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LEFROY GOLD MINES PTY LTD

(A subsidiary of Central Kalgoorlie Gold Mines NL)

MICROFILMED
FICHE No 013703-04

ANNUAL REPORT ON GOLD EXPLORATION OVER

EL 21/94 - BELL BAY

AND

EL 22/94 - PIPERS RIVER

NE TASMANIA

FOR PERIOD

OCTOBER 1994

TO

OCTOBER 1995

DATE	
22 SEP 1995	
EL 21/94	FOLIO 31
EL 22/94	FOLIO 37

95-3774

**ANNUAL REPORT ELs 21/94 BELL BAY
& 22/94 PIPERS RIVER 1994-95 -
KEELE R A- LEFROY GOLD MINES**

Perth Office
George Town Office
Tasmania Development & Resources

Author : Richard A. Keele
16 September 1995

AMG REFERENCE POINTS ADDED

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1. TENEMENT INFORMATION

Pipers River (Licence No. 22/94)

The outline of EL, with exclusion zones, is shown in Figure 1.

The area contains the following Land Tenure: Private Property, Crown Land State Forest, Lefroy RAP - State Forest.

The area contains the Lulworth Area; Australian Heritage Commission Area, Registered Entry.

Minimum Expenditure during 1st year: \$40,400.00

Bell Bay (Licence No. 21/94)

The outline of the EL, with exclusion zones, is shown in Figure 2.

The area comprises the following Land Tenure: Private Property, State Forest -Multiple Use Forest Land, Crown Land and Den Ranges RAP - State Forest.

The area excludes:- 0.8 km² Crown Reserves, 2 km² Curries River Reservoir, 11 km² Tippogoree Hills Rap, 481 ha Mining Leases and 607 ha Four Mile Creek Wildlife Sanctuary.

Minimum Expenditure in the 1st year: 43,800.00

2. REASONS FOR EXPLORATION

The taking up of the two ELs followed the NETGOLD initiative in 1993/94 which was funded by the State Government. The company perceived a rare opportunity to take up ground in a gold-bearing province that had had no systematic modern exploration techniques applied to it. The main targets for exploration are:

- (1) extensions to known deposits
- (2) low-grade zones around known deposits that would be suitable for open cut mining and
- (3) grass roots discoveries in covered or poorly exposed regions.

The Mathinna Group, like other Palaeozoic beds elsewhere around the world, host high-grade gold veins that supported highly profitable operations over several decades in the last century (eg., Lefroy from 1869-1905; Beaconsfield 1874-1914). The Mathinna Terrane is equivalent in age and type to the Melbourne Zone in Victoria which hosts several large deposits up to 1m oz's (eg. Woods Point, Walhalla, >30t Au.). Recent advances in the understanding of the genesis and controls on mesothermal gold deposits, especially in Australia, has suggested that new techniques and ideas could be profitably applied to this class of deposit.

3. SUMMARY OF EXPLORATION

The following exploration activities were conducted during the year:

1. Regional reconnaissance BLEG stream sediment survey
2. Processing and interpretation of aeromagnetic data.
3. Landsat imaging and interpretation.
4. Reconnaissance geological investigations.

4. PREVIOUS EXPLORATION

The history and development of the goldfields at Back Creek and Lefroy are summarised in reports by Groves (1966), Gee and Legge (1969), Marshal (1969); a more recent summary is given by McClenaghan (1994). Details are given in an early report by Broadhurst (1935) which relies heavily on the work of Thureau (1882a & b) and Montgomery (1894) from the last century. Morris-Nunn and Tassell (1984) considered the mines in terms of their industrial heritage values, quoting in depth from these early sources.

The author is not aware of any modern exploration of any significance that has been carried out for gold over the two EL's.

5. DETAILS OF EXPLORATION ACTIVITY

5.1. STREAM SEDIMENT SURVEY

A reconnaissance stream sediment survey was conducted over the Pipers River and Bell Bay EL's. The survey utilised the BLEG (bulk leach extractable gold) sampling technique to cover the drainage around the Lefroy and Back Creek goldfields. The main results from this survey - that covers both EL's - are reported below.

PIPERS RIVER

The main areas of anomalism are located in the SW corner of WEYMOUTH and NW corner of RETREAT adjacent to the Lefroy and Back Creek goldfields. Apart from these areas, the majority of the stream sediment samples in the Pipers River EL were not at all anomalous. In the large area of forest east of 509000E no sample came in over 2.8 ppb Au and the majority of samples were <0.1ppb. This is particularly so in the south of the EL. The following drainage samples are considered to be anomalous:

1. Blanket Creek Tributary Anomaly (No. 6868; 13.9ppb Au)
This is a medium sized area that drains the region of State Forest between Baker Tier and the Back Creek goldfields.

2. Baker Tier Anomaly (No. 6869; 28.3ppb Au)
This sample comes from a creek that drains off the Baker Tier east of the Lefroy goldfield. Although the sample is quite anomalous, the catchment area is small.
3. Spring Creek Anomaly (No. 6865; 120ppb Au)
This sample is taken from Spring Creek that drains directly off the Union, Sir John Franklin and other mines in the Back Creek goldfield.
4. Back Creek Anomaly (No. 6864; 54ppb Au)
This anomalous sample comes from part of Back Creek system that drains a large catchment due north of the Den Ranges.

BELL BAY

The main areas of stream sediment anomalism in the Bell Bay EL lie NW and SE of the Lefroy goldfield. The remaining areas are either not anomalous, eg., south and east of the Den Ranges, particularly east of 506000E; or not tested because of the presence of Jurassic dolerite and large areas of thick Quarternary sediment. The following drainage samples are considered anomalous:

1. Londonderry Creek Anomaly (No. 6813; 10.26 ppb Au)
This sample comes from a small catchment that drains the mineralised area south of Monarch Hill.
2. Fourteen Mile Creek Anomaly (No. 6809; 13.74 ppb Au)
The anomalous sample from this small catchment drains the area containing the *abandoned Native Industry mine*.
3. Den Creek Anomaly (No. 6803; 26.6 ppb Au)
This anomaly, which 1 km downstream has been diluted to 14 ppb, drains an area of old alluvial workings.
4. Fourteen Mile Creek Tributary Anomaly (No.6876; 9.00 ppb Au)
The possibly anomalous sample from this catchment drains the Den Ranges.
5. Back Creek Tributary Anomaly (No.6875; 8,60ppb Au)
This possibly anomalous sample, although located on the Pipers River EL, drains a small area SE of the Lefroy goldfield.

The area NW of the Lefroy goldfield did not show up in the survey as being anomalous; however, given that the catchment for one of the anomalies in the Lefroy EL (Curries River Anomaly) overlaps the Bell Bay EL, this area is considered anomalous. The relief in this region is subdued and the area is covered by sand and other recent deposit indicating that the initial reconnaissance programme will have to be followed up with further work.

5.2. AEROMAGNETICS

In addition to the aeromagnetic images produced by NETGOLD, Southern Geoscience Consultants Pty Ltd of 8 Kearns Crescent, Ardross W A 6153, have produced a series of high quality images of the Pipers River data at 1:250 000 scale. A list of these images is appended at the back of this report (Appendix 3). John Ashley has made a 'quick pass' interpretation of the magnetics at 1:25 000 scale, a reduction of which is reproduced at the back of the report at 1:50 000 scale.

The results show the following:

1. Distribution of Tertiary basalts

There were two major periods of basaltic volcanism in the region as shown by the normal and reversely polarised magnetic character of the flows. Normal polarised magnetic basalts (giving positive anomalies) occur in a belt along the eastern side of Pipers River, whilst the reverse polarised magnetic flows (giving negative anomalies) occur in the western half of Pipers River and Bell Bay. The basalts are linear and branching in character suggesting that the flows filled valleys and low points in the topography at the time of extrusion. Between 50000E and 50500E a N-S system of branching linear magnetic anomalies indicate that they flowed northward to Bass Strait. Others have distinctly linear edges suggesting that they were fault-controlled valleys (ie., grabens).

2. Magnetic character of the Mathinna Group sediments.

The NW to NNW-trending linear anomalies in the Mathinna Group are due to subtle difference in magnetic character that exist between individual beds in the Mathinna Group. These are principally due to lithological variations within the sediments, but it may also be due to faults paralleling the regional strike. J. Ashley's interpretation shows that the strongest magnetic character occurs towards the top of the Stoney Head Sandstone, ie., at the boundary with the overlying Turquoise Bluff Slate (this can be seen in Plan 5 as a major 'magnetic contact'). In contrast, the lower part of the Stoney Head Sandstone bed - the one that hosts the gold deposits at Lefroy - displays a much weaker magnetic character.

A major break in the magnetic character of the Mathinna Beds occurs in the southeast corner of Piper River EL. When projected to the NW this 'break' passes through the Back Creek gold deposit; it may correspond to the Turquoise Bluff Slate-Bellingham Formation boundary or it may be a major structure associated with the axis of the Piper River recumbent syncline.

3. Interpreted Structure

The many offsets on the magnetic linears are interpreted to be faults. These faults trend E-W, WNW-ESE and NNE-SSW; the two former sets show sinistral offsets, whereas the latter shows dextral offsets (see Plan 5). A pair of E-W linears coincide with the extensions of the Volunteer and Pinafore lode structures at Lefroy. The northern linear locally controls the edges of the basalt flows suggesting that this linear had been reactivated as a fault during Tertiary volcanism.

5.3. LANDSAT IMAGING

An interpretation of a Landsat image of the Bell Bay and Pipers River EL's has been produced by Peter Wilson and Associates of Perth, W. A at 1:100 000 scale (Plan 6). The bands included in this interpretation are 7,5 & 3. An accompanying scene, also at 1:100 000 scale, covers parts of the two EL's from Bell Bay to the upper reaches of Back Creek and from the Tippogoree Hills to the coast (Figure 2).

INTERPRETATION OF LANDSAT DATA

Peter Wilson has outlined in his interpretation a number of major faults, the most significant of which are: NW-trending structures that parallel to Tamar Graben (eg., on the eastern side of the Tippogoree Hills) and a number of N-S structures that are prevalent in the eastern half of Pipers River EL (Plan 6). These first order faults are accompanied by a number of second and third order structures, the most significant of which by far are: N-S, WNW-ESE & ENE-WSW faults and shear zones. Discrete fracture zones - often associated with spectral anomalies - have been identified between Baker Tier and Turquoise Bluff on Pipers River EL.

SPECTRAL ANOMALIES

Pipers River

A total of 7 spectral anomalies are located on Pipers River EL. Four of these are located in a region due east of Lefroy (eg., Baker Tier) and three are located close to or along the Turquoise Bluff Track that connects Lefroy and Back Creek. A circular feature is centred approximately at 5 454 000N, 502 000E, north of the Turquoise Bluff Track.

Bell Bay

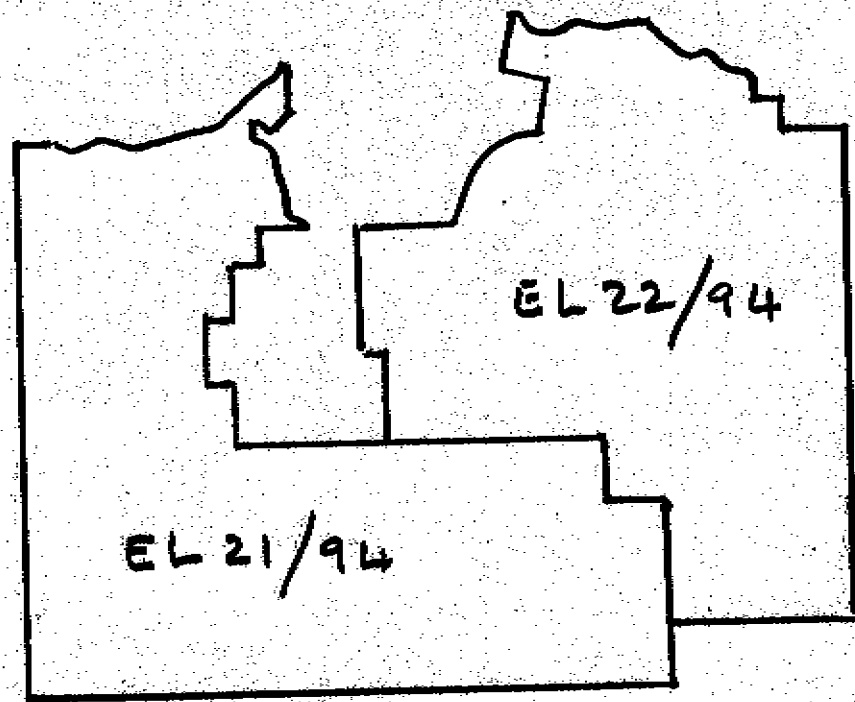
Two spectral anomalies are located respectively 1 km E and 2 km ESE of Monarch Hill (at the southern end of the Lefroy gold line). These two anomalies occur around an elliptical feature 1 km by 1.5 km that lies south of the Bridport Hwy and east of Orlando Creek. A third spectral anomaly lies 2.5 km due north of Curries River Dam, on the NW side of the Lefroy goldfield.

5.4. RECONNAISSANCE GEOLOGICAL MAPPING

An assessment of the structural and metamorphic setting of the Mathinna Group on the two EL's was commenced. The following preliminary results were obtained:

1. Structure/Tectonics.

The Pipers River recumbent fold appears not (along the Bridport Highway) to extend east of 510 000 mE. Whilst it is clear that the mineralised districts of Back Creek and Lefroy are contained within this tectonic unit, it is important to establish whether any relationship between the gold mineralisation and this structure exists.



LOCATION OF EL'S 21/94, 22/94

Lefroy Goldmines Pty Ltd. - NE Tasmania

Landsat TM 4/3/94 Bands 753

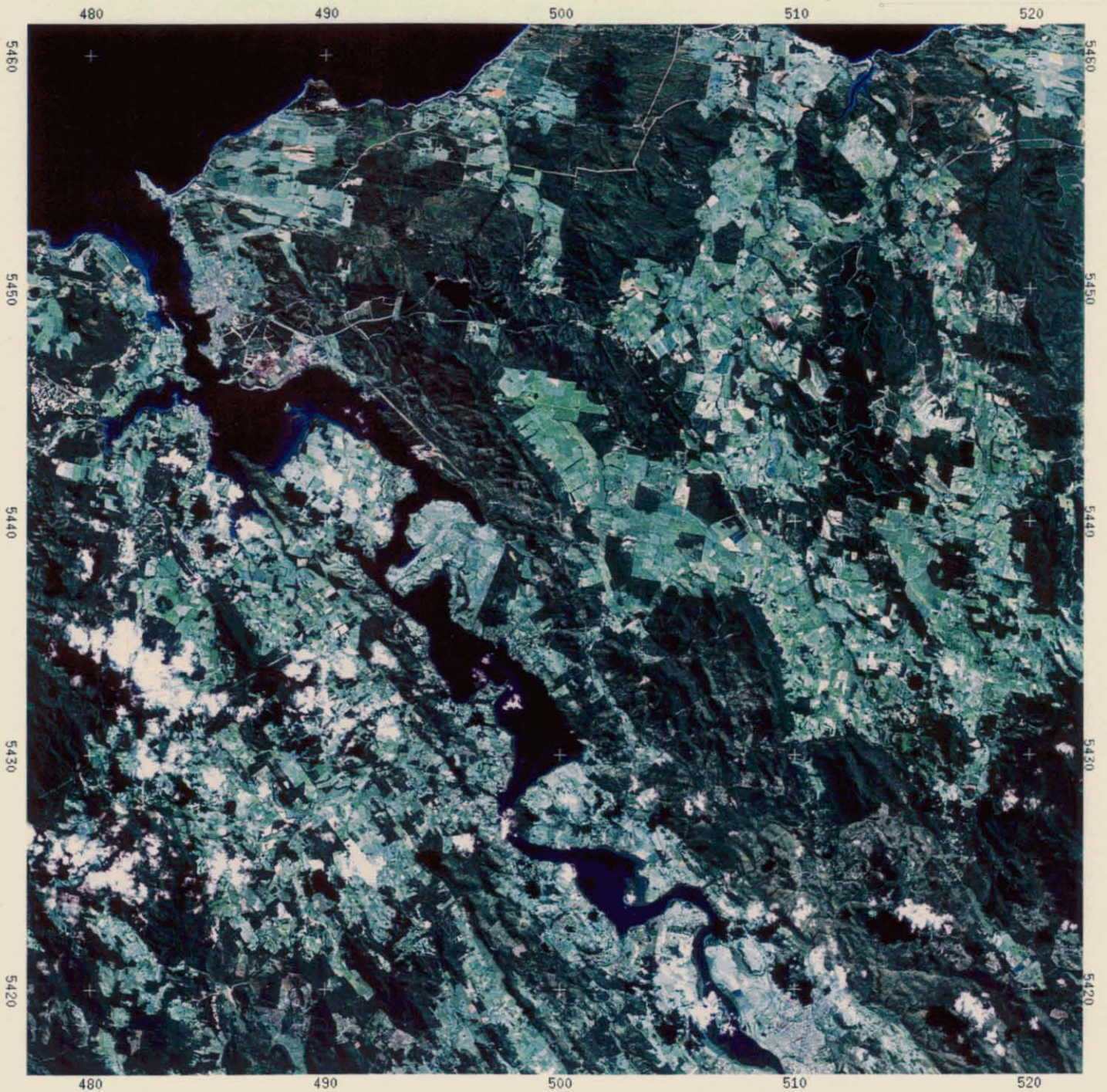
7

Produced by Peter Wilson & Associates P/L.

21-July-1995

R

SCALE 1:250,000



759009

Lefroy Goldmines Pty Ltd. - NE Tasmania

Landsat TM 4/3/94 Bands 753

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Produced by Peter Wilson & Associates P/L.

21-July-1995

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SCALE 1:250,000



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2. Metamorphic Grade.

Preliminary investigations indicate that there are differences in metamorphic grade across the region. These cannot be quantified at this stage but when investigated more thoroughly may prove to be a discriminator between mineralised and non-mineralised terrains.

6. CONCLUSIONS AND RECOMMENDATIONS

- 6.1. Exploration to date has shown that the stream sediment survey has been effective in outlining areas of known and potential gold mineralisation in the district. On both EL's, two strongly anomalous, six probably anomalous and two possibly anomalous catchments have been defined.
- 6.2. The aeromagnetic data has shown that there is sufficient magnetic character in the Mathinna Group to identify: (1) magnetic linears (or gradients) representing lithology and structure (e.g., faults), (2) 'magnetic contacts' within the stratigraphy, and (3) major breaks in magnetic character (i.e. terrane boundaries). Further interpretation of aeromagnetic data is recommended.
- 6.3. The Landsat imaging has defined a number of anomalous spectral zones, major & minor faults, shear zones and small-scale fracture zones (i.e., 3rd order structures). The latter, including dilational sites such as veins and reefs, are considered essential to the occurrence of gold mineralisation. Further work is recommended.
- 6.4. It is recommended that follow-up work be conducted over a number of anomalous catchment areas outlined by the stream sediment survey. Work in these areas would include: soil sampling, geological mapping, rock chip sampling, RAB drilling and RC drilling - if results warrant.
- 6.5. It is recommended that consideration be given to reducing the size of both leases as a result of the regional stream sediment programme. In the Pipers River EL, the catchments east of 509,000mE have low, or very low, gold levels in their stream catchments. This area is recommended for relinquishment.

The Bell Bay EL contains much ground that would never be seriously explored for gold, eg., Jurassic Dolerites of the Tippagoree Hills, very thick Tertiary/Quaternary sediments (underlain by Permian sediments) in the 14 Mile Creek catchment. These areas would form the basis for relinquishment of ground in this EL

7. PROPOSED EXPLORATION PROGRAMME FOR BOTH EL'S

Summary of programme:

Stream sediment survey	20 days
Soil sampling survey	40 days
Underground rock chip sampling	10 days
RAB drilling	1000m
Percussion (RC) drilling	500m
Analytical	1500 samples
Geological mapping	25days

The following programme is proposed for the year 1995/96:

1. STREAM SEDIMENT SAMPLING.

All anomalous catchments outlined in this report will be sampled at a density of one sample per 500m, or less, along the major streams. The following catchments are included:

Bell Bay

The Den Creek, Londonderry Creek, 14 Mile Creek, 14 Mile Creek Tributary (Glen Rd) anomalies will be followed up. The area NW of Lefroy will also be followed up with further detailed. This area is favourable because it lies along a NW structural trend that contains known gold mineralisation at Lefroy.

Pipers River

Blanket Creek and Baker Tier anomalies will be followed up. The exposed block of Mathinna Group in State Forest (5 km south of Weymouth) will also be followed up because many of the creeks on the eastern side of the range have become choked at their lower levels.

20 days

2. RECONNAISSANCE SOIL SAMPLING

Bell Bay

The region around the Native Industry group of mines will be sampled with reconnaissance soils, both north and south of the current Mining Lease. Sampling will be at 40 metre intervals.

5 days

3. DETAILED SOIL SAMPLING

Bell Bay

Monarch Hill, south of the Volunteer workings at Lefroy, will be sampled on a 200 m by 20 m grid. This area includes a number of small mines e.g., Monarch, Orlando and Londonderry. The grid will be an extension of the current AMG grid at Lefroy.

20 days

Pipers River

A small soil survey will be conducted around the Union and Sir John Franklin mines at Back Creek.

15 days

4. RAB DRILLINGBell Bay

To be determined

500m

Pipers River

The region between Lefroy and Back Creek along the Turquoise Bluff Track will be RAB drilled using available tracks. Holes will be drilled to test bedrock.

500m

5. PERCUSSION (RC) DRILLING

Where appropriate

500 m

6. ANALYTICAL

1500 samples

7. GEOLOGICAL MAPPING

Mapping will be conducted in the following areas:

Bell Bay

Back Creek

Regional

Pipers River

Monarch Hill

Regional

25 days

8. BIBLIOGRAPHY

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AMG REFERENCE POINTS ADDED

759014

EXCLUSIONS

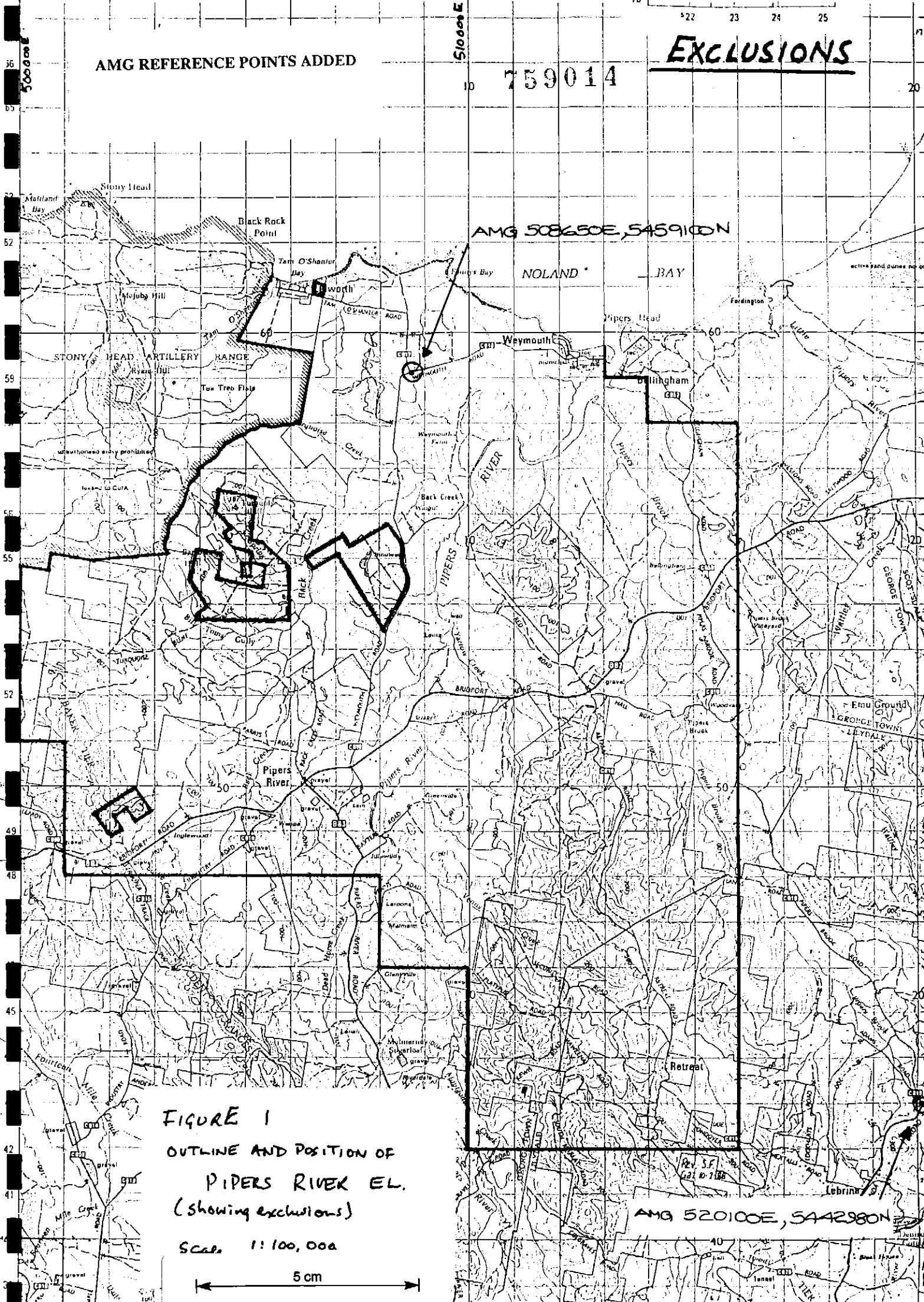
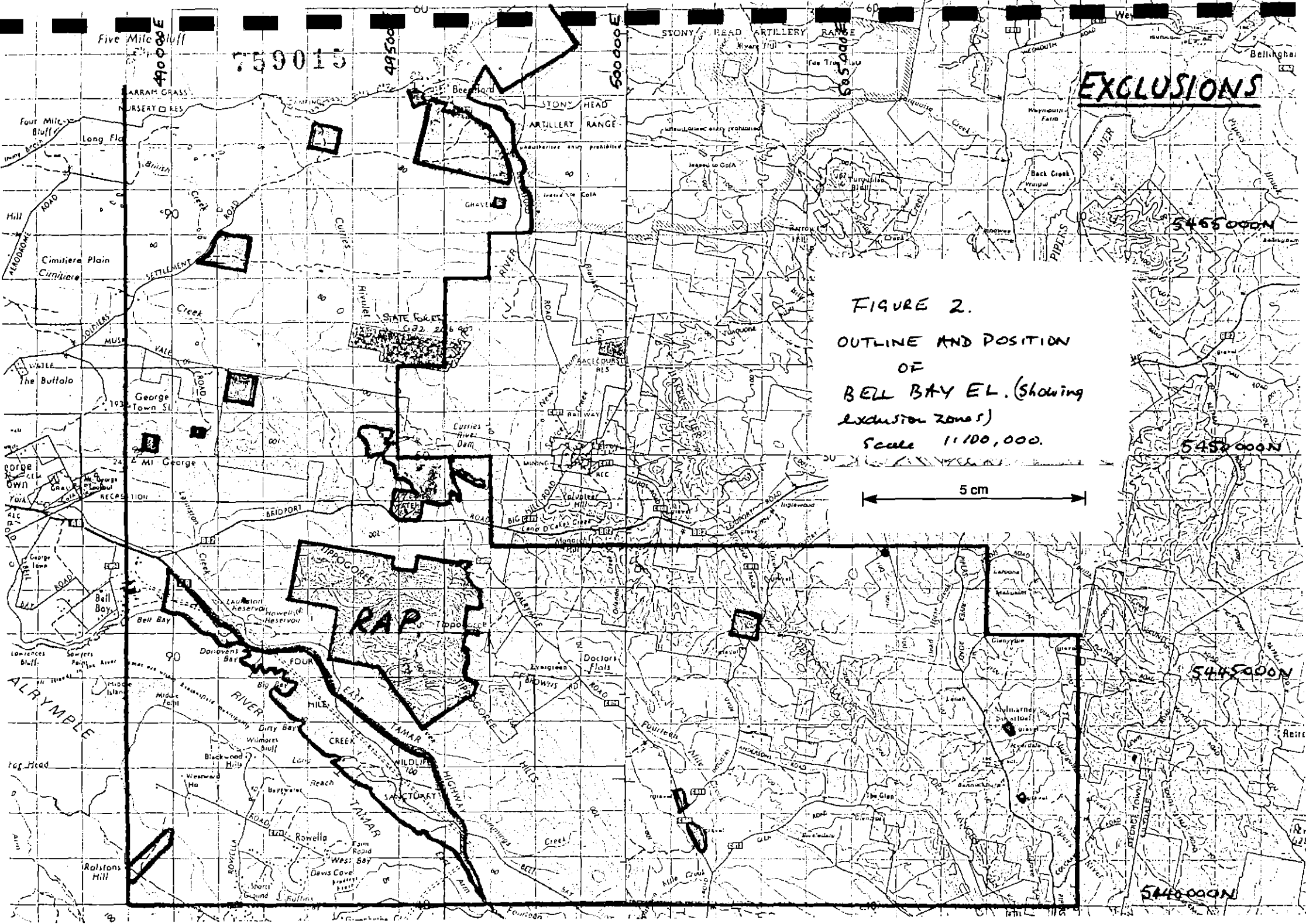


FIGURE 1
 OUTLINE AND POSITION OF
 PIPERS RIVER EL.
 (showing exclusions)

Scale 1:100,000
 5 cm



EXCLUSIONS

FIGURE 2.
 OUTLINE AND POSITION
 OF
 BELL BAY EL. (Showing
 Exclusion Zones)
 Scale 1:100,000.

5 cm

759013

Five Mile Bluff
 40000

50000

60

5465000N

5450000N

5445000N

5440000N

ALRYMPLE

RAP

tag Head

Rolfson Hill

Four Mile Bluff

Cimiteria Plain

The Buffalo

George Town

Bell Bay

ALRYMPLE

tag Head

Rolfson Hill

Four Mile Bluff

Cimiteria Plain

The Buffalo

George Town

Bell Bay

ALRYMPLE

tag Head

Rolfson Hill

Four Mile Bluff

Cimiteria Plain

The Buffalo

George Town

Bell Bay

ALRYMPLE

tag Head

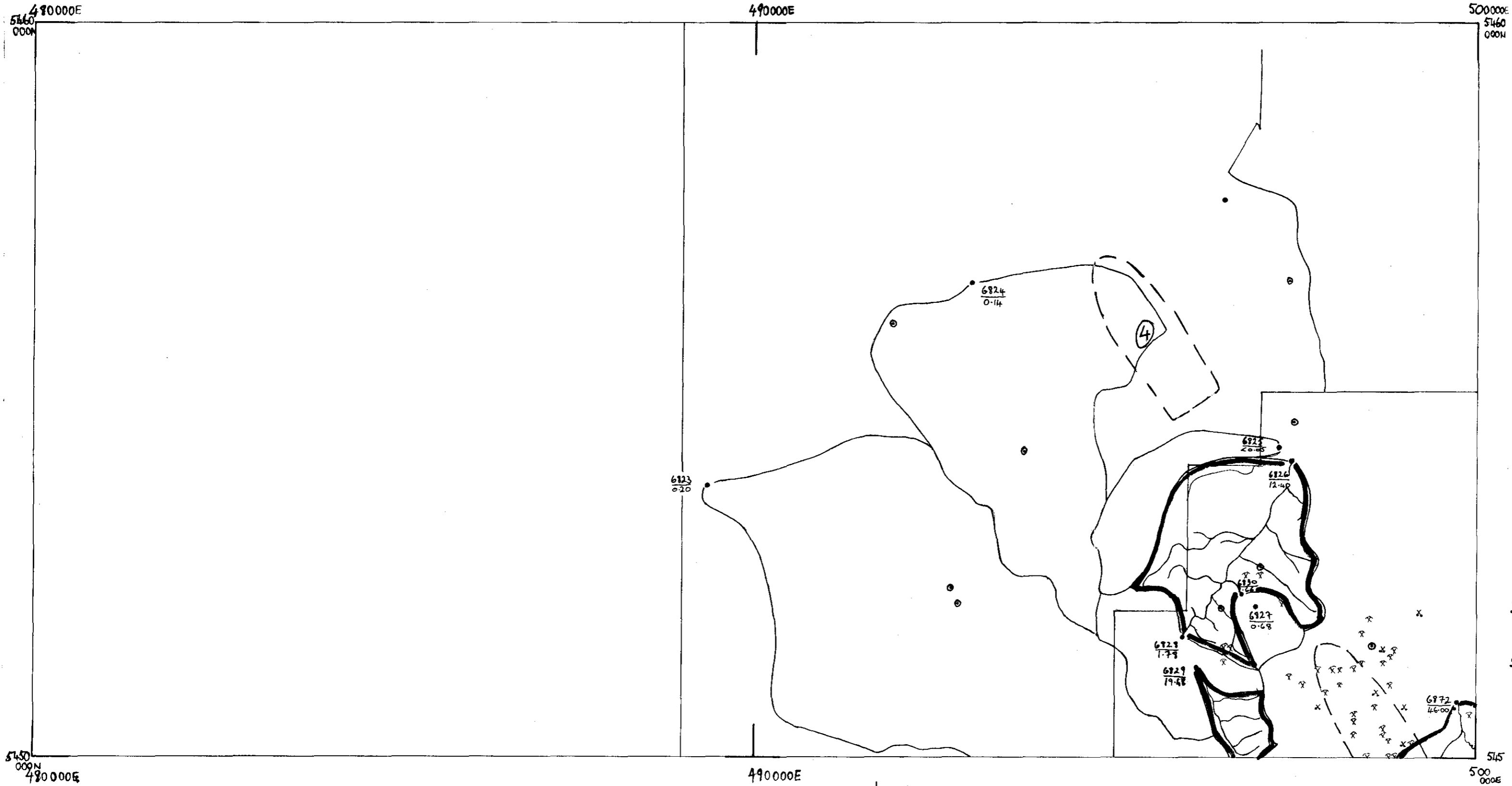
Rolfson Hill

1:25 000

STREAM SEDS

LOW HEAD

LOW HEAD

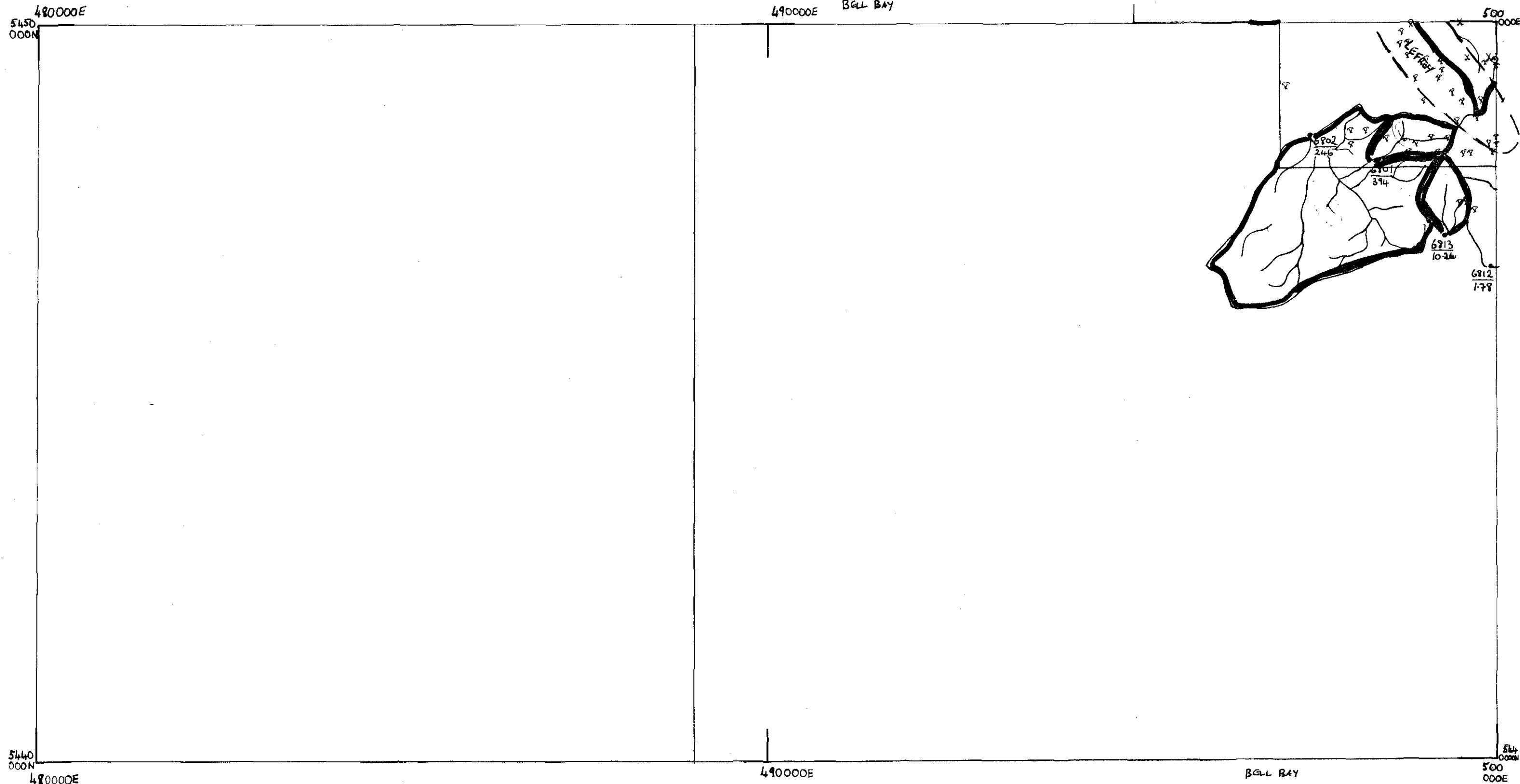


- BLUE STREAM SEDIMENT
- 6829 SAMPLE NO. (PAPER PLAN)
19.88 gold content ppt.
- SITES INDICATED BUT NOT SUITABLE FOR SAMPLING
- ▲ ROCK CAMPS
- ⊖ ANOMALOUS CATCHMENTS IN RFD
- ⊙ STRUCTURAL ZONES

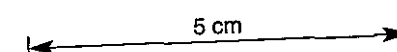
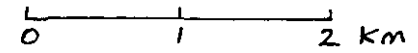
1:25000

STREAM SEDS
D. M.P.D.

BELL BAY



PLAN 2.
 STREAM SEDIMENT
 SURVEY
 BELL BAY
 Scale 1:50,000

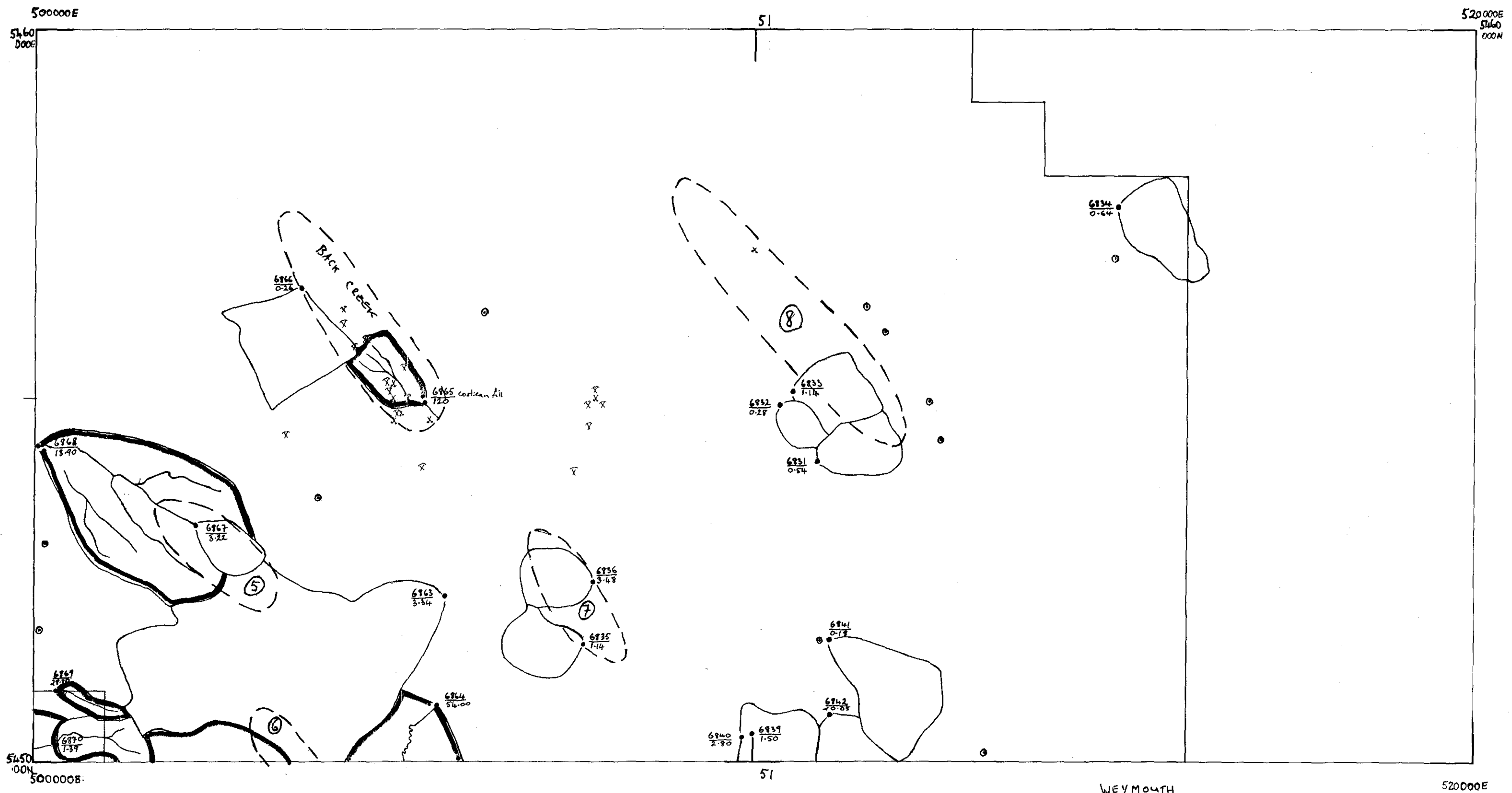


1:25 000

STREAM SEDS

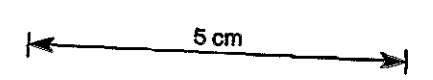
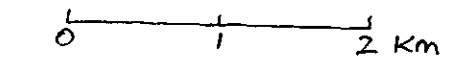
WEYMOUTH

WEYMOUTH



PLAN 3
 STREAM SEDIMENT
 SURVEY

WEYMOUTH sheet.
 Scale 1: 50 000

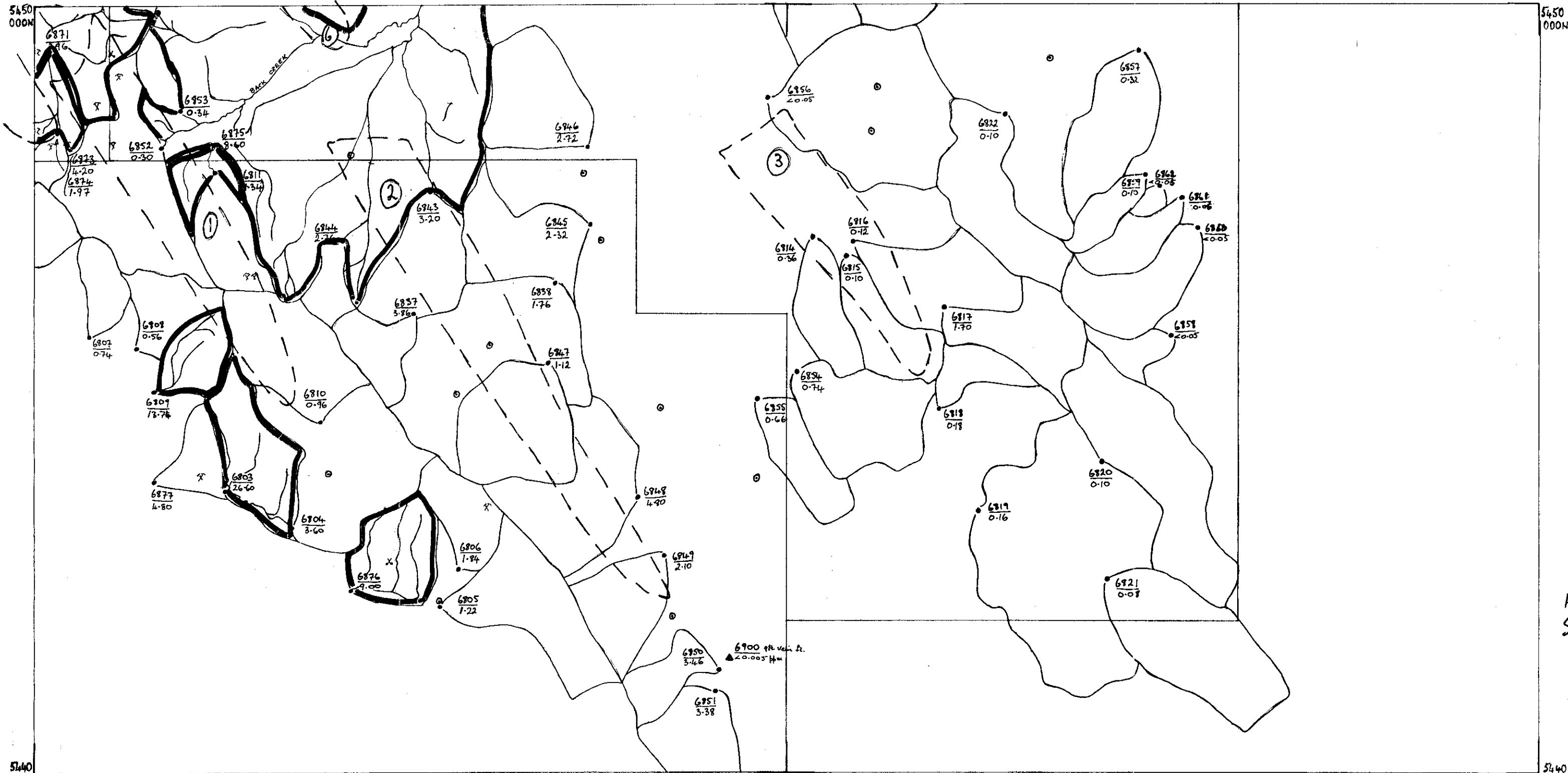


RETREAT

1:25000

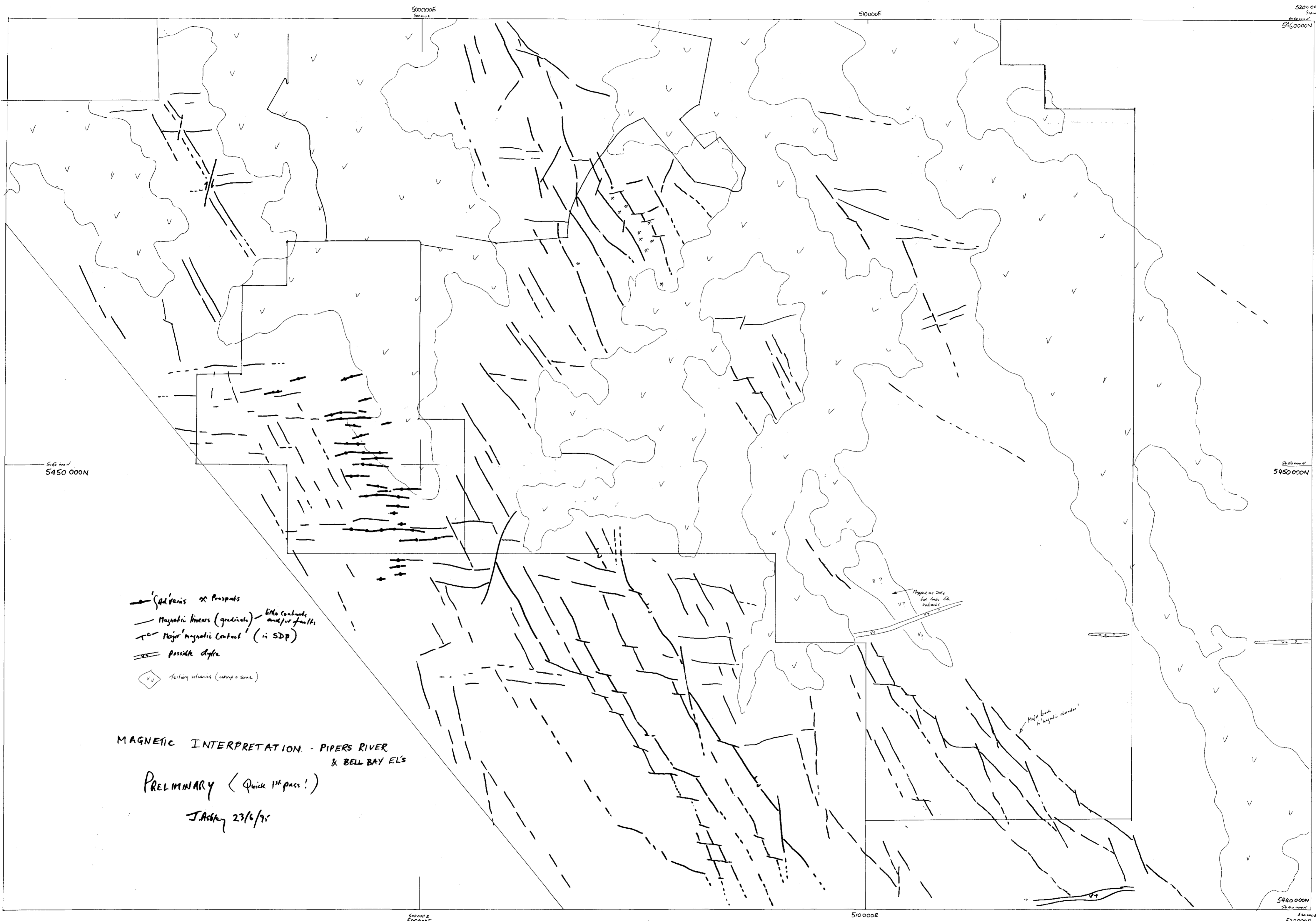
STREAM SEDS

RETREAT



PLAN 4.
 STREAM SEDIMENT SURVEY
 RETREAT sheet.
 Scale 1:50 000
 0 1 2 km

5 cm



- (dashed) or Prospects
- Magnetic lines (gradients) — like contacts and/or faults
- Major magnetic contact (in SDP)
- possible dyke
- ◊ Tertiary volcanics (contour + scale)

MAGNETIC INTERPRETATION - PIPERS RIVER
& BELL BAY ELs

PRELIMINARY (Quick 1st pass!)

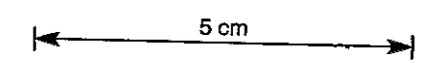
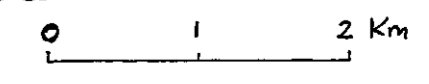
J. Ashkey 23/6/95

J. Ashkey's
NEW H.M.G. INTERP.

LEFROY - BRICK

1:25,000

PLAN 5
INTERPRETED
AEROMAGNETICS
(J. Ashkey).
Scale 1:50 000



TAS
P. WILSON

LANDSAT
INTERP 1995

5 cm

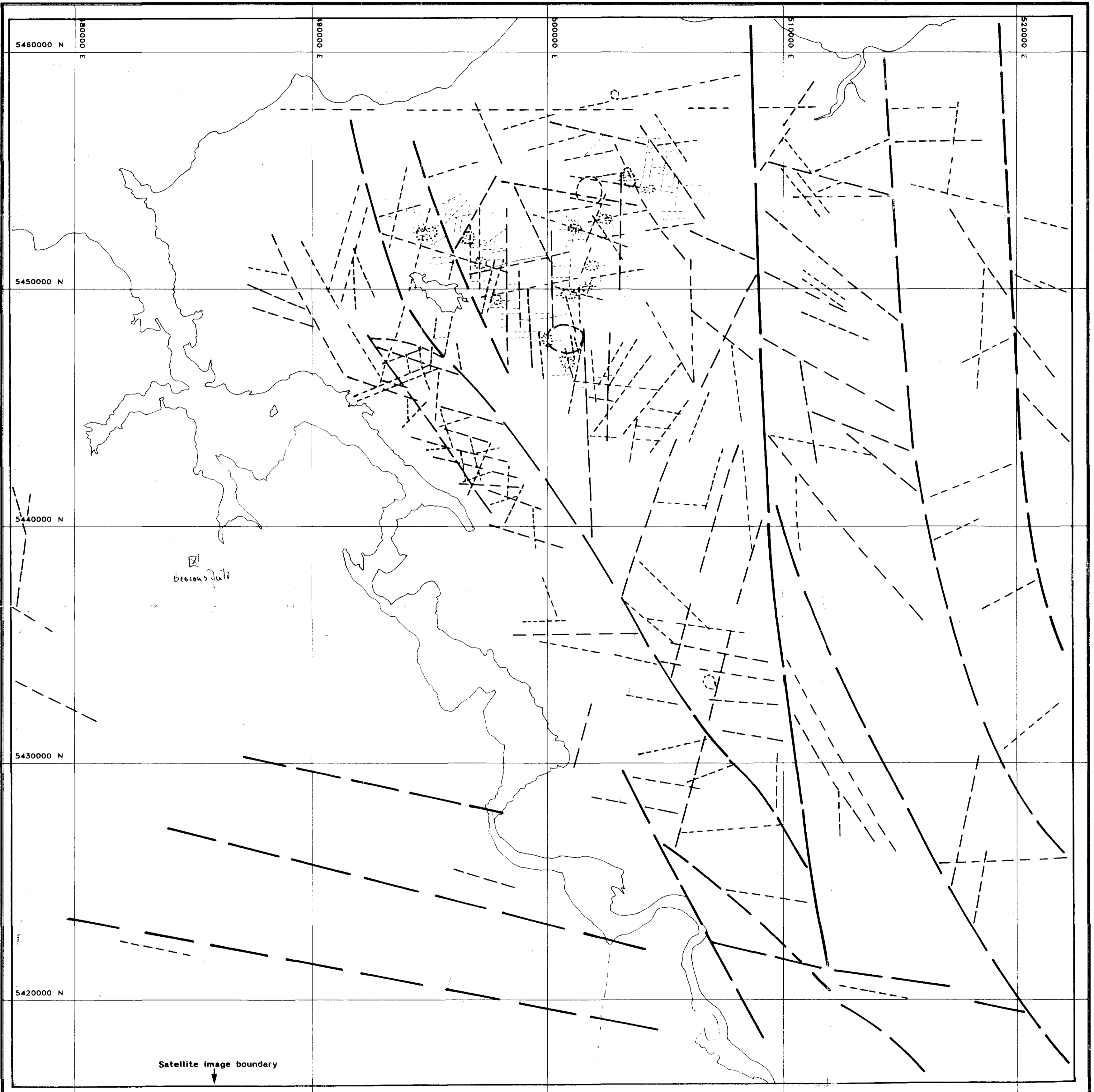
1:100,000

PLANG
LANDSAT TM STRUCTURAL
INTERPRETATION (P. Wilson)

Scale 1:100,000

0 1 2 3 4 5 Km

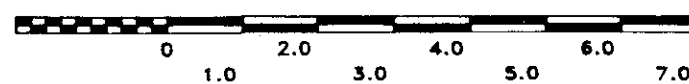
759021



LEGEND

- Major fault
- - - - Minor fault
- · - · Shear zone
- · - · Fracture zone
- · · · Anomalous zone

KILOMETRES



LEFROY GOLDMINES PTY LTD

NORTH EAST TASMANIA
LANDSAT TM STRUCTURAL INTERPRETATION

DRAWN : Wilson

SCALE 1 : 100000

DATE : 3 AUG 1995

PLOT : TA

INTERNATIONAL EARTHSCAN PTY LTD

759022

APPENDIX 1

RESULTS OF STREAM SEDIMENT SURVEY
ELs 21/94 and 22/94, LEFROY, TASMANIA

1. THE SURVEY

The reconnaissance geochemical survey of the Central Kalgoorlie Els was carried out between 27 March and 13 April. The survey was based on the collection of BLEG(bulk leach extractable gold) samples from the drainage of the region surrounding the Lefroy and Back Creek goldfields. The aim of the survey was to establish the overall gold response of the region and to locate repetitions of the quartz-gold lodes of the type already found at Beaconsfield, Lefroy and Back Creek. The sample site distribution was designed to cover the Mathinna sediments and their contained structural zone, to avoid as much as practicable the Cainozoic sediments and to minimise entry to private property. Samples were also collected in the Lefroy and Back Creek areas to indicate how known gold mineralisation is expressed in the streams and to aid in the interpretation of the regional geochemistry. The general conditions and details of the field sampling are described in the Appendix.

2. THE RESULTS

The results were received from ANALABS on 9 May and BLEG values on the 77 samples were found to range from 396 ppb Au to less than the detection limit of 0.05 ppb Au. Simple statistical treatment of the results on cumulative frequency graph paper suggests that the samples can be grouped into five populations(see figure).

<u>Table</u>	<u>Class interval(ppb Au)</u>	<u>Total samples</u>	<u>Cumulative total</u>	<u>Cumulative %</u>
	300-400	2	77	100
	200-300	1	75	97.4
	100-200	1	74	96.1
	10-100	9	73	94.8
	5-10	2	64	83.1
	2-5	16	62	80.5
	1-2	14	46	59.7
	0.5-1	8	32	41.6
	0.2-0.5	6	24	31.2
	0.1-0.2	6	18	23.4
	<0.05-0.1	12	12	15.6

3. THE INTERPRETATION

The population groups are -

Population 5	100-400 ppb	4 samples	5%
Population 4	10-100 ppb	9 samples	12%
Population 3	5-10 ppb	2 samples	3%
Population 2	1-5 ppb	30 samples	39%
Population 1	<1 ppb	32 samples	42%

Populations 5, 4 and 3 are considered to be strongly anomalous, anomalous and possibly anomalous respectively, collectively being 20% of the total group. The samples from these categories are listed below. Values below 5 ppb are not regarded as anomalous(generally similar values were established by Billiton in their 1989-90 NE Tasmania reconnaissance survey and also in their later more detailed work at Lisle).

Population 5- strongly anomalous

<u>Sample No.</u>	<u>Au(ppb)</u>	<u>Drainage</u>
P406871	396	Blanket Creek
P406801	394	Land O'Cakes Creek
P406802	246	Curries River
P406865	120	Spring Creek

Population 4- anomalous

<u>Sample No.</u>	<u>Au(ppb)</u>	<u>Drainage</u>
P406864	54.00	Back Creek
P406872	46.00	Blanket Creek
P406869	28.30	Blanket Creek trib.
P406803	26.60	Den Creek
P406829	19.48	Curries River trib.
P406868	13.90	Blanket Creek trib.
P406809	13.74	Fourteen Mile Creek
P406826	12.40	Curries River
P406813	10.26	Londonderry Creek

Population 3 - possibly anomalous

<u>Sample No.</u>	<u>Au(ppb)</u>	<u>Drainage</u>
P406876	9.00	Fourteen Mile Creek trib.
P406875	8.60	Back Creek trib.

Details of these samples are given in the Appendix.

All results are plotted on an accompanying series of overlays to the 1:25,000 scale computer-generated geology maps recently produced by The Tasmanian Geological Survey. The overlays also contain the catchment boundaries of the samples and the structural zones and allow comparison of the results with the geology and mineralisation on the coloured maps.

4. CONCLUSIONS

- 4.1 The strongly anomalous samples occur on creeks draining mineralised parts of the Lefroy and Back Creek goldfields. The BLEG samples are therefore effective in locating known gold mineralisation although how much of the response is due to contamination from historical mining and processing is not easily measured.

- 4.2 The other anomalous samples occur on creeks draining the Lefroy goldfield as well as areas to the SSE of Lefroy and also to the East and NE of Lefroy in the Bakers Tier area and its northern extensions half way between Lefroy and Back Creek. Some of the anomalous catchments contain recorded mineral deposits. Others do not such as 868, 803, 809 and 829. Not all catchments containing mineral deposits are found to be anomalous even in the Lefroy goldfield.
- 4.3 Geologically, the most anomalous BLEG results are associated with the sandstone-dominated Stony Head Sandstone which hosts the gold veins at Lefroy trending NNW through the area into the NW of EL 21/94 before swinging round NE towards Stony Head. Outside Lefroy, the best geochemical response is to the SSE in the SE corner of EL 21/94 just W of the Den Ranges. To the NNW of Lefroy, the formation is obscured by Quaternary windblown sand which has made most of the stream sediment sampling ineffective by swamping the drainage system.
- 4.4 The siltstone-dominated Turquoise Bluff Slate, overlies the Stony Head Sandstone to the east, and is most geochemically-active in the Back Creek goldfield and in the Baker Tier area in the NW of EL 22/94. To the south, in the Den Ranges, the catchments are generally in the 1-5 ppb(Population 2) range which is considered to be the background gold content for this siltstone formation.
- 4.5 The last formation of the Mathinna Beds in this region is the overlying Bellingham Formation which occupies all of EL 22/94 east of 509,000mE. The catchments in this area are not anomalous and almost exclusively in the range 0-1 ppb(Population 1). This is taken to be the background levels for gold in this sandstone-dominated formation.

5. RECOMMENDATIONS

- 5.1 The anomalous catchments defined by this stream sediment survey are sufficiently promising to be followed up by reconnaissance soil sampling analysing for gold and arsenic along access tracks and ridge and spur traverses or taped grids where appropriate. The areas of promise are -

-the Bakers Tier area immediately to the east and NE of Lefroy and its northern extensions which are between the Lefroy and Back Creek goldfields, the Turquoise Bluff Slate,

-the Stony Head Sandstone which extends along strike to the SSE of Lefroy and which already contains some mineral deposits, and

-the Stony Head Sandstone with its structural target striking to the NNW of Lefroy which has not to been tested adequately geochemically because of poorly developed drainage in the wind blown sand cover of this area.

- 5.2 Following the results of this stream sediment survey, consideration should be given towards reducing the areas of the two regional ELs 21 and 22/94. EL 21/94 need only cover the areas NNW and SSE of Lefroy and EL22/94 could be reduced to concentrate on the Back Creek and Bakers Tier areas. Such a move would reduce substantially Central's required expenditure on the licences and allow funding to be concentrated on testing the potential of the Lefroy goldfield which has just been awarded as EL 1/95. The reduction should await the full appreciation of the structural study in case an important structural target which has not been tested geochemically should be released prematurely.

D. McP. DUNCAN
26 May 1995

Appendix
also four 1:25,000 scale maps and overlays accompanying

Anomalous Samples- Stream Sediment (BLEGS)

Population 5 STRONGLY ANOMALOUS

Sample No. P406871-----396.00ppb Au

Blanket Creek

AMG 500,200mE, 5,449,400mN; EL 1/95

dry silt, sand, gravel; active sediment

catchment lithologies- Mathinna sandstones (Sds) and siltstones (Sdp); Cainozoic gravels (Cgra), silts and clays (Cc)

mineral deposits- numerous old gold mines and workings of the eastern part of the Volunteer lode system, also Blanket Creek is a known alluvial gold prospect

Comments- lies in Lefroy structural zone.

Sample No. P406801-----394.00ppb Au

Land O'Cakes Creek

AMG 498,250mE; 5,448,100mN; EL 1/95

dru quartz gravel; active sediment

catchment lithologies- Mathinna sandstones and siltstones

mineral deposits- numerous old gold mines and workings of the Land O'Cakes lode system and the western part of the Volunteer lode system

Comments- near Lefroy structural zone.

Sample No. P406802-----246.00ppb Au

Curries River

AMG 497,400mE; 5,448,450mN; EL1/95, EL21/94

dry quartz gravel, active sediment

catchment lithologies- Mathinna sandstones and siltstones; Cainozoic gravels, silts and clays; Permian sediments and Jurassic dolerite

mineral deposits- numerous old gold mines and workings as described for Land O' Cakes Creek which drains into this catchment

Comments- near Lefroy structural zone.

Sample No. P406865-----120.00ppb Au

Spring Creek

AMG 505,450mE; 5,454,950mN; EL 22/94

dry soil, silt (quartz-bearing); Cainozoic gravels, silts and clays

mineral deposits- numerous old gold mines and workings of Back Creek goldfield, also known alluvial gold prospects

Comments- lies in Back Creek structural zone; sampled costean fill in widespread alluvial workings and dams which have obscured the natural channelways of Spring Creek; not a valid test of present day active sediment.

Population 4 ANOMALOUS**Sample No. P406864-----54.00ppb Au**

Back Creek

AMG 505,600mE; 5,450,800mN; EL 22/94

dry silt, sand, gravel; active sediment

catchment lithologies- mainly Cainozoic gravels, silts and clays, basalt and Mathinna siltstones

mineral deposits- some old gold mines and workings in higher catchments; Native and New Industry, Marshall, Corporal and Monkland

Comments- a very large catchment covering parts of structural zones 1,2 and 6; downstream from a number of other sample points, one of which is anomalous(406875-8.60ppb).

Sample No. 406872-----46.00ppb Au

Blanket Creek

AMG 499,700mE, 5,450,800mN; EL 1/95

dry silt, sand, gravel; active sediment

catchment lithologies- mainly Cainozoic gravels, silts and clays, basalt, Mathinna siltstones and sandstones

mineral deposits- some old gold mines and workings including Brigadier, United Miner, Specimen Hill and East Prince with the alluvials at Blanket Creek and Poverty Lead

Comments- catchment includes part of the Lefroy structural zone; also downstream of the very anomalous sample 406871 (396.00ppb Au)

Sample No. P406869-----28.30ppb Au

Blanket Creek tributary, off Baker Tier
AMG 500,300mE; 5,451,000mN; EL22/94

dry soil, silt, gravel; active sediment

catchment lithologies- mainly Mathinna siltstone and Cainozoic gravels

mineral deposits- old Welcome gold mine and workings in catchment

Comments- near Lefroy refuse disposal site.

Sample No. P406803-----26.60ppb Au

Den Creek

AMG 502,550mE; 5,443,700mN; EL21/94

dry gravel; inactive sediment in bank

catchment lithologies- mainly Mathinna sandstones and siltstones, and Cainozoic gravels, silts and clays

mineral deposits- none recorded in catchment

Comments-soil choked creek with no currently active sediment.

Sample No. P406829-----19.48ppb Au

Curries River tributary

AMG 496,100mE; 5,451,250mN; EL 1/95

dry silt, sand, gravel; active sediment

catchment lithologies- Mathinna sandstones

mineral deposits- none recorded in catchment

Comments- on western edge of Lefroy goldfield.

Sample No. P406868-----13.90ppb Au

Blanket Creek tributary

AMG 500,050mE; 5,454,350mN; EL 22/94

dry sand, gravel; active sediment

catchment lithologies- mainly Mathinna siltstones (some sandstones), and Cainozoic gravels, silts and clays

mineral deposits- none recorded in catchment

Comments- includes structural zone 5.

Sample No. P406809-----13.74ppb Au

Fourteen Mile Creek

AMG 501,600mE; 5,445,000m; EL21/94

dry gravel, inactive sediment in bank

catchment lithologies- Mathinna sandstones and siltstones; minor Cainozoic gravels(perched)

mineral deposits- none recorded in catchment

Comments- on edge of structural zone 1.

Sample No. P406826-----12.40ppb Au

Curries River

AMG 497,400mE; 5,454,050mN; EL 1/95

dry sand; inactive sediment in bank

catchment lithologies- Mathinna sandstones and Cainozoic aluvium and wind blown sand

mineral deposits- catchment includes the NW margin of the Lefroy goldfield and the western extensions of the Chum and Pinafore lode systems, with such deposits as Recruit, East Recruit, Perseverance, Golden Zone, Grest West Extended and Old Comrades

Comments- current treatment plant operating near tributary upstream of sample point- additional contamination?

Sample No. P406813-----10.26ppb Au

Londonderry Creek

AMG 499,250mE; 5,447,050mN; EL 21/94

dry quartz gravel; active sediment

catchment lithologies- Mathinna sandstones and siltstones

mineral deposits- old gold mines and workings, Londonderry, Enterprise, New Monarch and Orlando

Comments- mullock heaps also in catchment.

Population 3 POSSIBLY ANOMALOUS**Sample No. P406876-----9.00ppb Au**

Fourteen Mile Creek tributary(drain)

AMG 504,200mE; 5,442,400mN; EL 21/94

dry sand, gravel on clay base; active sediment

catchment lithologies- mainly Mathinna siltstones and sandstones, Cainozoic silts and clays, minor Permian sediments

mineral deposits- alluvial gold workings of Old Den and the Glen

Comments-possibly in perched Cainozoic gravels(unmapped).

Sample No. P406875-----8.60ppb Au

Back Creek tributary

AMG 502,400mE; 5,448,200mN; ELs 21/94, 22/94

dry silt, sand, gravel; active sediment

catchment lithologies- Mathinna sandstones and siltstones, Cainozoic gravels, silts and clays

mineral deposits- old gold mines and workings in the catchment, New and Native Industry(covered by current mining lease 65M/78)

Comments-within structural zone 1; local report of previous owner, of property containing sample site, washing gold from Cainozoic gravels.

APPENDIX 2

Stream Sediment (BLEG) AMG Coordinates-Central Kalgoorlie ELs Lefroy

Sample No.	Metres East	Metres North	Material
406801	498250	5448100	dry gravel, active
406802	497400	5448450	dry gravel, active
406803	502550	5443700	dry gravel, in bank
406804	503450	5443250	dry gravel, in bank
406805	505400	5442200	wet gravel, active
406806	505650	5442700	dry gravel, active
406807	500750	5445700	dry gravel, active
406808	501350	5445550	dry gravel, in bank
406809	501600	5445000	dry gravel, in bank
406810	503800	5444600	dry sand, humus, active
406811	502400	5447850	dry gravel, active
406812	499900	5446650	dry silt, sand, gravel, active
406813	499250	5447050	dry gravel, active
406814	510350	5447000	dry gravel, active
406815	510800	5445750	wet silt, sand, gravel, active
406816	510900	5446950	wet silt, sand, gravel, active
406817	512100	5446100	wet silt, sand, active
406818	512000	5444750	dry silt, sand, active
406819	512550	5443450	wet silt, sand, active
406820	514200	5444050	wet silt, sand, active
406821	514250	5442550	wet silt, sand, active
406822	512900	5448600	dry silt, sand, active
406823	489400	5453750	dry sand, in bank
406824	493000	5456450	dry silt, sand, active
406825	497250	5454250	dry sand, gravel, active
406826	497400	5454050	dry sand, in bank
406827	496950	5452050	wet silt, sand, gravel, active
406828	495950	5451850	dry sand, gravel, active
406829	496100	5451250	dry silt, sand, gravel, active
406830	496750	5452250	dry silt, sand, gravel, active, compare 6827
406831	510900	5454150	dry sand, gravel, active
406832	510350	5454900	dry silty soil, active ?
406833	510550	5455050	dry silty soil, active?
406834	515050	5457600	dry sand, gravel under clay, active
406835	507650	5451650	dry silt, gravel, active
406836	507800	5452500	dry soil, gravel, active

APPENDIX 2
TABLE OF AMG COORDINATES
OF STREAM SEDIMENT
(BLEG) SAMPLES.

759031

Stream Sediment (BLEG) AMG Coordinates-Central Kalgoorlie ELs Lefroy

	N	E	
406837	505050	5446000	dry gravel, active
406838	506950	5446400	dry soil, active?
406839	510000	5450400	dry silt, sand, gravel, active above dam
406840	509850	5450350	dry silt, sand, gravel, active below dam
406841	511050	5451750	dry sandy soil, active?
406842	511050	5450650	dry sandy soil, active?
406843	505250	5447600	dry silt, sand, gravel, active
406844	504100	5446950	dry soil, minor gravel, active?
406845	507400	5447150	wet silt, sand, gravel, active
406846	507350	5448150	dry silt, sand, gravel, under soil, active
406847	506850	5445350	wet silt, sand, gravel, active
406848	508000	5443600	dry silt, sand, gravel, active
406849	508400	5442850	dry silt, sand, gravel, active
406850	509100	5441350	dry silt, sand, gravel, active
406851	509050	5441050	wet silt, sand, gravel, active
406852	501700	5448150	dry silt, sand, gravel, active
406853	501950	5448650	dry sandy soil, active?
406854	510150	5445250	dry silt, sand, gravel, active
406855	509600	5444900	dry silt, sand, gravel, active
406856	509750	5448800	dry silt, sand, gravel, active
406857	514700	5449400	dry silt, sand, active
406858	515100	5445700	wet silt, sand, gravel, active
406859	514750	5447800	dry silty soil, active?
406860	515450	5447100	wet silt, sand, gravel, active
406861	515250	5447500	dry silt, sand, active
406862	514950	5447650	wet silt, sand, gravel, active
406863	505700	5452300	dry silt, sand, gravel, active
406864	505600	5450800	dry silt, sand, gravel, active
406865	505450	5454950	dry soil, silt possibly from costean?
406866	503700	5456500	dry sandy soil, active?
406867	502250	5453300	dry sandy soil, active?
406868	500050	5454350	dry sand, gravel, active
406869	500300	5451000	dry soil, silt, gravel, active
406870	500300	5450250	dry silt, sand, gravel, active
406871	500200	5449400	dry silt, sand, gravel, active
406872	499700	5450800	dry silt, sand, gravel, active
406873	500300	5448350	dry silty soil, active?
406874	500300	5448350	dry silt, sand, gravel, active, compare 6873

539032

Stream Sediment (BLEG) AMG Coordinates-Central Kalgoorlie ELs Lefroy

406875		502400		5448200		dry silt, sand, gravel, active	
406876		504200		5442400		dry sand, gravel on clay base, active	
406877		501600		5443800		dry silt, sand, gravel, active	
406900		509250		5441500		quartz vein, rubble in paddock	

APPENDIX 3

**759035****ANALYTICAL DATA**

SAMPLE PREFIX

REPORT No.

REPORT DATE

CLIENT ORDER No.

PAGE

103380.80.10844

08/05/95

D DUNCAN

1 OF 4

	SAMPLE No.	Au	Au						
METHOD		GG342	GG313						
1	P406801	394.00	-						
2	P406802	246.00	-						
3	P406803	26.60	-						
4	P406804	3.60	-						
5	P406805	1.22	-						
6	P406806	1.84	-						
7	P406807	0.74	-						
8	P406808	0.56	-						
9	P406809	13.74	-						
10	P406810	0.96	-						
11	P406811	1.34	-						
12	P406812	1.78	-						
13	P406813	10.26	-						
14	P406814	0.36	-						
15	P406815	0.10	-						
16	P406816	0.12	-						
17	P406817	1.70	-						
18	P406818	0.18	-						
19	P406819	0.16	-						
20	P406820	0.10	-						
21	P406821	0.08	-						
22	P406822	0.10	-						
23	P406823	0.20	-						
24	P406824	0.14	-						
25	P406825	<0.05	-						

APPENDIX 3
 TABULATED GEOCHEMICAL
 DATA - STREAM SEDIMENT
 SURVEY

Results in ppm unless otherwise specified
 element not determined

IS = Insufficient sample
 SNR = sample not received

AUTHORISED OFFICER

**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT No.

REPORT DATE

CLIENT ORDER No.

PAGE

100380.80.10844

08/05/95

D DUNCAN

2 OF 4

METHOD	SAMPLE No.	Au	Au						
		GG342	GG313						
1	P406826	12.40	-						
2	P406827	0.68	-						
3	P406828	1.76	-						
4	P406829	19.48	-						
5	P406830	1.66	-						
6	P406831	0.54	-						
7	P406832	0.28	-						
8	P406833	1.14	-						
9	P406834	0.64	-						
10	P406835	1.14	-						
11	P406836	3.48	-						
12	P406837	3.86	-						
13	P406838	1.76	-						
14	P406839	1.50	-						
15	P406840	2.80	-						
16	P406841	0.18	-						
17	P406842	<0.05	-						
18	P406843	3.20	-						
19	P406844	2.76	-						
20	P406845	2.32	-						
21	P406846	2.72	-						
22	P406847	1.12	-						
23	P406848	4.80	-						
24	P406849	2.10	-						
25	P406850	3.46	-						

Results in ppm unless otherwise specified
 element not determined

IS = insufficient sample
 SNR = sample not received

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759037

ANALYTICAL DATA

SAMPLE PREFIX

REPORT No.

REPORT DATE

CLIENT ORDER No.

PAGE

103380.60.10844

08/05/95

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3 OF 4

METHOD	SAMPLE No.	Au	Au						
		66342	66313						
1	P406851	3.38	-						
2	P406852	0.30	-						
3	P406853	0.34	-						
4	P406854	0.74	-						
5	P406855	0.66	-						
6	P406856	<0.05	-						
7	P406857	0.32	-						
8	P406858	<0.05	-						
9	P406859	0.10	-						
10	P406860	<0.05	-						
11	P406861	0.06	-						
12	P406862	<0.05	-						
13	P406863	3.34	-						
14	P406864	54.00	-						
15	P406865	120.00	-						
16	P406866	0.26	-						
17	P406867	3.22	-						
18	P406868	13.90	-						
19	P406869	28.30	-						
20	P406870	1.39	-						
21	P406871	396.00	-						
22	P406872	46.00	-						
23	P406873	4.20	-						
24	P406874	1.97	-						
25	P406875	8.60	-						

Results in ppm unless otherwise specified
element not determinedIS = Insufficient sample
SNR = sample not receivedAUTHORISED
OFFICER

ANALYTICAL DATA

SAMPLE PREFIX

REPORT No.

REPORT DATE

CLIENT ORDER No.

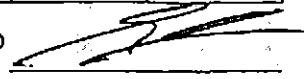
PAGE

SAMPLE PREFIX		REPORT No.		REPORT DATE		CLIENT ORDER No.		PAGE	
		103380.60.10844		08/05/95		D DUNCAN		4 OF 4	
	SAMPLE No.	Au	Au						
METHOD		GG342	GG313						
1	P406876	9.00	-						
2	P406877	4.80	-						
3	P406900	-	<0.005						
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24	DETECTION	0.05	0.005						
25	UNITS	ppb	ppm						

Results in ppm unless otherwise specified
element not determined

IS = insufficient sample
SNR = sample not received

AUTHORISED OFFICER



APPENDIX 4

IMAGING RECORD

759040

AREA: PIPERS RIVER

DATE: 23/6/95

CLIENT: CENTRAL KALGOORLIE GOLD MINES

- INTENSITY NON LINEAR STRETCH - GREYSCALE	
- INTENSITY NON LINEAR STRETCH - PSEUDOCOLOUR	✓
- INTENSITY LINEAR STRETCH - GREYSCALE	
- INTENSITY LINEAR STRETCH - PSEUDOCOLOUR	✓
- SECOND DERIVATIVE	
- NORTH GRADIENT	
- NE GRADIENT	
- EAST GRADIENT	
- SE GRADIENT	
- GRADIENTS (BLUE = NE, GREEN = E, RED = SE)	
- AGC ON NORTH GRADIENT	✓
- AGC ON NE GRADIENT	✓
- AGC ON EAST GRADIENT	✓
- AGC ON SE GRADIENT	✓
- GRADIENTS (BLUE = NEAGC, GREEN = EAGC, RED = SEAGC)	✓
- FIRST DERIVATIVE (LINEAR)	
- AGC ON FVD	
- AGC ON 2D	
- INTENSITY (NL) SHADED WITH 50% NORTH GRADIENT	
- INTENSITY (NL) SHADED WITH 50% NE GRADIENT	
- INTENSITY (NL) SHADED WITH 50% EAST GRADIENT	
- INTENSITY (NL) SHADED WITH 50% SE GRADIENT	
- INTENSITY (LIN) SHADED WITH 50%/75% NORTH AGC GRADIENT	✓
- INTENSITY (LIN) SHADED WITH 50%/75% NE AGC GRADIENT	✓
- INTENSITY (LIN) SHADED WITH 50%/75% EAST AGC GRADIENT	✓
- INTENSITY (LIN) SHADED WITH 50%/75% SE AGC GRADIENT	✓
- INTENSITY (LIN) SHADED WITH 50%/75% FVD AGC	
- INTENSITY (LIN) SHADED WITH 50%/75% 2D AGC	
- TOTAL COUNT - GREYSCALE	
- POTASSIUM - PSEUDOCOLOUR	✓
- URANIUM - PSEUDOCOLOUR	
- THORIUM - PSEUDOCOLOUR	
- TERNARY RADIOMETRICS (BLUE = UL, GREEN = THL, RED = KL)	
- BOUGER GRAVITY - PSEUDOCOLOUR	✓

APPENDIX 4

IMAGING RECORD FROM REPT.

By SOUTHERN GEOSCIENCE
CONSULTANTS Pty Ltd.