 cm  
72-869

**AUSTRALIA AND NEW ZEALAND  
EXPLORATION COMPANY**

**LOCATION MAP  
N.W. TASMANIA  
SHOWING SAMPLE POINTS  
PLATE III A**

1146

Prepared by:		Drawn by:	
Scale: 1" = 40 chns.	Date:	Proj. N <sup>o</sup>	
Drawing N <sup>o</sup>	Report N <sup>o</sup>	Lib. N <sup>o</sup>	



760053 72-869

**AUSTRALIA AND NEW ZEALAND  
EXPLORATION COMPANY**

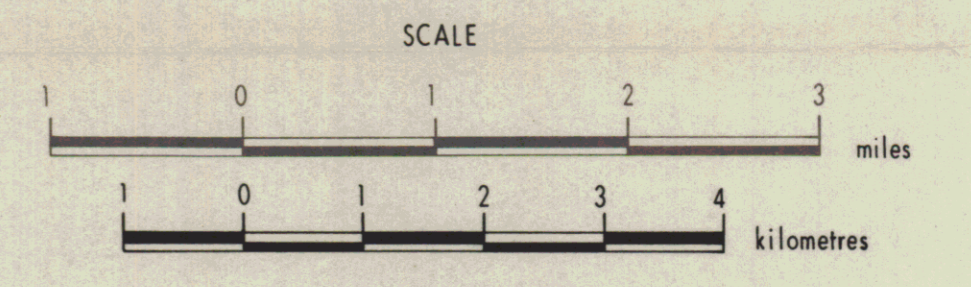
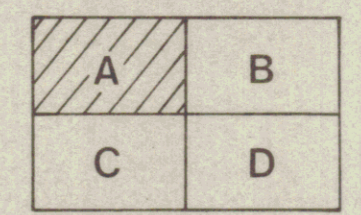
*Bluff, Sunda, Sunc, Rogt*

**LOCATION MAP  
N.W. TASMANIA  
SHOWING SAMPLE POINTS  
PLATE III B 1147**

Prepared by: N.R. Kinnane	Drawn by: L. Armour
Scale: 1" = 40 chns.	Date: July 15, 1972
Drawing No: 11/72	Report No: 01/72
	Lib. No: A-3

- CHROME VALUES**
- ① + 19000 p.p.m. (Threshold)
  - ② 3300 to 19000 p.p.m.
  - ③ 1000 to 3300 p.p.m.
  - ④ < 1000 p.p.m.
- ZINC VALUES**
- ① + 640 p.p.m. (Threshold)
  - ② 450 to 640 p.p.m.
  - ③ 160 to 450 p.p.m.
  - ④ 72 to 160 p.p.m.
  - ⑤ 20 to 72 p.p.m.
  - ⑥ < 20 p.p.m.
- TUNGSTEN VALUES**
- ① + 100 p.p.m.
  - ② 30 to 100 p.p.m.
  - ③ 14 to 30 p.p.m.
  - ④ 2 to 13 p.p.m.
  - ⑤ < 2 p.p.m.
- MOLYBDENUM VALUES**
- ① 10 p.p.m.
  - ② 5 to 9 p.p.m.
  - ③ 2 p.p.m.
  - ④ < 2 p.p.m.
- LEAD VALUES**
- + 58 p.p.m. (Threshold)
  - 28 to 58 p.p.m.
  - 20 to 28 p.p.m.
  - < 20 p.p.m.
- COPPER VALUES**
- + 82 p.p.m. (Threshold +)
  - 47 to 82 p.p.m.
  - 10 to 47 p.p.m.
  - < 10 p.p.m.
- TIN VALUES**
- + 2700 p.p.m. (Threshold 1)
  - 1200 to 2700 p.p.m.
  - 530 to 1200 p.p.m. (Threshold 2+)
  - 75 to 530 p.p.m.
  - 20 to 75 p.p.m.
  - < 20 p.p.m.

SHEET LOCALITY DIAGRAM



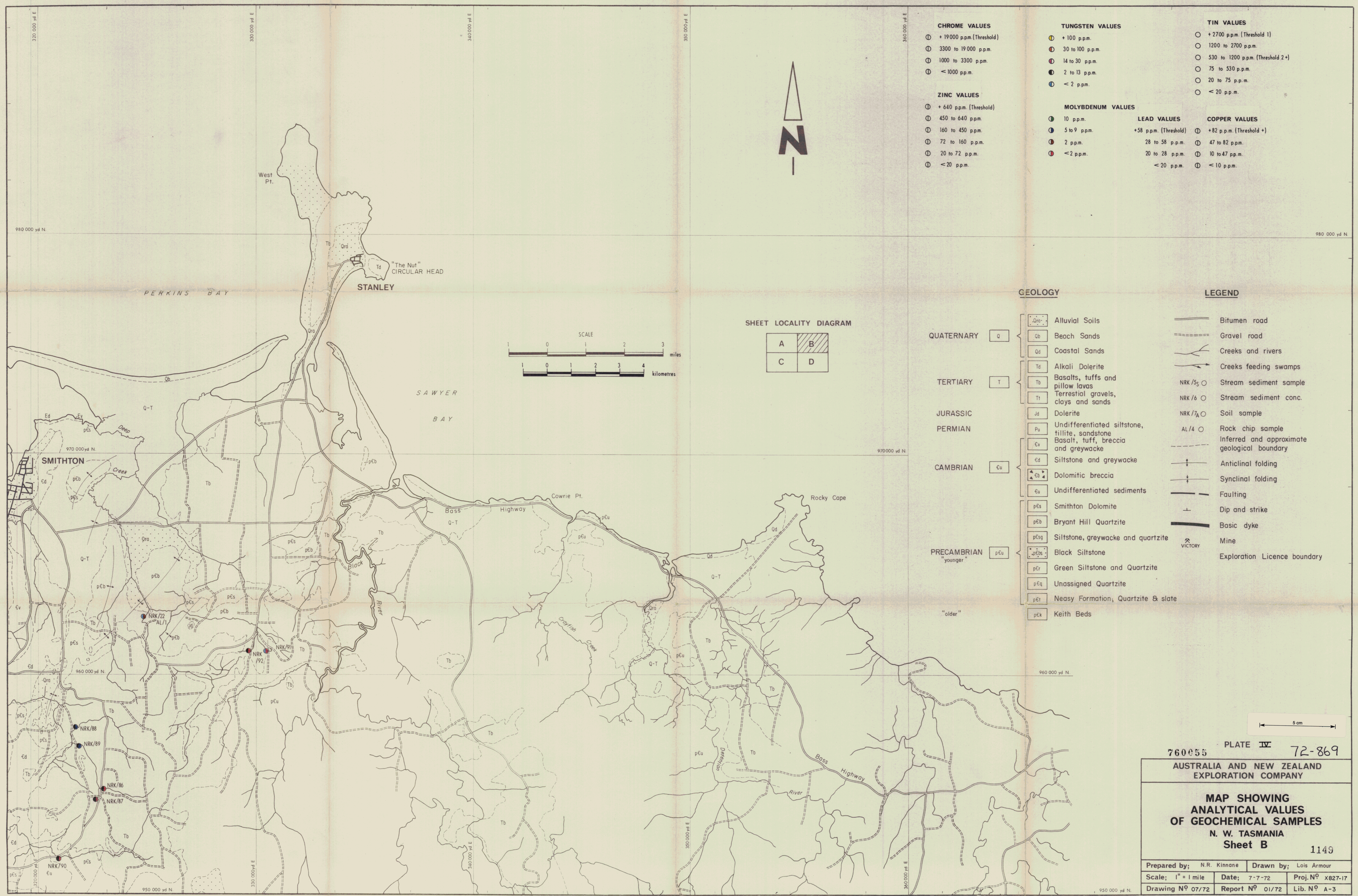
760054 PLATE IV 72-869

AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

**MAP SHOWING ANALYTICAL VALUES OF GEOCHEMICAL SAMPLES N. W. TASMANIA Sheet A**

1148

Prepared by: N. R. Kinnane	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing N <sup>o</sup> 06/72	Report N <sup>o</sup> 01/72
	Lib. N <sup>o</sup> A-3

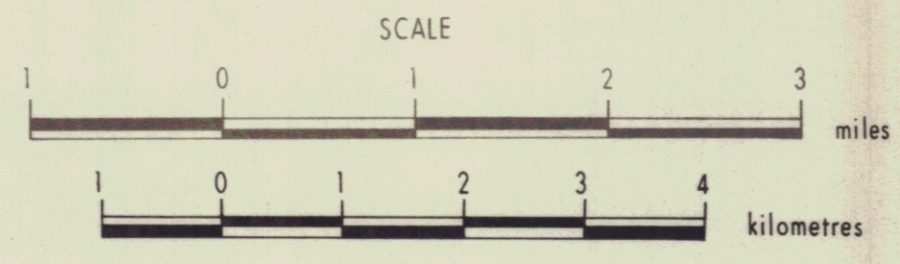
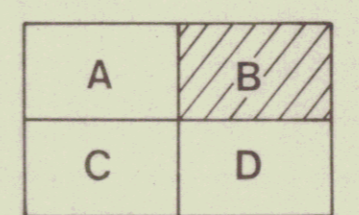


CHROME VALUES	TUNGSTEN VALUES	TIN VALUES
① + 19000 p.p.m. (Threshold)	① + 100 p.p.m.	① + 2700 p.p.m. (Threshold 1)
② 3300 to 19000 p.p.m.	② 30 to 100 p.p.m.	② 1200 to 2700 p.p.m.
③ 1000 to 3300 p.p.m.	③ 14 to 30 p.p.m.	③ 530 to 1200 p.p.m. (Threshold 2+)
④ < 1000 p.p.m.	④ 2 to 13 p.p.m.	④ 75 to 530 p.p.m.
	⑤ < 2 p.p.m.	⑤ 20 to 75 p.p.m.
		⑥ < 20 p.p.m.

ZINC VALUES	MOLYBDENUM VALUES	LEAD VALUES	COPPER VALUES
① + 640 p.p.m. (Threshold)	① 10 p.p.m.	+58 p.p.m. (Threshold)	① +82 p.p.m. (Threshold +)
② 450 to 640 p.p.m.	② 5 to 9 p.p.m.	28 to 58 p.p.m.	② 47 to 82 p.p.m.
③ 160 to 450 p.p.m.	③ 2 p.p.m.	20 to 28 p.p.m.	③ 10 to 47 p.p.m.
④ 72 to 160 p.p.m.	④ < 2 p.p.m.	< 20 p.p.m.	④ < 10 p.p.m.
⑤ 20 to 72 p.p.m.			
⑥ < 20 p.p.m.			

SHEET LOCALITY DIAGRAM



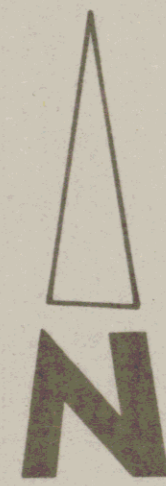
GEOLOGY		LEGEND			
QUATERNARY	Q	Qa	Alluvial Soils	—	Bitumen road
		Qb	Beach Sands	- - - - -	Gravel road
		Qd	Coastal Sands	~ ~ ~ ~ ~	Creeks and rivers
TERTIARY	T	Td	Alkali Dolerite	→ → →	Creeks feeding swamps
		Tb	Basalts, tuffs and pillow lavas	NRK/5s ○	Stream sediment sample
		Tt	Terrestrial gravels, clays and sands	NRK/6 ○	Stream sediment conc.
JURASSIC	J	Jd	Dolerite	NRK/7s ○	Soil sample
PERMIAN	P	Pu	Undifferentiated siltstone, tillite, sandstone	AL/4 ○	Rock chip sample
		Pv	Basalt, tuff, breccia and greywacke	- - - - -	Inferred and approximate geological boundary
CAMBRIAN	C	Cd	Siltstone and greywacke	↕	Anticlinal folding
		Cb	Dolomitic breccia	↕	Synclinal folding
		Cu	Undifferentiated sediments	—	Faulting
		CS	Smithton Dolomite	↕	Dip and strike
		Cb	Bryant Hill Quartzite	—	Basic dyke
		CSg	Siltstone, greywacke and quartzite	⋈	Mine
PRECAMBRIAN	PC	CSs	Black Siltstone	⋈	Exploration Licence boundary
"younger"		CSq	Green Siltstone and Quartzite		
		CSu	Unassigned Quartzite		
		CSr	Neasy Formation; Quartzite & slate		
"older"		CSk	Keith Beds		

760055 PLATE IV 72-869

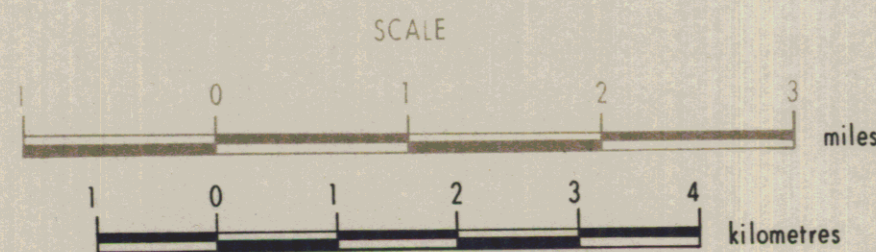
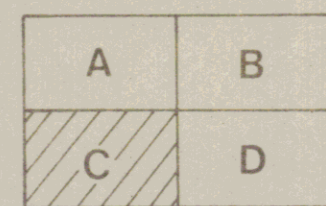
AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

MAP SHOWING ANALYTICAL VALUES OF GEOCHEMICAL SAMPLES N. W. TASMANIA Sheet B 1149

Prepared by:	N.R. Kinnane	Drawn by:	Lois Armour
Scale:	1" = 1 mile	Date:	7-7-72
Drawing N°	07/72	Report N°	01/72
		Lib. N°	A-3



SHEET LOCALITY DIAGRAM



**CHROME VALUES**

- ① + 19000 p.p.m. (Threshold)
- ② 3300 to 19000 p.p.m.
- ③ 1000 to 3300 p.p.m.
- ④ <1000 p.p.m.

**ZINC VALUES**

- ① + 640 p.p.m. (Threshold)
- ② 450 to 640 p.p.m.
- ③ 160 to 450 p.p.m.
- ④ 72 to 160 p.p.m.
- ⑤ 20 to 72 p.p.m.
- ⑥ <20 p.p.m.

**TUNGSTEN VALUES**

- ① + 100 p.p.m.
- ② 30 to 100 p.p.m.
- ③ 14 to 30 p.p.m.
- ④ 2 to 13 p.p.m.
- ⑤ <2 p.p.m.

**TIN VALUES**

- ① + 2700 p.p.m. (Threshold 1)
- ② 1200 to 2700 p.p.m.
- ③ 530 to 1200 p.p.m. (Threshold 2 +)
- ④ 75 to 530 p.p.m.
- ⑤ 20 to 75 p.p.m.
- ⑥ <20 p.p.m.

**LEAD VALUES**

- ① + 58 p.p.m. (Threshold)
- ② 28 to 58 p.p.m.
- ③ 20 to 28 p.p.m.
- ④ <20 p.p.m.

**COPPER VALUES**

- ① + 82 p.p.m. (Threshold +)
- ② 47 to 82 p.p.m.
- ③ 10 to 47 p.p.m.
- ④ <10 p.p.m.

**MOLYBDENUM VALUES**

- ① 10 p.p.m.
- ② 5 to 9 p.p.m.
- ③ 2 p.p.m.
- ④ <2 p.p.m.

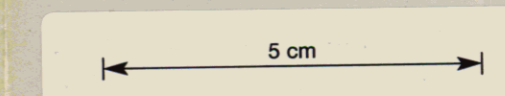
PLATE IV 72-869

AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

**MAP SHOWING ANALYTICAL VALUES OF GEOCHEMICAL SAMPLES N. W. TASMANIA Sheet C**

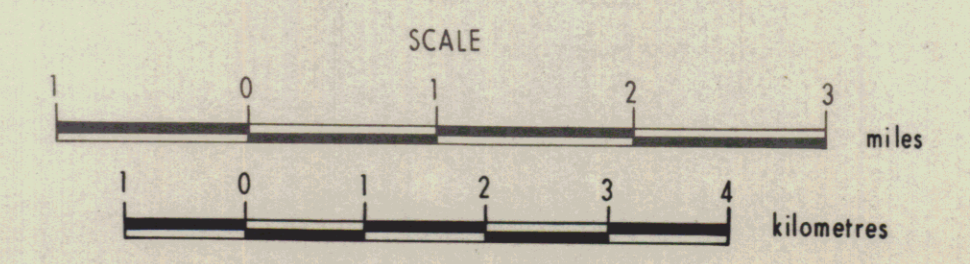
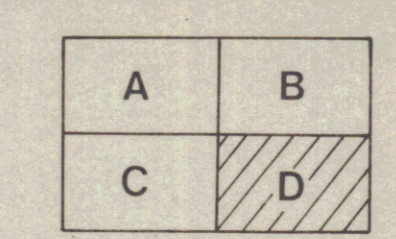
760056 1150

Prepared by: N.R. Kinnone	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing N <sup>o</sup> 08/72	Report N <sup>o</sup> 01/72
	Lib N <sup>o</sup> A-3





SHEET LOCALITY DIAGRAM



- CHROME VALUES**
- ① + 19 000 p.p.m. (Threshold)
  - ① 3300 to 19 000 p.p.m.
  - ① 1000 to 3300 p.p.m.
  - ① < 1000 p.p.m.

- ZINC VALUES**
- ① + 640 p.p.m. (Threshold)
  - ① 450 to 640 p.p.m.
  - ① 160 to 450 p.p.m.
  - ① 72 to 160 p.p.m.
  - ① 20 to 72 p.p.m.
  - ① < 20 p.p.m.

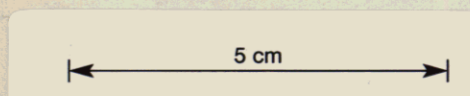
- TUNGSTEN VALUES**
- ① + 100 p.p.m.
  - ① 30 to 100 p.p.m.
  - ① 14 to 30 p.p.m.
  - ① 2 to 13 p.p.m.
  - ① < 2 p.p.m.

- MOLYBDENUM VALUES**
- ① 10 p.p.m.
  - ① 5 to 9 p.p.m.
  - ① 2 p.p.m.
  - ① < 2 p.p.m.

- TIN VALUES**
- + 2700 p.p.m. (Threshold 1)
  - 1200 to 2700 p.p.m.
  - 530 to 1200 p.p.m. (Threshold 2+)
  - 75 to 530 p.p.m.
  - 20 to 75 p.p.m.
  - < 20 p.p.m.

- LEAD VALUES**
- + 58 p.p.m. (Threshold)
  - 28 to 58 p.p.m.
  - 20 to 28 p.p.m.
  - < 20 p.p.m.

- COPPER VALUES**
- ① + 82 p.p.m. (Threshold +)
  - ① 47 to 82 p.p.m.
  - ① 10 to 47 p.p.m.
  - ① < 10 p.p.m.



76057 PLATE IV 1151  
72-869

AUSTRALIA AND NEW ZEALAND  
EXPLORATION COMPANY

**MAP SHOWING  
ANALYTICAL VALUES  
OF GEOCHEMICAL SAMPLES  
N. W. TASMANIA  
Sheet D**

Prepared by; N. R. Kinnone	Drawn by; Lois Armour
Scale; 1" = 1 mile	Date; 7-7-72
Drawing N <sup>o</sup> 09/72	Report N <sup>o</sup> 01/72
	Proj. N <sup>o</sup> X827-17
	Lib. N <sup>o</sup> A-3

- CHROME VALUES**
- ① + 19000 p.p.m. (Threshold)
  - ① 3300 to 19000 p.p.m.
  - ① 1000 to 3300 p.p.m.
  - ① <1000 p.p.m.

- ZINC VALUES**
- ① + 640 p.p.m. (Threshold)
  - ① 450 to 640 p.p.m.
  - ① 160 to 450 p.p.m.
  - ① 72 to 160 p.p.m.
  - ① 20 to 72 p.p.m.
  - ① < 20 p.p.m.

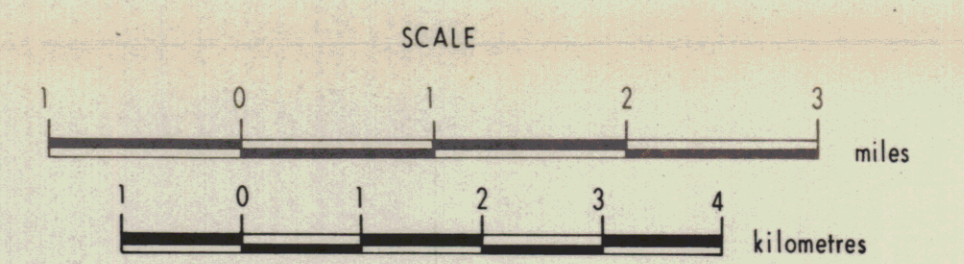
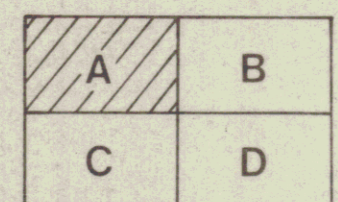
- TUNGSTEN VALUES**
- ① + 100 p.p.m.
  - ① 30 to 100 p.p.m.
  - ① 14 to 30 p.p.m.
  - ① 2 to 13 p.p.m.
  - ① < 2 p.p.m.

- MOLYBDENUM VALUES**
- ① 10 p.p.m.
  - ① 5 to 9 p.p.m.
  - ① 2 p.p.m.
  - ① < 2 p.p.m.

- |                         |                           |
|-------------------------|---------------------------|
| <b>LEAD VALUES</b>      | <b>COPPER VALUES</b>      |
| + 58 p.p.m. (Threshold) | + 82 p.p.m. (Threshold +) |
| 28 to 58 p.p.m.         | 47 to 82 p.p.m.           |
| 20 to 28 p.p.m.         | 10 to 47 p.p.m.           |
| < 20 p.p.m.             | < 10 p.p.m.               |

- TIN VALUES**
- + 2700 p.p.m. (Threshold 1)
  - 1200 to 2700 p.p.m.
  - 530 to 1200 p.p.m. (Threshold 2+)
  - 75 to 530 p.p.m.
  - 20 to 75 p.p.m.
  - < 20 p.p.m.

SHEET LOCALITY DIAGRAM



5 cm 1152

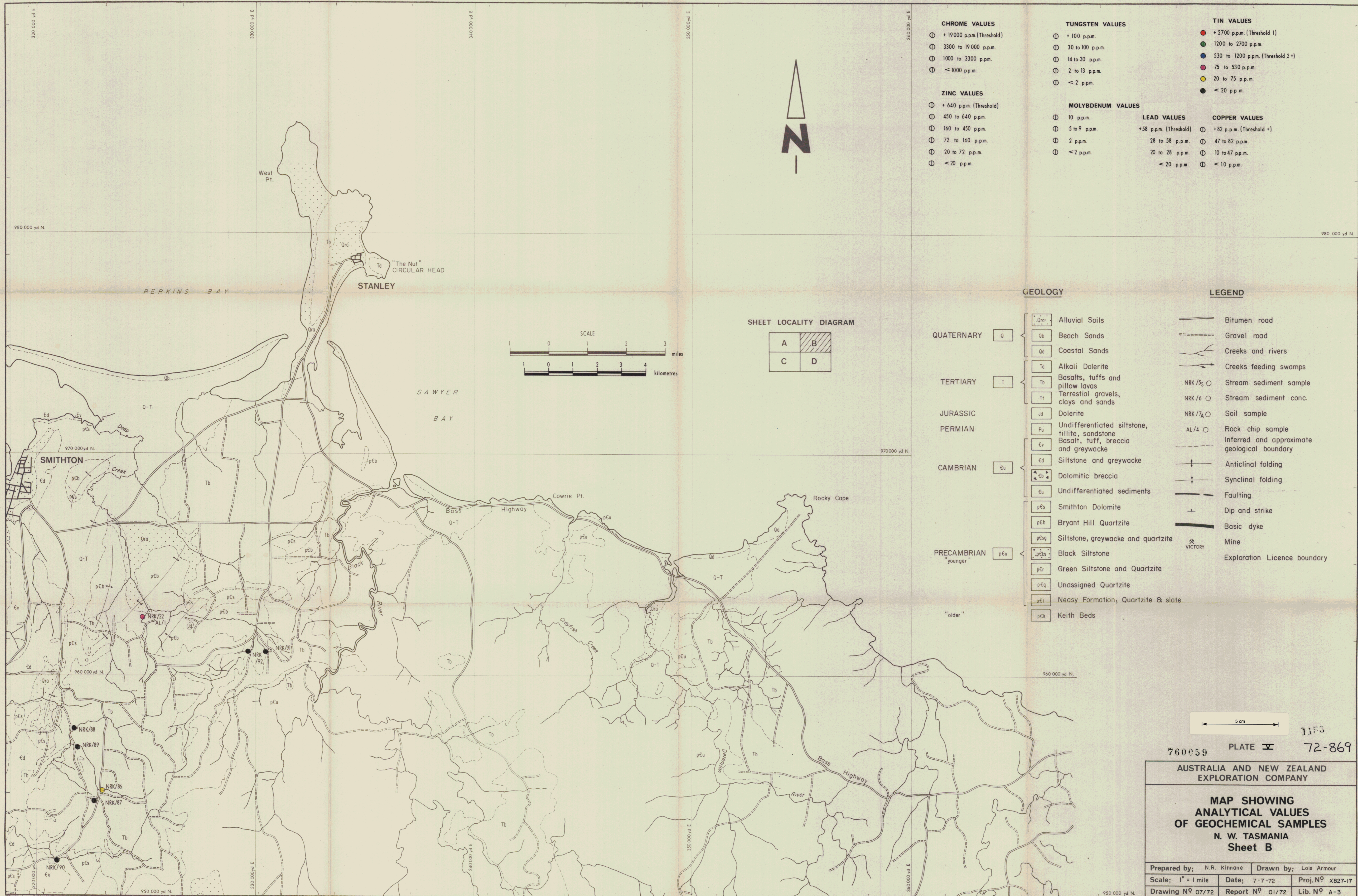
760058 PLATE V 72-869

AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

**MAP SHOWING ANALYTICAL VALUES OF GEOCHEMICAL SAMPLES N. W. TASMANIA Sheet A**

Prepared by: N. R. Kinnane	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing N <sup>o</sup> 06/72	Report N <sup>o</sup> 01/72
	Lib. N <sup>o</sup> A-3



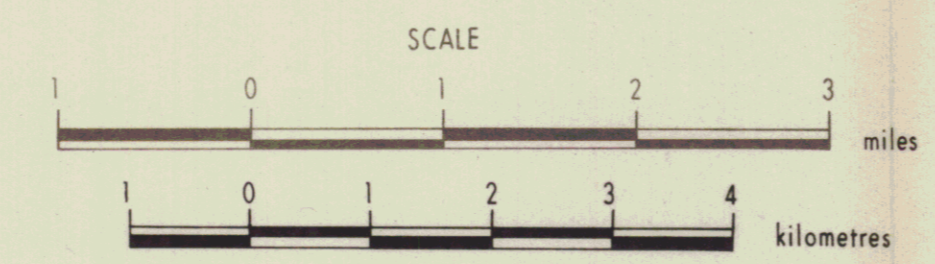
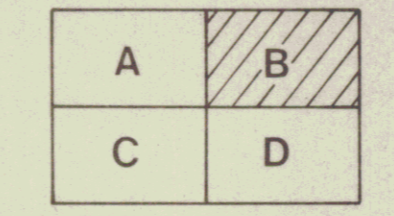


CHROME VALUES	TUNGSTEN VALUES	TIN VALUES
⊕ + 19000 p.p.m. (Threshold)	⊕ + 100 p.p.m.	● + 2700 p.p.m. (Threshold 1)
⊕ 3300 to 19 000 p.p.m.	⊕ 30 to 100 p.p.m.	● 1200 to 2700 p.p.m.
⊕ 1000 to 3300 p.p.m.	⊕ 14 to 30 p.p.m.	● 530 to 1200 p.p.m. (Threshold 2+)
⊕ < 1000 p.p.m.	⊕ 2 to 13 p.p.m.	● 75 to 530 p.p.m.
	⊕ < 2 p.p.m.	● 20 to 75 p.p.m.
		● < 20 p.p.m.

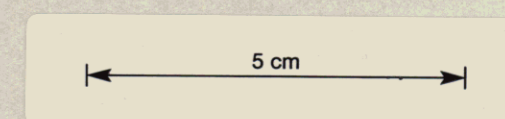
  

ZINC VALUES	MOLYBDENUM VALUES	LEAD VALUES	COPPER VALUES
⊕ + 640 p.p.m. (Threshold)	⊕ 10 p.p.m.	+58 p.p.m. (Threshold)	⊕ +82 p.p.m. (Threshold +)
⊕ 450 to 640 p.p.m.	⊕ 5 to 9 p.p.m.	28 to 58 p.p.m.	⊕ 47 to 82 p.p.m.
⊕ 160 to 450 p.p.m.	⊕ 2 p.p.m.	20 to 28 p.p.m.	⊕ 10 to 47 p.p.m.
⊕ 72 to 160 p.p.m.	⊕ < 2 p.p.m.	< 20 p.p.m.	⊕ < 10 p.p.m.
⊕ 20 to 72 p.p.m.			
⊕ < 20 p.p.m.			

SHEET LOCALITY DIAGRAM



GEOLOGY		LEGEND			
QUATERNARY	Q	Qra	Alluvial Soils	—	Bitumen road
		Qb	Beach Sands	-----	Gravel road
		Qd	Coastal Sands	~	Creeks and rivers
TERTIARY	T	Td	Alkali Dolerite	~	Creeks feeding swamps
		Tb	Basalts, tuffs and pillow lavas	NRK/35 ○	Stream sediment sample
		Tt	Terrestrial gravels, clays and sands	NRK/6 ○	Stream sediment conc.
JURASSIC	J	Jd	Dolerite	NRK/7A ○	Soil sample
PERMIAN	P	Pu	Undifferentiated siltstone, fillite, sandstone	AL/4 ○	Rock chip sample
		Pv	Basalt, tuff, breccia and greywacke	---	Inferred and approximate geological boundary
CAMBRIAN	C	Ed	Siltstone and greywacke	↕	Anticlinal folding
		Edb	Dolomitic breccia	↕	Synclinal folding
		Eu	Undifferentiated sediments	---	Faulting
PRECAMBRIAN "younger"	Pc	pEs	Smithton Dolomite	+	Dip and strike
		pEb	Bryant Hill Quartzite	—	Basic dyke
		pEsg	Siltstone, greywacke and quartzite	⋈	Mine
		pEts	Black Siltstone	---	Exploration Licence boundary
		pEtr	Green Siltstone and Quartzite		
		pEq	Unassigned Quartzite		
		pEt	Neasy Formation, Quartzite & slate		
		pEk	Keith Beds		
			"older"		



760059 PLATE V 72-869

1153

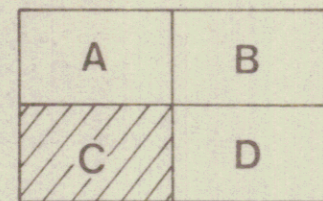
AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

MAP SHOWING ANALYTICAL VALUES OF GEOCHEMICAL SAMPLES N. W. TASMANIA Sheet B

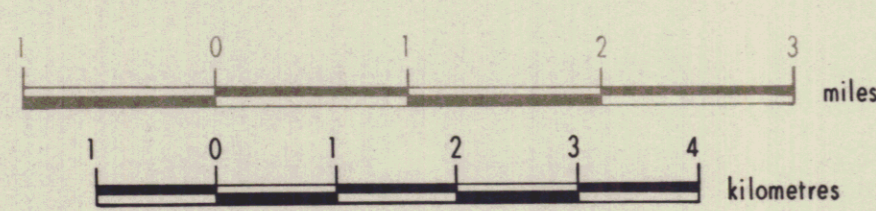
Prepared by: N.R. Kinnane	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing No 07/72	Proj. No X827-17
Report No 01/72	Lib. No A-3



SHEET LOCALITY DIAGRAM



SCALE



**CHROME VALUES**

- ⊙ +19000 p.p.m. (Threshold)
- ⊙ 3300 to 19000 p.p.m.
- ⊙ 1000 to 3300 p.p.m.
- ⊙ <1000 p.p.m.

**ZINC VALUES**

- ⊙ +640 p.p.m. (Threshold)
- ⊙ 450 to 640 p.p.m.
- ⊙ 160 to 450 p.p.m.
- ⊙ 72 to 160 p.p.m.
- ⊙ 20 to 72 p.p.m.
- ⊙ <20 p.p.m.

**TUNGSTEN VALUES**

- ⊙ +100 p.p.m.
- ⊙ 30 to 100 p.p.m.
- ⊙ 14 to 30 p.p.m.
- ⊙ 2 to 13 p.p.m.
- ⊙ <2 p.p.m.

**TIN VALUES**

- +2700 p.p.m. (Threshold 1)
- 1200 to 2700 p.p.m.
- 530 to 1200 p.p.m. (Threshold 2 +)
- 75 to 530 p.p.m.
- 20 to 75 p.p.m.
- <20 p.p.m.

**MOLYBDENUM VALUES**

- ⊙ 10 p.p.m.
- ⊙ 5 to 9 p.p.m.
- ⊙ 2 p.p.m.
- ⊙ <2 p.p.m.

**LEAD VALUES**

- ⊙ +58 p.p.m. (Threshold)
- ⊙ 28 to 58 p.p.m.
- ⊙ 20 to 28 p.p.m.
- ⊙ <20 p.p.m.

**COPPER VALUES**

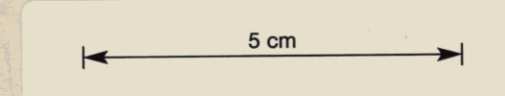
- ⊙ +82 p.p.m. (Threshold +)
- ⊙ 47 to 82 p.p.m.
- ⊙ 10 to 47 p.p.m.
- ⊙ <10 p.p.m.

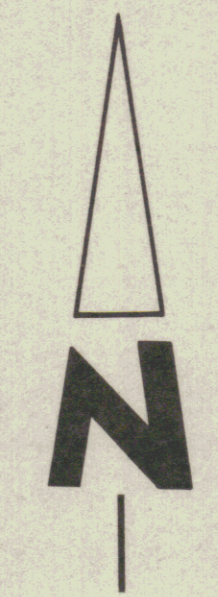
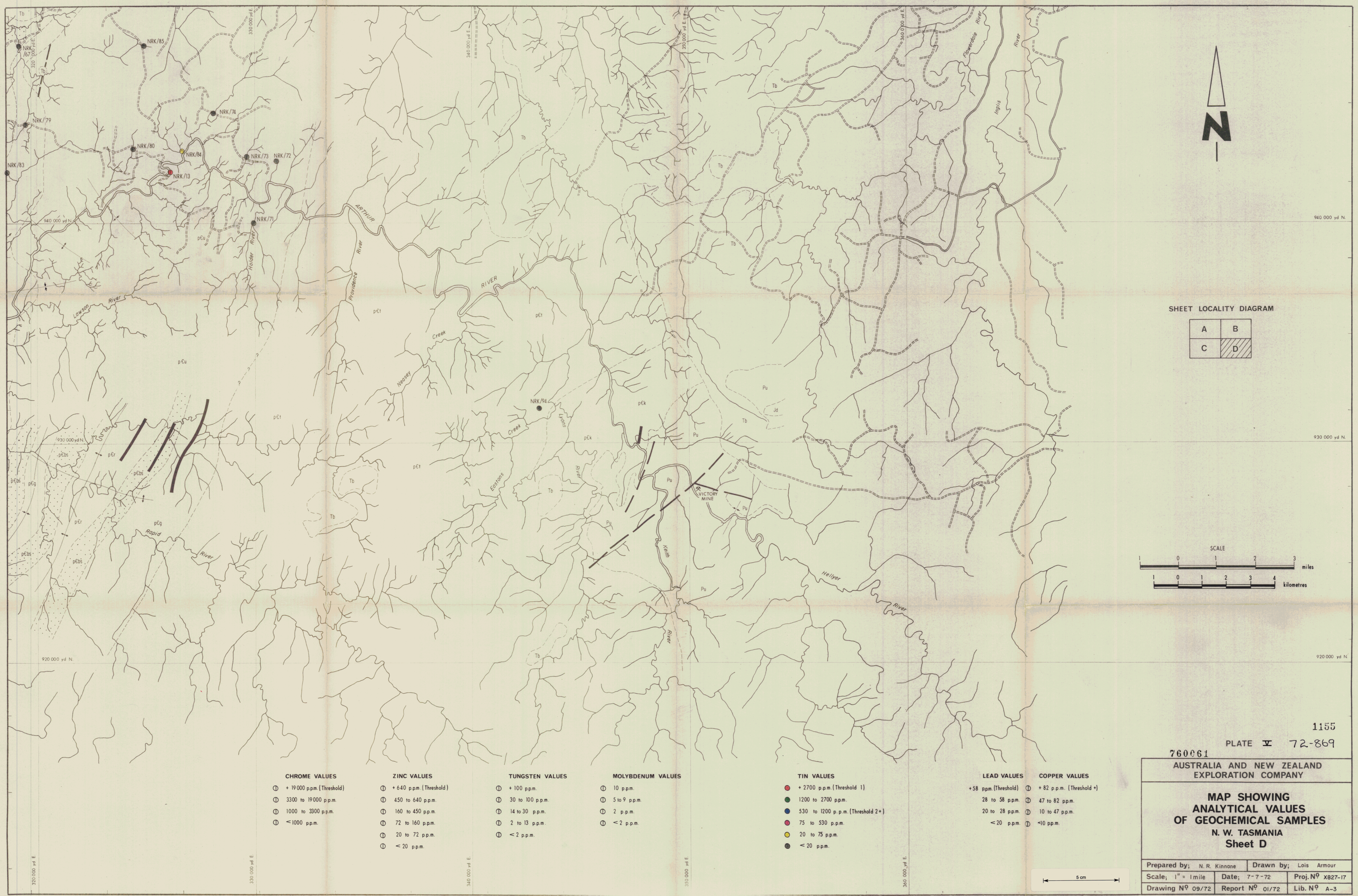
1154  
760060 PLATE V 72-869

AUSTRALIA AND NEW ZEALAND  
EXPLORATION COMPANY

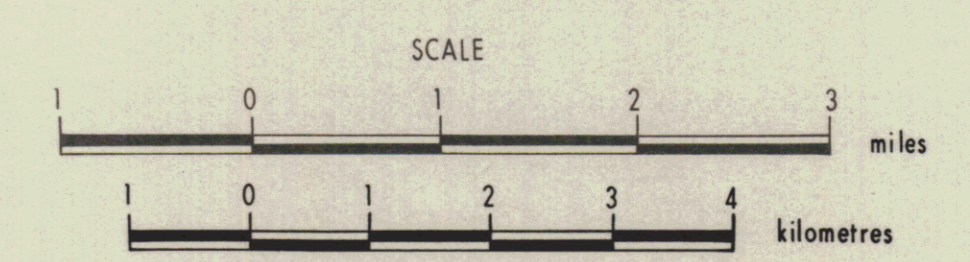
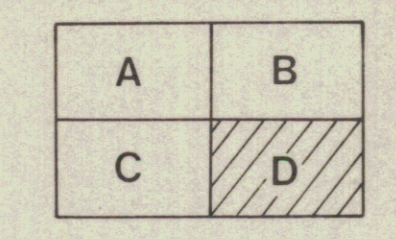
**MAP SHOWING  
ANALYTICAL VALUES  
OF GEOCHEMICAL SAMPLES  
N. W. TASMANIA  
Sheet C**

Prepared by: N. R. Kinnane    Drawn by: Lois Armour  
Scale: 1" = 1 mile    Date: 7-7-72    Proj. N<sup>o</sup> X827-17  
Drawing N<sup>o</sup> 08/72    Report N<sup>o</sup> 01/72    Lib N<sup>o</sup> A-3





SHEET LOCALITY DIAGRAM



- CHROME VALUES**
- ⊕ + 19 000 p.p.m. (Threshold)
  - ⊕ 3300 to 19 000 p.p.m.
  - ⊕ 1000 to 3300 p.p.m.
  - ⊕ < 1000 p.p.m.

- ZINC VALUES**
- ⊕ + 640 p.p.m. (Threshold)
  - ⊕ 450 to 640 p.p.m.
  - ⊕ 160 to 450 p.p.m.
  - ⊕ 72 to 160 p.p.m.
  - ⊕ 20 to 72 p.p.m.
  - ⊕ < 20 p.p.m.

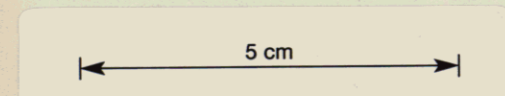
- TUNGSTEN VALUES**
- ⊕ + 100 p.p.m.
  - ⊕ 30 to 100 p.p.m.
  - ⊕ 14 to 30 p.p.m.
  - ⊕ 2 to 13 p.p.m.
  - ⊕ < 2 p.p.m.

- MOLYBDENUM VALUES**
- ⊕ 10 p.p.m.
  - ⊕ 5 to 9 p.p.m.
  - ⊕ 2 p.p.m.
  - ⊕ < 2 p.p.m.

- TIN VALUES**
- + 2700 p.p.m. (Threshold 1)
  - 1200 to 2700 p.p.m.
  - 530 to 1200 p.p.m. (Threshold 2+)
  - 75 to 530 p.p.m.
  - 20 to 75 p.p.m.
  - < 20 p.p.m.

- LEAD VALUES**
- ⊕ + 58 p.p.m. (Threshold)
  - ⊕ 28 to 58 p.p.m.
  - ⊕ 20 to 28 p.p.m.
  - ⊕ < 20 p.p.m.

- COPPER VALUES**
- ⊕ + 82 p.p.m. (Threshold +)
  - ⊕ 47 to 82 p.p.m.
  - ⊕ 10 to 47 p.p.m.
  - ⊕ < 10 p.p.m.



1155  
 PLATE V 72-869  
 760061

AUSTRALIA AND NEW ZEALAND  
 EXPLORATION COMPANY

**MAP SHOWING  
 ANALYTICAL VALUES  
 OF GEOCHEMICAL SAMPLES  
 N. W. TASMANIA  
 Sheet D**

Prepared by: N. R. Kinnane	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing N <sup>o</sup> 09/72	Report N <sup>o</sup> 01/72
	Lib. N <sup>o</sup> A-3

- CHROME VALUES**
- ⊕ + 19000 p.p.m. (Threshold)
  - ⊕ 3300 to 19000 p.p.m.
  - ⊕ 1000 to 3300 p.p.m.
  - ⊕ < 1000 p.p.m.

- ZINC VALUES**
- ⊕ + 640 p.p.m. (Threshold)
  - ⊕ 450 to 640 p.p.m.
  - ⊕ 160 to 450 p.p.m.
  - ⊕ 72 to 160 p.p.m.
  - ⊕ 20 to 72 p.p.m.
  - ⊕ < 20 p.p.m.

- TUNGSTEN VALUES**
- ⊕ + 100 p.p.m.
  - ⊕ 30 to 100 p.p.m.
  - ⊕ 14 to 30 p.p.m.
  - ⊕ 2 to 13 p.p.m.
  - ⊕ < 2 p.p.m.

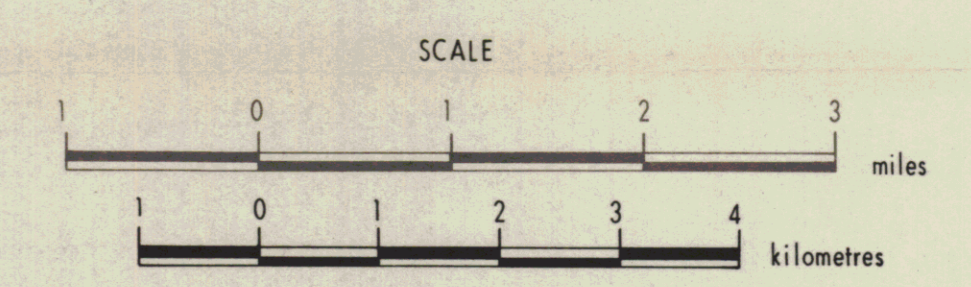
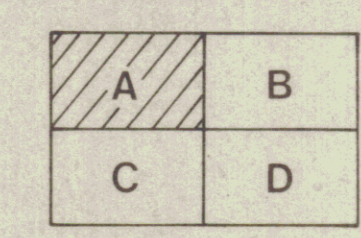
- MOLYBDENUM VALUES**
- ⊕ 10 p.p.m.
  - ⊕ 5 to 9 p.p.m.
  - ⊕ 2 p.p.m.
  - ⊕ < 2 p.p.m.

- LEAD VALUES**
- ⊕ + 58 p.p.m. (Threshold)
  - 28 to 58 p.p.m.
  - 20 to 28 p.p.m.
  - < 20 p.p.m.
- COPPER VALUES**
- ⊕ + 82 p.p.m. (Threshold+)
  - 47 to 82 p.p.m.
  - 10 to 47 p.p.m.
  - < 10 p.p.m.

- TIN VALUES**
- + 2700 p.p.m. (Threshold 1)
  - 1200 to 2700 p.p.m.
  - 530 to 1200 p.p.m. (Threshold 2+)
  - 75 to 530 p.p.m.
  - 20 to 75 p.p.m.
  - < 20 p.p.m.



SHEET LOCALITY DIAGRAM



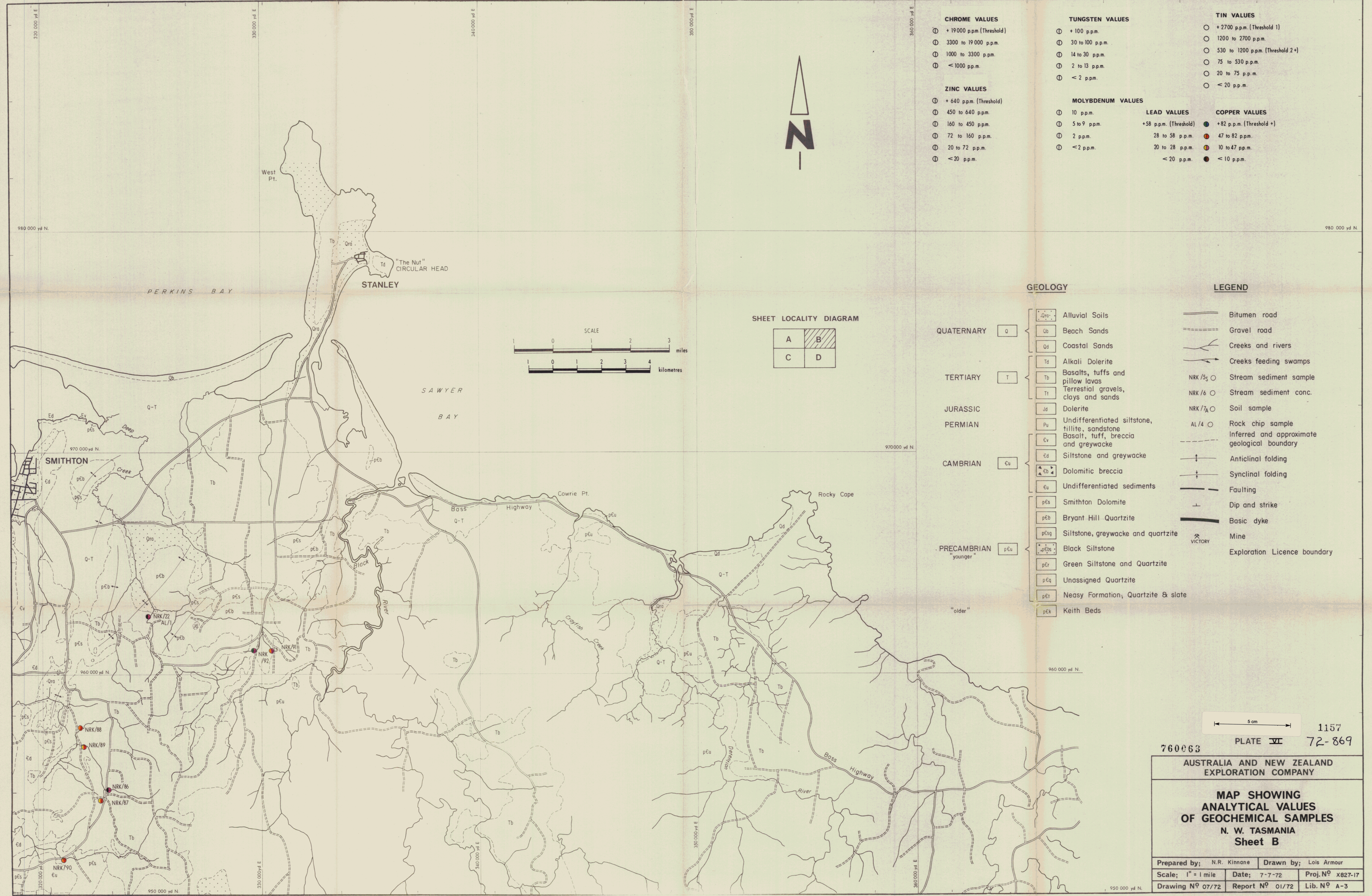
1156

76062 PLATE VI 72-869

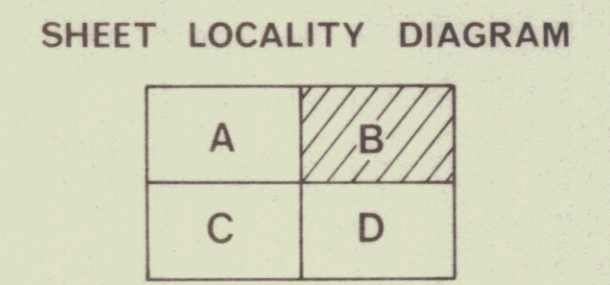
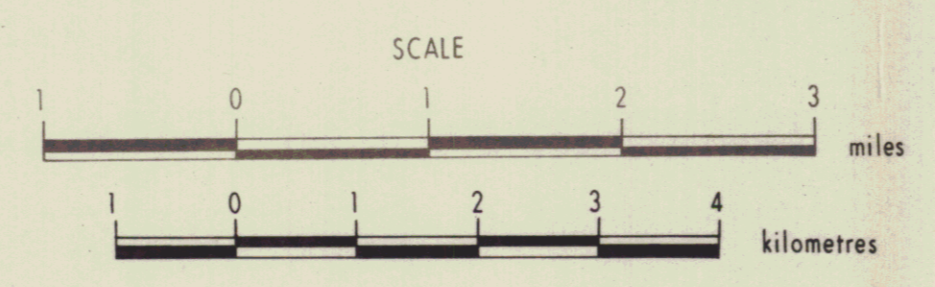
AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY

**MAP SHOWING ANALYTICAL VALUES OF GEOCHEMICAL SAMPLES N. W. TASMANIA Sheet A**

Prepared by: N. R. Kinnane	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing No: 06/72	Report No: 01/72
	Proj. No: x827-17
	Lib. No: A-3



CHROME VALUES	TUNGSTEN VALUES	TIN VALUES
⊖ + 19000 p.p.m. (Threshold)	⊖ + 100 p.p.m.	○ + 2700 p.p.m. (Threshold 1)
⊖ 3300 to 19000 p.p.m.	⊖ 30 to 100 p.p.m.	○ 1200 to 2700 p.p.m.
⊖ 1000 to 3300 p.p.m.	⊖ 14 to 30 p.p.m.	○ 530 to 1200 p.p.m. (Threshold 2+)
⊖ < 1000 p.p.m.	⊖ 2 to 13 p.p.m.	○ 75 to 530 p.p.m.
	⊖ < 2 p.p.m.	○ 20 to 75 p.p.m.
		○ < 20 p.p.m.
ZINC VALUES	MOLYBDENUM VALUES	LEAD VALUES
⊖ + 640 p.p.m. (Threshold)	⊖ 10 p.p.m.	⊖ + 58 p.p.m. (Threshold)
⊖ 450 to 640 p.p.m.	⊖ 5 to 9 p.p.m.	⊖ 28 to 58 p.p.m.
⊖ 160 to 450 p.p.m.	⊖ 2 p.p.m.	⊖ 20 to 28 p.p.m.
⊖ 72 to 160 p.p.m.	⊖ < 2 p.p.m.	⊖ < 20 p.p.m.
⊖ 20 to 72 p.p.m.		
⊖ < 20 p.p.m.		
COPPER VALUES		
⊖ + 82 p.p.m. (Threshold +)		
⊖ 47 to 82 p.p.m.		
⊖ 10 to 47 p.p.m.		
⊖ < 10 p.p.m.		



GEOLOGY		LEGEND			
QUATERNARY	Q	Qa	Alluvial Soils	—	Bitumen road
		Qb	Beach Sands	---	Gravel road
		Qd	Coastal Sands	~	Creeks and rivers
TERTIARY	T	Td	Alkali Dolerite	→	Creeks feeding swamps
		Tb	Basalts, tuffs and pillow lavas	○	NRK/5s Stream sediment sample
		Tt	Terrestrial gravels, clays and sands	○	NRK/6 Stream sediment conc.
JURASSIC	J	Jd	Dolerite	○	NRK/7a Soil sample
PERMIAN	P	Pu	Undifferentiated siltstone, tillite, sandstone	○	AL/4 Rock chip sample
		Pv	Basalt, tuff, breccia and greywacke	- - -	Inferred and approximate geological boundary
CAMBRIAN	C	Cd	Siltstone and greywacke	↑	Anticlinal folding
		Cb	Dolomitic breccia	↓	Synclinal folding
		Cu	Undifferentiated sediments	—	Faulting
		pCs	Smithton Dolomite	+	Dip and strike
		pEb	Bryant Hill Quartzite	—	Basic dyke
		pCsq	Siltstone, greywacke and quartzite	⊗	Mine
PRECAMBRIAN	Pc	pE	Black Siltstone	⊗	VICTORY
"younger"		pCr	Green Siltstone and Quartzite	—	Exploration Licence boundary
		pCq	Unassigned Quartzite		
		pE1	Neasy Formation, Quartzite & slate		
"older"		pE2	Keith Beds		

5 cm

1157  
PLATE VI 72-869

760063

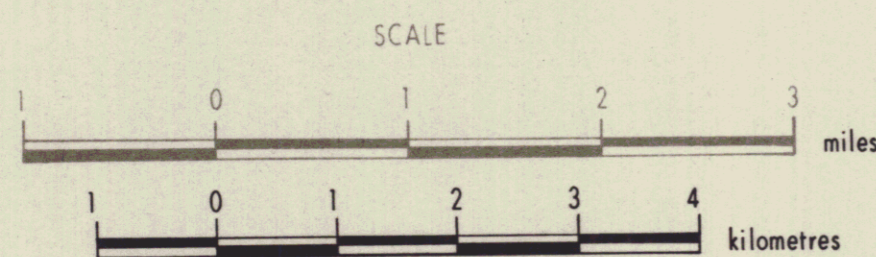
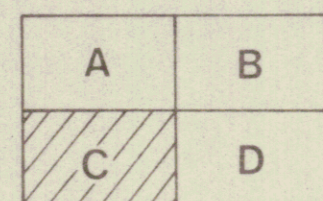
AUSTRALIA AND NEW ZEALAND  
EXPLORATION COMPANY

MAP SHOWING  
ANALYTICAL VALUES  
OF GEOCHEMICAL SAMPLES  
N. W. TASMANIA  
Sheet B

Prepared by: N.R. Kinnane	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing N <sup>o</sup> 07/72	Report N <sup>o</sup> 01/72
	Lib. N <sup>o</sup> A-3



SHEET LOCALITY DIAGRAM



- CHROME VALUES**
- ⊙ + 19000 p.p.m. (Threshold)
  - ⊙ 3300 to 19000 p.p.m.
  - ⊙ 1000 to 3300 p.p.m.
  - ⊙ <1000 p.p.m.
- ZINC VALUES**
- ⊙ + 640 p.p.m. (Threshold)
  - ⊙ 450 to 640 p.p.m.
  - ⊙ 160 to 450 p.p.m.
  - ⊙ 72 to 160 p.p.m.
  - ⊙ 20 to 72 p.p.m.
  - ⊙ <20 p.p.m.

- TUNGSTEN VALUES**
- ⊙ + 100 p.p.m.
  - ⊙ 30 to 100 p.p.m.
  - ⊙ 14 to 30 p.p.m.
  - ⊙ 2 to 13 p.p.m.
  - ⊙ <2 p.p.m.

- TIN VALUES**
- + 2700 p.p.m. (Threshold 1)
  - 1200 to 2700 p.p.m.
  - 530 to 1200 p.p.m. (Threshold 2 +)
  - 75 to 530 p.p.m.
  - 20 to 75 p.p.m.
  - <20 p.p.m.

- LEAD VALUES**
- ⊙ + 58 p.p.m. (Threshold)
  - ⊙ 28 to 58 p.p.m.
  - ⊙ 20 to 28 p.p.m.
  - ⊙ <20 p.p.m.

- COPPER VALUES**
- ⊙ + 82 p.p.m. (Threshold +)
  - ⊙ 47 to 82 p.p.m.
  - ⊙ 10 to 47 p.p.m.
  - ⊙ <10 p.p.m.

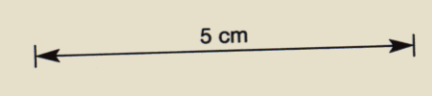
- MOLYBDENUM VALUES**
- ⊙ 10 p.p.m.
  - ⊙ 5 to 9 p.p.m.
  - ⊙ 2 p.p.m.
  - ⊙ <2 p.p.m.

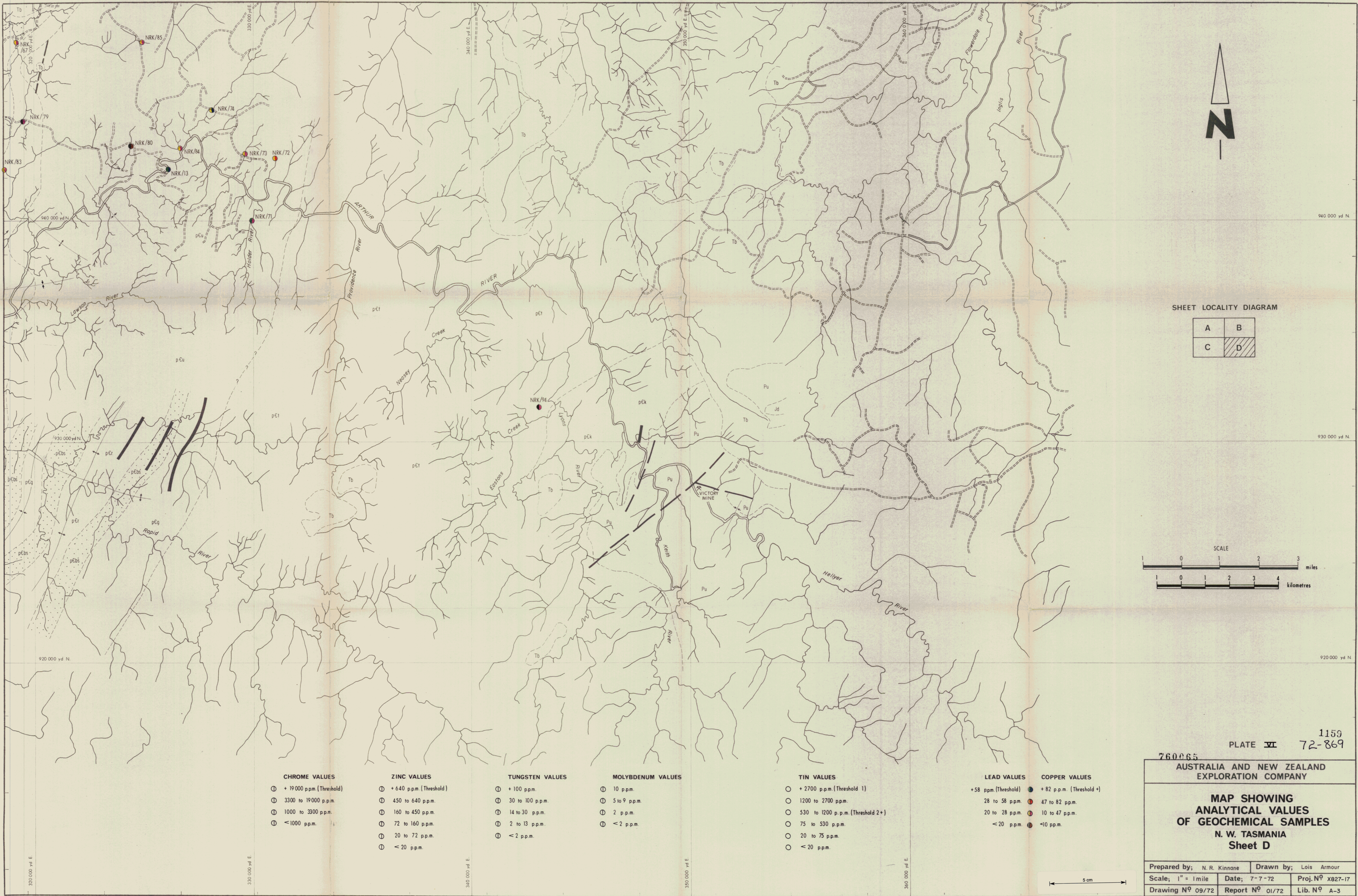
1158  
 PLATE VI 72-869  
 760664

AUSTRALIA AND NEW ZEALAND  
 EXPLORATION COMPANY

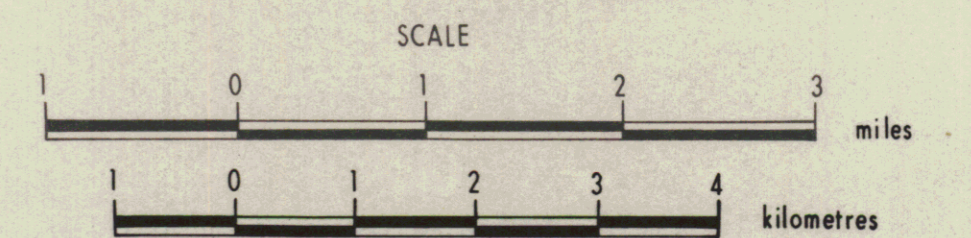
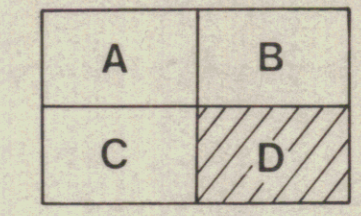
**MAP SHOWING  
 ANALYTICAL VALUES  
 OF GEOCHEMICAL SAMPLES  
 N. W. TASMANIA  
 Sheet C**

Prepared by: N. R. Kinnane    Drawn by: Lois Armour  
 Scale: 1" = 1 mile    Date: 7-7-72    Proj. N<sup>o</sup> X827-17  
 Drawing N<sup>o</sup> 08/72    Report N<sup>o</sup> 01/72    Lib. N<sup>o</sup> A-3





SHEET LOCALITY DIAGRAM



- CHROME VALUES**
- ⊕ + 19 000 p.p.m. (Threshold)
  - ⊕ 3300 to 19 000 p.p.m.
  - ⊕ 1000 to 3300 p.p.m.
  - ⊕ < 1000 p.p.m.

- ZINC VALUES**
- ⊕ + 640 p.p.m. (Threshold)
  - ⊕ 450 to 640 p.p.m.
  - ⊕ 160 to 450 p.p.m.
  - ⊕ 72 to 160 p.p.m.
  - ⊕ 20 to 72 p.p.m.
  - ⊕ < 20 p.p.m.

- TUNGSTEN VALUES**
- ⊕ + 100 p.p.m.
  - ⊕ 30 to 100 p.p.m.
  - ⊕ 14 to 30 p.p.m.
  - ⊕ 2 to 13 p.p.m.
  - ⊕ < 2 p.p.m.

- MOLYBDENUM VALUES**
- ⊕ 10 p.p.m.
  - ⊕ 5 to 9 p.p.m.
  - ⊕ 2 p.p.m.
  - ⊕ < 2 p.p.m.

- TIN VALUES**
- + 2700 p.p.m. (Threshold 1)
  - 1200 to 2700 p.p.m.
  - 530 to 1200 p.p.m. (Threshold 2+)
  - 75 to 530 p.p.m.
  - 20 to 75 p.p.m.
  - < 20 p.p.m.

- LEAD VALUES**
- + 58 p.p.m. (Threshold)
  - 28 to 58 p.p.m.
  - 20 to 28 p.p.m.
  - < 20 p.p.m.

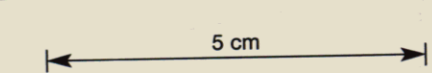
- COPPER VALUES**
- + 82 p.p.m. (Threshold +)
  - 47 to 82 p.p.m.
  - 10 to 47 p.p.m.
  - < 10 p.p.m.

1159  
 PLATE VI 72-869  
 760065

AUSTRALIA AND NEW ZEALAND  
 EXPLORATION COMPANY

**MAP SHOWING  
 ANALYTICAL VALUES  
 OF GEOCHEMICAL SAMPLES  
 N. W. TASMANIA  
 Sheet D**

Prepared by; N. R. Kinnane	Drawn by; Lois Armour
Scale; 1" = 1 mile	Date; 7-7-72
Drawing N <sup>o</sup> 09/72	Proj. N <sup>o</sup> X827-17
Report N <sup>o</sup> 01/72	Lib. N <sup>o</sup> A-3



- CHROME VALUES**
- ① + 19000 p.p.m. (Threshold)
  - ② 3300 to 19000 p.p.m.
  - ③ 1000 to 3300 p.p.m.
  - ④ < 1000 p.p.m.

- ZINC VALUES**
- ① + 640 p.p.m. (Threshold)
  - ② 450 to 640 p.p.m.
  - ③ 160 to 450 p.p.m.
  - ④ 72 to 160 p.p.m.
  - ⑤ 20 to 72 p.p.m.
  - ⑥ < 20 p.p.m.

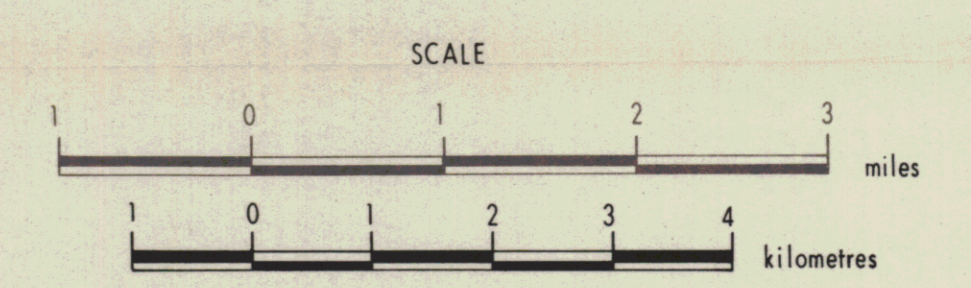
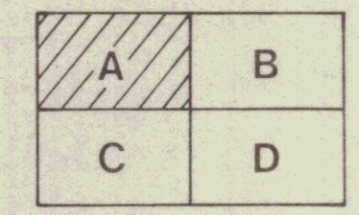
- TUNGSTEN VALUES**
- ① + 100 p.p.m.
  - ② 30 to 100 p.p.m.
  - ③ 14 to 30 p.p.m.
  - ④ 2 to 13 p.p.m.
  - ⑤ < 2 p.p.m.

- MOLYBDENUM VALUES**
- ① 10 p.p.m.
  - ② 5 to 9 p.p.m.
  - ③ 2 p.p.m.
  - ④ < 2 p.p.m.

- LEAD VALUES**
- ① + 58 p.p.m. (Threshold)
  - ② 28 to 58 p.p.m.
  - ③ 20 to 28 p.p.m.
  - ④ < 20 p.p.m.
- COPPER VALUES**
- ① + 82 p.p.m. (Threshold +)
  - ② 47 to 82 p.p.m.
  - ③ 10 to 47 p.p.m.
  - ④ < 10 p.p.m.

- TIN VALUES**
- ① + 2700 p.p.m. (Threshold 1)
  - ② 1200 to 2700 p.p.m.
  - ③ 530 to 1200 p.p.m. (Threshold 2+)
  - ④ 75 to 530 p.p.m.
  - ⑤ 20 to 75 p.p.m.
  - ⑥ < 20 p.p.m.

SHEET LOCALITY DIAGRAM



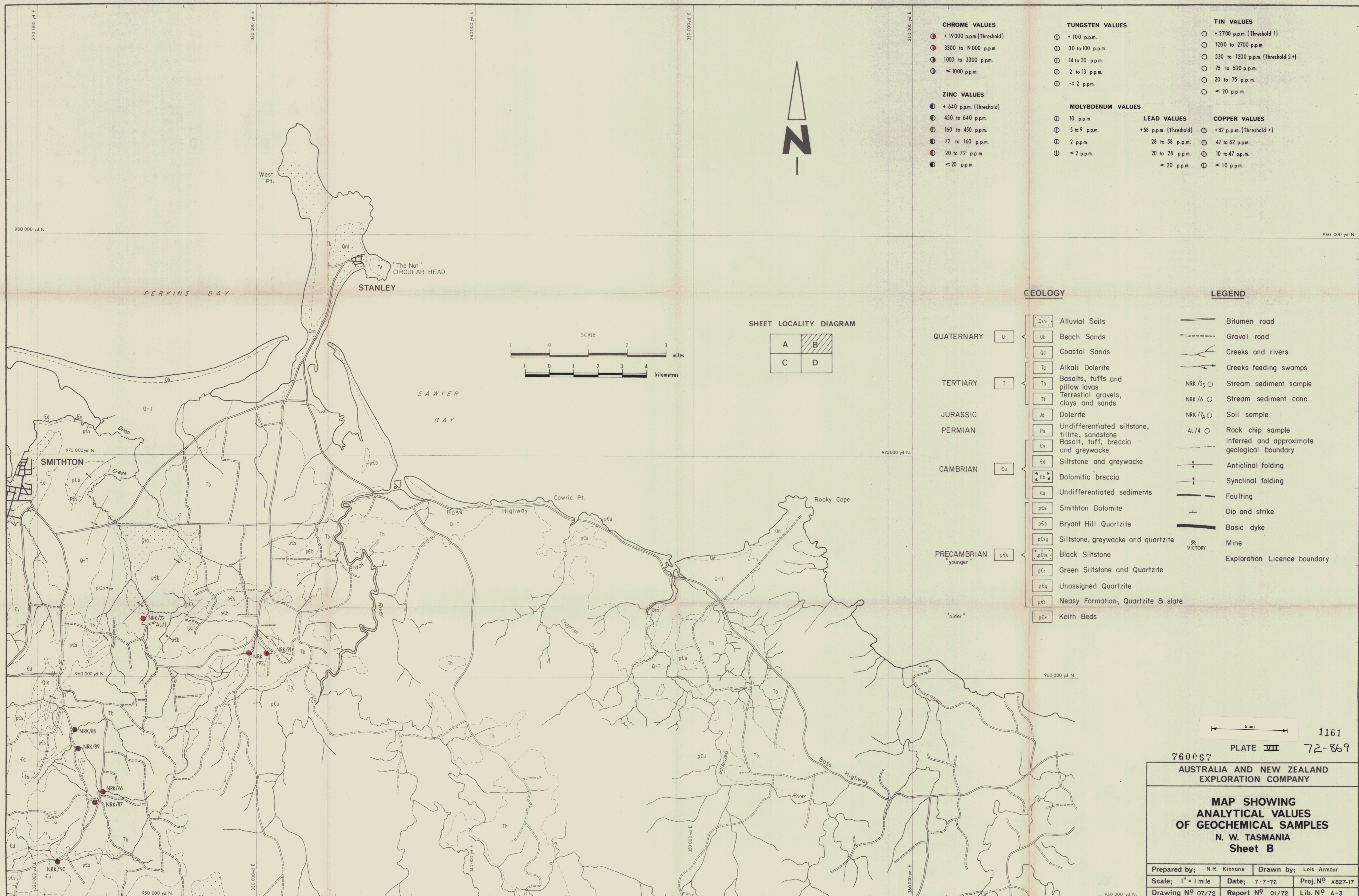
5 cm 1160

PLATE VII 72-869  
760066  
AUSTRALIA AND NEW ZEALAND  
EXPLORATION COMPANY

**MAP SHOWING  
ANALYTICAL VALUES  
OF GEOCHEMICAL SAMPLES  
N. W. TASMANIA  
Sheet A**

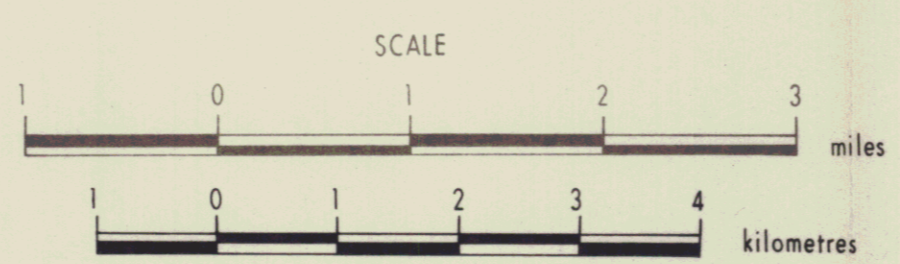
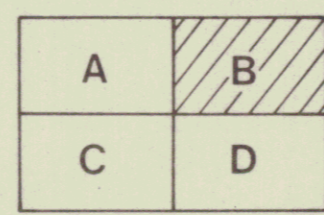
Prepared by: N. R. Kinnane	Drawn by: Lois Armour
Scale: 1" = 1 mile	Date: 7-7-72
Drawing N <sup>o</sup> 06/72	Proj. N <sup>o</sup> X827-17
Report N <sup>o</sup> 01/72	Lib. N <sup>o</sup> A-3





CHROME VALUES	TUNGSTEN VALUES	TIN VALUES
① + 19000 p.p.m. (Threshold)	① + 100 p.p.m.	○ + 2700 p.p.m. (Threshold 1)
② 3300 to 19000 p.p.m.	② 30 to 100 p.p.m.	○ 1200 to 2700 p.p.m.
③ 1000 to 3300 p.p.m.	③ 14 to 30 p.p.m.	○ 530 to 1200 p.p.m. (Threshold 2+)
④ < 1000 p.p.m.	④ 2 to 13 p.p.m.	○ 75 to 530 p.p.m.
	⑤ < 2 p.p.m.	○ 20 to 75 p.p.m.
		○ < 20 p.p.m.
ZINC VALUES	MOLYBDENUM VALUES	LEAD VALUES
① + 640 p.p.m. (Threshold)	① 10 p.p.m.	+58 p.p.m. (Threshold)
② 450 to 640 p.p.m.	② 5 to 9 p.p.m.	28 to 58 p.p.m.
③ 160 to 450 p.p.m.	③ 2 p.p.m.	20 to 28 p.p.m.
④ 72 to 160 p.p.m.	④ < 2 p.p.m.	< 20 p.p.m.
⑤ 20 to 72 p.p.m.		
⑥ < 20 p.p.m.		
COPPER VALUES		
① + 82 p.p.m. (Threshold +)		
② 47 to 82 p.p.m.		
③ 10 to 47 p.p.m.		
④ < 10 p.p.m.		

SHEET LOCALITY DIAGRAM



GEOLOGY

LEGEND

QUATERNARY	Q	Qa	Alluvial Soils	Bitumen road
		Qb	Beach Sands	Gravel road
		Qd	Coastal Sands	Creeks and rivers
		Ta	Alkali Dolerite	Creeks feeding swamps
TERTIARY	T	Tb	Basalts, tuffs and pillow lavas	NRK/55 ○ Stream sediment sample
		Tt	Terrestrial gravels, clays and sands	NRK/6 ○ Stream sediment conc.
JURASSIC	J	Jd	Dolerite	NRK/7a ○ Soil sample
PERMIAN	P	Pu	Undifferentiated siltstone, fillite, sandstone	AL/4 ○ Rock chip sample
		Ev	Basalt, tuff, breccia and greywacke	Inferred and approximate geological boundary
CAMBRIAN	C	Ed	Siltstone and greywacke	Anticlinal folding
		Cb	Dolomitic breccia	Synclinal folding
		Cu	Undifferentiated sediments	Faulting
PRECAMBRIAN "younger"	pCu	pEs	Smithton Dolomite	Dip and strike
		pEb	Bryant Hill Quartzite	Basic dyke
		pCsq	Siltstone, greywacke and quartzite	Mine
		pCs	Black Siltstone	Exploration Licence boundary
		pCr	Green Siltstone and Quartzite	
		pCq	Unassigned Quartzite	
		pCr	Neasy Formation; Quartzite & slate	
		pCk	Keith Beds	
			"older"	

5 cm

1161  
72-869

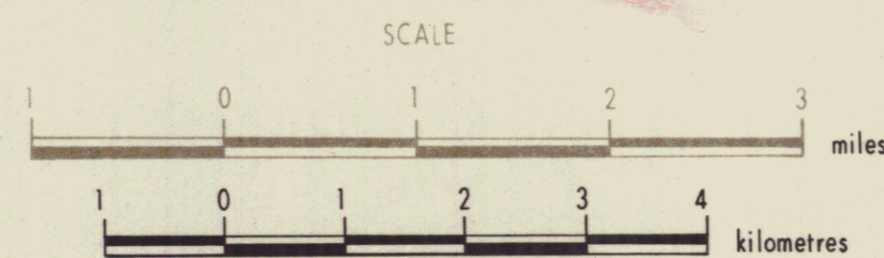
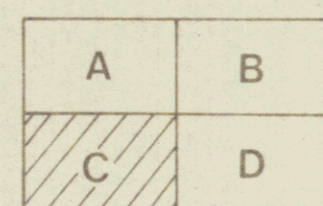
760067  
AUSTRALIA AND NEW ZEALAND  
EXPLORATION COMPANY

MAP SHOWING  
ANALYTICAL VALUES  
OF GEOCHEMICAL SAMPLES  
N. W. TASMANIA  
Sheet B

Prepared by:	N.R. Kinnane	Drawn by:	Lois Armour
Scale:	1" = 1 mile	Date:	7-7-72
Drawing N <sup>o</sup>	07/72	Proj. N <sup>o</sup>	X827-17
Report N <sup>o</sup>	01/72	Lib. N <sup>o</sup>	A-3



SHEET LOCALITY DIAGRAM



**CHROME VALUES**

- ① + 19000 p.p.m. (Threshold)
- ② 3300 to 19000 p.p.m.
- ③ 1000 to 3300 p.p.m.
- ④ < 1000 p.p.m.

**ZINC VALUES**

- ① + 640 p.p.m. (Threshold)
- ② 450 to 640 p.p.m.
- ③ 160 to 450 p.p.m.
- ④ 72 to 160 p.p.m.
- ⑤ 20 to 72 p.p.m.
- ⑥ < 20 p.p.m.

**TUNGSTEN VALUES**

- ① + 100 p.p.m.
- ② 30 to 100 p.p.m.
- ③ 14 to 30 p.p.m.
- ④ 2 to 13 p.p.m.
- ⑤ < 2 p.p.m.

**TIN VALUES**

- ① + 2700 p.p.m. (Threshold 1)
- ② 1200 to 2700 p.p.m.
- ③ 530 to 1200 p.p.m. (Threshold 2 +)
- ④ 75 to 530 p.p.m.
- ⑤ 20 to 75 p.p.m.
- ⑥ < 20 p.p.m.

**LEAD VALUES**

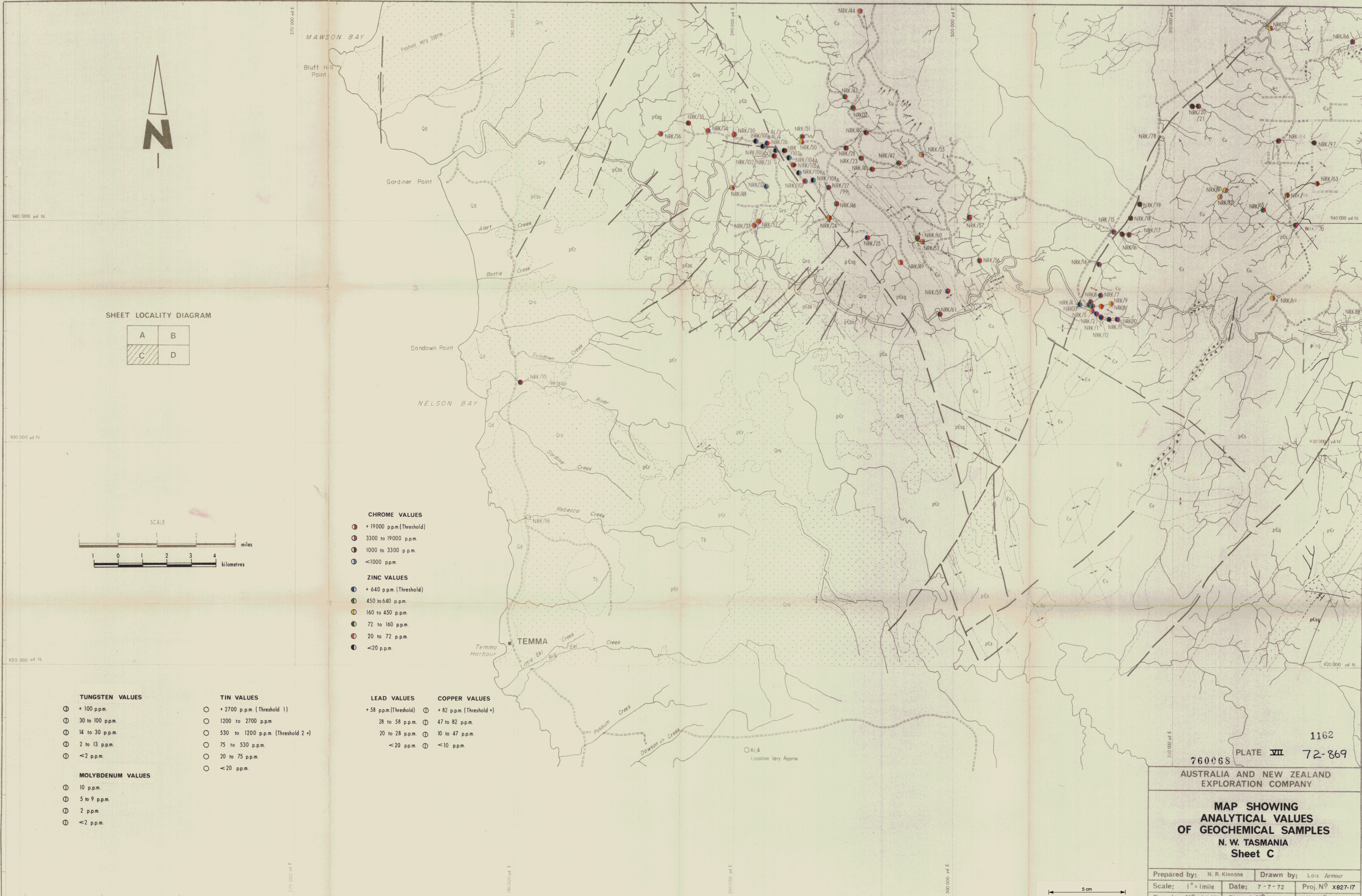
- ① + 58 p.p.m. (Threshold)
- ② 28 to 58 p.p.m.
- ③ 20 to 28 p.p.m.
- ④ < 20 p.p.m.

**COPPER VALUES**

- ① + 82 p.p.m. (Threshold +)
- ② 47 to 82 p.p.m.
- ③ 10 to 47 p.p.m.
- ④ < 10 p.p.m.

**MOLYBDENUM VALUES**

- ① 10 p.p.m.
- ② 5 to 9 p.p.m.
- ③ 2 p.p.m.
- ④ < 2 p.p.m.

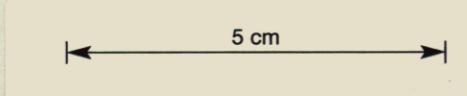


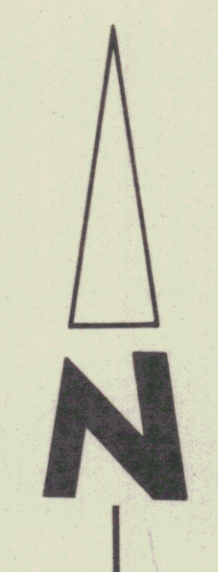
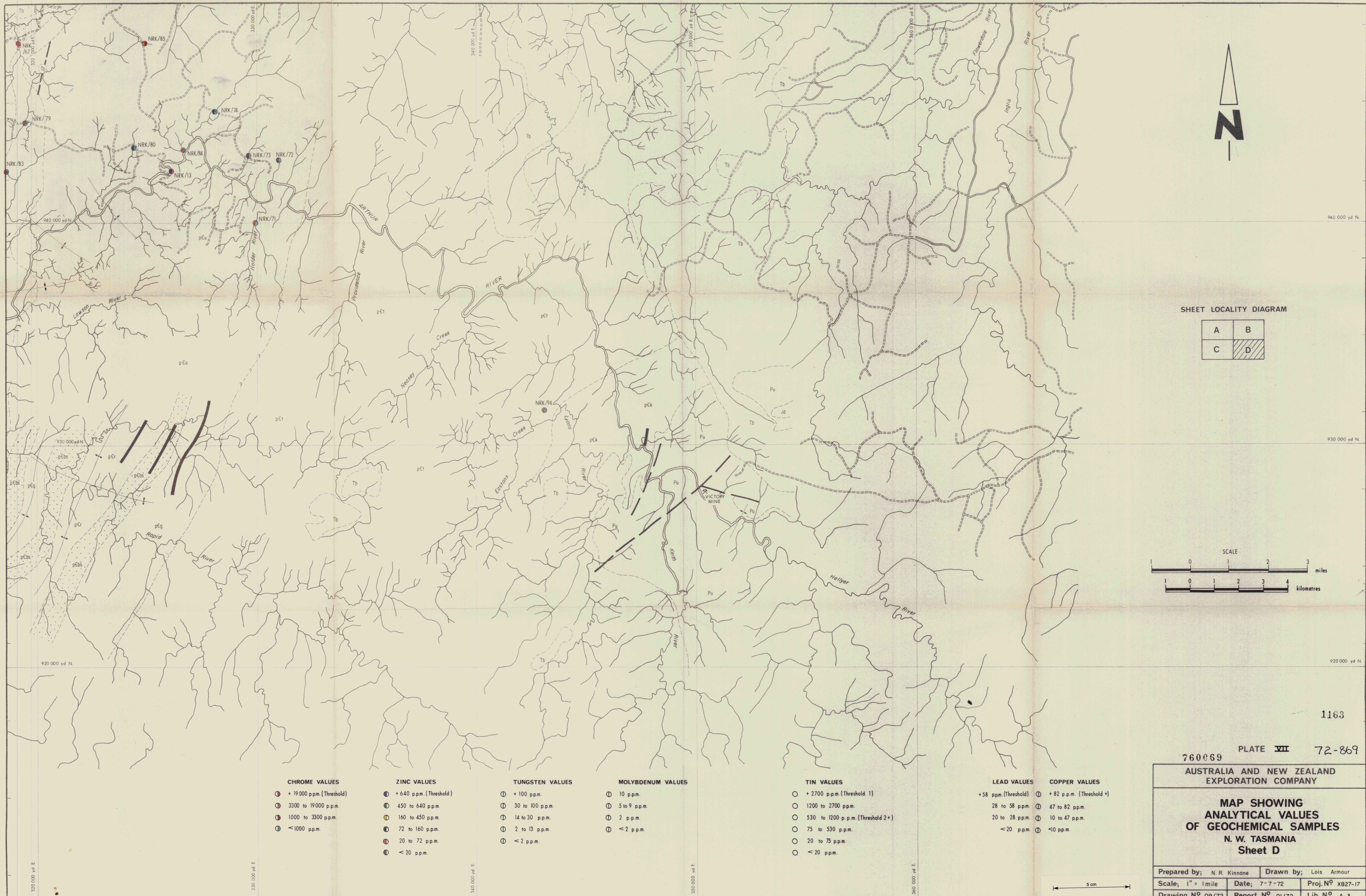
1162  
76068 PLATE VII 72-869

AUSTRALIA AND NEW ZEALAND  
EXPLORATION COMPANY

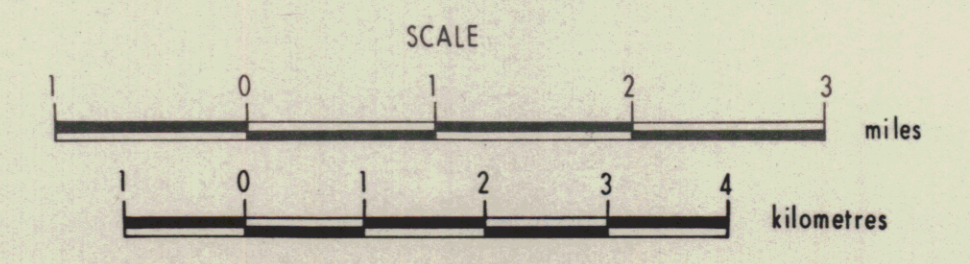
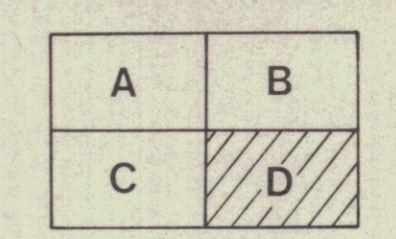
**MAP SHOWING  
ANALYTICAL VALUES  
OF GEOCHEMICAL SAMPLES  
N. W. TASMANIA  
Sheet C**

Prepared by: N. R. Kinnane    Drawn by: Lois Armour  
Scale: 1" = 1 mile    Date: 7-7-72    Proj. N<sup>o</sup> X827-17  
Drawing N<sup>o</sup> 08/72    Report N<sup>o</sup> 01/72    Lib. N<sup>o</sup> A-3





SHEET LOCALITY DIAGRAM



- CHROME VALUES**
- + 19 000 p.p.m. (Threshold)
  - 3300 to 19 000 p.p.m.
  - 1000 to 3300 p.p.m.
  - < 1000 p.p.m.

- ZINC VALUES**
- + 640 p.p.m. (Threshold)
  - 450 to 640 p.p.m.
  - 160 to 450 p.p.m.
  - 72 to 160 p.p.m.
  - 20 to 72 p.p.m.
  - < 20 p.p.m.

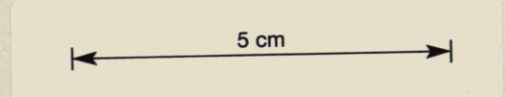
- TUNGSTEN VALUES**
- + 100 p.p.m.
  - 30 to 100 p.p.m.
  - 14 to 30 p.p.m.
  - 2 to 13 p.p.m.
  - < 2 p.p.m.

- MOLYBDENUM VALUES**
- 10 p.p.m.
  - 5 to 9 p.p.m.
  - 2 p.p.m.
  - < 2 p.p.m.

- TIN VALUES**
- + 2700 p.p.m. (Threshold 1)
  - 1200 to 2700 p.p.m.
  - 530 to 1200 p.p.m. (Threshold 2+)
  - 75 to 530 p.p.m.
  - 20 to 75 p.p.m.
  - < 20 p.p.m.

- LEAD VALUES**
- + 58 p.p.m. (Threshold)
  - 28 to 58 p.p.m.
  - 20 to 28 p.p.m.
  - < 20 p.p.m.

- COPPER VALUES**
- + 82 p.p.m. (Threshold +)
  - 47 to 82 p.p.m.
  - 10 to 47 p.p.m.
  - < 10 p.p.m.



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76069 PLATE VII 72-869

<b>AUSTRALIA AND NEW ZEALAND EXPLORATION COMPANY</b>		
<b>MAP SHOWING ANALYTICAL VALUES OF GEOCHEMICAL SAMPLES N. W. TASMANIA Sheet D</b>		
Prepared by; N. R. Kinnane	Drawn by; Lois Armour	
Scale; 1" = 1 mile	Date; 7-7-72	Proj. N <sup>o</sup> X827-17
Drawing N <sup>o</sup> 09/72	Report N <sup>o</sup> 01/72	Lib. N <sup>o</sup> A-3