



IRON ORE GEOLOGY

- Zones of supergene enrichment
- Channel iron deposits and pisolite (Rube Pisolite and Pionodona Formation)
- Brookman Iron Formation (Note: also includes some Well Wall Formation)
- Maria Mamba Iron Formation
- Banded iron-formation in granite-greenstone terrane

IRON ORE MINERALIZATION STYLES

- Pisolate and limonite inverte paleochert mineralization or **channel iron deposits (CID)** of the Gneissic Rube Pisolite and Pionodona Formation. Mineralization style is Regolith — alluvial to beach placer mineralization.
- Hematitic conglomerate of the Neoproterozoic Est Creek Formation (Tarnamath Group, Officer Basin), which formed in a near-shore environment. Mined at Yarras 10. Mineralization style is Stratobound sedimentary — clastic-hosted.
- Supergene-enriched hematite and hematite-goethite mineralization hosted by banded iron-formation of the **Brookman Iron Formation** (Innerswainy Basin). Includes nearby scoria and detrital deposits derived from the Brookman Iron Formation. Mineralization style is Sedimentary — banded iron-formation (supergene enriched).
- Supergene-enriched hematite and hematite-goethite mineralization hosted by banded iron-formation of the **Maria Mamba Iron Formation** (Innerswainy Basin). Includes nearby scoria and detrital deposits derived from the Maria Mamba Iron Formation. Mineralization style is Sedimentary — banded iron-formation (supergene enriched).
- Supergene-enriched hematite and hematite-goethite mineralization hosted by banded iron-formation (Innerswainy Iron Formation and Clackville Formation) of the **Archean Pilbara Craton**. Includes nearby scoria and detrital deposits. Mineralization style is Sedimentary — banded iron-formation (supergene enriched).
- Magnetite-rich banded iron formation or taconite**. May be hosted by iron formations of the Archean granite-greenstone terranes or Neoproterozoic-Paleoproterozoic Hamersley Basin. Mineralization style is Sedimentary — banded iron-formation (taconite).

IRON ORE SITE TYPE AND STAGE OF DEVELOPMENT

- Open mine
- Proposed mine, closed mine, and mineral deposit — with a mineral resource estimate
- Exploration site or prospect — without a mineral resource estimate (only selected sites are shown)

IRON ORE TENEMENTS AND MINISTERIAL RESERVES BY COMPANY GROUP

- BHP Billiton plus joint ventures (JV) and proposed JVs with, O Minerals (Bochu) / Mitsui / POSCO / JFE Steel / Wharfedale JV
- Rio Tinto plus JV with CMEC (Snodgrass) / Bostell
- Rio Tinto plus JV with Hancock Prospecting / Wright Prospecting
- Hancock Prospecting
- Rube River Iron Associates (Rio Tinto / Mitsui / Nippon Steel / Sumitomo)
- Mineralogy group of companies
- Fortescue Metals Group plus JV with Consolidated Minerals or Mind Mining. Includes iron ore tenements of Fortescue Metals Group, FMG Pilbara, and FMG Chichester
- Other — iron ore and Ministerial Iron Ore Temporary Reserves. Some of these tenements may be joint ventured with the company groups above
- Other — not known as being explored for iron ore

Tenements are colour coded if they are known to be targeted for iron ore from a combination of iron ore State Agreement Acts, authorization to explore for iron ore granted or applied for under Section 111 of the Mining Act 1978, and company public announcements. This includes tenements of the application stage. Inclusion of such tenements here does not imply that the tenement applications will be granted or that iron ore authorization under Section 111 will be granted. Other tenements (shown in grey) may also be prospective for iron ore. Colour-coded iron ore tenements may also be prospective for other minerals.

The tenement layer consists of many tenements (both granted and pending applications) that overlap in time and space with complex relationships. However the tenements are depicted as if they form a 2D layer. Care should be taken when interpreting the colour-coded tenements and, where necessary, further details should be obtained from the accompanying CD product or from DGR's online mining tenement database TENGGRAPH.

MAIN TECTONIC UNITS
modified from Tyler, IM, and Hooking, RH, 2001

- Proterozoic sedimentary and volcanic rocks
- Neoproterozoic sedimentary and volcanic rocks
- Mesoproterozoic sedimentary and volcanic rocks
- Paleoproterozoic sedimentary and volcanic rocks
- Paleoproterozoic igneous and metamorphic rocks
- Neoproterozoic-Paleoproterozoic sedimentary and volcanic rocks
- Archean granite-greenstone

Townships

- Population more than 10 000
- 1000-10000
- Less than 1000
- Locality
- Conservation estate boundary
- Highway
- Road, sealed
- Road, unsealed
- Major track
- Railway (operational or under construction)
- Conveyer
- Gas pipeline
- Oil pipeline
- Coastline
- Major iron ore processing plant
- Iron Ore Port / Proposed Port
- State Agreement Act boundary
- Internal Fortescue Metals Group (plus JV only)

DATA DIRECTORY

Item	Source	Date/Version	Agency
Geological units	GSWA	2007	Dept of Industry and Resources
Iron ore geology	GSWA	2007	Dept of Industry and Resources
Supergene enrichment	GSWA	2007	Dept of Industry and Resources
Mining and minerals	MINDEX	Jul. 2007	Dept of Industry and Resources
Mining tenements	MINDEX	Jul. 2007	Dept of Industry and Resources
Coastline	DOC	Mar. 2006	Dept of Environment and Conservation
Topography	Landgate	Aug. 2005	Landgate
Coastline	ALGA	1999	Geoscience Australia
Port	Company data	Oct. 2006 - Jul. 2007	BHP Billiton, Hamersley, Rio, Nippon Steel, POSCO, JFE Steel, Wharfedale, Mitsui, Nippon Steel, Sumitomo

Compiled by Cooper, RW, and Flint, DA, 2007
Edited by Thompson, A
Cartography by Jones, AK
Information on mines, deposits, prospects, and processing plants was extracted from the mines and mineral deposits (MINDEX) database, DGR. In July 2007. More detailed information on sites, tenements, company groupings, and geology are available on an accompanying CD. The CD contains more accurate information on the distribution limits of the Brookman Iron Formation. For more up-to-date information see the online databases at www.dgr.wa.gov.au.
Published by the Geological Survey of Western Australia. Digital and hard copies of this map, as well as the full digital data behind the map (separate CD), are available from the Information Centre, Department of Industry and Resources, 100 Plain Street, East Perth, WA, 6004. Phone (08) 9222 3449, Fax (08) 9222 3444.
Web: www.dgr.wa.gov.au/gswa Email: geologicalsurvey@dgr.wa.gov.au
The recommended reference for this map is:
Cooper, RW, and Flint, DA, 2007. Iron ore deposits of the Pilbara region — 2007 (1:500 000 scale). Western Australia Geological Survey.

Department of Industry and Resources
Geological Survey of Western Australia

Scale 1:500 000
Horizontal datum: GDA 1984
Vertical datum: Australian Height Datum 1984
GDA 1984 datum on coordinates with an error of the order of 100 metres.