

Pinjarra Lakes Regolith Landform Map

TRANSPORTED REGOLITH

Alluvial Sediments

Aap - Alluvial fan deposits
 - Well rounded to sub-rounded, fine to medium, red / brown, quartzose sands and silts covering a low relief land surface, which is incised by ephemeral channels and gullies ranging in depth from 0.5 to 2m. The short gullies contain coarse angular cobbles of granitoid and volcanoclastic rocks proximal to bedrock source crops, and a mixture of red and brown gravel, sand and silt sized quartzose sediments. The ephemeral creek beds are lined with sparse to medium density low trees, grading outwards to low scrubby bushes and dry herbaceous ground cover.

Aeolian sediments

Ier-1 - Residual pedestal island and embankments
 - Well rounded and fine to very fine grained, pale yellow to cream coloured, quartzose sands with minor gypsiferous sands and kopi gypsum. In some places, large discoidal gypsum crystals form distinct layers with a matrix of well rounded fine sands and pale grey clay. These sediments are underlain in places by well rounded fine to medium pale grey to pale orange, variably weathered, quartzose sand containing occasional dark red, mottles, with minor distinct layers of pale green clay of the Miocene Garford Formation. Forming steep sided, variably consolidated, pedestal islands and peninsulas within playa lakes. The islands are more sparsely vegetated by dry herbaceous ground cover, low salt tolerant bushes and the occasional low tree.

Iub - Source bordering dunes
 - A mixture of well rounded, fine to medium grained, white, creamy white, pale orange, pale yellow and grey quartzose sands, with minor amounts of clays and seed and flour gypsum along with other evaporite minerals. Forming lunette dunes with minor small semi-vegetated clay pans in the dune swales. The dunes commonly form crescentic shapes with the long axis at ninety degrees to the prevailing wind direction. Relatively sparse in vegetation compared to the orange, quartz sief dunes. Halophytic vegetation is common, with low scrubby bushes grading to small herbaceous plants towards the shore of playa lakes and clay pans.

Iul - Sief dunefield
 - Well rounded fine to medium grained, orange to yellow quartzose sands with minor clays. Longitudinal sief dunefield with ridges and swales strongly oriented NW to SE, dune ridge crests are more sparsely vegetated than swales and vegetation includes medium to dense woodland, with an understory of low scrubby bushes, and a dark, delicate organic crust at ground level.

Iui - Irregular dunefield
 - Well rounded fine to medium grained, orange to yellow quartzose sands, with minor clays, calcareous sands and occasional calcrete cobbles comprising a non-longitudinal, irregular dunefield of lower relief and more sparsely vegetated than the longitudinal dunefield. Vegetated by generally open woodland, low scrubby bushes and a dark organic crust at ground level.

Colluvial Sediments

CHpd - Alluvial apron
 - Well rounded fine grained red, brown and orange quartzose sands and silts covering a low relief depositional plain between the Gawler Ranges and the dunefield area. Contains patches of fine-grained calcareous soils, deposited within and flanking the Gawler Ranges. The sediments may contain a component of residual material from weathering of the Gawler Ranges bedrock. The depositional plain is vegetated in patches of sparse to medium density woodland and areas of low scrubby bushes and herbaceous ground cover.

Cher - Colluvial sediments blanketing bedrock
 - Well rounded, sub-angular coarse, medium and fine grained, brown and orange quartzose sands and sub-angular to rounded gravels, and cobbles, composed of Gawler Ranges bedrock. Underlain by bedrock subcrop with occasional minor bedrock outcrop containing moderately to highly weathered, granitic and felsic volcanic rocks of the Hiltaba Suite and Gawler Ranges Volcanics forming low rounded hills and rises. Vegetated by the occasional small tree and low density, low scrubby bushes and dry herbaceous ground cover.

Playa Lake

Epp-1 - Playa lake
 - Well rounded, medium to fine, black, brown, light green and grey, quartzose sands with abundant evaporite minerals including halite and gypsum at the surface and with black, brown, pale grey/blue, pale green and red clays sometimes at the surface, deposited in a very low relief playa lake environment. Commonly contain water saturated sediments and a salt crust varying in thickness from 1cm to 15cm towards the middle of larger lakes, and surface water in some places at the time of mapping. The lake margins contain soft and puffy sediments when dry. The lake substrate is comprised of Tertiary palaeochannel fill sediments of the Garford and Pidinga Formation. Higher vegetation is non-existent and a halophytic bacteria populates some lakes creating a slight pink coloration.

Epp-2 - Groundwater discharge spring zone
 - Well rounded, red, brown, grey, green, blue and black quartz sand and clays, in which numerous groundwater discharge points are formed on the surface of playa lakes. Distinguished by groundwater outflow features, halite efflorescence, iron staining and ferruginous induration of surrounding sediments to form variably consolidated ferricrete pavements. Sometimes forming low mounds on playa lake surface and sometimes containing large discoidal gypsum crystals and minor other sulphate minerals. Higher vegetation is non-existent due to the extreme salinity of the playa lake environment.

SW - Surface water

- Surface Water in playa lakes, (see Epp-1 for description) and Pinjarra Dam.

Upp - Clay pans and relict playa lakes
 - Well rounded and fine grained, light brown, dark brown, grey and black, quartzose and gypsiferous, sand and clay deposited in clay pans, with widespread but minor evaporite minerals including halite and seed gypsum at the surface, and interstitial gypsum and halite just below the surface. The sediment texture is soft and puffy when dry inside and around the margins of clay pans. Occasionally containing moist sediments towards the middle of larger clay pans, and surface water immediately after rain was observed at the time of mapping. The immediate substrate is comprised of Tertiary palaeochannel fill sediments of the Garford and Pidinga Formation.

Paleaeovalley Fill Sediments

Ier-G - Garford and Narlaby Formation
 - Well rounded, fine to medium grained, orange, creamy white and yellow, mainly quartzose sands and with minor kopi, seed gypsum and clay, underlain by outcrops of well rounded, fine to medium grained, variably consolidated, grey, creamy, brown and light green, with occasional dark red mottles, fine laminated to relatively massive, sands, silts and clay of the Miocene Garford Formation. Forming steep sided low embankments and peninsulas on the shores of playa lakes and clay pans. Covered in low open woodland, low scrubby bushes and dry herbaceous ground cover.

Ier-P - Pidinga and Khasta Formation
 - Well rounded, fine to medium grained, orange, creamy white and yellow, mainly quartzose sands and with minor kopi, seed gypsum and clay, underlain by outcrops of well rounded, fine to medium grained, semi-consolidated, dark brown, grey and black, fine laminated to medium bedded, carbonaceous and sometimes abundantly siliceous sponge spicular, marine transgressive, sands, and silts, of the late Eocene Pidinga Formation. Forming steep sided low embankments and peninsulas on the shore of playa lakes and clay pans. Covered in low open woodland, low scrubby bushes and dry herbaceous ground cover.

IN-SITU REGOLITH

Bedrock

SMer - Granitic bedrock outcrop
 - Exposed granitic and felsic volcanic bedrock of the Hiltaba Suite Granite and Gawler Ranges Volcanics. Ranging from moderately weathered, with minor kaolinitisation of feldspars, to saprolitic regolith, which contains completely weathered feldspars, quartz grus and original igneous textures. Forming low hills and steep sided bluffs within the Gawler Ranges, small outcrops at the top of low rounded hills within the dunefields areas and occasionally small exposed pavements on the shores of playa lakes. Rockholes are commonly developed on the surface of scattered exposed basement outcrops. Small scrubby bushes occasionally grow in the cracks of more weathered outcrops and lichens are common.

LANDFORMS

ap Alluvial plain pd Depositional plain pp Playa plain ub Source bordering dune ul Longitudinal dunefield
 ui Irregular dunefield er Rises

VEGETATION

From: Rankin and Flint, 1991. For a more detailed description see Laut et al, 1997.

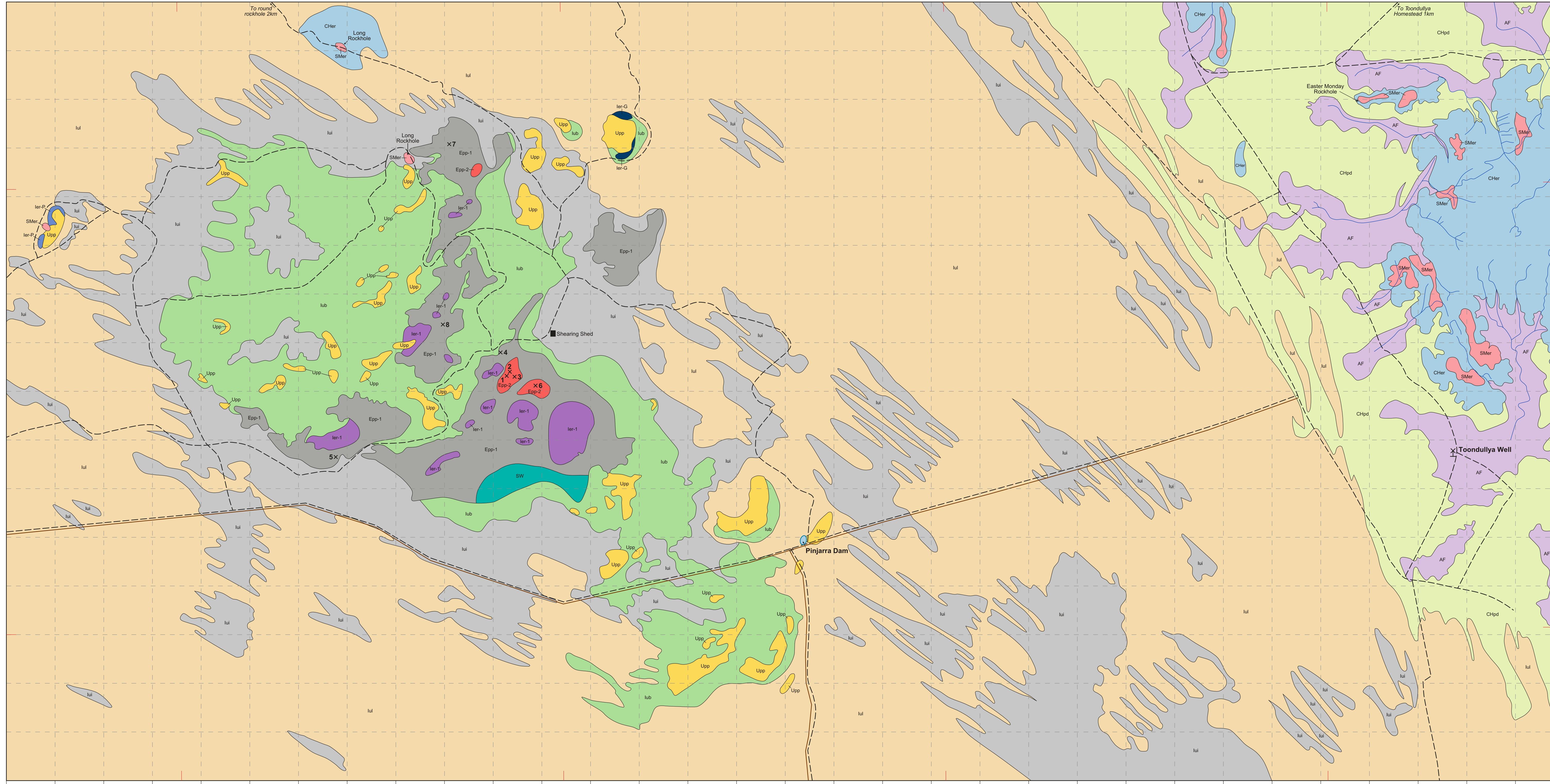
Gawler Ranges: Mixed cover of low open woodland with shrub understorey, low mixed chenopod shrubland and herbaceous vegetation. The hills have a cover of *Eucalyptus Dumosa* subsp. (pleiata), *E. socialis*, *Triodia irritans*, *Stipa* spp. and *Bassia* spp., with minor *Casuarina cristata* on the footslopes.

Flood Plains: *Acacia sowdenii*, *Maireana sedifolia* and *E. porosa*

Dunefield: *E. socialis* and *Triodia irritans* on the dunes and *E. socialis* and *E. gracilis* in the interdunal corridors.

Source bordering dunes: Low open woodland and mallee scrub with chenopod understorey, the dunes have a cover of *E. socialis* and *Casuarina cristata*, with *Acacia sowdenii* and *Maireana sedifolia* in the interdune areas.

Lake depressions: Up to the lake shores *Arthrocnemum* sp. and *Pachyocoma tenuis* are present, and the playa lake surfaces are barren.

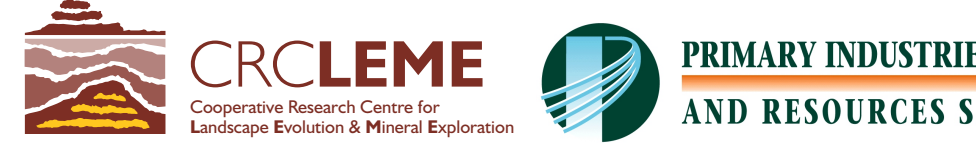


Compiled by W. Kimber (CRCLEME/ANU) and Dr J.D.A Clarke (CRCLEME/ANU)

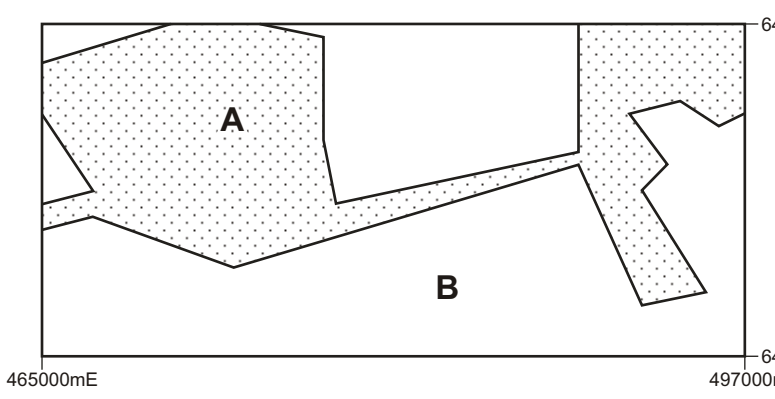
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Bibliographic Reference:
 W. Kimber, J.D.A. Clarke, 2002. *Pinjarra Lakes regolith landform map* CRC LEME Department of Geology, Australian National University, Canberra.



Reliability Diagram, Pinjarra Lakes Regolith Map



A Detailed ground traverse, Aerial photographs, Landsat 7 imagery, Streaky Bay 1:250 000 geology sheet, Toondully and Pinjarra 1:50 000 topographic maps, Digital Elevation Model, Radiometrics.

B Aerial photographs, Landsat 7 imagery, Streaky Bay 1:250 000 geology sheet, Toondully and Pinjarra 1:50 000 topographic maps, Digital Elevation Model, Radiometrics.

References

1. P. Laut, P.C Heyligers, G. Keig, E. Loffler, C. Margules, R.M Scott, and M.E Sullivan, 1977a *Environments of South Australia: Province 4, Eyre and Yorke Peninsulas*. CSIRO Division of Land Use Research, Canberra.
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3. L.R Rankin and R.B Flint, *Streaky Bay South Australia 1:25 000 Geological Series-Explanatory Notes*, Department of Mines and Energy South Australia, 1991.
4. L.R Rankin and R.B Flint, *Streaky Bay South Australia 1:25 000 Geological Series*, Department of Mines and Energy South Australia, 1991.

