2. THE MINING ASSETS

2.1 Introduction

This section gives an overview of Exxaro and its Material Properties including historical company development, location and property description and operating results.

2.2 Exxaro – Corporate Structure and Business Structure, History and Strategy

2.2.1 Corporate and Business Structure

Exxaro is a public listed company. Its primary listing is on the JSE Limited ("JSE") and it has an American Depositary Receipt ("ADR") programme on the New York Stock Exchange, Inc ("NYSE"). Kumba Iron Ore is a company to be listed on the JSE. The principal executive offices of Exxaro are located at Kumba Limited, Roger Dyason Road, Pretoria West, 0001, Pretoria, Gauteng Province, Republic of South Africa.

Exxaro and its subsidiaries conduct underground and/or surface mining and related activities, including exploration, development and operation of mines, metallurgical processing, smelting and refining. Exxaro's ownership comprises holdings in Direct Subsidiaries, Indirect Subsidiaries, Joint Ventures (Direct and Indirect) and Associate Companies (Direct and Indirect). These subsidiaries, joint ventures and associate companies comprise dormant companies, exploration companies, mining companies, investment holding companies, marketing companies, mineral rights holding companies, mining related service companies and property holding companies.

Exxaro's operational structure will be based on five reporting entities: Base Metals; Industrial Minerals; Heavy Minerals; Iron Ore and Coal. Exxaro's corporate structure is depicted in Figure 1.3.

In South Africa, Exxaro and its subsidiaries have 12 producing mines, six projects, three smelters/plants, five coal processing plants and one coal destoning plant.

In Australia, Exxaro will operate the Tiwest JV in association with Kerr McGee, and has the Moranbah South coal project. In Namibia, Exxaro operates the Rosh Pinah mine. In Madagascar, Exxaro has an option to acquire the Toliara Sands Project. Kumba Iron Ore has two operating mines and two projects.

2.2.2 History

Exxaro was incorporated and registered as a public company in the Republic of South Africa in June 2000 and listed on the JSE on 26 November 2001 following the unbundling of Kumba from Mittal Steel South Africa Limited ("Mittal Steel"), formerly Iscor Limited ("Iscor"). Table 2.1 provides a brief description of the significant milestones in the history of Exxaro.

Table 2.1 Historical Milestones

Date	Activity
1932	Thabazimbi Iron Ore Mine commences mining operations.
1953	Sishen Iron Ore Mine commences mining operations.
1955	Acquisition of Durban Navigation Collieries.
1969	Rosh Pinah Lead-Zinc Mine commences mining operations.
1976	Sishen Iron Ore Mine commences export of iron ore via recently completed railway line to Saldanha Bay.
1980	Grootegeluk Coal Mine commences mining operations.
1983	Tshikondeni Coal Mine commences mining operations.
1989	Iscor is privatised and listed on the JSE.
1992	Leeuwpan Coal Mine commences mining operations.
1995	Acquisition of a 35% shareholding in Ticor Limited of Australia.
1996	Acquisition of interest to conduct a feasibility study on the Hope Downs exploration property.
1996	Commencement of major re-engineering and transformation programme.
1998	Acquisition of remaining 65% interest in Zincor Limited from Gold Fields of South Africa.
1999	Increase shareholding in Ticor Limited of Australia to 43.4%.
2000 – 20 November	Iscor shareholders approve the process of putting assets into separate legal entities.
2001	Sale of 40% of Kumba's interest in the Heavy Minerals Project to Ticor Limited.
2001	Divestment of gold exploration interests in exchange for an interest in Mincor Resources NL.
2001 – 1 March	Announcement of restructuring.
2001 – April	Increase in shareholding in Ticor Limited of Australia to 43.8%.
2001 – 26 November	Kumba (Iscor Mining division) unbundled and separately listed on the JSE.
2003	Anglo American becomes Kumba's majority shareholder.
2005 – 13 October	Announcement of the transaction that will result in the creation of Exxaro and Kumba Iron Ore.
2005 – 22 November	Take-out of Ticor Limited minority shareholders through a Scheme of Arrangement.

2.3 Background

SRK is a subsidiary of the international group holding company, SRK Group. SRK has been commissioned by the directors of Kumba to prepare a CPR on the Material Properties which will be incorporated into Exxaro and Kumba Iron Ore.

The description of the transaction is summarised in Section 1.2.1.

Table 2.2 Salient Historical Operating Statistics

IRON ORE		2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)
Production						
Sishen Mine	(Kt)	25,903	26,168	13,470	27,609	28,458
Thabazimbi Mine	(Kt)	2,421	2,389	1,270	2,503	2,530
Total	(Kt)	28,324	28,557	14,740	30,112	30,987
Sales						
Sishen Mine exports	(Kt)	19,916	20,946	10,004	20,923	22,113
COAL						
KUMBA COAL						
Coking Coal						
Production						
Grootegeluk Mine	(Kt)	1,670	1,830	884	1,972	1,859
Tshikondeni Mine	(Kt)	404	377	193	437	414
Total	(Kt)	2,074	2,207	1,077	2,409	2,273
Thermal Coal						
Production	(Kt)	13,351	13,036	7,201	14,017	14,573
Sales to Eskom	(Kt)	13,198	13,051	7,154	14,356	14,703
Other Coal						
Production						
Grootegeluk Mine	(Kt)	1,194	1,313	628	1,403	1,551
Leeuwpan Mine	(Kt)	1,631	1,456	845	1,615	1,442
Total	(Kt)	2,825	2,769	1,473	3,018	2,993
EYESIZWE COAL						
Thermal Coal						
Production						
Arnot Colliery	(Kt)	4,924	5,629	3,074	6,019	4,976
Matla Colliery	(Kt)	12,548	14,167	7,761	15,528	12,425
New Clydesdale Colliery	(Kt)	853	1,003	519	1,108	1,185
North Block Complex	(Kt)	980	1,428	859	2,518	3,063
Total	(Kt)	19,305	22,227	12,212	25,173	21,649
HEAVY MINERALS						
Ticor SA						
Production						
Ilmenite	(Kt)	44	91	87	262	358
Zircon	(Kt)	45	53	25	49	47
Rutile	(Kt)	19	20	9	20	23
Low manganese pig iron	(Kt)		3	12	63	89
Scrap pig iron	(Kt)			3	5	8
Chloride slag	(Kt)			13	96	134
Sulphate slag	(Kt)			10	40	30
Ticor[1]						
Production						
Ilmenite	(Kt)	223	214	109	236	220
Zircon	(Kt)	39	40	19	38	35
Rutile	(Kt)	15	18	9	18	16
Leucoxene	(Kt)	9	13	5	11	12
Synthetic rutile	(Kt)	89	90	56	112	111
Pigment	(Kt)	46	47	27	54	53
BASE METALS						
Zinc						
Production						
Rosh Pinah (zinc concentrate)	(Kt)	75	91	54	124	126
Zincor (zinc metal)	(Kt)	105	115	55	104	102
Chifeng (zinc metal)[2]	(Kt)			3	12	15
Rosh Pinah (lead concentrate)	(Kt)	28	22	18	27	25
INDUSTRIAL MINERALS						
Glen Douglas						
Production						
Dolomite	(Kt)	543	642	327	653	689
Aggregate	(Kt)	650	586	302	705	666
Lime	(Kt)	99	99	36	73	26

(1) Ticor was consolidated from 1 April 2003. The production tonnes reflect Ticor's 50% interest in its Tiwest JV joint venture. Physical information provided for periods prior to consolidation are for comparative purposes only.

(2) The effective interest in the physical information of the Chifeng refinery has been disclosed.

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

2.4 Overview of the Material Properties

The following sections include Tables which present the design and operating capacities of production units which will be in operation for the duration of the various LoM Plans.

2.5 Iron Ore

Exxaro's iron ore interests comprise its 20% stake in Sishen Iron Ore.

2.5.1 Sishen Mine

Sishen Mine is located in the Magisterial District of Postmasburg in the Northern Cape Province of South Africa, some 280km northwest of Kimberley. Located at latitude 27°47'S and longitude 23°00'E, the site is accessed via a tarred road, the R27, between Vryburg and Upington.

Exploration, development and production history dates from the early 19th Century, however large scale exploration only commenced in the 1940s. Following a diamond-drilling programme in 1947, mining operations at Sishen Mine commenced in 1953, primarily providing ore for consumption at domestic steel mills. A further exploration programme during the 1960s led to a significant increase in the resource base, and coupled with the completion of the Sishen to Saldanha railway line, in 1976, enabled increased production through export of iron ore. Total mine production since 1953 is estimated at 812Mt yielding some 665Mt of saleable product (refer to Table 2.3). Sishen Iron Ore has a 100% equity stake in Sishen Mine, but a 78.6% undivided share in the Sishen Mine minerals rights. The remaining mineral rights are held by Mittal Steel, which is entitled to 6.25Mtpa of final ore products over the life of the mine.

Table 2.3 Sishen Mine: Historical Production

Year[(1)]	Tonnes Treated (Mt)	Lump (Mt)	DR (Mt)	DRS (Mt)	Fine (Mt)	CS (Mt)	Total Products (Mt)
1953 – 1970	31.5	25.5					25.5
1971 – 1980	127.4	68.0			35.4		103.4
1981 – 1990	209.5	100.0		6.6	62.7	0.8	170.1
1991 – 2000	268.5	134.7	1.3	3.9	72.6	6.6	219.1
2001[(F)]	31.3	14.3	0.8	0.2	6.9	1.7	23.9
2002[(F)]	30.9	15.1	0.2	0.6	8.7	1.7	26.3
2003[(F)]	32.0	15.0	0.7	0.6	8.7	1.8	26.8
2003[(H2)]	16.1	7.6	0.5	0.3	4.5	0.7	13.6
2004[(C)]	32.8	14.7	1.3	0.7	8.3	2.5	27.5
2005[(C)]	31.8	15.2	1.3	1.2	8.8	2.4	28.8
Total	**811.8**	**410.1**	**6.1**	**14.1**	**216.6**	**18.2**	**665.0**

(1) Tonnes treated between 1953 and 1997 estimated from average yields from 1998 to 30 June 2001.

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

Sishen Mine currently comprises conventional open-pit operation, processing through a single processing facility with an operating capacity of 32.5Mtpa of RoM. The Main Plant production at Sishen Mine is focused on the beneficiation of high-grade iron ore (beneficiated Fe≥60%) to produce a product of 66%Fe. Saleable products comprise some 28.5Mtpa and include Lump, Direct Reduction ("DR"), Direct Reduction Shaft Furnace ("DRS"), Fines and Coarse Sinter ("CS"). These products are supplied in varying amounts to domestic steel mills with the majority, 22Mtpa, exported via the port facilities at Saldanha. In addition to the exports and sales on commercial terms Kumba has an agreement with Mittal Steel to supply Mittal Steel domestically with 6.25Mtpa of saleable product on a cost plus 3% management fee basis of which a maximum of 1.8Mtpa is to be delivered to Saldanha Steel.

The Sishen Expansion Project ("SEP") is based on the introduction of new jigging process technology that is planned to upgrade traditionally lower grade iron ore (Fe >50%) to export quality at some 64%Fe. The project is planned to be undertaken in two phases for which a Feasibility Study for Phase I, some 13Mtpa of product, was completed in January 2005. Phase II is planned to increase SEP production by a further 10 – 20Mtpa of product but is dependent on a higher rail capacity than included in the current Transnet contract agreement. SRK has consequently reviewed and included the TEPs associated with the SEP Phase I project. SRK understands that Kumba is currently undertaking investigations to increase the SEP capacity and, subsequent to review, these projections may be included in the current valuation exercise either through a DCF analysis or attributing value to the Mineral Resource.

Table 2.4 Sishen Mine: Current Infrastructure

Type	Infrastructure	Detail
Mine Access	North Pit, South Pit	Long life asset with waste mining capacity of 4,100ktpm and ore mining capacity of 2,800ktpm in current mine configurations.
Process Facilities	Main Plant	Long life asset with operating capacity of 2,900ktpm comprising conventional heavy media circuits to produce various iron ore products.
	SEP Plant	Long life asset with operating capacity of 1,400ktpm comprising jig circuits.
Tailings Facilities	No. 1 Plant	Long life asset.

Table 2.4 provides summary details of the infrastructure currently servicing Sishen Mine, type of operation and projected life. Table 2.5 provides a summary of the principal operating statistics for the years ending 30 June 2002 to 31 December 2006 inclusive. The increase in capital expenditure in 2006 is principally associated with the construction of the SEP process plant which forms the principal project capital for Sishen. The SEP Phase I project is being constructed over some three years from 2006 at a total capital cost of ZAR4.0 billion. In addition to the SEP capital for 2006, sustaining capital is required in terms of the main plant and replacement mining equipment. The increase in cash production costs between 2003 and 2006 is largely as a result of an increase in on-mine costs, notably diesel.

Table 2.5 Sishen Mine: Historical Operating Statistics

Statistics	Units	2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(Mt)**	30.9	32.0	16.3	32.8	31.8	33.5
Waste Mined	**(Mt)**	57.2	65.4	30.8	54.7	58.6	78.9
Stripping Ratio	**(tw : to)**	1.8	2.0	1.9	1.7	1.8	2.4
Overall Yield	**(%)**	84	82	83	85	89	86%
Sales							
Lump	**(Mt)**	15.1	15.0	7.7	14.7	15.2	14.7
DR Ore	**(Mt)**	0.2	0.7	0.6	1.3	1.3	1.7
DRS Ore	**(Mt)**	0.6	0.6	0.4	0.7	1.2	1.2
Coarse Sinter	**(Mt)**	1.7	1.8	0.7	2.5	2.4	3.0
Fine	**(Mt)**	8.7	8.7	4.1	8.3	8.8	8.4
Total	**(Mt)**	26.3	26.8	13.5	27.5	28.8	29.0
Expenditure Statistics							
Total Cash Production Costs	**(ZARm)**	1,156	1,239	619	1,353	1,540	1,803
Total Capital Expenditure	**(ZARm)**	251	197	96	170	243	1,718
Expenditure Efficiencies							
Total Cash Production Costs	**(ZAR/t treated)**	37.4	38.8	38.0	41.3	48.4	53.8
	(ZAR/t sales)	44.0	46.3	46.0	49.2	53.5	62.2

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

2.5.2 Sishen South Project

The Sishen South Project is located 12km southwest of Postmasburg in the Northern Cape and 85km south of Sishen Mine. The Sishen South Project consists of two phases. The LoM and associated FM and NPV presented in this CPR represents Sishen South Project Phase I, while Sishen South Project Phase II is valued as an exploration project.

The project site is accessed via a gravel road, the R383, to Postmasburg. A rail network exists between Beeshoek and Sishen Mine and a link will be constructed to a siding at the Beeshoek Mine from the Sishen South Project which is 14km to the south. Power is available via Postmasburg or the Beeshoek Mine and the Sishen South Project plans to utilise power from Postmasburg, which will be sourced via a new Eskom Holdings Limited ("Eskom") line to be constructed between Postmasburg and the Sishen South Project.

A new sub-station will be installed at site and the existing sub-station at Postmasburg upgraded. In terms of water supply 35m^3/hr is required at site principally as potable water and at the plant this will be obtained from the de-watering programme that is to be established. De-watering will commence at some 100m^3/hr and build-up to a maximum of 350m^3/hr for Phase I. Excess water is planned to be delivered to the Vaal-Gamagara pipe line.

The region is semi-arid with annual rainfall between 300mm and 500mm, and current land use is limited to sheep and goat farming and minor irrigation agriculture. The surface topography is medium to flat and the site is some 1,300m above sea level. Exploration has been undertaken by Kumba since 1953 and a number of option and feasibility type studies had been completed.

The increase in planned rail capacity to 35Mtpa has enabled Kumba to proceed with a combination of Phase I of the Sishen South Project and to introduce SEP. The high grade iron ore available at the Sishen South Project is considered comparable to that of the Sishen Expansion Project – 64%Fe Lump ore and 63.5%Fe Fine ore. A feasibility study was completed by Kumba in June 2005. SRK's review of Sishen South is based upon the designs and projections contained in this CPR.

2.5.3 Thabazimbi Mine

Thabazimbi Mine is situated in the Magisterial District of Thabazimbi, Limpopo Province, South Africa, some 200km north of Johannesburg. Located at latitude 24°36'S and longitude 27°23'E, the site is accessed via a tarred road, the R511, between Brits and Lephalale. Exploration, development and production history dates from 1919, however large-scale exploration only commenced in the 1930s when Iscor acquired the mineral rights.

Substantive mining operations at Thabazimbi Mine commenced in 1932, primarily providing ore for consumption at domestic steel mills. Total mine production since 1932 is some 154Mt yielding some 118Mt of saleable products (refer to Table 2.6). Thabazimbi Mine is effectively a Mittal captive operation, which operates on a cost plus 3% management fee basis.

Table 2.6 Thabazimbi Mine: Historical Production

Year	Tonnes Treated (Mt)	Lump (Mt)	Fine (Mt)	Total Products (Mt)
1932 – 1970	49.8	19.9	17.2	37.1
1971 – 1980	28.2	11.2	9.7	20.9
1981 – 1990	29.3	11.7	10.1	21.8
1991 – 2000	31.1	13.5	11.1	24.6
2001(F)	2.6	1.0	1.1	2.1
2002(F)	2.7	1.3	1.1	2.4
2003(F)	2.8	1.3	1.1	2.4
2003(H2)	1.5	0.7	0.6	1.3
2004(C)	3.1	1.3	1.2	2.6
2005(C)	3.1	1.3	1.2	2.5
Total	**154.2**	**63.2**	**54.4**	**117.7**

(F) Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

Table 2.7 Thabazimbi Mine: Current Infrastructure

Type	Infrastructure	Detail
Mine Access	Donkerpoort Nek/East Pit	Short life asset
	Buffelshoek West Pit	Short life asset
	Donkerpoort West Pit	Short life asset
	Kwaggashoek East Pit	Short life asset
Process Facilities	No.1 Plant	Short life asset with operating capacity of 270ktpm comprising conventional dense medium separation circuits
Tailings Facilities	No. 1 Plant	Short life asset

Thabazimbi Mine comprises an established conventional open-pit operation, processing through a single processing facility with an operating capacity of some 3Mtpa of RoM. The operation is considered to be a short-life operation although investigations into the Phoenix Project, a significant LoM extension project, are well-advanced.

Table 2.7 provides summary details of the infrastructure currently servicing Thabazimbi Mine, type of operation and projected life. Table 2.8 indicates a summary of the principal operating statistics for the years ending 30 June 2002 through to 31 December 2006 inclusive. Actual production for the financial year ending 31 December 2005 is some 2.5Mt of saleable products.

The declining stripping ratio is a result of the relatively short LoM as well as the topography particular to Thabazimbi. A number of the pits started with very high stripping ratios due to the mountainous terrain where, in places, the side or top of the mountain initially needed to be removed to create a stable slope or to access the ore. The stripping ratio, as the elevation drops, therefore declines.

Table 2.8 Thabazimbi Mine: Historical Operating Statistics

Statistics	Units	2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(Mt)**	2.7	2.8	1.5	3.1	3.1	3.0
Waste Mined	**(Mt)**	34.9	33.2	19.8	34.5	25.0	15.4
Stripping Ratio	**(tw : to)**	12.8	12.0	12.9	11.2	7.5	5.1
Overall Yield	**(%)**	89	87	85	81	83	85
Sales							
Lump	**(Mt)**	1.3	1.3	0.7	1.3	1.2	1.1
Fine	**(Mt)**	1.1	1.1	0.6	1.2	1.3	1.4
Total	**(Mt)**	2.4	2.4	1.3	2.6	2.5	2.5
Expenditure Statistics							
Total Cash Production Costs	**(ZARm)**	395	341	160	370	388	358
Total Capital Expenditure	**(ZARm)**	69	106	80	104	40	66
Expenditure Efficiencies							
Total Cash Cost of Sales	**(ZAR/t treated)**	145.2	123.6	104.1	120.0	127.0	119.3
	(ZAR/t sales)	164.8	140.3	125.4	145.4	153.0	143.2

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

2.5.4 Exploration Potential

Sishen Iron Ore has seven iron ore exploration projects in various development stages as indicated in Table 2.9 below.

Table 2.9 Iron Ore Exploration Properties: Development Stages

Exploration Project	Development Stage
Assen	The Assen Project has small classified mineral resources and is deemed an ***Advanced Exploration Area.***
Kromdraai	The Kromdraai Project has no classified mineral resources and is deemed an ***Exploration Area.***
Sishen South Phase II Project	The Sishen South Project has significant Measured Resources and has been the subject of high level technofinancial investigations but a final decision to proceed with construction has not been made. It is deemed a ***Pre-Development Project.***
Zandrivierspoort	This Project has significant Indicated Resources, but no feasibility type work has been done. It is deemed a ***Pre-Development Project.***
Falémé	The Falémé Project has significant Indicated Resources and has been the subject of some feasibility work, but a final decision to proceed with construction has not been made. The mineral titles for the Falémé Project are currently under dispute. It is deemed a ***Pre-Development Project.***
Phoenix	The Phoenix Project has significant unclassified mineralisation and is currently the subject of a technical feasibility study and a final decision to proceed with construction has not been made. It is deemed to be a ***Pre-Development Project.***
Boven Zeekoebaart	This Project has some Inferred Resources and is deemed an ***Exploration Area***.

Table 2.10 to Table 2.16 provide summary details of the iron ore exploration projects.

Table 2.10 Exploration, Iron Ore: Assen Project

Location	25°10'S, 27°35'E. North West Province, South Africa, ~55km north-northwest of Brits.	
Ownership	100% Sishen Iron Ore. Pending new order prospecting right application.	
Total Area	5,831.36Ha	
Exploration Completed(1)	ZAR1.74m	
Planned Exploration	ZAR0.84	Years 1 and 2
Potential	The Assen project's potential is limited to the mineralisation intersected to date (small high grade hematite deposit). The planned exploration aims to bring this mineralisation into a classified Mineral Resource category.	

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

Table 2.11 Exploration, Iron Ore: Kromdraai Project

Location	25°14'S, 28°44'E. Gauteng Province, South Africa, ~70km northeast of Pretoria.		
Ownership	100% Sishen Iron Ore. Prospecting rights.		
Total Area	7,650.646Ha		
Exploration Completed(1)	ZAR0.80m	Based on estimate by Kumba	
Planned Exploration	ZAR0.21m	Years 1 and 2	
	Measured	Indicated	Inferred
	0.56Mt at 60% Fe		
Potential	The Kromdraai project's potential is limited to the mineralisation identified to date. The planned exploration aims to bring this mineralisation into a classified Mineral Resource category.		

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

Table 2.12 Exploration, Iron Ore: Sishen South Phase II Project

Location	28°21'S, 22°58'E. Northern Cape Province, South Africa, ~70km south of Sishen and immediately west of the Beeshoek project of Assmang.		
Ownership	100% Sishen Iron Ore. Pending mining right application.		
Total Area	10,731.29Ha		
Exploration Completed(1)	ZAR40m	Based on estimate by Kumba	
Planned Exploration	ZAR6.8m	Years 1 and 2	
Mineralisation	see Mineral Resources	Medium (50% – 60% Fe) to high grade (>60% Fe) hematite mineralisation	
Mineral Resources(2), (3)	Measured	Indicated	Inferred
	51Mt at 64.6% Fe	93Mt at 63.9% Fe	42Mt at 62% Fe
Potential	The Sishen South Phase II project is at the pre-development stage and the potential is well-explored. The planned expenditure is mainly feasibility level work.		

(1) Historical costs have been adjusted to present day terms by adjusting for inflation. Historical costs from 1980s discounted by 50% and from 1960s by 75%. Historical costs could not be split between Sishen South Project Phase I and Phase II and therefore SRK applied a 50 : 50 allocation.
(2) Compiled and signed by Louis Jacobs and Pieter Mienie, both registered Pr.Sci.Nat. with SACNASP.
(3) Refer to Table 4.2.

Table 2.13 Exploration, Iron Ore: Zandrivierpoort Project

Location	23°41'S, 29°35'E. Limpopo Province, South Africa, ~25km north-northeast of Polokwane.		
Ownership	Some titles held 100% by Pietersburg Iron Ore Company, in which Sishen Iron Ore Company holds a 50% interest. Pending prospecting permit application.		
Total Area	347.91Ha	Sisen Iron Ore	
	2,393.74Ha	Pietersburg Iron Ore	
Exploration Completed(1)	ZAR10m	Based on estimate by Kumba	
Planned Exploration	ZAR4.7m	Years 1 and 2	
Mineralisation	see Mineral Resources	Low grade (~35% Fe) magnetite mineralisation	
Mineral Resources and Reserves(2)	Measured	Indicated	Inferred
	34.93% Fe	–	447Mt
Potential	The Zandrivierspoort project's potential is limited to the mineralisation identified to date. Planned work is aimed at upgrading the resource and technical information.		

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.
(2) Compiled and signed by Louis Jacobs and Pieter Mienie, both registered Pr.Sci.Nat. with SACNASP.

Table 2.14 Exploration, Iron Ore: Falémé Project

Location	12°45'N, 11°31'W. Extreme southeast corner of Senegal. Local infrastructure is very poor to non-existent.	
Ownership	Mineral title held 100% by Miferso(1). Kumba holds an option to acquire 80% interest financing all exploration and development costs. Miferso to supply infrastructure. The mineral title is currently under dispute.	
Total Area		
Exploration Completed(2)	ZAR43.9m	Based on estimate by Kumba
Planned Exploration	ZAR8.5m	Years 1 and 2
Potential	The Falémé project's potential is high, with exploration expenditure reflecting this.	

(1) Senegalese Government development company.
(2) Historical costs came to USD7m. Converted by ZAR6.313 = USD1.

Table 2.15 Exploration, Iron Ore: Phoenix Project

Location	Limpopo Province, South Africa, ~15km south of Thabazimbi.	
Ownership	Sishen Iron Ore holds 100% interest. Pending mining licence conversion application.	
Total Area	2,010.577Ha	
Exploration Completed	ZAR34.7m	Based on estimate by Kumba
Planned Exploration	Not finalised	
Potential[(1)]	The Phoenix project is at the pre-development stage, and the potential is well explored. The project is currently subject to a pre-feasibility study.	

(1) Compiled and signed by D Rossouw, J H Feldtmann and R Kruger, all of Kumba.

Table 2.16 Exploration, Iron Ore: Boven Zeekoebaart Project[1]

Location	29°06'S, 22°15'E. Approximately 35km north-northeast of Marydale, the deposit borders the Gariep River in the Northern Cape Province, South Africa.	
Ownership	50% owned by Sishen Iron Ore. Valid Prospecting Right.	
Total Area	384.82Ha	Mineral Title
Potential	The average grade of the ore is reported to be 64% Fe.	

(1) From Venmyn valuation report, 2004.

2.6 Coal

Exxaro's coal interests comprise a 100% interest in Kumba Coal and Eyesizwe.

2.6.1 Grootegeluk Mine

Grootegeluk Mine is situated in the Magisterial District of Lephalale in the Limpopo Province of South Africa, some 240km northwest of Pretoria (Tshwane) and 70km south of the border with Botswana. Located at latitude 23°39'S and longitude 27°43'E, the site is accessed via a tarred road, the R517, between Modimolle (formerly Nylstroom) and Lephalale (formerly Ellisras).

Exploration history in the Waterberg Coalfield dates from 1920, although larger scale exploration did not commence until the 1940's. Following intensive exploration by Iscor, beginning in 1973, a mining lease was granted in 1979. In 1980 Grootegeluk Mine was established as the first and to date the only coal mine in the Waterberg Coalfield. Total mine production (including discard) since 1980 is some 561Mt rendering some 282Mt of saleable coal (refer to Table 2.17). Grootegeluk Mine is a conventional open-pit operation. Processing is through five coal preparation plants with a combined operating capacity of 2,979ktpm. A sixth coal plant is under construction. Saleable products include semi-soft coking coal, metallurgical coal and thermal coal, with the latter predominating as a dedicated supply to the Matimba Power Station. Metallurgical coal is primarily supplied to Mittal steel mills, with certain semi-soft coking coal exported via ports at Durban and Richards Bay in the KwaZulu-Natal Province of South Africa.

Table 2.17 Grootegeluk Mine: Historical Production

Year	Tonnes Processed (Mt)	Coking Coal (Mt)	Metallurgical Coal (Mt)	Thermal Coal (Mt)	Total Products (Mt)
1980 – 1990	132.8	17.5		49.9	67.4
1991 – 1995	107.7	6.6	0.2	45.2	52.1
1996[(F)]	27.3	1.8	0.2	13.3	15.3
1997[(F)]	25.9	1.5	0.3	12.3	14.0
1998[(F)]	29.4	1.4	0.5	12.9	14.8
1999[(F)]	27.8	1.2	0.7	11.5	13.4
2000[(F)]	29.4	1.3	1.2	11.8	14.3
2001[(F)]	29.1	1.5	1.3	12.0	14.8
2002[(F)]	32.2	1.7	1.2	13.4	16.2
2003[(F)]	32.4	1.8	1.3	13.0	16.2
2003[(H2)]	17.6	1.0	0.6	7.2	8.8
2004[(C)]	35.3	2.0	1.4	14.0	17.4
2005[(C)]	34.3	1.9	1.6	14.2	17.6
Total	**561.2**	**41.2**	**10.3**	**230.7**	**282.2**

Table 2.18 below gives summary details of the infrastructure currently servicing Grootegeluk Mine, type of operation and projected life.

Table 2.18 Grootegeluk Mine: Current Infrastructure

Type	Infrastructure	Detail
Mine Access	Main Open Pit	Long life asset with current operating capacity of 2,979ktpm RoM and 1,674ktpm waste.
Process Facilities	GG1	Long life asset with operating capacity of 1,366ktpm comprising conventional coal circuits to produce semi-soft coking coal and thermal coal.
	GG2	Long life asset with operating capacity of 1,245ktpm comprising conventional coal circuits to produce thermal coal.
	GG3	Long life asset with operating capacity of 159ktpm comprising a raw coal crushing facility used to produce unwashed coal for blending at Matimba.
	GG4 and 5	Long life asset with operating capacity of 209ktpm comprising a beneficiation facility to produce metallurgical coal.
	GG6	Long life asset under construction, due for commissioning in early 2006, with operating capacity of 584ktpm comprising a beneficiation facility to produce semi-soft coking coal and thermal coal for Matimba.
Tailings Facilities	No. 1, No. 2, No. 3, No. 5	Two medium life assets, No. 1 and No. 2 with No. 3 and No. 5 temporarily closed.

Historical operating statistics for the past four years for Grootegeluk Mine are summarised in Table 2.19 below.

Table 2.19 Grootegeluk Mine: Historical Operating Statistics

Statistics	Units	2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(Mt)**	32.2	32.4	17.6	35.3	34.3	36.2
Waste Mined	**(Mt)**	21.7	20.2	9.4	17.3	24.2	22.8
Stripping Ratio	**(tw : to)**	0.7	0.6	0.5	0.5	0.7	0.6
Overall Yield	**(%)**	50	50	49	49	51	50
Sales							
Semi-soft Coking Coal	**(Mt)**	1.7	1.8	1.0	2.0	1.9	2.6
Metallurgical Coal	**(Mt)**	1.2	1.3	0.6	1.4	1.6	1.5
Thermal Coal	**(Mt)**	13.4	13.0	7.2	14.0	14.2	14.6
Total	**(Mt)**	16.2	16.2	8.7	17.4	17.6	18.8
Expenditure statistics							
Total Cash Costs	**(ZARm)**	657	723	343	724	819	853
Total Capital Expenditure	**(ZARm)**	132	92	11	181	231	296
Expenditure efficiencies							
Total Cash Costs	**(ZAR/t treated)**	20.4	22.3	19.5	20.5	23.9	23.6
	(ZAR/t sales)	40.5	44.7	39.2	41.6	46.4	45.4

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

2.6.2 Leeuwpan Mine

Leeuwpan Mine is situated in the Magisterial District of Delmas in the Mpumalanga Province of South Africa some 80km east of Johannesburg. Located at latitude 26°08'S and longitude 28°41'E, the site is accessed via a tarred road, the R50, between Delmas and Leandra.

Exploration, development and production history in the area dates from 1988 leading to commencement of mining operations in 1992. Total mine production since 1992 is estimated at some 25Mt yielding some 14Mt of saleable coal (Table 2.20).

Leeuwpan Mine comprises two conventional open-pit operations, processing through a jig plant and separate coal washing facility, with operating capacity of 215ktpm. The saleable product is metallurgical and steam coal which is supplied to the domestic steel mills, other local distributors and exported via port facilities at Matola and Durban, as well as thermal coal which is supplied to Eskom's Majuba power station.

Table 2.20 Leeuwpan Mine: Historical Production

Year	Tonnes Treated (Mt)	Metallurgical Coal (Mt)	Thermal Coal (Mt)	Total Products (Mt)
1992 – 1995	1.4	0.8		0.8
1996(F)	1.2	0.8		0.8
1997(F)	1.4	0.8		0.8
1998(F)	1.0	0.7		0.7
1999(F)	1.9	0.9		0.9
2000(F)	2.3	1.4		1.4
2001(F)	2.5	1.6		1.6
2002(F)	2.7	1.6		1.6
2003(F)	2.7	1.4	0.1	1.5
2003(H2)	1.4	0.6	0.2	0.8
2004(C)	2.8	1.3	0.4	1.7
2005(C)	3.2	1.4	0.5	1.9
Total	**24.7**	**13.2**	**1.3**	**14.4**

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

Table 2.21 provides summary details of the infrastructure currently servicing Leeuwpan Mine, type of operation and projected life.

Table 2.21 Leeuwpan Mine: Current Infrastructure

Type	Infrastructure	Details
Mine Access	Main Open Pits	Long life assets with current operating capacity of 405ktpm RoM and 1,586ktpm waste.
Process Facilities	No. 1 Plant	Long life asset with operating capacity of 215ktpm comprising conventional coal circuits to produce metallurgical and thermal coal.
	Jig	Long life asset with 190ktpm operating capacity comprising crush and screen circuits to produce power station coal.
Tailings Facilities	Various slurry ponds	Long life assets.

Historical operating statistics for the past four years for Leeuwpan Mine are summarised in Table 2.22.

Table 2.22 Leeuwpan Mine: Historical Operating Statistics

Statistics	Units	2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(Mt)**	2.7	2.7	1.4	2.8	3.2	4.9
Waste Mined	**(Mt)**	11.0	9.6	5.8	13.0	11.5	21.0
Stripping Ratio	**(tw : to)**	4.0	3.8	4.1	4.3	3.7	4.3
Overall Yield	**(%)**	60	53	60	62	62	63
Sales							
Metallurgical Coal	**(Mt)**	1.6	1.4	0.6	1.3	1.4	1.4
Thermal coal	**(Mt)**		0.1	0.2	0.4	0.5	1.2
Export Coal	**(Mt)**						0.5
Total	**(Mt)**	1.6	1.5	1.0	1.7	2.0	3.1
Expenditure statistics							
Total Cash Costs	**(ZARm)**	94	98	45	125	126	166
Total Capital Expenditure	**(ZARm)**	15	25	35	52	104	61
Expenditure efficiencies							
Total Cash Costs	**(ZAR/t treated)**	34.7	35.9	32.2	44.0	40.0	33.9
	(ZAR/t sales)	57.5	67.8	45.1	72.7	64.3	53.6

(F) Financial Year ended 30 June.
(H2) Six months ended 31 December due to the change of Financial Year.
(C) Calendar Year ended 31 December.

2.6.3 Tshikondeni Mine

Tshikondeni Mine is situated in the Magisterial District of Thohoyandou, in Limpopo Province, South Africa, some 140km east of Musina (formerly Messina) and 15km south of the border with Zimbabwe. Located at latitude 22°30'S and longitude J' 30°50'E, the site is accessed via a tarred road, the R525 some 100km east of Tshipise.

Exploration in the Pafuri eastern sector of the Soutpansberg Coalfield dates from 1950, although larger scale exploration did not take place until the 1970's. In 1973 Iscor began an extensive exploration program. Mining operations at Tshikondeni Mine subsequently commenced in 1983, and to date it remains the only coal mine in the Soutpansberg Coalfield. Total mine production since 1983 is some 10.7Mt RoM yielding some 6.1Mt of saleable coal (Table 2.23).

Tshikondeni Mine comprises an underground mining operation, accessed by four surface declines, processing through a single coal preparation plant with an operating capacity of 75ktpm. The saleable product is coking coal, which is supplied solely to Mittal steel mills.

Tshikondeni Mine is effectively a Mittal captive operation, which operates on a cost plus 3% management fee basis.

Table 2.23 Tshikondeni Mine: Historical Production

Year	Tonnes Treated (Mt)	Metallurgical Coal (Mt)
1983 – 1990	1.5	1.0
1991 – 1995	1.9	1.3
1996(F)	0.5	0.3
1997(F)	0.6	0.3
1998(F)	0.6	0.3
1999(F)	0.6	0.3
2000(F)	0.7	0.4
2001(F)	0.8	0.4
2002(F)	0.8	0.4
2003(F)	0.8	0.4
2003(H2)	0.4	0.2
2004(C)	0.8	0.4
2005(C)	0.8	0.4
Total	**10.7**	**6.1**

(F) Financial Year ended 30 June.
(H2) Six months ended 31 December due to the change of Financial Year.
(C) Calendar Year ended 31 December.

Table 2.24 provides summary details of the infrastructure currently servicing Tshikondeni Mine, type of operation and projected life.

Table 2.24 Tshikondeni Mine: Current Infrastructure

Type	Infrastructure	Details
Mine Access	Mupani	Short life asset with current operating capacity of 10ktpm Rom.
	Mutale	Medium life asset with current operating capacity of 15ktpm RoM.
	Nyala	Short life asset with current operating capacity of 40ktpm RoM.
	Vhukati	Medium life asset with current operating capacity of 10ktpm RoM.
Process Facilities	No. 1 Plant	Long life asset with operating capacity of 254ktpm comprising conventional coal circuits to produce metallurgical and thermal coal.
Tailings Facilities	Various slurry ponds	Long life assets

Historical operating statistics for the past four years for Tshikondeni Mine are summarised in Table 2.25.

Table 2.25 Tshikondeni Mine: Historical Operating Statistics

Statistics	Units	2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(kt)**	820	750	380	830	780	751
Overall Yield	**(%)**	49	50	51	53	54	53
Sales							
Coking Coal	**(kt)**	404	377	205	434	393	400
Expenditure statistics							
Total Cash Costs	**(ZARm)**	209.7	209.8	116.6	223.0	267.0	254.1
Total Capital Expenditure	**(ZARm)**	33.1	50.2	15.0	34.9	29.9	55.9
Expenditure efficiencies							
Total Cash Costs	**(ZAR/t treated)**	255.7	279.7	306.8	268.7	342.3	338.5
	(ZAR/t sales)	519.1	556.5	568.8	513.8	679.4	635.1

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

2.6.4 Arnot Colliery

Arnot Colliery is situated approximately midway between the towns of Middelburg and Carolina in the Mpumalanga province. The colliery is approximately 43km by road from Middelburg, 65km by road from Carolina and 25km by road from Hendrina. Arnot Colliery has been in operation since 1972. Total mine production (including discard) since 1972 is some 157Mt. Historical production information appears in Table 2.26.

Table 2.26 Arnot Colliery: Historical Production

Year	No. 2 Shaft (Mt)	No. 8 Shaft (Mt)	Opencast (Mt)	Mini Pit (Mt)	Mini Pit BWest (Mt)	No.10 Shaft (Mt)	Total (Mt)
1972 – 1980	11.9	4.9	19.6	4.1			**40.4**
1981 – 1990	13.6	8.0	33.7				**55.2**
1991 – 2000		28.4	4.2		0.6	0.6	**33.8**
2001(C)		3.1				1.7	**4.7**
2002(C)		2.9				2.2	**5.1**
2003(C)		1.8		1.0		3.4	**6.1**
2004(C)		2.1		1.0		2.9	**6.0**
2005(C)		2.2		0.9		1.9	**5.0**
Total	**25.5**	**53.3**	**57.4**	**6.9**	**0.6**	**12.8**	**156.5**

(C) Calendar Year ended 31 December.

Arnot Colliery is a long life asset with an operating capacity of 5,700ktpa of coal. It produces mainly thermal coal, which it supplies on contract to Eskom. The underground operations of Arnot Colliery are contracted to supply 5,000ktpa of thermal coal to Eskom's Arnot power station.

Arnot Colliery currently has three primary long life facilities: No. 3 Shaft, No. 8 Shaft and No. 10 Shaft. Details on Arnot Colliery's infrastructure appear in Table 2.27 and details of Arnot Colliery's historical operating statistics appear in Table 2.28.

Table 2.27 Arnot Colliery: Current Infrastructure

Type	Infrastructure	Detail
Mine Access	3, 8 and 10 Incline Shafts	Long life asset with current operating capacity of approximately 5,700ktpa of coal.
Production Facilities	Beneficiation Plant	Beneficiates 14% of RoM.
Discard Facilities	Voids in the opencast	Long life assets.

Table 2.28 Arnot Colliery: Historical Operating Statistics

Statistics	Units	2001(C)	2002(C)	2003(C)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(Mt)**	4.7	5.1	6.1	6.0	5.0	5.2
Overall Yield	**(%)**	96	98	96	97	97	95
Sales							
Thermal Coal	**(Mt)**	4.7	5.1	6.1	6.0	5.0	5.0
Total	**(Mt)**	4.7	5.1	6.1	6.0	5.0	5.0
Expenditure statistics							
Total Working Costs	**(ZARm)**	234.2	272.4	355.2	366.9	380.9	406.7
Total Capital Expenditure (Eskom Funded)	**(ZARm)**	11.3	0.2	7.1	0.2	125.7	na
Expenditure efficiencies							
Total Cash Costs	**(ZAR/t RoM)**	49.4	53.3	57.8	61.0	76.6	77.8
	(ZAR/t sales)	49.4	53.3	57.8	61.0	76.6	81.5

(C) Calendar Year ended 31 December.

The progressive increase in working costs at Arnot can be attributed to:

- Annual wage increases;
- Higher staff complements due to additional new sections; and
- Increase in extraordinary costs mainly due to replacement/repairs of underground equipment.

2.6.5 Matla Colliery

Matla Colliery is located in the Kriel District of Mpumalanga, approximately 20km west of Kriel, 50km southwest of Witbank and 30km south of Ogies. The mine was founded towards the end of 1973 to supply Eskom's 3,600 MW Matla Power Station. Total mine production (including discard) since 1978 is some 284Mt.

Historical production information appears in Table 2.29.

Table 2.29 Matla Colliery: Historical Production

Year	Mine 1 (Mt)	Mine 2 (Mt)	Mine 3 (Mt)	Total (Mt)
1978 – 1980	3.9			**4.0**
1981 – 1990	33.1	38.7	20.2	**92.0**
1991 – 2000	24.8	51.2	43.6	**119.5**
2001(C)	3.0	5.7	3.6	**12.3**
2002(C)	3.7	2.0	7.2	**12.8**
2003(C)	4.1	3.4	8.1	**15.6**
2004(C)	3.9	3.7	8.0	**15.6**
2005(C)	3.0	2.4	7.1	**12.5**
Total	**79.5**	**107.1**	**97.8**	**284.4**

(C) Calendar Year ended 31 December.

Matla Colliery is contracted to supply 10Mtpa bituminous coal to Eskom's Matla Power Station. The current rate of production is between 12.5 – 13.5Mtpa, depending on Matla Power Station's requirements. Matla extracts bituminous coal from the No. 2 and No. 4 Seams. This coal is mined from underground mines at Matla Mine 1, Mine 2 and Mine 3.

Matla Colliery also supplies a further 2Mtpa of coal to Sasol at Eskom's request over a period of four years. Mine 1 (No. 4 Seam) produces approximately 3Mtpa of coal from three Continuous Miner sections, Mine 2 (No. 2 Seam) produces 2.5Mtpa of coal from one development section and one short-wall section, and Mine 3 (No. 4 Seam) produces approximately 7Mtpa of coal from three development sections and one short-wall section. The No. 2 Seam and No. 4 Seam contributions to the total Matla annual production is maintained at approximately 30% and 70%, respectively.

Details on Matla Colliery's infrastructure appear in Table 2.30 and details on Matla Colliery's historical operating statistics appear in Table 2.31.

Table 2.30 Matla Colliery: Current Infrastructure

Type	Infrastructure	Detail
Mine Access	Vertical Shafts	Long life asset with current operating capacity of approximately 14,000ktpa of coal.
Production Facilities	No. 1 Mine	Long life asset with current operating capacity of approximately 3,000ktpa comprising conventional coal circuits to produce bituminous coal.
	No. 2 Mine	Long life asset with current operating capacity of approximately 4,500ktpa comprising conventional coal circuits to produce bituminous coal.
	No. 3 Mine	Long life asset with current operating capacity of approximately 6,500ktpa comprising conventional coal circuits to produce bituminous coal.

Table 2.31 Matla Colliery: Historical Operating Statistics

Statistics	Units	2001(C)	2002(C)	2003(C)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(Mt)**	12.3	12.8	15.6	15.6	12.5	13.5
Overall Yield	**(%)**	100	100	100	100	100	98
Sales							
Thermal Coal	**(Mt)**	12.3	12.8	15.5	15.5	12.4	13.1
Total	**(Mt)**	12.3	12.8	15.5	15.5	12.4	13.1
Expenditure statistics							
Total Working Costs	**(ZARm)**	494	492	579	596	694	664
Total Capital Expenditure	**(ZARm)**						
(Eskom Funded)		90	162	10	39	3	na
Expenditure efficiencies							
Total Cash Costs	**(ZAR/t RoM)**	40.2	38.4	37.1	38.2	55.5	49.3
	(ZAR/t sales)	40.2	38.4	37.3	38.4	55.9	50.6

(C) Calendar Year ended 31 December.

Matla has in the past mined approximately 15Mtpa. The additional 3Mtpa in 2003 and 2004 reflects a planned increase in production following a request for coal to be supplied to Eskom's Majuba and Tutuka Power Stations (2.5Mtpa) and to Sasol (0.5Mtpa).

2.6.6 New Clydesdale Colliery

New Clydesdale Colliery is located approximately 140km east of Johannesburg, in the province of Mpumalanga. It is one of the oldest mines in South Africa, having been worked on sporadically since 1949. Total mine production since 1981 is some 29Mt of coal yielding 17Mt of saleable coal. Historical production information appears in Table 2.32.

Table 2.32 New Clydesdale Colliery: Historical Production

		Production			
Year	**Annual Sales (Mt)**	**Vaalkrans East (Mt)**	**Vaalkrans South (Mt)**	**Vaalkrans North (Mt)**	**Total (Mt)**
1981 – 1990	7.9				**7.9**
1991 – 2000	4.4			2.4	**6.8**
2001(C)	0.7			1.2	**1.9**
2002(C)	1.0	0.8		0.5	**2.3**
2003(C)	1.0	2.4			**3.4**
2004(C)	1.1	2.4	0.3		**3.8**
2005(C)	1.2	0.8	0.4	0.3	**2.7**
Total	**17.3**	**6.4**	**0.7**	**4.4**	**28.8**

(C) Calendar Year ended 31 December.

New Clydesdale Colliery is primarily an export colliery which currently produces coal for both the export and domestic markets. It mines the Nos. 1, 2, 4 and 5 Seams in the Vaalkrans North opencast operation and No. 2 Seam from the pillars in the Vaalkrans South underground Area.

New Clydedale Colliery produces A-grade coal for sale on both the export and domestic markets. It exports, through the Richards Bay Coal Terminal, steam coal with a high calorific value, high volatiles and medium sulphur. Some A-grade product is sold on the domestic market. Future underground mining will take place in the Diepspruit Nos. 1 and 2 Seams.

Details on New Clydesdale Colliery's infrastructure appear in Table 2.33 and details of New Clydesdale Colliery's historical operating statistics appear in Table 2.34.

Table 2.33 New Clydesdale Colliery: Current Infrastructure

Type	Infrastructure	Detail
Mine Access	Vaalkrans South No. 2 Shaft	Medium life asset with current operating capacity of approximately 1,550ktpm of coal.
Production Facilities	Vaalkrans East	Short life asset with current operating capacity of approximately 750ktpm comprising conventional coal circuits to produce export coal. This operation will cease at the end of 2005.
	Vaalkrans South/Diepspruit	Medium life asset with current operating capacity of approximately 1,100ktpm comprising conventional coal circuits to produce export coal.
	Vaalkrans N – 4 Upper	Short life asset with current operating capacity of approximately 250ktpm comprising conventional coal circuits to produce export coal.
	Vaalkrans N – 4 Lower	Short life asset with current operating capacity of approximately 300ktpm comprising conventional coal circuits to produce export coal.
Discard facility	Discard card	Medium life asset.

The plant feed during 2003/2004 is double that of 2005 as a consequence of coal buy-ins from third parties and the stooping of underground pillars. New Clydesdale Colliery is geared to serve the current Richards Bay Coal Terminal ("RBCT") entitlement (common user entitlement) and supplies approximately 180kt of A grade product to the inland market. The budget is compiled to serve these markets. To meet these budget requirements, the product is a function of the plant feed and yield. Therefore, the higher the quality of raw coal supplied, the higher the yield in the plant. New Clydesdale Colliery currently has various production sources resulting in yields ranging from approximately 55% to 72%. This will determine the rate of plant feed required.

Table 2.34 New Clydesdale Colliery: Historical Operating Statistics

Statistics	Units	2001(C)	2002(C)	2003(C)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(Mt)**	1.2	1.3	2.4	2.7	1.5	2.4
Overall Yield	**(%)**	73	67	78	74	71	75
Sales							
Thermal Coal	**(Mt)**	0.7	1.0	1.0	1.1	1.2	1.8
Total	**(Mt)**	0.7	1.0	1.0	1.1	1.2	1.8
Expenditure statistics							
Total Cash Costs	**(ZARm)**	87	160	167	193	259	293
Total Capital Expenditure	**(ZARm)**	5	26	19	19	31	24
Expenditure efficiencies							
Total Cash Costs	**(ZAR/t treated)**	72.5	123.1	69.6	71.5	172.7	121.9
	(ZAR/t sales)	76.7	143.1	77.5	78.5	193.3	163.3

(C) Calendar Year ended 31 December.

2.6.7 North Block Complex

The North Block Complex comprises the following:

- Glisa Colliery;
- Strathrae Colliery;
- Eerstelingsfontein Project; and
- Belfast Project.

The operations in the North Block Complex are situated in Mpumalanga Province between the towns of Carolina, Arnot and Machadodorp. Since 2001 North Block Complex has produced some 8.6Mt of coal. Historical production information appears in Table 2.35.

Glisa Colliery is situated approximately 280km east of Johannesburg, near the town of Belfast, in the Province of Mpumalanga. The colliery produces a D-grade product which is mainly supplied to the domestic market. Glisa Colliery consists of opencast operations, which produce thermal coal for Eskom, and underground operations, which produce D-grade coal. The underground at Glisa Colliery will be depleted by March 2006 and the opencast at Glisa will be depleted by June 2006.

Strathrae Colliery is located approximately 200km northeast of Johannesburg and approximately 15km south of Wonderfontein on the Carolina – Wonderfontein road, in the Province of Mpumalanga. It is a relatively new acquisition by Eyesizwe that was refurbished and commissioned in October 2004. The colliery produces thermal coal for Eskom and metallurgical B-grade coal. Strathrae Colliery is an opencast operation, with a four-year LoM. Strathrae Colliery expects to reclaim 355kt of material from a dump, which will be sold to Eskom, over a 12-month period.

The Eerstelingsfontein Project area is located approximately 230km north-northeast of Johannesburg and 20km south from the town of Belfast. Eerstelingsfontein will be mined by means of an opencast operation using the strip mining method and RoM coal will be transported by road to the Strathrae plant.

The **Belfast Project** reserve area is located approximately 220km north-northeast of Johannesburg near the town of Belfast. A feasibility study has been conducted on this project.

Table 2.35 North Block Complex: Historical Production

Year	Opencast (Mt)	Underground (Mt)	Strathrae Discard Dump (Mt)	Strathrae West Pit (Mt)	Total (Mt)
2001(C)	0.3	0.5			0.8
2002(C)	0.5	0.6			1.1
2003(C)	1.2	0.5			1.7
2004(C)	1.6	0.7	0.2		2.5
2005(C)	1.7	0.7	0.4	0.1	2.9
Total	**5.0**	**3.0**	**0.5**	**0.1**	**8.6**

(C) Calendar Year ended 31 December.

Details on the North Block Complex's infrastructure appear in Table 2.36 and details of the North Block Complex's historical operating statistics appear in Table 2.37.

Table 2.36 North Block Complex: Current Infrastructure

Type	Infrastructure	Detail
Mine Access		
– Glisa opencast	Truck and shovel	Short life asset with operating capacity of approximately 1,500kt of coal in 2005 and 2006.
– Glisa underground	Highwall entry	Short life asset with operating capacity of approximately 500kt of coal.
– Strathrae opencast	Truck and shovel	Short life asset with operating capacity of approximately 5,000kt of coal.
– Eerstelingsfontein opencast	Truck and shovel	Medium life asset with operating capacity of approximately 2,980kt of coal between 2010 and 2012.
Process Facilities		
– Glisa	Crushing plant	Medium life asset.
	High Grade Coal Plant	Medium life asset.
– Strathrae	DMS plant	Short life asset with current operating capacity of approximately 250ktpm comprising conventional coal circuits to produce export coal.
Tailings Facilities	Various slurry ponds	Medium life asset.

Table 2.37 North Block Complex: Historical Operating Statistics

Statistics	Units	2001(C)	2002(C)	2003(C)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(kt)**	830	1,040	1,700	2,500	2,980	2,193
Overall Yield	**(%)**	100	100	100	100	94	96
Sales							
Thermal Coal	**(kt)**	821	1,138	1,717	2,518	3,063	1,780
Metallurgical Coal	**(kt)**						319
Total	**(kt)**	821	1,138	1,717	2,518	3,063	2,099
Expenditure statistics							
Total Cash Costs	**(ZARm)**	40	69	93	150	187	149
Total Capital Expenditure	**(ZARm)**	10	2	11	46	3	7
Expenditure statistics							
Total Cash Costs	**(ZAR/t treated)**	48.2	66.3	54.7	60.0	62.8	68.1
	(ZAR/t sales)	48.7	60.6	54.2	59.6	61.1	71.1

(C) Calendar Year ended 31 December.

2.6.8 Twistdraai Colliery

The Twistdraai Colliery is located in the centre of the Highveld Coal field, some 11km east of Secunda in the Mpumalanga Province. The region is typified by low rolling hills typical of the Karoo Sequence of the Highveld region. The Colliery is situated predominantly on the farms Goodehoop 290IS, Grootvlei 293IS, and Frischgewaagd 294IS in close proximity to the Sasol Synfuels factory in Secunda. The export mine at Twistdraai was commissioned in 1996. A total of 27.88Mt of coal has been exported, beneficiated from 76.05Mt at the Twistdraai Export Plant from 1996 through to 30 June 2005. During January 2006 Sasol signed a Memorandum of Understanding with Eyesizwe to acquire a 35% stake in Twistdraai Colliery.

2.6.9 Sintel Char Project

Kumba Coal was given board approval to commence with construction of a Sintel Char Plant in the vicinity of the Grootegeluk coal mine. Construction is set to commence in 2006 with commissioning planned for the latter half of 2007. The objective of the Sintel Char Plant is to convert metallurgical suitable coal to a high carbon product by taking out all unwanted volatiles and tars and carbonising the product to a desired hardness and reactivity. The sintel char to be produced is used in the South African ferrochrome industry, which uses a blend of coal as a reductant in the smelting process.

The Sintel Char Project is expected to commence production in 2007 and ramp up to full production by 2009, processing some 210ktpa to produce some 138ktpa of Lumpy Char and some 11ktpa of Char (<20mm). Estimated real capital expenditures for the project are expected to be some ZAR182m.

2.6.10 Inyanda Project

The Inyanda Project is located on the farm Kalbasfontein 284JS, Witbank district, 14kms north of Witbank. Kumba Coal owns the surface rights to Portion 21 of the farm Kalbasfontein 284 JS. An application for a “new order” Mining Right for the Remaining Extent of Portion 20, Portion 21 and Portion 22 of the farm Kalbasfontein 284 JS was submitted to the DME on 27 October 2004. The Inyanda Project is an equal joint venture between Eyesizwe and Kumba Coal. The project has been approved by both the Kumba Coal and Eyesizwe Boards.

The Inyanda Project is expected to commence production in 2007 and ramp up to full production by 2008, processing some 1.4Mtpa to produce an average of 1Mtpa of A-grade export steam coal. Estimated real capital expenditures for the project are expected to be some ZAR257m.

2.6.11 Mafube JV Phase II Project

Mafube Colliery is a 50 : 50 joint venture between Anglo Coal and Eyesizwe. Mafube Colliery is located approximately 180km east of Johannesburg, between the towns of Middleburg and Belfast, in the Province on Mpumalanga.

The No. 1 and No. 2 Seams at the colliery will be exploited in two phases:

- Mafube JV Phase I is currently expected to supply approximately 1,180ktpa of coal to Eskom’s Arnot power station until 2007.

- The Mafube JV Phase II Project will be a large opencast mine supplying an average of 6Mtpa RoM to a coal processing plant to produce an average of 2.7Mtpa of "A" grade export quality thermal coal and supply an average 2.1Mtpa of middlings coal to Eskom's Arnot power station. The project is expected to commence production in 2007 and ramp up to full production by 2008. Anglo coal commenced with the Phase II Project feasibility study in August 2004.

According to the agreement Exxaro will only participate in the Mafube JV Phase II Project and the FM and associated NPVs in Section 14 reflect Phase II only. Estimated real capital expenditures for the project are expected to be some ZAR2,000m. Two scenarios are presented in the CPR, Scenario I excludes Nooitgedacht Inferred Resources and Scenario II includes Nooitgedacht Inferred Resources.

2.6.12 Belfast Project

The Belfast Project is located approximately 7km to the south of the town of Belfast. The project area is linked to the N4 national road and the main railway line to Maputo. It is also connected via Carolina with the Richards Bay line. The project will mine export and thermal coal using opencast and underground mining methods.

The Belfast Project is expected to commence production in 2008 and ramp up to full production by 2010, processing some 2Mtpa to produce an average of 1.2Mtpa of washed coal and 0.7Mtpa of coal for supply to Eskom. Estimated real capital expenditures for the project are expected to be some ZAR188m.

2.6.13 Ingcambu Project

The Ingcambu Project is situated 5km north east of Ermelo in the Province on Mpumalanga. Ingcambu is a joint venture between Ingcambu Investment (Proprietary) Limited (40%); Eyesizwe (50%) and Anglo Khula Mining Fund (10%). The project mines export and thermal coal using opencast and underground mining methods.

The Ingcambu Project has commenced production in 2005 and is expected to process some 0.7Mtpa to produce some 0.25Mtpa of Eskom middlings and 0.25Mt of export steam coal in 2006. The level of confidence in the data is limited and therefore SRK have restricted the LoM to 2006 (the LoM is limited to access to portion 26 of the farm Uitgevallen – for further details refer to Section 3.3.5).

2.6.14 Exploration Potential

Kumba Coal and Eyesizwe have eight coal exploration projects in various development stages as indicated in Table 2.38 below.

Table 2.38 Coal Exploration Properties: Development Stages

Exploration Project	Development Stage
Grootegeluk West (five farms)	This project is the natural expansion for Grootegeluk, and has inferred resources. It is deemed an ***Exploration Area***.
Van Wykspan/Zonderwater	This project is for the underground extraction of export quality coal in the Waterberg Coalfield, the resources have been explored to an Inferred status and is deemed to be an ***Exploration Area***.
Vredehof	This exploration area in northern KwaZulu-Natal has no classified mineral resources and is deemed an ***Exploration Area***.
Strehla	This project is situated in the Witbank Coalfield some 30kms to the east of Delmas, The coal has been drilled to a Indicated Resource status, but no feasibility work has been done and is therefore deemed to be an ***Advanced Exploration Area***.
Moranbah South	This project in the Bowen Basin Qld. has significant inferred resources and has been the subject of a pre-feasibility study. It still requires some exploration and is therefore an ***Advanced Exploration Area***.
Waterberg (South and North)	This area has been extensively drilled and undergone a pre-feasibility study, Although the resources are classified at Measured and Indicated levels, the marketing of the coal is problematic. This project is deemed an ***Advanced Exploration Area.***
Sheepmoor (North)	This project in eastern Mpumlanga, has been explored to a Measured and Indicated status, some trial mining has occurred and feasibility studies undertaken. Some mining technical problems require alleviation before development can take place. This project is deemed an ***Advanced Exploration Area.***
Carolina	There has been extensive drilling and geological modelling in this area, and the resources can be classified as Indicated. No pre-feasibility studies have been commissioned and as such the area is deemed to be an ***Exploration Area.***

Table 2.39 to Table 2.46 provide summary details of the coal exploration projects.

Table 2.39 Exploration, Coal: Grootegeluk West

Location	23°37'S, 27°27'E. Limpopo Province, South Africa, ~32km west-northwest of Lephelale	
Ownership	Prospecting right 100% by Exxaro	
Total Area	5,434.77Ha	
Exploration Completed(1)	ZAR65.0m	
Planned Exploration	ZAR4.0M	Year 1 By March 2006 Application for New order prospecting permit
Mineralisation	6,075 Mt	Thick Interbedded and Multiple Seam coal deposit
Mineral Resources and Reserves(2)	Inferred	
Potential	This project is aimed at the potential expansion of the existing Grootegeluk Coal Mine. The drilling has confirmed the presences and continuity of the coal deposit	

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

(2) Refer to Table 4.8.

Table 2.40 Exploration, Coal: Van Wykspan/Zonderwater

Location	23°35'S, 27°40'E. Limpopo Province, South Africa, ~10km – north of Lephelale	
Ownership	Application for Prospecting permit 100% by Exxaro	
Total Area	2506.07Ha	
Exploration Completed(1)	ZAR4.5m	16 boreholes completed
Planned Exploration	Unknown	Application for New order prospecting permit
Mineral Resources and Reserves	Inferred	
Potential	This project is aimed at a potential export quality coal supply from the Middle Ecca Coal Seams	

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

Table 2.41 Exploration, Coal: Vredehof

Location	27°25'S, 30°23'E. KwaZulu-Natal Province, South Africa, ~25km – East of Wakkerstroom.	
Ownership	Prospecting right granted to 02/02/2010 – 100% by Exxaro	
Total Area	2,914.30Ha	
Exploration Completed(1)	Unknown	No boreholes complete
Planned Exploration	Unknown	
Mineralisation		Multiple Seam coal deposit
Mineral Resources and Reserves	Reconnaissance	
Potential	This project is aimed at a potential coking coal supply from the Middle Ecca Coal Seams (Gus, Dundas and Coking)	

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

Table 2.42 Exploration, Coal: Strehla

Location	26°13'S, 28°59'E. Mpumalanga Province, South Africa, ~30km – East of Delmas	
Ownership	Prospecting Right Application – 100% by Exxaro	
Total Area	2,602.44Ha	
Exploration Completed(1)	ZAR7.5m	127 boreholes drilled
Planned Exploration	Unknown	
Mineralisation	22.25Mt	Multiple Seam coal deposit
Mineral Resources and Reserves(2)	Indicated	
Potential	This project is aimed at a potential export/thermal coal supply from the Middle Ecca Coal Seams. Note should be made that the Prospecting Right has been refused and an appeal has been made	

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

(2) Refer to Table 4.19.

Table 2.43 Exploration, Coal: Morambah South

Location	22°05'S, 148°06'E. Queensland State, Australia, ~10km – south east of Moranbah	
Ownership	50% Exxaro and 50% Anglo Coal Australia	
Total Area	12,643.46Ha	
Exploration Completed(1)	ZAR67.5m	77 boreholes drilled
Planned Exploration	Unknown	On hold
Mineralisation	586.45Mt	Multiple Seam coal deposit
Mineral Resources and Reserves(2)	Indicated	
Potential	This project is aimed at a potential coking coal supply	

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

(2) Refer to Table 4.20.

Table 2.44 Exploration, Coal: Waterberg North and South

Location	23°33'S, 27°13'E. Limpopo Province, South Africa, ~40km – west of Lephelale	
Ownership	100% Exxaro	
Total Area	19338.32Ha	
Exploration Completed(1)	ZAR51.8m	312 boreholes drilled
Planned Exploration	Unknown	On hold
Potential	This project is aimed at a potential coking coal and thermal coal supply	

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

Table 2.45 Exploration, Coal: Sheepmoor North

Location	26°39'S, 30°18'E. Mpumalanga Province, South Africa, ~40km – Southeast of Ermelo	
Ownership	100% Exxaro	
Total Area	9532,65Ha	
Exploration Completed(1)	ZAR119.59m	472 boreholes drilled
Planned Exploration	Unknown	On hold
Potential	This project is aimed at a potential export/thermal coal supply	

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

Table 2.46 Exploration, Coal: Carolina

Location	26°10'S, 29°59'E. Mpumalanga Province, South Africa, ~14km – North of Breyten	
Ownership	100% Exxaro	
Total Area	6460.86Ha	
Exploration Completed[1]	ZAR16.73m	47 boreholes drilled
Planned Exploration	Unknown	On hold
Potential	This project is aimed at a potential export/thermal coal supply	

(1) Historical costs have been adjusted to present day terms by either adjusting for inflation or by using present day costs for a specific activity. The latter method was used preferentially.

2.7 Heavy Minerals

Exxaro's Heavy Minerals interests comprise a 100% interest in Ticor, Ticor SA and Ticor Smelter. Exxaro has an option to acquire 100% of Namakwa Sands and Ticor SA has an option to acquire 100% of the Toliara Sands Project.

2.7.1 Hillendale Mine

Ticor SA currently operates the Hillendale Mine, 20km southwest of Richards Bay, where mining of heavy mineral sands is undertaken. Initial processing of the heavy mineral sands ore is performed in the Primary Wet Plant ("PWP") located at Hillendale Mine. The Heavy Mineral Concentrate ("HMC") is transported by 35t road trucks to the Central Processing Complex ("CPC") in Empangeni, some 20km west of Richard's Bay, where the HMC is treated in the Mineral Separation Plant ("MSP"). Final zircon and rutile products are exported from the MSP via Richards Bay harbour. The crude ilmenite product from the MSP is used as feedstock for the Ticor Smelter smelters at the CPC, where TiO_2 slag and low manganese pig iron are produced. Saleable products include: ilmenite; chlorinatable TiO_2 slag; sulphatable TiO_2 slag; zircon; rutile and low manganese pig iron.

Exploration in these areas dates from the 1980s and, following the acquisition of the KwaZulu-Natal properties from Shell South Africa (Proprietary) Limited and Rhoex Limited in the 1990s, a feasibility study for the combined Iscor Heavy Minerals ("IHM") project commenced in 1995 and was completed in June 1996. This feasibility study formed the basis of a detailed engineering and design phase, commencing in November 1996, to which further technical adjustments were made during 1998, to improve the overall economics of the assets. Preliminary site construction at the Hillendale Mine and the CPC commenced in 1998, however, the Mittal Steel (formerly Iscor) board decided to delay the development of the IHM Project due to adverse market conditions and high interest rates. Following further technical improvements and optimisation studies the Mittal Steel board approved the implementation of the IHM project in March 2000. During April 2001 the mining of heavy minerals sands at the Hillendale Mine site commenced and the PWP was commissioned (refer to Table 2.47).

Table 2.47 Hillendale Mine: Historical Production

Statistics	**Units**	**2001**[C]	**2002**[C]	**2003**[C]	**2004**[C]	**2005**[C]
Production Statistics						
Tonnage Mined	**(kt)**	3,428	7,279	8,512	9,307	8,356

(C) Calendar Year ended 31 December.

Table 2.48 Hillendale Mine: Current Infrastructure

Type	Infrastructure	Detail
Mine Access	Hillendale Main Open Pit	Medium life asset with current operating capacity of 833ktpm or 9.99Mtpa RoM. Production from Hillendale is currently planned until early 2011; this implies a remaining life of 5.5 years.
Process Facilities	Hillendale PWP	Long life asset with operating capacity to produce 73ktpm of HMC per month or 876ktpa of HMC. The PWP throughput rate is 1,200tph or 816ktpm RoM feed. The PWP is planned to be transferred to Block P area after processing at Hillendale is completed.
Tailings Facilities	Hillendale Residue Dam	Medium life asset with operating capacity of 155ktpm of slimes or 1.86Mtpa of slimes. Hillendale mining operation is currently constrained by the Residue Dam settling capacity. Hillendale Residue Dam has an active area of 130Ha.
MSP	Empangeni	Long life asset MSP servicing Ticor SA mines and projects (Hillendale, Fairbreeze Project and Block P). MSP design capacity is 105tph of HMC feed.
Smelter	Ticor Smelter	Long life assets (two smelters) servicingTicor SA mines and projects (Hillendale, Fairbreeze Project and Block P) and Toliara Sands project, Madagascar.

Table 2.48 above provides summary details of the current infrastructure servicing Hillendale Mine, type of operation and projected life.

Table 2.49 provides a summary of the principal operating statistics for the years 2001 to 2006. Cash cost expenditure statistics are available from 2003 onwards.

Table 2.49 Hillendale Mine: Historical Operating Statistics

Statistics	Units	2001(C)	2002(C)	2003(C)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnage Mined	**(kt)**	3,428	7,279	8,512	9,307	8,356	7,676
HMC	**(kt)**	335	726	817	655	581	468
Slimes Mined	**(kt)**	334	1,007	1,160	1,744	1,827	2,028
Ilmenite	**(kt)**	208	454	458	460	373	353
Zircon	**(kt)**	18	55	51	49	46	47
Rutile	**(kt)**	7	23	18	20	24	21
Pig iron	**(kt)**			36	75	105	75
Grades Recovered/Mined							
Heavy Minerals	**% of ore tonnes**	9.80%	10.00%	9.60%	7.00%	4.90%	5.00%
Slimes	**% of ore tonnes**	9.70%	13.80%	13.60%	18.70%	20.50%	26.42%
Ilmenite	**% of HMC**	62.00%	62.40%	56.00%	70.20%	68.00%	61.00%
Zircon	**% of HMC**	5.30%	7.60%	6.20%	7.50%	8.80%	8.70%
Rutile	**% of HMC**	2.20%	3.10%	2.20%	3.10%	3.90%	3.20%
Products and Feed Rates							
HMC Feed tonnage to MSP	**(kt)**	427.7	705.1	819.0	710.1	546.7	647.0
Ilmenite Crude	**(kt)**	212.5	453.7	457.3	459.4	373.2	339.0
Ilmenite Uric	**(kt)**	39.3	35.9	96.9	118.8	318.6	214.9
Ilmenite Roaster	**(kt)**		10.7	79.4	145.1	36.8	137.4
Ilmenite Feed to Smelter	**(kt)**			112.8	211.1	298.3	318.0
Total	**(kt)**	679.5	1,205.4	1,565.4	1,644.5	1,573.6	1,656.3

(C) Calendar Year ended 31 December.

2.7.2 Fairbreeze Project

The proposed Fairbreeze Project Mine is located 45km southwest of Richards Bay in the KwaZulu-Natal Province of South Africa. Fairbreeze Project is 47km by road from the CPC at Empangeni and 24km by road from the Hillendale Mine. A feasibility study was completed by Ticor SA during June 2005 on the Fairbreeze Project. During July 2005 the decision was taken by Ticor SA that owner operator mining would be used instead of using the services of a mining contractor. The Fairbreeze Project Mine will be required to supplement the HMC produced by the Hillendale Mine, to enable the MSP to operate at its design capacity of 105t HMC per hour. Access to the Fairbreeze Project will be via a new interchange directly from the KwaZulu-Natal N2 highway, which runs adjacent to the west of the deposits.

Fairbreeze Project was approved as the second mine to be developed in the original IHM feasibility study for the Ticor SA mineral sands operation. Original commissioning time for Fairbreeze Project was set at October 2003. Due to delays in the commissioning of the smelter at the CPC in Empangeni a large crude ilmenite stockpile inventory was created. As a result of this readily available stockpile construction of the Fairbreeze Project Mine was delayed by Kumba and Ticor.

Construction at the Fairbreeze Project Mine is expected to start in March 2006 with commissioning planned for July 2008. The proposed Fairbreeze Project Mine will consist of a hydraulic mining operation, a PWP and a residue disposal facility or slimes dam. The HMC will be transported by road to the CPC at Empangeni for processing in the MSP. Reject material from the MSP at the CPC will be transported back to the mine for blending and disposal with the sand tailings from the PWP. The Fairbreeze Project Mine PWP will have a capacity of 600tph of RoM feed.

A 9,000t bulk sample from the Fairbreeze Project C deposit was processed as part of the research conducted for the feasibility study. Pilot plant test work for the Fairbreeze Project deposit has also been completed.

The four separate orebodies that are available for mining are the Fairbreeze Project A, B, C and C Extension deposits. The Fairbreeze Project C and Fairbreeze Project C Extension orebodies have the highest total heavy mineral grades and will be mined first. The anticipated mine life for the C and C Extension orebodies is 10 years. The feasibility study predominantly focused on the Fairbreeze Project C and C Extension orebodies. In the future a separate feasibility study will be carried out for the potential mining of the Fairbreeze Project A and B deposits. The Fairbreeze Project C and C Extension deposits have a higher total heavy mineral grade and higher silt than the Hillendale deposit. In general the Fairbreeze Project deposits have good zircon grades, which will increase co-product sales.

Water for the Fairbreeze Project will be supplied by the Mhlathuze Water commission from the Mhlathuze River. Eskom will supply a 20MVA line to the Fairbreeze Project C Extension area, to the south west of the town of Mtunzini.

2.7.3 Toliara Sands Project

The Toliara Sands Project comprises the Ranobe heavy mineral deposit located 35km north of Toliara in southwest Madagascar and the Manombo – Monombe exploration tenements located to the north of Ranobe. Ticor SA has an option to acquire 100% of the Toliara Sands Project.

2.7.4 Tiwest JV

The current Tiwest JV operations comprise the mines at Cooljarloo near Cataby, approximately 170km north of Perth, the dry separation plant at Chandala near Muchea, approximately 70km north of Perth, and the port facilities and pigment plant at Kwinana approximately 40km south of Perth.

Table 2.50 Tiwest JV: Historical Operating Statistics

Statistics	Units	2001(C)	2002(C)	2003(C)	2004(C)	2005(C)	2006(C)
Production Statistics							
Cooljarloo North	**(kt)**	5,358	2,960	5,735	5,790	5,394	6,229
Cooljarloo South	**(kt)**	15,096	14,326	14,301	15,814	18,650	19,375
Total	**(kt)**	20,454	17,286	20,091	21,604	24,044	25,604
Products							
Ilmenite	**(kt)**	437	438	433	472	442	478
Zircon	**(kt)**	81	78	80	76	70	76
Rutile	**(kt)**	28	34	34	35	32	30
Leucoxene	**(kt)**	14	23	31	21	24	18
Total	**(kt)**	560	573	578	604	568	602

(C) Calendar Year ended 31 December.

2.7.5 Namakwa Sands

The location of the mine site is 500km from Cape Town on the West Coast at Brand-se-Baai with the nearest towns Koekenaap, Lutzville and Vredendal. The mine is divided in an East and West section each with a PCP. The MSP is 50km from the mining site on the way to Vredendal. The Smelter is located 300km further on the way to Cape Town on the coast at Port of Saldana. The products are dispatched from the port.

Namakwa Sands was founded in 1994. The project was initiated in two phases at a total nominal cost of ZAR2.1 billion. At full capacity, 17Mtpa of ore is mined to produce 200ktpa of titania slag, 120ktpa of pig iron, 25ktpa of rutile and 125ktpa of zircon. Namakwa Sands forms part of the Base Metals Division of Anglo American Plc.

Further details on Namakwa Sands will be filed in a Circular to Shareholders later this year should Exxaro decide to exercise the option to acquire Namakwa Sands.

2.7.6 MRNL

MRNL is a junior Australian exploration company, which discovered heavy mineral deposits north of the town of Toliara is south-west Madagascar, extending some 150km north to Morombe. There are two lease areas, Ranobe and Manombo – Marombe, together designated the Toliara Sands Project.

An option agreement with MRNL covering the Toliara Sands Project was signed in November 2003. At the same time a back-to-back agreement was signed giving Exxaro a 100% stake in the project together with a commitment to provide 100% of the funding.

An option fee of USD2m has been paid, giving Exxaro exclusive rights to the Toliara Sands Project. Exxaro will fund exploration and feasibility studies. On exercise of the option MRNL will be paid approximately 30% of the project NPV, a proportion of the NPV at the time of financing and the balance at commissioning.

2.7.7 Exploration Potential

Exxaro has seven heavy minerals exploration projects in various development stages as indicated in Table 2.51.

Table 2.51 Heavy Minerals Exploration Properties: Development Stages

Exploration Project	Development Stage
Manombe – Morombe	Some exploration work has been done on the M-M Project. It has no classified mineral resource and is deemed to be an ***Exploration Area***.
Letsitele Project	Significant exploration work has been undertaken and the mineralisation is well-understood. It is deemed an ***Advanced Exploration Area***.
Gravelotte Project	Significant exploration work has been undertaken, the mineralisation is well-understood and it can be classified in the Measured and Indicated categories. It is deemed an ***Pre-Development Project***.
Port Durnford Project	Significant drilling is planned to allow estimation of classifiable resources. Port Durnford is deemed an ***Exploration Area***.
Fairbreeze Project Blocks A, B and D	Significant exploration work has been undertaken at Fairbreeze Project and significant mineralisation in the Measured and Indicated categories has been classified. Fairbreeze Project Blocks A, B and D are deemed to form a ***Pre-Development Project***.
Kentani Project	Significant exploration work has been undertaken and the mineralisation is well understood and classified into the Measured category. Kentani is deemed an ***Advanced Exploration Area.***

Tables 2.52 to 2.57 provide summary details of the heavy minerals projects.

Table 2.52 Exploration, Heavy Minerals: Manombe – Morombe Exploration Project

Location	60 – 140 km North of Toliara port in south-west Madagascar
Ownership	Exxaro (100%) has exclusive rights to an option to acquire the project
Total Area	2,370km^2
Exploration Completed	ZAR1.62m
Planned Exploration	ZAR1.32m
Mineralisation	Low trash, heavy mineral suite dominated by ilmenite and zircon
Potential	Limited work on the Manombe – Morombe property indicates further potential for economic heavy mineral sand deposits. The focus of work to date has been almost exclusively on the neighbouring Ranobe deposit

Table 2.53 Exploration, Heavy Minerals: Letsitele Project

Location	23°55'S, 30°23'E. 4 km south of town of Letsitele, Limpopo Province, South Africa. Local infrastructure is fairly good	
Ownership	Mineral title held 100% by Exxaro. Pending application for prospecting right	
Total Area		
Exploration Completed	ZAR1.0m	Estimate
Planned Exploration	ZAR0.53m	Years 1 and 2
Mineralisation(1)	See Mineral Resources	V-Ti-magnetite rock mineralisation rich in ilmenite.
Potential	The Letsitele project's potential is reasonably well-known, and resource evaluation is planned for the next two years	

(1) Refer to Table 4.21.

Table 2.54 Exploration, Heavy Minerals: Gravelotte Project

Location	8 km north of town of Gravelotte, Mpumalanga Province, South Africa. Local infrastructure is fairly good	
Ownership	Mineral title held 100% by Exxaro	
Total Area	6,888.83Ha	
Exploration Completed	ZAR1m	Estimate
Planned Exploration	Mineralisation	
Mineralisation	See Mineral Resources	Ilmenite-rich sand and V-Ti-magnetite mineralisation with basal pebble layer
Mineral Resources and Reserves(1)	Measured and Inferred	Grades
	218.7Mt	4.71% – 10.71% THM[2] 4.0% – 9.1% ilmenite
Potential	The Gravelotte project's potential is well-defined	

(1) Refer to Table 4.21.

Table 2.55 Exploration, Heavy Minerals: Port Durnford Project

Location	South of the Hillendale mine, near Richards Bay in South Africa	
Ownership	Ticor South Africa (KZN) (51%) and Imbizu Mineral Holdings (49%) have a prospecting right to this area	
Total Area	3,946Ha	
Exploration Completed	ZAR1m	Estimate
Planned Exploration	Drilling of approximately 10,000m will commence in February 2006 at a cost of ZAR4.6m	
Mineralisation	Heavy Minerals suite of ilmenite, zircon and rutile	
Mineral Resources and Reserves	None classified	
Potential	A large low grade deposit	

Table 2.56 Exploration, Heavy Minerals: Fairbreeze Project Blocks A, B and D

Location		45 km southwest of Richards Bay, KwaZulu-Natal Province, South Africa. The project is located close to the Ticor CPC and local infrastructure is very good	
Ownership		100% by Kumba. Pending application for conversion of mining rights	
Exploration Completed		ZAR1.7m[1]	Geological surveys, reconnaissance auger drilling and RC drilling for resource definition
Planned Exploration		R250k	Geology and Resource modelling
Mineralisation		Three heavy mineral sands deposits.	
Mineral Resources[2]		Measured	Indicated
	Area A	139.8Mt at 2.83% Ilmenite	
	Area B		26.9Mt at 2.45% Ilmenite
	Area D		9.2Mt at 2.51% Ilmenite
	Total	139.8Mt at 2.83% Ilmenite	36.1Mt at 2.47% Ilmenite
Potential		The Fairbreeze Project hosts small to large heavy mineral sands deposits	

(1) Kumba estimate.

(2) Refer to Table 4.21.

Table 2.57 Exploration, Heavy Minerals: Kentani Project

Location	32°36'S, 28°30'E. Just north of of the Kei River mouth, 65 km southeast of Butterworth, Eastern Cape Province, South Africa. Local infrastructure is fairly good	
Ownership	100% by Exxaro. Valid prospecting right	
Total Area		Mineral title
Exploration Completed	ZAR3.0m	Explored since 1970s. Drilling during 1980s, intensively in places. Estimated costs
Planned Exploration	ZAR7.2m	Years 1 and 2
Mineral Resources[1]	Measured 232.9Mt at 4.5% ilmenite	
Mineralisation	Four heavy mineral sands deposits	
Potential	The Kentani project hosts medium to large heavy mineral sands deposits which are scheduled for resource evaluation drilling	

(1) Refer to Table 4.21.

2.8 Base Metals

Exxaro's Base Metals interests comprise a 89.5% interest in Rosh Pinah, a 100% interest in Zincor and an effective 22% interest in Chifeng (after Phase III of the plant is commissioned).

2.8.1 Rosh Pinah

Rosh Pinah is situated in the Karas region of southwest Namibia, Southern Africa, some 800km south of the capital city of Windhoek. Located at latitude 27°56'S and longitude 17°03'E, the site is accessed via a gravel road from the regional town of Keetmanshoop. Exploration, development and production history in the area dates from 1915 leading to discovery of the sulphide deposits in 1964 and construction of Rosh Pinah in 1967.

Production commenced in 1969 and continued until 1993 when Imcor Zinc (Proprietary) Limited was placed in liquidation. Following a period negotiation with the Namibian Government Rosh Pinah ceded the mining rights associated with the mine to PE Minerals, and Iscor sold a 5% interest in Rosh Pinah to three Namibian empowerment groups. This has since diluted to 4.4%. A further 6.1% interest was obtained by PE Minerals for vesting certain exploration properties into Rosh Pinah.

Kumba has also stated its intention to dispose of a further 39.5% to similar empowerment groups in due course. Mining recommenced, and total mine production since 1967 is estimated at some 21Mt grading 8% zinc and 2.4% lead. Rosh Pinah comprises a mechanised underground operation processing through a conventional crushing-milling-flotation circuit with an operating capacity of 65ktpm.

Rosh Pinah has a five-year LoM. Regional exploration has been carried out and no significant new orebodies have been identified. Recently, the regional exploration program was stopped, and three alternative plans have been considered. These are:

- Manage to closure (five-year LoM);
- Sustain operation with annual exploration drilling to extend life of existing orebodies (estimated life is five-year LoM plus eight additional years); and
- Modified focus plan – a plan to increase development and drilling of existing orebodies to achieve a 10-year LoM in three years and thereafter to maintain this on an annual basis.

This report is based on the manage-to-closure (five-year LoM) option. This option is not necessarily the way forward. This report is done on the manage-to-closure option due to the reliance on known reserves and resources only.

Table 2.58 Rosh Pinah: Historical Production

Year	Tonnes Milled	Grades		Metal Recovered	
	(Mt)	Zinc (%)	Lead (%)	Zinc (kt)	Lead (kt)
1970 – 1980(1)	4.9	7.5	2.3	302.0	86.6
1981 – 1990(1)	5.3	7.5	2.2	324.8	87.2
1991 – 1996(1)	5.1	7.0	2.1	313.4	86.9
1997(F)	0.5	7.4	2.6	30.7	11.1
1998(F)	0.5	9.0	3.0	35.8	11.9
1999(F)	0.5	9.3	3.2	38.4	12.6
2000(F)	0.6	8.4	2.8	39.7	11.5
2001(F)	0.6	7.3	2.5	35.7	11.1
2002(F)	0.6	7.4	2.5	37.7	10.8
2003(F)	0.7	8.7	2.4	41.0	11.3
2003(H2)	0.4	9.7	3.3	21.8	5.4
2004(C)	0.7	10.8	2.9	66.1	14.1
2005(C)	0.7	9.9	3.3	69.2	14.0
Total	**21.1**	**8.0**	**2.4**	**1,356.2**	**374.7**

(1) Grades – weighted averages of 1988 – 2001, Recoveries based on weighted averages of 1996 – 2005.
(F) Financial Year ended 30 June.
(H2) Six months ended 31 December due to the change of Financial Year.
(C) Calendar Year ended 31 December.

Table 2.59 indicates summary details of the infrastructure currently servicing Rosh Pinah, type of operation and projected life. Zinc concentrate is sold directly for consumption at Zincor Refinery and Lead concentrate is exported via port facilities at Walvisbay.

Table 2.59 Rosh Pinah: Current Infrastructure

Type	Infrastructure	Detail
Mine Access	Decline No. 1	This is situated in the central portion of the mine with portal access at the 400m level and provides access for: personnel and materials, waste transportation and intake ventilation. Access to the lower levels at 50L is via main haulages and spiral ramps.
	Decline No. 2	This is situated in the southern portion of the mine with portal access at the 400m level and provides access for personnel and materials, waste transportation and intake ventilation. Access to the lower levels at 50L is via main haulages and spiral ramps.
	Decline No. 3	Situated in the immediate vicinity of Decline No. 1 with portal access at the 400m level, this provides access for transportation of ore via conveyor and has a capacity of 100ktpm.
Process Facilities	Rosh Pinah Plant	Short life asset with operating capacity of 750 – 800ktpa and conventional crushing, milling and flotation circuits to produce base metal concentrates.
Tailings Facilities	No. 1 Dam	Short life asset comprising an unlined facility.

Table 2.60 provides a summary of the principal operating statistics at Rosh Pinah.

Table 2.60 Rosh Pinah: Historical Operating Statistics

Statistics	Units	2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(kt)**	600	670	367	700	713	775
Metal Grades							
Zinc	**(%)**	7.4	8.7	9.7	10.8	9.9	11.2
Lead	**(%)**	2.5	2.4	3.3	2.9	3.3	2.3
Development	**(m)**	2,716	3,941	1,920	3,825	4,485	3,000
Zinc Metal Recovery	**(%)**	81.9	84.0	85.5	86.5	84.4	86
Lead Metal Recovery	**(%)**	75.8	74.2	76.7	71.8	75.5	75
Sales							
Zinc Concentrate	**(kt)**	76	91	54	124	126	126
Lead Concentrate	**(kt)**	31	23	18	27	25	24
Zinc Concentrate Grade	**(%)**	53.4	53.7	53.6	53.6	54.9	55
Lead Concentrate Grade	**(%)**	46.7	51.6	51.9	51.7	56.5	55
Expenditure Statistics							
Total Cash Costs	**(NADm)**	127	161	94	241	268	307
Total Capital Expenditure	**(NADm)**	35	33	9	28	37	11
Expenditure Efficiencies							
Total Cash Costs	**(NAD/t treated)**	211.7	240.3	256.1	344.3	375.9	396.1
	(NAD/t Zinc concentrate)	1,671.1	1,769.2	1,740.7	1,943.5	2,127.0	2,436.5

(F) Financial Year ended 30 June.
(H2) Six months ended 31 December due to the change of Financial Year.
(C) Calendar Year ended 31 December.

2.8.2 Zincor

Located 50km east of Johannesburg in Springs, Zincor is an electrolytic zinc plant with the capacity to produce 110ktpa of zinc metal and 170ktpa of sulphuric acid. The plant employs some 569 permanent people and 186 contractors and processes some 230ktpa of zinc concentrate, sourced predominantly from Rosh Pinah and Black Mountain. Zincor is currently the only zinc refinery in South Africa.

The majority of sales are made to customers in the galvanising, zinc chemical and zinc alloy industries. The plant's pricing structures are linked to the London Metals Exchange. The plant is on the site of an old Gold Fields of South Africa Limited gold plant (Vogels), and some of the old plant buildings and equipment (tanks, thickeners, etc.) are still in use. The zinc plant was commissioned in 1968 with two concentrate roasters. Subsequently two larger roasters were also installed, the first in 1975, the second in 1980.

Table 2.61 Zincor: Historical Operating Statistics

Statistics	Units	2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)	2006(C)
Production Statistics							
Zinc	**(kt)**	176	116	55	106	102	111
Acid	**(kt)**	105	187	85	169	168	155
Sales							
Zinc	**(ZARm)**	863	799	346	736	913	1,088
Acid	**(ZARm)**	39	45	21	46	51	51
By-product	**(ZARm)**	7	11	5	10	13	2
Total Revenue	**(ZARm)**	909	855	372	792	977	1,141
Expenditure Statistics							
Production Costs	**(ZARm)**	728	831	394	765	966	880
Total Capital Expenditure	**(ZARm)**	54	33	11	34	34	40
Expenditure Efficiencies							
Cost per Ton Zinc/Acid Produced	**(ZAR/t acid)**	2,591	2,743	2,814	2,782	3,578	3,308

(F) Financial Year ended 30 June.
(H2) Six months ended 31 December due to the change of Financial Year.
(C) Calendar Year ended 31 December.

2.8.3 Chifeng Phase

The Chifeng smelter is located in Chifeng City, which is the second largest city of Inner Mongolia Autonomous Region and about 500km north east of Beijing. The distance from the center of the city to the smelter is about 5.5km.

Chifeng is a joint venture, established by Kumba Base Metals China Limited (Hong Kong), Chifeng Hongye Zinc-smelting Company Limited and Chifeng Baiyinnuoer Lead and Zinc Mine in July 2003 with total assets of RMB785m. The annual production capacity of the smelter is 50ktpa of electrolytic zinc, and 90ktpa of sulphuric acid. The bulk of the main product, zinc ingot, and by-product, sulphuric acid, are sold in the Northeast and the North of China. Some of the production is exported to Korea and Japan. To fully utilise the resource advantages in Chifeng region and to transfer resources into economic growth an expansion strategy is followed. The Phase III project, currently under construction, is focused on increasing the production to 110ktpa of zinc products, and 180ktpa of sulphuric acid. The current ownership structure is: Hongye 100% of Phase I (23,75ktpa zinc) and 26% of Phase II (25ktpa zinc). Baiyinuoer Mines 14% of Phase II (25ktpa zinc) and Kumba 60% of Phase II (25ktpa zinc). Phase II pays a rental lease (fixed on a quarterly basis and variable on an annual basis) for the equipment in Phase I. Exxaro will have a 25% interest in Chifeng Phase III Project, which is expected to commence production in 2007, processing some 110ktpa of zinc concentrate to produce some 52ktpa of zinc metal and alloy. This will give Exxaro an effective 22% interest in Chifeng.

The decision to build a smelter in Chifeng City was made by the Chifeng municipal government to exploit the rich lead-zinc deposits in the region. The smelter was built on the outskirts of Chifeng near the Yingjin River in the early 1990s, and was progressively commissioned between August 1994 and September 1995. In 1999 the smelter was transformed from a State-owned enterprise to a limited liability company. In 2001 discussions with Kumba resulted in a decision to cooperate in a joint venture. Kumba's 60% share in the JV was secured by an injection of USD18m in order to fund the expansion work at the Chifeng site, namely the provision of a new calcine handling facility, expansion and development of leaching and purification and their conversion from batch processing to continuous, the addition of a second tankhouse, induction furnace and casting line and the provision of an additional steam boiler. The expansion, providing a design capacity of 50ktpa slab zinc, was commissioned at the end of 2003.

Table 2.62 Chifeng Phase II: Historical Operating Statistics[(1), (2)]

Statistics	Units	2003[(C)]	2004[(C)]	2005[(C)]
Sales				
Zinc Metal	**(t)**	2,670	12,305	14,664
Acid	**(t)**	3,982	16,963	8,441
Zinc Metal in Dross	**(t)**	72	324	386

(1) Chifeng commenced production during 2003 (numbers are effective from 1 August 2003).

(2) The above table reflects Exxaro's 60% of Phase II production (excluding the Phase I portion of production).

2.8.4 Black Mountain Mine and Gamsberg Project

The Black Mountain base metal mine exploits lead, zinc, copper and silver from the mining of ore by underground methods from various deposits. The mine produces three concentrates with the zinc concentrate delivered to Zincor. Lead and copper concentrates are exported to various smelters worldwide via Saldanha, from which silver is also extracted. The mine was originally destined to be closed in 2002 but the discovery and development of the Deeps project has resulted in an extension of mining to at least 2014.

The Black Mountain mine is located adjacent to the town of Aggeneys in the Northern Cape Province, South Africa some 110km east of the regional centre of Springbok.

Further details on the Black Mountain Mine and Gamsberg Project will be filed in a Circular to Shareholders later this year should Exxaro decide to exercise the option to acquire the Black Mountain Mine and Gamsberg Project.

2.8.5 Exploration Potential

Exxaro has three base metal exploration projects in various development stages as indicated in Table 2.63.

Table 2.63 Base Metals Exploration Properties: Development Stages

Exploration Project	Development Stage
Zebrafontein	This asset has no classified mineral resource and minor exploration has taken place. It is deemed to be an ***Exploration Area***.
Rosh Pinah	A lot of work has been done, however more finds are possible. No classified resource to date. It is deemed to be an ***Advanced Exploration Area***.
Sperrgebiet	Airborne exploration yielding minor targets. No ground follow-up initiated. It is deemed to be an ***Exploration Area***.

Table 2.64 to Table 2.66 provide summary details of the base metals exploration projects.

Table 2.64 Exploration, Base Metals: Zebrafontein Project

Location	Southwestern part of Namibia	
Ownership	EPLs held 100% by Rosh Pinah	
Total Area	12,605.21Ha	
Exploration Completed	ZAR1m	Based on estimate by Kumba
Planned Exploration	ZAR0.1m	Years 1 and 2
Mineralisation	The primary exploration target is a SEDEX-type zinc-lead deposit of the Rosh Pinah style, hosted within metasedimentary rocks of the Port Nolloth Group	
Potential	Limited work has been completed, however, the mineralisation history of the area bodes well for further finds	

Table 2.65 Exploration, Base Metals: Rosh Pinah Project

Location	Southwestern part of Namibia	
Ownership	EPLs held 100% by Rosh Pinah	
Total Area	43,879.00Ha	
Exploration Completed	ZAR12.0m	Based on estimate by Exxaro
Planned Exploration	ZAR0.5m	Years 1 and 2
Mineralisation	The primary exploration target is a SEDEX-type Zn-Pb deposit of the Rosh Pinah style, hosted within metasedimentary rocks of the Port Nolloth Group	
Potential	The aim is to find extensions to the Rosh Pinah ore body, or nearby satellite deposits. The complex geological structure and historic discoveries of mineralised extensions of the Rosh Pinah ore body indicate good potential for further finds	

Table 2.66 Exploration, Base Metals: Sperrgebiet Project

Location	South-western part of Namibia	
Ownership	EPLs held 100% by Rosh Pinah	
Total Area	315,362.21Ha	
Exploration Completed	ZAR3.0m	Based on estimate by Exxaro.
Planned Exploration	ZAR0.1m	Years 1 and 2
Mineralisation	The primary exploration target is a SEDEX-type Zn-Pb deposit of the Rosh Pinah style, hosted within metasedimentary rocks of the Port Nolloth Group	
Potential	Limited work has been completed, however, the mineralisation history of the area bodes well for further finds	

2.9 Industrial Minerals

Exxaro's industrial minerals interests comprise the Glen Douglas Mine and Kumba FerroAlloys.

2.9.1 Glen Douglas

Glen Douglas is situated in the Magisterial District of Vereeniging, Gauteng Province, South Africa, some 65km south of Johannesburg. Located at approximately latitude 26°31'S and longitude 28°04'E, the site is accessed via the R59 between Johannesburg and Vereeniging.

Glen Douglas is an open pit-mine producing products comprising metallurgical dolomite, aggregate and agricultural lime. The dolomite is sold to Mittal Steel's Vanderbijlpark and Newcastle Works and the aggregate and lime to a wide range of customers in Gauteng and the Free State Province.

Exploration and development dates from 1954, and mining operations commenced in 1957. Total tonnes mined is some 18.4Mt producing some 17.3Mt of products.

Two pits are mined by the open pit and truck methods. The pits are designated B and C: B pit rock is high in silica (>2.5%) and supplies the aggregate industry, while C pit rock contains <2.5% SiO_2 and supplies the metallurgical industry, essentially Mittal Steel. The current pit strip ratio is approximately 1 : 1. About 1.5Mt of dolomite is mined per year.

Annual sales are approximately 1.4Mt of dolomite. This is distributed as follows:

- Steel industry – 50%;
- Aggregate – 47%; and
- Agricultural lime – 3%.

Product shipping is 50% by rail (essentially metallurgical grades) and 50% by road.

Table 2.67 Glen Douglas: Historical Production

Year	Tonnes treated (RoM) kt	Metallurgical dolomite kt	Aggregates kt	Total Products kt
1991 – 2000	10.3	6.5	3.5	10.0
2001(F)	1.0	0.6	0.4	1.0
2002(F)	1.3	0.6	0.6	1.2
2003(F)	1.4	0.6	0.6	1.2
2003(H2)	0.7	0.3	0.3	0.6
2004(C)	2.2	1.0	1.0	2.0
2005(C)	1.5	0.7	0.7	1.3
Total	**18.4**	**10.3**	**7.1**	**17.3**

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

Table 2.68 gives summary details of the infrastructure currently servicing Glen Douglas, type of operation and projected life.

Table 2.68 Glen Douglas: Current Infrastructure

Type	Infrastructure	Detail
Mine Access	A Pit and B Pit	Long Life asset with operating capacity of 120ktpm RoM and 135ktpm waste mined
Process Facilities	No. 1 Plant	Long life asset with operating capacity of 120ktpm comprising conventional crushing circuits to produce Metallurgical dolomite and Aggregate products
Tailings Facilities	Settling Pond	Long life asset used for temporary storage of fines

Table 2.69 gives a summary of the principal operating statistics for Glen Douglas.

Table 2.69 Glen Douglas: Historical Operating Statistics

Statistics	Units	2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)	2006(C)
Production Statistics							
Tonnes Treated	**(kt)**	1,357	1,420	720	2,234	1,451	1,489
Waste Mined	**(kt)**	1,207	1,407	790	2,221	1,525	1,750
Stripping Ratio	**(tw : to)**	0.9	1.0	1.1	1.0	1.1	1.2
Overall Yield	**(%)**	95	93	94	94	93	97
Sales							
Metallurgical Dolomite	**(kt)**	560	642	337	997	669	720
Aggregates	**(kt)**	650	585	292	998	656	680
Agricultural lime	**(kt)**	94	94	36	110	21	46
Total	**(kt)**	1,304	1,321	665	2,105	1,346	1,446
Expenditure Statistics							
Total Cash Costs	**(ZARm)**	38.3	47.1	27.9	88.9	61.3	69.8
Total Capital Expenditure	**(ZARm)**	3.2	3.9	0.4	7.3	5.4	13.4
Expenditure Efficiencies							
Total Cash Costs	**(ZAR/t treated)**	28.2	33.2	38.7	39.8	42.3	46.9
	(ZAR/t sales)	29.4	35.7	41.9	42.2	45.6	48.3

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.

2.9.2 Kumba FerroAlloys

The Kumba FerroAlloys facility is located in Pretoria close to the Kumba head office. The plant is designed to produce 3ktpa atomized Crude ferrosilicon (“FeSi”) powder, but is currently producing 6ktpa following the upgrading of the plant and productivity improvements. The plant can be expanded.

FeSi is widely used in the iron ore and steel industry as a ferro-alloy in lump or granular form and contains 75% silicon. These lumps are diluted with scrap steel to contain 15% silicon, melted and atomised. In the atomised form FeSi powder consists of extremely fine spherical particles of the alloy for use in dense medium separation applicable to a wide variety of mineral extraction processes.

FeSi powder is made by atomisation of molten FeSi with a high-pressure stream of inert nitrogen gas. The result is a high-grade powder with superior qualities in respect of sphericity, degradation resistance, specific gravity and magnetic properties.

Table 2.70 Kumba FerroAlloys: Historical Operating Statistics

Statistics	Units	2002(F)	2003(F)	2003(H2)	2004(C)	2005(C)	2006(C)
Production Statistics							
Coarse Ferrosilicon	**(kt)**	2.48	3.38	1.86	3.74	3.86	4.01
Fine Ferrosilicon	**(kt)**	1.69	1.74	0.72	1.90	2.17	2.26
Other Ferrosilicon	**(kt)**	0.16	0.24	0.13	0.01	0.04	0.04
Expenditure Statistics							
Production Costs	**(ZARm)**	18.3	23.7	10.7	29.4	34.4	36.9
Total Capital Expenditure	**(ZARm)**		0.6	0.5		1.9	2.4
Expenditure Efficiencies							
Cost per ton Coarse Ferrosilicon produced	**(ZARm/t)**	7,353	7,030	5,775	7,869	8,923	9,192

(F) Financial Year ended 30 June.

(H2) Six months ended 31 December due to the change of Financial Year.

(C) Calendar Year ended 31 December.