

DEPOSIT SUMMARY

Mt Tom Price Iron Deposit - Western Australia

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DATA
METALLOGENICA

The Mount Tom Price mine, which commenced production in 1965, is located some 210 km WNW of Newman and 260 km SSW of its export port of Dampier. It is owned and operated by the Rio Tinto Group company Hamersley Iron Pty Ltd. The orebody at Mount Tom Price originally contained the second largest known accumulation of high grade hematite in the Hamersley province and occurs near the keel of the large Turner Syncline, close to its eastern extremity. The initial reserve totalled around 900 Mt @ 64% Fe with a high lump to fines ratio, and low impurities. The impurity content of the high grade ore reserve in 1990 was 0.053% P, 3.5% SiO₂ and 1.9% Al₂O₃. The deposit is some 7.5 km long and up to 1.6 km wide, but averages 0.6 km, occupying two local synclines and part of the intervening anticline. These early folds have been subjected to later cross folding producing an *en echelon* pattern, while two south-dipping normal faults parallel, and in part limit, the ore. The base of the northern syncline is higher than that of the southern giving an overall southerly dip and apparent thickness of 150 m, extending to a depth of 250 m below surface.

The orebody is composed mainly of hematite within the Brockman Iron Formation, with the majority of the ore associated with the Dales Gorge and underlying Colonial Chert Members. The deepest drilling at the mine is generally to the top of the Marra Mamba Iron Formation which is overlain by the 150 m thick Paraburdoo Member (the carbonate unit of the Wittenoom Formation), that passes up into the shaly 157 m thick Bee Gorge Member, followed by the 30 to 40 m thick cherty Mount Sylvia Formation. The overlying 50 m thick Mount McRae Shale is composed of black pyritic shale, capped by the uppermost unit of the Wittenoom Formation, a 12 m thick chert band, the Colonial Chert Member.

The Colonial Chert is followed by the 150 m thick basal Dales Gorge Member of the Brockman Iron Formation, comprising 17 alternations of BIF and shale. These have been grouped into 3 sub-units on the basis of shale content. The lowest, DG1, and uppermost DG3 have 6% and 7% shale respectively, while the intervening DG2 has 31%. The Dales Gorge is overlain by the 50 m thick Whaleback Shale Member composed of green to black shale and chert, which is in turn followed by a 360 m thick BIF unit with only minor shale, the Joffre Member.

Some 90% of the ore at Mount Tom Price is within the Dales Gorge Member, with local enrichment in the Joffre Member where it is in fault contact with mineralised Dales Gorge. The remainder of the ore is in the Colonial Chert and Whaleback Shale Members. Primary Dales Gorge Member BIFs away from any enrichment are dominated by chert and magnetite, accompanied by variable, but lesser hematite, carbonate and Fe-silicates. The high grade mineable reserves at Mount Tom Price are present as hematite ore which preserves the meso- and micro-banding of the original BIF, is characteristically porous (averaging 30% porosity), has a high lump yield and low contaminants. In places the porous ore alternates with dense bright metallic lustre hematite with only around 4% porosity to produce a defined banding. It is essentially composed of randomly oriented fine grained platy hematite and martite with individual plates being 0.001 to 0.25 mm across. Fusing of these micro-plates, gives the lump ore its character. Ultra-fine earthy hematite filling the voids is generally less than 5%. Shale macro-bands within the orebody have been partially replaced by iron oxides and at times may exceed 50% Fe.

The orebody was capped by a variable layer of low grade hydrated material, predominantly goethite, averaging 18 m in thickness, but down to 50 m in synclinal troughs. It has an irregular and patchy distribution controlled by fractures and joints, etc.. Minor deposits of 'canga' - 1 to 20 cm fragments of hematite and/or BIF cemented by goethite - occur as scree deposits and hillside wash in streams.

This description is based on information available at the time of writing in 2002. It is a summary of published sources, the chief of which follow:-

Selected references:

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References and further information are available from Porter Geoconsultancy at www.portergeo.com.au