

**INDURATION MODIFIER** 

bedrock fragments

Calcrete - pods, slabs, blocky, and massive

Calcareous earths; calcareous nodules; soil carbonate.

Fe segregations, Fe-saprolite and Fe stained hardpan.

Duricrust - nodular; iron rich; fragmental as single species or a mixture

Lag - variable composition but dominantly gravel-sized consisting of

Lag-gravels: dominantly sandy quartzofeldspathic, or quartzofeldspathic

Lag-gravels: fine ferruginous gravels (mostly without cutans on grains).

Ferruginous fragments - mixed composition: lateritic residuum, duricrust,

Iron segregations in exposed saprolite, or concentrated at the surface.

Hardpan - either dominantly siliceous cement and iron stained;

(Greenstone Saprock and Bedrock)

Aeollan sands and deep colluvial clays Lacustrine sediments lateritic gravels and calcareous clays

Palaeochannel with mega-mottles in sands and gravels

Extensive playa floors consisting of clay gypsum and hallte

Greenstone Bedrock Environments II

(Greenstone Bedrock)

SIR SAMUEL

COMPOSITE RADIOMETRIC IMAGE OF SIR SAMUEL WITH REGOLITH POLYGONS

## Transported regolith Alluvial sediments Aeolian sediments Colluvial sediments CHfs26 Evaporite Lacustrine sediments Lacustrine sediments In-situ regolith Saprolite Relicts of an earlier weathered landscape on greenstones, now stripped at the crests of rises and forming colluvial lower slopes. Ferruginous nodules, saprolite, gossanous material, rare lateritic duricrust, medium granular sandy loam, colluvial sands. Rare calcrete, hardpan at 50cm, red earths. Thin complex association of ferruginous saprolite and ferruginous mottled zone overlying lateritic residuum on weathered greenstone bedrock. Pisolithic granules, ferruginous saprolite and indurated mottled zone fragments as ' lag with a fine granular red sand to loamy fine sandy matrix.' SCer5 Extensive exposures of iron segregations in completely weathered greenstone bedrock. Extensive gravel to pebble surface lags. Some patches of colluvium over discontinuous but extensive saprolite exposures. Some scattered exposures fresher rock. Patches of calcrete and calcareous earths. Shallow stony acid red earths and some hardpan Highly kaolinized granitic bedrock; rare fresh outcrop; local pockets of colluvial gritty sand; lag consists of quartzo-feldspathic grits and gravel, and some silcrete cobble. Outcrops of greenstone bedrock and fresh unweathered rock with pockets of red clay. Saprolite contains iron segregations. Extensive lag deposits consisting of iron segregations and fresh and iron indurated greenstone saprock ranging from pebble to boulder sizes. Rare pockets of laterite. Rare outcrops of fresh granitic bedrock; common pallid granite saprolite exposures and subcrop; thin discontinuous colluvial gritty sands with quartzo-feldspathic granule lag with rare silcrete fragments and very rarely developed Thin discontinuous gritty sandy colluvium over pallid felsic saprolite and rare outcrops of fresher rock. Very rare calcrete and silcrete, some hardpan.. Extensive quartzo-feldspathic granular lag, with rare silcrete pebbles and some ferruginous granules. Tends to occur below breakaways as undulating and inclined tracts and concave pediments Extensive exposures of greenstone sequences with local patches of ferruginous saprolite usually as flat ridge crests. Calcrete, extensive stony colluvium. Localised exposures of iron segregations (massive ironstone). Lags consisting of ferruginous and lithic fragments. Highly weathered bedrock Extensive saprolite formed from metamorphosed felsic volcanics sometimes covered by a thin colluvial mantle. Extensive quartzo-feldspathic granule and gravel lag with some ferruginous fragments. Large patches of silcrete pebbles. Shallow acid red and red-brown gritty sandy earths are dominant. Sediments occur above breakaways Moderately weathered bedrock Extensive areas of granitic saprolite exposed through a colluvial mantle. Silcrete pebbles and rarer cobbles and very rare patches of calcrete. Quartzo-feldspathic granule lag is extensive and includes some ferruginous fine gravels and lithic fragments. Sandy earths. Local crests, low breakaways and abutting pediments with nearby minor re-entrants. Moderately weathered gabbro forming saprolite pockets over low hills to hills. Coarse gravel and cobble gabbro lag with occasional calcrete cappings, and patches of calcareous red clay. Narrow alluvial tracts within floors of shallow

SMel4

(Granitic Bedrock)

DEPOSITIONAL LANDFORMS

Alluvial landforms

Alluvial plain

Terraced land

Colluvial fan

Playa plain

Sandplain

ep

Sheet flow fan

Depositional plain

Erosional landforms

Erosional plain Pediment

Pediplain

Etchplain

Rises

Hills

Low hills

Escarpment

EROSIONAL LANDFORMS

Longitudinal dune

Flood plain

----- Minor road

---- Vehicle track

Landing ground

MINERAL OCCURRENCE

—-—- Minor administrative boundary

(Data provided by Bureau of Resource Sciences from the MINLOC database)

SIR SAMUEL REGOLITH-LANDFORMS Sediments consisting of levee deposits, some broad channel alluvial deposits up to 15m thick. Hardpan extensive within 2m of the surface; some fine granule quartzo-feldspathic lag; some granite saprolite as substrate. Fluvial sediments with mainly overbank characteristics. Channel deposits rarer. Extensive clays with interbedded discontinuous granule, gravel and sandy lenses. Occur on a flat floodplain with some narrow levee banks flanking Alluvial clay loams and light clays with some bands and lenses of coarse stream-bed deposits. A few lenses of calcrete with extensive hardpan development at 0.75m. Sediments are primarily derived from greenstone sources and are intermixed with the distal portions of sheet flow fan sequences. Aeolian sand derived from colluvial sands originating from granitic substrate; some lateritic gravels and duricrusts exposed or as subcrop on broad crests. Mass movement Extensive shallow stony colluvium over extensive patchy exposures of greenstones with local ferruginous saprolite usually on broad ridge crests. Very rare calcrete patches. Local exposures of iron-segregations. Local hardpan within >0.5m depth. Ferruginous and lithic fragments as lag. Sheet flow deposit Clay loam to light clays overlying greenstone saprock and saprolite. Channel deposits present in broad flat drainage floors within alluvial plain in broad major tributary valleys. Granule to gravel sized lag consisting of ferruginous Alluvial and lacustrine sediments with rarer sheet flow sediments with some aeolian reworking. Calcrete at depth. Extensive sheet flow deposits originally fluvial in origin with some local channel stringers at depth. Generally overlie greenstone saprock and /or saprolite. Dark brown to black ferruginous and lithic gravel and granule lag over flat to Granular fine sandy clay to light clays initially as sheet flow deposits now almost completely reworked into low "Wanderrie" banks overlying greenstone saprock and saprolite. Flat floored hollows between banks with quartz, lithic gravels and pebbles. Granular ferruginous and lithic lags on banks." Sediments up to about 2m thick over fresh granite to granite saprolite; surface lag consisting of quartzo-feldspathic Colluvium consisting of gritty red sand overlying granitic bedrock. Distinctive quartz gravel cobble and boulder lag. vegetation; eucalypts, grasses and rarer mulga on the lower footslopes. Colluvium consisting of gritty red sand overlying granitic bedrock. Some cobble to gravel scree on gentler fringing slopes of granitic hills occurring as dome forms with exposed tors. Generally free of vegetation but grasses and thinned mulga surround the colluvial fringes. Clay loams forming sheet flow deposits on very slightly undulating greenstone tracts with black shales; few very low hills. Lag is ferruginous granule and gravel, lithic fragments and quartz. Some carbonate patches in subsoils; some hardpan development and patches of calcareous, and red earths. Thin gritty colluvial sands formed into sheet flood deposits and consisting of red and earthy sands associated with bedrock on a very broad undulating, inclined plain Extensive acid/neutral duplex soils with compact dense B horizons. Colluvial sediments consisting of gritty sandy loam derived from a substrate varying from weathered to fresh granitic bedrock. Small patches of fresh granitic bedrock are exposed but only represent about 5pc of the surface exposure. Regolith thickness varies from 4m to less than 1m. ENHANCED THEMATIC MAPPER IMAGE OF SIR SAMUEL WITH REGOLITH POLYGONS Pockets of gritty sandy colluvium derived from weathering granite. Sediments consisting of 1-2m thick sandy to clayey loams with extensive surface gravel and granular quartzo-feldspathic and ferruginous lag; underlain by metasediments (shales) and granite. 5m thick hardpan within >0.5m depth; pockets of calcrete, and gravel lenses. Gritty sand to loam textured colluvium; some fine gravel bedload as lenses. Coarse granular quartzo-feldspathic lags. Pockets of granitic saprolite (grus). Some hardpan within 2m of surface. Some fresh rock substrate below colluvium; Clay loams to light clays between 1 and 2m thick over granitic saprolite and saprock. Gravel and granule-sized lag consisting of saprolite, lithic fragments ( mainly greenstone and some granite), pisolites and quartz. Hardpan10cm below surface and 5 to 10m thick. Clayey sand forming sheet flow deposits with a fan shape on a gently inclined flat plain. Duplex structureless brown Fine grained sediments; some lenses of coarse grained channel deposits. Extensive 2-5m thick hardpan; substrate consists of an extensive and deeply weathered stripped granitic profile. Minor contributions from mafic rock sources shown in lags. Hardpan from 0.5 to 1m; acid red earths common. Flat to gently inclined plains sometimes fan shaped. Some lenses of coarse channel deposits. Extensive 2-5m thick hardpan within 1m of surface. Weathered profiles on granitic bedrock may be variably stripped and form a common substrate. Clay loams and light clays with lenses of channel gravels and lenses of calcrete at depth form a gently inclined fan shaped plain. Greenstone saprolite is predicted to be generally15m below the surface. Some patches of hardpan present; granule to gravel lags dominated by ferruginous components. Extensive cobble and gravel-sized lag deposits derived from greenstone outcrops and banded iron formation. Mid to lower slopes of strike ridges and inter-ridge hilly tracts are mantled by saprolite fragments. Extensive sheet flow deposits over granitic saprolite at 2 - 6m. Some granitic saprolite as outcrop. Extensive quartzo-Fine sandy loams to fine sandy clay loams as sheet flow deposits on a very gently inclined plain traversed by a complex pattern of shallow channels. Dominant soils are acid sandy red earths with ferruginous fine gravel throughout and hardpan within 1m. Local patches of salinisation. Ferruginous dark brown to black lag. Mottled and pallid saprolite. Fine sandy clay loams dominated by granular ferruginous clasts in top 1m form extensive sheet flow deposits on a very gently inclined plain with some local very shallow drainage floors. Greenstone saprolite is mostly pallid within upper 2m. Extensive dark brown fine gravel lags. Acid red earths, duplex profiles with very compact brown clays Fluvially transported sediments as sheet flow fans with fine black granules as a major component on a gently inclined plain. Acid red sands with hardpan in the upper 1.5m. Fine loamy sands to fine sandy loams dominate sheet flow sediments to a depth of about 1 to 2m with hardpan at Clay dominated surface response about 0.5m. Ferruginous fine grading to coarse gravels within 1m of greenstone mottled to pallid saprolite at 2-3m Brown to black fine gravel lag extends over long very gentle slopes to valley floors. Acid red sands and earthy sands. Iron oxide dominated surface response Vegetation dominated surface response Clay loam sheet flow deposits over weathered greenstone at 1 to 3m. Gravel and granule lag consisting of Surfaces with iron oxides and clays dominated ferruginous saprolite, lithic fragments and quartz. Some hardpan and calcrete. Local pockets of exposed fresh greenstone saprolite. Red earths with carbonate, and calcareous earths. Vegetated regions on iron oxide dominated surfaces Vegetated regions on dominantly clay covered surfaces Colluvial clayey sands; some hardpan within the upper 2m of the regolith, and rarer pockets of calcrete. Sediments initially of fluvial origin and containing groundwater calcrete. Mixed sheet flow deposit and channel stringers. Some aeolian reworking of the sandier portions of the sheet flows. Formed on a plain along the main drainage axes. Acid sandy red earth and acid red sands; shallow calcareous earths. Fluvially transported sandy sediment slightly resorted by aeolian action. Rare evaporites and calcrete, and some hardpan within 2m of the surface. Sediments occur on plains generally flanking main drainage axes of broader valley floor complexes. Very rare small saline playas. Acid red sands and red sandy earths and duplex profiles common. INTERPRETED LANDSCAPE CLASSES Extensive deep saprolitic clays with patches of sheet flow deposits up to 2m thick derived from greenstone bedrock exposures. Local thin colluvium and minor alluvium with acid red earths. Acid red earths and hardpan on low remnant sheet flows. Red earths with carbonate in erosional tracts Fluvially transported sandy sediment slightly resorted by aeolian action. Rare evaporites and calcrete, and some hardpan within 2m of the surface. Granitic saprolite is common along with quartzo-feldspathic lag gravels. Coarse irregular pattern of broad sandy rises with acid red sand and red earthy sands dominant and resting on a broad plain. fluvially transported sandy deposits modified by aeolian action into a complex of low sand rises with flat floored sometimes saline playas in lowland clayey areas. Scattered clayey areas and evaporites and traces of calcrete. Acid red sands on sandy rises. Duplex soils with compact clay B horizons on lowland floors. Minor local calcareous earths Extensive colluvial sediment derived mostly from greenstones and rarely less than 2m thick usually >5m and consists of clayey fine sands to clay loams, with some localised clay-rich parts. Mottled plastic clays at >5m. Sediments occur along broad drainage axes. Broad sinuous rises with irregular shaped crests and floors and are in part anastomotic. Deep colluvial clayey sands and aeolian sands; some saprock exposed; some lateritic gravels and duricrust exposed, Extensive lateritic profiles eroded on crests. Deep colluvial sands and gravels on slopes and swales. Saprolite is Wind-modified sheet flow sediments underlain by highly weathered granitic bedrock; small patches of calcrete Fluvially transported sandy sediment reworked by aeolian action into sorted sand deposits. Excavated hollows now form small playa floors. Some coarse quartz lag probably derived from granitic saprolite. Small patches of calcrete and evaporite. Numerous small clay pans with coarse quartz gravel lag, some saline and adjacent to sandplains. Sandy deposits partly reworked by wind. Evaporite deposits associated with major saline playa systems. Occasional patches of calcrete. Acid red sands and acid red sandy earths. Local duplex profiles with compact structureless brown Colluvial fan deposits Colluvial mantle containing pisoliths, quartz, ferruginous saprolite and lithic fragments overlying pisolitic lateritic residuum, iron segregations merging into greenstone saprolite and saprock. Polymictic lags vary from fine ferruginous to coarse lithic fragments and locally derived quartz. Lacustrine sediments Clays, halite and gypsum; aeolian sands with gypsum; rare unmodified sheet flow sediments; rare patches of Calcrete up to 10m thick, overlain by and interleaved with fluvial deposits but also rests directly on granite saprolite, saprock and unweathered granite. Usually occupies broad drainage axes within major valley floors. Slight irregular depressions, undulations and minor sinkholes are common. NOTE: The CSIRO "RED" classification is Extensive playa floors consisting of sediments dominated by clays, gypsum and halite; those more familiar with that scheme Saline clays, aeolian sands with halite, gypsum and some calcrete developed over fluvial sediments at about 10m depth. A complex pattern of small playas, clays pans, lunettes and hummocks covered with halophitic shrubs and patches of Acacia scrub. Completely weathered bedrock Large patches of shallow gritty sand; locally derived colluvium; extensive quartzo-feldspathic grits; boulder and cobble Pisolitic lateritic residuum is rare. A colluvial mantle of ferruginous gravels, pebbles and fragments is extensive and covers gently inclined plain. Acid granular to gravelly fine sandy red earth with hardpan within 1m of the surface. Fine granular ferruginous veneer on weathered greenstones. Represents erosional relicts of an earlier extensive weathered landsurface. Crestal regions are slightly eroded exposing deeper parts of the weathered mantle. Lateritic materials (pisolitic and indurated), iron segregations, hardpan, fe-saprolite.

WILUNA SG51-9 SG50-12 SANDSTONE DUKETON SG50-16 SG51-14 SH50-4 SH51-1 SH51-2



NGMA PRODUCT OF THE NATIONAL GEOSCIENCE MAPPING ACCORD A COLLABORATIVE PROJECT BETWEEN AGSO AND GSWA

**DIGITAL DATA** All map elements are stored digitally as topologically structured Arc/Info coverages. Descriptions for each of the map polygons and site data are stored in an Oracle relational database. Map information can be purchased from AGSO as hard copy plots and as digital data sets.

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**REGOLITH-LANDFORMS IMAGE MAP SHEET SH51-13** 

prolonged exposure to light

**EDITION 1** January 1998



## RADIOMETRIC SIGNATURE

Slightly weathered bedrock

with some duplex profiles on lower slopes and on local alluvial tracts.

Potassium (Regions associated with exposed granitic bedrock) Thorium (Various ferruginous materials at the surface) Uranium (Calcrete; calcareous sediments and soils) Black to brown Low K, Th, U (Duricrusts and exposed bedrock low in K, Th & U; often greenstones and some sandplains) White to yellowish High K, Th, U (Geomorphically active regions associated with exposed granitic saprolite and sediments derived from granite)

Moderately weathered greenstone bedrock with patches of calcrete. Some colluvium and scree deposits on hills to low hills and moderately eroding slopes. A general mantle of cobble-sized lag is present. Little or no deeply weathered remnants remain in these hilly belts.

Patches of lateritic residuum. Some duricrust, iron segregations, mottled zone and calcrete. Clayey sands and clay loams, ferruginous granules, and gravels often formed as colluvium. Extensive saprock and saprolite at depth. Rare outcrops of fresh rock. Lags variable and extensive.

Saprolite derived from arenaceous Proterozoic sedimentary rocks. Local patches of colluvium and alluvium. Quartzose and lithic pebble and gravel lags extending over low hills and rises and across alluvial tracts. Shallow stony red sands

Saprolite derived from medium to coarse grained arenaceous and conglomeratic sediments. Patches of coarse sandy colluvium less than 1m thick. Quartzo-feldspathic fine gravel lag, and local patches of silcrete pebbles and rarer cobbles; some arenite fragments. Some fresh sedimentary rock outcrop. Acid red and brown sands, and duplex soils.

Extensive outcrops of granitic (rarer doleritic) saprolite and fresher bedrock exposures. Patches of colluvium and

alluvium. Extensive quartizo-feldspathic granular lag. Ferruginous gravels, hardpan and some calcrete. Acid red earths and hardpan, red earths with carbonate at depth, and localised calcareous earths. Association of rises and low hills.

Saprock extensively developed over greenstone subcrop. Patchy calcrete exposures. Extensive granule sized lag;

some narrow alluvial tracts with minor drainage channels in broad drainage floors within a complex array of very low rises and shallow swales. Generally, part of a gently undulating plain.