



University of Adelaide

Department of Geology and Geophysics

Interpretation of Airborne Geophysical Data Over the Petermann Ranges Area,
Southwestern Northern Territory

Andrew M. Lewis B.Sc. (Hons)

March, 1989

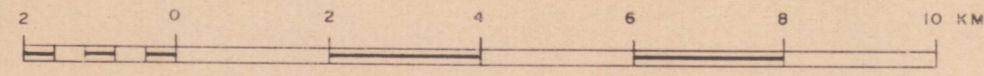
awarded 31.1.90

A thesis submitted to the University of Adelaide in fulfilment of the requirements for the
degree of Master of Science.

HULL



SCALE 1:100 000



AMG Zone 52

LITHOMAGNETIC UNITS

- Granite G1 Strongly magnetic granite
- Granite G2 Weakly magnetic granite
- Sheared (gneissic) granite
- Magnetic porphyroblastic schist
- Igneous intrusion C1 Circular/elliptical features
- Igneous intrusion C2
- AM** Metamorphosed/granitized gneiss
- AB** Original gneissic basement
- B1** Strongly magnetic mafic basement complex
- B2** Moderately magnetic quartz-feldspathic basement complex
- F** Fault related anomaly
- P** Magnetic quartz-feldspar porphyry
- V1** Strongly magnetic metavolcanics
- V2** Weakly magnetic metavolcanics

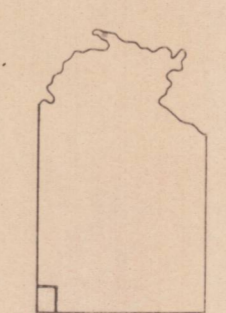
LEGEND

- Magnetic zone boundary
- Lithomagnetic unit boundary
- Fault, interpreted horizontal movement metres of vertical movement on downthrown side
- Thrust fault, barbs on lower plate
- Fold axis, antiform, synform
- Dyke
- Magnetic high
- Magnetic low
- Where interpretation is uncertain lines are broken
- Modeled profile 1641
- Modeled profile 1641a
- Depth (metres below surface)
- Susceptibility contrast ($\times 10^3$ S.I.)
- Dip estimate
- Three dimensional magnetic model
- Measured magnetic susceptibility ($\times 10^3$ S.I.)

1:100 000 Sheet Location

Part of 1:250 000 Sheet BLOODS RANGE SG 52-3

HULL 4748	BLOODS RANGE 4848
POTTYOU 4747	PETERMANN 4847
COCKBURN 4746	DUFFIELD 4846



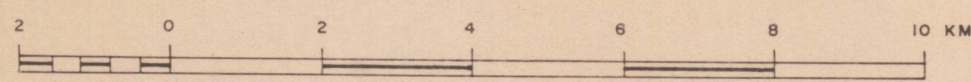
HULL 4748 MAGNETIC INTERPRETATION PLATE 1

Interpretation by: A.M. Lewis
Dept of Geology and Geophysics
University of Adelaide (1988)
From: N.T.G.S. Petermann Airborne Geophysical Survey (1985)
Drawn by: B. Otte-GEODRAFTING, Adelaide

BLOODS RANGE



SCALE 1:100 000



AMG Zone 52

LITHOMAGNETIC UNITS

- Granite G1 Strongly magnetic granite
- Granite G2 Weakly magnetic granite
- Sheared (gneissic) granite
- Magnetic porphyroblastic schist
- Igneous intrusion C1 Circular/elliptical features
- Igneous intrusion C2
- AM** Metamorphosed/granitized gneiss
- AB** Original gneissic basement
- B1** Strongly magnetic mafic basement complex
- B2** Moderately magnetic quartzo-feldspathic basement complex
- F** Fault related anomaly
- P** Magnetic quartz-feldspar porphyry
- V1** Strongly magnetic metavolcanics
- V2** Weakly magnetic metavolcanics

LEGEND

- Magnetic zone boundary
- Lithomagnetic unit boundary
- Fault, interpreted horizontal movement metres of vertical movement on downthrown side
- Thrust fault, barbs on lower plate
- Fold axis, antiform, synform
- Dyke
- Magnetic high
- Magnetic low
- Where interpretation is uncertain lines are broken
- Modeled profile
- Depth (metres below surface)
- Susceptibility contrast ($\times 10^3$ S.I.)
- Dip estimate
- Three dimensional magnetic model
- Measured magnetic susceptibility ($\times 10^3$ S.I.)

1:100 000 Sheet Location

Part of 1:250 000 Sheet BLOODS RANGE SG 52-3



HULL 4748	BLOODS RANGE 4848
POTTOYU 4747	PETERMANN 4847
COCKBURN 4746	DUFFIELD 4846

BLOODS RANGE 4848 MAGNETIC INTERPRETATION

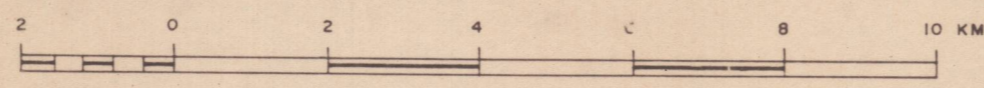
PLATE 2

Interpretation by: A. M. Lewis
Dept. of Geology and Geophysics
University of Adelaide (1988)
From: N.T.G.S. Petermann Airborne Geophysical Survey (1985)
Drawn by: B. Otte - GEODRAFTING, Adelaide

POTTOYU



SCALE 1:100 000



AMG Zone 52

LITHOMAGNETIC UNITS

- Granite G1 Strongly magnetic granite
- Granite G2 Weakly magnetic granite
- Sheared (gneissic) granite
- Magnetic porphyroblastic schist
- Igneous intrusion C1 Circular/elliptical features
- Igneous intrusion C2

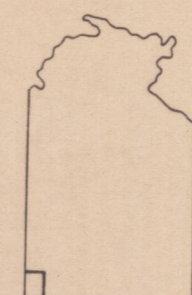
- AM** Metamorphosed/granitized gneiss
- AB** Original gneissic basement
- B1** Strongly magnetic mafic basement complex
- B2** Moderately magnetic quartz-feldspathic basement complex
- F** Fault related anomaly
- P** Magnetic quartz-feldspar porphyry
- V1** Strongly magnetic metavolcanics
- V2** Weakly magnetic metavolcanics

LEGEND

- Magnetic zone boundary
- Lithomagnetic unit boundary
- Fault, interpreted horizontal movement metres of vertical movement on downthrown side
- Thrust fault, barbs on lower plate
- Fold axis, antiform, synform
- Dyke
- Magnetic high
- Magnetic low
- Where interpretation is uncertain lines are broken
- Modeled profile
- Two dimensional magnetic model
- Three dimensional magnetic model
- Measured magnetic susceptibility ($\times 10^3$ S.I.)

1:100 000 Sheet Location

Part of 1:250 000 Sheet PETERMANN RANGES SG 52-7



HULL 4748	BLOODS RANGE 4848
POTTOYU 4747	PETERMANN 4847
COCKBURN 4746	DUFFIELD 4846

POTTOYU
4747
MAGNETIC INTERPRETATION

PLATE 3

Interpretation by: A.M. Lewis
Dept. of Geology and Geophysics
University of Adelaide (1988)
From: N.T.G.S. Petermann Airborne Geophysical Survey (1985)
Drawn by B. Otte - GEODRAFTING, Adelaide

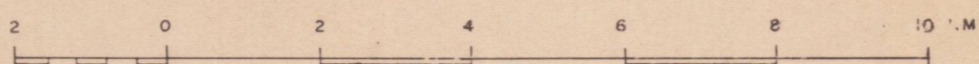
PETERMANN



LITHOMAGNETIC UNITS

- Granite G1 Strongly magnetic granite
- Granite G2 Weakly magnetic granite
- Sheared (gneissic) granite
- Magnetic porphyroblastic schist
- Igneous intrusion G1 Circular/elliptical features G2
- AM** Metamorphosed/granitized gneiss
- AB** Original gneissic basement
- B1** Strongly magnetic mafic basement complex
- B2** Moderately magnetic quartzo-feldspathic basement complex
- F** Fault related anomaly
- P** Magnetic quartz-feldspar porphyry
- V1** Strongly magnetic metavolcanics
- V2** Weakly magnetic metavolcanics

SCALE 1:100 000



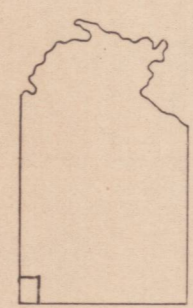
AMG Zone 52

LEGEND

- Magnetic zone boundary
- Lithomagnetic unit boundary
- Fault, interpreted horizontal movement metres of vertical movement on downthrown side
- Thrust fault, barbs on lower plate
- Fold axis, antiform, synform
- Dyke
- Magnetic high
- Magnetic low
- Where interpretation is uncertain lines are broken
- Modeled profile
- Depth (metres below surface)
- Susceptibility contrast ($\times 10^3$ S.I.)
- Dip estimate
- Three dimensional magnetic model
- Measured magnetic susceptibility ($\times 10^3$ S.I.)

1:100 000 Sheet Location

Part of 1:250 000 Sheet PETERMANN RANGES 50 52-7



HULL 4748	BLOGS RANGE 4848
POTTOYU 4747	PETERMANN 4847
COCBURN 4746	DUFFIELD 4846

PETERMANN
4847

MAGNETIC INTERPRETATION

PLATE 4

Interpretation by: A. M. Lewis
Dept of Geology and Geophysics
University of Adelaide (1988)
From: N.T.G.S. Petermann Airborne Geophysical Survey (1985)
Drawn by: B. Otte - GEODRAFTING, Adelaide

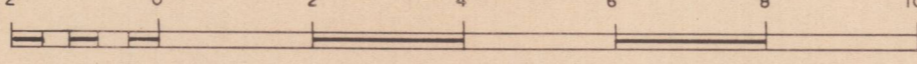
COCKBURN



LITHOMAGNETIC UNITS

- Granite G1 Strongly magnetic granite
- Granite G2 Weakly magnetic granite
- Sheared (gneissic) granite
- Magnetic porphyroblastic schist
- igneous intrusion C1 Circular/elliptical features
- igneous intrusion C2
- AM** Metamorphosed/granitized gneiss
- AB** Original gneissic basement
- B1** Strongly magnetic mafic basement complex
- B2** Moderately magnetic quartzo-feldspathic basement complex
- F** Fault related anomaly
- P** Magnetic quartz-feldspar porphyry
- V1** Strongly magnetic metavolcanics
- V2** Weakly magnetic metavolcanics

SCALE 1:100 000

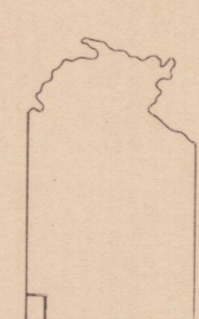


AMG Zone 52

LEGEND

- Magnetic zone boundary
- Lithomagnetic unit boundary
- Fault, interpreted horizontal movement metres of vertical movement on downthrown side
- Thrust fault, barbs on lower plate
- Fold axis, antiform, synform
- Dyke
- Magnetic high
- Magnetic low
- Where interpretation is uncertain lines are broken
- Modeled profile
- Depth (metres below surface)
- Susceptibility contrast ($\times 10^3$ S.I.)
- Dip estimate
- Three dimensional magnetic model
- Measured magnetic susceptibility ($\times 10^3$ S.I.)

1:100 000 Sheet Location
Part of 1:250 000 Sheet PETERMANN RANGES SG 52-7



HULL 4748	BLOODS RANGE 4848
POTTOYU 4747	PETERMANN 4847
COCKBURN 4746	BUFFIELD 4846

COCKBURN
4746
MAGNETIC INTERPRETATION

PLATE 5

Interpretation by: A. M. Lewis
Dept. of Geology and Geophysics
University of Adelaide (1988)
From: N.T.G.S. Petermann Airborne Geophysical Survey (1985)
Drawn by: B. Otte - GEODRAFTING, Adelaide

DUFFIELD



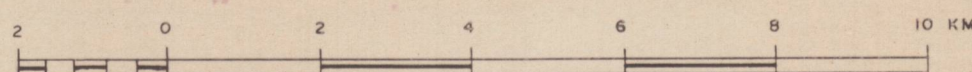
LITHOMAGNETIC UNITS

- Granite G1 Strongly magnetic granite
- Granite G2 Weakly magnetic granite
- Sheared (gneissic) granite
- Magnetic porphyroblastic schist
- Igneous intrusion C1 Circular/elliptical features
- Igneous intrusion C2
- AM** Metamorphosed/granitized gneiss
- AB** Original gneissic basement
- B1** Strongly magnetic mafic basement complex
- B2** Moderately magnetic quartz-feldspathic basement complex
- F** Fault related anomaly
- P** Magnetic quartz-feldspar porphyry
- V1** Strongly magnetic metavolcanics
- V2** Weakly magnetic metavolcanics

LEGEND

- Magnetic zone boundary
- Lithomagnetic unit boundary
- Fault, interpreted horizontal movement metres of vertical movement on downthrown side
- Thrust fault, barbs on lower plate
- Fold axis, antiform, synform
- Dyke
- Magnetic high
- Magnetic low
- Where interpretation is uncertain lines are broken
- Modeled profile
- Depth (metres below surface)
- Susceptibility contrast ($\times 10^3$ S.I.)
- Dip estimate
- Three dimensional magnetic model
- Measured magnetic susceptibility ($\times 10^3$ S.I.)

SCALE 1:100 000



AMG Zone 52

1:100 000 Sheet Location

Part of 1:250 000 Sheet PETERMANN RANGES 5G 52 - 7



HULL 4748	BLOODS RANGE 4848
POTTOYU 4747	PETERMANN 4847
COCKBURN 4746	DUFFIELD 4846

DUFFIELD
4846
MAGNETIC INTERPRETATION

PLATE 6

Interpretation by: A.M. Lewis
Dept of Geology and Geophysics
University of Adelaide (1988)
From: N.T.G.S. Petermann Airborne Geophysical Survey (1985)
Drawn by: B. Otte-GEODRAFTING, Adelaide