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Minerals and Energy
REPUBLIC OF SOUTH AFRICA

A Strategic Framework for Implementing Sustainable Development in the South African Minerals Sector: Towards Developing Sustainable Development Policy & Meeting Reporting Commitments

Discussion Document (2nd Draft)

APRIL 2009

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Foreword

PENDING

Executive Summary

Towards the latter part of 2005, the South African Department of Minerals and Energy (DME) initiated the ***Sustainble Development through Mining (SDM)*** programme to develop a sustainable development strategy for the South African mining sector and to work towards reporting sustainble development progress to the United Nations in 2010, in terms of South Africas commitments made at the Johannesburg World Summit on Sustainable Development.

This detailed report forms an important step in articulating sustainable development conceptually in the mining sector of South Africa and to sound a call for discussion based on further work required in the mining sector.

It has articulated a proposed **vision** and a number of **strategy goals** for the programme and has illustrated the partial and ongoing attainment of these through "on the ground" **projects** which are described in summarised detail in the appendixes. As context, the report has also provided a review of, inter alia, existing initiatives and the place and linkages that this strategy fills within them.

The overarching vision that has informed and directed the development of this framework is articulated as:

> *"By 2015, the SA minerals sector is contributing optimally to sustainable development. This contribution is further articulated into a number of key strategic objectives, goals and projects leading to desired outcomes. "Optimally" is defined as the most effective, efficient and favourable contribution by the minerals and mining sector to sustainable development, taking into account the social, economic, biophysical and governance opportunities and constraints facing the South African minerals sector, as determined and endorsed either through stakeholder consensus or the majority stakeholder view".*

It has also illustrated links and synergies between sectoral and non-sectoral initiatives including, critically, the Department of Environmental and Tourism's National Strategy for Sustainable Development (NSSD), and has provided a solid platform for further linkages as this programme continues to unfold in the future. Further abbreviated and differentially targeted versions of this report will be circulated in the coming months to consolidate the effort to solicit input and buy-in from stakeholders. The critical intent of this report is to update and refine the principles of Sustainable Development in the mining sector of South Africa.

The proposed ***Key Strategic Objectives (KSO)*** of the SDM strategy are:

(i) That the South African Mining sector reflects the Sustainable Development values, principles and aspirations of the country. All stakeholders in the sector must share an SD vision based on a culture of mutual respect The vision of sustainable development in the sector must be communicated effectively to all stakeholders

(ii) To recognise that sustainable development strategy and policy must transcend both the government of the day and the requirements of the UNCSD and should be valid and appropriate across all time scales. Furthermore, that community empowerment, environmental and social rights are central and enduring tenets of the sector and that all those operating within the minerals sector earn a social license to do so.

(iii) That the Sustainable Development strategy facilitates the transition from finite resource based industries and economies to sustainable knowledge based economies and that building and accounting for social and natural capital is implicit.

(iv) That the Sustainable Development strategy promotes economic diversification in existing and future mining industries and that the minerals sector takes due cognisance of globalisation's influence on sustainable development and the consequences thereof, including the implications of trade barriers, global market forces, international agreements, requirements and conventions.

(v) That Sustainable Development Policy acknowledges the potential and realised contribution of the industry for socio-economic empowerment and that policy creates conditions to ensure the continuation of this valued contribution.

(vi) That value extraction from South Africa's minerals sector benefits vulnerable groups and value addition from South Africa's mineral resources are maximised locally

(vii) Government is empowered to facilitate sustainable development outcomes and to link to national and international sustainable development strategies and initiatives and that government, industry and other stakeholders realise the synergies achieved through effective cooperation

(viii) The Minerals Sector moves towards sustainable end states and to internalise negative costs and associated consequences and that the cumulative and life-cycle aspects of the sector are fully aligned with sustainable development principles

(ix) Aligning beneficiation strategies with appropriate national development objectives including poverty alleviation, small scale mining, environmental management, social upliftment.

The ***KEY STRATEGY GOALS*** of the SDM strategy are:

(i) Enabling South Africans to make balanced & informed decisions regarding the extraction of mineral resources & their utilisation

(ii) Enabling South Africa to measure & assess progress towards sustainable development objectives in the minerals sector (using a principles-cri.

(iii) Minimizing the impacts and risks of mineral resource development, use and management on the health & safety of South Africans

(iv) Optimising environmental management in the sector

(v) To develop and improve tools and mechanisms to ensure improved compliance in the sector & to improve regulatory capacity

(vi) Poverty alleviation & mineral resource development

(vii) Enabling SA to effectively implement the beneficiation strategy which promotes growth and competitiveness and works towards closing the gap between the 1st and 2nd economies

This document has been developed for stakeholders to encourage input and participation in finalising the proposed Sustainable Development principles by the Department of Minerals and Energy and some of the projects which will realise the goals of the programme. As the title of the document implies, it is principally a framework as it has been constructed and proposed as a first building block onto which stakeholders can fit and recommend additional or refined linkages, projects and goals. Framework implies strength and rigidity, but also a degree of openness to be filled as the framework evolves into a fully fledged Sustainable Development strategy as the sector continues operating.

Thus, the principle participatory intent of this document is threefold: (i) to request input and comment from industry and stakeholders to be part of the development of a South African minerals sector SD framework & (ii) to request that industry and stakeholders provide examples and descriptions of ongoing SD programmes, projects and initiaves to be part of this document series (these will act as examples and a demonstration of the South African minerals sector's journey to sustainability) and (iii) to form a building block for the development of sector specific Sustainable Developent policy as required by DEAT's national strategy.

This document, iterative and "living", will be updated every year and form the ulitmate reporting tool for, inter alia, the United Nations and South Africa's SD commitments.

South Africa, through the DME, is one of the first emerging markets to initiate an authority led Sustainable Development strategy for the country's mining sector and of this – together with existing laudable industry and stakeholder initiative - we can be justifiably proud. The Department of Minerals and Energy encourage all stakeholders to build on this first report and to play their part in assisting the mineral's sector in its movement towards a Sustainable Development future.

Glossary of Terms /Acronyms / Abbreviations

	AMP	African Mining Partnership
	BID	Background Information Document
	COM (SA)	Chamber of Mines South Africa
	CSMI	Centre for Sustainability in Mining and Industry
	DEAT	Department of Environmental Affairs and Tourism
	DME	Department of Minerals and Energy
	Ecocentric	An environmental /biophysical/"green" focus – an emphasis on the biophysical sphere of the SD model.
	EIR	Extractive Industries Review
	EMP	Environmental Management Programme
	EU	European Union
	GDP	Gross Domestic Product
	GMD	Global Mining Dialogue
	GMI	Global Mining Initiative
	GRI	Global Reporting Initiative
	HIV	Human Immunodeficiency Virus
	ICMM	International Council on Mining and Metals
	IDPs	Integrated Development Plans
	IGFMMMSD	Inter-governmental Forum for Mining, Minerals, Metals and Sustainable Development
	IUCN	World Conservation Union
	JPOI	Johannesburg Plan of Implementation
	JSE-SRI	A tradable social responsibility index on the Johannesburg Securities Exchange
	LED	Local Economic Development
	MDGs	Millennium Development Goals
	MHSC	Mine Health and Safety Council
	Mining Charter	Broad-based Socio-Economic Charter for the Mining Sector
	MMSD	Mining Minerals and Sustainable Development
	MPRDA, 2002	Mineral Petroleum Resources Development Act, 2002 (Act No 28 of 2002)
	NEMA, 1998	National Environmental Management Act, 1998 (Act No 107 of 1998)
	NEPAD	New Partnership for Africa's Development


	NGO	Non-Governmental Organisation
	NSSD	National Strategy for Sustainable Development
	OECD	Organisation for Economic Co-operation and Development
	REACH	Registration Evaluation and Authorisation of Chemicals
	RBTS	Resource-based Technology Strategy
	SA	South African
	SA NFSD	South Africa's National Framework for Sustainable Development
	SADC	South African Development Community
	SD	Sustainable Development
	SDM	Sustainable Development through Mining
	SDFs	Spatial Development Frameworks
	ToC	Theory of Constraints
	UNCED	United Nations Conference on Environment and Development
	UNCSD	United Nations Commission for Sustainable Development
	WBCSD	World Business Council for Sustainable Development
	WMMF	World Mines Ministries Forum
	WSSD	World Summit on Sustainable Development
	WTO	World Trade Organisation

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1. PURPOSE OF THIS DISCUSSION DOCUMENT

1.1 INTRODUCTION

This discussion document has been developed as a key deliverable in the "Sustainable Development through Mining Strategy" project component of the Department of Minerals and Energy's (DME) *Sustainable Development through Mining (SDM) Programme* – the Department's principal reporting and policy development tool for Sustainable Development (SD). *This report serves a number of purposes*, which include the following

To provide a starting point for the development of a South African minerals sector sustainable development strategy with developmental participation from stakeholders and industry

To summarise and introduce the vision, the concept of sustainable development through mining and the key objectives of the Strategic Framework for Sustainable Development project;

Provide successive draft discussion documents which will contain the main research outputs, assumptions and assertions of the framework – presented explicitly for the purpose of stakeholder debate and input. This will ultimately be consolidated into a final version of the document which will spell out the "Strategy for Sustainable Development through Mining", possible policy development and/or incentives and projects for the South African Mining sector;

Propose a specific Sustainable Development vision for the South African minerals and mining industry, key strategic objectives, goals, outcomes and projects ("actions") that underpin the initiative and to measure the degree of attainment of same (see Chapter 6)

To allow stakeholders to comment and inform the development of Sustainable Development in the SA Minerals and Mining Sector, through participation in the development of this document;

To provide a link (and additional information) to projects that have been/will be completed under the Sustainable Development Through Mining banner

To provide a platform for the publication and illustration of stakeholder and industry SD programmes, projects and initiatives which provide a positive statement of South Africa's journey to SD;

To consider and expand on relevant and appropriate components of existing sustainable development initiatives and frameworks of the mining industry and other stakeholders, and to place the DME initiative firmly at their core (e.g. the National Framework for Sustainable Development and the Chamber of Mines/ Sustainability and Transformation Report);

To facilitate discussion between relevant stakeholders and to assist the Minerals and Mining Board in advising the Minister on the development and implementation of the Sustainable Development through Mining Programme;

To form a template for reporting to the UNCSD in terms of sector contributions to Sustainable Development

To form a precursor for Sustainable Development policy for the South African Minerals Sector

NOTE ON TERMINIOLOGY: IN THIS DOCUMENT THE TERMS *"SDM STRATEGY"*, *"SDM PROGRAMME"* AND THE *"STRATEGIC FRAMEWORK"* ARE USED SOMEWHAT INTERCHANGEABLY. IN THE ESSENCE THEY ARE THE SAME WITH *STRATEGY* REFERRING TO THE INITIAL PHASES OF THIS PROJECT WHEN VISION AND OBJECTIVES WERE BEING DEVELOPED AND *PROGRAMME* REFERRING TO THE STRATEGY ROLE AS AN UMBRELLA FOR THE DIFFERENT SUSTAINABLE DEVELOPMENT PROJECTS WHICH FIT UNDER IT. *STRATEGIC FRAMEWORK* REFERS TO THE SDM STRATEGY. THESE TERMS WILL BE "TIDIED UP" IN LATER VERSIONS OF THIS DOCUMENT AND A SINGLE PHRASE ADOPTED.

The discussion document is structured into three sections described below:

- The first section provides an overview of Sustainable Development in the Minerals and Mining sector and the sustainable development challenges facing the sector.
- Secondly, the document provides information on the vision of the SDM programme, as well as the rationale and process followed in the development of this programme. It also presents the preliminary sustainability monitoring set for the Sector.
- The third section provides a broader perspective of the strategic themes in the SDM Programme, as well as information on the project and objectives of project groupings under the programme.

It is important to note that this discussion document reflects and summarises "work in progress". Notwithstanding these, the discussion document is an important and critical first step in developing Sustainable Development policy and strategy for the SA mining sector. Indeed, it is probably the first authority driven SD strategy document of its kind in the developing world and one that the DME hopes will grow from strength to strength.

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2. SUSTAINABLE DEVELOPMENT AND MINING: BACKGROUND AND SITUATIONAL ANALYSIS

2.1 The South African Mining Sector: Background

The Chamber of Mines (CoM) of South Arica provides accurate and contemporary data on the country's mineral's landscape – it is beyond the scope of this report to repeat and provide detailed summary of much of that information here. In the short summary which follows, this report draws on three publications, two from the Chamber of Mines; (a summary of facts and figures on the South African mining sector[42] and the organisation's annual report[43]) and the SAMI publication (2007)[44] from the Minerals Economic Directorate of the Department of Minerals and Energy.

After more than a century of mining activities in South Africa, the country remains one of the most geologically and mineral rich regions in the world. South Africa boasts more than half of the world's reserves of manganese, chromium and platinum group metals. In addition, it has 40% or more of the world's vanadium, gold and vermiculite reserves[25]. The country's mineral legacy is reflected in robust production statistics, the continual emergence of new mining investments, a dynamic mining supplies and services sector, and globally prominent firms.

South Africa's mineral industry, largely supported by gold, diamond, coal and platinum group metals production, has made an important contribution to the national economy. It has provided the impetus for the development of an extensive and efficient physical infrastructure and has contributed greatly to the establishment of the country's secondary industries. The mineral industry is a well-established and resourceful sector of the economy, has a high degree of technical expertise and the ability to mobilize capital for new development. Mining is South Africa's largest industry in the primary economic sector, followed by agriculture. Other sectors that contribute significantly to the country's economy are: manufacturing, electricity, building and construction. The wholesale, retail, tourism, financial services, information and communications sectors also continue to show significant growth.[44]

South Africa is a leading world supplier of a range of minerals and mineral products of consistently high quality. In 2006, some 53 different minerals were produced from 1 212 mines and quarries, of which 47 produced gold, 33 produced platinum-group minerals, 89 produced coal and 240 produced diamonds, all as primary commodities. There was a significant increase of 99 mines from 2005 in the number of operating mines and quarries recorded by the Department of Minerals and Energy (DME), which can be attributed to the improvement in the quality of data from the mining industry and expansions in the mining industry encouraged by the provisions of the Minerals and Petroleum Resources Development Act of 2002[44].

South Africa is ranked seventh in the world's exploration spending during 2006, accounting for 4 percent of total world exploration budget compared with Canada's and Australia's 19 and 11 percent, respectively (ranking 1st and 2nd). South Africa's exploration expenditure has been on the increase since 2002; a total of R3, 325 billion was spent over the last three years (2003-2005)

of which R1218.4 billion was spent in 2003, R1,265 billion in 2004 and R1,239 billion in 2005. A total amount of R1,936 billion was spent in 2006.

2.2 SA Mining Sector – Status

Mining continues to be South Africa's principle earner of foreign exchange, although levels of earning are declining. During the 1990s, mining directly generated 41 per cent of total exports, approximately the same as the fast-growing manufactured exports sector. In 1997 the value of mineral exports was R51 billion. In that year, for the first time possibly since the start of the 20th century, non-gold mineral exports (at R27 billion) exceeded the value of gold exports, a testimony to the resilience and growth of the non-gold sector. Gold, with exports valued at R25 billion, was responsible for one-sixth of South Africa's export earnings[25]. Following a number of years of stabilisation and decline in investment (most notably 2004 and 2005), its is encouraging, as the CoM[42] puts it, that fixed investment in the sector as improved by almost 15% in 2006.

The South African mining sector began to recover in late 2006 and first half of 2007. Higher dollar prices and a slightly weaker exchange rate translated into a 34.3% increase in the value of mineral sales to R195.6-billion in 2006. Real fixed investment improved by 14.8% to R14.2-billion. Unfortunately, the improvement in investment was insufficient to compensate for the declines that had taken place in 2004 and 2005 with the result that production fell by 1.5% in 2006. The increase in mining investment was particularly clear in the second half of 2006 and had its genesis in the weaker rand exchange rate coupled with high-level engagement between government, labour and industry on ways to address regulatory and infrastructural constraints.[43]

The South African mining sector makes a number of positive contributions to the country's economy – succinctly summarised by the Chamber of Mines[43] (2006) as:

- accounting for 7% of gross domestic product (GDP) directly, although the indirect multiplier effects take the contribution to about 18.4% of GDP in total. The industry's contribution to GDP fell by 0.7% mainly because of the declines in investment recorded in 2004 and 2005, which manifested in lower overall mining production in 2006. The indirect multipliers include backward linkages (e.g. transport, professional services, etc.), forward linkages (e.g. electricity generation) and the induced effect via mining generated incomes
- directly accounted for 6.5% of total fixed investment and for 9.1% of the total private sector investment versus 6.3% and 8.7% respectively in 2005. If the multiplier effect is taken into account, mining helped generate about 16% of total investment in the economy. The reason for the rise in the contribution of mining is the encouraging recovery in real mining invest- ment that grew by 14.5% in 2006 following declines of 20% in 2004 and 13.2% in 2005
- continues to act as a magnet for investment in South Africa. As at 29 December 2006 the mining sector accounted for R1.6- trillion, or 31.2%, of the value of the Johannesburg Securities Exchange. About R15.6-billion was paid to investors in the form of dividends. The mining sector contributed substantially to the JSE being ranked in the top 20 stock exchanges world-wide
- contributed R140-billion to South African exports, representing 32.3% of the country's total merchandise exports and accounting for 25.2% of the country's total foreign exchange earnings. If beneficiated minerals are added to primary minerals (e.g. ferro-alloys, steel,

chemicals, catalytic converters), then the sector accounts for just over 50% of merchandise exports

In terms of foreign exchange earnings per unit of GDP, mining generates the most foreign exchange of the economy

concluded R24-billion worth of empowerment deals, making the resources sector the largest contributor to black economic empowerment (BEE) deals by value for the second year in a row according to Business Map (around R21-billion in BEE deals were concluded in 2005). Over the past 11 years a total of R91-billion worth of empowerment deals have been concluded in the resources sector making it the largest contributor to empowerment by value (versus financial services, which has concluded R61-billion in deals thus far)

moved about 100 million tons of bulk commodity ores for export on the rail system and thus was the dominant user of the country's railways and ports. The 100 million tons of bulk commodity exports represents 54% of the whole of Transnet's volume of transport in 2006

directly employed an average of 458 600 workers in 2006, against 444 132 in 2005. It is estimated that another 152 800 workers are employed in associated industries that either supply products to, or use products from the mining industry. Around five million people are directly dependent for their daily subsistence on mine employees

accounted for 6.3% of those employed in the non-agricultural formal sector of the economy and 8.1% of the total private sector of non-agricultural employment in 2006. If the multiplier and induced effects of the industry are used, the contribution to employment as a result of mining rises to about 20% of total non-agricultural formal sector employment in South Africa

paid R40-billion in wages and benefits to employees, which accounted for about 5.4% of the total compensation paid to all employed people in the country in 2006. This contributed substantially to domestic demand in the economy

paid R16.2-billion in direct taxes and a major portion of indirect taxes to the fiscus in 2006. Mining direct taxes accounted for about 12.4% of total company tax (and secondary tax on companies) paid to government

was the world's largest producer of platinum group metals (pgms), gold, chromium, ferrochrome, vanadium, manganese and vermiculite. The industry was also a major supplier of aluminium (world rank 9), antimony (7), coal (5), ferromanganese (4), ferrosilicon (6), iron ore (7), manganese ore (2), nickel (9), phosphate rock (10), silicon (8), titanium minerals (2), uranium (11) and zirconium (2)

accounted for a substantial amount of the supply and demand for energy. The industry consumed 31 800 gigawatt hours – 15.3% of Eskom's local electricity sales, whilst 112 million tons of coal was mined and used for electricity generation, which accounted for about 93% of the electricity produced in the country. The mining industry used about 762 million litres of diesel in 2006, or 9% of the total amount of diesel used in the country in that year. About 43.7 million tons of coal was first mined and then used in the manufacture of synthetic fuels and accounted for about 37 % of local liquid fuel supply. This represents an annual saving of foreign exchange of more than R30-billion annually

Additional important references/resources for historical, contextual and statistical information on the sector can be found at:

- *http://www.bullion.org.za/Publications/Facts&Figures2006/F&F2006.pdf*
- *http://www.bullion.org.za/Publications/Annual2007/AnRep2007.pdf*
- *http://www.dme.gov.za/pdfs/minerals/SAMI%202006_2007.pdf*

2.2.1 A brief consideration of contemporary challenges faced by the sector

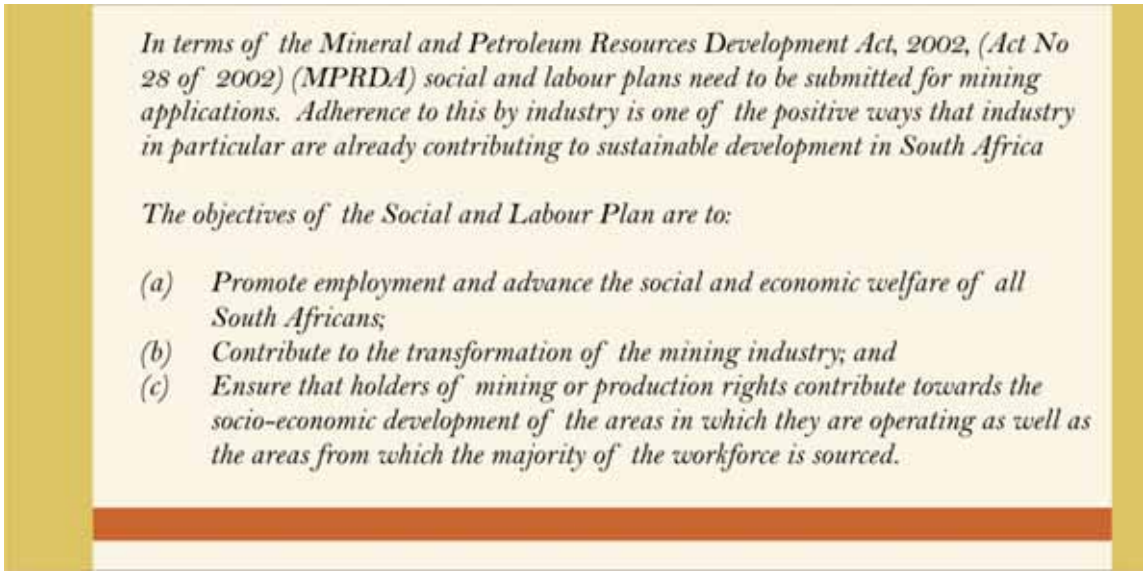
Sustainable Development challenges in the SA Mining sector are multifold. Contemporary global and country specific concerns such as global warming and energy supply (and cost) are well within the public eye. *The 2008/2009 economic downturn is likely to have a significant impact on mining in South Africa and (at least) its short term financial sustainability*. Major players have already indicated (December 2008) very significant reductions in planned capital spending[a]. Other challenges such as mine closure are perhaps less well known - although well documented and regulated, the issue of sustainable mine closure is an appropriate example of such a challenge. As an example, a comprehensive and appropriate authority/regulatory driven and proposed SD strategy, policy and guidance in respect of sustainable mine closure has been largely absent in the country.

There are a number of Sustainable Development challenges in the sector and solutions are much needed, not least to meet international and local reporting commitments and imperatives, but also to match, compliment and ensure implementation of laudable SD initiatives, largely industry driven and initiated, which have taken and continue to take place (the South African Chamber of Mines is an appropriate example here)..

It is important that this document and its aims and objectives are long term, and not focussed solely on addressing short term sustainable development objectives

Mining continues to be, and will continue to be for the foreseeable future, a very significant contributor to the South African economy. Operationally, there are also a number of pressing Sustainable Development issues and constraints in the sector that need to be addressed if we are to ensure that the sector operates and is regulated more appropriately than it has been to date. The Sustainable Development challenges are numerous, and some other examples include the fact that the developmental needs of industry are often not (yet should be) interlinked with regional and local community needs. For instance, integration of the mining social and labour plans must, in terms of the MPRDA 2002 and its supporting Regulations, fall in line with the municipal Integrated Development Plans (IDPs), Spatial Development Frameworks (SDF), Local Economic Development Plans (LED) amongst others.

[a] In December 2008 Anglo American announced plans to cut capital spending by approximately US$4bn. Credit Suisse reports (http://www.telegraph.co.uk/finance/newsbysector/industry/mining/3659184/Anglo-to-slash-capital-spending.html) that mining companies may defer $50bn worth of development projects – or two thirds of 2009's spending plans – for a year, as credit remains tight and commodity prices continue to weaken.



In terms of the Mineral and Petroleum Resources Development Act, 2002, (Act No 28 of 2002) (MPRDA) social and labour plans need to be submitted for mining applications. Adherence to this by industry is one of the positive ways that industry in particular are already contributing to sustainable development in South Africa

The objectives of the Social and Labour Plan are to:

(a) Promote employment and advance the social and economic welfare of all South Africans;
(b) Contribute to the transformation of the mining industry; and
(c) Ensure that holders of mining or production rights contribute towards the socio-economic development of the areas in which they are operating as well as the areas from which the majority of the workforce is sourced.

The above is provided as an example of a situational problem within Sustainable Development in the minerals sector, and an example of one of many drivers initiating and informing the SDM programme and this document series. More clarity will emerge as a consequence of the process being undertaken in, specifically, later revisions of this discussion document.

2.2.2 The Chamber of Mines (CoM) response to sustainability challenges

In many respects the South African Chamber of Mines has lead the private sector's sustainability journey and provides a contemporary touchstone for the organisation's members for sustainable development issues. Sustainable Development enjoys a prominent position in its Annual Report (2007)[b] which asserts:

> The Chamber subscribes to the sustainable development definition of the 1987 Brundtland Report, namely, development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Chamber believes that mining can make a sustainable contribution to the development of a nation, a region and the world. The Chamber actively engages both locally and internationally in programmes aimed at achieving sustainable development through mining and promoting responsible mining.

The CoM is also the key engagement mechanism between the public and private sector. The CoM, a member of the ICMM[c], has provided a critical Sustainable Development assessment in its 2007 *The South African Mining Industry's Sustainability and Transformation Report* which is an essential resource for those wanting to understand how the CoM is leading the private mining sector's sustainability journey. (In addition, considerable additional detail is provided in this document around many CoM sustainable development challenges & initiatives). By way of summary, a key

[b] http://www.bullion.org.za/Publications/Annual2007/AnRep2007.pdf
[c] A mining industry association that promotes sustainable development through mining (elaborated on elsewhere in this document).

assessment from this report[d] is reproduced below which summarises the South African mining industry's performance in respect of sustainability and transformation.

Indicator	Objective/benchmark	Progress 2005	2006	Completeness of information[1]
Transformation				
Procured goods and services from BEE owned, controlled or influenced companies (%)		Not available	35%	70%
Women in mining (%)	10% by 2009	3.5%	4.1%	100% (DME)
HDSA in management (%)	40% by 2009	Not available	28%	75%
Housing				Insufficient quantitative information
ABET	6 869 per year	1 530	3 361	100% MQA
Learnerships/apprenticeships	800 per year	1 078	1 137	100% MQA
Environment				
Energy efficiency	By 2014 15% reduction from 2004			Insufficient quantitative information
Health: Occupational				
Dust samples > limit (%)	< 5% by 2008	6.4%	6%	55%
Silicosis (cases)	0 from 2013	1 411	1 597	65%
Noise Induced Hearing Loss cases	0 from 2008	2 551	2 103	70%
Health: HIV/AIDS				
Voluntary counselling and testing (VCT) employees attended	100% by 2011	49%	60%	55%
HIV+ employees on wellness programme	100% by 2011	29%	32%	70%
HIV+ employees on ART	80% by 2011	10%	14%	60%
Safety				
Fatality frequency rate (av. % reduction since 2003)	20% reduction per year	13%	12%	100% (DME)

[1] The extent to which the information is representative of the whole mining industry (as measured by percentage of total employment)

Key:

Green = on target

Yellow = progress

Red = no progress/information

[d] www.bullion.org.za/Departments/SafetySusDevl/Downloads/SDRtext07.pdf

General Sustainable Development background and definition

The Brundtland Commission's definition of Sustainable Development states: "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their needs[1]". The concept can be seen as a process of continually striving for a dynamic balance between people, planet and prosperity through:

Using and protecting the physical and natural environment and resources, by ensuring equitable and sustainable use of natural resources now and in future;

Creating equitable and viable economic systems with an ethical basis by ensuring economic growth with greater equity and self-reliance; and

Acknowledging and guiding social and cultural systems and values towards greater equity, responsibility and human well being by improving health, income and living conditions of the poor majority.

The model described above is a classical model of SD. Work in recent years has centered on building on this model and taking it further and this is elaborated on in Section 3. The Sustainable Development model proposed for the purposes of the SDM programme is an amalgam (dialectic) between that adopted by DEAT in its draft framework report[41] (critically important in that the SDM framework sits "under" DEAT's initiative) and the five capitals model (see Figure 1). Further elaboration is provided in Section 3.

Figure 1: A Sustainable Development model proposed for the SA mining sector. Bi-directional capital flow between the spheres and exemplar divisions in the diagram is implicit and not marked. The "convergence point" denoted by the red oval is the area in which the SDM programme aims to operate.

2.3 Initial Emergences of Sustainable Development in the SA mining sector

Limpitlaw *et al*[23] summarise that the SD issues became most notably prominent during the First Round Table Conference on Mining and Environment, held in Berlin in June 1991, shortly before the Earth Summit in Rio de Janeiro in 1992.

Most recently, strategy planning around sustainable development has been either guided or influenced by the outcomes of the World Summit on Sustainable Development (WSSD, Johannesburg, 2002). These outcomes were influenced over a period of time by several high level initiatives and detailed information on these developments can be accessed elsewhere. What is relevant is that earlier initiatives and influences such as Agenda 21 (resulting from the UN Conference on Environment and Development, Rio de Janeiro, 1992) did not specifically address minerals or mining related matters.

As a result these issues were not initially included in the UN's Commission on Sustainable Development (CSD). This changed when the 8th session of the CSD listed "minerals, metals and rehabilitation in the context of sustainable development" as a priority for future endeavours. The WSSD brought worldwide consideration of sustainable development issues to the fore and also resulted in recognition that mining and related sectors had a potentially significant contribution to make towards achieving sustainable development, particularly when considering linkages and flows between developing and developed countries.

Details on historical and contemporary Sustainable Development initiatives (principally industry led) are provided in the boxes overleaf.

Limpitlaw[7] provides a useful historical summary of (largely completed) appropriate and key Sustainable Development initiatives that have taken place around mining.

The EIR (Extractive Industries Review): a World Bank review of its investment in mining that focussed on community and environmental issues. It was critical of the possible contribution of mining to SD and recommended no further World Bank investment in certain extractive projects, such as coal mining.

The MMSD – an industry initiated project to scope the potential contribution of mining to sustainable development globally. This report and the derivation of strategic direction contained herein use this report and its contents to a large degree.

The GRI – an organisation promoting uniformity and completeness in SD reporting. It is not restricted to the minerals sector, but has developed a "minerals sector supplement" that proposes certain appropriate high level indicators for the minerals sector.

ICMM (International Council on Mining & Metals) – an industry association originating in the same initiative as the MMSD. The ICMM has provided a collective platform for addressing several key issues, notably protection of biodiversity, mining in protected areas, social impacts and management of health and safety in the sector. Its members are largely multinational companies.

The ICMM-IUCN dialogue on protected areas.

JSE-SRI – a tradeable social responsibility index on the Johannesburg Securities Exchange, created to help investors to distinguish between companies on the basis of their triple bottom line performance.

The South African Mineral and Petroleum Resources Development Act, 2002 and the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry (referred to as the Mining Charter) has been developed in accordance with section 100(2)(a) of the MPDRA, 2002. It establishes a framework, targets and a time-table for effecting the entry of historically disadvantaged South Africans into the mining industry.

A number of more active contemporary, industry led national and international Sustainable Development initiatives are currently underway – examples of these include (see box overleaf):

EXAMPLES OF CONTEMPORARY SUSTAINABLE DEVELOPMENT INITIATIVES

- South African Cyanide Guideline for Gold Mining- a voluntary initiative by the gold mining industry (through the CoM) aimed at improving its management of cyanide, reducing risks to personnel; members of the public and the environment resulting from the industry's use of cyanide. (http://commdev.org/content/document/detail/727/)
- The Extractive Industries Transparency Initiative – an initiative which aiming to strengthen governance by improving transparency and accountability in the extractives sector. (http://eitransparency.org/)
- ICMM's Resource Endowment Initiative – seeks to identify circumstances in which positive socio-economic outcomes can flow from minerals endowments, thus avoiding the "resoiurce curse". (http://www.icmm.com/page/2097/resource-endowment-initiative-phase-3-update)
- The RJC - The Responsible Jewellery Council is an international not-for-profit organisation representing over 80 member companies across the gold and diamond jewellery supply chain. RJC Members are committed to promoting responsible ethical, human rights, social and environmental practices in a transparent and accountable manner throughout the industry from mine to retail. Their commitment aims to reinforce consumer and stakeholder confidence in diamond and gold jewellery products. (http://www.responsiblejewellery.com/)
- The UN Global Compact – a strategic policy initiative for businesses committed to aligning their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption. By doing so, business, as a primary agent driving globalization, can help ensure that markets, commerce, technology and finance advance in ways that benefit economies and societies everywhere. (http://www.unglobalcompact.org/AboutTheGC/index.html)
- The E3 programme – promotes the advancement of environmental stewardship in the exploration stage of mineral development worldwide. It aims to provide rapid access to the most up to date information, in the most accessible multi-media formats, for the purpose of encouraging the implementation of sound environmental management practices by the exploration community, its contractors and sub-contractors. (www.e3mining.com)

2.3.1 The National Context: The South African Mining Sector & responses to existing Sustainable Development initiatives

The South African minerals and mining sector, has in recent years, responded largely positively in principle to sustainability challenges. This response has been slightly skewed, however, with the majority of emphasis on responding to sustainability prerogatives, challenges and developing sustainable development frameworks coming from established industry[17;18;19] and

consultantancies[14;15;16]. Much positive work has been done in this realm, most notably starting with the highly accredited MMSD project[13], and continuing through the work of the Chamber of Mines[20;21] and the CSMI[22;23] (Centre for Sustainability in Mining and Industry). A number of other industry initiatives are summarized in the box on the preceding page.

Specific sustainability "work" by NGO's, communities and small-scale miners is less well reported but the argument can be made that these organisations, by their very nature and mandate, have sustainability agendas[e].

The South African Government, under the leadership of the Departmet of Environmental Affairs and Tourism (DEAT), has also recently published a National Strategy for Sustainable Development[f] for public comment and the DME has initiated the development of a Programme for Sustainable Development through Mining (SDM). **Critically, DEAT's strategy calls for the development of sector specific strategies and actions.**

2.4 The National Sustainable Development landscape and the mining sector's role in it

2.4.1 National Satretgy for Sustainable Development[e]

The team responsible for developing this strategy document has provided comprehensive comment and opinion on the NSSD and its predecessor the National Framework for Sustainable Development. Thus, Sustainable Development in the mining sector and its critical linkage with NSSD has been recognised and the necessary integration will be implemented. A critical aspect to remember when considering the effective and productive interplay between the two is that the **NSSD is a non sector based framework** and only speaks of SD at a broad, national level, effectively setting the stage for sector based strategy, with this document being the beginning of one such sector specific strategy.

The NSSD does not generally speak in terms of specifics, rather it articulates broad, high level principles of SD and places them within a South African context. The DME strategy is designed to enlarge on and detail the principles that the NSSD proposes.

2.4.1.1 The Historical Mining Environment and its Affect on National Sustainable Development.

What sort of potential negative effects could mining have that a strategy such as the NSSD and SDM may to seek to offset? A few examples are provided below:

Mining tends to attract labour from afar resulting in haphazard settlements in mining towns or areas adjacent thereto.

[e] These "smaller" organisations (stakeholders in the South African mining sector) are considered in the context of this report to be part of the sustainability debate and agenda and the consideration and inculcation (as appropriate) of their central mission(s) into the sector's sustainability fabric is a key, implicit SDM objective. These "smaller" organisations were extensively canvassed during the stakeholder consultation portion of this work, and one of the main aims of the circulation of this report is to elicit further formal articulated positions on SD and "what it means to them."

[f] http://www.environment.gov.za//nssd_2005/background_docs/08%20JULY%202008%20NFSD.pdf

Mining has also historically contributed to social and health impacts such as increasing the risk of contracting and spreading HIV/AIDS due to single sex living arrangements e.g. hostel dwelling.

Mining has not often necessarily contributed significantly to rural development in 'labour migratory areas', although this does not undermine its contribution to income and improved quality of life for families whose members are employed by the mines.

Due to its extractive nature, mining can lead to negative impacts on the environment such as land degradation, water & air quality deterioration.

Mining has not always resulted in appropriate economic benefits and spin-offs for rural communities, although legislation such as the MPRDA and the introduction of ancillary Social and Labour Plans seek to address some of these concerns[29].

South Africa has a significant second economy and efforts need to continue to bridge the gap between the rich and the poor.

Local municipalities are largely under-resourced and lack capacity.

More information?

LINKS

1 Linking this strategy to DEATs NSSD
2. Linking the DME's sustainability mandate with NEPAD, AMP and others
3. Non-sectoral sustainable development initiatives

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3. THE SUSTAINABLE DEVELOPMENT THROUGH MINING PROGRAMME: AIMING FOR BALANCE

3.1 Programme Background

Following on from the World Summit on Sustainable Development (WSSD) in 2002, the Department of Minerals and Energy (DME) initiated a programme to develop a national strategic framework to guide the mining and minerals sector in South Africa towards Sustainable Development. This Sustainable Development through Mining (SDM) Programme embraces initiatives and policies emanating from the United Nations Johannesburg Plan of Implementation (JPOI), the UN Global Impact, the Mineral and Petroleum Resources Development Act (MPRDA), the Business Charter for Sustainable Development (BCSD) and the Mining, Minerals and Sustainable Development Initiative (MMSDI) among others.

As stated previously, the classic definition of Sustainable Development is – "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs". The DME has integrated this philosophy through the articulation of its vision of the SDM Programme which states "by 2015 the SA mining sector will contribute optimally to sustainable development". From 2010 to 2011 the UNCSD progress reporting will specifically focus on "Mining" and "Waste Management". However, during 2006-2007 and 2008-2009, UNCSD reporting will focus on cross-cutting issues which relate to mining i.e. air pollution, climate change, sustainable development for Africa and rural development.

The overall aim of the DME is to ensure that the extraction of mineral and petroleum resources in South Africa contribute optimally to sustainable development, and to prevent or minimise the negative impacts of prospecting and mining through the development and implementation of policies, legislation, strategies and programmes.

Some of the specific intentions outlined by the DME in pursuit of its vision are:

To develop a common vision for sustainable development through mining among stakeholders

To create a strategic framework for sustainable development through mining in South Africa and to develop a monitoring system to measure the effectiveness of the sector's contribution to sustainable development in South Africa

To identify and prioritise derelict and ownerless mines for rehabilitation through the development of a framework to deal them

Develop effective measures and systems to strengthen sustainability governance that will prevent future derelict and ownerless mines

To facilitate capacity building (within regulatory bodies specifically), community projects as well as the promotion of women in mining

LINK 4 Linking JPOI and other initiatives to the SDM Programme

A model for creating a Strategic Framework for Sustainable Development in the Minerals and Mining Sector

The classical vision of SD as it lies at the nexus of biophysical, social and economic realms and is supported within a framework of good governance, is presented in Figure 2 below,

Sustainable Development, the understanding thereof and the move towards more sustainable practices within the minerals and mining sector, has been historically characterised by an ecocentric focus, where a disproportionate amount of emphasis has been placed on "righting" the biophysical impacts of mining. This is understandable and is, in some sense, logical because sustainable development had its birth within the environmental movement. Without diminishing or underemphasising the need for action in the biophysical sphere, there is broad consensus that in order for mining to be practiced more sustainably, actions and interventions in the social, economic and governance realms must concurrently take place.

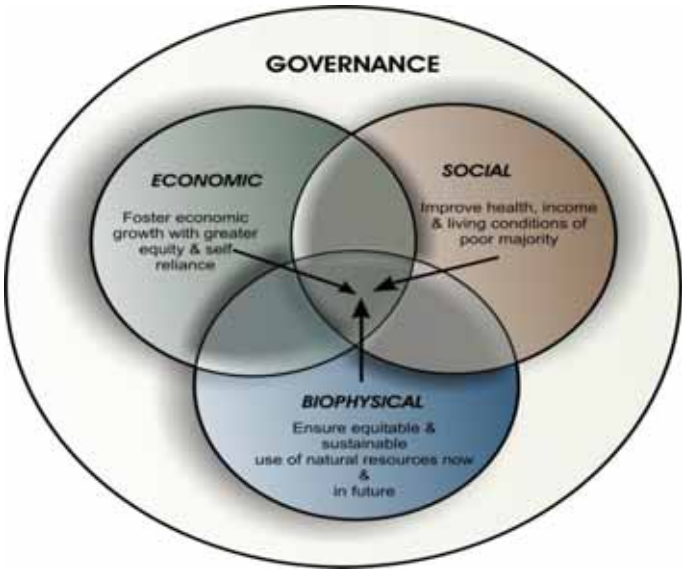

Figure 2: The classical concept of sustainable development – its trifocal spheres and the supporting "matrix" of good governance

Existing and contextual models for understanding Sustainable Development in the SA Mining sector

Two models of sustainable development are presented here to provide the broad readership of this report with an introduction to the concept and specifically how it pertains to the SA mining sector. This information is provide mainly for context reasons, in support of the proposed model for SD as presented in Figure 1 earlier on in the report. A detailed consideration of these concepts, although appropriate, is beyond the scope of this report.

Looking at these concepts from an overview perspective, they both speak of a "desired" end state and a form of balance (as opposed to equality) that will denote a more sustainable (yet dynamic) system. The trifocal model is more generic and proposes the need for parity of effort in fostering economic growth, use of resources and improvement of living conditions all under effective and just governance. Applying the trifocal model to the mining sector, it becomes easy to see how the sector "operates" (or has an effect) in all three spheres. For instance, while the economic benefits and growth associated with the sector is obvious; it also has influence in the other spheres by improving (or negatively affecting) social and biophysical conditions.

The five capitals model articulates a slightly different view as it focuses on the creation, transformation and flow of "capital" between and within environmental, societal and economic realms and a sustainable state. The mining and minerals sector creates economic capital (from the sale of beneficiated gold for instance) and has a direct relationship with the transformation of natural capital (e.g. the disturbance and rehabilitation of land) & societal capital in order to achieve this. The 5 capitals model is slightly more complex as it considers further delineations between manufactured capital and financial capital (within economic capital) - as an example - and the flows between these subsets. Further detail and delineations are provided in Figure 6.

In order for the SA minerals and mining sector to therefore contribute optimally to sustainable development, a broad framework is needed with guiding principles. The absence of a strategic framework can lead to a short term reactive focus on current problems (such as acid mine drainage in sensitive areas and mine closure priorities) without a clear, longer term, broad strategic response to sustainable development imperatives. While a focus on contemporary issues and problems is vital for the DME, there is a definite need to take a strategic view of the sector, into the future, in order to enhance its contribution to sustainable development.

DEAT's SD model (as envisioned in their national Sustainable Development discussion documents) emphasises governance as a key supportive element of Sustainable Development, this is an aspect underemphasised in the trifocal and 5 capital models. As such, the model proposed for the SDM (Figure 1) project takes DEAT's sustainable development model (Figure 4) and overlays the key principles of the trifocal and 5 capitals models to form an optimised amalgam appropriate for the minerals sector.

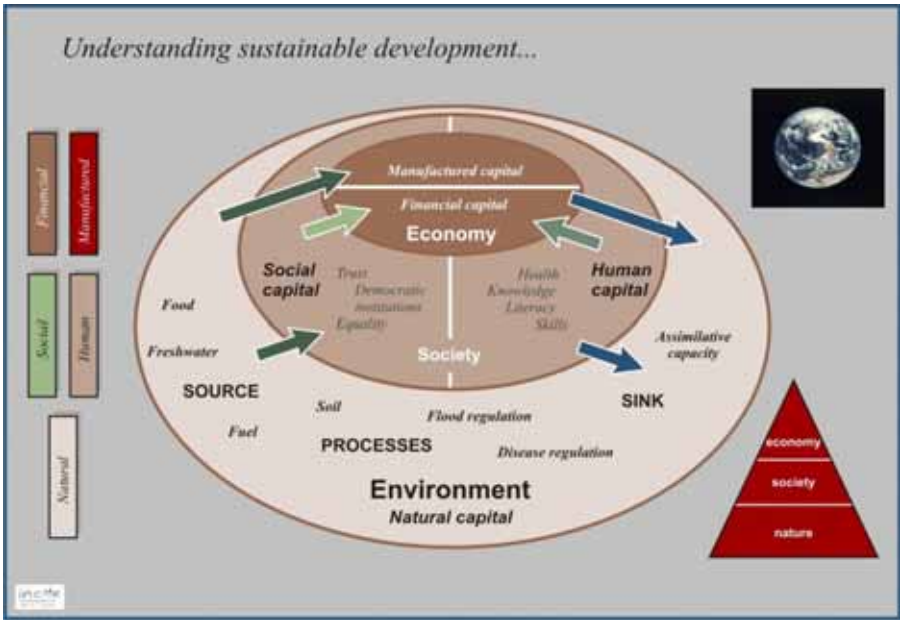

Figure 3: A visualization of the 5 capitals model. (Source: Incite Sustainability)[31]

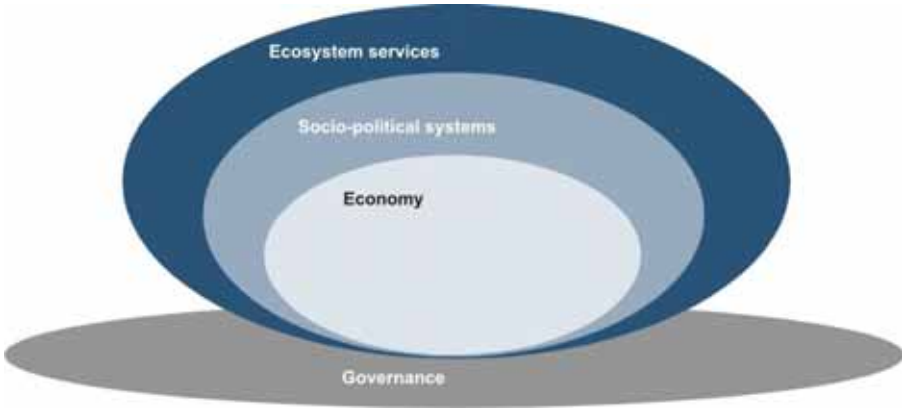

Figure 4: DEATs SD model, as depicted in discussion documents around the NSSD[41].

The overall intent of the SDM Programme is to move from this unbalanced picture to a more inclusive one where social, economic, biophysical and governance actions move the sector towards balance. Defining and motivating the need for this move towards balance is a central theme of this document and provides detail on the existing conditions of the mining and minerals sector in SA

3.2 The Strategic Framework for Sustainable Development in the Mining and Minerals sector.

The framework aims to achieve a vision and pathway for the mining sector to contribute optimally to sustainable development - this framework aims to identify and provide direction regarding, amongst others:

Institutional structures (at government and business sector level)

Policy, planning and legal aspects

Competency and capacity building

Financial resources

Research priorities

Infrastructure & technology requirements

Monitoring, evaluation & reporting

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4. DEVELOPING THE SUSTAINABLE DEVELOPMENT STRATEGIC FRAMEWORK

4.1 Why a strategic framework?

The absence of a strategic framework could lead to a short term reactive focus on immediate problems without a clear, longer term, broad strategic response to sustainable development imperatives. While a focus on contemporary issues and problems is vital for the DME and the sector as a whole, there is a definite need to take a long-term strategic view of the sector in order to enhance its contribution to sustainable development.

Sustainable Development, in this context, is a broad concept, encompassing amongst others, the full minerals resource value chain, expectations of a range of stakeholders and complex regulatory environments. Achieving the vision of sustainable development, therefore, needs to be guided by a framework to ensure synergy between stakeholder efforts and directed progress in this regard.

With a broadly supported vision in place, the approach that will be adopted in developing the strategic framework will be to identify key obstacles to achieving the vision and to develop strategies and plans to overcome these obstacles.

The overarching ambition of the strategic framework will be to ultimately, through scoping, research, pre-implementation and implementation project phases, give effect to the fulfillment of the DME's commitments in terms of the Johannesburg Plan of Implementation (JPOI)).

4.2 Approach

The approach adopted in developing and proposing this strategy takes into consideration the various initiatives that are taking place, or have taken place, around sustainable development in the mining industry. Some of these are, the Mining Minerals and Sustainable Development (MMSD) project, the International Council on Mining and Metals (ICMM) principles on sustainable development, Global Reporting Initiative (GRI), the African Mining Partnership (AMP) and the Global Mining Dialogue (now the Intergovernmental Forum on Mining Minerals Metals and Sustainable Development (IFMMMSD).

It moves from these as base and considers the drivers of development in the country to ensure alignment with them. Examples such as these are the Millennium Development Goals (MDGs) and the contribution to the 6% national growth target by 2014.

Critically, the approach adopted looks at some of the international milestones such as the World Summit on Sustainable Development's Johannesburg Plan of Implementation which has set specific targets for the minerals industry to report on, as well as the National Framework for Sustainable Development (NFSD).

4.2.1 Consultation

4.2.1.1 Introduction

Initial, high level consultation among a representative sample of stakeholders who constituted interested and affected parties within the minerals industry for example government departments, the mining industry, non governmental organisations, financial institutions took place. This was undertaken largely to understand existing initiatives with regard to sustainable development within the specific industries and sub-sectors, as well as to understand constraints to achieving sustainable development, as perceived and experienced by active stakeholders in the minerals sector.

A statutory SD Committee has been established by the Minerals and Mining Development Board to, *inter alia*:

- Assist the Board in advising the Minister on the development and implementation of the Sustainable Development through Mining (SDM) Programme;
- Positively engage all stakeholders as well as other interested and affected parties to participate in and contribute individually and collectively to the SDM Programme;
- Take specific actions, develop projects with deliverables and targets, and to integrate existing projects/actions; and
- Facilitate effective reporting to the UNCSD and to place SD high on the agenda.

It must be stressed that this initial consultation formed a beginning for this discussion document and is very much still ongoing – the rounds of consultation and interviews that formed the initial stages of the development of this document were intended merely to initiate the process. Subsequent consultation will take place for further development of this strategy and, critically, its movement towards policy. In addition, consultation will take place around the appropriate set of indicators required to monitor the mineral sector's sustainability journey.

In parallel with the specialist studies, limited stakeholder consultation was undertaken to understand and extract additional perspectives on what constitutes constraints in the sector. This section presents, in highly summarised format, the results of this exercise. Input from the circulation of this discussion document will add to this information to provide a more complete picture of constraints and SD challenges in the sector, and to inform the development of the SD strategy going forward.

4.2.1.2 Applying the Theory of Constraints (ToC) Methodology

Background to the ToC

Since its roots 20 years ago as a manufacturing scheduling method, the Theory of Constraints (TOC) methodology has now developed into a systems methodology that links elements of both soft and hard system methods. The development of "Theory of Constraints" is credited to Dr Eliyahu M. Goldratt.[8-11]

The TOC has evolved over the past 20 years from a production scheduling technique to a systems methodology which is primarily concerned with managing change. Originally it was developed to devise a systematic approach to identifying what was preventing a company or organisation from achieving its goals. The theory of constraints methodology strives to ensure that any changes undertaken as part of an ongoing process of improvement will benefit the system as a whole, rather than just part of the system. At its most basic level, TOC provides a set of tools that guide the user to find answers to the basic questions relating to change, namely:

What to change?

What to change to?

How to cause the change?

- *It is in this context that it has been used to understand the constraints facing the minerals sector in South Africa. As alluded in the introductory sections of the report, this process is not yet complete and is, out of necessity, open ended to continue to receive inputs around constraints in the mining sector. One of the principal purposes of this report is the solicitation of further and additional inputs relating to constraints in this sector.*

4.2.1.3 Stakeholder consultation methodology

At the initiation of this project, a stakeholder consultation process was undertaken to identify constraints affecting the mining sector, the aim being to develop these into opportunities and research areas for improvement in a Sustainable Development context (see ToC description above). A database was developed with approximately 350 individuals representing a broad range of stakeholders affecting and affected by the mining sector in South Africa. These ranged from artisinal/small scale mining representatives through to mining companies, mining technical consultants and financial institutions who work in the industry. Government departments and regional DME consultation is ongoing.

While an electronic mail and Background Information Document (BID) was sent out to each individual on the contact database, it was not feasible to engage/interview each representative on their specific opinions regarding constraints in the sector. Selected representatives from appropriate sectors were targeted and interviewed. This was undertaken with a degree of subjectivity and based on perceived activity and experience within the sector. These interviews took the form of a discussion centred on constraints facing the mining sector that rested within the specific individuals' area of competency. The results of these interviews were then recorded and

collated, together with the inputs from the broader based electronic mail consultation. Appendix A provides a summary of these stakeholder groupings.

4.2.1.4 Summarised results of this consultation process

The outputs of this initial round of consultation are presented in Appendix 1. To some extent the input from this process informed the development of specialist areas of additional study referenced above. Again, it must be emphasised that this listing is entirely provisional and open ended, in the sense that the purpose of the circulation of this report is to add to this listing and correct perceived shortcomings. The constraints will then be used to inform and develop research areas.

In terms of the research areas, it must be said that when the SDM programme was initially developed, a number of research needs were highlighted as important and projects were developed around these[9]. These projects are listed in this report. The ideal would have been to have a multi-stakeholder agreed vision and objectives upfront and work from there to develop research areas and projects around them.

This in no way detracts from the existing completed and in progress projects as they all fit a definite and required Sustainable Development constraint and research area. In addition, they all fit neatly in the proposed framework and vision articulated in this report.

4.2.2 Specialist studies

Some specialist studies were commissioned in order to apply specialist and focused knowledge and experience to understanding SD constraints in the South African minerals sector. These constraints are summarised in Appendix 1 of the document.

These studies of which some are still ongoing and recorded in this document as such, considered the minerals sector specific realms of economics, governance, sociology, beneficiation, minerals taxonomy, amongst others, and the SD constraints within each. Sections 5.2 through to 5.15 in the next section of this document provide detail (or will in the future provide detail) on the "specialist" study areas commissioned to further understand Sustainable Development constraints in the South African mining sector.

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[9] A diverse group of internal DME & CSIR experts were consulted around the derivation of the initial list of constraints

5. UNDERSTANDING SUSTAINABLE DEVELOPMENT CONSTRAINTS IN KEY "SPECIALIST" AREAS OF THE SA MINING SECTOR

5.1 Introduction

As mentioned in Section 4 above, a number of specialist studies were commissioned in order to understand key sustainable development constraints in the sector. Some of these are still outstanding but summarised outputs from selected studies are provided. They are presented here to stimulate initial discussion, debate and formal feedback from stakeholders who may wish to add to them or suggest other specialist studies they feel may be required.

5.2 The Governance sphere: constraints to sustainability

Effective governance is essential to sustainable development as it provides a framework and a mechanism to develop open, accountable and participatory decision-making processes with regard to the allocation, use and distribution of mineral and energy resources for development, and the wise management of the environment(s)[h]. in which these resources occur. Governance refers then to the traditions, institutions and mechanisms by which authority in the sector is exercised at the levels of community, institutional, industry and government.

Good governance, as defined in a range of legislation, for example the MPRDA, the Constitution, the King II Report and the Mining Charter, is considered to include the principles of:

Accountability (for actions taken now and in the future).

Social and corporate responsibility for people and communities. This implies that all stakeholders – government, business and communities – have a role to play in managing environmental resources responsibly.

Transparency in relation to information provided for decision-making and the decision-making process itself.

Equity in relation to representation, as well as dealing with and addressing historical and future disadvantage.

Fairness in terms of due process in relation to decision making and implementation.

Reporting in terms of monitoring compliance and progress in implementation.

[h] Environment in its broadest sense, encompassing biophysical, social and economic realms.

Conditions for ensuring the development of a sustainable governance process would include:

The management and distribution of communication and accountability between different stakeholders and processes.

The maintenance of political stability, committed leadership and the absence of violence.

Government effectiveness in terms of the capacity to monitor and ensure compliance.

Regulatory quality and the ability of the industry to trade the costs of compliance with long term sustainability.

Rule of law and respect for the processes required to plan for and ensure sustainability.

Control of corruption.

Link 5: Understanding deficiencies: specialist studies behind the framework development - ***Governance***

5.3 Women in Mining: constraints to sustainability

While legislation compels mining companies to employ women at all levels in the sector, including senior positions, there are many barriers to women's participation in mining.

Women account for about 5% of employees in the formal mining sector and are concentrated mostly in clerical occupations. It is not clear how many women are among the estimated 20,000 small scale and artisanal miners, but women seem to be clustered in artisanal mining.

Barriers to women in mining, which is a constraint to the long term sustainability of the sector, have not been adequately researched but available information suggests that major issues include low levels of education, lack of technical education, unsupportive work cultures and organisations, lack of mentors and facilities for women in the workplace, the physical requirements of mining and poor attention to ergonomics in mining.

Greater appreciation of the circumstances of women in mining, in particular barriers to entry and advancement, could improve women's opportunities in the sector, and assist in achieving the targets set out in legislation.

5.4 Artisinal Mining: constraints to sustainability

Small scale and artisanal mining involves minimal or no machinery and can be undertaken by individuals, families, groups in which some individuals are employees, and co-operatives. Many miners work informally outside of the legal sector.

Most often, poverty drives small scale and artisanal mining. Mining may be seasonal or may supplement other economic activities such as subsistence agriculture. Approximately 20,000 small scale and artisanal miners are active in the country many of whom are women[36]. Six thousand[37] of

the total population of small and artisanal miners, mostly on the small scale mining end of the spectrum, are estimated to operate within the legal framework for mining.

There are significant risks and social costs associated with small scale and artisanal mining, including occupational health and safety risks, water and soil pollution, public health risks such as sanitation, and environmental degradation[38]. Nonetheless artisanal and small scale mining can play a crucial role in poverty alleviation, by providing employment and stimulating local economies by creating demands for goods and services. Small scale and artisanal mining is likely to continue for "as long as poverty makes them necessary"[39].

Not all small scale and artisanal mining activities are economically viable. Care should be taken to ensure that only viable mining projects are supported. Where mining activities are not viable, other interventions are required of government. These interventions could involve alternate livelihoods, mitigating the impacts of small scale and artisanal mining, and social welfare. Although small scale and artisanal mines may not be net contributors to sustainable development they could operate more consistently with sustainable development principles.

Greater appreciation of the circumstances of small scale and artisanal miners could support further development of policy and intervention strategies. Lessons from the many initiatives, undertaken in the various provinces of the country to support small scale miners, could form the basis for a more consistent and systemic approach to small scale and artisanal mining. However there is a need for further quantitative surveys and information to inform policy development.

5.5 Occupational Health & Safety sustainability challenges

Occupational health and safety risks affect people and the economy and can also affect the environment. These effects on people, the economy and the environment link the OHS and sustainable development agendas. Total costs of occupational health and safety incidents/accidents, as well as disease have been estimated at between 1 and 3 percent of GDP in various countries.

In most mining countries, the accident and ill-health experience of mining compares poorly to that of other economic sectors such as manufacturing, construction and rail, leading to mining's reputation as the most hazardous industrial sector. The safety performance of South African mines has improved over the years, but not at the same rate as that of other major mining countries such as Australia, Canada and the USA. In 2006, 200 miners died in mine accidents corresponding to a rate of 0.19 deaths per million hours worked. In contrast, the safety rate for Australian mines was 0.05 deaths per million hours worked in 2003 (corresponding to the deaths of 12 miners). The available data suggest there is a huge burden of occupational disease amongst miners past and present. Major concerns are silica exposure, noise induced hearing loss, TB and HIV/AIDS. In 2004, there were approximately 4000 cases of noise induced hearing loss and approximately R75 million was paid out in compensation.

The tripartite stakeholders (employers, government and labour) in mining agreed to targets and milestones at the Mine Health and Safety Summit of 2003, which are aimed at addressing the major health and safety concerns in the sector. In addition, a tripartite leadership action was

agreed to in 2008 which aims to strengthen the culture of health and safety, promote learning and capacity building and make workplaces healthier and safer.

The Mine Health and Safety Act is enabling rather than prescriptive and smaller companies may have difficulty in interpreting performance standards and in undertaking risk assessments. Their needs for more guidance should be addressed.

In 2008 a tripartite leadership action was agreed to which aims to strengthen the culture of health and safety, promote learning and capacity building and make workplaces healthier and safer

Both safety and health hazards, and therefore sector specific sustainable development constraints, can be addressed by correctly identifying and addressing the underlying and direct factors that contribute to occupational risks. A major shortcoming in the sector overall is the lack of competence associated with risk management. This can be addressed by sharing the best practices already developed in the sector, improving training, and strict adherence to risk management principles.

The targets and milestones initiative should be supported and monitored by stakeholders within and outside of the mining sector.

Specific interventions are required to ensure that contract workers, who are now employed in significant numbers in mining, enjoy the same level of OHS protection as permanent workers.

To reduce TB on mines, silica dust exposures and HIV infection must be controlled. A major intervention involving isoniazid preventative therapy (IPT) for TB is underway in the gold mining sector and has the potential to reduce the risk of TB among miners. Mining stakeholders can act to support the progress of this study.

5.6 Beneficiation: constraints to sustainability .

A draft beneficiation strategy for South Africa's Minerals Industry is presently being developed (September 2008) for comment – see Link 6 below. It will be circulated and this strategy updated with its key elements soon.

5.7 Broad Based Black Economic Empowerment: sustainability challenges

Outputs pending.

5.8 Climate Change constraints to sustainability

Outputs pending.

5.9 Energy supply issues constraints to sustainability

Outputs pending.

5.10 Food security constraints to sustainability

Outputs pending.

5.11 The economic sphere: perspectives and capital deficiencies in the SA mining sector & constraints to sustainability

The extraction of non-renewable resources appears to contradict the concept of sustainable development in two ways; firstly, the extraction of these resources implies that they will not be available to future generations, and secondly, external costs arising from mining activities adversely affect the environment, thereby indirectly affecting the quality of life of future generations. This report sub section is concerned largely with reviewing the mechanisms that are available for ensuring that resource depletion and environmental externalities are dealt with in such a way that mining activities become sustainable.

It will be seen that the problem of resource depletion does not necessarily imply that mining activities are unsustainable. Given the requirements of sustainable development discussed above, it is evident that mining may be sustainable as long as the rents associated with mining activities are captured and reinvested in alternative forms of capital. Externalities, which refer to costs that are borne by society as a result of mining activities, and that are not taken into account in the economic decision making of the private mining company, can be dealt with by ensuring that these external costs are internalised. Thus, economic analysis reveals that mining activities need not contradict the notion of sustainable development. Economists can inform policymakers as to the appropriate policy tools that can be implemented for ensuring that mining activities are sustainable.

5.12 Beneficiation

The DME in co-operation with Mintek are best placed to develop appropriate policies, strategies, incentives etc. to promote beneficiation in SA and to set specific norms and standards in this regard and to understand the constraints and deficiencies in this particular area of the SA mining landscape due to their long and diverse experience, and as such detailed attention is not paid to this research area in this document.

A draft beneficiation strategy is currently being finalised for comment. The strategy provisionally proposes that a benefaction strategy for South Africa should "seek to facilitate economic diversification, expedite progress towards a knowledge based economy and attain incremental growth in GDP in mineral value addition per capita in line with the vision outlined in the NIPF and the Advanced Manufacturing Technology Strategy."

Link 6 – South Africa's draft beneficiation strategy (for comment)

5.13 Mining & Financial Risk

Outputs pending.

5.14 The biophysical sphere: perspectives and capital deficiencies in the SA mining sector

Biophysical environmental impacts are seldom considered in combination across the full minerals and mining cycle; i.e. consideration of all sectoral phases of activity. More typically, they are considered on a phase-by-phase basis and, as a consequence, the significance of cumulative impacts is rarely considered. Unforeseen impact thresholds may, therefore, become exceeded as multiple sets of sub-threshold sectoral impacts combine in an additive or more complex manner.

Exceeding thresholds applies to many aspects of the environment. For example, terrestrial ecosystem decay occurs as there is cumulative loss and fragmentation of ecosystem by sectoral activities, up to the point where system composition, structure and function collapse. In the case of freshwater resources, both ecological and equity thresholds i.e. the quantity and quality requirements of both sectoral and non-sectoral water users – including ecosystems, can become exceeded as sectoral developments progress from initial to later phases of activity.

Table 1: Biophysical environmental constraints to the minerals and mining sector's optimal contribution to sustainable development

Key issue	Biophysical environmental constraint
Decision-making based on full cost accounting – including costs to the affected biophysical environmental resource base	Sectoral decision-making focuses on maximization of short-term economic benefit without accounting for the full suite of biophysical environmental externality costs.
Unsustainable use of water resources (freshwater and marine)	Conflict exists between the sector's demand for water and other user demands (i.e. in terms of equity of resource allocation), which is aggravated by the sector's impact on water quality.
Direct ecosystem impacts attributable to the minerals and mining sector	Biotic and abiotic ecosystem services are compromised by sectoral activities as a result of ecosystem elimination and fragmentation and pollution effects.
Governance and division of institutional responsibilities	Poorly defined, or understood, boundaries of institutional responsibility and accountability reduce the effectiveness of decision-making by lead authorities, thereby compromising the country/region's biophysical environmental resource base.
Atmospheric impacts attributable to the minerals and mining sector	Atmospheric emissions (e.g. greenhouse gases, metal vapours, dust) produced by, or in support of the sector, result in contamination of the air, water and soil, which compromises the capacity of the biophysical environment to provide essential ecosystem services.
Legacy environmental impacts	Inadequate provision is made for rehabilitation of the biophysical environment affected by the minerals and mining sector

As a first step in directing the change in allegiance that is advocated, it is necessary to re-state the constraints in the form of sustainability objectives that are aligned with an enlightened interpretation of sustainable development. This re-statement is presented in Table 4 below.

Table 2: Re-statement of biophysical environmental constraints as sustainability objectives aligned with an enlightened interpretation of sustainable development (SD) at the level of implementation

Key issue	**Conservative implications for SD**	**Enlightened implications for SD**
	Biophysical environmental constraints	**Biophysical environmental sustainability objectives**
Decision-making based on full cost accounting – including costs to the affected biophysical environmental resource base	Sectoral decision-making focuses on maximization of short-term economic benefit without accounting for the full suite of biophysical environmental externality costs.	Sectoral decisions take full cognisance of the strategic significance of the country's minerals resource base and the potential for beneficiation, and are informed by credible accounting of the full suite of biophysical environmental externality costs associated with such decisions.
Unsustainable use of water resources	Conflict exists between the sector's demand for water and other user demands (i.e. in terms of equity of resource allocation), which is aggravated by the sector's impact on water quality.	The sector uses water effectively and efficiently and has minimal impact on the country's/region's water resources.
Direct ecosystem impacts attributable to the minerals and mining sector	Biotic and abiotic ecosystem services are compromised by sectoral activities as a result of ecosystem elimination and fragmentation and pollution effects.	Sectoral impacts on ecosystems are understood and quantified, and effective controls are in place to manage (avoid, mitigate) these impacts within acceptable limits.
Governance and division of institutional responsibilities	Poorly defined, or understood, boundaries of institutional responsibility and accountability compromises effective decision-making by lead authorities, thereby compromising the country's/region's biophysical environmental resource base.	Institutional responsibilities are clear and broadly accepted, and governance structures guide cooperative and effective authority decision-making.
Atmospheric impacts attributable to the minerals and mining sector	Atmospheric emissions (e.g. greenhouse gases, metal vapours, dust) produced by, or in support of, the sector result in contamination of the air, water and soil media, which compromises the capacity of the biophysical environment to provide essential ecosystem services.	Atmospheric emissions produced by, or in support of, the sector's activities are within acceptable limits.
Legacy environmental impacts	Inadequate provision is made for rehabilitation of the biophysical environment affected by the minerals and mining sector	The sector conforms to environmental performance standards that eliminate the risk of legacy environmental impacts.

The biophysical environmental sustainability objectives listed above aim to support the minerals and mining sector's optimal contribution to sustainable development. However, there are a number of key determinants and controls (policies, institutional structures, environmental performance standards, etc.), which can be defined as elements of an enabling strategic framework that will influence the realisation of these objectives.

5.15 The Social Sphere: perspectives and capital deficiencies in the SA mining sector

There are a number of key areas falling within the social sphere where a large volume of information and interpretative assessment already exists. Much good work has already been done in these areas and, in some cases, this work needs to be augmented and updated. Examples of organisations which are active in this area and that are well qualified to provide information on constraints include Coaltech (having recently completed a study on women in mining); the Mine, Health & Safety Council & Centre for Sustainability in Mining & Industry, Wits University (expertise and information around Health, Safety and HIV), amongst others.

Later versions of this document will include information in this respect.

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6. FORMULATING THE VISION AND KEY STRATEGIC OBJECTIVES:

6.1 The SDM programme's vision for SD in the minerals sector

The overarching objective or vision that has informed and directed the development of this framework is articulated as:

"By 2015, the SA minerals sector is contributing optimally to sustainable development. This contribution is further articulated into a number of key strategic objectives, goals and projects leading to desired outcomes. "Optimally" is defined as the most effective, efficient and favourable contribution by the minerals and mining sector to sustainable development, taking into account the social, economic, biophysical and governance opportunities and constraints facing the South African minerals and petroleum sector, as determined and endorsed either through stakeholder consensus or the majority stakeholder view".

Figure 5 (overleaf) provides a conceptual view on the definition of and relationship between the objectives, goals and outcome subsets of the vision and the positioning of the projects described in Sections 7 to 12 of this report.

6.2 Unlocking the vision

South Africa's mineral wealth - and the transformation of that wealth - has contributed to a positive and enviable economic climate in the country, a climate to be maintained with due deference and attention to the positive industry and human drivers, as well as the many negative legacy outcomes associated with mining. With this firmly in mind "the vision", articulated above, should aim to ensure that SA is a leader in sustainable development and the extraction, use, beneficiation, management and regulation of mineral resources through expertise in minerals regulation and policy administration, resource science and technology, social empowerment and economics. It should further improve mineral resource competitiveness, specifically in terms of creating access and opportunities for Historically Disadvantaged Individuals (HDI's) and formulate and implement principles, practices and knowledge bases for sustainable development of mineral resources for the health, safety, environmental protection and prosperity of all South Africans.

A number of ***key strategic objectives*** have been developed out of this vision, the provisional listing of eight below forms a basis for debate and consideration. For each strategic objective, a number of ***strategy goals*** have been derived, then ***outcomes*** and ***projects*** to ensure the attainment of the vision and aim of this Sustainable Development initiative.

Actions/projects are critically, linked to project progress and implementation timetables. Responsibilities and resources, including financial, are also discussed in some cases. (project progress and implementation matrices and timetables have not been attached to this report and are still under development).

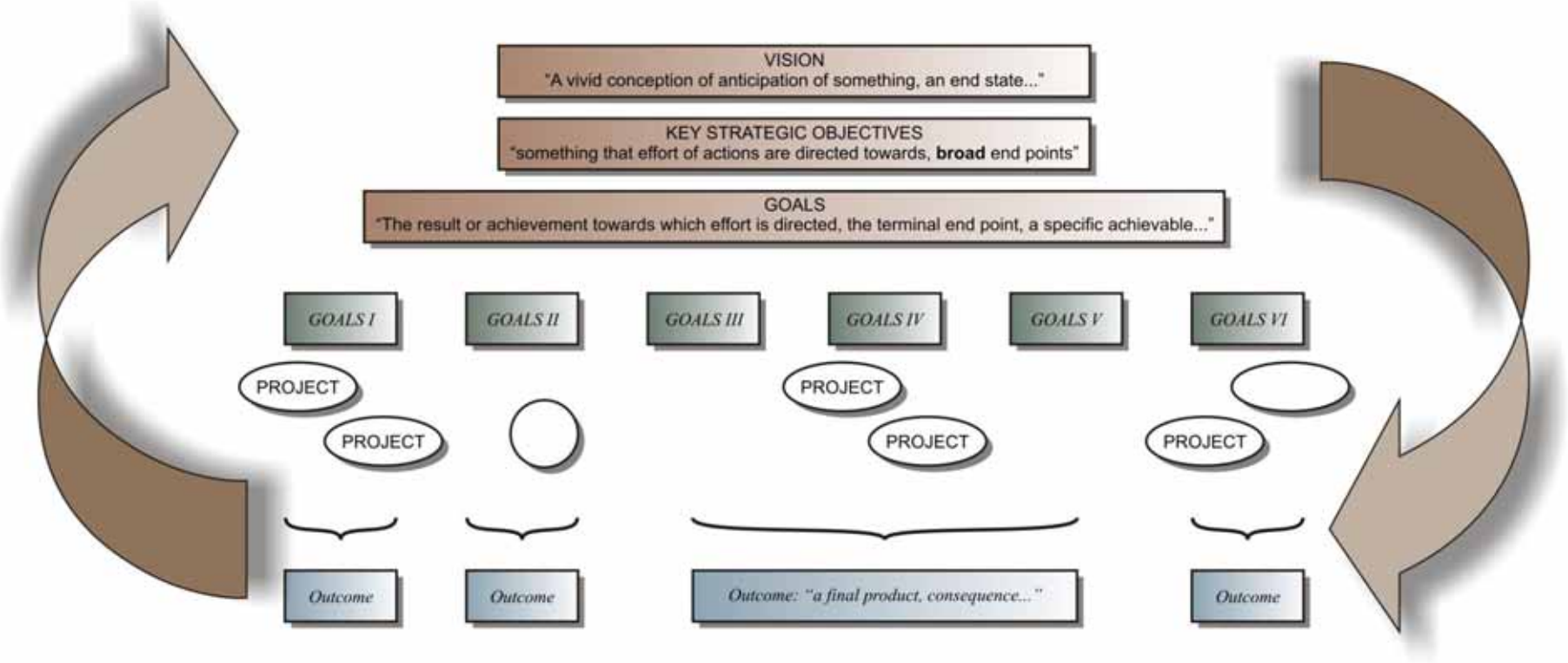

Figure 5. Representing the typology, definition & flow of the vision-objectives-goals-projects and outcome methodology underpinning the development of this strategic framework (the purpose of this diagram is largely conceptual and not all detail has been included)

6.3 Key Strategic Objectives (KSO's) of the SDM Strategy

i) That the South African Mining sector reflects the Sustainable Development values, principles and aspirations of the country. All stakeholders in the sector must share an SD vision based on a culture of mutual respect. The vision of sustainable development in the sector must be communicated effectively to all stakeholders

ii) To recognise that sustainable development strategy and policy must transcend both the government of the day and the requirements of the UNCSD and should be valid and appropriate across all time scales. Furthermore, that community empowerment, environmental and social rights are central and enduring tenets of the sector and that all those operating within the minerals sector earn a social license to do so.

iii) That the Sustainable Development strategy facilitates the transition from finite resource based industries and economies to sustainable knowledge based economies and that building and accounting for social and natural capital is implicit.

Key Strategic Objectives are "broad end points" which the efforts underling this SDM programme are directed towards...

iv) That the Sustainable Development strategy promotes economic diversification in existing and future mining industries and that the minerals sector takes due cognisance of globalisation's influence on sustainable development and the consequences thereof, including the implications of trade barriers, global market forces, international agreements, requirements and conventions.

v) That the Sustainable Development Policy acknowledges the potential and realised contribution of the industry for socio-economic empowerment and that policy creates conditions to ensure the continuation of this valued contribution.

vi) That value extraction from South Africa's minerals sector benefits vulnerable groups and value addition from South Africa's mineral resources are maximised locally

vii) Government is empowered to facilitate sustainable development outcomes and to link to national and international sustainable development strategies and initiatives and that government, industry and other stakeholders realise the synergies achieved through effective cooperation

viii) The Minerals Sector moves towards sustainable end states and to internalise negative costs and associated consequences and that the cumulative and life-cycle aspects of the sector are fully aligned with sustainable development principles

ix) Aligning beneficiation strategies with appropriate national development objectives including poverty alleviation, small scale mining, environmental management, social upliftment.

6.3.1 SDM Strategy Framework Goals

A number of goals have been developed out of the objectives listed above and these are proposed below. Each goal is in turn tied to a specific outcome relating to SD improvement, after which research and development projects are associated with these goals are listed. Industry and stakeholder projects in the South African Minerals Sector which are aligned to achieving these objectives and goals will be listed and described in later iterations of this report. Sections 7 through 12 hold up each of these goals separately and present the outcomes and research projects currently noted in associated with them. Industry and stakeholder projects in the South African Minerals Sector which are aligned to achieving these objectives and goals will be listed and described in later iterations of this report.

In the descriptions provided in Section 7, individual projects are discussed and elaborated on with a view to understanding how each of them link to the overall vision and specifically the objectives and goals under which they have been grouped. While their link may be implicit given their placing is a specific section, in some cases more detail is provided in the text.

Goal: *a terminal end point, flowing from a broad objective, towards which projects or groups of projects aspire…*

Strategic Framework Goals:

I. Enable South Africans to make balanced & informed decisions regarding the extraction of mineral resources & their utilisation

II. Enable South Africa to measure & assess progress towards sustainable development objectives in the minerals sector.

III. Minimise the impacts and risks of mineral resource development, use and management on the health & safety of South Africans

IV. Optimise environmental management in the sector

V. Develop and improve tools and mechanisms to ensure improved compliance in the sector & to improve regulatory capacity

VI. Poverty alleviation & mineral resource development

VII South Africa will have a beneficiation strategy that promotes growth and competitiveness towards closing the gap between the 1st and 2nd economies

In later versions of this report, once stakeholder comment and input has been assessed and collated and the SDM strategy enjoys general consensus, more comprehensive assessment, review and comparison of projects in the sector, and their link to the vision, objectives and goals will take place.

6.4 Measuring the Sector's contribution to Sustainable Development in South Africa

The SDM strategy is a long term, multi-stakeholder document that has a number of bold and ambitious objectives at its core. Progress towards these must be effectively measured. At the same time, the DME recognises the worldwide trend towards reporting on sustainability and its role in regulating industry with respect to reporting sustainability performance. The development of the SD indicators project has three primary objectives:

(i) to measure and report on progress within the SDM strategy's ***vision***, ***strategy goals*** and the ***key strategic objectives;*** as well as the country as a whole in relation to moving the mining sector towards improved sustainability;

(ii) to promote & build onto existing reporting guidelines such as the recently launched 3rd generation GRI guidelines to ensure the sector as a whole and the industries that operate within it report adequately and in terms of best international practice

(iii) to become one of the first public agencies to adopt, refine (w.r.t developing uniquely South African indicators) and implement sustainability reporting.

The project team responsible for the development of the SD indicators recognise the wealth of indicator-related information that exists and the established guidelines that have been implemented, as well as the resources committed by industry in particular to meeting these. The team has involved members of the CSIR, Mintek and the DME, to develop the preliminary reporting framework presented in the following sections. These draft Principles and Criteria are intended to stimulate discussion and input by stakeholders (i.e. any interested or affected party) within the Sector.

6.4.1 Short description of the preliminary Principles and Criteria development process

The monitoring system for the mining and minerals sector has been structured using the Principles-Criteria-Indicators-Standards (PCIS) reporting framework (Box 1). This indicator development framework is goal-based and therefore guided by the vision for sustainable development in the mining sector. Within a goal-based framework, indicators are developed and organised according to how they relate to various goals (Principles) and objectives (Criteria) that have been identified to achieve the articulated vision. With time, standards can be designed for each indicator to benchmark progress towards achieving each Principle. All of the above involves communication and interaction with stakeholders in the sector.

Box 1: PCIS Definitions

Principles - Broad goal statements for achieving sustainable development in mining.
A principle is a fundamental truth or law as the basis for reasoning/decision making.

Criteria - The management objectives that are set in order to achieve the broad goals set out in the principles.

Indicators - Tools for measuring whether the management objectives set in the criteria are being achieved.

Standards - Minimum levels set as targets to which management should strive in an attempt to improve sustainability.

Step 1:
Confirmation of the purpose of the indicator set

It is well recognised that progress toward sustainable development requires increased information for decision-making. The regular measurement of indicators allows one to track trends through time, providing information for more informed choices, as well as allowing for continuous improvement. The aim of this monitoring system is therefore to report on the contribution to sustainable development made by the South African mining and minerals sector, to aid relevant decision makers and track progress over time.

Figure 6 illustrates how the goal-based indicator set functions within the larger initiative for sustainable development in mining. As with the vision, the PCI set is informed by key literature and thinking on Sustainable Development in terms of how best the sector can practically participate in achieving the society's sustainability goals. The monitoring results will track progress made by the sector in reaching its vision, and will highlight areas where improvement is needed if the ultimate goal is to be met. Thus, while the monitoring framework is one of several projects within the sustainable development in mining initiative, it should function as an independent feedback tool for assessing continual improvement in the sector as a whole.

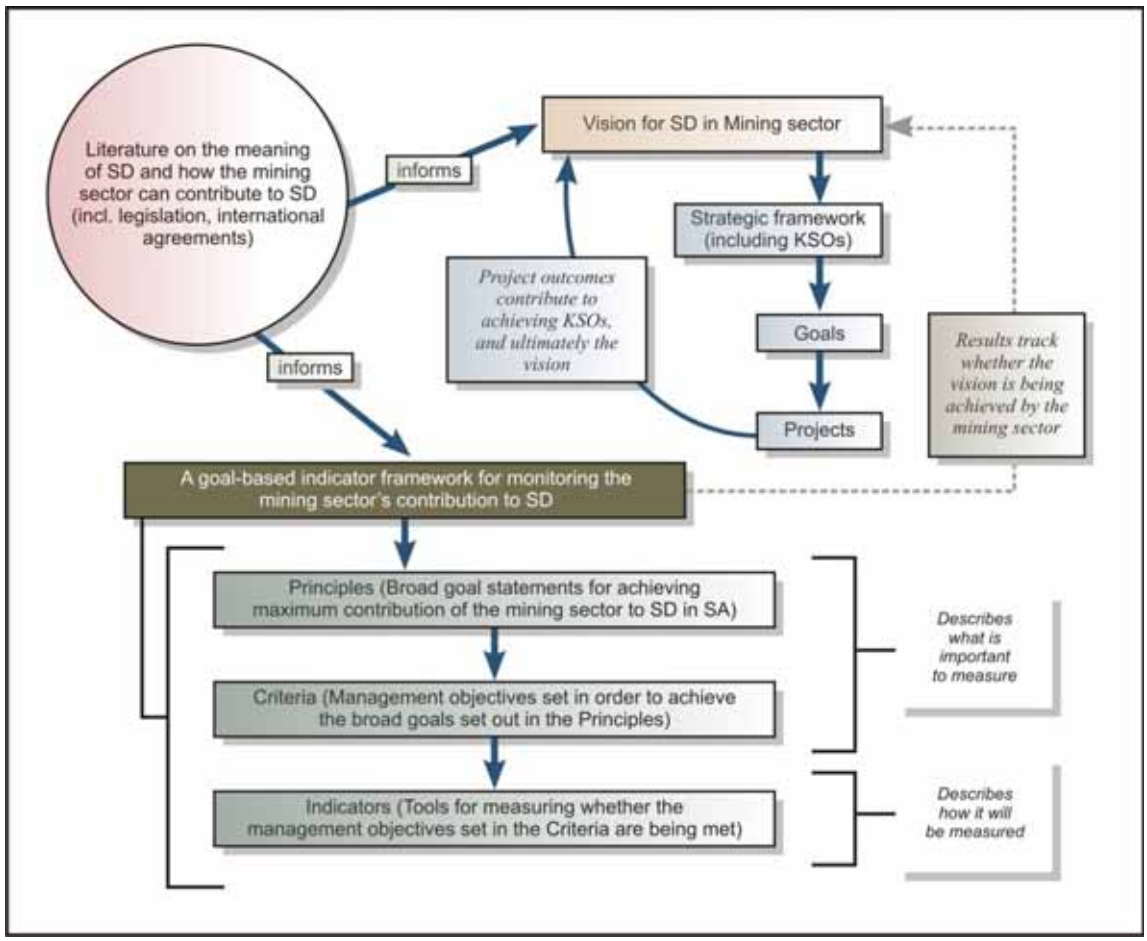

Figure 6: The purpose of the PCI set and its links with other projects in the SDM initiative

Step 2: Review of international and local SD literature

In order to unpack the vision for sustainable development in mining into tangible or practical components to be measured, a series of influential documents were reviewed. These included:

- the Johannesburg Plan of Implementation (JPOI) from the World Summit on Sustainable Development (WSSD),
- the Mining, Minerals and Sustainable Development (MMSD) reports,
- the National Strategy for Sustainable Development (NSSD),
- the International Council on Mining and Metals (ICMM) principles,
- the World Bank Group Extractive Industries Review (EIR),
- The Global Reporting Initiative (GRI) Mining and Metals Sector Supplement,

Azapagic, A. 2004. Developing a framework for sustainable development indicators for the mining and minerals industry. Journal of Cleaner Production 12, 639-662;

Limpitlaw, D. Sustainable Development review of the mining and minerals sector. Centre for Sustainability in Mining and Industry, School of Mining Engineering, University of the Witwatersrand; and

Relevant national legislation.

Key factors/variables describing the fundamentals of sustainable development were pulled from these documents and captured as tables of what was termed "SD elements" for the purpose of this process. As per convention, these elements were initially grouped into four pillars or themes of sustainable development: social development, economic development, environmental protection and governance. This division allowed the team to check the overall comprehensiveness and balance of the SD elements that were to form the basis for the Principle and Criteria developed.

Step 3: Development of draft Principles using SD elements

Using the tables of Sustainable Development elements, the team worked individually to group similar elements together to form fewer, more strategic issue categories. These groups cut across the initial four pillars/themes in many cases, as the links between different elements became clearer. The team then brainstormed together, sharing their interpretation of how the broader categories should be focussed, and linked this to the stakeholder inputs in the draft SDM Strategy. Once a fair degree of consensus was gained, the team debated the most suitable phrasing for each broad category, and in doing so formulated the first draft list of Principles.

Step 4: Review and refine draft Principles and assign draft Criteria under each

At a second workshop, the team checked first draft list of Principles against key national legislation (such as the National Environmental Management Act (NEMA) and the Minerals and Petroleum Resources Development Act (MPRDA)) as well as the draft sustainable development in mining strategy, to ensure their compatibility and relevance. The team reviewed the last workshop's outcomes and discussed possible improvements to the wording of each Principle and reworked these as necessary. While involved with this, the team referred back to the tables detailing the SD elements as defined by key literature, and determined under which Principle each factor/variable best fits. The second draft therefore contained a refined set of Principles along with an initial breakdown of the factors/variables to be achieved in order to meet these goals.

Step 5: Review and refine draft Principles and Criteria

A third workshop focussed primarily on forming appropriately phrased Criteria under each Principle. The factors/variables assigned under each at the previous meeting were discussed and reworded as management objectives. Once all the criteria under a Principle were complete, the team again revisited the phrasing and focus of the Principle to ensure its suitability. In two cases the team debated whether one Principle should be combined with another Principle, but in both cases it was decided that combining these would increase the risk of losing important details when monitoring.

The team then wrote up short explanations for each Principle, and this third draft is the list presented below for stakeholder input.

THE FOLLOWING IS INTENDED TO STIMULATE DISCUSSION OF WHAT IS IMPORTANT TO MEASURE, TO ENSURE THE SDM VISION WILL BE ACHIEVED IN THE MEDIUM TO LONG TERM.

6.4.2 Preliminary Principles and Criteria

Principle 1: Maximise the contribution of the mining sector to national economic development (links with MPRDA: 2f)

Brief Explanation: As a key sector in the South African economy, mining and minerals must play a role in maximising the potential opportunities and benefits of its activities. Technology development, trade and investment should assist South Africa in achieving sustainable growth.

Criteria (Management objectives set out to achieve the broad goal outlined in the principle)

Relevant technology is developed, and inter- and intra-sectoral transfer is ensured
- SMME development

Compliance with appropriate trade and investment policies and regulations

Ensure diversity and competitiveness of the sector

Facilitate local (South African) beneficiation

Direct financial contribution from mining is optimised

Principle 2: Contribute to the socio-economic development of South Africa (links with MPRDA: 2i)

Brief Explanation: As the sector's activities are situated within, or impact on, local communities, industries in the sector have a responsibility to practically promote and uplift community livelihoods. In order to work towards sustainable, resilient communities both social and economic needs must be addressed. These include creating opportunities for community economic initiatives based on local entrepreneurship, infrastructure development, skills development and resources, as a basis for local economic development and competitiveness prior to and after mine closure.

Criteria (Management objectives set out to achieve the broad goal outlined in the principle)

Ensure skills development and transfer

- multi-skilling

Prioritise job creation and employment

Contribute towards community development

- Working towards poverty-related targets
- Improve/build basic infrastructure
- Improved access to appropriate energy sources (reduce use of low grade wood and coal)
- Improving food security and natural resource-based livelihoods
- Contribute towards community education and capacity building e.g. computer rooms, libraries
- Access to land – tenure, ownership
- Access to sanitation
- Access to safe drinking water

Facilitate the development of sense of place and belonging

- Community at large
- Employee integration into community

Principle 3: Expand opportunities for historically disadvantaged persons (links with MPRDA: 2d; 100)

Brief Explanation: The mining sector must continue to contribute to the correction of historical imbalances caused by the legacy of apartheid. The empowerment of historically disadvantaged South Africans in the mining sector presents opportunities for the sector to eliminate discrimination against individuals.

Criteria (Management objectives set out to achieve the broad goal outlined in the principle)

Ensure the mining sector is aligned with applicable national guidelines that address historically disadvantaged persons (related to race, gender and where applicable, age).

Principle 4: Develop and strengthen health and safety programmes and initiatives (links with MPRDA: 2h)

Brief Explanation: Improved health care and mitigation of health and safety risks are key areas in which the mining sector can reinforce the development of human capital and contribute towards sustainable practice. Therefore, it is essential that there is continued implementation and improvement of measures to safeguard people from health and safety hazards and the risks associated with mineral resource extraction, use, and mine closure. Furthermore, a strengthened contribution by the mining sector to general health care and health education initiatives can significantly assist in reducing the burden that inadequate community health care has on human capital development.

Criteria (Management objectives set out to achieve the broad goal outlined in the principle)

- Continued and enhanced involvement in reducing the spread, and increasing the treatment, of communicable diseases (e.g. HIV; TB);
- Seek and ensure continual improvement of occupational health and safety conditions (e.g. Reduce work related injuries and health impacts);
- Seek and ensure continual improvement of all aspects of operations that could have a significant impact on communities neighbouring mining sector facilities (e.g. Reduce health risks associated with emissions from operational facilities and safety risks associated closed/decommissioned facilities).

Principle 5: Promote responsible practice

Brief Explanation: In addition to compliance with applicable laws and regulations the mining sector must continue to develop and maintain commitment to voluntary codes and initiatives aimed at responsible and ethical business practices, sustainable development principles and the implementation of sound systems for corporate governance.

Criteria (Management objectives set out to achieve the broad goal outlined in the principle)

Comply and exceed the requirements of the applicable laws and regulations;

Adopt and promote basic human rights and best practice business ethics;

Implement policies and practice that promote environmental and social performance & accountability;

Facilitate and encourage the use of appropriate tools for responsible and integrated material management throughout the mining sector value chain (e.g. life cycle analysis, risk assessment);

Promote and encourage the use of the 'precautionary principle' when assessing the risks associated with mining sector developments and that of existing operations.

Principle 6: Contribute to achieving sustainable (efficient) patterns of production and consumption

Brief description: Industries in the mining and minerals sector should participate in reducing their impact by adopting efficient processes and applying best available technologies. Measures must be taken to manage every activity undertaken in a sound manner, and with a focus on continuous improvement.

Criteria (Management objectives set out to achieve the broad goal outlined in the principle)

Application of cleaner production principles

Waste minimisation, increased waste reuse and recycling

Sound management of chemicals and hazardous wastes

Energy efficiency, Use of renewable/alternative energy sources

Green procurement

Water management

Air management

Land management

Principle 7: Reduce impact on life support systems and the ecological services they provide

Brief Explanation: The nature of mining is such that the biophysical environment is impacted upon, resulting in various forms of environmental degradation. These impacts need to be reduced and mitigated sufficiently to ensure that ecological services continue to function optimally in order to support life. The mining sector must show commitment to the long term well-being and resilience of the biophysical environment.

Criteria (Management objectives that are set out to achieve broad goals outlined in the principle)

Manage and mitigate affected natural capital / ecosystems

Contribute towards biodiversity conservation

Ensure effective and appropriate land rehabilitation

Ensure comprehensive disaster management and planning

Principle 8: Develop effective partnerships and communication networks to promote good governance

Brief Explanation: A key element in achieving the maximum contribution to Sustainable Development by the mining sector is creating and maintaining strong links with other role-players and organisations that are working towards similar goals. In order to be effective, these networks require a culture of democracy, honesty and respect, so that optimal cooperation can take place to reach mutually beneficial outcomes in the short, medium and long term. These outcomes will be greater than those a single role-player could have achieved working alone.

Criteria (Management objectives that are set out to achieve broad goals outlined in the principle)

Ensure transparency and availability of information;

Maintain democratic (open, fair and inclusive) communication channels;

Implement co-operative governance;

- Partnerships between and within government departments, industry, civil society

Participate and encourage multi-stakeholder, integrated (local level) planning.

Principle 9: Ensure the ability of government (i.e. the DME) to fulfill its mandate

Brief description: The Department of Minerals and Energy is central in driving the process of ensuring an optimal contribution to Sustainable Development by the mining and minerals sector. The capacity of government to fulfill three distinct elements, namely rule making, rule application and rule adjudication becomes critically important in achieving any goals established.

Criteria (Management objectives that are set out to achieve broad goals outlined in the principle)

Strengthen and maintain regulatory capacity

Ensure a common vision for the contribution of mining sector to Sustainable Development in South Africa

Ensuring capacity/resources for meeting reporting commitments

Strengthen capacity to enforce legislation/regulations and address impacts throughout the life cycle

Promote accountability

6.4.3 Guiding questions: Comment on the Preliminary Principles and Criteria

1. Read through each Principle (broad goal) and answer the following:

a) Do the Principles address the key aspects needed to ensure the mining and minerals sector is contributing to Sustainable Development?
b) Bearing in mind that a maximum of 10 Principles is preferred, are any additional Principles necessary to complete this set?
c) Are there any Principles that should not be included in this set? Please elaborate.
d) Should any of the Principles be reworded to better reflect the key aspects required for contributing to Sustainable Development by the sector?

2. Read through the Criteria (objectives) and answer the following:

a) If the all the Criteria under each Principle were achieved, would this ensure that the Principle concerned would also be achieved (i.e. are the Criteria under each Principle complete and appropriate)?
b) Are there any Criteria that should not be included in this set? Please elaborate.
c) Should any of the Criteria be reworded to better reflect the key objectives required for contributing to Sustainable Development by the sector?

3. Are there any other comments regarding the preliminary Principles and Criteria set?

6.5 A SDM Road Map going forward

As elaborated on in earlier sections of this report, one of the principle objectives of this document is to solicit input and guidance from industry and stakeholders around not only goals and objectives for the SDM programme, but also to collect detail on existing SD projects and initiatives which fit under existing (or new) goals and outcomes described in the following sections. Figure 7 provides a road map indicating the origins and derivative processes followed to date in developing this SD framework and also points industry and stakeholders in the direction of additional information requirements. Appendix B provides a template/information request for details and information around SD projects which are contributing to South Africa SD and the attainment a SD vision.

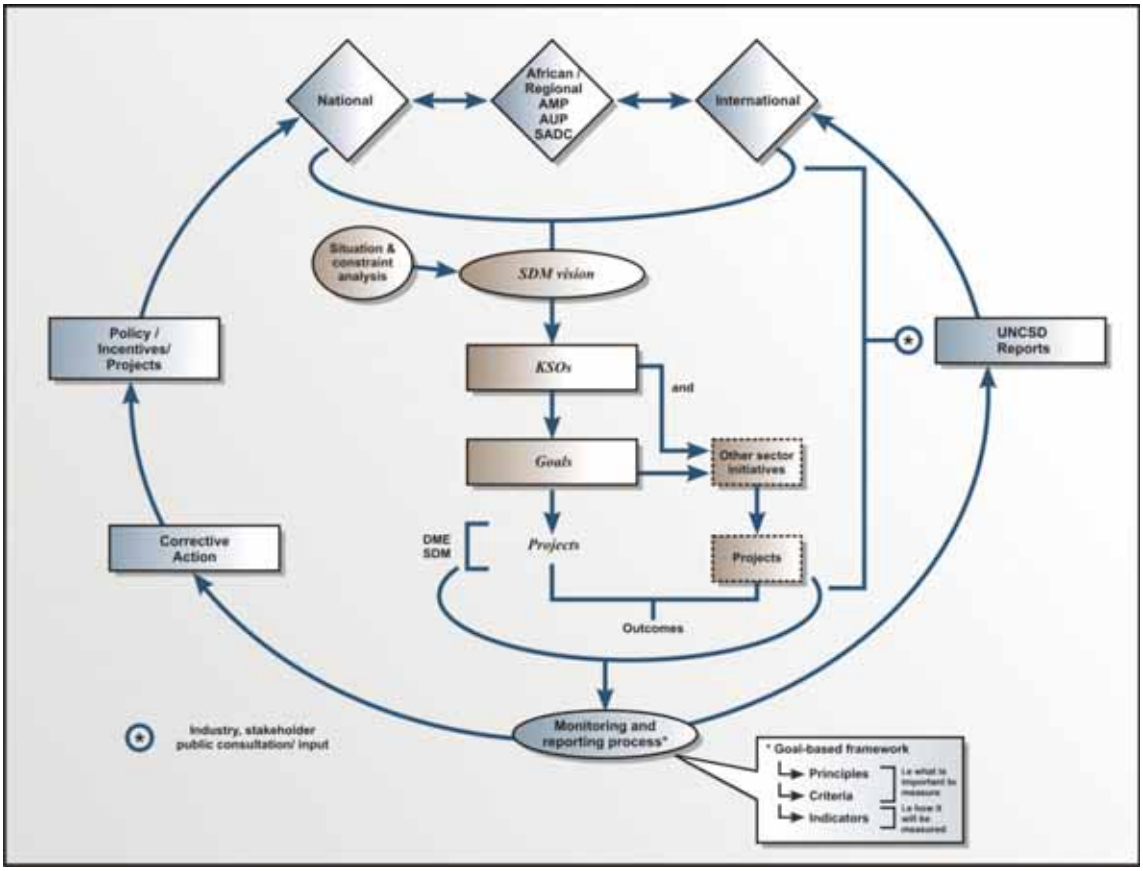

Figure 7: A "road map" indicating the origins and derivative processes followed to date in developing this Sustainable Development framework and also points industry and stakeholders in the direction of additional information requirements

Link 7 – Indicator Docs

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7. STRATEGY GOAL (I)♦:

TO ENABLE SOUTH AFRICANS TO MAKE BALANCED AND INFORMED DECISIONS REGARDING THE EXTRACTION OF MINERAL RESOURCES AND THEIR UTILISATION

OUTCOME:

To create an easily accessible and integrated knowledge base of South Africa's mineral resources and the economic, environmental and social dimensions of their extraction and use across the value chain.

Link 8 - *Project:* Creation of a database for derelict and ownerless mines

8. STRATEGY GOAL (II):

TO ENABLE SOUTH AFRICA TO MEASURE & ASSESS PROGRESS TOWARDS SD OBJECTIVES IN THE MINERALS SECTOR

OUTCOME:

To develop, according to best international practice, a set of indicators that will consider and measure progress towards sustainability objectives, targets etc, as articulated in the National Strategic Framework for SD in the Minerals Sector. These indicators will have as definitive reference point existing international and national best practice reporting.

♦ See Box on Page 35 where these goals are cross referenced

9. STRATEGY GOAL (III):

MINIMIZING THE IMPACTS AND RISKS OF MINERAL RESOURCE DEVELOPMENT, USE AND MANAGEMENT ON THE HEALTH & SAFETY OF SOUTH AFRICANS

OUTCOME:

Safeguarding South Africans from health and safety hazards and the risks associated with mineral resource extraction development, use and mine closure.

10. STRATEGY GOAL (IV):

OPTIMISING ENVIRONMENTAL MANAGEMENT IN THE SA MINERALS SECTOR

OUTCOME:

The mining sector ensures the protection and safeguarding of biodiversity in areas affected by mining and that the rehabilitation and remediation of affected land is undertaken to appropriate levels. Also it will ensure protection of the environment affected by mining, using best international practice management interventions with respect to the current situation, specific focus being on closure and post closure aspects.

Link 9 - *Project:* Best Practice Granite and Stone Mining Guidelines

11. STRATEGY GOAL (V):

TO DEVELOP AND IMPROVE TOOLS AND MECHANISMS TO ENSURE IMPROVED COMPLIANCE IN THE SECTOR AND TO IMPROVE REGULATORY CAPACITY. (APPENDIX F)

OUTCOME

A mining industry that has good governance at all levels with improved compliance to all sustainable development parameters, with all relevant monitoring and evaluation systems.

(Link 10) *Project:* Development of a Decision Support System

(Link 11) *Project*: Development of Mine Environmental Management Series guidelines

(Link 12) *Project*: Development of a Site Inspection Assistant Tool

12. STRATEGY GOAL (VI)

POVERTY ALLEVIATION & MINERAL RESOURCE DEVELOPMENT

OUTCOME :

To ensure that mineral resource development contributes optimally to poverty alleviation in South Africa

13. STRATEGY GOAL (VII):

SOUTH AFRICA WILL HAVE A BENEFICIATION STRATEGY THAT PROMOTES GROWTH AND COMPETITIVENESS TOWARDS CLOSING THE GAP BETWEEN THE 1ST AND 2ND ECONOMIES

OUTCOME:

Measurable, commodity specific beneficiation strategies are developed

Link 6 – South Africa's draft beneficiation strategy (for comment)

14. CONCLUDING REMARKS

This document summarises a proposed framework and platform for South Africa's Minerals Sector to pursue SD. Critically, the DME as national custodian of the mineral resources of the country cannot do this alone and requires input from as diverse a range of industry and stakeholder representatives as possible. This is the first of a number of envisaged revisions as South Africa's Mineral sector SD strategy develops and grows. This report (or variations of it) will be used to both present South Africa's SD vision, goals & achievements to the UN as well as report on progress towards attaining them.

This report forms an important first step in summarising the progress the DME's Sustainable Development through Mining (SDM) Programme has made to date, and to sound a call for discussion based on further work that may be required in the future. It has articulated a vision and a number of goals for the programme and has illustrated the partial and ongoing attainment of these through real projects. Furthermore, it has illustrated links and synergies between sectoral and non-sectoral initiatives (including, critically, DEAT's National Strategy for Sustainable Development) and has provided a solid platform for further linkages as this programme continues to unfold in the future.

Further abbreviated and differentially targeted versions of this report will be circulated in the coming months to consolidate the effort to solicit input and buy-in from different stakeholder groups. The critical intent of these reports will be to consolidate, update and refine the philosophy and projects comprising the SDM programme on an ongoing, iterative basis. In addition, comment and verification of the preliminary monitoring set presented in this report is urgently required.

The project team behind this report and specifically the Department of Minerals & Energy are confident that you the reader will heed this call and request for participation. We look forward to your engagement in the coming months.

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15. REFERENCES

1. http://www.dictionary.com
2. http://www.un.org/esa/sustdev/csd/csd11/CSD_mulityear_prog_work.htm
3. http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POIChapter4.htm
4. Brundtland, G.H (1996) Our Common Future: revisited *The Brown Journal of World Affairs* 3(2) 173-175
5. Hoadley, E. M., Limpitlaw, D. and Weaver, A.D. (2002). *Mining, Minerals and Sustainable Development in Southern Africa.* The Report of the Regional MMSD Process, MMSD southern Africa, Vol. 1, pp 77. (Including Vol.2 - executive summary and Vol. 3 – research CD).
6. OECD (2003?) *Sustainable Development Strategies.* A Resource Book: Organisation for Economic Co-operation and Development. Paris and united Nations Development Programme. New York.
7. Limpitlaw, D. (2006). *Executive Summary: Sustainable Development Research Project.* Presented at the CoM SD conference, Kyalami, South Africa.
8. Goldratt, E.M. (1990a). *The Haystack Syndrome: Sifting Information from the Data Ocean.* North River Press, Croton-on-Hudson. New York.
9. Goldratt, E.M. (1990b). *What is this thing called the Theory of Constraints?* North River Press, Croton-on-Hudson. New York.
10. Goldratt, E.M. (1997). *Critical Chain.* North River Press. Great Barrington. Massachusetts.
11. Goldratt, E.M. and Cox, J. (1992). *The Goal: A Process of Ongoing Improvement. 2nd edition. North River Press. Great Barrington.* Massachusetts.
12. Mabin, V. (1999). Goldratt's *"Theory of Constraints" Thinking Processes: A Systems Methodology linking Soft with Hard.* Wellington, New Zealand.
13. Hoadley, E. M., Limpitlaw, D. and Weaver, A.D. (2002). *Mining, Minerals and Sustainable Development in Southern Africa.* The Report of the Regional MMSD Process, MMSD southern Africa, Vol. 1, pp 77. (Including Vol.2 - executive summary and Vol. 3 – research CD).
14. KPMG.(2003a). *Integrated Sustainability Reporting in South Africa,* KPMG Sustainability Services, and pp20.
15. KPMG (2003b). *Mining: A Survey of Global Reporting Trends.* KPMG Energy and Natural Resources, pp 95.
16. KPMG. (2004). *Survey of Integrated Sustainability Reporting in South Africa.* KPMG Sustainability Services, pp 28.
17. Anglo American. (2004). *Creating Enduring Value: Anglo American Report to Society.* Anglo American Report, pp74.
18. BHP Billiton. (2004). *Health, Safety, Environment and Community Report* : *Working for a Sustainable Future*. BHP Billiton Group pp 20.
19. Impala Platinum Holdings Limited. (2004). Corporate Responsibility Report. *Impala Platinum* pp116.
20. Chamber of Mines. (2002). *South African Mining Industry: Statistical Tables.* Chamber of Mines of South Africa, pp48.
21. Chamber of Mines. (2003). *The Mining Industry and HIV/AIDS.* Chamber of Mines of South Africa. Version 3, pp 12.

22. Limpitlaw, D. and Hoadley, E.M. (2005). Sustainability and Reporting in the Minerals Sector : A Developing Country Perspective. *Proceedings Second International Conference: Sustainable Development Indicators in the Minerals Industry (SDIMI),* ed. P.N. Martens, Aachen International Mining Symposia, VGE, Essen, pp 647-662.

23. Limpitlaw, D., Hoadley, E. M., Van der Woude, S. and Ally, I. (2005). *Measuring and Enhancing Progress in Sustainable Development in the Minerals Sector.* CSMI Report (2000-2004), Wits University. South Africa.

24. Dhar, B.B. and Thakur, D.N. (1996). *Proceedings of the First World Mining Environment Congress.* New Delhi,Balkema, Rotterdam, pp 93-104

25. Segal, N. and Malherbe, S. (2000). *A Perspective on the South African Mining Industry in the 21st Century:* An independent report prepared for the Chamber of Mines of South Africa. The Graduate School of Business, University of Cape T own and Genesis Analytics. South Africa.

26. British Geological Survey. (2004). *Sustainable Development of Minerals.* Mineral Matters 8, ODPM-BGS Joint Minerals Programme, Keyworth, Nottingham, UK, pp 4.

27. Australian Information and Research Services. (2001). Sustainable Development and the Australian Minerals Sector. Department of the Parliamentary Library. Australia.

28. Moyo, A. (2007) Policy Analyst at DEAT. Personal communication. 13 march 2007.

29. DEAT (2006) Government Gazette No 29293. *A Strategic Framework for Sustainable Development in South Africa:* Draft for Public Comment. 29 September 2006. http://www.deat.gov.za. Accessed in March 20007.

30. DEAT (undated) Directorate International Sustainable Development Cooperation Progress Update. *South Africa's National Strategy for Sustainable Development (People, Planet, Prosperity – a framework for Sustainable Development in South Africa).* Power point presentation given at Ekurhuleni. Available at: http://www.sacities.net

31. www.incite.co.za

32. Porritt, J. (2006). *Capitalism as if the World Matters*. Earthscan, London

33. Cornelissen, H. 2005. Personal communication on the definition of a derelict and ownerless mine. Department of Minerals and Energy, Mineralia Centre, 391, C/o Andries and Visagie Street, Pretoria, 0001.

34. International Institute for Environment and Development (IIED). 2002. *Mining for the future*. Appendix C: Abandoned Mines Working Paper. Mining, Minerals and Sustainable Development project. Report no. 28, 20p.

35. United States Environmental Protection Agency (EPA). 1997. *EPA's National Hardrock Mining Framework. Appendix F: Selected methods of ranking sites.* Office of Water, Washington. 21p.

36. Mutemeri N and Petersen F. *"Small-scale Mining in South Africa: Past, Present and Future."* Natural Resources Forum, 26 (2002), 287.

37. Hardre, Bernd Dreschler –, MMSD Research, Topic 1. Final Report, (August 2001)

38. Hilson G and Van der Vorst R. *"Technology, Managerial, and Policy Initiatives for Improving the Environmental Performance in Small Scale Gold Mining Industry".* Environmental Management. Vol 30, No6. pp754-777.

39. Hentschel T, Hruschka F, and Priester M. *Artisanal and Small Scale Mining – Challenges and Opportunities.* MMSD. International Institute for Environment and Development and WBCSD(2003) 5

40. WRC (2005) "*The Development of Appropriate Procedures towards and after Closure of Underground Gold Mines from a Water Management Perspective*" Report no. 1215/1/05 .Pulles, Banister and van Biljon, 2005).

41 DEAT (2006). *A framework for Sustainable Development in Soiuth Africa – Draft for Public Comment.* Department of Environmental Affairs & Tourism, Pretoria.

42 Chamber of Mines of SA (2006). Facts and Figures. http://www.bullion.org.za/Publications/Facts&Figures2006/F&F2006.pdf

43 Chamber of Mines of SA (2007). Annual Report 206-2007. http://www.bullion.org.za/Publications/Annual2007/AnRep2007.pdf

44 DME (2007). South Africa's Minerals Industry. Published by Directorate: Minerals Economics. Pretoria.

APPENDIX A - SELECTED PROJECTS AND PROGRAMMES LINKING ONTO THE PROPOSED GOALS

Example of the projects and programmes initiated by the DME linking onto the proposed goals

15.1 SDM Projects

15.1.1 Creation of a ranking system and database for derelict and ownerless mines This project aims to address aspects of the governance and biophysical spheres of sustainable development and is closely linked to all Key Strategic Objectives (KSO's), but more specifically KSO III & VII.

The South African mining industry is more than a century old, and has many mines that were improperly closed and abandoned. Some of these mines are ownerless, and for government and industry to move towards and attain sustainability, the need for understanding the location, status and impact of these old operations is strategically important.

The project to create a database for derelict and ownerless mines has, as its objective, to understand the number of mines that are abandoned and ownerless and their impact on the environment, economy and the social spheres. Understanding these impacts will therefore assist with developing a proper strategy and an implementation plan for correct closure and rehabilitation of these mines. This strategy will be called the "National Strategy for Rehabilitation of Derelict and Ownerless mines"

Linking the database for derelict and ownerless mines and the South African Mineral Deposits Database (SAMINDABA) currently hosted by the Council for Geoscience (CGS), a complete picture of the South African mineral deposits, their locations now and previously would be created, which would help in moving the industry towards an understanding of challenges that need to be resolved in order for it to contribute optimally to sustainable development. The knowledge created from this database will also be essential to the understanding needed for new areas of explorations and rate of extractions.

15.1.2 Development of Regional Mining and Closure Strategies

In order for South Africans to benefit from the mining of her mineral resources, it is important that mining should be conducted within a regional development context. The regional development context implies that mining activity in any region or area should be integrated into the developmental plans of that region as agreed by various

regional stakeholders. This approach will prevent the phenomena currently known as "ghost towns" when mines close, and will serve to move mining closer to sustainable development. It is important to also understand that the developmental issues do not only imply economic contribution of the mine to the region but also equally important is the prevention of irreparable environmental and social damage to the region.

This project aims to identify and assess existing mining problems caused by past and current poor mining practices and to develop technologies and methodologies to mitigate critical problem areas within a region. The project also places an emphasis on the socio-economic development contribution and the overall economic and biophysical impact of the industry on the region. Critically important for the project is the understanding of the economic, social and biophysical capacity of the region, in order to ensure that mineral extraction is conducted within the limits of the region. The project also ensures protection of sites of importance such as heritage sites, sacred sites and protection of endangered species.

The information generated from these strategies will assist in decision making regarding granting permission or licences for new mining areas, evaluation of Environmental Impact Assessments (EIA) and Environmental Management Plans (EMP), social and labour plans, closure and rehabilitation plans, in order to ensure that they are conducted in a manner that contributes to the sustainability of the region.

15.1.3 Development of Regional Mining and Closure strategies

One of the outcomes of the regional closure strategies is the assessment of the impact of mining to health and safety of regions.

Institutions such as the Mine Health and Safety Council and National Institute for Occupational Health (NIOH) are extremely competent in understanding and providing details of the impact of mining to health and safety especially in the area of occupational health and safety. Interaction between the SDM initiative and these institutions is vital to ensure that within a region all aspects that contribute to sustainability are addressed.

However the programme will cover issues that may have adverse impact on both occupational and especially public health, issues such as addressing acid mine drainage, understanding and managing decant of contaminated water from mines, impact of slimes dams to health and safety and providing alternative methods to construction, location and maintenance and rehabilitation of slimes dams. Other indirect impacts of mining to health and safety will be addressing the impact of mining to the biophysical environment.

15.1.4 Development of a Decision Support System (DSS)

Success or failure of any sustainable development initiative hinges heavily on governance as outlined in the early part of this report. The development of the decision support system aims at enabling government and other parties to monitor the compliance of the mining industry with the sustainable development framework for mines. The DSS will support data capture, storage, retrieval and reporting per mine, mine sector and region. The system will be able to be interfaced with the National Mining and Promotion System (NMPS) of the DME. Data and information from all the projects within the programme will be consolidated through the DSS to ensure that it is available when decisions need to be taken.

Crucial decisions would include among others, evaluations of applications for mining and/or prospecting, evaluations of the EMPs, assessing social and labour plans, closure plans. The regional mining and closure strategies project provides the bulk of the information needed to assist in decision making.

15.1.5 Development of Mine Environmental Management Series guidelines

Three guidelines are being developed; the purpose of which is to assist the meaningful implementation of the environmental requirements of the Minerals and Petroleum Resources Development Act through clear guidance on DME requirements and environmental standards. As such, these guidelines are aimed at applicants for rights engaging in prospecting, mining, and related activities that fall under the ambit of the MPRDA. The guidelines include:

- Mine Closure guidelines
- Best Practice Granite Mining Guidelines (LINK 6)
- Monitoring and Performance assessment guideline
- Scoping, EIA and EMP guidelines

The guidelines are aimed at ensuring that there is full transparency pertaining to the requirements of the MPRDA and as such all relevant stakeholders have reference guides to all activities, from mining to post rehabilitation monitoring.

15.1.6 Development of a Site Inspection Assistant Tool (SIAT)

The purpose of this tool is to develop a system to facilitate mine audits by DME and the transfer of this data to decision support system. This system is called the Site Inspection Assistance Tool (SIAT). The SIAT assists the officer by automation of data capturing during the inspection process. The tool will ensure that the environmental officer is able to verify the information contained in the EMPs. It will be able to also provide a template according to which the inspections can be conducted. It will ultimately replace the environmental officer's notebook, instruction book, and cell

phone into one tool with added features such as GPS and camera. A key component of this area is in assisting the department officials when taking decisions especially those decisions that are related to socio-economic and environmental impacts.

15.1.7 Training and Skills development

This project involved the recruitment and training of young graduates in the fields of sustainable development (through the three science councils involved in the SDM project). Active training and development took place principally by sending the interns on short courses to develop technical and business skills and the assignment of mentors for the duration of their stay at the council concerned. Practical project exposure and skills development for women in areas where mining takes place is a principle focus of this project.

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APPENDIX B – RECORD OF ISSUES RAISED BY STAKEHOLDERS

Table A1: Summary of the stakeholder consultation groupings to date

No.	Stakeholder grouping/consultation type	Number of consultations
1	Direct emails (BID) soliciting input from the stakeholder database [i]	307 [j]
2	Mining consultants (including environmental consultants specialising in the mining & energy sector)	8
3	Academic & research institutions	3
4	NGOs (incl. small scale mining representatives and community organisations)	4
5	Industry (including representative bodies)	9
6	Financial institutions	4
7	Mining forums[k]	3
8	Government departments (non – DME)	5
9	Regional DME representatives	Ongoing

Table A2: Summary of the stakeholder consultation groupings to date

(red = high; orange = medium; yellow = low)

No.	CONSTRAINT/OBSTACLE	FREQ. OF ISSUE BEING RAISED
Governance		
1	Lack of a clear definition and common understanding of sustainable development (SD)	
2	Lack of cooperation and commitment to SD, particularly w.r.t coordination and implementation of SD, on both a inter and intra government level	
3	Capacity (HR) and competency (training) inadequacies within government with respect to SD	
4	Lack of a neutral government department to oversee SD in SA	
5	No common framework for SD	
6	Absence of formal indicators for government to measure attainment of SD in sector	
7	Inability to make/request/understand trade-offs with respect to SD	
8	Low levels of inclusive decision making within government hamper SD	

[i] Eleven percent of emails returned as "unavailable", "no know user" or the like. This rate of "strike" is considered acceptable and representative, particularly based on experience with environmental scoping studies where large scale stakeholder consultation is required. Furthermore, it was assumed that if direct emails were not returned, that the intended user (or his/her designate) had read the content and decide to(or not) to respond.

[j] Only a 10% return rate on these emails were achieved – i.e. feedback in terms of providing assessment of constraints only achieved a feedback rate of approximately 10%. This was not entirely unexpected and - to a degree the methodology and outcome was pre-empted by the decision to undertake focused stakeholder meetings to elite input and opinion around specific constraints from appropriate individuals in the sector.

[k] Conferences and workshops specifically aimed at the sector, for instance the South African Institute for Mining & Metallurgy's annual colloquium

No.	CONSTRAINT/OBSTACLE	FREQ. OF ISSUE BEING RAISED
9	Complex regulatory/governance structures confers images of non transparency, and susceptibility to corruption	
10	Technical, inaccessible nature of the sector requires high level of understanding for the lay person to engage with government on SD.	
11	Perceptions of preferential treatment of larger industries by government in terms of allowing industry to "get away with" poor SD practice and reporting	
12	Low salaries offered by government generally for junior and mid level posts attract often attract inexperienced personnel who are unable to function at the level they are supposed to	
13	Non-optimal staff retention strategies & career planning within the DME hamper the consistent and long term implementation of SD in the authority	
Economic		
	Current recessionary economic environment	
	Energy supply (ESKOM) issues have major effect on SA mining	
	Future impacts of climate change (and the industy's response to it)	
	Incomplete cost accounting in the sector does not take into account externalities adequately	
14	Currency fluctuations (particularly negative trends) lead to poor SD, particularly within the economic and social realms	
15	The formal mining economy does not integrate the small scale/informal/artisinal sector adequately	
16	Regulatory compliance requirements are onerous and increase the cost of business, there by impacting negatively on SD	
Legal		
17	Time frames, as stipulated in the MPRD, are inadequate for sustainable functioning of the consulting sector (exacerbated by DME response times)	
18	Lack of prescriptive guidance with respect to new legislation (for instance the aide memoir is too generic a template)	
19	Conversion time for converting old mining licenses to mining rights is seriously impacting on the sustainability of the industry	
20	Lack of performance assessments being carried out, impacting negatively on the sustainability of operating mines particularly	
21	Perceptions that the DME is highly politicised and that this is leading to ineffectiveness of MPRD as a mechanism for SD.	
Biophysical		
22	Incomplete accounting of full suite of biophysical externality costs (due to the sector focusing on short term economic benefits)	
23	Water use vs. demand conflicts, coupled with the sectors impact on water quality, comprise ecosystem services and negatively affect SD – generally poor water management	
24	Atmospheric emissions are strongly associated with the sector and are produced by, and in support of, the sector's activities. Large scale potential and realised interlinked contamination is compromising SD.	
25	Generally poor rehabilitation provision in the sector (by industry) has a negative impact on SD	25
Social		
27	The stakeholder engagement process (for instance the requirement for social and labour plans) is viewed as negative by many mines – this hampers SD	
28	Mining charter was developed primarily in response to inputs from large industry – not suitably representative of the small scale sector and the diverse social groupings it supports	
Mining financial		
29	Existing banking financing requirements do not support small scale mining, requirements onerous and very difficult to meet.	
30	Rehabilitation guarantee requirements are unrealistic for many small scale mining	
31	Delays in the conversions of mining rights are severely hampering sustainability of industry	

No.	CONSTRAINT/OBSTACLE	FREQ. OF ISSUE BEING RAISED
32	Non finalisation of royalty aspects and has problematic for assessment and granting of finance (projected cash flow assessment)	
33	Opinion shapers (e.g CEOs) are generally not educated w.r.t sustainable development	
34	BBE and mining: perception that BBE companies are allowed to disregard SD issues because of economic imperatives.	
35	Risk associated with mining sustainability is poorly understood and is likely to have important relationship to SD	
Occupational health & safety (incl. HIV issues)		
	Pending	
Women in mining and general transformation, including BBE		
	Pending	
OTHER CONSTRAINT AREAS		
	Pending	

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APPENDIX C – SUGGESTED TEMPLATE FOR INDUSTRY AND STAKEHOLDERS TO SUPPLY INFORMATION REGARDING SUSTAINABLE DEVELOPMENT PROJECTS.

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SUGGESTED TEMPLATE/INFORMATION REQUIREMENTS FOR SD PROJECT LISTING

1	*Name of Organisation/Stakeholder*
2	*Sectoral (e.g. coal, NGO, academia etc)*
3	*Title of SD project/initiative*
4	*Goal & Outcome description**
5	*Description of Project (including how it contributes to sustainable development)*
6	*Start and completion dates*
7	*Key deliverables*
8	*Contact person and details for further information*
9	*Pictures/photographs*

*if these don't fit into those listed in this document, please suggest alternatives