Mineral Resources Tasmania
Tasmanian Geological Survey
Record 2002/21

Western Tasmanian Regional Minerals Program — Area 3, northwest Tasmania

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CONTENTS

Appendices

Figures

Introduction

As part of the Western Tasmanian Regional Minerals Program (WTRMP) being run by Mineral Resources Tasmania, McPherson Duncan & Associates was awarded a short contract to investigate the geological basis of geophysical responses — magnetic and radiometric — contained in the recently acquired airborne data covering northwest Tasmania.

Eighteen days were spent in the field over two trips in February and April 2002, with twelve days being spent in the office researching targets, compiling field notes and reporting.

Methodology

The approach used in this project was to scan the geophysical results in association with the high-quality geological mapping of the region produced by MRT and to spot the mismatches for possible ground checking. Discussions were held with MRT geologists most familiar with the region and also with contract geophysicists Dr J. Bishop, Dr D. Leaman and S. Webster. Research was carried out on MRT open-file reports to filter out those anomalies which had been explained by the work of mineral exploration companies. This work led to an appreciation of the main geophysical anomalies in the region and their geological implications. Finally, a list was drawn up of field sites where it was believed that ground inspection of geology had a reasonable chance of solving the anomalies (Appendix 1) with the emphasis on the main geological enigmas of the region.

Results

The field sites visited are shown in Figure 1 and the results of the two field trips are laid out in note form in Appendix 2. The thirty-four rock samples collected and submitted to MRT are listed in Appendix 3 along with suggestions for their follow-up investigation. A listing of photographs and their locations and subjects provided to MRT is contained in Appendix 4. Those geological details collected during the fieldwork which are judged worthy of addition to the geological maps are listed in Appendix 5.

Tipunah Road Anomaly

The coincidence of dolerite and this NNE-trending regional magnetic anomaly has been recorded at two more localities; on Tipunah Road near Kellys Knob and on Gibson Plains track, both north of the previously mapped localities.

This reinforces the evidence from the south that this regional magnetic anomaly is caused by dolerite dykes. Whether the dykes have intruded along a fault or thrust associated with the Boat Harbour Fault has not been revealed by this study.

WNW-trending magnetic linears

The coincidence of dolerite with two of these magnetic anomalies has been found at the Circular Head dolomite quarry at Smithton (a swarm of three dykes) and in Cambrian sedimentary rocks at Blackwater Road. Deeply weathered dolerite dykes have already been mapped on a WNW-trending magnetic trend at Lake Mikany, near Smithton, where they have been given a Cambrian or Precambrian age.

Attempts to find the cause of the most prominent WNW-trending linears have not been successful because of Quaternary cover on the Woolnorth plains or possibly because of recessive weathering against the Scopus Formation sedimentary rocks. By augering such magnetic responses along Barcoo Road, Geopeko interpreted them as basic dykes according to the geochemical signature of the resulting samples. Age dating should be carried out on the fresh dolerite in the quarry to determine whether the dykes are Precambrian or much younger and related to the opening of Bass Strait ?rifting associated with the formation of the Bass Basin.

The Far Horizons

These folded magnetic signatures lie concealed under the Woolnorth plains. Several traverses have failed to find any surface geological expression of these anomalies and they are assumed to be due to unknown magnetic stratigraphies folded into north-plunging synclines.

From the regional mapping, these folded horizons must be within or stratigraphically above the Smithton Dolomite. If they are separated by one outcrop (questionable) of Cambrian Scopus Formation in the Welcome River, then the northern horizon must be within the Scopus or above. In either case, magnetic horizons are not characteristic of either formation and so they are worthy of investigation.

The northern closure is cut off by a WNW-trending fault with a three kilometre sinistral movement (north block west). The fault appears to be occupied by a dolerite dyke.

To the south, other magnetic horizons in forested country east of Mt Cameron West are known to be Keppel Creek Formation correlates. Using recently built forestry tracks for access and exposure, the magnetic responses were found to have a variety of causes such as sandstone (basaltic tuff or volcaniclastic rocks), basaltic flows or lateritised sedimentary rocks.

Seventeen Mile Plains structure

This triangular area, defined to the east by the Smithton Dolomite outcrops along the Montagu River and to the northwest and southwest by the magnetic response of the basalts of the Spinks Creek correlates, is a structural anomaly with a space problem which may imply thicker or more flat-lying Smithton Dolomite. Bedrock is completely obscured by alluvium according to the map and the site could not be visited due to fallen timber.

This 20 km^2 area has the potential to contain enormous resources of Smithton Dolomite close to and accessible

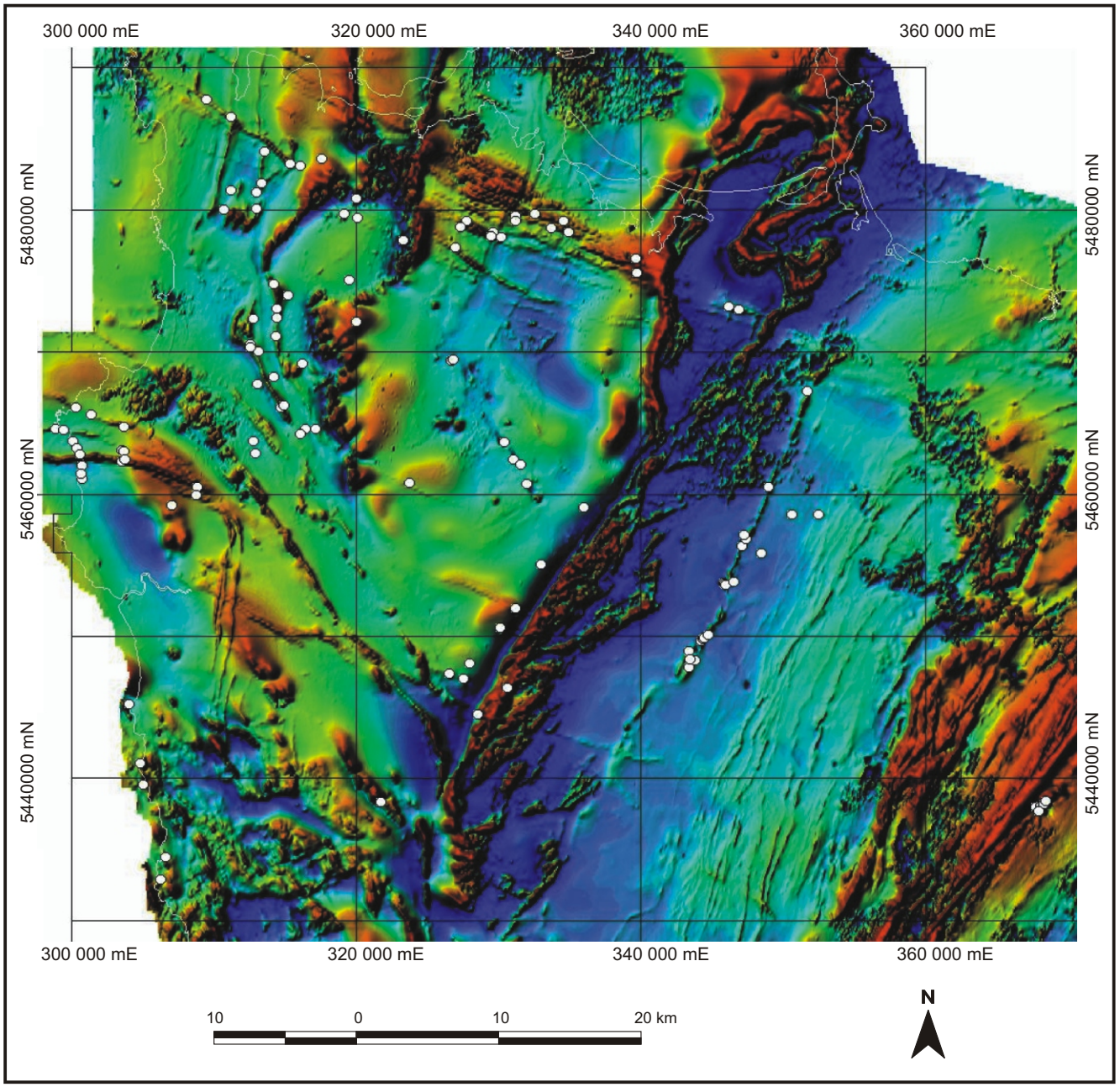

Figure 1

WTRMP ground-truthing fieldwork. Localities visited with background of WTRMP Total Magnetic Intensity (NW sun angle). 1:25 000 scale map sheet boundaries shown.

from the land surface. It is currently under threat of exclusion from the *Mineral Resources Development Act* by reservation and every effort should be made to keep it available for exploration.

Arcuate magnetic trend

This east-trending, intense magnetic trend, which crosses the coast south of Marrawah and runs inland for some kilometres before swinging south and splitting into two parallel traces, is confined to the Rocky Cape Group. This major response, and several associated fainter and discontinuous responses in the West Point area, have no expression in the relatively well-exposed Precambrian orthoquartzite bedrock at any of the numerous localities examined.

The cause of the magnetic trend is still unknown but may be due to a series of dolerite dykes, to mineralisation, or to some other geological feature. The character of the response is not unlike that of the dolerite but is more intense in the north. It swings to the south and fades to two parallel rails before tailing out in the Nelson River magnetic feature. This body, and other discrete magnetic anomalies in the Rocky Cape Group, were drilled in 1967 by Pickands Mather and subsequently by CRA-Geopeko in 1982 and Pacific Nevada in the last several years. The anomalies have proved to be caused by magnetite-carbonate lodes in shears or fault zones with modest gold, silver and base metal values.

The large strike extent of the arcuate magnetic response, at over 30 km, tends to rule out the signature as being primarily from mineralisation.

Smithton Dolomite anomalies

Several broad magnetic anomalies lie in the Smithton Dolomite adjacent and to the west of the contact with the sedimentary rocks of the Keppel Creek Formation and its contained basic volcanic rocks just south of Smithton, near Edith Creek, and at Leensons Road just south of Roger River West. From Edith Creek to the south, the contact is the Roger River Fault forming a prominent scarp in the landscape. These anomalies look to have a deep source and are clearly not resolvable by surface inspection or possibly even shallow drilling.

The anomalies may be due to the response from the Cambrian basalt stratigraphically underneath the dolomite but the possibility of sediment-hosted base metal deposits at or near to a possible basin-edge growth fault with basic volcanic rocks in the substrate must not be overlooked.

Results of drilling by Pacific Nevada on the spot anomalies at Leensons Road (holes BU001–003) remain closed file.

River Flat anomalies

Broad, high radiometric responses occur where the Duck River, the Roger River and the Arthur River flow onto the Quaternary plains from the eastern ranges underlain by Keppel Creek Formation sedimentary rocks.

These anomalies are presumed to be caused by clay-rich overbank deposits left on the flats after flooding, the provenance being from the Cambrian sedimentary rocks exposed on the range east of the scarp. As these anomalies occur mostly (but not always) on improved pastures, the possibility was considered that the radioactivity was derived from soil additives added during cultivation by the farmers. This can probably be discounted.

Keith River gossans

These gossans occur between the two magnesite deposits at the Arthur River and Lyons River and occupy the site of an intense aeromagnetic high. The high is asymmetric towards the southwest, with the weaker northeast section having been explored by CRA using two diamond-drill holes. The holes encountered well-bedded siltstone with magnetite and pyrite bands up to 300 mm thick. Field measurements showed that the southwest part of the anomaly had ironstone gossans with some fresh pyrite-magnetite? mineralisation which had a high magnetic susceptibility.

As the gossanous cap shows a more subdued magnetism than the mineralisation, it is concluded that the magnetic high infers a substantial volume of primary magnetite–sulphide mineralisation of the Savage River ore type which has never been tested.

Blackwater Road silica occurrence

While investigating two small magnetic highs along Blackwater 1 Road (which remain unresolved although they could be due to lateritised sediments of the Keppel Creek Formation), banks of white silica sand up to three metres high overlying the Black River Dolomite correlates were seen for some 100 m along the road.

This should be investigated for a possible silica flour deposit overlying dolomite. An alternative explanation is that the occurrence is part of the extensive Tertiary sand and gravel deposits which are mapped within about one kilometre to the south of this location. This could be quickly resolved by further mapping.

Recommendations

Geophysical modelling

Geophysical modelling should be carried out on:

- a number of traverses across the trend of the Tipunah Road anomaly;
- four traverses across the Far Horizons of the western Smithton Basin and including the structural anomaly at Seventeen Mile Plain, such as;
  - 320 000 mE; 5 480 000 mN to 306 000 mE; 5 486 000 mN;

- 319 000 mE; 5 477 000 mN to 306 000 mE; 5 482 000 mN;
- 327 000 mE; 5 472 000 mN to 306 000 mE; 5 472 000 mN;
- 329 000 mE; 5 477 000 mN to 307 000 mE; 5 463 000 mN.

- a number of traverses across the trend of the arcuate magnetic response near West Point, including one parallel to the Arthur River Road along line 303 000 mE from 5 471 000 mN to 5 460 000 mN;
- the three broad, deep magnetic anomalies in the Smithton Dolomite near Smithton, Edith Creek and Roger River West;
- a north-trending traverse along line 331 000 mE crossing the WNW-trending swarm of magnetic linears between Smithton and Montagu (has been carried out by S. Webster);
- an east-west traverse across the Keith River aeromagnetic anomaly on line 5 438 000 mN.

Geological investigations

Further geological investigations should be carried out on:

- the unknown Far Horizons under the Woolnorth plains by shallow drilling or excavating;
- the deep magnetic anomalies in the Smithton Dolomite by deep drilling;
- the arcuate magnetic trend near West Point by drilling, possibly deep;
- the dolomite in the Seventeen Mile Plains area by drilling;
- the Keith River gossans and magnetic high, by diamond drilling;
- the Blackwater Road silica sand occurrence.

The drilling is recommended where it appears likely that only subsurface information would provide an answer to the geophysical signature and should be attempted only where the geophysical modelling provides a solution within feasible drilling distance from the surface.

Other geological work

Age dating and petrographic and chemical analysis should be carried out as a matter of urgency on the fresh dolerite currently exposed in the Circular Head dolomite quarry.

Rock samples should be analysed according to the suggestions in Appendix 3.

Acknowledgements

The writer wishes to thank the staff of Mineral Resources Tasmania for numerous discussions and for making available a wide range of maps, reports, digital products and scientific instruments. Thanks are also due to temporary employee John Hooper who ably assisted in the fieldwork.

[21 June 2002]

APPENDIX 1

WTRMP Area 3 geophysics — field check list and comments

Numbered items in **bold** have been ground checked

SMITHTON BASIN MAGNETICS

1. Tbv — Mt Cameron West and satellite flows — 306 700 mE; 5 473 700 mN. Geopeko Anomaly E.
2. Qhy — active dune, beach sand and gravel. Discrete magnetic high at 308 400 mE; 5 477 100 mN — unknown — Tb or part TAG trend to north.
3. Qgi — probable strand lines — picked out by faint arcuate magnetic and radiometric trends — 307 200 mE; 5 471 300 mN.
4. NNE-trending mag for 8 km, coincident with Esb mapped at 310 300 mE; 5 482 000 mN — should hit Woolnorth Road at 311 300 mE; 5 486 000 mN — facing east into synclinal axis.
5. **First magnetic horizon above Esd, synclinally folded — could be checked in the Welcome River at 311 700 mE; 5 481 200 mN and in tributary at 313 000 mE; 5 480 000 mN. UNKNOWN, Geopeko Boggy Creek Anomaly.**
6. **Second magnetic horizon above Esd, synclinally folded — could be checked on Woolnorth Road at 313 550 mE; 5 484 000 mN and at 315 350 mE; 5 483 150 mN — outcrop of Scopus Formation in Welcome River at 313 000 mE; 5 481 100 mN if correct separates the two horizons with obvious stratigraphic implications. UNKNOWN.**
7. **NW-trending magnetic linear at least 10 km long — one of a number — could be checked on Woolnorth Road at 309 400 mE; 5 487 700 mN and 312 000 mE; 5 485 600 mN with creek, and 315 350 mE; 5 483 150 mN as at 6 above — possibly a basic dyke along fault with 3–3.5 km sinistral movement. UNKNOWN, Geopeko Anomaly D.**
8. Tbps — Studland Bay basalt and pyroclastic rocks — magnetic response at 305 000 mE; 5 486 000 mN.
9. Tbpm — Marrawah basalt and pyroclastic rocks — magnetic response centred on 306 000 mE; 5 467 000 mN.
10. Redpa — Ess sediment — low intensity NNW magnetic trend — in sedimentary rock or basic lava? At 313 000 mE; 5 465 000 mN and to southeast, facing is to southwest where lies the synclinal axis with Esd in MHA. Redpa drilling and outcrop. UNKNOWN.
11. Pro orthoquartzite, discrete magnetic high at 312 000 mE; 5 460 000 mN. Also NNW subdued magnetic trend coincident with Ess over Ecb at 313 000 mE; 5 460 000 mN? No Esb mapped so check. Facing to northeast here into tight synclinal axis. Small magnetic high at 313 500 mE; 5 458 800 mN also. UNKNOWN, access Fairview Road.
12. NW magnetic trend — possible western limb of TAG syncline under Tb and its seaward extension — check beach under Tl at low tide at 305 000 mE; 5 469 000 mN, notice Ef in corner of beach. UNKNOWN.

ROCKY CAPE MAGNETICS

13. **Discrete magnetic high at Richardson Flats at 307 000 mE; 5 459 000 mN on Qha. UNKNOWN.**
14. Minor discrete magnetic high on edge of main E-W magnetic linear in Proterozoic siltstone Prm at 306 700 mE; 5 461 000 mN. UNKNOWN.

14A. Strong E-W magnetic linear in Pro (orthoquartzite) intersected by the Arthur River Road at 303 600 mE; 5 462 200 mN over about 400 m. UNKNOWN.

14B. Above linear hits coastal platform at 300 700 mE; 5 462 300 mN in Prm siltstone over about 400 m. Prm(c) looks anomalous in this position (possible faulting?) as does Ef along beach to north. Cuffeys Creek may provide traverse down to beach. UNKNOWN.

14C. Same linear to east as it curves to south in Prm at 308 800 mE; 5 460 400 mN, access Linnanes Road. UNKNOWN.

14D. Subsidiary magnetic linear to south — part of tram tracks to south — in Prm to south at 308 900 mE; 5 459 800 mN, access Linnanes Road. UNKNOWN.

14E. Subsidiary magnetic linear E-W to north and coincides with fault (Pro against Prm) on Arthur River Road at 303 600 mE; 5 463 300 mN. UNKNOWN.

14F. Above linear hits coast and islands at West Point in Pro at 299 000 mE; 5 464 600 mN, access by West Point Road in Aboriginal site. Doctors Creek also cuts this trend. UNKNOWN.

14G Magnetic linear further north — part of the tram track system — lying in Pro on coast at 300 300 mE; 5 466 000 mN; at West Point Road branch at 301 450 mE; 5 465 450 mN; and on Arthur River Road at 303 750 mE; 5 464 600 mN. UNKNOWN.

14H. Subsidiary magnetic linear cutting Arthur River Road at 303 712 mE; 5 464 613 mN.

SMITHTON BASIN MAGNETICS

15. **Prominent NNW magnetic trend in Ess leading off to covered areas in north along Hays Tier — no Esb known — so why magnetic stratigraphy?**

Access from Bass Highway to 314 800 mE; 5 466 000 mN and possible site across from Redpa at 313 650 mE; 5 468 000 mN. Anomaly C Geopeko. UNKNOWN.

16. Discrete magnetic high in Eds (dolomite) covered by Quaternary at 325 500 mE; 5 473 250 mN — FJ anomaly of Geopeko (TCR 84-2148) — in tea tree swamp. UNKNOWN — basaltic?

17. Cluster of three magnetic highs due to Tbv in Scopus Formation at 326 500 mE; 5 465 000 mN — Anomaly F Pawnbrokers – Geopeko EL 7/1983 and 8/1983.

18. Subdued magnetic high in Prm siltstone in centre of the Harcus Dome at 317 400 mE; 5 475 650 mN. UNKNOWN — access by Buckbys Road.

19. Small N-trending discrete magnetic high in Esb at 323 412 mE; 5 477 807 mN. Geopeko Anomaly G. UNKNOWN.

20. As above, NNW trending in Esb at 320 046 mE; 5 480 692 mN. Geopeko Anomaly GM. UNKNOWN.

20A. Scattered magnetic response at 317 869 mE; 5 479 561 mN due to Tbv on Harcus Hill — two other responses to east at 319 170 mE; 5 479 617 mN and 320 103 mE; 5 479 363 mN. UNKNOWN — probably basalt.

21. Discrete magnetic high in Scopus at 332 500 mE; 5 459 800 mN, at SE end of magnetic alignment, mapped on 1:250 000 scale map as Tb. UNKNOWN.

21A. Discrete magnetic high at 331 600 mE; 5 462 000 mN — UNKNOWN. Some Tb with magnetic response some 1 km to NW.

21B. Discrete magnetic high at 330 400 mE; 5 463 600 mN — UNKNOWN. Some Tb with magnetic response some 1.5 km to north.

22. Parallel and faint NNW magnetic linear to east of 21 also crossing Scopus Formation and close to road at 334 400 mE; 5 462 000 mN — UNKNOWN.

23. Discrete magnetic high at 337 500 mE; 5 467 900 mN and others near Duck River — Cultural — UNKNOWN.

24. Spot magnetic high at 337 700 mE; 5 470 000 mN as above. UNKNOWN.

25. Large, deep? magnetic anomaly, NNE trend near Edith Creek, centre at 339 000 mE; 5 465 500 mN, Pld at depth of 21–27 m under Quaternary cover: is response coming from Esb at depth under Pld? UNKNOWN — unsolvable from surface.

26. Spot magnetic high in Scopus Fm at 329 800 mE; 5 459 500 mN — UNKNOWN (Tb?).

27. Discrete magnetic low? in Scopus Formation at 326 700 mE; 5 469 300 mN — Unknown (Tb?). Between two Tb anomalies on WNW alignment.

28. Seventeen Mile Plain structural anomaly centred at 320 000 mE; 5 472 000 mN — implies thicker or more flat-lying Smithton Dolomite Eds — so good exploration target.

29. Christmas Hills basalts with magnetic response with satellite highs at: (a) spot high at 330 600 mE; 5 471 900 mN near a NE-trending magnetic linear, and (b) a doublet magnetic high at 332 300 mE; 5 472 000 mN — UNKNOWN probably Tb.

30. Proterozoic dolerite/gabbro dykes on prominent WNW magnetic trend at Lake Mikany at 346 600 mE; 5 473 000 mN mapped in dome. Check and measure SI ($\times 10^{-3}$) units.

31. WNW magnetic LINEAR accessible at 326 900 mE; 5 477 100 mN on Barcoo Road and 332 000 mE; 5 474 000 mN on railway formation. UNKNOWN.

32. As above but different LINEAR accessible at 327 600 mE; 5 479 000 mN — over about 700 m of road. UNKNOWN.

33. Other LINEARS near Scopus and Cuba roads at 335 000 mE; 5 478 300 mN and east and ?under at Smithton Dolomite quarry near 339 000 mE; 5 476 000 mN.

34. Esb basic rocks in Togari Group? — possible extensions of basic lavas in Coventry Creek area at 343 000 mE; 5 471 000 mN. UNKNOWN.

35. Esb again on edge of Smithton at 343 500 mE; 5 478 000 mN or closer to road.

ROCKY CAPE (COWRIE SILTSTONE)

36. Magnetic linear, NE trend in Rocky Cape Group near 355 000 mE; 5 474 000 mN on road east of South Forest. UNKNOWN.

37. As above at 352 500 mE; 5 468 400 mN near Boat Harbour fault but access?

38. NNE magnetic LINEAR — Tipunah Road access near Kellys Knob at 351 700 mE; 5 467 000 mN. UNKNOWN.

39. As above but fainter linear at 352 500 mE; 5 465 400 mN on road with CPd dykes mapped.

40. NNE magnetic LINEAR — on road near Gibson Plain at 349 000 mE; 5 460 400 mN. UNKNOWN.

41. Twin magnetic highs at 351 600 mE; 5 460 400 mN and 351 900 mE; 5 461 000 mN, access from road at 351 300 mE; 5 460 000 mN. UNKNOWN, probably Tb.

42. LINEAR at Wedge Plains Road at 347 300 mE; 5 457 000 mN.

43. LINEAR at Tayatea Road at 346 000 mE; 5 453 400 mN.

44. LINEAR at Milkshake Road at 344 500 mE; 5 449 900 mN.

45. LINEAR at Milkshake Road at 343 400 mE; 5 449 000 mN.

45A. LINEAR at Milkshake Road at 343 400 mE; 5 448 100 mN.

46. Spot magnetic high on WNW magnetic linear in Eds covered by Quaternary at 331 200 mE; 5 451 900 mN. Cultural or otherwise? UNKNOWN. Percussion drilled by Pacific Nevada (BU001 to 23 m; closed file).

47. Elongate/doublet magnetic high in Eds covered by Quaternary at 330 100 mE; 5 450 500 mN, cultural unknown? Both this and 46 sit on some subdued magnetic texturing against and running north into the RR fault, compare Edith Creek 25 and Smithton. Deep response caused by Esb? Percussion drilled as above by BU002 and 003 to 21 m and 25 m respectively. As EL14/97 (TCR 99-4323).

48. Radio counts at 333 000 mE; 5 455 000 mN more typical of the Keppel Formation than the dolomite but is this due to shallow Keppel or soil from Keppel derived from adjacent scarp?

49A. Hunter Island — JB, Cuvier Bay radio high in Cowrie Siltstone at 309 000 mE; 5 515 000 mN. Unknown — possibly granite (with magnetic high just to east at 310 000 mE).

49B. Also radio high near 310 000 mE; 5 520 000 mN on coast to north of Cuvier Bay in Rocky Cape quartzite and odd ones at the cave bay, east coast.

50. Keith River Gossan zone — centre of anomaly at 368 000 mE; 5 438 000 mN. Drill holes KR1 and 2 — dolomite, siltstone, shale and quartzite of Pam, part of AMC. Siltstones contain magnetite and pyrite bands in well bedded pale green siltstone and occasional amphibole dyke. Mag bands up to 300 mm thick in KR2.

51A. Spot magnetic high in Ess/Psvw Keppel Formation near road at 326 500 mE; 5 447 200 mN.

51B. As above in Psvw against (fault) Black River Dolomite.

52. 328 500 mE; 5 444 600 mN on road bend, crossing WNW magnetic trend in Ess Black River Dolomite, may connect up trend crossing synclinal structure.

53. Spot magnetic high at 322 600 mE; 5 440 200 mN.

54. Frankland River bridge at Blackwater Road — main trend reported by M. Roach as having mineralisation under bridge at 321 700 mE; 5 438 300 mN in Balfour Subgroup, chloritic siltstone to mudstone from map — consider walking river looking for magnetic rocks.

55. Tsgs at Esb contact with hematitic ironstone Pswri close by outcrop, magnetic and radiometric high in Tsgs at 322 400 mE; 5 451 700 mN, may be difficult to access — off Chromite Road.

56. Radiometric anomaly at 343 000 mE; 5 458 000 mN in Pssc chert and dolomite in Black River.

57. Does Prcb run north with a radiometric trend following 'fault line' magnetic trend on its western edge — check this north from 350 000 mE; 5 460 000 mN.

ROCKY CAPE MAGNETICS

60. Composite magnetic high at 307 123 mE; 5 456 719 mN.

61. Tram track magnetics before swing west (1 km apart) at 311 422 mE; 5 457 818 mN.

62. NNE-trending tram tracks meet WNW trend 1 km apart at 310 922 mE; 5 452 820 mN.

63. Western part of doublet magnetic high on NNW trend at 313 421 mE; 5 447 322 mN.

64. Part of above , separated to southwestern part at 314 321 mE; 5 446 222 mN.

65. Part of WNW magnetic linear at 314 821 mE; 5 450 121 mN.

66. Other part of same WNW magnetic linear at 317 620 mE; 5 450 121 mN.

67. Togari trend NNW 314 921 mE; 5 456 520 mN.

68. Togari Group on other limb of syncline at 317 720 mE; 5 458 518 mN.

RADIOMETRIC RESPONSE

Rocky Cape west near Marrawah

- Prm siltstone high/white, Pro orthoquartzite subdued;
- Tb Marrawah basalts — blue/green moderate response;
- Mt Cameron West — bright red;
- Esb–Ess about the same although Ess gets white at times, but at Trowutta Ess blue green and Esb dark subdued;
- Quaternary sand cover — low response, dark.

Cameron–Mella–Togari — Total counts

- Quaternary at Togari and Brittons Swamp — blue green to white — explain at 322 000 mE; 5 467 000 mN and 329 000 mE; 5 466 000 mN. Why?
- Quaternary at Smithton and Duck River in reds 335 000 mE; 5 477 000 mN. In green/blues at 336 000 mE; 5 473 000 mN. In whites at 335 000 mE; 5 461 000 mN and 338 000 mE; 5 461 000 mN —shallow cover, or clay spread by creeks or wind from scarps?

Roger–Sumac–Dempster

- Salmon River siltstone — low response.
- Classic white response at 336 000 mE; 5 459 000 mN over Quaternary — coming from Duck River presumably — another at 328 000 mE; 5 448 000 mN where Arthur River cuts low plain.

Along SW to #48 blue/green response over Quaternary 330 000 mE; 5 455 000 mE — coming off scarp?

- Near Trowutta — good distinction between Esb and Ess (Keppel Formation) sedimentary rocks. Ess

blue/green Esb more subdued — but when horizons are very narrow can't tell them apart.

- Black River Dolomite — subdued.
- Cowrie siltstone — good response in blue, white, reds.
- Sil Eds (Smithton dolomite) — black response.

J Bishop Radiometrics

- Area 1 — high at 303 500 mE; 5 463 100 mN (List 14E).
- Area 2 — large radiometric high at 328 000 mE; 5 448 500 mN; Arthur River.
- Area 3 — near coastal high at 307 000 mE; 5 435 000 mN (List 69).

Spikes thought boobs

Two discrete magnetic highs at 361 800 mE; 5 447 800 mN and 363 300 mE; 5 448 900 mN — cause unknown basalt? — in Prc pyritic siltstone, Rocky Cape Group separated by Arthur River; difficult to get to from Rabalga track. Tb basalt lava or possible plug at 366 000 mE; 5 447 000 mN with Tbuh nepheline hawaiite.

Targets of opportunity

Radiometric highs with possible mineralisation at Couta Rocks (List 70), Sarah Anne Rocks (List 71), Sundown Point (List 72).

[28 February 2002]

APPENDIX 2

WTRMP Area 3 — Field notes — NW Tasmania

FIELD TRIP — 6–15 February 2002 (J. B. Hooper, assistant)

(all magnetic susceptibility (ms) measurements expressed in SI units × 10^{-3}).

DD 1 (List 15)

Hays Tier, near Redpa — NNW prominent magnetic trend in Ess sedimentary rocks — no Esb basalt mapped so why mags?

Access by forestry track from Bass Highway (at 316 450 mE; 5 464 500 mN into plantation. Track along ridge with no outcrop (o/c) — good laminated siltstone road base (not magnetic), float in plantation is cleaved siltstone (plus odd fragments vein quartz) presumably from bedrock, at 314 712 mE; 5 466 003 mN lateritic/maghemite? gravel to 2 mm, magnetic susceptibility (ms) 3.3, 4.78, 4.0 (× 10^{-3} ms units). Sample R011101. Further lateritic gravel along ridge with cavities and hollow forms. End of track at 314 961 mE; 5 466 137 mN with old car body. Larger laterite gravel, magnetic susceptibility 1.6, 2.5 (List 15A).

Access via Redpa by farm track to traverse of Hays Tier further north. Traverse begins 313 050 mE; 5 467 650 mN at unpassable bridge and runs along old rail bed along edge of creek to 314 200 mE; 5 468 191 mN. Some sedimentary o/c in cuttings along track, arkosic sandstone with upright cleavage on western edge of Tier at break of slope (ms 0.4 av.) but rapidly becomes biscuit coloured siltstone for rest of traverse with some minor quartz veining towards the end (ms 0.2 av.). Climb onto top of forested tier from edge of creek but no o/c there or in creek and no sign of laterite (List 15B).

Orientation stop on Bass Highway on Bond Tier — 317 175 mE; 5 464 475 mN — Ess shale, argillite, siltstone (oxidised), cleavage steep and variable. Ms 0.03–0.53, av. 0.29. East end of road cutting has a dome shaped pod of altered ?tuff (basic), now clay with silica veinlets. Ms 0.8, 1.6, 0.8. (List 15C).

As above at 316 077 mE; 5 464 128 mN — Hay Tier on road — Ess cleaved siltstone, upright cleavage, bedding dips shallow east at one point. Ms 0.22–0.37, av. 0.28 (List 15D). Outcrops on road cutting to east, some coarser mg quartz sandstone with some east dipping quartz veins less than 30 mm thick. Ms 0.01–0.30, av. 0.21.

Cause of magnetic anomaly unknown but possibly laterite on siltstone bedrock on ridge tops; poor outcrop.

DD 2 (List 14)

West Point, Marrawah — strong curvilinear magnetic trend, WNW curving to W as it runs out to sea; some smaller and discontinuous, W and WNW magnetic trends.

298 895 mE; 5 464 478 mN (List 14 F) — on the coast right on West Point — in Rocky Cape (RC) orthoquartzite Pro, bedding dips 30–40° SE, ms 0.01–0.03 non magnetic, no obvious mineralisation, veining, alteration or rock type change.

300 347 mE; 5 466 007 mN (List 14G) — next bay north of West Point — in orthoquartzite as before but with 1–2 m thick shear or breccia zones. Shear zones have leached boxworks in quartz and red hematite? Sample 102.

Traverse south along coast from West Point (List 14B) — begins at 299 450 mE; 5 464 450 mN in orthoquartzite Pro then along to Forrest Conglomerate on next headland crossing subsidiary magnetic high, no exposure due to sand. Conglomerate Ef — NW dipping coarse conglomerate with sandstone layers. Clasts are angular, orthoquartzite plus some carbonate. Ms 0.02–0.05, av. 0.03. Conglomerate sits with angular unconformity on RC maroon siltstone Prmc, east dipping with fine sandy layers (turbidites?) and some convolute bedding. Ms 0.08–0.1, av. 0.09.

Next headland (300 426 mE; 5 463 165 mN) — Pro, N dipping, bedded quartzite with some cross bedding, ms 0.00–0.04, av. 0.03.

Next headland (300 611 mE; 5 462 711 mN) — Prmc, finely bedded green siltstone, right way up on convolute bedding truncations, ms 0.11–0.19, av. 0.15, just to north of major magnetic linear.

Next outcrops (300 735 mE; 5 461 951 mN) — Prm, well bedded, pale green to grey siltstone with occasional sandstone beds, sometimes lenticular and discontinuous. Ms 0.04–0.13, av. 0.08, just to south of major magnetic linear. Reef outcrop mapped as Prm on flank of linear too far offshore to check. Some 20 m south, red isolated outcrop 10 m long of red shale with quartzite interbeds, strikes 030 mag and dips 56° to NW, ms 0.02–0.23, av. 0.15.

Next major outcrops (300 741 mE; 5 461 000 mN — Prm, well bedded sandstone/siltstone (av. ms 0.14) and occasional orthoquartzite (av. ms 0.04).

Major headland near house (300 689 mE; 5 461 338 mN) — Pro, bedded orthoquartzite unit in cliff 20 m high, ms av. 0.04.

End of Traverse

301 431 mE; 5 465 511 mN (List 14H) — West Point track intersection — low orthoquartzite pavements to NE but ms 0.02 best value. Black basalt? gravel in road base gives ms 0.7–1.3, av. 0.99. Sample 103. Most of this

anomaly follows track east to Arthur River Road so may be partly cultural?

303 712 mE; 5 464 613 mN (List 14H) on Arthur River Road — low ridge in orthoquartzite + quartz vein stockwork, ms 0.00–0.11, av. 0.03.

303 537 mE; 5 463 010 mN — west of highway (List 14E) — radiometric anomaly on mapped Prm siltstone (metapelite?) exposed in gravel pits, up faulted into Pro (N–S road also shows up due to flooring with siltstone) — WNW magnetic linear corresponds with mapped northern fault. 303 692 mE; 5 462,943 mN — east of highway — pelitic sediments in floor of quarry taken out for road metal. Sample 104. Pelite ms 0.00–0.06, av. 0.03. Quartzite forms east wall of quarry as a vertical fault plane on 030mag strike, ms 0.03–0.05, av. 0.04. Pelite layers strike 020mag, dip16° to W. Fabric of fault and dragged beds indicate last movement as east-side-up.

Arthur River Road at 303 579 mE; 5 462 198 mN — big E-W magnetic linear structure crosses road (List 14A) — poor outcrop in Pro orthoquartzite — northern o/c ms 0.02–0.04, av. 0.03, central o/c ms 0.02–0.05, av. 0.03. Quartzite ridge near kelp factory, ms 0.00–1.10, av. 0.32. Trace ferruginous nodules on surface of rocks, also disseminations, irregular and isolated and vein forms at 303 749 mE; 5 462 319 (Sample 105). Travel south on intermittent o/c, more ferruginous spots and boxworks, ms 0.11 max. then S to ms 0.04 max. but still with occasional spots.

Cause of magnetic linears is still unknown — no obvious rock type on surface. May be related to deep mineralisation showing some trace on surface in poor outcrop or somehow associated with faulting or perhaps due to deep Precambrian dolerite.

DD 3 (List 69)

Near Temma — radiometric anomaly — centre at 306 850 mE; 5 434 650 mN on dairy farm. Coincident with ridges of dark laminated metapelite visited at 306 622 mE; 5 434 431 mN where bedding strike is 155 mag and dip 46° to SW. Ms 0.28–0.60, av. 0.44. Brown laminations are 1.06 ms. Some o/c with numerous quartz veins less then 50 mm thick, some contorted into 'chicken guts' refolds. Sample 106.

Temma Harbour — 306 301 mE; 5 432 859 mN — bedded siltstone and sandstone to 1 m thick — siltstone has fine bedding laminations from mm to cm scale, also with lenticular to discontinuous sandy beds (possible distal turbidites?). Ms 0.09–0.19, av. 0.14, not unduly magnetic but with good radio signal.

Couta Rocks — 305 031 mE; 5 439 525 mN (List 70) — laminated siltstone with sand interbeds up to 1 m thick — distal turbidites? — upright facing on loads, flutes also dewatering structures? Beds –055 mag strike, 34° NW dip. Siltstone, ms 0.16–0.35, av. 0.27. Quartzite ms 0.04–0.16, av. 0.09. Radiometric high but best mags may be in next bay north.

Sarah Anne Rocks — 304 854 mE; 5 441 011 mN (List 71) — siltstone with v fissile bedding, almost slate — 320 mag strike, 81° NE dip, numerous pyrite concentrations and cubes. Ms 0.190–0.1.45, av. 0.50. Off edge on both magnetic and radiometric highs.

Sundown Point — 304 080 mE; 5 445 179 mN (List 72) — uniformly dipping beds (strike 112 mag, 20° N dip) in siltstone, some lenticular fg sandstone layers. Syngenetic pyrite and limonite cubes. Ms 0.01–1.54, av. 0.63. Moving north beds fold gradually in very open synform (strike N-S mag, dip W 16°), then turn over to north dipping on farthest point 304 321 mE; 5 445 384 mN where they are intruded by igneous dyke of ms 0.37–0.54, av. 0.46. Good radio response but no mags.

Radiometric highs due to the Rocky Cape siltstones which have more clay and mica than the orthoquartzite.

DD4 Tipunah Road Anomaly — Cowrie Siltstone Tayatea Road Traverse (List 43)

345 850 mE; 5 453 655 mN — flat lying pyritic siltstone, black to green laminations, strike 135mag, dip 8° NE. Ms 0.09–0.19, av. 0.16. Iron staining on road cutting.

345 904 mE; 5 453 583 mN — siltstone beds more massive with occasional iron stained, pyrite beds to 10 mm thick. Ms 0.17–0.24, av. 0.21. Strike 120mag, dip 12° N. Cleavage on east end road cut strike 010mag, vertical.

345 961 mE; 5 453 529 mN — poor outcrop near centre of NNE magnetic anomaly, siltstone cleavage fragments and rubble, ms 0.13–0.18, av. 0.15. On east side of anomaly, banded siltstone float and subcrop on verge. Ms 0.22–0.24, av. 0.24. (road base is basalt or fg dolerite at ms 2.6).

346 534 mE; 5 453 739 mN — bedded siltstone in road cut, strike 300mag, 6° NE dip. Ms 0.19–0.29, av. 0.24.

No obvious cause of magnetic anomaly; Pistol Apiary Siltstone picked out by radiometric anomaly above Cowrie Siltstone background.

Milkshake Road Traverse (List 44)

344 278 mE; 5 449 627 mN — thick bedded quartzite with thin pelite partings in road cut, strike 025mag, dip 27° SE, ms 0.06–0.12, av. 0.09. Sample 108 — spotted pelite towards centre of magnetic anomaly at 344 400 mE; 5 449 750 mN.

344 461 mE; 5 449 842 mN — centre of magnetic anomaly at mapped dolerite dyke. Oxidised o/c of orange-brown to brick red dolerite Pmd, relict textures preserved. Ms 0.44–14.3, av. 4.45. Other side of spur line ms 0.23–17.6, av. 5.71. Sample 109 — oxidised dolerite and spotted pelite on contact (local hornfels effect ?, pseudomorphs after andalusite?).

344 781 mE; 5 450 018 mN — oxidised siltstone float and sub o/c particularly towards end of traverse. Sample 107 — spotted pelite (local hornfels effect?).

Pmd dolerite is a possible cause of the magnetic anomaly at this locality.

Milkshake Road Traverse (List 45)

343 371 mE; 5 448 906 mN — southern side of mapped dolerite dyke at contact. Ms Pmd 0.01–16.9, av. 3.0. Sediments — spotted arenite — strike 045mag, 41° SE dip. Ms 0.08–0.13, av. 0.11.

Dolerite dyke at N contact — Ms 6.27–15.0, av. 10.0. Sedimentary rocks ms 0.03–0.21, av. 0.13. Strike beds 355mag, 21° W dip. Then folds down to SE as at the southern contact before resuming attitude. Dyke measures 33 m along track. Spotting in sedimentary rocks on both sides of dyke.

Pmd dolerite is possible cause of the magnetic anomaly at this locality. There is also some folding and possible faulting.

Milkshake Road Traverse (List 45A)

343 448 mE; 5 448 097 mN — Traverse eastern track from junction to 343 805 mE; 5 448 204 mN where small scrape reveals black shale beds strike 130mag, dip 44° SW. Ms 0.04–0.11, av. 0.06. Poor o/c along track.

Traverse southeastern track to 343 396 mE; 5 447 770 mN — white jointed sedimentary blocks and irregular shapes in brown matrix, may be sedimentary breccia or tectonic melange, some upright shearing. Ms 0.02-0.04, av. 0.03. Otherwise, sparse o/c in siltstone, no bedding readings and no dolerite seen.

On track on way back to 45 just past track 45A at 343 46 mE; 5 448 313 mN. Red soil on bank with sandstone blocks and possible dolerite rubble coming down slope. Ms 0.1–9.4, av. 3.64.

No obvious cause of magnetic anomaly but possible dolerite float observed and also possible tectonic disruption. Unknown.

Wedge Plains Road Traverse (List 42)

347 125 mE; 5 456 277 mN in gravel pit east of road — buff coloured siltstone with quartz veins. Bedding 040mag strike, 16° SE dip. Broken fabric in places with quartz blocks in siltstone but not good outcrop. Ms 0.04-0.07, av. 0.05.

Bedding in hard grey to dark siltstone rib in road bank, strike 025mag, 30° NW dip, ms 0.1-0.2, av. 0.15. Above it is the buff siltstone and above that the hard quartzite in the slope of the pit. Sample 110 — unusual discoidal sedimentary concretion or nodule.

In gravel pit to west of road, bedding in blocky siltstone in cut, strike 038mag, 22° NW dip. Ms 0.09–0.22, av. 0.15. To far west of road, black carbonaceous shale and black to green banded, pyritic, siltstone sub crop. Ms 0.04–0.23, av. 0.12.

347 392 mE; 5 456 759 mN — buff siltstone with bedding at strike 025mag, dip 35°SE. Ms 0.01–0.15, av. 0.07.

Centre of magnetic anomaly — 347 289 mE; 5 457 029 mN — basically no outcrop on track, sparse black shale float with some pyritic veins and boxworks. Ms av. 0.08.

348 444 mE; 5 455,729 mN — black pyritic shale.

350 635 mE; 5 458 463 mN — black shale, also possible small oxidised mafic intrusion, best ms 0.17.

352 512 mE; 5 458 459 mN — Apiary Road, fresh green dolerite with red soil. Ms 0.35–12.1, av. 6.35. Sample 112.

No obvious reason for magnetic anomaly here, possible evidence for tectonic disruption.

Also the Pistol Apiary (Prcb) siltstone outlines defined by the radiometric response above the Cowrie Siltstone background can be extended north, the western edge at least to 349 000 mE; 5 460 000 mN.

Tipunah Road Traverse (List 38)

351 680 mE; 5 467 181 mN — 50 m SE along road — oxidised, dolerite rubble in side of track. Ms 0.01–8.52, av. 2.47, Sample 111.

Evidence that Pmd dolerite is coincident with magnetic anomaly.

Gibson Plains track (List 40)

348 943 mE; 5 460 419 mN — dolerite/siltstone contact in cutting with oxidised, brown red, dolerite rubble over 50–100 m along track. Ms 3.26–15.0, av. 9.91. Sample 113.

Evidence that Pmd dolerite is coincident with magnetic anomaly.

Arthur River section of Tipunah Road anomaly

Traversed spur line from Milkshake Road and dropped down to river through jungle, no o/c other than quartzite/siltstone. Slope debris contained no basic rocks but some spotted pelite. Climbed out but got lost and eventually regained track which has minimal outcrop. No dolerite seen but possible thermal effects disclose its proximity.

DD 5 Woolnorth–Smithton Basin rocks

313 550 mE; 5 484 000 mN (List 6) — upper magnetic horizon above Eds — west limb of syncline. Flat plain with dairy farms — no outcrop in drainage ditches — 200 mm layer of sandy soil with basaltic pebbles over 300 mm sand.

Traverse from Red Marsh Road across dairy paddocks to toe of syncline at 313 350 mE; 5 481 750 mN in flat pasture with indeterminate drainage with no o/c. Then south to Welcome River and west along river in paper bark trees to locate mapped Cambrian Scopus Formation Csc o/c at 313 000 mE; 5 481 100 mN. Ms 0.2–0.31, av. 0.21. Strike of schistosity? 043mag, dip 41° NW. Other schistose o/c across river 20 m west with ms 0.15–0.27, av. 0.22. Sample 114 from both o/c – lithic wacke? (quartzite, quartz or other flattened grains — volcaniclastic?).

315 350 mE; 5 483 150 mN — conjunction of mag linears on Woolnorth Road — no o/c. Basic volcanic (plagioclase phyric) among other occasionally angular

blocks in gutter, ms 16.3–29.9, av. 23.1, almost certainly exotic, sample 115.

316 100 mE; 5 483 000 mN — Harcus River on Woolnorth Road, banks are iron-stained sand on way to hard pan. No bedrock but bed load of angular basalt (plagioclase phyric) with ms 10.6–53.1, av. 32.6. Probably introduced during bridge building rather than natural.

317 561 mE; 5 483 500 mN — Horsepiss Creek on Woolnorth Road, sandy banks no o/c, big boulders of basalt? lying on bank certainly introduced for culverts.

309 461 mE; 5 487 658 mN (List 7) — NW trending magnetic linear crosses Woolnorth Road — no o/c — variety of rubble in gutter probably introduced. Basic rocks — basalt (Sample 116) with plagioclase phenocrysts, quartzite, hard pan.

311 200 mE; 5 486 400 mN — Welcome River traverse from Woolnorth Road towards sea — looking for intersection with NW magnetic linear — no o/c — banks of dark glutinous mud.

311 665 mE; 5 481 178 mN (List 5) — Welcome River traverse ending at bridge — where lower magnetic horizon above Eds intersects river. Massive mapped dolomite o/c in river at 311 219 mE; 5 481 300 mN, no fabric, no bedding (Sample 117 — light brown mg crystalline dolomite). Ms 0.02–0.04, av. 0.03. Some 20–30 m upstream, a few more o/c of dolomite, light grey, no fabric or bedding, ms 0.01–0.02, av. 0.02 (Sample 118). Proceed along river east to bridge but no o/c.

Traverse along upper Welcome River across folded magnetic structure (Boggy Plains anomaly of Geopeko) from 310 693 mE; 5 479 920 mN to 313 000 mE; 5 480 000 mN, no outcrops in river, basically a drainage ditch, other than hard pan layers and thick with scrub and cutting grass. Hard pan ms 0.01–0.04, av. 0.03.

No explanation for magnetic horizons and linears from surface mapping.

DD6 Smithton Basin rocks

330 632 mE; 5 446 300 mN — Kununah bridge over Arthur River, Cambrian Spinks Creek volcanics, ms 1.83–10.2, av. 3.54, good magnetic response. Sample 119 — dark grey, massive basalt with occasional green plagioclase/phenocrysts. Outcrops in cliffs show calcite/pyrite veining and on joint faces. Other basalt samples have amygdales and large? plagioclase phenocrysts (Sample 120).

DD 7 Rocky Cape rocks

321 729 mE; 5 438 304 mN (List 54) — Blackwater Road at Frankland River Bridge, finely bedded quartzite and siltstone Prbg in river platforms. Strike beds 302 mag, 60° NE dip, ms 0.12–4.97, av. 2.01. Downstream from bridge by 100 m, well-bedded quartzite with strike 330mag, dip 60° NE.

Upstream from bridge by 50 m, well bedded siltstone (Sample 121) with disseminated magnetite? Ms 5.28–10.6, av. 7.43. Big sample (122) from here also shows bedded siltstone with disseminated magnetite? mineralisation cross cut by veinlets of carbonate and sulphide? now limonitic? Ms 0.62–10.32, av. 5.59.

Magnetics associated with this stratigraphy presumably due to disseminated mineralisation — magnetite?

FIELD TRIP — 5–12 April 2002 (J. B. Hooper, assistant)

DD8 WNW magnetic linears

326 992 mE; 5 477 229 mN (List 31) — Barcoo Road gravel pit, exposures in bed of pit of Scopus shale, fg sandstone and pebbly sandstone, beds strike 010mag, dip 45° E; silica and ferruginous veinlets, 325 mag strike, vertical dip; Ms 0.05–0.28, av. 0.16. **No result**.

327 744 mE; 5 479 125 mN (List 32) — Barcoo Road — bedded fg sandstone/buff shale, some hard pan. Ms 0.12–0.16, av. 0.14. Further south at 327 314 mE; 5 478 680 mN — fg sandstone, some pebbly, beds strike 350 mag, dip 34° east; Ms 0.06–0.15, av. 0.11. Back to car then north and complete traverse at 327 934 mE; 5 479 288 mN with no further outcrop. **No result**.

329 615 mE; 5 478 353 mN (List 32A) — Williams Road — proceed to 330 223 mE; 5 478 003 mN only road base exotic boulders, can't find track to south; return to car and traverse south along track to 329 486 mE; 5 478 073 mN and complete traverse across linear but no outcrop. **No result**.

331 220 mE; 5 479 450 mN (List 33D) — no outcrop on centre of anomaly; proceed to 331 234 mE; 5 479 102 mN — Edwards Road gravel quarry — beds 010 mag strike, dip 57° W — green cleaved siltstone, banded and bedded — some sandy layers in places; Ms 0.26–0.41, av. 0.34; good exposures in Scopus on faces 20 m high; no obvious magnetic response or metamorphism but is off the magnetic linears. Some exotic basalt fragments in floor brought in as road base and on edge. **No result.**

332 564 mE; 5 479 636 mN (List 33B) — Cannels Road — centre of magnetic linear but no outcrop even in drainage trench near locked gate and pig farm. **No result.**

334 600 mE; 5 479 130 mN (List 33A) — unable to examine, farm property but owners not home. **No result**.

334 900 mE; 5 478 350 mN (List 33) — Cuba Road — grassy verges and no outcrop; 333 709 mE; 5 478 650 mN western intersection — private block with trains — grassy with no outcrop. **No result**.

339 700 mE; 5 475 500 mN (List 32B) — Bass Highway, Duck River bridge. Well bedded dolomite; beds strike 145mag, 26° dip to SW; beds up to 300 mm massive, others thin bedded, some with nodules. Ms 0.03–0.09,

av. 0.05. Sample 123 — bedded dolomite, 124 — nodule in dolomite. **No result**.

339 644 mE; 5 476 473 mN (List 33C) — Circular Head Dolomite Quarry — dolomite beds 165mag strike, 32° dip west, sample 140. Open folding on 120° mag trending axis with anticline to NE. Ms 0.01–0.07, av. 0.04. Three subvertical basic dykes up to 3 m wide in west wall of pit on upper benches trending about 105° mag. Small dyke in floor of pit on east wall is the freshest and was sampled (sample 141). Ms 0.41–13.10, av. 5.20 on lower dyke. Ms on upper dyke 0.79–10.9, av. 4.88. **Coincidence of WNW magnetic linears and basic dolerite dykes**.

346 900 mE; 5 472 mN (List 30) — Lake Mikany — east end of dam wall; dolerite/gabbro dykes on Smithton map; oxidised, mafic dykes preserved in clay — no fresh rock. Ms 0.1–0.34, av. 0.21. Magnetism presumably destroyed by alteration.

346 200 mE; 5 473 100 mN — west end dam wall; mafic dykes altered and lateritised, some kernels of original texture still preserved. Ms 0.11–0.52, av. 0.33. **Coincidence of WNW magnetic linears and basic dolerite dykes**.

328 564 mE; 5 444 473 mN (List 52) — Blackwater Road — mafic dyke identified in road cutting in Keppel Creek Formation sedimentary rocks; altered to clay with preserved textures; mag readings over 30 m of cutting obscured by papier maché veneer. Ms 2.05–10.1, av. 4.59. Magnetic structure runs through to Arthur River mouth. **Coincidence of WNW magnetic linears and basic dolerite dykes**.

DD 9 Keith River gossans

367 775 mE; 5 437 900 mN (List 50) — Farquhars Road and Prospect Track intersection — weathered, clay rich metasediment in track cutting; Ms 0.28–0.4, av. 0.33. 100 m along track to NE — fg siliceous siltstone, no bedding; Ms 0.15–0.25, av. 0.20. 100 m up side track to ridge top, cutting of siliceous quartzite/schist? Ms 0.05–0.10, av. 0.08.

368 104 mE; 5 437 957 mN — track intersection heading up ridge, gossanous rocks in cut and float from ridge, some banded with fresh sulphides; Ms 0.42–91.8, av. 19.84. Sample 129 — banded gossans with fresh sulphides; 130 — gossanous, limonitic boxworks after pyrite.

368 300 mE; 5 438 121 mN — old open cut overgrown with cutting grass; quartzite bedrock, odd gossanous rubble.

368 450 mE; 5 438 350 mN — end traverse at bend in track with oxidised, fg metasediment. Ms av. 0.08.

367 985 mE; 5 437 600 mN — on other track up ridge, open cut in metasediments. Ms av. 0.18. 100 m down ridge, gossans of limonite/hematite, no fresh sulphides. Ms 1.16–2.31, av. 1.8.

Main, southern part of magnetic anomaly probably due to sulphide-magnetite mineralisation of the Savage River type, as the enclosing sedimentary rocks and the limonite gossans are not that magnetic as shown by the Ms readings above.

DD 10 The Far Horizons (continued)

323 292 mE; 5 477 775 mN (List 19) — Buckbys Road Spur 15; Anomaly G Geopeko; mapped as sediments of Keppel Creek Formation but found to contain massive basalt; Ms 12.7–74.2, av. 36.6. Sample 131 — massive, dark green fg basalt; sample 132 — quartz, epidote-altered basalt. **Basalt gives magnetic signature to non-magnetic sediments**.

316 258 mE; 5 469 124 mN — Keppel Creek correlates in fresh road cutting; black and grey shale/siltstone; beds 015mag strike, 30° SE dip; cleavage 020mag strike, 54° SE dip.

313 148 mE; 5 469 973 mN (List 15E) — Jims Plain Road — basalt or dolerite float in area of red-brown soil but no o/c in cleared and wind-rowed plantation. Sample 133.

312 586 mE; 5 470 453 mN (List 15E) — spur off Jims Plain Road at intersection with woodcutter's bus; buff coloured siltstone rubble. Ms 0.23–0.26, av. 0.24. Anomaly C Geopeko.

On road running south, best magnetic section N for 100 m from 312 577 mE; 5 470 208 where o/c beds in sandstone and shale have 308°mag strike, 65°NE dip. Ms 0.45–4.04, av. 1.98. Best values in sandstone at 4.0, sample 134 — sandstone with sand layers minus quartz and may be basaltic tuff or volcaniclastic rocks? Associated chocolate-coloured soils give Ms 2.6, 2.73 and 2.3. Go north on track from intersection to end at 313 079 mE; 5 471 380 mN, no o/c anywhere. **Magnetic horizon may be due to sandstone/basalt tuff or volcaniclastic rock**. 312 809 mE; 5 472 268 mN (List 15D) — spur to west from Jims Plain Road and ends at AMG given, no o/c anywhere. **These horizons have a much smoother magnetic signature than the 'lumpy' character of those with massive basalt lavas**.

314 400 mE; 5 471 000 mN (List 15B) — Jims Plain Road — mapped massive basalt confirmed here. **Explains magnetic signature**.

314 470 mE; 5 472 300 mN (List 15A) — Jims Plain Road — at intersection, red/chocolate-coloured soils up to 18.7 Ms with best float at 1.82 ms of leached rocks with pseudo igneous texture in clays. Along strike at 314 462 mE; 5 472 967 mN — chocolate-coloured soils on ridge in windrow area give massive basalt rubble and purple lithic wackes. Basalt ms 0.82–13.1, av. 4.27; Sample 135. Wackes have ms 0.4–1.52, av. 0.75. Occurrence of basalt explains magnetic signature.

319 533 mE; 5 474 978 mN (List 18A) — Jims Plain Road — radiometric anomaly. Active gravel pit in Rocky Cape quartzite. **Anomaly presumably due to extensive clay veneer in base of pit**. Beds in quartzite 027 mag strike, 13° SE dip. Ms 0.02–0.19, av. 0.08. Sample 136 — black bituminous? substance in fault with splays in quartzite.

320 000 mE; 5 472 000 mN (List 28) — Seventeen Mile Plain structural anomaly — possible flat-lying Smithton Dolomite — **good exploration potential for large tonnages. Under threat from Reserve Nomination to exclude exploration**. Access attempted along Grunter Road but timber blockage at 323 200 mE; 5 474 400 mN.

DD 11 carbonates

312 801 mE; 5 463 637 mN — Redpa, King Property — main outcrops of Tertiary limestone — horizontal bedding in cavernous limestone — red and cream, recrystallised limestone with fossils. Sample 137. **No magnetism**, ms 0–0.05, av. 0.03.

312 967 mE; 5 462 760 mN — Redpa, Gunns plantation to south of Kings Road — hill of PC dolomite, capped by Tertiary limestone; dolomite bedding dips steeply east as on map. **Non magnetic dolomite** — ms 0–0.03, av. 0.02. Sample 138.

323 784 mE; 5 460 735 mN — Togari, Lee's property — greyish white dolomite outcrops along Montagu River; Sample 142. Ms 0–0.7, av. 0.04. Non magnetic but faint WNW magnetic linear runs through on aeromags heading for structural break in Togari Group to NW. **Probably a basic dyke signature**. Some laterite rubble by road is magnetic, ms av. 21 but has probably been brought in for track base.

DD 12 Rocky Cape (continued)

308 816 mE; 5 460 384 mN (List 14C) — Linnanes Road — part of arcuate magnetic signature — grass pasture in paddocks — no o/c. **No result — preferred explanation is deep dolerite dyke**.

308 745 mE; 5 459 864 mN (List 14D) — Linnanes Road — as above — pyritic siltstone in gravel quarry with boxworks and fresh pyrite cubes. Trend of o/c same as bedding which is 144mag strike, 42° NE dip. Ms 0.06–0.11, av. 0.09. **No result — as above**.

307 050 mE; 5 459 150 mN (List 13) — Richardsons Flat on Westmore Property. Isolated magnetic high. Flat featureless paddock in pasture with N-S drainage ditches. No o/c anywhere. Two concrete water tanks for stock 100 m apart on E-W line. Ms — on concrete 0.07–86, av. 15.72. Sample 139 is sandstone float at the site and is similar to sandstone bedrock dug up in dam about 200 m south of magnetic anomaly centre. Ms of sandstone is 0.05–0.07, av. 0.06. **Cultural magnetic anomaly presumably caused by reinforcing steel in concrete tanks**.

DD 13 Harcus Hill area

320 046 mE; 5 480 692 mN (List 20) — Geopeko magnetic anomaly GM — traverse 400 m SE along track from 320 430 mE; 5 480 793 mN. Basalt float and brown, maghemite-rich soil on edge of track. Ms av. 37.5. Traverse on spur line gives sediment and volcaniclastic with basalt and other lithic fragments. **Cambrian volcanic rocks in Crimson Creek correlates(Ess) produce magnetic signature**.

Attempts to get to two other magnetic responses at 319 170 mE; 5 479 617 mN and 320 103 mE; 5 479 363 mN (List 20A) blocked by thick regrowth bush and no forestry roading.

315 230 mE; 5 473 899 (List 15F) — Suunto Track intersection with Jims Plain Road — attempt to get out to Anomaly C Geopeko (the Far Horizons) to west on new forestry roads. Reach 314 201 mE; 5 474 675 mN just before road ends — laterite (ms 0.2–42.6, av. 23.1) and silcrete (ms 0.43) over oxidised basic volcanic rock (less than 1 ms). **Cambrian basalt defines magnetic horizon**. Try other track to west but it stops at 313 900 mE; 5 473 500 mN.

DD 14 Scopus Formation anomalies

326 700 mE; 5 469 300 mN (List 27) — discrete magnetic low? from Riseborough Road. Regrowth jungle and no access along tracks overgrown with cutting grass. Quarry in Scopus sedimentary rocks dipping east at 326 850 mE; 5 469 350 mN. Ms 0.21-0.25, av. 0.23. **No resolution**.

330 400 mE; 5 463 600 mN (List 21B) — discrete mag high from Brittons Link Road. Reached centre of anomaly — buff-coloured, oxidised siltstone in tree roots, no red soil or o/c. Drive along road to north by 400 m but no change in soil. **No explanation**.

331 061 mE; 5 462 379 mN — mapped Tb on Poilinna Road; chocolate coloured soil and basalt rubble. Ms 6.75–32.6, av. 15.01.

331 600 mE; 5 462 000 mN (List 21A) — discrete magnetic high from Poilinna Road; traverse to centre in open rain forest on edge of creek with pallid soil and clay and Scopus sediment in creek bed gravel. **No explanation**.

332 000 mE; 5 460 600 mN — discrete magnetic high from Poilinna Road; attempt to access by taking track to west but blocked by fallen timber at 332 296 mE; 5 460 436 mN. **No resolution in time available**.

DD15 anomalies on Duck River Flats

336 000 mE; 5 459 000 mN — high radiometric response around Duck River over the farm paddocks of Brodies Road where the river spills onto the Quaternary plains from the Roger River fault scarp. Also carries on down the Duck River becoming more channelised and outlines the drainage from the other tributary creeks — White Water, Birthday and Edith. Presumed to be due to **clay-rich overbank deposits** left after floods which bring down the clay from the Togari Group sedimentary rocks (Ess) exposed east of the fault scarp.

333 000 mE; 5 455 000 mN (List 48) — this radio response also presumed derived from **clay deposits**, this time supplied by the Roger River draining from the east. There is intermittent response of this nature along the whole scarp.

328 000 mE; 5 448 000 mN — also high radio response around Arthur River on farm paddocks down to the end of Jaegers Road, presumably for the **same reason**.

331 200 mE; 5 451 900 mN — magnetic high on WNW magnetic linear in young eucalypt plantation. Drilled by Pacific Nevada, BU001 to 23 m presumably in dolomite bedrock. **CLOSED FILE**.

330 100 mE; 5 450 500 mN — elongate doublet magnetic high in pasture paddocks along Leensons Road. Drilled by BU002 and 3 as above presumably to dolomitic bedrock. **CLOSED FILE**.

326 573 mE; 5 447 326 mN (List 51A) — spot magnetic high in Keppel Formation sedimentary rocks. Laterite on sediments, poorly exposed. **Laterite is magnetic**, ms 6.34–10.4, av. 7.65.

327 531 mE; 5 446 969 mN (List 51B) — spot magnetic high in Keppel sedimentary rocks faulted against Black River dolomite (Pssc). **Cause of magnetics not resolved**. Sand overlying Pssc over about 100 m along Blackwater 1 Road and in banks up to 3 m high. **Potential silica flour deposit, Sample 143**.

END OF FIELD PROGRAM

[18 April 2002]

APPENDIX 3

WTRMP Area 3 — NW Tasmania
Sample list — possible action

Sample	*Field description*	*Possible action*
011101	maghemite? nodules/laterite	none
011102	leached boxworks in orthoquartzite	base metals, major chemistry
011103	basalt, in road base	none, orientation only
011104	metapelite	T/S, chemistry
011105	orthoquartzite, ferruginous pseudomorphs	base metals (b/m), major chem.
011106	laminated metapelites	T/S, major chemistry
011107	spotted pelites, oxidised	none
011108	spotted pelites, oxidised	none
011109	oxidised dolerite	immobile elements
011110	siliceous concretion	T/S
011111	oxidised dolerite	immobile elements
011112	fresh green dolerite	T/S, chemistry
011113	oxidised dolerite	immobile elements
011114	lithic wacke/volcaniclastic?	T/S, chemistry
011115	basic volcanic, not in situ	none, orientation
011116	basic volcanic, not in situ	none, orientation
011117	light brown dolomite	T/S, major chemistry
011118	light grey dolomite	T/S, major chemistry
011119	plagioclase phyric basalt	T/S, chemistry
011120	amygdaloidal basalt	T/S, chemistry
011121	magnetic siltstone	PTS, chemistry, b/m, au
011122	veined, magnetic siltstone	PTS, chemistry, b/m, au
011123	bedded dolomite	T/S, major chemistry
011124	nodular dolomite	T/S, major chemistry
011125	magnesite, from K Pinner	T/S, major chemistry
011126	magnesian limestone from Pinner	T/S, major chemistry
011127	dolomite, from Pinner	T/S, major chemistry
011128	dolomite, from Pinner	T/S, major chemistry
011129	gossans/banded mineralisation	PTS, chemistry
011130	limonitic boxworks of above	PTS, chemistry
011131	massive dark green basalt	T/S, chemistry
011132	quartz, epidote altered basalt	T/S, chemistry
011133	basalt or dolerite float	T/S
011134	sandstone/volcaniclastic	T/S, chemistry
011135	massive basalt	T/S, chemistry
011136	black bituminous substance	identify
011137	Tertiary limestone	T/S, chemistry
011138	dolomite	T/S, chemistry
011139	sandstone	T/S
011140	dolomite	T/S, major chemistry
011141	dolerite dyke	T/S, chemistry, age dating
011142	pale grey dolomite	T/S chemistry
011143	silica sand	sieve analysis, chemistry

[2 May 2002]

APPENDIX 4

WTRMP Area 3 — NW Tasmania — List of field photos

2. Mt Cameron West volcanic centre; from beach at Marrawah (304 500 mE; 5 468 500 mN).

3 & 4. Bedded orthoquartzite, Rocky Cape Group; West Point, Marrawah (299 000 mE; 5 464 500 mN).

5. View of coastal traverse in Rocky Cape Group across magnetic linear; south from West Point, Marrawah (299 500 mE; 5 464 500 mN).

6. Forest Conglomerate resting with angular unconformity on Rocky Cape siltstone; coastal traverse from West Point, Marrawah (300 178 mE; 5 463 737 mN).

7 & 8. Well bedded, northwest-dipping siltstone, Rocky Cape Group; on coastal traverse from West Point, Marrawah (300 741 mE; 5 461 706 mN).

9. Red-brown, bedded orthoquartzite, Rocky Cape Group; at southern end of coastal traverse from West Point, Marrawah (300 689 mE; 5 461 338 mN).

10 & 11. Dark, laminated metapelites dipping southwest on radiometric anomaly; off road to Temma (306 622 mE; 5 434 431 mN).

12. Well-bedded siltstone, Rocky Cape Group; Temma Harbour (306 301 mE; 5 432 859 mN).

13. View east across pastures concealing synclinal toe in unknown magnetic stratigraphy, Red Marsh Road, Woolnorth Station (312 300 mE; 5 481 650 mN).

14. View north across pastures concealing west limb of syncline in unknown magnetic stratigraphy, Red Marsh Road, Woolnorth Station (313 250 mE; 5 482 200 mN).

15. View over pastures concealing WNW linear and other magnetic trends; Woolnorth Road (315 350 mE; 5 483 150 mN).

16. Thinly bedded, magnetic siltstone, Balfour Subgroup; Frankland River bridge (321 729 mE; 5 438 304 mN).

26. Three east-trending vertical dolerite dykes in upper benches of western wall of Circular Head quarry, Smithton (339 644 mE; 5 476 473 mN).

[4 June 2002]


Plate 2


Plate 3


Plate 4


Plate 5


Plate 6


Plate 7


Plate 8


Plate 9


Plate 10


Plate 11


Plate 12


Plate 13


Plate 14


Plate 15


Plate 16


Plate 26

APPENDIX 5

WTRMP Area 3 — NW Tasmania
Suggested additions to maps

1. Add fault to east of siltstone at 303 692 mE; 5 462 943 mN (List 14E).
2. Add oxidised dolerite rubble for 50 m along Tipunah Road at 351 680 mE; 5 467 181 mN (List 38).
3. Add oxidised dolerite rubble and outcrop over 100 m along Gibson Plains track at 348 943 mE; 5 460 419 mN (List 40).
4. Extend Pistol/Apiary siltstone, western edge north to at least 349 000 mE; 5 460 000 mN on radiometric response.
5. Add three dolerite dykes, west trending, thickest up to 3 m, at western wall of open cut at Circular Head dolomite quarry, Smithton at 339 644 mE; 5 476 473 mN (List 33c).
6. Add dolerite dyke to Blackwater Road sediments, 30 m thick with WNW trend at 328 564 mE; 5 444 473 mN (List 52).
7. Extend Cambrian basalts west to take in occurrence at 323 292 mE; 5 477 775 mN (List 19).
8. Add Cambrian basalt lens to this mapped sedimentary outcrop at 313 148 mE; 5 469 973 mN if thin section 133 checks out (15E in field notes).
9. Add Cambrian sedimentary outcrop to map at 312 586 mE; 5 470 453 mN stretching south to 312 577 mE; 5 470 208 mN, contains sample 134 which is a magnetic sandstone (basaltic tuff or volcaniclastic) coincident with magnetic horizon (15E in field notes).
10. Add Cambrian basalt lens to sedimentary outcrop on map from 314 470 mE; 5 472 300 mN to 314 462 mE; 5 472 967 mN (15A in field notes).
11. Add Cambrian basalt lens (lateritised) to magnetic trend at 314 201 mE; 5 474 675 mN (15F in field notes).
12. Possibly add laterite to Cambrian sediment at 326 573 mE; 5 447 326 mN (List 51A).
13. Possibly add silica sand over Black River Dolomite formation at 327 531 mE; 5 446 969 mN and for 100 m south along road. If the occurrence checks out to be normal Tsgs which is mapped to the south then add that coverage (List 51B).

[20 June 2002]

APPENDIX 6

WTRMP Area 3 — Geophysics — ground checking

Temma Area — mineral exploration

- Aeromagnetics show a number of magnetic highs, most running NNW, strongly discordant to bedding, in enclosing Proterozoic sedimentary rocks — sandstone, siltstone.
- Magnetic anomalies core drilled by Pickands Mather, 1967 (4 DDH — PG1, LE1, T301 and 302), then by CRA-GEOPEKO in 1982 at Possum Creek, Little Eel Creek and Strickland.
- Drilling has shown that the anomalies are due to magnetite-carbonate associated lodes with peripheral gold, silver and base metal values (Cu, Zn, Pb, As).
- Some anomalies examined in geophysical consultants report (Flagstaff Geoconsultants) in 1999.
- Pacific Nevada re-interpreted area as having promise for Au-hosted Proterozoic iron formations or iron-rich breccia zones and drilled three more DDH at Strickland.
- Drill core showed several substantial zones up to 12 m wide of sulphide-magnetite-siderite mineralisation — interpreted as discordant, steeply dipping, shear or fault zones with modest Cu and Au values —1.6 m at 2.2 g/t Au; 2.3 m at 1.01% Cu and less than 0.1 g/t Au and 7% pyrite.
- Planned drilling at Possum not completed.
- Most of the magnetic anomalies in this area have been named and partially investigated if not drilled.

Balfour area

- Not yet fully evaluated here but contains a series of NNW-trending magnetic highs from The Clump to the Interview River about 40 km.
- Contains a number of small deposits of discordant quartz-dolomite sulphide lodes (largest body is Murrays Reward, contained 0.5 Mt at 0.8% Cu).
- These transgressive lodes form a linear trend parallel to stratigraphy and lie close to the above prominent magnetic alignment.
- Most recent exploration was by CRA for sediment hosted Cu deposits by targeting possible low magnetic patterns where magnetite responses may have been destroyed by invading brines depositing sulphide minerals.

Montagu area

- Series of magnetic anomalies explored and named by Geopeko in early 1980s.
- Some had ground magnetics follow up on grid lines and some had auger drilling with anomalous geochemistry.
- Some of the above were on the Barcoo Road WNW magnetic linears interpreted as the Proterozoic dolerite/gabbro dykes.
- Two of the Barcoo Road linears (List 31 and 32) were auger drilled as anomalies DB2 and DB1. DB1 showed anomalous Zn, Fe, Ba and Ni over a coincident 800 nT anomaly and DB2 showed above background Zn, Cu, Fe and Ba over a weak magnetic anomaly of 250 nT. These linears were then interpreted as basic dykes (TCR 83-1950).
- Geopeko also developed a small ground magnetic grid and one line of auger holes over their Boggy Creek anomaly on the Woolnorth plains (TCR 84-2148). They reported the geochemistry from the auger samples as Ba to 44 ppm, Cu to 115 ppm, Fe to 7.47%, Cr to 950 ppm and Ni to 460 ppm. The cause is unknown but it could be due to partially lateritised basalt.

DD meeting with D Seymour, 10 December 2001

- Arcuate magnetic trend 300 832 mE; 5 462 589 mN at Mawson Bay, West Point; in Rocky Cape Group (orthoquartzite); crosses coast at concealed part of shore platform; runs inland crossing Arthur River Road and curves south dividing into two parallel tracks eventually fading out; cuts across stratigraphy; may be composite in north with a strong WNW trend cross cutting weaker tracks which cross coast at West Point in orthoquartzite. Cause unknown.
- NNW magnetic trend at 320 967 mE; 5 439 446 mN in Rocky Cape Group; access at Frankland River Bridge; a geophysical case history for student excursions (see M. Roach, CODES). Cause unknown.
- Distinct magnetic trends; N-S at 324 789 mE; 5 434 137 mN. E-W at 332 857 mE; 5 427 344 mN, Togari Group rocks as synclinal keels or thrust slivers. Very complicated structure in this area with up to three Devonian foldings, arcuate thrust runs off to southeast.
- Series of NNW magnetic trends run off southerly as the Balfour trend in sequence 323 940 mE, 5 428 830 mN; 326 134 mE, 5 422 743 mN; 329 177 mE, 5 413 189 mN; 334 910 mE, 5 404 413 mN; 331 654 mE, 5 404 271 mN. Cause unknown.
- NNW magnetic trends discontinuous from #3 at 313 960 mE; 5 446 736 mN and 307 237 mE; 5 457 989 mN. Cause unknown — the northern one may be Tertiary basalt.
- Western limb of tight syncline in Togari Group — magnetic trend defined by basic lavas Esb —

315 150 mE; 5 456 524 mN. Check Justin Legge's thesis, CODES.

- Eastern limb of syncline in Togari Group with shear or thrust boundary, west dipping, 318 248 mE; 5 458 540 mN.
- Dolerite dyke? along WNW fault with 3–3.5 km sinistral movement, but apparently no effect E or W. 310 268 mE; 5 486 932 mN. Cause unknown.
- East-facing Esb basalt? at 310 856 mE; 5 483 824 mN running north and passing east of Hunter Island, cause unknown.
- Unknown magnetic trends — possible Esb closures at 311 696 mE; 5 479 204 mN and 311 864 mE; 5 472 148 mN — reverse plunges of synforms? Does that make closure at 313 628 mE; 5 482 312 mN a horizon in the Smithton Dolomite? Cause unknown.
- Another WNW magnetic trend — basic dyke? At 315 980 mE; 5 450 056 mN. Cause unknown.
- WNW magnetic trend swarm — dolerite in Scopus Formation at 330 000 mE; 5 480 000 mN plus some magnetic stratigraphy in Scopus and possibly Smithton Dolomite. Cause unknown.
- Discrete magnetic high in Smithton Dolomite (Eds) near Edith Creek at 338 750 mE; 5 465 660 mN — close to Roger River Fault. Drilled by Pacific Nevada? Check MRT — could there be a response from the basic lavas under the dolomite? Cause unknown.
- Dolerite/gabbro exposure at Lake Mikany 346 500 mE; 5 473 042 mN. On trend of WNW mag, check with susceptibility meter.
- NNE linear magnetic trend in Rocky Cape Group (Cowrie Siltstone) runs for 38 km, segmented not continuous, runs into or under the Togari Group in south. Correlates with edge of stratigraphic unit for part of length in Apiary Road area, may be a fault or thrust. Report by DS who has found a fault in one place and a basic dyke in another. Part of a complicated structural picture with the Boat Harbour Fault.

DD Meeting with D Seymour, 4 December 2001

- WNW magnetic linears — dolerite-gabbro mapped on trend at Lake Mikany, near Smithton — 346 000 mE; 5 473 000 mN. Sinistral movement (north block west) on one of linears at 311 279 mE; 5 486 087 mN by an amount of 3.2–3.6 km.
- Scopus Formation — Mid to Late Cambrian thin-bedded sandstone and mudstone— magnetic highs — 335 000 mE; 5 480 600 mN.
- Dolerite intrusions drilled by Ashton Mining, where?
- Spring mounds near Smithton (Deep Creek Bay) underlain by Smithton Dolomite — investigated by Pacific Nevada e.g. 345 000 mE; 5 479 000 mN.
- Seventeen Mile Plain Area — structural anomaly — area may be underlain by flat-lying Smithton Dolomite — any water bores or other subsurface info? 320 000 mE; 5 472 000 mN.
- Tipunah Road Area — N-S line of magnetic high — structural report written by DS (1997/09) — 354 000 mE; 5 462 000 mN.
- Detention Quartzite — silicified under basalt — possibly greybilly effect, refer Calder and Inglis gravels.
- Check Soloriens reports by Ken Morrison [TCR 92-3403], does it cover Balfour and has Pacific Nevada drilled recently?

DD meeting with J. Bishop, 22 November 2001

- Thin skinned tectonics — Leaman, Baillie and Powell — Exploration Geophysics 1994 (25):19-23.
- Contentious Issues Symposium — check.
- Broadscale modelling along transects — geology to support along transect.
- Geothermal systems — hot rocks.
- Energy/oil/oil shale.
- Keith River gossan area — 368 000 mE; 5 438 000 mN — reconcile geology and drilling with magnetics — check BHP/CRA report.
- Isolated magnetic highs — like Gawler Craton — kimberlites or basalt diatremes?

Meeting with J. Bishop, 13 November 2001; G. Green, R. Poltock, DD

A. Check new features in geophysics.

B. Check mismatches between known geology and geophysics.

C. Where we have a chance of settling question e.g. is there a near-surface radiometric response?

- NW Smithton Basin — WNW anomalies, check M. Hall mapping.
- Kara–Housetop granite, Blythe River area — hematite/chert in Burnie Formation, Cu bodies at Natone, Highclere — po zones in Shell drilling.
- Dial Range — Geopeko.
- Windows in basalt north of Hellyer.
- Ridgley — Upper Oonah spilites and carbonates in Burnie Formation.
- Mt Roland, Gog Range — spilites and keratophyres.
- Parkham area — N-S striping in Tertiary — Tenneco — roll front U deposits.
- Tamar area — looking for Tertiary — uranium response in radiometrics.
- Wilmot area — basalt and older bedrock — Lake Barrington copper zone, Moina sandstone and windows, replacement bodies (tin) about 1 km isobath on granite edge.

- Sprent–Ulverstone metamorphic rocks — core complexes — diapiric–collision — gold around margins of such bodies in New Guinea — intensively farmed area.

Accuracy on ground of magnetic anomalies 10–50 m maximum

MRT workshop, 12 November 2001

Northwest

- Balfour area — old antiform with old crust in centre.
- Temma — smaller equivalent of Balfour–Cu deposits along magnetic trend.
- South Smithton Basin — Proterozoic basalt and others in sedimentary rocks — D. Seymour.
- South of Balfour — very tight triangular areas — with Roger River trend (faults?).
- King Island — older and younger metamorphic rocks, granites, mylonite zones, boundaries defined by Gresham's mapping, wind-blown sand obscures granite response.

Other areas

- Radiometrics — Meredith Granite, Mt Stewart ultramafic body, is there a vegetation effect? Huskisson Syncline and ultramafic expression, linears in west of granite, some extending south with deposits.
- South Henty Fault, Housetop Granite — inliers calcsilicate, boundary down SE side, may be fault. Heemskirk Granite — good magnetic expression and phases, Kara, N-S striping in magnetics near Deloraine.
- Elliot Bay — granites response, dolerite-Tertiary boulder fields on graben edge, MRV continue at depth in magnetics under Tertiary in graben.
- Mt Lyell-ENE structures (Leaman), mineral deposits aligned, magnetics source under Tyndalls could be modelled, Jukes Proprietary could be modelled with physical properties — numerous samples from hydro tunnel underneath already available, Tertiary patterns — faults with boulder deposits, Siluro-Devonian basin west of Mt Lyell.
- Zeehan — folded sediments, Lower Owen has magnetic response particularly the conglomerate section, NW trends lining up with the edge of the ultramafic rocks at Burbanks, ultramafic rocks peter out towards Zeehan Palaeozoic rocks.
- Ultramafic package with Avebury prospect, E-W fault stretches through to coast, skarn limestone in package, Avebury and East Avebury defined with magnetics.
- North Huskisson area — cup-shaped basin with magnetic anomaly, now on Allegiance ground (2 km depth), metal deposits in area.
- Magnet area, Bischoff, Waratah, Cleveland, Balfour area.
- Wombat Flat adamellite, extends under rocks to northeast.
- Tamar Valley, Beaconsfield on edge of magnetic high of Anderson Creek ultramafic rocks.
- Lefroy — E-W structures collinear with Volunteer Reef.
- Rosebery, Hellyer, Que River.
- Granite Tor — southern limit of granite boundary inaccurate.

Actions

- Get map of draped geology and magnetics for northwest.
- Print out of drill holes vs magnetic anomalies.
- Geopeko drilled magnetic anomaly; see J. Pemberton.
- Correlate exploration reports with geophysics to generate targets.
- Produce list of misfits, new features and other questions posed by new data.
- Produce subset of problems solvable by ground checking and prioritise.

[17 January 2002]