

Surficial materials

Calccrete-calcite
None identified on the map. Calccrete occurs as surficial deposits of limestone developed in the soil, commonly cementing grains of sand and gravel. There are no known calccrete quarries within the map area.

Gravel
Two main categories of gravel are defined: colluvial and lateritic.

Colluvial
Colluvial gravel outcrops in the north to northeast portion of the map in topographically rugged areas. It consists of boulder conglomerates as partly consolidated scree and valley-fill deposits. There are no known colluvial gravel quarries within the map area.

Lateritic
Lateritic gravel occurs as scattered outcrops throughout the map, generally overlying sandstone. Areas of greater coverage include the Leveard and Robinson Rivers and their tributaries. The lateritic gravel is red to purple and contains nodules and pebbles of green and reddish-brown sandstone in a matrix of fine to medium-grained, angular quartz sand. Lateritic gravel is mainly produced from quarries east of Derby near the Mackay road along the Derby - Gibbo River Road. There is also extraction of lateritic gravel from within the Derby townsite, east of the Derby Highway. Many quarries show evidence of intermittent use, having been developed along the Derby - Gibbo River Road and the Great Northern Highway where lateritic gravel has been extracted beneath a thin sand horizon. Gravel thicknesses measured from sites range from 10 m to 17 m. Note: Some quarries extracted sand near the roads and highways may also target underlying lateritic gravel.

Limestone
Limestone occurs as narrow, discontinuous strips of closely spaced, low-relief coastal dunes. These are generally less than 200 m wide, composed of pale pinkish grey quartz sand and shell debris occur along the west coast of King Sound, north of the Fozzie River. For all deposits, the groundwater table is generally less than 10 m below the ground surface. There has been no recorded production of limestone for the Shire of Derby.

Sand and gravel
Two main categories of sand are defined: red sand and reddish brown sand. A separate category of sand and gravel is described.

Red sand
Dunefields of parallel longitudinal dunes aligned east-west, between 0.5 km to 1 km apart, are found on both sides of the lower Fitzroy River. These dunefields comprise deep, red, loose sandstone, fine to medium sands, although red silty sands and sandy silts are found. The largest area of red sand occurs as an elongated strip between the Fitzroy and Leveard Rivers. The main recorded production of red sand is from a quarry east of the Derby townsite, along the Derby - Gibbo River Road. Many quarries (now inactive) that were developed in the red sand area located within the Derby townsite. Several smaller pits (probably intermittently active) occur along the Derby Highway. Water holes have recorded thicknesses of red sand ranging from 2 m to 14 m.

Reddish brown sand
Large tracts on both sides of the Leveard River and, to a lesser extent, both sides of the Fitzroy River consist of extensive, gently undulating, low-relief sandstone with areas of through-going drainage. The sand is reddish brown, homogeneous, fine grained and contains subrounded quartz grains in a variably silty matrix. It is known locally as 'podium'. Many new quarries and several active pits have been developed in this sand, mainly along the Great Northern Highway, and the Derby - Gibbo River and Bina Roads. Borehole evidence shows thicknesses ranging from 1.8 m to 6.1 m.

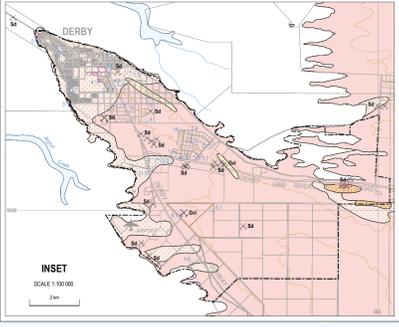
Sand and gravel
Shells and pebbles with beds of sand and gravel are found in several areas across the Derby map. Alluvial sand and gravel is found in the Fitzroy, Leveard and Robinson Rivers and their tributaries. The primary source of sand and gravel from alluvial deposits is from the lower Fitzroy River area within 20 km of Derby. There is also sand extraction on the Bay Road approximately 20 km east of Derby. All quarries are prone to flash flooding. Alluvium thicknesses have been measured in water courses and range from 8 m to 30 m.

Hard rock
The Derby region has a wide variety of hard rock types that are potentially amenable for crushed rock aggregates. There are no known hard rock quarries within the map area.

Igneous and metamorphic rocks
Basalt and dolerite form a small percentage of outcrops in the northern part of the map, occurring as both irregularly trending and scattered outcrops.

Sedimentary rocks
Conglomerate occurs mainly in the northeastern part of the map in the Robinson River catchment but also in the north, near Cone Bay.

Sandstone
Sandstone outcrops discontinuously across the map, generally more than 50 km from Derby. The main occurrence of sandstone is in the northern part of the map, west of the Robinson River in the south several sandstone units occur on both sides of the Fitzroy River. There are also scattered outcrops of sandstone between the Fitzroy and Leveard Rivers.



Basic raw materials

Surficial materials

- Calccrete-calcite: White to light grey calcium carbonate cemented sand and gravel
- Gravel (colluvial): Cobble to boulder conglomerates as partly consolidated scree and valley-fill deposits
- Gravel (lateritic): Red and purple nodular and psammic gravel, occasional boulders of lateritic sandstone, in an angular, silty, quartz sand matrix, residual, coastal sectors and lateritic interfluves
- Limestone: Pale pinkish grey quartz sand and shell debris, eolian, coastal dunes, spits, and beach ridges
- Sand and gravel: Deep, red, loose siliceous sand, with silty sands and sandy silts; eolian; sandstone and dunefields
- Red sand: Reddish brown, silty, medium-grained sand; eolian and alluvial; low-relief sandstones with some areas of through-going drainage
- Reddish brown sand: Grey, brown, and yellow sands and silty sands, some overlying lateritic gravels
- Sand and gravel: Grey, brown, and yellow sands and silty sands, some overlying lateritic gravels

Hard rock

- Igneous and metamorphic rocks: Basalt: Basalt interbedded with tuff, agglomerate, felspathic sandstone, quartz sandstone, siltstone, and mudstone; Dolerite: Dark grey, medium- to fine-grained metamorphosed dolerite, and minor coarse porphyritic varieties; Granite: Pink to grey, medium- to coarse-grained granitic rock
- Sedimentary rocks: Conglomerate: Well lithified pebbles to cobble clasts of quartzite in a matrix of ferruginous sandstone; Limestone: Silty limestone, calcarenite, calcarenaceous shale and siltstone; bedded limestone and dolomite in part; Sandstone: Variegated, fine- to medium-grained, strongly cross-bedded sandstone with subordinate siltstones; bedrock escarpments

Quarries and pits

- Active: Mining Lease, i.e. (Mining Act 1978)
- Inactive: Extractive industry licence (Planning and Development Act 2005)
- Clay: Minor road
- Gravel: Major road
- Crushed rock: Track
- Sand: Local government authority

Boreholes (showing thickness of surficial material, in metres)

- Water bore: (from WAPMIS database, DAP)
- Petroleum well: (from WAPMIS database, DAP)

Tenements for basic raw materials

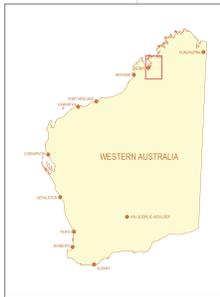
- Mining Lease, i.e. (Mining Act 1978)
- Extractive industry licence (Planning and Development Act 2005)
- Local government authority
- Drainage network
- Contract, operation in metres

Crown reserve for basic raw materials

- Southern (Land Administration Act 1997)
- Cadastral

Basic raw materials on the map have been compiled from existing Geological Survey of Western Australia and Geoscience Australia (formerly Australian Geological Survey Organisation or Bureau of Mineral Resources) maps. Uncoloured areas indicate unbedded and surface deposits of consolidated basic raw materials resources. Mining tenements, sourced from Department of Mines and Petroleum. Extractive industry licences, sourced from Shire of Derby. Topography and cadastral, sourced from Landgate.

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Government of Western Australia
Department of Mines and Petroleum
Geological Survey of Western Australia
Western Australian Planning Commission

SCALE 1:200 000

RESOURCE POTENTIAL FOR LAND USE PLANNING
Basic Raw Material Resources
DERBY

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