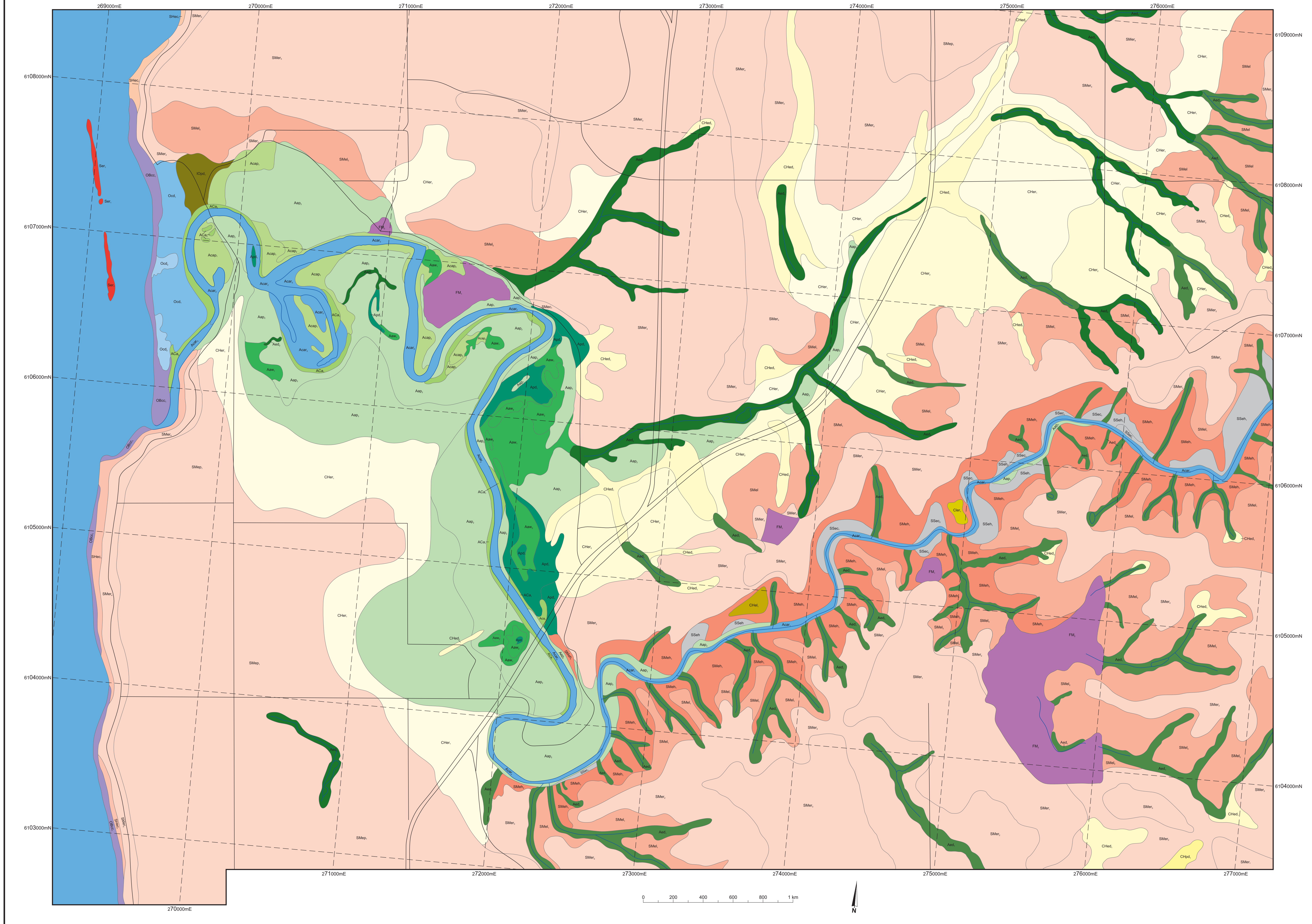


# 1:10,000 Lower Onkaparinga, Regolith-Landform Map



- TRANSPORTED REGOLITH**
- Alluvial sediments**
- Asu** Brown, sub-rounded to rounded, well-sorted, silts composed of lithic fragments. Low relief, moderate slope gradient (5-12%), alluvial plains adjacent to main channel in upstream areas. Dominated by grasses and various trees including river red gum (*Eucalyptus camaldulensis*), pink gum (*Eucalyptus fasciculata*), blue gum (*Eucalyptus leucocoryn*), Olive (*Olea europaea*).
  - Asm** Rounded, well-sorted, fine to medium grained, silts and sand, composed of lithic and quartzose fragments. Low relief, low slope gradient (2-5%), alluvial plains forming terrace in downstream areas. 0.5-1.5m above main channel. Silts (70%) very fine grained, rounded, brown. Sands (30%) fine to medium grained, rounded to sub-rounded, yellow to white. Landform sparsely colonised by grasses.
  - Asn** Red, white, yellow and orange, sub-rounded to rounded, very fine to medium grained silts, clays and sands, composed of lithic and quartzose fragments. Low relief, low slope gradient (2-5%), alluvial plain forming a terrace 2-3 metres above the Aa2 terrace. The junction between Aa2 and Aa3 is a low relief, high (>20%) gradient type escarpment. Hardpan, nodular and powder carbonate accumulations widespread throughout formation. Brown loam soil profile present approx 5-10 cm thick, colonised by grasses and various vegetation types.
  - Asp** Brown to grey, rounded, well-sorted, very fine silt composed of lithic material. Depositional area of low topographic relief and low slope gradient (2-5%). Approximately 0.2-0.5m higher than adjacent main channel, subject to tidal influences and flooding. Dominated by olive (*Olea europaea*), pink gum (*Eucalyptus fasciculata*) and blue gum (*Eucalyptus leucocoryn*).
  - Asq** Grey, brown, red and purple, sub-rounded to rounded, very fine to fine grained lithic silts. Surface lag of angular siltstone bedrock and nodular carbonate gravels. Medium relief and medium slope gradient (>12%) depression with minor channel. Minor exposed siltstone and limestone moderately weathered bedrock. Red-brown, purple and grey siltstone and limestone with bedrock fabric and structures present. Dominated by olive (*Olea europaea*).
  - Asr** Sub-rounded to rounded, well-sorted, very fine to fine grained, quartzose and lithic silts, clays and sands. Low relief, low slope gradient depression with minor channel, quartzose and lithic silts and clays. Occurring in downstream areas.
  - Ass** Black to dark brown, very fine, well-sorted, silts, clays and muds in swampy depressions. Lithic and organic rich silts, clays and muds. Very low relief, low slope gradient, ephemeral swamp area adjacent to major channels. Dominated by reeds, bulrushes and grasses.
  - Asu** Black to dark brown, well-sorted, very fine, silts, clays and muds in swampy depressions. Organic-rich, lithic silts, clays and mud. Very low relief, low slope gradient, submerged swamp area adjacent to major channels. Dominated by reeds, bulrushes and grasses.
  - Asv** Dark brown, well-sorted, very fine to fine grained, rounded to sub-rounded silts composed of lithic material. Very low relief, low slope gradient, meandering major channel, upstream areas have occasional siltstone and limestone weathered bedrock exposure.
  - Asw** Dark brown, rounded, well-sorted, very fine to fine grained, rounded silts, composed of lithic material with minor white, rounded, fine grained quartzose sands. Very low relief, low slope gradient, meandering major channel, midstream sections.
  - Asx** Dark brown and white, rounded, well-sorted, very fine to fine grained silts and sands composed of lithic and quartzose material. Very low relief, low slope gradient, ephemerally flooded and channel areas within major channel systems. Minor siltstone (Ardroonum sp.).
  - Asy** White and yellow, rounded to sub-rounded, medium grained, well-sorted quartzose sands with minor brown and maroon, fine grained lithic silts. Very low relief, low slope gradient, major channel, downstream and estuary mouth areas.
  - Asz** Brown to grey, sub-rounded to rounded, very fine to fine grained, well-sorted silts and sands, composed of lithic and quartzose material. Very low topographic relief and low slope gradient area, forming bank or levee areas adjacent to major channels in mid-stream sections. Minor channel deposition.
  - Ata** White to yellow, sub-rounded to rounded, medium grained, moderately sorted, quartzose sands. Very low topographic relief and low slope gradient area, forming bank adjacent to main channel in downstream and channel mouth areas. Surface expression identical to regolith.
  - Atb** Dark brown to brown and grey, rounded, moderately sorted, very fine to fine silts, with minor fine to medium sands, composed of lithic and quartzose material. Very low topographic relief and low gradient area, forming alluvial plains within major channel systems. Dominated by samphire (*Ardroonum* sp.).
  - Atc** Dark brown, brown and grey, rounded, moderately sorted, very fine silt and fine to medium grained sand, composed of lithic and quartzose material. Very low relief, low slope gradient area, forming plain and saltmarsh landforms adjacent to major channels throughout midstream and downstream areas. Dominated by samphire (*Ardroonum* sp.) and other chenopods.
  - Atd** Aeolian sand
  - Atf** White to yellow, rounded to sub-rounded, well-sorted, fine to medium grained, quartzose sands with minor heavy mineral constituents. Low relief, moderate slope gradient land surface forming a depositional plain adjacent to beach deposits. Fine to medium grained quartzose sand with frosted grain surfaces. Red-brown and black, minor heavy mineral constituents generally fine grained. Area largely affected by increased urban activity.
- Coastal sediments**
- Atg** White to yellow, rounded to sub-rounded, well-sorted, fine to medium grained quartzose sands with minor heavy mineral content and lithic clasts. Low relief, low slope gradient land surface, forming a beach deposit. Red-brown and black lithic silts and heavy minerals generally fine grained and sub-rounded.
  - Ati** White to yellow, rounded to sub-rounded, well-sorted, medium grained quartzose sand, minor heavy mineral content. Low topographic relief (1-5m) medium slope gradient, land surface forming sand dunes adjacent to the beach. Grain surfaces are pitted and frosted. Red-brown and black heavy minerals generally fine grained and angular. Dominated by grasses, heath and low open shrubland.
  - Atj** White to yellow, rounded to sub-rounded, well-sorted, medium grained quartzose sands. Moderate topographic relief, medium to high slope gradient land surface, forming hummocky irregular sand dunes 3-12m high. Grain surfaces pitted and frosted. Plane laminated and cross-bedding structures. Dominated by heath and low open shrubland.
- Colluvial Sediments**
- Chf** Grey, brown and maroon, poorly-sorted sub-angular to sub-rounded lithic silts and quartzose sands. Area of low topographic relief and low slope gradient. Minor angular to sub-rounded siltstone, limestone and nodular carbonate gravel lag. Cleared land used for pastoral purposes, brown loam soil profile and grass dominated land surface.
  - Chg** Brown, grey and white, sub-angular to sub-rounded, poorly-sorted, medium grained lithic silts and quartzose sands. Area of low topographic relief and moderate slope gradient. Moderate angular to sub-rounded siltstone, limestone and nodular carbonate gravel lag. Cleared land used for pastoral purposes. Brown loam soil profile and grasses with minor olive trees (*Olea europaea*).
  - Chh** Brown, grey, red, maroon and white, sub-rounded to sub-angular moderately sorted, medium to fine grained, lithic silts and gravels. Low relief, low to moderate slope gradient area in a broad and elongate erosional drainage depression. Sparse red-brown lithic silts and minor red-brown, purple and grey siltstone, limestone and nodular carbonate gravel lag. Surface expression identical to regolith. Grasses common.
  - Chi** Yellow, white, brown, purple and maroon, poorly-sorted rounded to angular fine lithic silts and coarse bedrock boulders. Area of medium to high topographic relief and slope gradient forming a landside deposit. Regolith constituents represent fragments of siltstone and sandstone weathered bedrock, with carbonate accumulations and soils. Fine to medium grained silts and sands with siltstone boulder and clasts. Minor anthropogenic fill present, consisting of road aggregate and concrete slabs. Dominated by grasses and olive (*Olea europaea*).
  - Chj** Red, maroon and brown, poorly-sorted, rounded to angular fine lithic silts and coarse bedrock boulders. Area of low to moderate topographic relief and low slope gradient forming a landside deposit. Regolith constituents represent fragments of siltstone bedrock and soil profiles. Fine to medium grained silts and sands, siltstone boulder and clasts. Dominated by grasses and olive (*Olea europaea*).
- IN-SITU REGOLITH**
- Moderately weathered bedrock**
- SMa** Yellow, white, brown and pink, very fine to medium grained, sub rounded to sub angular, moderately-sorted quartzose and lithic sands. Quartzose sands generally fine to medium, lithic sands generally very fine to fine grained. Area of low topographic relief and low slope gradient. Widespread hardpan, nodular and powder regolith carbonate accumulations. Minor anthropogenic fill present. Topsoil of fine brown silts prevalent, varied vegetation, generally grassland, cleared for pastoral purposes.
  - SMb** Red-brown, purple and blue-grey, well-sorted, rounded, very fine to fine grained siltstone. Prominent bedrock fabrications-laminations and bedding, when seen in section. Area of low topographic relief and low slope gradient. Very fine, brown, silty soil with sub-angular to angular lithic gravel and boulders. Minor hardpan and nodular carbonate accumulations. Various planted vegetation species, dominated by olive (*Olea europaea*). Surface expression includes soil profile consisting of brown loamy soil.
  - SMc** Red-brown, purple and blue-grey, rounded, well-sorted, very fine to fine grained siltstone. Prominent bedrock fabrications-laminations and bedding. Area of low topographic relief and moderate slope gradient. Minor ferruginisation. Very fine, brown, silty soil with sub-angular to angular lithic gravel and boulders. Minor hardpan regolith remains. Various planted vegetation species, dominated by olive (*Olea europaea*). Surface expression dominated by soil profile consisting of brown loamy soil.
  - SMd** Orange, yellow, grey, pink and white, unconsolidated, rounded to sub angular, moderately-sorted, very fine to medium grained siltstones, sandstones, limestone, clays and marls. Minor, black, red and maroon, heavy minerals amongst siltstones and limestones. Area of low topographic relief and slope gradient. Common powder, hardpan, pisolite and very regolith carbonate accumulations. Various planted vegetation species, dominated by olive (*Olea europaea*). Surface expression dominated by soil profile consisting of brown loamy soil.
  - SMe** Yellow, white, grey and brown, unconsolidated very fine to medium grained, moderately-sorted, rounded to sub-rounded quartzose sands with minor clay silts and heavy minerals. Area of low topographic relief and slope gradient. Common hardpan, nodular, vein and powder carbonate accumulations. Surface lag of medium grained, rounded quartzose sands. Vegetation is highly variable.
  - SMf** Yellow, white, brown and pink, very fine to medium grained, sub rounded to sub angular, moderately-sorted, quartzose and lithic sands. Quartzose sands generally fine to medium, lithic sands generally very fine to fine. Areas of low topographic relief and moderate to medium slope gradient. Minor hardpan, nodular and powder regolith carbonate accumulations. Minor ferruginisation. Area dominated by olive (*Olea europaea*), dryland tea tree (*Melaleuca lanceolata*) and sheoak (*Casuarina cristata*). Brown silty soil profile present.
  - SMg** Yellow, white, brown and pink, very fine to medium grained, sub rounded to sub angular, moderately-sorted quartzose and lithic sands. Quartzose sands generally fine to medium, lithic sands generally very fine to fine. Areas of medium topographic relief and moderate to medium slope gradient. Hardpan, nodular and powder regolith carbonate accumulations. Increasingly ferruginised towards the top of the profile. Vegetation dominated by olive (*Olea europaea*), dryland tea tree (*Melaleuca lanceolata*) and sheoak (*Casuarina cristata*). Brown silty soil profile present.
  - SMh** Light grey to blue grey, limestone with minor heavy mineral content, very fine grained, well-sorted, light grey to grey-blue in colour. Bedrock fabrics and structures preserved. Area of high to very high topographic relief with a high slope gradient. Minor ferruginisation. Sub-angular to angular lithic gravel and boulder lag. Minor hardpan regolith carbonate accumulations. Dominated by olive (*Olea europaea*). Very fine, brown, silty soil.
  - SMi** Red-brown, purple and blue-grey, well-sorted, very fine grained siltstone. Bedrock fabric and structures present laminations, bedding and jointing. Area of high to very high topographic relief with a high slope gradient. Minor ferruginisation. Sub-angular to angular lithic gravel and boulder lag. Minor hardpan regolith carbonate accumulations. Dominated by olive (*Olea europaea*). Very fine, brown, silty soil.
  - SMj** Limestone with minor heavy mineral content, very fine grained, light grey to grey-blue in colour. Moderately weathered bedrock exposures. Bedrock fabrics and structures preserved. Area of high to very high topographic relief with a high slope gradient. Hardpan, vein and powder regolith carbonate accumulations increasing towards top of formation. Area dominated by olive (*Olea europaea*), dryland tea tree (*Melaleuca lanceolata*), blue gum (*Eucalyptus leucocoryn*) and sheoak (*Casuarina cristata*). Thin layer of brown silty soils covering bedrock.
  - SMk** Orange, yellow, white, brown and pink, very fine to medium grained, moderately-sorted sub rounded to sub angular, quartzose and lithic sandstones, silts and clays. Areas of medium to high topographic relief with a high to very high slope gradient, locally forming an escarpment. Widespread hardpan, nodular and powder regolith carbonate accumulations, ferruginised towards the top of the profile. Containing black, very fine-grained, rounded, heavy minerals in silts and clays. Layers of rounded to sub-rounded, quartzose and lithic pebbles, 2-5cm thick, widespread throughout the profile. Vegetation dominated by grasses and olive (*Olea europaea*).
- Highly Weathered**
- SMl** Yellow, white, brown and pink, very fine to medium grained, sub rounded to sub angular, moderately-sorted, quartzose and lithic sandstones, silts, clays and marls. Area of moderate to high topographic relief and slope gradient, locally forming an escarpment. Widespread hardpan, nodular, powder and vein carbonate accumulations. Area of high to very high topographic relief with a high slope gradient, locally forming a cliff or escarpment. Bedrock fabrics and structures preserved. Quartzose sands generally fine to medium, lithic sands generally very fine to fine. Ferruginised throughout the profile. Dominated by low open heath and shrubland.
  - SMm** Red-brown, purple and blue-grey, well-sorted, very fine to fine grained siltstone. Bedrock exposure with minor ferruginisation and surficial weathering. Area of high to very high topographic relief with a high slope gradient. Bedrock fabrics and structures preserved. Mainly bedrock exposure with minor coarse angular clasts of bedrock material.
  - SMn** Light grey to blue grey, limestone with minor heavy mineral content, very fine grained, well-sorted, light grey to grey-blue in colour. Bedrock fabrics and structures preserved. Area of high to very high topographic relief with a high slope gradient. Vegetation dominated by olive (*Olea europaea*).
  - SMo** Red-brown, purple and blue-grey, well-sorted, very fine to fine grained siltstone. Bedrock exposure with minor ferruginisation and surficial weathering. Area of high to very high topographic relief with a high to very high slope gradient, locally forming a cliff or escarpment. Bedrock fabrics and structures preserved. Minor vegetation, consisting of grasses and olive (*Olea europaea*).
  - SMp** Limestone with minor heavy mineral content, very fine grained, light grey to grey-blue in colour. Bedrock exposure with minor ferruginisation and surficial weathering. Area of high to very high topographic relief and slope gradient, locally forming a cliff or escarpment. Bedrock fabrics and structures preserved. Minor vegetation consisting of grasses and olive (*Olea europaea*).
- Weathered Bedrock**
- SMq** Calcarenite and marl type regolith. Bedrock fabrics, structures and degree of weathering unknown. Occurs as a natural reef or barrier bar offshore, constantly underwater. Area of low topographic relief and moderate slope gradient. Some anthropogenic fill.
- OTHER**
- SMr** Man made anthropogenic fill, highly variable regolith.
  - SMs** Areas used for quarrying (Limestone).
- TOPOGRAPHIC RELIEF DEFINITIONS**
- Very low topographic relief - 0-0.5m
  - Low topographic relief - 0.5-1.5m
  - Moderate topographic relief - 1.5-8m
  - Medium topographic relief - 8-15m
  - High topographic relief - 15-30m
  - Very high topographic relief - 30m and above
- GRADIENT DEFINITIONS**
- Low slope gradient - (er, ep, ap, aw) 2 - 5%
  - Moderate slope gradient - (er) 5 - 12%
  - Medium to high slope gradient - (er) 12%
  - High to Very High slope gradient - (er, ec) > 20%
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- Map coordinates of this map correspond to the Geocentric Datum of Australia 1994 (GDA-94).  
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