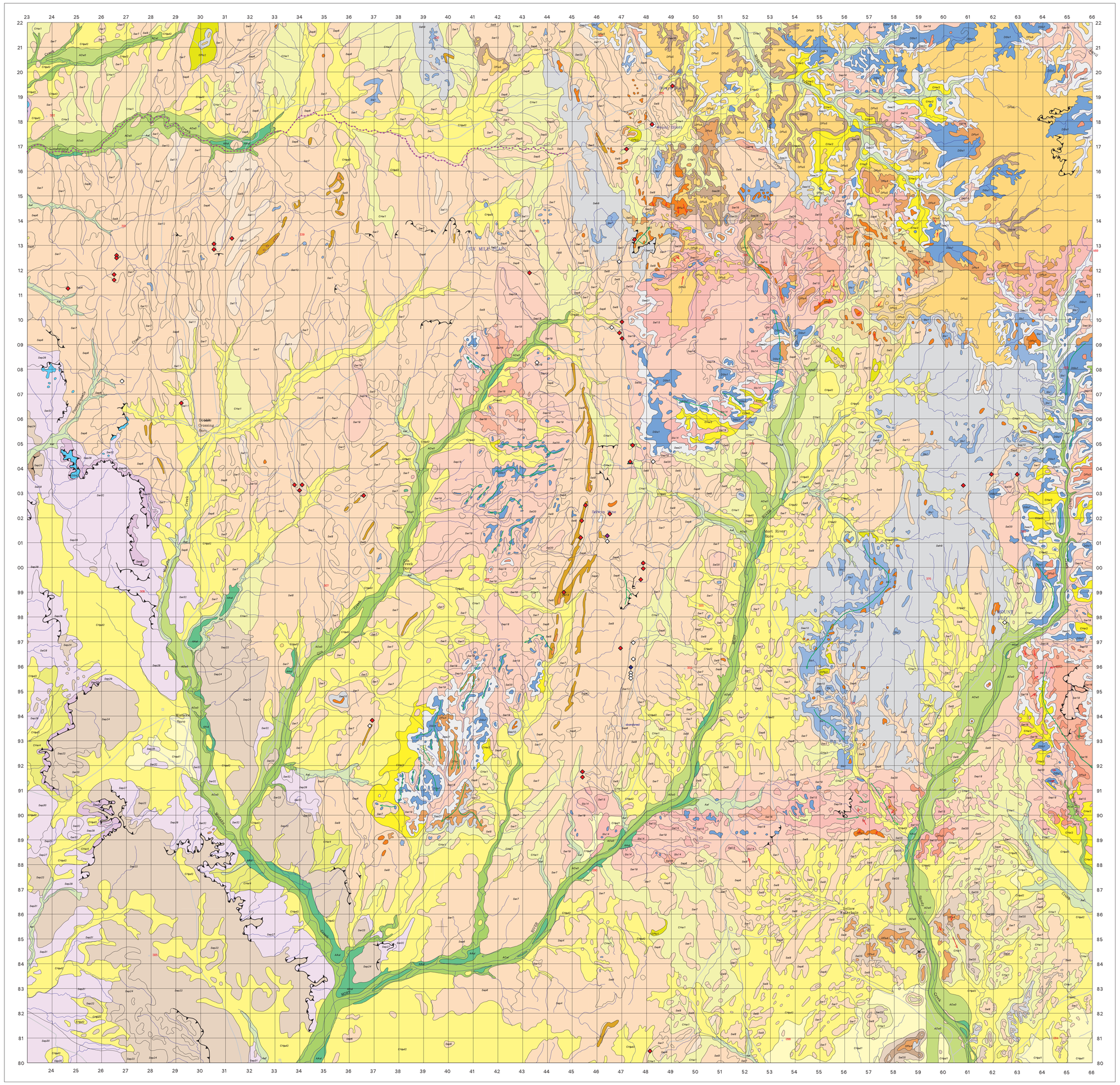
SELWYN Regolith - Landforms



SCALE 1 : 65,000

2.5 0 2.5 5 7.5 10 km

UNIVERSAL TRANSVERSE MERCATOR
SPHEROID AUSTRALIAN
ZONE 54

REGOLITH TYPES

Major bedrock type

Metamorphics

Granite

Mesozoic sediments

Cambrian sediments

Metamorphics

Granite

Mesozoic sediments

Cambrian sediments

Durlcrust
Proterozoic bedrock
Ferruginous

- Dfs1 — *Massive and in places slabby fe duricrust or collapsed ferruginous saprolite over mottled and bleached saprolite. Legs of lithic fragments, fe duricrust gravels and pisoliths. Pods of fe segregations in the mottled zone. Silicification at the saprolite is common and typically extends into the bleached zone. Plateaux, mesas and buttes.*
- Dfs3 — *Massive and in places slabby fe duricrust over ferruginous and mottled saprolite. Legs of ferruginous lithic gravels, fragments of fe duricrust and pisoliths. Pods of fe segregations in the mottled zone. Duricrust is associated with massive stratigraphic hematitic beds. Minor cemented angular colluvial Fe gravels. Flat top hills, minor plateaux.*
- Dfs3 — *Massive and in places slabby fe duricrust over ferruginous, mottled and bleached saprolite. Legs of ferruginous lithic gravels, fragments of fe duricrust and pisoliths. Pods of fe segregations in the mottled zone. Silicification and intense bleaching of the underlying saprolite. Plateaux, mesas and buttes.*

Siliceous

- Dfs7 — *Mottled silcrete, silicified and bleached saprolite. Upper part of the profile is iron-stained and mottled. Feldspars and micas weathered to clay (kaolinite) and iron oxides. Silicification and intense bleaching of the underlying saprolite commonly extends several 10s of metres. Minor fe duricrust. Low hills, mesas, plateaux and dissected plateaux.*

Post-Proterozoic bedrock
Ferruginous

- Dfs4 — *Massive fe duricrust and highly ferruginous saprolite over mottled (irregular to mega sub-circular) and in places bleached bedrock. Saprolite partly silicified. In places silcrete/ caps rather than fe duricrusts have developed. The underlying Proterozoic bedrock is typically very highly weathered, mottled, bleached and in places silicified. Plateaux, mesas and buttes.*
- Dfs5 — *Ferruginous saprolite with patches of massive fe duricrust over mottled (irregular to mega sub-circular) and in places bleached bedrock. Saprolite partly silicified. Mesozoic sediments are typically deeply weathered. Underlying Proterozoic bedrock is typically very highly weathered, mottled, bleached and in places silicified. Plateaux, mesas and buttes.*

Siliceous

- Dfs2 — *Silicified, ferruginous and mottled saprolite. Re-cemented ferruginous and siliceous collapsed saprolite common over plateau surface. Plateaux, mesas and buttes.*

Saprolite
Proterozoic bedrock

- Sp1 — *Silicified and bleached saprolite. Upper part of the profile which may or may not be present is iron-stained and mottled. Feldspars and micas weathered to clay (kaolinite) and iron oxides. Bleached zone is generally several 10s of metres thick and silicified. Minor fe duricrust. Low hills, mesas, plateaux and dissected plateaux.*
- Sa2 — *Partly silicified and weakly mottled bleached saprolite (several 10s of metres thick). The upper part of the profile is ferruginous and mottled. Saprolite partly covered by lithosols consisting of ferruginous/bleached lithic fragments, gravels and minor fe duricrust nodules and pisoliths. Low hills, minor scarps and rises.*
- Sap3 — *Ferruginous and mottled saprolite. Mottled zone overlies bleached saprolite. Partly covered by lags of ferruginous and silicified saprolite, quartz and lithic fragments. In places lags overlie bleached saprolite. Erosional plains.*
- Sap4 — *Saprolite partly covered by lithosols and lags consisting of highly ferruginous saprolite fragments and lithic gravels. Upper part of the profile typically highly ferruginous. Highly dissected erosional plain (< 9m relief).*
- Sap5 — *Highly weathered mottled saprolite covered by extensive veneers of residual gravelly soils and lags of ferruginous saprolite, quartz, lithic fragments and minor fe pisolithe and ferruginous gravels. Residual clays generally < 1.0 meter thick. Minor alluvium along stream channels. Erosional plains (< 9m relief).*
- Sap6 — *Highly weathered saprolite overlain by extensive veneers of polymictic gravel lags including ferruginous lithic and saprolite fragments, minor quartz, fe pisolithe and ferruginous gravels. Lags are generally < 1.0 meter thick. Narrow tracts of alluvium along some stream channels. Erosional plains, minor sediments.*
- Ser7 — *Mottled and ferruginous saprolite partly covered by lithosols and lithic lags consisting of ferruginous lithic fragments, quartz gravels with a red siltclay matrix. Rises (9-30m relief).*
- Sa88 — *Ferruginous and diffusely mottled saprolite partly covered by lithosols. Colluvial gravels are associated with fans and aprons flanking steeper slopes. Minor rises, sediment. Low hills (30-90m relief).*
- Sah9 — *Saprock partly covered by lithosols and colluvium flanking steep hill slopes. Hills (90-120m relief).*
- Sea10 — *Saprock partly covered by scree and lithosols. Weathering is variable ranging from highly weathered bleached and silicified bedrock to slightly weathered bedrock . Escarpment.*
- Sa11 1 — *Fe-rich saprolite largely covered by veneers of fe duricrust fragments, ferruginous lithic gravel lags and red clay soils with minor fe nodules. Erosional plains, minor pediments (< 9m relief).*
- Ser12 — *Highly ferruginous and diffusely mottled saprolite. Saprolite partly covered by highly ferruginous lithic gravel lags and reddish orange clays/fine sands. Locally developed fe duricrusts and fe segregations. Rises, minor low hills (30-90m relief).*
- Sa13 3 — *Highly ferruginous bedrock associated with stratigraphic hematitic beds. Saprolite partly covered by ferruginous gravel lags, lithosols and pockets of red clay soil over massive diffusely mottled hematitic bedrock. Low hills (30-90m relief) and mesa/low ridges.*
- Sfs14 — *Highly ferruginous, mottled and bleached saprolite. Feldspars and micas weathered to clay (kaolinite) and iron oxides. Silicification and intense bleaching of the underlying saprolite common. Legs of ferruginous and silicified saprolite and quartz gravels. Minor fe duricrust. Plateaux, mesas.*
- Sa15 — *Ferruginous saprolite and mottled saprolite over bleached bedrock. In places silicification of the saprolite extends to the bleached zone. Most feldspars and micas weathered to clays and fe oxides. Lithosols and gravel lags over saprolite. Low hills (30-90m relief) and minor scarps.*
- Sa16 — *Upper part of the profile consists of ferruginous and mottled saprolite. At depth typically strongly bleached and partly silicified. Most of the soluble minerals in the upper part of the profile have weathered to clays (kaolinite) and Fe oxides, with quartz as a resistate. Rises and mesas (9-30 metres relief).*
- Sap17 — *Bleached granitic saprolith, partly covered by lithic lags, residual clay and sandy soil. Erosional plains (< 9m relief).*
- Sap18 — *Granitic saprolite covered by extensive veneers (generally <. 1m) of residual sands and gravel lags consisting of mica, quartz and feldspar sands; siliceous, ferruginous and bleached saprolite fragments, quartz and minor fragments of Fe duricrust. Local river channel alluvium and sheet flow sediment of sand and gravel. Erosional plains (< 9m relief).*
- Sa19 — *Upper part of the profile is ferruginous and diffusely mottled. About half of primary minerals (feldspars and micas) weathered to clays and oxides. Partly covered by gritty sands and lithic gravels. Rises (9-30m relief).*
- Sa120 — *Upper part of the profile is ferruginous and diffusely mottled with most of the primary minerals (feldspars and micas) weathered to clays and oxides. Gravel scree and lithosols on steeper slopes. Minor river channel alluvium and sheetflow colluvium. Low hills (30-90m relief).*
- Sea21 — *Saprock partly covered by scree and lithosols. Weathering is variable ranging from highly weathered mottled, bleached and silicified bedrock to slightly weathered bedrock. Escarpment.*

Post-Proterozoic bedrock

- Sap22 — *Ferruginous saprolite covered by a veneer of residual sands, clay and lags. Legs of highly ferruginous saprolite and lithic fragments. Minor siliceous lithic gravels. Erosional plains (< 9m relief).*
- Ser23 — *Ferruginous and mottled saprolite, in places silicified, partly covered by lithosols and gravel lags. Rises (9-30m relief).*
- Sap24 — *Ferruginous saprolite covered by residual sand, clay and lags. Saprolite is typically mottled and partly silicified. Legs of ferruginous lithic and fe duricrust fragments, quartz pebbles and silcrete gravels in a reddish orange sandy to silty soil matrix. Erosional plains (< 9m relief).*
- Sd25 — *Ferruginous and mottled saprolite and saprock. In places the saprolite is bleached and silicified. Partly covered by lithosols. Low hills (30-90m relief).*
- Sea26 — *Saprock, Fe-stained and diffusely mottled saprolite. Partly covered by scree and lithosols. Escarpment.*
- Sap27 — *Ferruginous and mottled saprolite. Mostly covered by thin lithic gravel lags and lithosols. Erosional plains (<. 9m relief) minor pediments.*
- Sd28 — *Mottled and in places ferruginous and silicified saprolite. Partly covered by gravelly lithosols. Low hills (30-90m relief).*
- Sap29 — *Ferruginous and mottled saprolite. Saprolite is covered by an extensive but thin blanket of gravel lags, consisting of ferruginous, lithic and fe duricrust fragments, quartz pebbles, silcrete gravels and residual reddish orange sandy soils. Erosional plains (< 9m relief).*
- Sap30 — *Saprolite largely covered by residual soils consisting of pale grey to brown silty clays and calcareous clays with minor calcareous lithic and chert lags. Erosional plains (< 9m relief).*
- Sap31 — *Saprolite covered by extensive hard setting residual dull green to reddish brown clays, swelling gilgai soils and minor gravel lags. Erosional plains (< 9m relief).*
- Ser32 — *Ferruginous and in places silicified saprolite mostly covered by thin stoney lithosols, lags and residual soils consisting of ferruginous saprolite, lithic fragments, chert, silcrete and residual clays. Rises (9-30m relief).*
- Sea33 — *The upper part of the weathering profile typically ferruginous, mottled and partly covered by lithosols. Escarpment.*

Mesozoic sediments

Cambrian sediments

Alluvial sediments

- ACla1 — *Recent alluvium consisting of interbedded gravel, and and clay with local beds of unconsolidated cobble conglomerate. In places partly cemented by clay, Fe or silica. Soils are reddish brown and grey sandy earths. Flood plains, channel floors.*
- ACla2 — *Overbank and channel overflow deposits consisting mainly of sand, clay and minor gravels. Typically thin and overlie residual sands, clays and saprolite. Flood out and flood plains.*
- AAla1 — *Alluvial terrace sediments consisting of interbedded sand, clay and gravel. In places truncated paleosouls indicate several cycles of deposition, erosion and weathering. Soils are reddish brown mottled earths and duplex soils. Alluvial terraces.*
- Aal — *Undifferentiated alluvial channel and overbank sediments consisting of various proportions of clay, sand and gravel. Forms narrow tracts between rises, low hills and hills. Typically intermixed with minor colluvial fooslope deposits adjacent to scarps, low hills and hills. Flood plains.*

Colluvial sediments

- Clfp1 — *Sheet flow consisting of silty clay loam, clay and sand. Local cracking clay soils (gilgai micro-relief). Sediments typically > 1.5m thick and overlie very highly weathered and mottled saprolite. Extensive lags consist of ferruginous saprolite, lithic fragments and quartz with minor fe duricrust fragments and Fe pisolithe. Minor alluvium and residual soils. Depositional plains.*
- Clfp22 — *Sheet flow and residual deposits consisting of various proportions of clay, sand and gravel. Local cracking clay soils (gilgai micro-relief). Sediments typically > 1.5m thick and overlie very highly weathered and mottled saprolite. Extensive lags consist of ferruginous saprolite, lithic fragments and minor fe duricrust fragments and Fe pisolithe. Minor alluvium. Depositional and erosional plains.*
- Cl4a1 — *Sheet flow colluvial and minor alluvial deposits forming a veneer (generally <. 1m thick) of sand, clay and gravel over mottled and typically bleached saprolite (mainly metamorphic). Gravelly lags are common and consist of ferruginous saprolite, quartz and lithic fragments. Pediments.*
- Cl4a2 — *Sheet flow quartzose/lithic/pathetic sand, clay and gravels (generally <. 1m thick) derived from granitic saprolite. Gravelly lags consist of siliceous, ferruginous and bleached saprolite fragments, quartz and fe duricrust fragments. Minor channel alluvium and residual sand. Protruding tors common. Pediments and erosional plains.*
- Cl4a3 — *Colluvial and alluvial clay, sand and gravel over ferruginous and mottled saprolite. Pediments.*
- Cl4a4 — *Colluvial sheet flow sands and lags consisting of lithic fragments and ferruginous gravels over highly weathered Cambrian sediments (typically mottled and ferruginous). Minor alluvial sand and gravel. Pediments.*
- Clfs1 — *Colluvial footslope gravel consisting of quartz, ferruginous saprolite and lithic fragments in a coarse sandy to gravelly earthy matrix. Footslopes.*
- Clfs2 — *Colluvial footslope deposits consisting of highly ferruginous saprolite, Fe duricrust fragments, Fe pisolithe and lithic fragments in a ferruginous earthy matrix. Footslopes, minor pediments.*

Regolith landform unit boundary
Erosional scarp
Paleo-drainage
Paleo-landform dip direction
Superimposed drainage
Drainage
Roads, vehicle tracks

*MINERAL OCCURRENCES (DEPOSITS) **

- *Gold*
- *Silver*
- *Copper*
- *Cobalt*
- *Uranium*
- *Unspecified*

** Data provided by Bureau of Resource Science from MINLOC database*

REGOLITH CODES

- *Gf — Ferruginous duricrust*
- *Gs — Siliceous duricrust*
- *Gc — Gypcrete*
- *Ac — Alluvial deposits*
- *AD — Overbank deposits*
- *AA — Alluvial terrace deposits*
- *Al — Alluvial sediments undifferentiated*
- *CH — Sheet flow sediments*
- *CT — Footslope deposits*

Metamorphic bedrock: *Meta-siltstone, meta-arenite, amphibolite, meta-basalt, gneiss, schist, phyllite and quartzite.*

Granitic bedrock: *foliated and non-foliated biotite granite, hornblende-biotite granite, tonalite and granodiorite.*

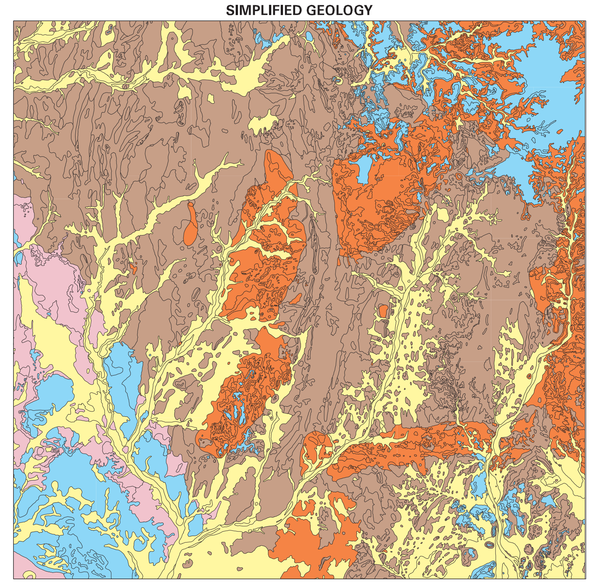
Mesozoic sediments: *Sandstone, siltstone, mudstone and conglomerate.*

Cambrian sediments: *Siltstone, sandstone, limestone, chert, silicified shale and dolomite.*

LANDFORM CODES

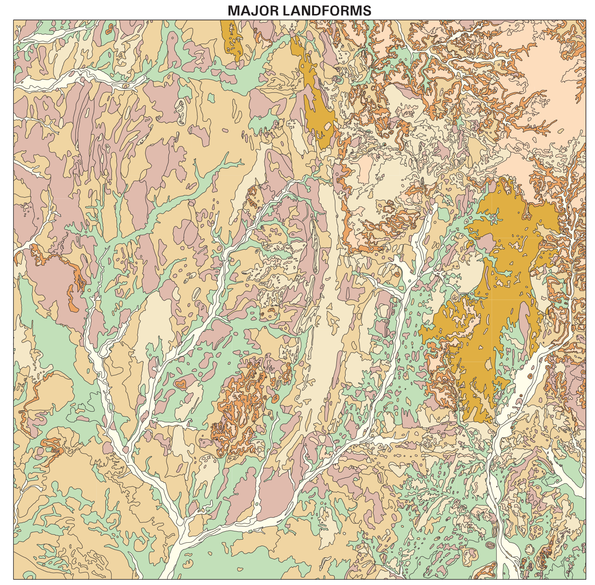
- *ly — Plateau*
- *ri — Pediments*
- *ep — Erosional plain (< 9m relief)*
- *er — Rises (9-30m relief)*
- *el — Low hills (30-90m relief)*
- *eh — Hills (90-120m relief)*
- *sc — Escarpments*
- *pf — Floodplain*
- *ao — Floodout, overbank plain*
- *at — Alluvial terrace*
- *fc — Colluvial fan*
- *fp — Colluvial plain*
- *ap — Alluvial plain*

SIMPLIFIED GEOLOGY



- *Mesozoic sediments: sandstone, siltstone, mudstone and conglomerate*
- *Cambrian sediments: siltstone, sandstone, limestone, chert, silicified shale and dolomite*
- *Granitic bedrock: foliated and non-foliated biotite granite, hornblende-biotite granite, tonalite and granodiorite*
- *Metamorphic bedrock: meta-siltstone, meta-arenite, amphibolite, meta-basalt, gneiss, schist, phyllite and quartzite*
- *Colluvium and alluvium*

MAJOR LANDFORMS



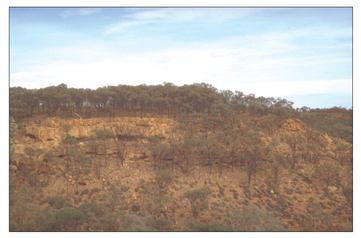
- *Erosional plains and pediments (< 9m relief)*
- *Rises (9-30m relief)*
- *Low hills (30-90m relief)*
- *Hills (90-120m relief)*
- *Escarpments*
- *Plateau surfaces*
- *Colluvial plains and minor footslopes*
- *Floodplains*

LANDSAT TM-5 IMAGE

False colour composite Landsat TM image (30m pixels) showing highly ferruginous saprolite and Fe duricrust in yellow-green; structured saprolite in red; vegetation black and vertical gravels in pale blue.

River channel gravels cemented by silica over highly weathered, mottled and silicified coarse granitic saprolite. Landform: Mesa (441203E, 7595801N)

Massive iron duricrust, highly ferruginous and mottled (in places silicified) saprolite (granite). Landform: Plateau edge (483911E, 7539416N)

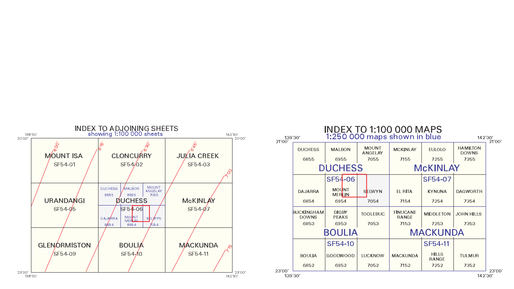


Ferruginous and mottled Mesozoic sediments (sandstone, claystone and siltstone). Minor iron duricrust. Landform: Mesa (450528E, 7617986N)

Slabby iron duricrust and ferruginous saprolite over mottled and bleached saprolite (schist and phyrite). Landform: Mesa and flat capped ridges (464200E, 7601300N)

Protruding granite tors surrounded by coarse residual and locally derived sheet flow quartzose and micaceous sands. Landform: Erosional Plain and local rises (461552E,7590887N)

INDEX TO ADJOINING SHEETS
1:250 000 maps shown in Grey



INDEX TO 1:100 000 MAPS
1:250 000 maps shown in Blue

Compiled by J.R.Willford (CRC LEME,AGSO), 1996

Cartography by D.Bulmanis, D.Hajnsek, J.R.Willford and P.Chaen (AGSO), 1996 Geographic Information Systems by D.Bulmanis and J.R.Willford (AGSO), 1996

It is recommended that this map be referred to as: J.R.Willford 1996 - Selwyn Regolith-Landforms. CRC LEME Cooperative Research Centre for Landscape Evolution and Mineral Exploration, (CRC LEME) Perth/Canberra

Regolith-Landforms polygons are based on interpretation of 1:25,000 colour ektachrome, enhanced Landsat TM imagery, airborne gamma-ray imagery and field observations.

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