



**POSITIVE SCOPING STUDY RESULTS FROM TETE PROJECT**  
**ROBUST ECONOMICS: NVP<sub>10</sub> US\$1.4 BILLION AND IRR 34%**

**29<sup>th</sup> NOVEMBER 2011**

Baobab Resources Plc ("Baobab" or the "Company") is an iron ore, base and precious metals explorer with a portfolio of exploration projects in Mozambique. The Company is pleased to present a summary of the Scoping Study (the 'Study') completed by independent consultants, Coffey Mining Pty Ltd, assessing the economic viability of the Company's Tete iron/vanadium/titanium Project ("the Project") in Mozambique. The Study has been completed to a 'scoping' level of accuracy, based on available technical information, and the results reported should be treated accordingly.

**HIGHLIGHTS**

- The Scoping Study, applying conventional beneficiation and smelting technologies, assessed two production scenarios:
  - Scenario 'A': base-case production of 3Mtpa titano-magnetite concentrate and 0.5Mtpa ilmenite concentrate products for export. Initial capital expenditure (capex) estimate of US\$448M.
  - Scenario 'B': capitalizing on the Project's access to low tariff hydro-electric power and strategic proximity to thermal coal reserves to add further value on site through the mine-mouth smelting of 1Mtpa pig iron. Initial capex estimate of US\$690M.
- While the base-case model for scenario 'A' demonstrates viable Project fundamentals, optimisations and financial modelling of Scenario 'B' at a 10% discount rate provides compelling economics with:

<b>US\$1.4B</b>	<b>NPV<sub>10</sub> (before tax).</b>
<b>34%</b>	<b>Internal Rate of Return (IRR before tax).</b>
<b>US\$275M</b>	<b>estimated average annual net cash flow after capex.</b>
<b>25 years</b>	<b>minimum life of mine.</b>

- No value has been ascribed to the vanadium content in either scenario. It is assumed that any vanadium credits in the Scenario 'A' concentrate would be off-set against titanium penalties. However, it is envisaged that a vanadium slag, extracted as a by-product in the pig iron process, could add significant Project value in Scenario B. Further metallurgical test work is required before this may be incorporated in the financial model.
- The Study has only modelled the Ruoni North inferred resource, comprising 93Mt of the current 267Mt global resource inventory. Based on drill results to date from the contiguous deposits of Tenge and Ruoni South, Coffey believes that the Tenge/Ruoni area could generate sufficient resources to support a standalone operation with a mine-life of 30 to 50 years (Scenarios 'A' and 'B' respectively).

**Commenting today, Ben James, Baobab's Managing Director, said:** *"the excellent Scoping Study results show very clearly the 'value add' from the plans for on-site smelting of pig iron and underlines the strategic advantages of the Project's unique geography with respect to infrastructure and complementary resources. Producing a higher value, high demand product will not only broaden the market base, but also mitigate the requirement to compete for rail and port access.*

*"The vanadium potential remains to be modelled and could add further to the value of this project. Reduced input costs through long-term domestic coal contracts and on-site power co-generation also need to be assessed, while the expanding resource base at Tenge-Ruoni, underpinning a meaningful +30 year mine life, allows scope for ramping up production. It's clear to us that we have the opportunity to add substantial value to the already impressive bottom line of this Project."*

## Key Findings & Outcomes

Economic analysis indicates that there is the potential to establish an economically viable operation at the Tete Project. This was based on the assumption that two concentrates can be produced, namely a titano-magnetite and an ilmenite concentrate. In addition, the scenario of producing pig iron was evaluated using conventional iron making technology (Rotary Kiln, Smelter), which is well established in South Africa. The estimated net present value (NPV) and internal rate of return (IRR) for the two product scenarios evaluated are shown below in Table 1.

Item	Unit	Scenario A Iron Concentrate	Scenario B Pig Iron
Resource base	Mt	93	93
Product produced	Mtpa	3	1
Gross Revenue	US\$M	5,133	12,101
Royalty	US\$M	154	363
Net Revenue	US\$M	4,979	11,738
Operating Expenditure	US\$M	2,735	4,571
Capital Expenditure	US\$M	448	690
	<i>- Initial</i>		
	<i>- Sustaining</i>	101	297
Cashflow	US\$M	1,695	6,180
Annual average net cash flow after CAPEX	US\$M	143	275
NPV @ 10%	US\$M	467	1,361
	<i>- Before tax</i>		
Internal Rate of Return (IRR)	%	28	34
	<i>- Before tax</i>		
Payback (Based on discounted cashflow)	Yr	4.1	3.2
Mine life	Yr	15	25

The Study has been completed to a 'scoping' level of accuracy, based on available technical information. The accuracy of the capital and operating expenditures presented in the Study are considered to be within a level accuracy of  $\pm 40\%$  to  $50\%$ .

The current 267Mt inferred resource base, comprising three areas, is summarised in Annexure 1. The 93Mt Ruoni North resource exhibits a much higher mass recovery and Fe head grade than both Chitongue Grande and South Zone and, as such, economic analysis of the Project was based on Ruoni North only, which currently has a sufficient large resource base to sustain a mine life of in excess of 15 years. Furthermore, preliminary drilling results indicate that the Tenge deposit, which is contiguous with Ruoni North, will exhibit a similar grade tenor and will possibly yield a larger tonnage.

The Project is strategically located to access abundant, low tariff hydro-electric power and thermal coal, two critical components in the beneficiation of iron ore and down-stream smelting.

Tete is rapidly becoming a significant mining and industrial hub with current estimates indicating that the area could be producing up to 20% of global coking coal within the next decade. The development of the coal reserves is being led by two of the world's mining powerhouses, Rio Tinto and Vale, as well as internationally respected steel manufacturers Jindal, Nippon Steel, Posco and Tata Steel. The Project stands to benefit from the significant infrastructure investments already being made in the region by these companies.

The mineralisation at Tete includes significant amounts of vanadium. However, for the purpose of the economic assessment no value was ascribed to vanadium in either the titano-magnetite concentrate or pig iron models. It was assumed that any credits associated with vanadium would be off-set by the potential penalties incurred as a result of titanium present in the titano-magnetite concentrate. It is envisaged that a vanadium slag could be extracted as a final process in the smelting stage of the pig iron production. Additional metallurgical testwork and capex/opex research is required before this stage could be incorporated into the financial model, which has the potential effect of enhancing the overall Project economics.

## Resources & Mining

The current 267Mt resource base, comprising three areas as summarised in Annexure 1, is the culmination of systematic diamond and reverse circulation drilling programmes completed since March 2009 totalling more than 57,000m. Mineralised zones are routinely submitted for X-Ray Fluorescence Spectrometry (XRF) head analysis followed by Davis Tube Recovery (DTR) determination and XRF assay of recovered magnetic concentrate. A total of more than 5,900 DTR determinations have been completed to date.

The Scoping Study only modelled the 93Mt JORC inferred mineral resource at Ruoni North. Ruoni North is one of three contiguous deposits comprising the Tenge/Ruoni area where the Company intends to release two additional resource statements based on completed and continuing drilling programmes in the coming months. Drill results to date from Tenge and Ruoni South are encouraging and Coffey believes that the Tenge/Ruoni area could generate sufficient resources to support a standalone operation with a mine-life of 30 to 50 years.

The Scoping Study assumed a conventional open pit method, drill and blast followed by load and haul, would be employed at the Project. Ruoni North pit optimisations, using Whittle Four-X software, were undertaken to generate pit shells from which mine production schedules could be developed for use in the cash flow model.

## Mineral Processing

The Scoping Study evaluated two production scenarios, namely:

- **Scenario 'A': Producing 3Mtpa of titano-magnetite concentrate**

This scenario assumes a crusher feed rate of approximately 6.4Mtpa to produce 3.0Mtpa of 150µm titano-magnetite concentrate grading 58% Fe and 0.7% V<sub>2</sub>O<sub>5</sub>. The concentrate would be beneficiated using a conventional low intensity magnetic separation (LIMS) circuit with the non-magnetic reject passing through a combined wet high intensity magnetic separation (WHIMS) and gravity separation circuit to generate a 0.5Mtpa ilmenite by-product concentrate grading c.50% TiO<sub>2</sub>. Both concentrate products would be railed to suitable ports for export.

- **Scenario 'B': Producing 1Mtpa of pig iron**

This scenario assumes a crusher feed rate of approximately 3.6Mtpa to produce 1.7Mtpa of 150µm titano-magnetite concentrate, which would be re-milled to 45µm and agglomerated before being refined to produce 1.0Mtpa of pig iron product. Additionally, approximately 0.3Mtpa of 50% TiO<sub>2</sub> ilmenite concentrate would be produced during the beneficiation process and sold separately. The vanadium may also be recovered as vanadium pentoxide slag and contribute further to Project revenue.

The iron making technology utilises multi-hearth furnaces and rotary kilns for the direct reduction of the agglomerated concentrate prior to smelting in an electric furnace. Titanium and other impurities are slagged off during the smelting process. The molten Fe/V then enters a vanadium recovery vessel before the hot metal is directed to the casting unit to mould pig iron billets. This technology is proven for the processing of ores of similar specification to the Project's ore and is in operation in many plants worldwide, including NZ Steel's Glenbrook facility in New Zealand and EVRAZ's Highveld Steel plant in South Africa.

Power co-generation is possible by capturing off-gases from the direct reduction and smelting processes and can constitute a significant percentage of the plant's overall energy requirements (co-generation accounts for c.60% of NZ Steel's Glenbrook plant requirements).

Please access the pdf version of this announcement at [www.baobabresources.com](http://www.baobabresources.com) to view process flow sheets in Annexure 2.

The pig iron market size is experiencing rapid growth and is currently estimated at c.70Mtpa (inclusive of domestic Chinese market). Demand is largely driven by the increasing number of electric arc furnace (EAF) steel plants being commissioned. EAF's, which primarily process scrap metal, value pig iron for its consistent high density, low impurity, qualities and its predictable behaviour in the smelting process. These benefits result in a consistent higher price of pig iron compared to scrap

Over the last decade the price of pig iron, driven by the burgeoning global demand for crude steel, has increased inexorably at an average rate of more than 15% per annum. The price of pig iron shows a strong correlation with raw material costs (iron ore and coal). Current pig iron prices are c.US\$500/t.

### Infrastructure

The Project is strategically located to access abundant, low tariff hydro-electric power and thermal coal, two critical components in the beneficiation of iron ore and down-stream smelting.

Tete is rapidly becoming a mining centre of global significance with current estimates indicating that the area could be producing up to 20% of the world's coking coal within the next decade. The Project stands to benefit from the significant infrastructure investments already being made in the region by companies such as Rio Tinto and Vale as they bring their coal reserves into production.

**Electricity & Coal Supply:** Low tariff hydro-electric power is readily available from the 2,075MW Cahora Bassa dam. Studies are underway to expand the dam's capacity by an additional 1,300MW. A new 1,500MW scheme at Mphanda N'kuwa, also on the Zambezi River, is in advanced planning stages and due to commence production in 2015.

The Project is surrounded by a number of tier one thermal and coking coal projects, mainly represented by Rio Tinto (in joint venture with Tata Steel at the Benga operation), Vale, Minas de Revuboe (a Joint Venture of Talbot Group, Nippon Steel and Posco), Jindal Steel and Power and London listed companies Ncondezi, Eurasian Natural Resources Corporation ('ENRC') and Beacon Hill Resources. Since it is likely that the coal companies' focus will be on the financially more lucrative coking coal export, Baobab expects to be able to source an abundance of low cost thermal coal ex-works.

Coal fired power plants have been proposed for Vale's Moatize and Rio Tinto's Benga coal operations as well as Jindal's project. Riversdale (now Rio Tinto) has announced that the Benga power station will commence production in 2013 at an initial capacity of 500MW with the option to expand to 2,000MW.

**Port:** The port of Beira is currently being refurbished to accommodate the coal production around Tete. Significant multilateral investment is going into upgrading the port of Nacala. Rio Tinto is also looking at barging opportunities on the Zambezi River and reportedly has the backing of both the Mozambique and Malawi governments.

Table 2		
Port Development Timeline		
Port	Capacity [Mtpa]	Target
Task force 1		
Beira	20	2014
Nacala	18	
Task force 2		
Beira Option 1	25	2016 / 2017
Option 2 (if Cape size vessels feasible)	40	
Nacala	30	
Greenfields Port	25	
Task force 3		
Beira Option 1	25	2025
Option 2 (if Cape size vessels feasible)	40	
Nacala	30	
Greenfields Port	75	

The government, in association with the private sector, has launched three task forces to move the development of coal export options forward. It is understood that these three task forces have been mandated to review the expansion options at Beira and Nacala and an additional Greenfields deep water port in Zambezia Province at different time horizons as summarised in Table 2. The development timeline coincides with the timeline of the Project, with first production modelled for 2016.

An order of magnitude study ('OMS') has been completed for the proposed Greenfields port by a consortium composed of Rio Tinto, Minas de Revuboe and Ncondezi. The port, located north of the Zambezi river mouth and less than 500km from Tete, would be capable of handling up to cape size vessels with an expandable capacity from an initial 25Mtpa to 100Mtpa.

**Rail:** The rail networks linking the Tete region with the ports of Beira and Nacala are in the process of refurbishment and expansion. Furthermore, a dedicated heavy haulage corridor linking the proposed Greenfields port with Tete was reviewed in the OMS mentioned above.

### Capital & Operating Expenditure Estimates

The accuracy of the capital and operating expenditures ('capex' and 'opex' respectively) presented in the Scoping Study are considered to be within a scoping level accuracy of  $\pm 40\%$  to 50%.

Table 3 summarises the capex estimates for the 6.4Mtpa Scenario 'A' and 3.7Mtpa Scenario 'B'. It is assumed that the existing port facilities will be upgraded by the port authority and the port capital cost is associated with the mobile equipment required to load and haul the material onto the ship loader feed.

The infrastructure capital cost estimate is based on similar scale operations in remote areas and includes an electrical power distribution allowance of US\$0.5M per kilometre, assuming a 40km distance from the main power source. The rail capital cost estimate was based on US\$1M per linear kilometre construction, again assuming a 40km distance to the nearest rail network at Tete, and includes all required rolling stock.

Working capital is set at US\$16M, covering the first six weeks of operating expenditure. Furthermore, sustaining capital was based on 2% of the total initial capital expenditure, which equated to US\$13M per annum for the 1Mtpa pig iron scenario and US\$9M per annum for the 3Mtpa concentrate scenario.

**Table 3**  
Summary Capital Costs

Cost Centre	Unit	Mill Throughput (Mtpa)	
		3.7	6.4
Infrastructure	[US\$M]	32	32
Concentrator	[US\$M]	130	200
Smelting & Refining	[US\$M]	390	Nil
Mining	[US\$M]	3	5
Rail	[US\$M]	90	170
Port	[US\$M]	5	5
Feasibility Study	[US\$M]	20	20
Total	[US\$M]	670	432

Table 4 summarises the opex estimates for both scenarios. Power costs are based on hydro-electric power supplied by the Cahora Bassa dam at US\$0.06/kWhr. The cost of coal is based on US\$90/t ex-works from a nearby plant.

**Table 4**  
Summary Site Operating Costs

Cost Centre	Unit	Mill Throughput (Mtpa)	
		3.7	6.4
Processing	[US\$/t milled]	5.75	5.40
Smelting & Refining	[US\$/t conc]	57.00	
Contract mining	[US\$/t mined]	3.00	2.50
General and administration	[US\$M/yr]	6	8
Rail	[US\$/t conc]	15	15
Port	[US\$/t conc]	7	7

## Financial Model & Sensitivity Analysis

The Scoping Study assumed long term commodity prices of US\$450/t, US\$90/t and US\$150/t for pig iron, titano-magnetite concentrate and ilmenite concentrate respectively. A 10% discount rate and 3% government royalty has been adopted for the base case cash flow analysis.

Due to the early stage of the Project and mining legislation revisions currently underway in Mozambique, it has not been possible to accurately model the impact of corporate taxation. Coffey has applied a flat rate of 32% company tax to the model from Year 1 (ie: no tax holiday simulated) to estimate approximate after tax NPV and IRR figures.

The model is ungeared, assuming 100% equity funding, and does not include any price or cost escalation.

Table 5 provides summaries of the base case cash flow models for both scenarios. While both scenarios demonstrate positive project economics, the production of pig iron clearly stands out as the more robust option.

Table 5					
Summary Base Case Cash Flow Model					
Item		Unit	Scenario A Value	Scenario B Value	
Physicals	Total Material	Mt	295	286	
	Waste	Mt	200	197	
	Strip Ratio (average)	w:o	2.1	2.2	
	Mill Feed Tonnes	Mt	94.2	89.4	
	Fe	%	34.8	34.8	
	<b>Titano- magnetite Concentrate &amp; Pig Iron</b>				
	Mass recovery	%	47.3	47.3	
	Concentrate production	Mtpa	3	1.7	
	Fe in concentrate	%	58	58	
	Pig Iron production	Mtpa		1	
	<b>Ilmenite Concentrate</b>				
	Mass recovery	%	8	8	
Ilmenite Concentrate	Mtpa	0.5	0.3		
Financials	Gross Revenue	US\$M	5,133	12,101	
	Royalty	US\$M	154	363	
	Net Revenue	US\$M	4,979	11,738	
	Operating Expenditure	US\$M	2,735	4,571	
	Capital Expenditure	US\$M	448	690	
		- Initial			
		- Sustaining	US\$M	101	297
	Cashflow	US\$M	1,695	6,180	
	Annual average net cash flow after CAPEX	US\$M	143	275	
	NPV @ 10%	US\$M	467	1,361	
		- Before tax			
		- After tax	US\$M	247	892
	Internal Rate of Return (IRR)	%	28	34	
		- Before tax			
	- After tax	%	21	27	
Payback (Based on discounted cashflow)	Yr	3.9	3.1		
Mine life	Yr	15	25		

A sensitivity analysis has been undertaken to examine the Project sensitivity to changes in key economic parameters. The resulting NPV estimates for Scenarios 'A' and 'B' are summarised in Tables 6 and 7 below.

In both Scenarios, the Project is most sensitive to a change to the Fe price. The next level down in sensitivity is a change to the ilmenite concentrate price, followed by the mine operating costs, rail cost and concentrator operating cost.

Table 6 Scenario A - Summary Sensitivity Analysis Results								
Change	Net Present Value @ 10.0% [\$ million] (Before tax)							
	Parameter							
[%]	Fe concentrate price	Ilmenite concentrate price	Concentrator opex	Mining opex	Rail opex	G&A opex	Initial Capex	Discount rate
60%	1,360	712	351	269	281	437	248	205
40%	1,062	630	390	335	343	447	321	273
20%	764	548	428	401	405	457	394	359
0%	467	467	467	467	467	467	467	467
-20%	169	385	505	533	529	477	540	604
-40%	-129	303	544	599	590	486	613	780
-60%	-426	222	582	664	652	496	686	1,007

Table 7 Scenario B - Summary Sensitivity Analysis Results									
Change	Net Present Value @ 10.0% [\$ million] (Before tax)								
	Parameter								
[%]	Pig Iron price	Ilmenite concentrate price	Conc opex	Smelt & Ref opex	Mining opex	Rail opex	G&A opex	Initial Capex	Discount rate
60%	3,132	1,528	1,276	956	1,251	1,279	1,334	1,006	618
40%	2,542	1,472	1,304	1,091	1,288	1,306	1,343	1,124	802
20%	1,951	1,416	1,332	1,226	1,324	1,334	1,352	1,242	1,042
0%	1,361	1,361	1,361	1,361	1,361	1,361	1,361	1,361	1,361
-20%	770	1,305	1,389	1,495	1,397	1,388	1,369	1,479	1,792
-40%	179	1,249	1,417	1,630	1,433	1,415	1,378	1,597	2,386
-60%	-411	1,194	1,445	1,765	1,470	1,442	1,387	1,716	3,220

*The information in this release that relates to Exploration Results is based on information compiled by Managing Director Ben James (BSc). Mr James is a Member of the Australasian Institute of Mining and Metallurgy, is a Competent Person as defined in the Australasian Code for Reporting of exploration results and Mineral Resources and Ore Reserves, and consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.*

*The information in the report which relates to the Mineral Resource is based on information compiled by Iain Macfarlane who is a Member of The Australasian Institute of Mining and Metallurgy and is employed by Coffey Mining Ltd. Mr. Macfarlane has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as Competent Person as defined in the 2004 Edition of the "Australasian Code for Reporting of Mineral Resources and Reserves". Mr. Macfarlane consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.*

**A COPY OF THIS ANNOUNCEMENT WITH ASSOCIATED DIAGRAMS IS AVAILABLE FOR DOWNLOAD FROM THE COMPANY'S NEW WEBSITE [www.baobabresources.com](http://www.baobabresources.com)**

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**ANNEXURE 1: Resource Inventory**

Detailed descriptions of individual resource areas may be found in announcements dated 30 August and 31 October 2011.

Tete Iron Ore Project Summarised Grade Tonnage Report Whole Rock Grade Estimates Derived by Ordinary Kriging No Lower Grade Cutoff Applied Resource Classification Based on JORC Code (2004) Guidelines															
AREA	Resource Classification	Tonnage (Mt)	Fe (%)	V <sub>2</sub> O <sub>5</sub> (%)	TiO <sub>2</sub> (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	P (%)	LOI (%)	CaO (%)	K <sub>2</sub> O (%)	MgO (%)	Mn (%)	Na <sub>2</sub> O (%)	S (%)
Ruoni North	Inferred	93.4	34.6	0.4	12.7	12.8	10.2	0.003	-1.6	2.6	0.2	5.0	0.2	1.2	0.2
Chitongue Grande	Inferred	60.9	24.9	0.2	9.6	29.4	12.0	0.003	-0.2	4.8	0.7	4.6	0.2	2.1	0.3
South Zone	Inferred	113.0	27.5	0.2	10.1	25.9	8.0	0.290	-0.7	5.2	0.3	6.9	0.3	1.2	0.3
<b>TOTAL</b>	Inferred	267.3	29.4	0.3	10.9	22.1	9.7	0.124	-0.9	4.2	0.4	5.7	0.2	1.4	0.3

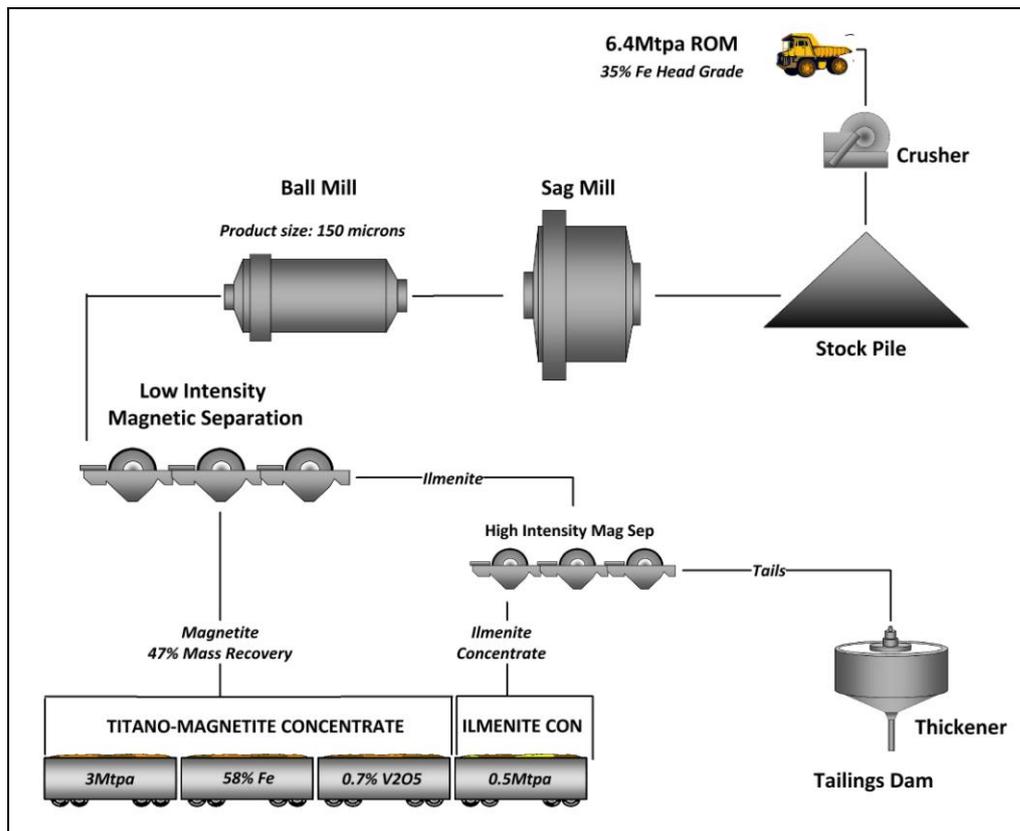
The expected weight recovery (mass recovery) and recovered concentrate grades, based on routine DTR determinations and XRF analysis, are in the order of:

- Ruoni North: 58% Fe, 0.8% V<sub>2</sub>O<sub>5</sub>, 12.9% TiO<sub>2</sub>, 0.8% SiO<sub>2</sub>, 3.5% Al<sub>2</sub>O<sub>3</sub>, 0.001% P and 0.1% S at a Mass Recovery of 47%.
- Chitongue Grande: 64% Fe, 0.7% V<sub>2</sub>O<sub>5</sub>, 4.8% TiO<sub>2</sub>, 1.5% SiO<sub>2</sub>, 2.8% Al<sub>2</sub>O<sub>3</sub>, 0.001% P and 0.4% S at a Mass Recovery of 20%.
- South Zone: 61% Fe, 0.7% V<sub>2</sub>O<sub>5</sub>, 7.7% TiO<sub>2</sub>, 1.5% SiO<sub>2</sub>, 3.2% Al<sub>2</sub>O<sub>3</sub>, 0.001% P and 0.3% S at a Mass Recovery of 23%.

The weighted average concentrate characteristics for the global 267.3Mt Inferred Resource are 61% Fe, 0.7% V<sub>2</sub>O<sub>5</sub>, 9% TiO<sub>2</sub>, 1.2% SiO<sub>2</sub>, 3.2% Al<sub>2</sub>O<sub>3</sub>, 0.005% P and 0.3% S at a Mass Recovery of 31%.

## ANNEXURE 2: Process Flow Sheets

### Scenario A: Producing 3Mtpa of titano-magnetite concentrate



### Scenario B: Producing 1Mtpa Pig Iron

