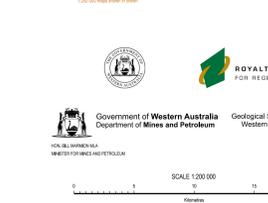
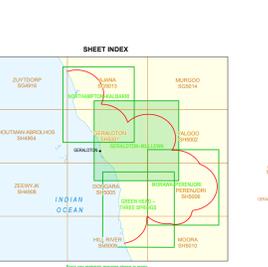


**Hard rocks**  
**Sedimentary rocks**  
**Banded iron-formation**  
 Banded iron-formation (BIF) outcrops in two locations. A small outcrop of BIF is exposed 42 km north of Mullewa in the region of the Mullewa River. The BIF is composed of alternating layers of iron-rich chert, iron oxides, carbonates and silicates in varying proportions. BIF also occurs in a narrow belt north-west of Morawa as exposures of iron-rich BIF with interbedded shale and grey, white and yellow-brown chert bands. This material has not been worked.  
**Chert**  
 Chert outcrops in an area 25 km southwest of Morawa and represents silicified sandstone, siltstone and other sedimentary rocks. Silicification took place over deposition. The chert is vertically zoned from white to grey and red and brown. It is commonly laminated and brecciated. A small inactive sand pit is found in this material.  
**Conglomerate**  
 Two small outcrops of conglomerate are located 50 km north of Morawa where it consists of discontinuous bands of boulders in a sandstone matrix and pebbles of chert, quartz, sandstone and iron quartz set in a quartz sandstone matrix. This material has not been worked.  
**Sandstone**  
 Sandstone is located up to 50 km east of Geraldton and 8 km outcrops west of Northampton. It outcrops as stratified, fine to coarse-grained, lithologic sandstone with some siltstone and argillaceous sandstone. The sandstone is grey and green. Active sand quarries, consisting material from the weathered sandstone, are located 13 km and 30 km east and 30 km northwest of Geraldton. Historic Christiania sand quarries are located 15 km north and 13 km northwest of Geraldton.  
**Sandstone, other conglomerate**  
 Sandstone is located in a series of belts between Mullewa and Morawa. Lithologies include well-bedded and cross-bedded quartz and lithologic sandstone, pebbly sandstone and conglomerate. Chert in the pebbles has predominantly of volcanic origin. In-place, well-sorted and massive siltstone are common. This material has not been worked.  
**Sandstone and conglomerate**  
 Ten poorly sorted sandstone to conglomerate is exposed in two areas — 50 km northeast and 50 km east-northeast of Mullewa — as small, isolated outcrops. The material is commonly siliceous and has not been worked.  
**Igneous and metamorphic rocks**  
**Basalt**  
 Small, isolated outcrops of basalt occur 42-47 km north-northwest of Mullewa and 71 km north of Morawa. They are grey to black, generally massive, rocks without pillows and flow lines and dykes are known. This material has not been worked.  
**Gabbro**  
 Three small, isolated outcrops of gabbro and diorite (monzonite) outcrop on 50 km north-northeast of Mullewa on rounded hills and on a ridge. Gabbro is a dark, coarse-grained, coarse-grained, intrusive igneous rock. This material has not been worked.  
**Granite**  
 Granite includes a range of rocks: porphyritic granite, granitic gneiss. They outcrop extensively in western half of the area and in a north-south belt east of Northampton and Geraldton. They are fine to medium grained, light to dark grey, medium to coarse grained, crystalline rocks, although porphyritic and coarse grained are common. They are generally massive to the except brown and brown orthoclase-rich. The active and inactive quarries, all within 25 km of Geraldton, supply the granite for crushed rock aggregate.  
**Ultramafic rock**  
 Ultramafic rocks — peridotite, serpentinite and their weathering products — outcrop 40 km north of Mullewa as small, discontinuous outcrops. This material has not been worked.

**Quarries and pits**  
 Active  
 Inactive  
 Proposed  
 Agg. Aggregate  
 Cyl. Clay  
 Gvl. Gypsum stone  
 Gvl. Gypsum  
 Lsd. Limestone  
 Lst. Limesand  
 Sd. Sand  
 Analyses  
 Limesand  
 Limestone  
 Sand and gravel  
 Fines  
 Gravels  
**Tenure for basic raw material**  
 Mining lease, live (Mining Act 1978)  
 Extinctive industry licence, live (Planning and Development Act 2009)  
 Crown reserve for basic raw materials  
**Boreholes**  
 Showing depth to groundwater in metres  
 Showing thickness of surficial material, in metres  
**Analyses**  
 Acid insoluble residue  
 Acid insoluble residue  
 Sand and gravel  
 Fines  
 Gravels  
**Legend**  
 Mining lease, live (Mining Act 1978)  
 Extinctive industry licence, live (Planning and Development Act 2009)  
 Crown reserve for basic raw materials  
 Boreholes  
 Showing depth to groundwater in metres  
 Showing thickness of surficial material, in metres  
 Analyses  
 Limesand  
 Limestone  
 Sand and gravel  
 Fines  
 Gravels  
 Local Government Authority boundary  
 Drainage  
 Contour, elevation in metres

**DATA SOURCES**

Theme	Data Currency	Organisation
Basic raw materials	2014	Geological Survey of Western Australia, Department of Mines and Petroleum
Topography	2013	Landgate - Geoscience Australia
Cartography	2008	Geological Survey of Western Australia, Department of Mines and Petroleum
Mining tenements	2015	Mineral Titles Division, Department of Mines and Petroleum
USA State Government areas (whereas indicated)		USA State Government areas (whereas indicated)



**RESOURCE POTENTIAL FOR LAND USE PLANNING**  
**Basic Raw Material Resources**  
**GERALDTON-MULLEWA**  
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 Email: [geological\\_survey@wa.gov.au](mailto:geological_survey@wa.gov.au)  
 Geological Survey of Western Australia 2015. Basic raw material resources, Geraldton-Mullewa (1:200 000 scale)  
 Geological Survey of Western Australia, Resource Potential for Land Use Planning