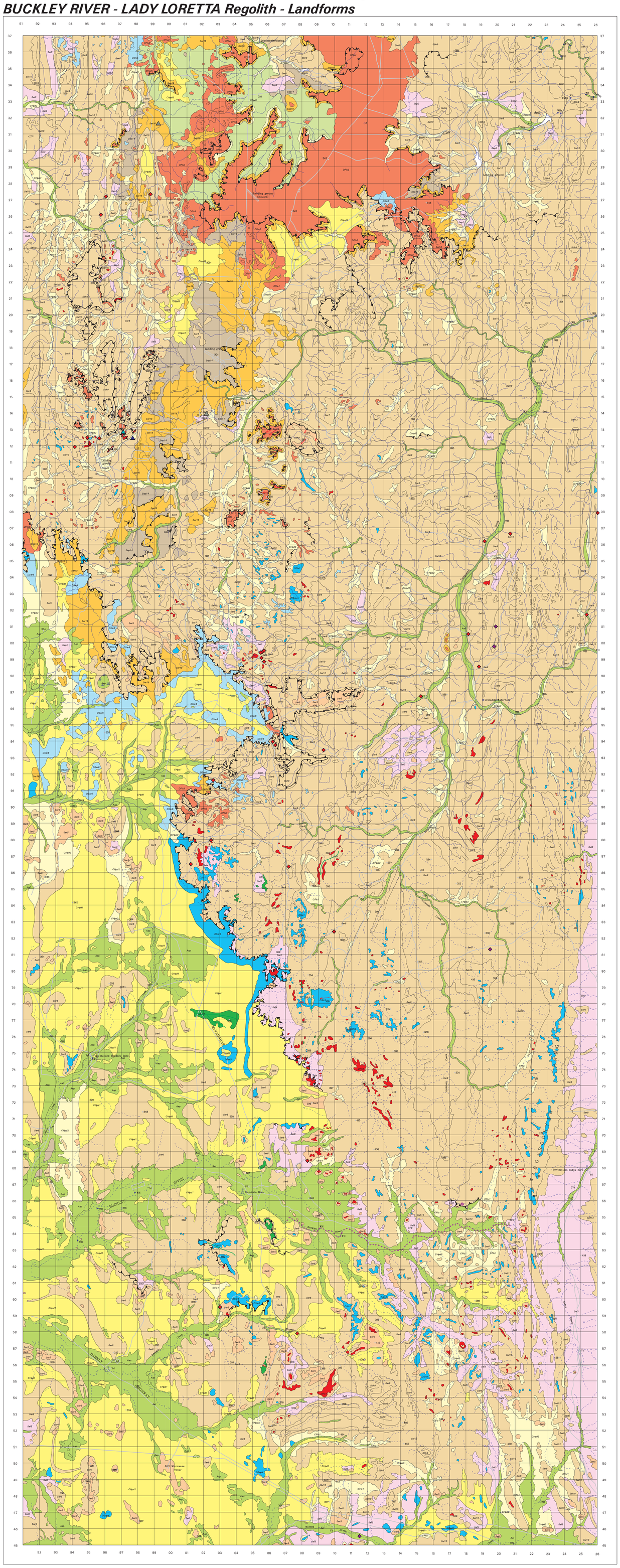
Interpretative Geochemical Sampling Strategy Map

BUCKLEY RIVER - LADY LORETTA Regolith - Landforms



SCALE 1 : 85,000

0.85 0 0.85 1.7 2.55 3.4 4.25 5.1 5.95 6.8 7.65 8.5 Kilometres

UNIVERSAL TRANSVERSE MERCATOR

REGOLITH/GEOCHEMICAL SAMPLING GUIDE *

Duricrust

Proterozoic bedrock

Ferruginous

Indurated materials cemented mainly by iron, including massive duricrust, slabby duricrust and highly ferruginous saprolite. Duricrust, nodules, pisoliths and ferruginous saprolite can be used for geochemical sampling in detecting underlying mineralisation. Massive Fe duricrusts are likely to be developed in-situ whereas slabby Fe duricrusts have developed from vertical and lateral movement of iron oxides. Broad spaced sampling recommended for Fe nodules and pisoliths.

Siliceous

Indurated materials cemented by mainly silica, including silcrete, iron-stained silicified/ bleached saprolite, mottled silicified saprolite and minor Fe duricrusts, silicified/bleached saprolite. Mottling developed within the silcrete and ferruginous lags can be used as a broad geochemical sampling media, otherwise drilling recommended.

Post-Proterozoic bedrock

Ferruginous

Indurated materials cemented by mainly by iron, including massive, slabby and nodular duricrust and ferruginous saprolite. Sampling ferruginous materials (duricrust, nodules, pisoliths and ferruginous saprolite) may be useful as broad geochemical indicators due to possible hydromorphic dispersion or reworking of mineralised bedrock into the sediments.

Siliceous

Indurated materials cemented by mainly silica, including iron stained silicified saprolite, silcrete and mottled silcrete. Mottling developed within the silcrete might be used as a broad geochemical sampling media due to possible hydromorphic dispersion or reworking of mineralised bedrock into the sediments.

Saprolite and skeletal soils

Proterozoic bedrock

Highly ferruginous saprolite, minor pockets of Fe duricrust. Duricrust, nodules, pisoliths and ferruginous saprolite can be used for geochemical sampling in detecting underlying mineralisation. Fe duricrust and ferruginous saprolite developed in situ.

Ferruginous saprolite and saprock partly covered by lithosols. Surface rock chip and soil sampling, good exposure.

Post-Proterozoic bedrock

Ferruginous, mottled and bleached saprolite. Sampling of ferruginous lags and saprolite may be useful providing there is hydromorphic dispersion or reworking of mineralised bedrock into the Mesozoic sediments.

Saprolite covered by extensive lags and thin residual soils

Proterozoic bedrock

Surface sampling either soils or ferruginous lags (fragments of ferruginous saprolite, minor nodules and pisoliths) may be used for geochemical sampling. Cover is thin (typically < 1 metre) and consists of residual soils and locally derived sheet wash sediments over ferruginous and mottled saprolite. Close spaced sampling recommended.

Post-Proterozoic bedrock

Surface sampling either soils or ferruginous lags (fragments of ferruginous saprolite, nodules and pisoliths) may be useful providing there is hydromorphic dispersion or reworking of mineralised bedrock into the sediments. Cover is thin (typically < 1 metre) and consists of residual soils and locally-derived sheet wash sediments over ferruginous and mottled saprolite.

Alluvium

Alluvial and lacustrine sediments of varying thickness. Stratigraphic rillingrequired to determine underlying regolith substrate. Suitable for stream sediment sampling - may give broad catchment geochemical indicators.

Heaved saprolite fragments in swelling clay soils may provide an indication of the substrate below.

Silicified alluvium and colluvium, unlikely to relate to the present day drainages. May give broad palaeo-catchment geochemical indicators.

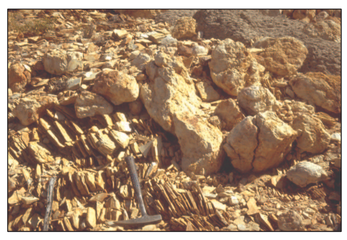
Partially cemented coarse and poorly sorted alluvium and colluvium. Derived largely from Mesozoic sediments, typically > 4 metres thick. Drilling recommended.

Colluvium

Extensive colluvial, residual and minor alluvial sediments. Ferruginous lags may be used as regional geochemical sampling media. Shallow RAB recommended. Most materials locally derived, colluvium generally < 2.0 metres.

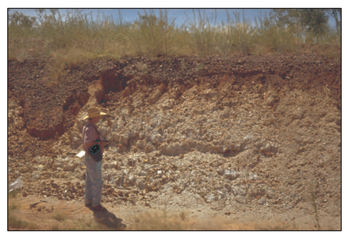
Extensive colluvial and minor alluvial sediments. Stratigraphic drilling required to determine underlying regolith substrate. RAB recommended. Cover over several meters deep in places, may or may not be locally derived. Sediments largely derived from Proterozoic bedrock. Ferruginous materials (fragments of ferruginous saprolite, nodules and pisoliths) may be useful in reconnaissance exploration.

** (the sampling strategy guide provides a simplified key to the distribution of 'major' regolith materials and recommended sampling approaches. It can be used to provide a broad based sampling framework of the map sheet area.)*



Silicified alluvial and colluvial gravels over bleached and partly silicified Proterozoic shales. Forms inversion of relief (305685E, 7756112N).

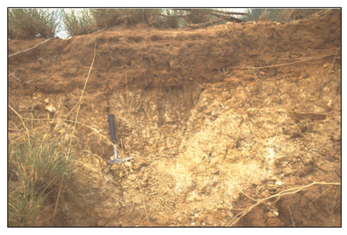
Pre-Cretaceous concordant summits forming mesas and plateau surfaces. Proterozoic sediments are capped by either siliceous or ferruginous duricrusts which overlie very highly weathered bleached saprolite (looking west from 305764E, 7798638N.



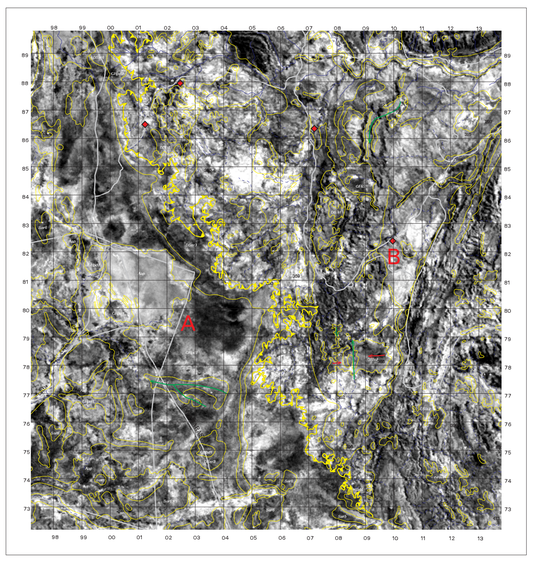
Fe duricrust gravels formed from Fe segregation in the mottled zone over highly weathered Proterozoic saprolite (320691E, 7745974N).

Massive Fe duricrust and highly ferruginous saprolite forming local mesas over mottled and bleached bedrock (30721E, 7756167N).

Sheet flow deposits and pediments over very highly weathered saprolite. Lags consist of ferruginous lithic, quartz and Fe duricrust fragments (324605E, 7755409N).



Veneer of sheet flow deposits and residual soil over very highly weathered saprolite (324605E, 7755409N).



Landsat TM band 5 overlain with regolith polygons and erosional scarps in yellow, palaeo slopes in red and palaeo channels in green.
A - Landforms above the scarp consist of highly weathered silicified, mottled and bleached saprolite. The saprolite is largely covered by a blanket of colluvial sands and gravels.
B - Landforms below the scarp are generally less weathered consisting of ferruginous and mottled saprolite and saprock. The saprolite is partly covered by lithosols. Soil geochemical surveys are likely to mainly reflect regolith materials above the scarp and bedrock lithology below the scarp.

Regolith landform unit boundary
Erosional scarp
Palaeo-drainage
Palaeo-landform slope
Superimposed drainage
Drainage
Roads, vehicle tracks
River capture
Lake

Proterozoic sediments:	*Siltstone, quartzite, stromatolitic dolomitic siltstone, shale, chert, meta-basalt, feldspathic quartzite laminated and dolomitic siltstone.*
Mesozoic sediments:	*Sandstone, siltstone, mudstone and conglomerate.*
Cambrian sediments:	*Siltstone, sandstone, limestone, chert, cherty breccia, silicified shale, conglomerate, phosphorite and phosphatic siltstone.*

MINERAL OCCURRENCES (DEPOSITS)

- *Zinc (Zn)*
- *Uranium (U)*
- *Copper (Cu)*
- *Lead (Pb), Zinc (Zn) and Silver (Ag)*
- *Barium (Ba)*
- *Phosphate (Ph)*

REGOLITH CODES

DF	*Ferruginous duricrust*
DS	*Siliceous duricrust*
S	*Saprolite*
AC	*Channel deposits*
A	*Alluvial sediments*
CH	*Sheet flow sediments*
CF	*Footslope deposits*

LANDFORM CODES

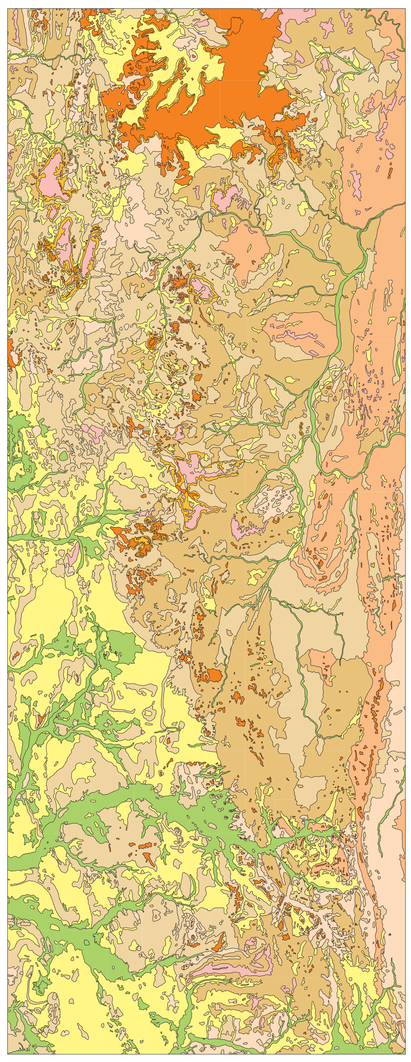
ls	*Plateau*
es	*Pediments*
ep	*Erosional plain (<.9m relief)*
er	*Rises (9-30m relief)*
el	*Low hills (30-90m relief)*
eh	*Hills (90-300m relief)*
ee	*Escarpment*
bh	*Bevelled hill*
af	*Floodplain*
ao	*Floodout, overbank plain*
of	*Alluvial terrace*
fc	*Colluvial fan*
pd	*Depositional plain*
ap	*Alluvial plain*

(Data provided by Bureau of Resource Science from the minloc database)*

LANDSAT TM IMAGE

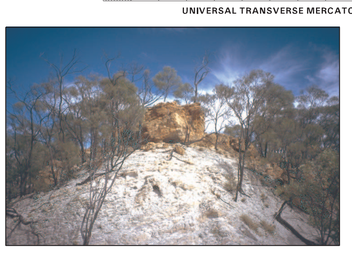
False colour composite Landsat TM image (30m pixels) showing highly ferruginous saprolite and Fe duricrust in yellow-green; structured saprolite in red, dark green and blue; sheet flow colluvium in pale blue.

MAJOR LANDFORMS



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

Sheet flow colluvial gravels over highly weathered and bleached structural saprolite (297142E, 7821720N).



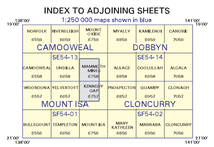
Silcrete and silicified saprolite over very highly weathered bleached Proterozoic shales (306193E, 7793361N).

Ferruginous Mesozoic sandstone with Cu mineralisation over highly weathered Proterozoic sediments (298488E, 7827877N).

Massive slabby Fe duricrust overlying ferruginous, mottled and bleached Proterozoic shales (303500E, 7759000N).

INDEX TO ADJOINING SHEETS

1:250,000 maps shown in blue



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It is recommended that this map be referred to as:
J.R.Wilford, R.R.Anand and J.Rogers 1996 - Buckley River-Lady Loretta Regolith-Landforms (1:85,000 map scale). 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 airphotos, enhanced Landsat TM imagery, airborne gamma-ray imagery and field observations.

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The Director
CRC LEME
c/- CSIRO Division of Exploration and Mining
Private Mail Bag
Post Office, WEMBLEY W.A. 6014
Tel:(09) 387 0272, Fax: (09) 387 0146

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