GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

BULLETIN 137   PLATE 3

MURCHISON PROVINCE

METAMORPHIC FACIES

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MINISTER OF MINES
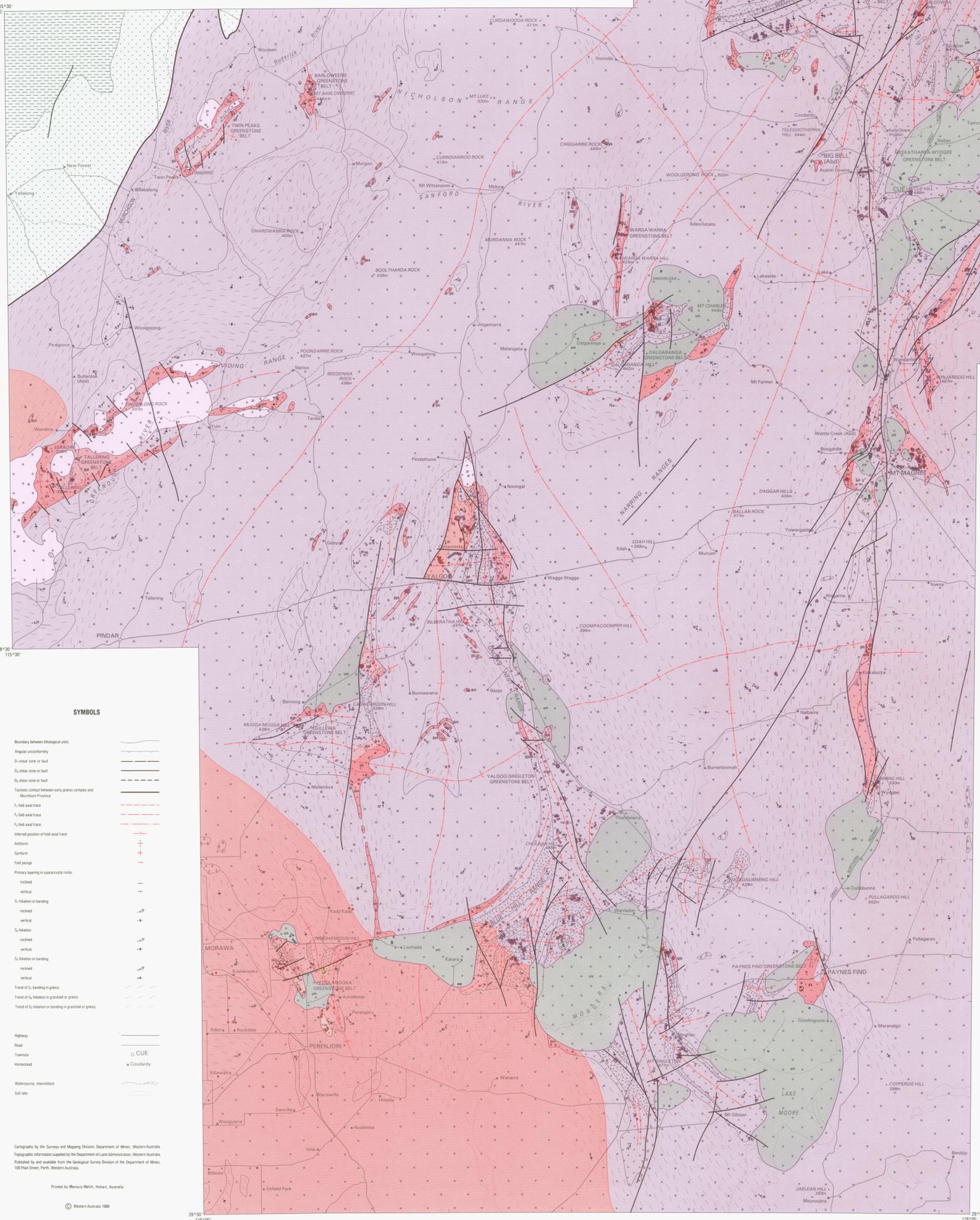D.R. KELLY, DIRECTOR GENERAL OF MINES

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OF WESTERN AUSTRALIA

INDEX TO 1:250 000 SHEETS

SCALE 1:500 000

Geology by K.P. Watkins and A.L. Ahmat 1982-86

SYMBOLS

Boundary between lithological units
Angular unconformity
D_1 shear zone or fault
D_2 shear zone or fault
D_3 shear zone or fault
Tectonic contact between early gneiss complex and Murchison Province
F_1 fold axial trace
F_2 fold axial trace
F_3 fold axial trace
Inferred position of fold axial trace
Antiform
Synform
Fold plunge
Primary layering in supracrustal rocks
  inclined
  vertical
S_1 foliation or banding
  inclined
  vertical
S_2 foliation
  inclined
  vertical
S_3 foliation or banding
  inclined
  vertical
Trend of S_1 banding in gneiss
Trend of S_2 foliation in granitoid or gneiss
Trend of S_3 foliation or banding in granitoid or gneiss

Highway
Road
Townsite   ○ CUE
Homestead   ● Coodardy

Watercourse, intermittent
Salt lake

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MINERALOGICAL CRITERIA FOR METAMORPHIC FACIES

MINERALS — MAFIC ROCKS — SEDIMENTARY ROCKS

Relict phases
Quartz
Albite
Oligoclase-andesine
Labradorite-bytownite
Prehnite
Pumpellyite
Epidote-clinozoisite
Zoisite
Stilpnomelane
Chlorite
White mica
Biotite
Tremolite-actinolite
Hornblende
Grunerite-cummingtonite
Cordierite
Garnet
Staurolite
Andalusite
Kyanite
Sillimanite
Clinopyroxene
Orthopyroxene
K-feldspar and sillimanite

PP Prehnite-pumpellyite facies
G   Greenschist facies
GA Greenschist amphibolite facies transition
LA Lower amphibolite facies
UA Upper amphibolite facies
GR Granulite facies

Mineral phase generally present
Mineral phase sometimes present
Mineral phase rarely present

REFERENCE

METAMORPHIC FACIES OF SAMPLE LOCALITIES

Unmetamorphosed or weakly metamorphosed
Prehnite-pumpellyite facies
Greenschist facies
Greenschist amphibolite facies transition
Lower amphibolite facies
Upper amphibolite facies
Granulite facies

Each point represents one or more samples

METAMORPHIC FACIES

Metamorphic facies boundary

M_1 Regional metamorphism of supracrustal rocks, pegmatite-banded gneiss and recrystallized monzogranite
  Prehnite-pumpellyite facies
  Greenschist facies
  Greenschist amphibolite facies transition
  Lower amphibolite facies
  Upper amphibolite facies
  Granulite facies

M_2 Contact metamorphism of supracrustal rocks by recrystallized monzogranite and pegmatite-banded gneiss protoliths. M_2 assemblages were generally partially retrograded during M_3
  Greenschist amphibolite facies transition, generally partially retrograded to M_3 greenschist facies
  Lower amphibolite facies, generally partially retrograded to M_3 greenschist facies
  Upper amphibolite facies, generally partially retrograded to M_3 greenschist or lower amphibolite facies

M_3 Contact metamorphism of supracrustal rocks by layered gabbro intrusions. M_2 and M_3 retrograde effects are rare
  Upper amphibolite facies
  Granulite facies

POST-FOLDING GRANITOIDS
  Unmetamorphosed or weakly metamorphosed
  Partially recrystallized, generally in low greenschist facies; remnants of igneous texture are preserved
  Contact effects of post-folding granitoids are minor and are not shown

BIG BELL METAMORPHISM
  Upper amphibolite facies syntectonic hydrothermal metamorphism

LITHOLOGICAL UNITS
  Boundary between major lithological units
  PROTEROZOIC ROCKS
    Proterozoic sedimentary rocks
  ARCHAEAN ROCKS
    Post-folding granitoid
    Recrystallized monzogranite
    Pegmatite-banded gneiss
    Metagabbro or metadolerite
    Luke Creek Group supracrustal rocks
    Mount Farmer Group supracrustal rocks
    Unassigned supracrustal rocks
    Early gneiss complex

MURCHISON PROVINCE

METAMORPHIC FACIES

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