

ENHANCED THEMATIC MAPPER IMAGE OF WILUNA WITH REGOLITH POLYGONS

AUSTRALIA 1:250 000

Transported regolith

SHEET SH51-1

Alluvial sediments

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. Alluvium consisting of sandy clays merging to stony sands and occurring in terraces associated with nearby active shallow tributary channels. Sandy red earths and red earths developed in alluvium which become stony at about 0.5m and give way to hardpan at 1m.

Overbank deposits 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.

Colluvial sediments 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 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.' Sheet flow deposits up to 1m thick with proto-hardpan, rest on older greenstone saprock and fresh rock pediment. Shallow soils and lithic lags overlie a younger surface consisting of shallow greenstone fresh rock or saprolite. Calcareous earth and salinized areas present adjacent playa lake complexes. Colluvium consisting of gritty red sand overlying granitic bedrock. Distinctive quartz gravel cobble and boulder lag. Associated with flanking slopes from strike ridges formed from quartz dykes. Notable because of the lack of 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. 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. Pockets of gritty sandy colluvium derived from weathering granite.

Extensive weathered granitic bedrock. Extensive granitic saprolite exposures. Gritty sands from local granitic outcrops, and extensive quartzo-feldspathic granular lags. Colluvial and aeolian reworked sands. Hardpan and very localised calcrete. Acid red sands and red sandy earths, some duplex profiles, and localised patches of calcareous earths. 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. 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. 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 quartzofeldspathic granule lag. Significant patches of quartz gravel and pebble lag over a gently inclined flat plain. Sandy sheet flow deposits over an inclined planar tract with footslope fans abutting plateaux and hills formed from prozoic siliclastic sedimentary bedrock. Extensive lags formed from ferruginous fragments, sandstones and silcrete pebbles. Acid red sands to sandy red earths, and hardpan to within 1m of the surface. 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. Sheet flow sands with parts modified by aeolian action. Halite, and saline clays with patches of calcrete. Complex patterns of saline playa floors and aeolian rises, often lunate in form. with intervening sheet flow sands. Local calcre pavements. Broad lowlands between hills and plateaux in Proterozoic arenites. Deep acid red sands on low duneforms Fine loamy sands to fine sandy loams dominate sheet flow sediments to a depth of about 1 to 2m with hardpan at 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. Fine sandy clay loam sheet flow sediments with fine gravel to 0.75m then becoming coarser and resting on mottled to pallid greenstone saprolite at about 2m. Ferruginous fine gravel lags extend over low broad rises with intervening swales within extensive planar tract. Coarser gravels and pebbles in swales. Acid red earths, and hardpan at 0.5m. 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. 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 Sheet flow deposits mostly sandy and extent over gently inclined flat planar tracts. Acid red earthy sands and sandy red earths with hardpan within the top 1m of the profiles. Ferruginous gravel fragments with occasional lithic cores some sandstone fragments, and silcrete pebbles.

Wind-modified sheet flow sediments underlain by highly weathered granitic bedrock; small patches of calcrete

Extensive lateritic profiles eroded on crests. Deep colluvial sands and gravels on slopes and swales. Saprolite is

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 Fluvially transported sandy sediment modified by aeolian action. Minor calcrete and very minor evaporites. Essentially continuous sandplain appearance with frequent small playas and sandy hummocks. Adjacent to more saline tracts of 'major drainage axes. Acid red sands and red sandy earths. Hardpan within top 2m. Granitic bedrock common' 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. Lacustrine sediments Lacustrine sediments

> 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.

Extensive playa floors consisting of sediments dominated by clays, gypsum and halite;

Completely weathered bedrock

Large patches of shallow gritty sand; locally derived colluvium; extensive quartzo-feldspathic grits; boulder and cobble Upper parts of the ferruginous horizon are discontinuous. Duricrusts and iron segregations are common. 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. 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.

Highly kaolinized granitic bedrock; rare fresh outcrop; local pockets of colluvial gritty sand; lag consists of quartzofeldspathic 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.

Moderately weathered bedrock Weathered and fresher Proterozoic arenaceous sediments with patches of colluvium and alluvium. Local scree and quartose and lithic gravel and pebble lag surrounding very pronounced hills and plateaux. Shallow stony red sands with duplex soils on lower slopes and local alluvial tracts. 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 with some duplex profiles on lower slopes and on local alluvial tracts. eratic sediments. Patches of coarse sand 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 granitic saprolite with outcrops of less weathered to rare fresh rock. Some colluvial mantles and extensive quartzo-felsdpathic septonic with ductops of less weathered to fate fless rock, some condition manifes and extensive quartzo-felsdpathic medium and coarse gravel lags. Smaller areas of quartz pebbles and rarer cobbles on a broadly undulating to very gently inclined plain with relief > 5m. Acid sandy red earths and rarer red sands with hardpan at 1m. Extensive weathered arenaceous Proterozoic siliclastic sediments. Colluvial sands and extensive quartzose gravel lags over undulating tracts with low rises and scattered small sedimentary rock outcrops. Acid red sands with hardpan Extensive discontinuous doleritic saprolite of variable thickness exposed and sometimes covered by a colluvial mantle of variable thickness but > 1m. Some outcrop of fresher bedrock and some larger areas of small corestones at the surface. Gently undulating terrain with local flat to very gently inclined plain with rises and low hills.

THEMATIC MAPPER SIGNATURE

Clay dominated surface response Iron oxide dominated surface response Vegetation dominated surface response Surfaces with iron oxides and clays dominated Vegetated regions on iron oxide dominated surfaces Vegetated regions on dominantly clay covered surfaces

MINERAL OCCURRENCE

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

————— Highway ----- Minor road ---- Vehicle track

—-—-- Minor administrative boundary Landing ground

Playa plain

Pediment

Rises

Low hills

EROSIONAL LANDFORMS

Erosional landforms

Sandplain

Lag-gravels: dominantly sandy quartzofeldspathic, or quartzofeldspathic

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

Ferruginous fragments - mixed composition: lateritic residuum, duricrust,

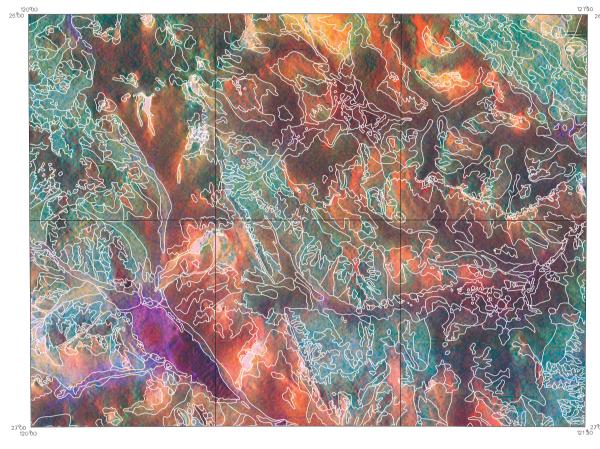
Iron segregations in exposed saprolite, or concentrated at the surface.

Hardpan - either dominantly siliceous cement and iron stained;

Fe segregations, Fe-saprolite and Fe stained hardpan.

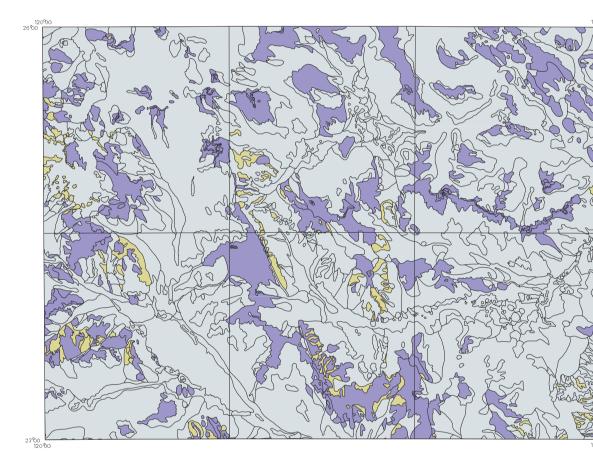
WILUNA REGOLITH-LANDFORMS

COMPOSITE RADIOMETRIC IMAGE OF WILUNA WITH REGOLITH POLYGONS



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)

INTERPRETED LANDSCAPE CLASSES



Rel	lict	NOTE: The CSIRO "RED" classification provided for comparative purposes for those more familiar with that scheme	
Ero	sional		
De	positional		

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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.

WILUNA



REGOLITH-LANDFORMS IMAGE MAP SHEET SH51-1

> **EDITION 1** January 1998 WARNING: Colours will fade with prolonged exposure to light

