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FINANCIAL CONSULTANTS

Economic Impact Assessment and Sustainable Land Use Assessment

prepared for SLR Consulting (Africa) (Pty) Ltd in support of the environmental impact assessment and the environmental management programme for the proposed mining development for

Mokala Manganese (Pty) Ltd

Report No.: 1/1

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Economic Impact Assessment and Sustainable Land Use Assessment

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ECONOMIC IMPACT ASSESSMENT AND SUSTAINABLE LAND USE ASSESSMENT

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ACRONYMS AND ABBREVIATIONS

Below a list of acronyms and abbreviations used in this report.

ACRONYMS / ABBREVIATIONS	DEFINITION
DEA	Department of Environmental Affairs
DME	Department of Minerals and Energy (now DMR)
DMR	Department of Mineral Resources
EIA	Environmental impact assessment
EMP	Environmental management plan
GDP	gross domestic product
IDP	Integrated Development Plan
JMLM	Joe Morolong Local Municipality
JTGDM	John Taolo Gaetsewe District Municipality
LED	Local economic development
Mercury	Mercury Financial Consultants (Pty) Ltd
MPRDA	Mineral and Petroleum Resources Development Act, Act 28 of 2002
SPDF	Spatial Development Framework
PV	Present value
SLP	Social and labour plan
SLR	SLR Consulting (Africa) (Pty) Ltd

1   INTRODUCTION

Mokala Manganese (Pty) Ltd (Mokala), is planning on converting their existing prospecting right into a mining right in order to undertake opencast activities on the remaining extent of the farm Gloria 266. The remaining extent of the farm Gloria 266 is located approximately 4 km, northwest of the town Hotazel in the Northern Cape Province. The project is referred to as the Mokala manganese project.

SLR Consulting (Africa) (Pty) Ltd (SLR), an independent firm of environmental consultants, has been appointed by Mokala to undertake the environmental impact assessment and compile the environmental management programme for the proposed mining development. SLR has appointed Mercury Financial Consultants (Pty) Ltd (Mercury) to undertake the Economic Impact Assessment and Sustainable Land Use Analysis for the proposed project.

2   OBJECTIVE OF THIS REPORT

Section 39 of the Mineral and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA) requires a mining right applicant to undertake an environmental impact assessment (EIA) and submit an environmental management plan (EMP). Section 39 (3) (a) –(c), together with Regulation 50 requires the establishment of baseline information concerning the affected environment and an investigation, assessment and evaluation of the impact of the proposed mining operation on the environment, socio-economic conditions and on heritage resources.

The objectives of this specialist investigation was to determine the following in support of undertaking the EIA and the compilation of the EMP as outlined in Regulation 50 of the MPRDA:

- quantify the impact on the socio-economic conditions of directly affected persons by determining the potential impact, in financial terms, of the loss in property value or infrastructure assets and determining the economic loss, in terms of net present value, of commercial, economic or as a result of the proposed mining activity (Regulation 50 (c)); and
- undertake a comparative assessment of the identified land use and development alternatives and their potential on the environment, social and cultural impacts in view of generally accepted sustainable development principles which considers the costs and benefits of social, environmental and economic factors (Regulation 50 (d)).

3 BACKGROUND INFORMATION

3.1 PROJECT OVERVIEW

Ntsimbintle Mining (Pty) Ltd (Ntsimbintle), which is a 100% BEE entity, holds 51% of the entire issued share capital of Mokala and Blue Falcon 222 Trading Proprietary Limited (RF) holds 49%. Mokala and is planning on converting their existing prospecting right into a mining right to establish an 800 000 tonne/annum manganese mining operation, Mokala Manganese Mine, on the remaining extent of the farm Gloria 266. The remaining extent of the farm Gloria 266 is located approximately 4 km, northwest of the town Hotazel and falls within the Joe Morolong Local Municipality (JMLM) and the John Taolo Gaetsewe District Municipality (JTGDM) located in the Northern Cape Province.

An initial capital investment of R260million is envisaged and the proposed development is expected to create 321 temporary employment opportunities during the construction phase and 331 permanent employment opportunities during the operational phase.

3.2 IDENTIFIED LAND USES

Ntsimbintle owns the remaining extent of the farm Gloria and currently only drilling activities are taking place on the farm Gloria 266, which has grazing capability.

The adjacent land uses are predominately mining. Gloria Mine owned by Assmang Manganese (Pty) Ltd (Assmang) is located on portion 1 of the farm Gloria 266. The landowner of the farm Kipling 271 is Assmang, although Kudumane Manganese Resources (Pty) Ltd (Kudumane) has applied to include the farm Kipling into its mining right. Kudumane's current mining right includes the farms York 279 and Hotazel 280. Kalagadi Manganese (Pty) Ltd is located to the south of the farm Gloria on Umtu 281.

There are a number of private landowners on the some portions of the farms in close proximity to the proposed project site. These farms are currently used for grazing. Areas surrounding the various mines has grazing capability.

3.3 PROVINCIAL, REGIONAL AND LOCAL SOCIO-ECONOMIC PROFILE

A summary of the socio-economic profile of the Northern Cape, the John Taolo Gaetsewe District Municipality (JTGDM) and the Joe Morolong Local Municipality (JMLM) is provided in Table 1. The information in Table 1 were based on statistics from the Census 2011 as conducted by Statistics SA and was adopted from the draft Social and Labour Plan for Mokala, unless otherwise specified.

TABLE 1: SUMMARY OF THE PROVINCIAL AND LOCAL SOCIO-ECONOMIC PROFILE

INDIACTOR	PROVINCIAL LEVEL – NORTHERN CAPE	LOCAL LEVEL - JOHN TAOLO GAETSEWE DISTRICT MUNICIPALITY (JTGDM)	LOCAL LEVEL -JOE MOROLONG LOCAL MUNICIPALITY (JMLM)
Population	1 145 861 million	224 797 people with majority of the population residing in the JMLM area[3]	89 531 people
Economic activity	Smallest contributing province to SA economy. Mining sector largest contributor to provincial GDP (26 %)[**]	Within the JMLM and JTGDM it was estimated in 2011 that the most dominant employment sector contributing to the provincial GDP was the mining sector[***]	
Unemployment*	9%	8%	5%
Employment*	25%	19%	9%
Education	4% of adult population have a tertiary qualification. 8% of the adult population have had no schooling. 80% of the population has some form of schooling.	4% of adult population have a tertiary qualification. 9% of the adult population have had no schooling. 77% of the population has some form of schooling.	2% of adult population have a tertiary qualification. 13% of the adult population have had no schooling. 72% of the population has some form of schooling.
Basic Services	78% of households have access to piped water inside dwellings or yards and 20% have access to piped water outside a yard and 3% have no access to piped water. Approximately 57% has access to flushing toilets 78% and85% has access to electricity for cooking and lighting respectively.	41% have access to piped water inside dwellings or yard and 56% have access to a water point outside of their yards. 4% has no access to water. 73% and 87% has access to electricity for cooking and lighting respectively.	16% of households have access to piped water inside dwellings or yards and 77 % have access to a water point outside of their yards. 8% has no access to water. 53% and 82% has access to electricity for cooking and lighting respectively.
Housing	Northern Cape Province consists of approximately 85% formal housing and 13% informal housing. [1]	JTGDM consists of approximately 88% formal housing and 11% informal housing. [1]	JMLM consists of approximately 94% formal housing and 2% informal housing. [1]

* It was argued that the employment and unemployment numbers are not fully representative of job scarcity in the area as a large number of the population responded not applicable to the question regarding employment status.
** Labour statistics South Africa (2012)
***JTGDM SPDF(2012)

The mining industry dominates the local economy in the John Taolo Gaetsewe District and Joe Morolong Local Municipalities. High levels of unemployment and low levels of education presents a significant challenge to the region and in particular the JMLM. According to the 2012-2017 JMLM integrated Development Plan, other challenges within the local municipality include the following:

- few employment opportunities;

- persistence of social ills such as poverty, crime and HIV/AIDS;

- lack of maintenance of infrastructure;

- weak transport infrastructure and long commuting distances; and

- limited range of products and services being offered.

Some of these aspects may present Mokala with opportunities to contribute towards socio-economic development in the region. These opportunities should typically be addressed in consultation with the relevant authorities as part of the mine's Social and Labour Plan (SLP) negotiations.

4   NATIONAL, PROVINCIAL AND LOCAL CONSIDERATIONS

South Africa faces the challenge of simultaneously meeting the following two imperatives:

- developing the economy to meet the needs of all South Africans; and
- ensuring that the productivity and viability of the underlying ecosystems and ecosystem services are maintained at healthy levels over time.

Essentially, these imperatives are embedded in the concept of sustainable development, which is commonly defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Several national, provincial and local policies, strategies and plans have been developed in view of sustainable development in South Africa, of which the most pertinent ones and outlined in Figure 1 and discussed in the sections below.

Constitution of South Africa
Better quality of life for all now and in the future through equitable access to resources and shared prosperity. Recognises the relationship between social, human and man made and natural resources capital

National Level
National Spatial Development Perspective (2006); New Growth Path (2010); National Development Plan 2030 (2010); National Strategy for Sustainable Development and Action Plan (2011); National Framework for Sustainable Development (2008)

Provincial Level
Provincial Spatial Development and Environmental Management Frameworks

Local Level
District and Local Municipality Spatial Development Frameworks and Integrated Development Plans

FIGURE 1: NATIONAL, PROVINCIAL AND LOCAL CONSIDERATIONS

4.1   NATIONAL POLICIES AND STRATEGIES

The Constitution guarantees South African citizens a better quality of life for all now and in the future through equitable access to resources and shared prosperity and recognises the relationship between social, human and man-made and natural resources capital.

4.1.1   National Strategy for Sustainable Development and Action Plan (2011)

The Strategy for Sustainable Development and Action Plan (NSSD1) is a proactive strategy that regards sustainable development as a long-term commitment, which combines environmental protection, social equity and economic efficiency with the vision and values of the country. It is a milestone in an ongoing process of developing support, and initiating and up-scaling actions to achieve sustainable development in South Africa (DEA, 2011) and has outlined the following strategic objectives:

- enhance systems for integrated planning and implementation;
- sustain ecosystems and use natural resources efficiently;
- move towards a green economy;
- build sustainable communities; and
- respond effectively to climate change.

4.1.2   National Development Plan 2030 (2010)

The national Development Plan aims to ensure that all South Africans attain a decent standard of living through the elimination of poverty and reduction of inequality by 2030. The core elements of a decent standard of living identified in the plan are:

- housing, water, electricity and sanitation;
- safe and reliable public transport;
- quality education and skills development;
- safety and security;
- quality health care;
- social protection;
- employment;
- recreation and leisure;
- clean environment; and
- adequate nutrition.

4.1.3   New Growth Path (2010)

South Africa has embarked on a new economic growth path in a bid to create 5million jobs and reduce unemployment from 25% to 15% over the next ten (10) years. The plan aims to address unemployment, inequality and poverty by unlocking employment opportunities in South Africa's private sector and identifies five priority areas (green energy, agriculture, mining, manufacturing and tourism) as part of the programme to create jobs

4.1.4   National Framework for Sustainable Development (2008)

The purpose of the National Framework on Sustainable Development is to enunciate South Africa's national vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable direction. It proposes a national vision, principles and areas for strategic intervention that will enable and guide the development of the national strategy and action plan.

The national framework for sustainable development seeks to build on existing programmes and strategies that have emerged in the first 14 years of democracy. It aims to identify key, short, medium and long–term challenges in our sustainable development efforts, sets the framework for a common understanding and vision of sustainable development; and defines strategic focus areas for intervention (DEAT, 2008).

4.1.5   National Spatial Development Perspective (NSDP) (2006)

The NSDP 2006 provides a framework for a focused intervention by the State in equitable and sustainable development. It represents a key instrument in the State's drive towards ensuring greater economic growth, buoyant and sustained job creation and the eradication of poverty. It provides:

- a set of principles and mechanisms for guiding infrastructure investment and development decisions;
- a description of the spatial manifestations of the main social, economic and environmental trends that should form the basis for a shared understanding of the national space economy; and
- an interpretation of the spatial realities and the implications for government intervention.

4.2 MINING LEGISLATION

Mining development in the past has characteristically been synonymous with a disregard for its social impacts and affected communities. In many instances, mining companies have invested huge amounts of capital for mining development and openly stated that they are contributing to socio-economic development at a grass roots level in mine-affected communities. In reality, however, communities in the developing world have usually been completely bypassed by any development benefits from the project and are often left in a marginalised state, in which they are far worse off than before the mine opened.

Recent legislation in South Africa, such as the Broad Based Socio-Economic Empowerment Charter (BBSEEC) for the Mining Industry and the Mineral and Petroleum Resources Development Act (MPRDA) have confirmed the requirement for mining companies to assess the social impacts of their activities from start to closure, and beyond. Unless a mining operation has considered the social impact and documented it, the Department of Minerals & Energy (DME) will not issue a mining right to the applicant (MPRDA Regulations, 2002). Mining companies also have to compile and implement a Social and Labour Plan (SLP) to promote socio-economic development in their affected communities and to prevent or reduce negative social impacts.

4.3 CONCLUSION

Although the growth of the South African economy is of strategic importance, consideration should be given to social and natural resources considering proposed developments. In view of the concept of sustainability the proposed project will have to contribute towards achieving sustainable development whilst contributing towards achieving these higher level objectives.

5 ECONOMIC IMPACT ASSESSMENT

This section focusses on the quantification of the impact on the socio-economic conditions of directly affected persons by determining the potential impact on of the loss in property value as well as the economic loss/gain, in terms of net present value as a result of the proposed mining activity as outlined in Regulation 50 of the MPRDA, (Regulation 50 (c)).

There are various direct and indirect factors which may impact on the macro and micro economic environment as a result the current land use as well as proposed development activities. The extent to which these factors are influenced will depend on the nature and scale of current and proposed land use activities. It is therefore important to understand and assess the economic footprint the

proposed development in comparison to the alternative land use.   Factors which need to be considered in during an economic assessment include a range economic, social and environmental indicators which are broadly illustrated in Figure 2. These factors may have a potential impact or influence on a local, regional, provincial or national levels during the various phases of the project life cycle.

It is however not possible to assign an economic value to all of these aspects, in particular external factors. External factors or externalities refer to the impact (positive or negative) of economic activity associated with the proposed development that are not incurred directly by those participating in the activity, but are instead borne by society and/or future generations (Nahman et al, 2009).

Typical external factors (externalities) associated with mining developments, will include social aspects such as additional pressures on infrastructure (housing, road network) and basic services (education, health care, transport, security, municipal services) due to an influx people; increase in social ills (crime, HIV/AIDS); health related impacts as a result of environmental pollution; and the general degradation of an area.   External environmental factors include pollution; cost of environmental management and rehabilitation; increase in water demand; and the change in post closure land use potential.

The potential social and environmental impacts which may result from the proposed development are investigated and assessed by various specialists as part of the environmental impact assessment process. Although it will not be possible to assign an economic loss or gain to these social and environmental aspects, these impacts will be evaluated as part of the alternative land use assessment in Section 6.

ECONOMIC IMPACT ASSESSMENT INDICATOR FRAMEWORK		
CATEGORY	**ASPECT**	**IMPACT OUTPUT**

ECONOMIC FACTORS

Land use →
- Tourism/ Recreational ⇨ Decrease/increase in property value & loss of income
- Agricutural/ Forestry ⇨ Decrease/increase in property value & loss of income
- Industrial ⇨ Decrease/increase in property value & loss of income
- Residential ⇨ Decrease/increase in property value
- Other ⇨ Decrease/increase in property value & loss of income

Employment →
- Current land use ⇨ Decrease/increase
- Project ⇨ Increase
- Surrounding land uses ⇨ Decrease/increase
- Secondary employment ⇨ Decrease/increase

Gross domestic product →
- Current land use ⇨ Decrease/increase in GDP
- Project ⇨ Decrease/increase in GDP
- Surrounding land uses ⇨ Decrease/increase in GDP

Local economic development → Increase/decrease in contribution towards LED

SOCIAL FACTORS

Economic impact of social impacts →
- Crime
- HIV/AIDS
- Informal settements
- Influx of job seekers
⇨ Pressure on infrastruture & service delivery ⇨
- Education
- Housing
- Security
- Transport
- Health care services
- Road infrastructure
- Basic services

ENVIRONMENTAL FACTORS

Economic impact of env impacts →
- Prevention of impacts ⇨ Costs to proponent
- Mitigation of impacts ⇨ Costs proponent
- Rehabilitation/clean-up ⇨ Costs proponent/government
- Secondary impacts ⇨ Pressure on infrastruture & service delivery ⇨ Health care, water
- Land use ⇨ Decrease in land value and land capability
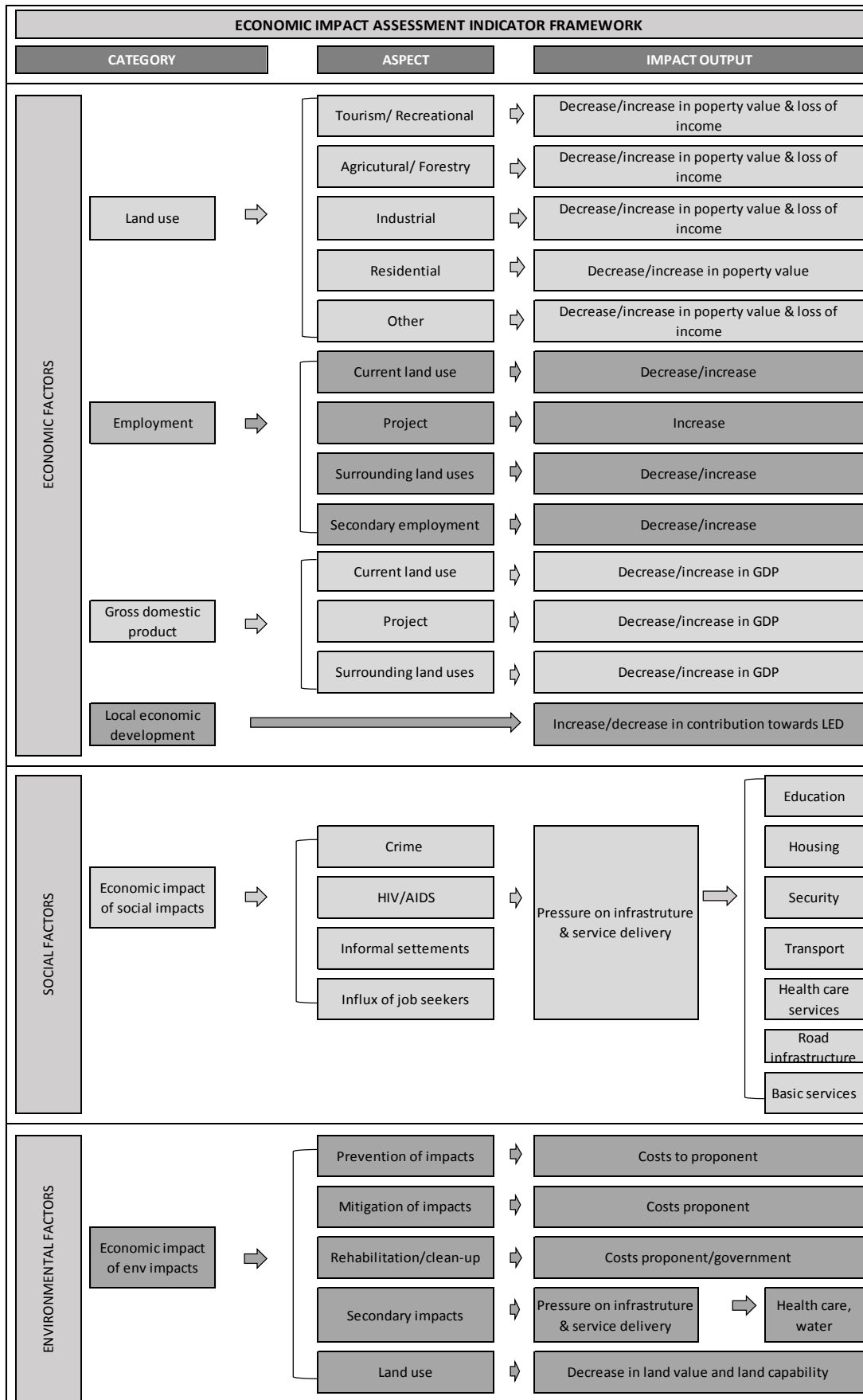
FIGURE 2: ECONOMIC IMPACT FRAMEWORK

5.1   QUANTIFICATION AND EVALUATION OF ECONOMIC CRITERIA

The following quantitative economic factors are assessed for the various project phases of the proposed development as illustrated in Figure 3:

- impact of current land/property value;

- Gross Domestic Product (GDP);

- direct employment; and

- future land use.
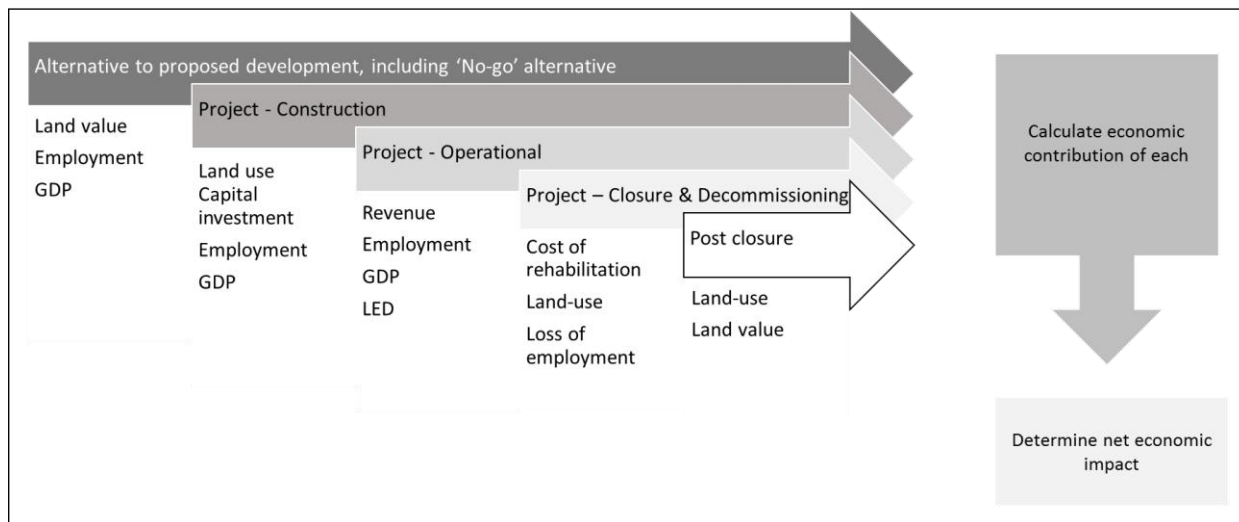
FIGURE 3: QUANTITATIVE ECONOMIC ASSESSMENT

In addition to the quantitative economic factors, the project will contribute towards the local and regional socio-economic environment.

5.1.1   Impact on current land/property value

Although the presence of mineral resources and existing operating mines in the area has resulted in the escalation of land value in the region over the past few years, a conservative approach which ignored the opportunistic over-inflation of property value was taken. In the past, the land was predominantly used for agricultural grazing. With reference to Table 2, land values for barren grazing land is estimated at R3 500 per hectare (personal communication with consultant at Grainvest). The extent of the area which will be directly impacted upon by the proposed mining development is approximately 154 Hectares. For the purpose of this report we have used the entire farm area of 450ha as our impacted area. A further 500m buffer radius was also applied. This added an additional 524ha to the impacted area, which resulted in a total area of impact of 974ha.

The capital investment required for the establishing of mining infrastructure was not taken into account to determine the land value post mine closure as the infrastructure is mining specific and it was assumed that it will be removed and the area completely rehabilitated during the decommission and closure phases of the mine in line with the EIA and EMP closure objectives. In line with the requirements of the MPRDA closure liability guideline, it was furthermore assumed that no mining infrastructure will remain post closure.

TABLE 2: POTENTIAL LOSS OF LAND VALUE CALCULATION

POTENTIAL LOSS OF LAND VALUE CALCULATION	
Agricultural grazing Land	
Potential hectares directly impacted	450ha
Buffer area surrounding impacted land based on 500m radius buffer	524ha
Total area impacted for duration of mining	974ha
Market value of agricultural grazing land per hectare prior to mining activities	R3 500
Value of land area impacted	R3 410 000
Value of infrastructure on impacted area:	R0
Houses	R0
Stores	R0
Irrigation systems	R0
Potential loss in property value over life of mine	**R3 410 000**

No infrastructure has been established on site. Therefore, as indicated in Table 2, the loss in property value in terms of current land use (agricultural grazing) is determined at R3 410 000 in present value terms.

Based on the size of the impacted land (974ha) and the feasible carrying capacity of the land of one cattle per ten hectare (this is a conservative (overstated) number and is based on personal communication with a member of the agricultural union who put the carrying capacity at one cattle per 10ha), it will be possible to accommodate 97 cattle within the area in question. The amount of workers are also overstated at one worker per 250ha; the ratio of workers in practice are not directly related to the size of the agricultural area but rather to the amount of life stock or agricultural activity. A more realistic ratio would have been one full time employee per 50 head of cattle. Even after taking a conservative approach Table 3 still illustrates that the area is too small to be viable for commercial farming.

TABLE 3: ALTERNATIVE LAND USE

ALTERNATIVE LAND USE	
Cattle grazing hectares needed per unit	10 cattle/ha
Average price per calf	R4 000
Calf Ratio	80%
Buffer Area	974ha
Employees per area 1 full time employee/250Ha	4 employees
Average farm wage per month	R2 420
Estimated income lost: farm workers wages including buffer zone	R324 000 per annum
Estimated income lost: farm workers including buffer zone area, PV life of mine	R5 717 763
Estimated agricultural income lost from impacted area including buffer zone,	R311 765 per annum
Estimated agricultural income lost from impacted area, including buffer zone PV of life of mine	R2 750 174

According to the information contained in Table 3, ceasing agricultural activities shows will result in a loss of income for farmworkers to the value of R129 600 per annum. As indicated above, the number of employees are overstated. This overstatement has a negative impact on the viability of the alternative land use, however in order to determine a maximum alternative land use impact, it will necessary to sacrifice economic viability to ensure that the effect on job losses and possible wage earnings are not understated.

Loss of income is based on an 80% calf ratio. It was assumed that the grazing land will be used for commercial farming and not stud farming purposes. The loss of income was calculated for the impacted area, which included the 524ha for the buffer zone. If the calculations were based on the 450ha farm area only, it would not have been possible to assign an economic value to agricultural activites except to indicate it would feasible for self-sustaining purposes.

5.1.2   Impact on John Talo Gaetsewe District GDP

According to Global Insights mining is the single largest Gross Domestic Product (GDP) contributor in the JTGDM node and is growing rapidly as illustrated by the Table 4 below. Rich mineral deposits together with current major investments give the mining sector strong potential for growth in the future.

TABLE 4: SECTOR CONTRIBUTION FOR THE JTGDM (GLOBAL INSIGHTS 2013)

SECTORS (R'000)	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Primary	**3 020 448**	**2 526 266**	**2 688 702**	**3 018 503**	**3 891 372**	**4 004 096**	**5 544 269**	**6 596 376**	**7 203 456**	**8 134 139**	**8 382 495**
Agriculture	173 530	213 615	225 322	200 850	245 019	303 523	347 635	362 858	363 624	354 386	396 231
Mining	2 846 918	2 312 651	2 463 380	2 817 653	3 646 353	3 700 573	5 196 634	6 233 518	6 839 832	7 779 753	7 986 264
Secondary	**163 347**	**158 850**	**174 371**	**185 057**	**218 311**	**230 954**	**314 499**	**378 276**	**360 810**	**396 517**	**419 071**
Manufacturing	73 737	79 273	82 553	91 564	98 005	91 939	138 847	115 609	119 639	122 274	136 434
Electricity	38 984	36 185	38 953	35 017	43 762	39 631	55 852	104 494	97 286	119 646	123 259
Construction	50 626	43 392	52 865	58 476	76 544	99 384	119 800	158 173	143 885	154 597	159 378
Tertiary	**1 144 217**	**1 251 030**	**1 334 856**	**1 563 106**	**1 753 689**	**2 055 000**	**2 310 116**	**2 496 245**	**2 763 061**	**3 168 956**	**3 470 540**
Trade	228 168	267 284	297 087	332 369	407 997	468 629	475 590	522 940	566 413	630 263	690 917
Transport	125 710	126 837	131 631	153 325	175 096	198 009	214 312	220 355	228 951	298 036	324 393
Finance	174 139	168 341	193 693	240 383	324 249	424 288	520 909	472 794	549 283	652 526	750 581
Community Service	616 200	688 568	712 445	837 029	846 347	964 074	1 099 305	1 280 156	1 418 414	1 588 131	1 704 649
Total Industries	**4 328 012**	**3 936 146**	**4 197 929**	**4 766 666**	**5 863 372**	**6 290 050**	**8 168 884**	**9 470 897**	**10 327 327**	**11 699 612**	**12 272 106**
Taxes less subsidies on products	251 600	304 433	368 433	413 254	515 971	719 218	762 379	859 496	948 228	1 107 636	1 174 662
Total (Gross GDP)	**4 579 612**	**4 240 579**	**4 566 362**	**5 179 920**	**6 379 343**	**7 009 268**	**8 931 263**	**10 330 393**	**11 275 555**	**12 807 248**	**13 446 768**

Table 4 shows that in 2012, the primary sector, followed by tertiary, contributed the most to the economy at 67.65% and 28.67% respectively. In 2012 the secondary contributed the least at 3.69%. The highest contributions in these sectors were as a result of activities in the mining, community services and the manufacturing industries. The finance industry had the highest year-on-year growth at 15.73% while the manufacturing although one the highest contributors, had the least at 6.35%.

TABLE 5: IMPACT ON LOCAL GROSS DOMESTIC PRODUCT

GROSS DOMESTIC PRODUCT - LOCAL	
Construction Phase	
Capital Investment 30% assumed as local spend	R78 000 000
Employment Value Created per Annum	R85 000 000
Construction Period (No of Years)	1
Addition to Local GDP during Construction (Present value (PV))	R163 000 000
Operational Phase	
Employment Value Created Life of Mine	R711 168 000
Contribution to Local GDP over Life of Mine (PV)	**R874 168 000**

It should be noted that GDP is a measure of all the goods and services produced domestically. The basic formula for calculating GDP is

$$GDP = C + I + E + G,$$

where C = Consumer Spending;

I = Investment made by industry;

E = Excess of Exports over Imports; and

G = Government Spending

In the calculations, neither the excess of exports over imports or any government spending were taken into account.   Local GDP was considered as the municipal area. It was assumed that the agricultural activities comprising 97 cattle would not be a feasible operation and the potential contribution to the local GDP would be insignificant when compared to the planned mining activity

TABLE 6: SUMMARY GDP AND ALTERNATIVE LAND USE

SUMMARY	
Contribution gained to Local GDP over life of mine	R874 168 000
Contribution lost in agriculture wages	-R1 114 533
Nett Contribution to Local GDP over Life of Mine	R873 053 467
Income generated over life of mine	R11 493 761 000
Income generated loss Agriculture	-R2 750 174
Net Income Generated	R11 491 010 826
Increase in Infrastructure/Property Value – Mining	R0
Loss of property value - life of mine	-R3 410 000

As outlined in Table 4, in 2012, the GDP of the district according to the latest IDP was R13.5 billion per annum of which mining contributed R8 billion.   If the proposed project is to proceed it will give an innitial injection of R163 000 000 during construction phase (Table 5) as a result of the temporary labour injection and an assumed local spend of 30% of the allocated capital expenditure. Nett Present Value contribution to local GDP for the life of the mine as per Table 6 will be R874 168 000 after accounting for agricultural employee income losses.

Mokala mine will contribute R1.35 billion in revenue earned per annum, which equates to a total of R11 493 761 000 (R11.5 billion) over the 15 years of life of mine. The Nett revenue earned after taking the loss of agricultural activity over the life of mine will be R11 491 010 826. Government will benefit from direct activities in the form of personal income taxes and company tax. Government earnings will be distributed by national government to cover public spending, which includes amongst other the provision and maintenance of transport infrastructure, health and education services. The loss of value for agricultural land is estimated at R3 410 000, this amount could be much higher but not high enough to have a significant impact.

Investment in the proposed development and subsequent creation of 331 full time employment opportunities as discussed in Section 5.1.3 below, will have a positive effect on the standard of living of the households directly and indirectly effected. This positive effect will further be enhanced through multiplying effects. It should be noted that for the purpose of this report, the GDP multiplying effects were not calculated.

5.1.3   Economic impact of direct employment

According to Global Insight (2013), the level of unemployment is a challenge in the district area as 8.24% of the total population and 30% of the economically active people is unemployed. The situation is especially severe in the JMLM. The area's job opportunities are provided by three primary economic sectors, which are agriculture, mining and retail. The other job opportunities essentially feed of these three sectors as indicated in Table 7.

TABLE 7: EMPLOYMENT DISTRIBUTION BY INDUSTRY FOR JTGDM (GLOBAL INSIGHT, 2013)

INDUSTRIES	2002		2012	
	NUMBER	%	NUMBER	%
Agriculture	4 277	19,1	3 408	10,9
Mining	4 378	19,5	12 890	41,1
Manufacturing	646	2,9	566	1,8
Electricity	115	0,5	101	0,3
Construction	774	3,5	884	2,8
Trade	2 446	10,9	2 536	8,1
Transport	813	3,6	720	2,3
Finance	896	4,0	999	3,2
Community services	5 470	24,4	6 498	20,7
Households	2 602	11,6	2 728	8,7
Total	**22 417**	**100,0**	**31 330**	**100,0**

In the calculations, a ratio of one worker per 100ha employed in the agricultural sector was used. This figure is over stated as the labour force is not based on an exact ratio as mentioned in section 5.1.1 above. To be conservative, the calculations were based on the adjusted area impacted (974ha), which results in an opportunity to employ ten individuals to maintain the agricultural activities as indicated in Table 8. In contrast, the proposed development will create 321 temporary employment opportunities during the construction phase and 331 permanent opportunities during the operational phase of the mine. The proposed development will therefore significantly outnumber the number of employment opportunities in comparison to agricultural.

TABLE 8: EMPLOYMENT OPPORTUNITIES AND LOSSES

MINING JOBS CREATED VS LOSS OF AGRICULTURAL JOBS			
	MINING JOBS	AGRICULTURE	NET JOBS IMPACTED
Construction Phase Temporary Employment	321	-4	317
Operational Phase Permanent Employment	331	-4	327

As indicated in Table 9, the loss in farm worker wages over the life of the proposed project would be R1 143 553 in present value terms. In comparison, the contribution in wages from the proposed mining project will R85 000 000 during the construction phase and R85 000 000 per annum during the operational phase, which totals to R711 168 434 over the life of the mine in present value terms. This is R710 024 881 more (present value) than the contribution from agricultural over the same period.

TABLE 9: COMPARITIVE EMPLOYMENT SUMMARY

EMPLOYMENT: COMPARATIVE SUMMARY	
Employment Value from Proposed Mining Activities - PV Life of Mine	R711,168,434
Employment Value Lost from Agricultural Activities PV Life of Mine	-R1 143 553
Nett Value of Employment Created PV Life of Mine	R710,024,881

In addition to wages, a contribution towards skills development is envisaged during the construction and operational phases which will favourably contribute towards the socio-economic environment in the region.

5.1.4   Future Land Use

In the EIA and EMP report compiled by SLR, the following closure objectives, including how these objectives will align with the current baseline environment was included:

- To maintain a relatively flat topography
- To maintain a functioning ecosystem
- Moderate groundwater quality
- Stable water table providing groundwater as a water supply source for domestic livestock watering
- Quiet rural/urban environment
- Environmental damage is minimised to the extent that they are acceptable to all parties involved
- The land is rehabilitated to achieve a condition approximating its natural state, or so that the envisaged end use of wilderness and grazing is achieved
- Backfilling of the open pit will take place on a concurrent basis.
- All surface infrastructure, excluding the realignment of the R380 will be removed from site after rehabilitation and the open pit will be completely backfilled.

- Once the Ga-Mogara drainage channel has been permanently realigned, the design and establishment of the Ga-Mogara drainage channel permanent realignment will focus on replicating aspects of existing Ga-Mogara drainage channel. This will include the following closure objectives:
    - Natural flow will be allowed to continue when this occurs
    - The design of the realignment will incorporate curves
    - Vegetation within the realigned drainage channel will consist of plant and animal species
    - endemic to the proposed project area.
    - The design will incorporate natural soils
- Mine closure is achieved efficiently, cost effectively and in compliance with the law.
- The social impacts resulting from mine closure are managed in such a way that negative socio-economic impacts are minimised.

According to SLR, the financial closure liability associated with the project at approximately December 2032 (LOM) has been calculated to be R 19 286 474 (current value including VAT) as per the Guideline Document for the Evaluation of the Quantum of Closure- Related Financial Provision Provided by a Mine as published by the Department of Mineral Resources (DMR). The closure liability calculations assumed that all infrastructure will be demolished and no handover of any facilities for post closure use has been allowed for.

Post closure, agricultural activities can be resumed and the property value can therefore be restored but likely at a lower value due to past mining activities.

5.1.5 Contribution towards socio-economic development

In addition to the direct and indirect economic impacts discussed above, the mine will through it corporate social investments and social and labour plan, contribute towards the local economic development in the area. The operation of the proposed mine with have the following positive socio-economic benefits to its employees and surrounding communities:

- development of skills through its skills development plan;
- investment in infrastructure development through local economic development and integrated development programmes;

5.2 ECONOMIC IMPACT ASSESSMENT

5.2.1 Impact assessment methodology

The impact assessment methodology was prescribed by SLR and is based on the Hacking method of determination of significance of impacts as tabulated in Table 10 below and complies with the method provided in the EIA guideline document. . Part A provides the approach for determining impact consequence (combining severity / nature, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D. The unmitigated scenario is considered for each impact.

TABLE 10: CRITERIA FOR ASSESSING IMPACTS (SLR, 2014)

PART A: DEFINITION AND CRITERIA		
Definition of SIGNIFICANCE		**Significance = consequence x probability**
Definition of CONSEQUENCE		**Consequence is a function of severity / nature, spatial extent and duration**
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	**H**	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action. Irreplaceable loss of resources.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	**L**	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE/ EXTENT of impacts	**L**	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national

PART B: DETERMINING CONSEQUENCE					
SEVERITY / NATURE = L					
DURATION	Long term	**H**	Medium	Medium	Medium
	Medium term	**M**	Low	Low	Medium
	Short term	**L**	Low	Low	Medium
SEVERITY / NATURE = M					
DURATION	Long term	**H**	Medium	High	High
	Medium term	**M**	Medium	Medium	High
	Short term	**L**	Low	Medium	Medium
SEVERITY / NATURE = H					
DURATION	Long term	**H**	High	High	High
	Medium term	**M**	Medium	Medium	High
	Short term	**L**	Medium	Medium	High
			L	**M**	**H**

			SPATIAL SCALE / EXTENT		
PART C: DETERMINING SIGNIFICANCE					
PROBABILITY	Definite/ Continuous	**H**	Medium	Medium	**High**
(of exposure to	Possible/ frequent	**M**	Medium	Medium	**High**
impacts)	Unlikely/ seldom	**L**	**Low**	**Low**	Medium
			L	**M**	**H**
			CONSEQUENCE		

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	**Decision guideline**
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

*H = high, M= medium and L= low and + denotes a positive impact.

5.2.2   Economic Impact Assessment

The assessment of the economic indicators which have been discussed in Section 5.1, is outlined in Table 11 below.

TABLE 11: ECONOMIC IMPACT ASSESSMENT ANALYSIS

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY/NATURE	DURATION	EXTENT/SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY/NATURE	DURATION	EXTENT/SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
Land use - property value	The loss in property value in terms of current land use (agricultural - grazing) is determined at R3 410 000 in present value terms. It was assumed that the current land use will be resumed once mining activities have ceased and the area has been rehabilitated completely in line with the EIA and EMP closure objectives. In line with the requirements of the MPRDA closure liability guideline, it was furthermore assumed that no mining infrastructure will remain post closure. Post closure, agricultural activities can be resumed and the property value can therefore be restored but likely a lower value due to past mining activities.	Construction Operational Decommissioning and closure	M	H	L	M	H	M	L	M	L	L	L	L
Land use – value of employment	It was conservatively estimated that agricultural activities (cattle farming) could create ten employment opportunities resulting in wages totalling R1 143 553 over the life of mine in present value terms. In contrast, the proposed mining development will create 321 temporary employment opportunities during the construction phase and 331 permanent opportunities during the operational phase of the mine. This will result in annual wage contribution of R85 000 000 during the construction phase and R85 000 000 per annum during the operational phase. Wages will total R711 168 000 during the operational phase (present value). The proposed development will therefore have a far more significant positive impact on the local and regional economy as a result of the number of employment opportunities which will be created during the construction and operational phases of the project.	Construction Operational	M+	M	M	M	H	M+	H+	M	M	M	H	M-H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY/NATURE	DURATION	EXTENT/SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY/NATURE	DURATION	EXTENT/SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
Land use - employment	It was assumed that the current land use will be resumed once mining activities have ceased and the area has been rehabilitated completely in line with the EIA and EMP closure objectives. A few agricultural employment opportunities can therefore be created once full closure has been achieved.	Decommissioning Closure	L+	H	L	M	L	L+	L+	H	L	M	M	M+
GDP	The proposed project will result in an initial injection of R163 000 000 during construction phase as a result of the temporary labour injection and an assumed local spend of 30% of the allocated capital expenditure as indicated in Table 5. The Nett Present Value contribution to local GDP for the life of the mine as per Table 6 was calculated as R874 168 000. In addition to the impact on the local GDP, the project will generate revenues of R11.5billion over the life of mine. It can therefore be concluded that the proposed project development will have a positive economic impact on local, regional and national level, although the impact on a local scale will be far more significant. It should be noted that in the unmitigated scenario the local economic benefit may-be neglected if Local initiatives to procure/source and employ from local resources are not encourage by management. Post closure, the land will be restored to ensure that agricultural activities can be resumed, although it will have a much smaller economic footprint than mining.	Construction Operational Decommissioning and closure	H+	M	H	H	H	M+ -H+	H+	M	H	H	H	H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY/NATURE	DURATION	EXTENT/SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY/NATURE	DURATION	EXTENT/SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
Socio-economic development	The proposed development is expected to create both positive and negative impacts. From a socio-economic perspective, the positive effects, in terms of export earnings, economic development, job creation, household income and government revenue that could be derived are deemed to outweigh the negative impacts that could ensue. The mine will be associated with a number of other negative effects that are more challenging to quantify and to offset. These are associated with the sense of place, loss of family ties, crime situation and pressure on socio-economic infrastructure. Some of the impacts would only last during the construction period (such as 'crime' and impact on socio-economic infrastructure), while others will extend into the operational period and will therefore be of a considerable longer term. All the above mentioned impacts have the potential to influence the local and regional economy, although it is not possible to quantify to what extent. It can still be argued that the socio economic environment will benefit from this project through proper mitigation such as skills development programs, HIV education programs, local economic development programs and as such will turn a potential negative into a long term possitive impact.	Construction Operational	M	M	L	M	M	M	M+	H	M-H	H	M	M+
	Post closure, the land will be restored to ensure that agricultural activities can be resumed, although it will have a much smaller socio-economic footprint than mining.	Decommissioning and closure												

6   SUSTAINABILITY ANALYSIS OF THE PROJECT

As outline in Section 2 of this report, one of the objective of this specialist investigation is to undertake a comparative assessment of the identified land use and development alternatives and their potential on the environment, social and cultural impacts in view of generally accepted sustainable development principles which considers the costs and benefits of social, environmental and economic factors as outline in Regulation 50 (d) of the MPRDA.

From an economic perspective, sustainable development requires that social well-being as minimum, is maintained over time. This could be interpreted is in terms of maintaining the stock of productive capital upon which social well-being depends. The stock of productive capital includes human capital (intangible skills and knowledge) and natural capital (ecological systems and natural resource deposits), as well as manufactured capital (tangible produced assets) (Nahman et ak, 2009). Under the *weak* definition of sustainability, the different forms of capital are assumed to be substitutable, and sustainable development simply requires maintaining the *total* stock of capital. Thus, welfare can be sustained even while natural capital is depleted, so long as this is compensated for through an increase in other forms of capital.

By contrast, *strong* sustainability recognises that natural capital is not readily substitutable with other forms of capital, and requires that the stock of natural capital is maintained in its own right. A compromise may be to allow some substitution between different forms of capital, so long as some minimum, core stock of critical natural capital is maintained (Nahman et al, 2009).

6.1   SUMMARY OF SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT UNDERTAKEN BY EAP

Table 12 below provides an overview of the social, economic and environmental impacts of the project which were assessed in the unmitigated and mitigated scenarios by the Environmental Assessment Practitioner. The ratings were used as an input into the sustainability assessment model.

TABLE 12: IMPACT ASSSESSMENT RATINGS

Aspect	Potential impact	Construction		Operational		Decommissioning		Closure	
		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Environmental indicators									
Soils and landcapability	Loss of soil resources through contamination	(m)	(l)	(m)	(l)	(m)	(l)	(m)	(l)
Soils and landcapability	Loss of soil resources through physical disturbance	(h)	(l)	(h)	(l)	(h)	(l)	(h)	(l)
Biodiversity	Physical destruction of biodiversity	(h)	(m)	(h)	(m)	(h)	(m)	(h)	(m)
Biodiversity	General disturbance of biodiversity	(h)	(l)	(h)	(l)	(h)	(l)	(h)	(l)
Surface water	Surface water pollution	(h)	(l)	(h)	(l)	(h)	(l)	(h)	(l)
Surface water	Alteration of drainage patterns	(h)	(m)	(h)	(m)	(h)	(m)	(h)	(l)
Groundwater	Contamination	(m)	(l)	(m)	(l)	(m)	(l)	(m)	(l)
Groundwater	Reduced water levels			(l)	(l)				
Air quality	Air pollution (PM10, PM2.5, Fall out dust)	(m)	(m)	(h)	(m)	(m)	(m)	(m)	(l)
Air quality	Air pollution (Mn)			(h)	(m)				
Visual	Negative landscape and visual impacts	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(l)
Heritage resources	Destruction of heritage resources	(m)	(l)	(m)	(l)	(m)	(l)		
Social indicators									
Noise	Increase in disturbing noise levels	(m)	(l)	(m)	(l)	(m)	(l)		
Traffic	Disturbance or roads	(h)	(m)	(h)	(m)	(h)	(m)		
Socio-economic	Inward migration	(h)	(m)	(h)	(m)	(h)	(m)		
Blasting	Blasting impacts			(h)	(m)				
Topography	Hazardous excavations, surface subsidence - impact on third parties	(h)	(l)	(h)	(l)	(h)	(l)	(h)	(l)
Economic incicators									
Economic	Economic impact	h	h	h	h	h	h	h	h
Economic - resources	Loss and sterilisation of mineral resources			(h)	(l)	(h)	(l)	(h)	(l)
Land use	Impact on surrounding land uses	(h)	(m)	(h)	(m)	(h)	(m)	(h)	(l)

6.2   SUSTAINABILITY ANALYSIS

The sustainability analysis was based on the information contained in Table 12.   The outcome of the analysis concluded an overall negative unmitigated rating. With mitigation, this rating was improved to a neutral position of zero as outlined in Figure 4. Positive economic impacts in the mitigated scenario by far outweighed the mitigated negative social and negative environmental impacts. Three out of a total of twenty indicators as indicated rated in Table 12 contributed towards the economic score. Therefore the overall positive economic weighting in relation to the social and environmental analysis was low (15%). Environmental and social indicators weighted 60% and 25% respectively. It should be noted that the rating system which is used to assess the various impacts is based on a subjective approach.   These impact ratings obtained were used to determine the sustainability potential of the project.
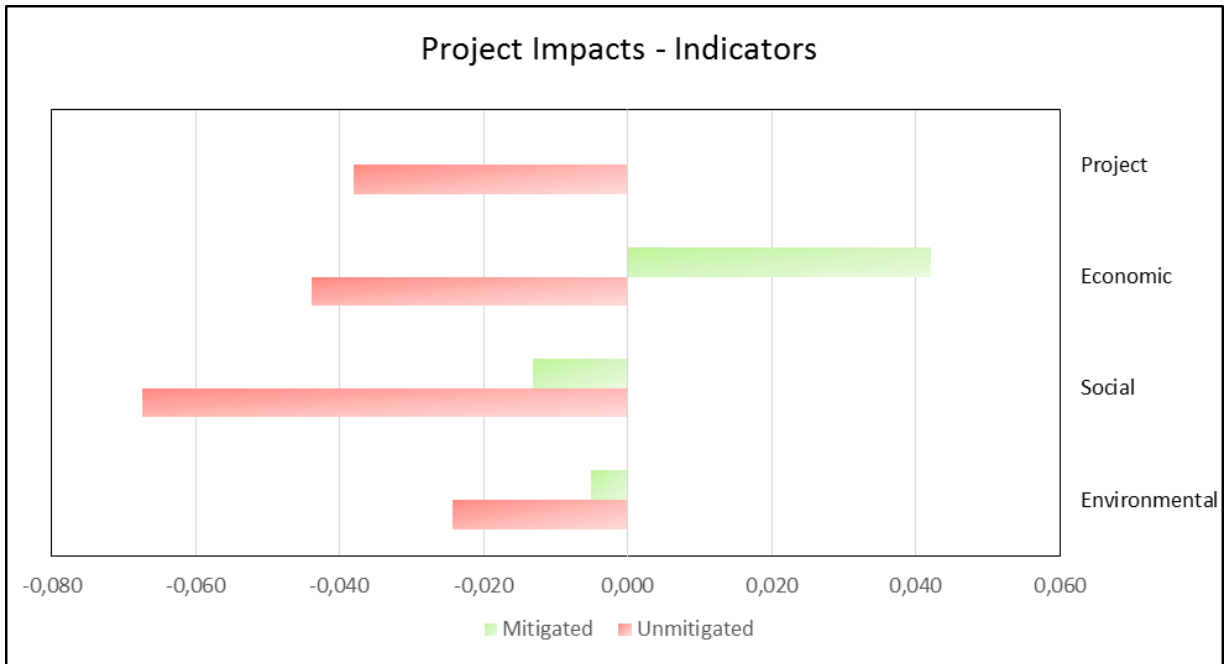
FIGURE 4: SUMMARY OF SUSTAINABILITY ANALYSIS – OVERALL PROJECT

When considering the various phases of the project as outlined in Figure 5, it is clear that there will be a negative overall mitigated impact during the construction, operational and decommissioning phases of the project. However, with the implementation of the mitigation measures as outlined in the decommissioning and closure plan included in the EMP, there will be an overall positive impact in the closure phase
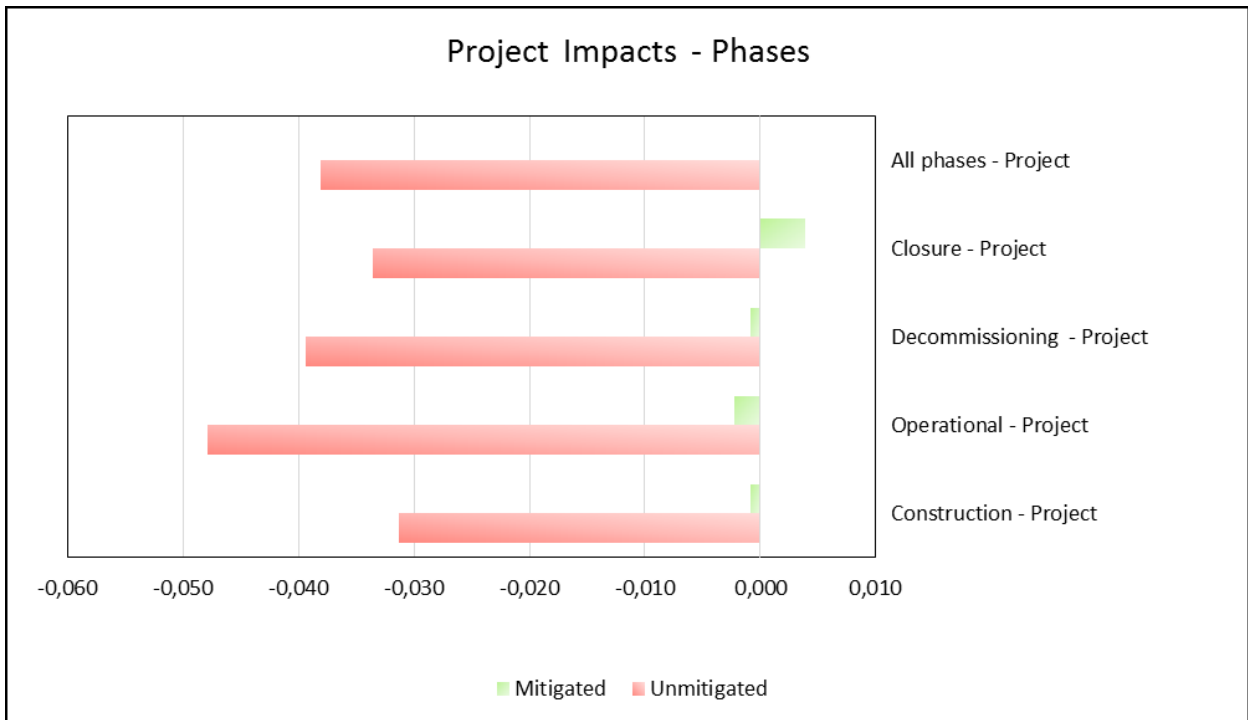

FIGURE 5: SUSTAINABILITY ANALYSIS – SUMMARY OF EACH PHASE OF THE PROJECT

It can therefore be summarised that although the overall mitigated project (all phases) will have a neutral impact on sustainability, a long term positive impact will be realised upon closure, mainly as a result of the positive economic benefit to the area.

7   ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to the economic impact assessment:

- the information supplied in relation to employment opportunities, income generation, life of mine, etc. by the client is an accurate reflection of the activities during construction, operational and closure phases of the proposed project;

- a discount factor supplied by the client was used to calculate the net present value calculations;

- information which were used in some of the agricultural calculations were sourced from third parties. Errors with this information could possible effect the results of the calculations and therefore the assessment;

- a buffer zone of 500m surrounding the impacted area was applied as a precautionary measure to ensure that the potential impacts associated with the planned project are not understated . All relevant calculations were based on this adjusted footprint, which included the buffer zone;

- the macro-economic data for this analysis was obtained from Quantec, Global Insights, Stats SA and local government websites (Integrated Development Plans and Spatial Development Framework reports). Errors with this information could possible effect the results of the calculations and therefore the assessment; and

- land values are based on average land values in the region, however the true value of the land is determined by a range of factors and will therefore most likely be higher or lower than the value used in this report.

8   MITIGATION MEASURES

To adequately minimise the negative economic and socio-economic risks and enhance the positive economic and socio-economic impacts, the mine will have to ensure the following:

- provide compensation for the permanent loss in land use and associated economic losses;

- ensure mitigation measures as outlined in EIA and EMP will be implemented;

- ensure adequate management and financial resources are made available to fully implement the mitigation measures as outlined in EIA and EMP;

- ideally develop specific socio-economic mitigation measures and corporate social investment strategies, including the plans for the establishment of light industrial activities post closure, in consultation with the relevant authorities to ensure progress towards achieving the national, provincial and local government priorities as outlined in Section 4.

9 CONCLUSION

Based on the assessment undertaken as part of this study, the proposed project is regarded as the preferred land use from a pure economic perspective.

The outcome of the sustainability analysis concluded an overall neutral impact from a sustainability perspective in the mitigated scenario. With the implementation of the mitigation measures as outlined in the decommissioning and closure plan, an overall positive impact will be realised with closure. It can therefore be argued that although the overall mitigated project (all phases) will have a neutral impact on sustainability, a long term positive impact will be realised upon closure, mainly as a result of the positive economic benefit to the area.

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References will be finalised on completion of report