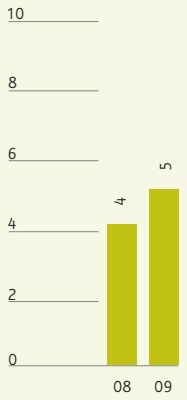
Nickel

Anglo American's nickel business comprises the wholly-owned Codemin mine in Brazil and the Loma de Níquel mine in Venezuela. The world class Barro Alto ferronickel project, also in Brazil, is due to begin production in early 2011.

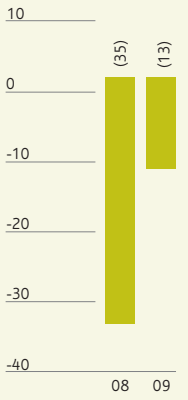
The Codemin nickel operation in Brazil – Ferronickel shots ready to be shipped after the granulation process. Image courtesy of Vismedia

Financial highlights[1]

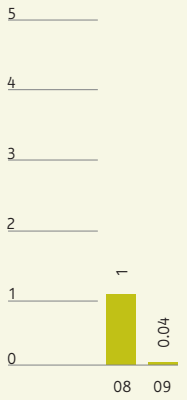
Share of Group net operating assets
(%)



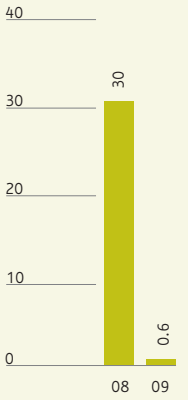
Underlying earnings
($m)



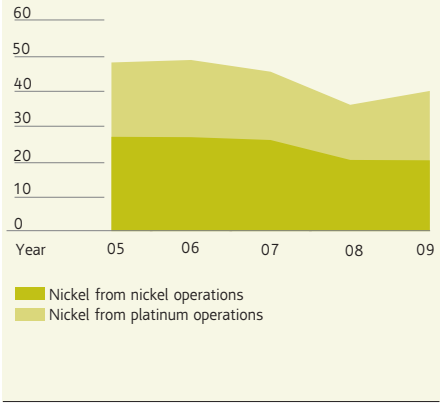
Share of Group operating profit
(%)



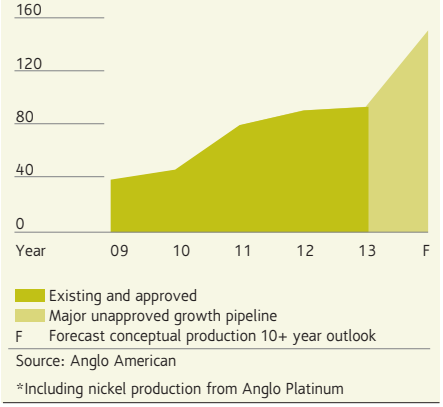
Operating margin
(%)



Anglo nickel production*
(kt)



Group potential nickel production*
(kt)



Source: Anglo American

*Including nickel production from Anglo Platinum

[1] Due to the portfolio and management structure changes announced in October 2009, the segments have changed from those reported at 31 December 2008. 2008 comparatives have been reclassified to align with current year presentation. The segment results include an allocation of corporate costs.

Financial data

US$m	2009	2008
Turnover		
Codemin	157	198
Loma de Níquel	191	210
Projects and Corporate	–	–
Total turnover	**348**	**408**
EBITDA		
Codemin	49	132
Loma de Níquel	11	48
Projects and Corporate	(32)	(30)
Total EBITDA	**28**	**150**
Depreciation and amotisation	(26)	**(27)**
Operating profit before special items and remeasurements		
Codemin	41	123
Loma de Níquel	(7)	30
Projects and Corporate	(32)	(30)
Total operating profit before special items and remeasurements	**2**	**123**
Operating special items and remeasurements	(88)	(130)
Operating profit after special items and remeasurements	(86)	**(7)**
Net interest, tax and minority interests	**(15)**	**(158)**
Underlying earnings		
Codemin	24	94
Loma de Níquel	17	(97)
Projects and Corporate	(54)	(32)
Total underlying earnings	(13)	**(35)**
Net operating assets	1,787	**1,401**
Capital expenditure	554	**530**

Business overview

19.9
kt total nickel production (excluding Anglo Platinum)

2
ferronickel operations and one approved ferronickel project

36
ktpa average nickel output of Barro Alto from 2012

Financial highlights: Nickel

$ million (unless otherwise stated)	2009	2008
Operating profit	**2**	123
EBITDA	**28**	150
Net operating assets	**1,787**	1,401
Capital expenditure	**554**	530
Share of Group operating profit	**0.04%**	1%
Share of Group net operating assets	**5%**	4%

Metal pour in the ferronickel smelter at Codemin, which produced 9,500 tonnes of nickel in 2009.

Nickel comprises two ferronickel operations: Codemin in Brazil and Loma de Níquel in Venezuela as well as the world class Barro Alto ferronickel project in Brazil. In addition, within the business unit's portfolio, there are two promising projects, both in Brazil, at the unapproved stage: Jacaré and Morro Sem Bone. These have the potential to significantly strengthen Anglo American's position in the worldwide nickel market, adding at least 66 ktpa to the Group's present annual total nickel production (including Anglo Platinum's nickel output) of 39.4 kt.

South America

1 100% Barro Alto Project (Brazil)
2 100% Codemin (Brazil)
3 91.4% Loma de Níquel (Venezuela)

Key

- Underground
- Open Cut
- Other

Industry overview

Nickel is the fifth most common element found on earth. It is found in about 20 countries, with known reserves estimated to last around 100 years at the present mining rate. The metal occurs as two main deposits: sulphides that are found underground, and laterites that can be mined by open pit methods.

Nickel is a hard, ductile metal with high resistance to corrosion and oxidation. Nickel's main use is as an alloying metal, along with chromium and other metals, in the production of stainless and heat resisting steel. About 60% of nickel is used to manufacture stainless steel and 25% in other steel and non-ferrous alloys. In a more recent development, the Chinese stainless steel industry, which has been absorbing growing volumes of nickel pig iron (NPI), is looking to a potential annual offtake of 100 kt of nickel in NPI form. Primary nickel is used in the form of pure nickel metal, ferronickel, nickel oxide and other chemicals. Nickel is also recycled in many of its applications and large volumes of scrap nickel are used to supply the steel industry.

Over the past decade, nickel usage has grown as developing nations have increased the pace of their industrialisation and urbanisation programmes. Demand has risen from about 1.1 Mt in 1999 to about 1.3 Mt in 2009, a compound average growth rate of 2% per annum.

This growth, however, has not been uniform, with short-lived peaks typically being followed by extended periods of relative weakness. The nickel market experienced its highest offtake in recent years in 2006 when demand reached in the order of 1.4 Mt; thereafter, demand declined every year up to and including 2009 when it was an estimated 1.3 Mt. A recovery in the nickel market is expected in 2010 and forecasts are that consumption could reach approximately 1.4 Mt.

On the production side, primary refined nickel output in recent years has been broadly in line with the strong growth of the world economy, with around 1.4 Mt of the metal being produced in 2007. The economic crisis in 2008 led to a production decline to just below 1.4 Mt, with output falling further in 2009 to an estimated 1.3 Mt.

In spite of the overall fall in world production in 2009, China, Norway and the European Union achieved modest increases in output, though declines were experienced in Russia, Australia and New Caledonia.

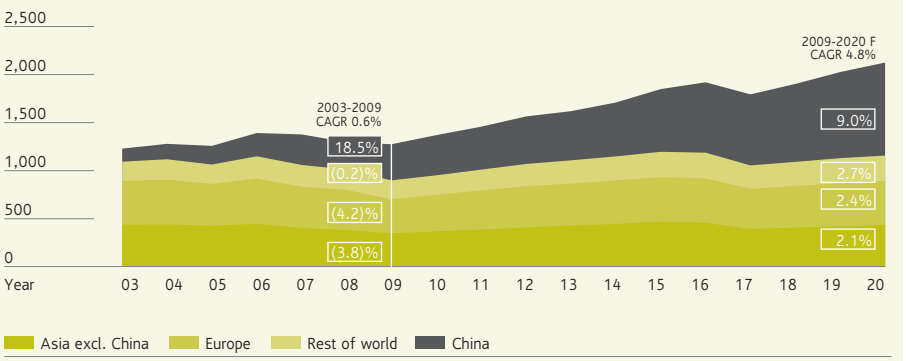
The supply/demand balance has been affected by the very high levels of Chinese imports during the year and also by strikes at Vale-Inco in Canada. Despite continuing strike action, demand from the stainless steel sector has started to weaken and London Metal Exchange (LME) stocks had risen significantly to a forecast level of around nine weeks' consumption by the end of 2009.

Markets

Average market price (c/lb)	2009	2008
Nickel	**667**	953

Nickel demand increased during the second half of the year, mainly due to higher Chinese stainless steel output and imports, after being negatively affected in the first half by price-led substitution, destocking in the stainless steel sector and weak global economic conditions. The nickel price reached a low of 427 c/lb during March, increased to 956 c/lb in August and ended the year at 838 c/lb.

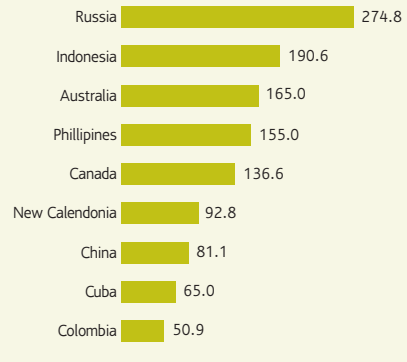
Estimated global primary nickel consumption
(kt)



Source: Copyright Brook Hunt, a Wood Mackenzie company: Metals Market Service – Long Term Outlook Nickel December 2009

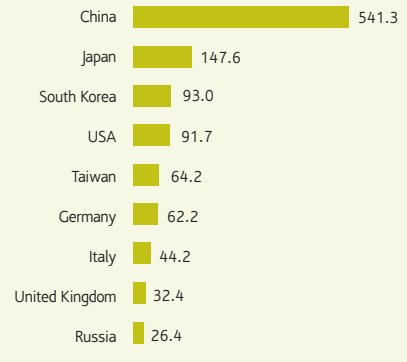
Market information

Leading nickel mining countries (2009 mined production)
(Kt)



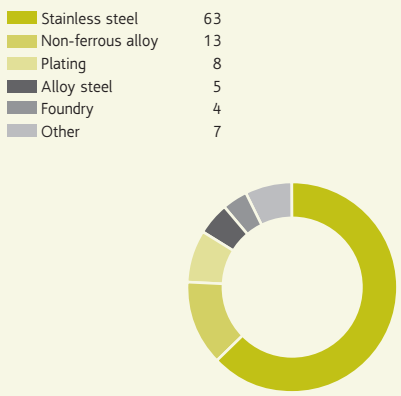
Source: World Bureau of Metal Statistics

Leading nickel consumers (2009 refined consumption)
(Kt)



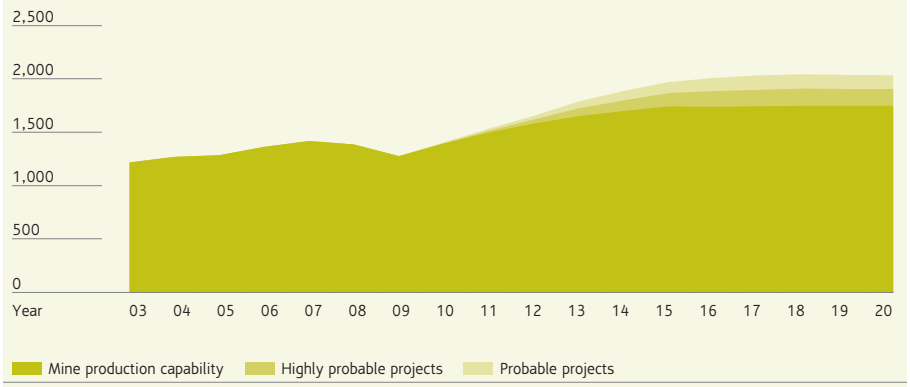
Source: World Bureau of Metal Statistics

Global nickel consumption – estimated primary end use in 2009
(%)



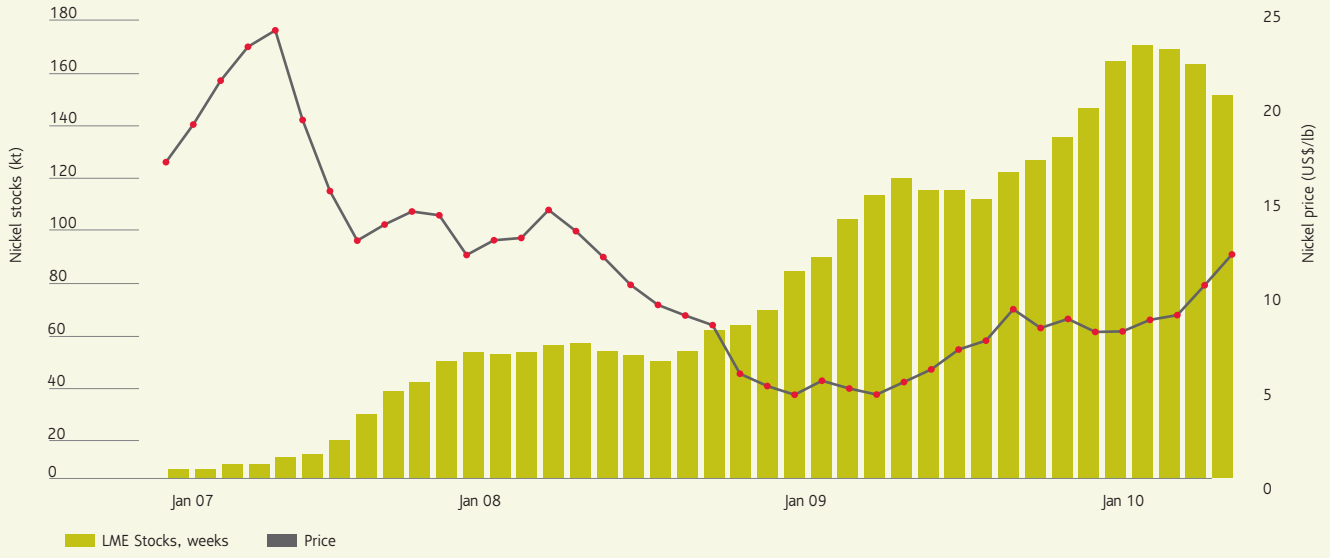
Source: Brook Hunt Estimates

Estimated global nickel refinery production capability
(Excludes possible projects) (kt nickel)



Source: Copyright Brook Hunt, a Wood Mackenzie company: Metals Market Service – Long Term Outlook Nickel December 2009

Total LME stocks and nickel price index
(shown to April 2010)



Strategy and growth

Nickel's strategy is in line with the Group's overall strategy of finding or acquiring, developing and operating world class, low cost mines in a socially and environmentally responsible manner, with an increasing focus on safety and asset optimisation.

Although prone to its own price volatility and metal cycle movements generally, nickel's medium and long term demand fundamentals are being driven by the ongoing development of the so-called BRIC nations (Brazil, Russia, India and China).

The restructuring of the Anglo American Group has brought with it the opportunity to have a new management team dedicated to the nickel business. With this team now in place, there is a sharpened focus on optimisation initiatives at the operations as well as on the successful execution of the Barro Alto project. Beyond Barro Alto, the business unit has significant optionality to develop the Jacaré and Morro Sem Bone projects, which would make Anglo American a growing player in the nickel market and one that is well positioned on the lower half of the industry cost curve.

Projects

The Barro Alto project was nearly 80% complete at the year end and is on schedule towards producing its first metal in early 2011 and full production in the second half of 2012. This project makes use of an existing operation and proven technology and will produce an average 36 ktpa of nickel in full production (41 ktpa over the first five years), with a cost position in the lower half of the curve. Further asset optimisation initiatives are under way which are expected to improve its cost positioning further. When Barro Alto reaches full production in 2012, Anglo American's nickel production (excluding nickel production from Anglo Platinum) will reach 61 ktpa, while additional potentially world class projects in the pipeline could increase production to 120 ktpa, with further upside potential, leveraging the Group's considerable nickel laterite technical expertise. Barro Alto has an approved life of mine of more than 25 years from its extensive resource base.

The unapproved Jacaré and Morro Sem Bone projects submitted their PAE (Economic Exploitation Plan) to the Brazilian mining authorities during 2009.

Construction work on the ferronickel plant at the Barro Alto project, which is due to produce its first metal in 2011, ramping up to an annual production of 41 kt over the first five years of a forecast 25 year life.

Project pipeline

Barro Alto — Overall capex: $1,600-1,800m

Country	**Brazil**
Ownership	**100%**
Incremental production	**36,000 tonnes per annum of nickel**
Full project capex	**$1,800-1,900m**
Full production	**Q3 2012**

The Barro Alto project is located in the state of Goias, Brazil, approximately 170km from Anglo's existing Codemin nickel operation. The project was approved in December 2006 and is forecast to come into production in Q1 2011. Average production over the 26 year life of mine will be 36 ktpa of nickel and capital costs are forecast at $1.8-$1.9bn. Once at full production, the operation is expected to be in the lower half of the cash cost curve, and will more than double Anglo American's nickel production. Conventional smelter-refinery technology will be used to process the saprolite ore to produce ferro-nickel, which is a technology already used by Anglo at its existing nickel operations.

Morro Sem Bone (unapproved) — Overall capex: TBD

Country	**Brazil**
Ownership	**100%**
Incremental production	**~30,000 tonnes per annum of nickel**
Full project capex	**TBD**
First production	**Potentially 2015**

Morro Sem Bone is located in Brazil and is expected to operate in the lower half of the cost curve. Potential start-up in 2015 with nickel production of ~30 ktpa. A pre-feasibility study is expected to be completed in 2010.

Jacaré (unapproved) — Overall capex: TBD

Country	**Brazil**
Ownership	**100%**
Incremental production	**up to 80,000 tonnes per annum of nickel**
Full project capex	**TBD**
First production date	**Potentially 2015**

The Jacaré project is located in Brazil and, at full production, is expected to operate in the lower half of the cost curve. Phase 1 of the project could potentially deliver 40 ktpa of nickel, with Phase 2 potentially delivering a further 40 ktpa with cobalt by-products. A conceptual study is expected to be completed in 2010.

Production data

Production (tonnes)	2009	2008	2007	2006	2005
Codemin					
Ore mined	547,700	498,400	539,300	487,600	528,600
Ore processed	512,000	475,900	522,600	518,600	521,400
Ore grade processed (% Ni)	2.1	2.1	2.1	2.1	2.1
Production	**9,500**	**9,100**	**9,900**	**9,800**	**9,600**
Loma de Níquel					
Ore mined	822,700	811,000	1,183,200	1,324,300	1,317,000
Ore processed	641,800	676,800	1,096,100	1,205,000	1,169,000
Ore grade processed (% Ni)	1.6	1.6	1.6	1.6	1.6
Production	**10,400**	**10,900**	**15,700**	**16,600**	**16,900**
Total Nickel segment nickel production	**19,900**	**20,000**	**25,600**	**26,400**	**26,500**
Platinum nickel production[1]	**19,500**	**15,500**	**19,200**	**21,700**	**20,900**
Total attributable nickel production	**39,400**	**35,500**	**44,800**	**48,100**	**47,400**

[1] Northam Platinum Limited was transferred to a disposal group in September 2007. Production information excludes Northam Platinum Limited. Northam Platinum Limited was sold on 20 August 2008.

Ore Reserve and Mineral Resource estimates as at 31 December 2009

Nickel

The Ore Reserve and Mineral Resource estimates were compiled in accordance with the Australasian Code for Reporting of Mineral Resources and Ore Reserves (The JORC Code, 2004) as a minimum standard. THE MINERAL RESOURCES ARE REPORTED AS ADDITIONAL TO ORE RESERVES.

The figures reported represent 100% of the Ore Reserves and Mineral Resources, the percentage attributable to Anglo American plc is stated separately. Rounding of figures may cause computational discrepancies.

Nickel				Tonnes		Grade		Contained metal	
Ore Reserves	Attributable %	LOM	Classification	2009	2008	2009	2008	2009	2008
Barro Alto (OP)[1]	100	27		Mt	Mt	%Ni	%Ni	kt	kt
Laterite			Proved	9.0	9.5	1.66	1.66	150	158
			Probable	30.5	31.2	1.71	1.72	522	535
			Total	**39.5**	**40.7**	**1.70**	**1.70**	**672**	**693**
Codemin – Niquelândia (OP)	100	6				%Ni	%Ni		
Laterite			Proved	3.2	3.2	1.33	1.33	42	42
			Probable	0.5	0.5	1.33	1.33	7	7
			Total	**3.7**	**3.7**	**1.33**	**1.33**	**49**	**49**
Loma de Níquel (OP)[2]	91.4	23				%Ni	%Ni		
Laterite			Proved	7.4	12.1	1.46	1.48	109	179
			Probable	25.0	21.0	1.42	1.46	354	306
			Total	**32.4**	**33.1**	**1.43**	**1.47**	**463**	**485**

Nickel			Tonnes		Grade		Contained metal	
Mineral Resources	Attributable %	Classification	2009	2008	2009	2008	2009	2008
Barro Alto (OP)[1]	100		Mt	Mt	%Ni	%Ni	kt	kt
Laterite		Measured	3.5	4.3	1.30	1.32	46	57
		Indicated	16.6	16.8	1.27	1.27	211	213
		Measured and Indicated	**20.1**	**21.1**	**1.28**	**1.28**	**257**	**270**
		Inferred (in LOM)	38.5	38.7	1.55	1.55	597	599
		Inferred (ex. LOM)	22.4	21.8	1.27	1.27	285	275
		Total Inferred	**61.0**	**60.5**	**1.45**	**1.45**	**883**	**875**
Codemin – Niquelândia (OP)[3]	100				%Ni	%Ni		
Laterite		Measured	3.3	3.4	1.29	1.29	43	43
		Indicated	3.5	3.5	1.25	1.25	44	44
		Measured and Indicated	**6.9**	**6.9**	**1.27**	**1.27**	**87**	**87**
		Inferred (in LOM)	–	–	–	–	–	–
		Inferred (ex. LOM)	–	–	–	–	–	–
		Total Inferred	–	–	–	–	–	–
Loma de Níquel (OP)[2]	91.4				%Ni	%Ni		
Laterite		Measured	1.9	0.9	1.51	1.38	29	13
		Indicated	7.2	4.8	1.51	1.45	109	69
		Measured and Indicated	**9.2**	**5.7**	**1.51**	**1.44**	**138**	**82**
		Inferred (in LOM)	–	1.7	–	1.39	–	23
		Inferred (ex. LOM)	6.4	4.5	1.53	1.50	97	68
		Total Inferred	**6.4**	**6.2**	**1.53**	**1.47**	**97**	**91**

Ore Reserve and Mineral Resource estimates as at 31 December 2009
continued

Nickel Projects			Tonnes		Grade		Contained metal	
Mineral Resources continued	Attributable %	Classification	2009	2008	2009	2008	2009	2008
Jacaré[4]	100		Mt	Mt	%Ni	%Ni	kt	kt
Ferruginous Laterite		Measured	–	–	–	–	–	–
		Indicated	98.5	–	1.19	–	1,175	–
		Measured and Indicated	**98.5**	–	**1.19**	–	**1,175**	–
		Inferred	80.8	–	1.16	–	939	–
Saprolite		Measured	–	–	–	–	–	–
		Indicated	25.3	–	1.54	–	388	–
		Measured and Indicated	**25.3**	–	**1.54**	–	**388**	–
		Inferred	85.1	–	1.36	–	1,156	–

Mining method: OP = Open Pit. LOM = Life of Mine in years based on scheduled Ore Reserves.
Due to the uncertainty that may be attached to some Inferred Mineral Resources, it cannot be assumed that all or part of an Inferred Mineral Resource will necessarily be upgraded to an Indicated or Measured Resource after continued exploration.

(1) **Barro Alto:** Ore from Barro Alto is currently being processed at the Codemin plant (the current life of the plant is 22 years). Mineral Resources are quoted above a 0.90% Ni cut-off and below an iron content of 30%.

(2) **Loma de Níquel:** Due to the increased uncertainty regarding renewal of mining concessions and the restoration of the 13 cancelled mining concessions, Anglo American's participation in Loma de Níquel is at risk and might not continue beyond 2012 (refer to note 7 on page 112). Three mining concessions are due for renewal in November 2012 (see page 48 for additional information). Currently, the areas with fully approved permits and active concessions account for 8.3Mt (at 1.46 %Ni) of the Ore Reserves reported above. Mineral Resources include all mineralisation inside a saprolite envelope defined by nickel and iron grade boundaries (>0.80% Ni and <35% Fe) and it also includes the 13 cancelled concessions.

(3) **Codemin – Niquelândia:** Mineral Resources are quoted above a 0.90% Ni cut-off and below an iron content of 30%.

(4) **Jacaré:** The submission of the Plano de Aproveitamento Economico (PAE) to Brazil's Departamento Nacional de Produção Mineral (DNPM), which included a pit optimisation, fulfils the test for "reasonable prospects for eventual economic extraction". The Mineral Resources are based on drilling to February 2009 and a block model finalised in December 2009. The PAE is currently under consideration by the DNPM.
The Saprolite Mineral Resources tabulated are a combination of higher-grade Mineral Resources that are expected to feed a pyrometallurgical treatment facility and lower-grade Mineral Resources that could be used to neutralise the acid in the proposed treatment of the Ferruginous Laterite material. Ferruginous Laterite is envisaged to be treated by hydrometallurgical processes.

Audits related to the generation of the Ore Reserve and Mineral Resource statements were carried out by independent consultants during 2009 at the following operations: Barro Alto, Codemin – Niquelândia and Jacaré