The quality of Environmental Management Programmes (EMPRs) within the coal mining industry in South Africa

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Mini-dissertation submitted in partial fulfilment of the requirements for the degree *Masters* in *Environmental Management* at the Potchefstroom Campus of the North-West University

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October 2015

Abstract

Mining operations negatively impact the environment and, as a result, South African legislation requires that, as part of an Environmental Impact Assessment, an Environmental Management Programme (EMPRs) be developed and implemented to manage all the impacts identified. The Coal Mining Sector was selected for this research because of the important role it plays within the South African economy. In this research, the quality of Environmental Management Programmes within the Coal Mining Sector of South Africa was reviewed. Based on Lee and Colley's method for reviewing the quality of Environmental Impact Reports, a review package was developed and used for the evaluation of the quality of the Environmental Management Programmes. According to the results, 62% of the Environmental Management Programmes achieved satisfactory quality grades despite omissions and inadequacies still being present. Distinct areas of weaknesses were found, such as confusion about what is required from an EMPR according to the guidelines and regulations of Department of Mineral Resources. Some EMPRs were generic documents with action plans presented that could not practically manage the impacts identified, and in some cases the Environmental Assessment Practitioner (EAP) did not possess the technical knowledge of the mining operation to develop effective action plans to manage the impact identified. All these factors influenced the outcome of the quality evaluation of the EMPRs reviewed.

Keywords: EMPR; Quality Evaluation Criteria; Review Areas

Acknowledgements

The assistance and support of the following people is gratefully appreciated:

Prof. Francois Retief for reviewing the drafts and providing advice, suggestions and assistance during this study; one anonymous mining operation who took part in this study by putting forward their EMPRs; one anonymous reviewer for valuable comments and suggestions; my family for their on-going support throughout this Master's programme.

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List of Acronyms

Acronym	Description
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMPR	Environmental Management Programme
MPRDA	Minerals and Petroleum Resource Development Act
DEAT	Department of Environmental Affairs and Tourism
NEMA	National Environmental Management Act
ECA	Environment Conservation Act

1 Introduction

Coal plays an important role in the South African economy. The South African Coal Road Map (Fossil Fuel Foundation, 2013) explains that the coal industry has been and today still continues to be the primary source of South Africa's energy requirements. Apart from the energy requirements, coal is also the feedstock for producing a substantial proportion of the country's liquid fuels, and provides a considerable source of foreign revenue from exports, representing over R50.5 billion in 2011 (Fossil Fuel Foundation, 2013). The Coal Mining Industry is also responsible for high levels of direct and indirect employment in South Africa.

Given South Africa's abundant coal reserves and the existing capital invested along the coal value chain, South Africa is likely to continue to include coal as part of its energy mix, where it has the potential to continue providing secure and affordable energy supply, extending employment and increasing export revenues (Fossil Fuel Foundation, 2013). These benefits are particularly relevant in light of South Africa's development priorities of job creation and economic growth. Notwithstanding all the advantages pointed out, coal mining poses significant environmental and social threats and impacts (Lloyed, 2002).

This study focusses on one particular tool mandated by South African legislation to be implemented to ensure that all environmental, social and historical/cultural impacts identified during the Environmental Impact Assessment (EIA) are managed; namely the Environmental Management Programme (EMPR).

1.1 What is an Environmental Management Programme?

An Environmental Management Programme (EMPR) can be described as a tool that provides assurance that the project proponent, proposed operation or project activity has made suitable provision to mitigate and manage impacts identified throughout all the phases of a project lifecycle (Department of Environmental Affairs and Tourism (DEAT), 2004). It follows on from the full life cycle understanding of Integrated Environmental Management (IEM), which is regarded as a continual process which ensures that environmental impacts are identified, managed and mitigated (DEAT, 2004).

In practice, an EMPR is an important tool to manage impacts on the environment. The EMPR is comprised of commitments and action plans that need to be implemented to ensure that the identified impacts are managed. Impact evaluation signifies the importance of the mitigation measures suggested during the Environmental Impact Assessment (EIA) study (Van Schalkwyk, 2012; Baby, 2011). Thus, EMPRs of good quality (which will have an influence in their effectiveness) should be developed when impacts are evaluated through a detailed EIA,

and completed with supporting baseline specialist studies for a proposed project and site (Van Schalkwyk, 2012).

DEAT (2004) highlights the following benefits for developing and implementing an EMPR:

- Encouraging mining right applicants to be more systematic and explicit in the design and development of mitigation measures and the intended means of implementation;
- Encouraging authorities to check the practicality and likelihood of implementation of mitigation and monitoring measures;
- Ensuring that the mitigation measures are properly incorporated into the project design and contract documentation after authorisation has been granted;
- Encouraging the project proponent to meet the requirements of the EMPR, which now form the basis for the conditions attached to the approval of the mining right; and
- Forcing the project proponent to internalise environmental impacts that would otherwise become a social cost.

1.2 South African mining legislation in relation to EMPRs

South Africa has legislation in place to regulate and enforce plans that mining companies need to develop and implement to ensure that all identified impacts are managed. This is to ensure that the consequence of the impact is either significantly reduced or eliminated. Mining operations can comprise other activities (e.g. bulk chemical storage areas, pollution control dams, waste management facilities, etc.), which will require some form of authorisation in terms of the listed activities and categories under the National Environmental Management Act (107 of 1998) (as amended), National Water Act (36 of 1998) and National Environmental Management Waste Act (59 of 2008) respectively. The requirements of the application of the authorisations under the abovementioned Acts are subject to some form of EIA and development of an Environmental Management Plan (EMP)[1].

The Minerals and Petroleum Resource Development Act (MPRDA) (28 of 2002) came into effect in 2004 and Section 39 of the Act requires that when an organisation applies for a mining right in South Africa, they need to appoint an independent Environmental Assessment Practitioner (EAP) to conduct an EIA and develop an EMPR to manage all identified environmental impacts associated with the proposed mining activity.

[1] For this research the focus will be only on the required EMPR in the Coal Mining Sector.

1.3 Problem statement

Considering the importance of an EMPR, the quality of an EMPR would influence the efficacy of managing impacts on the environment. Therefore, one should make sure that it is of an acceptable quality when developing an EMPR. However, the effectiveness the EMPR as a tool to manage environmental impacts still remains with how well it is implemented.

1.4 Research question

Research exists on the evaluation of the quality of Environmental Impact Reports (EIRs) through the development of review packages (Sandham *et al*, 2013b; Sandham *et al*, 2008; Lee, 2000; Lee *et al*, 1999 & Lee *et al.,* 1992), which will be further explored in Chapter 3. However, during the literature review it was found that not many of the studies evaluated the quality of EMPRs. Therefore the main research question for this research is:

'What is the quality of EMPRs within the Coal Mining Sector in South Africa?'

To answer this research question, a review package was developed to assess the quality of EMPRs. The coal mining industry was selected for this research because of the important role it plays in the South African economy and the significant environmental challenges it presents.

1.5 Dissertation structure

The dissertation is structured as follows:

The introduction and problem statement are described in Chapter 1; followed by an explanation of the methodology in Chapter 2. The literature review is presented in Chapter 3; followed by a description and analysis of the research findings in Chapter 4; and a discussion thereof appears in Chapter 0. The dissertation concludes with suggestions for future research, presented in Chapter 6.

2 Methodology

Internationally, the development and use of review packages or checklists has been the main methodological approach to review the quality of EIRs (Marais *et al*, 2015; Sandham, *et al*, 2013b; Baker & Jones, 2013; Lee, 2000; Lee & Colley, 1999; Lee & Colley, 1992). These review packages and/or checklists consist of a set of criteria developed to evaluate how well the assessment and reporting tasks have been performed in relation to the EIA (Sandham *et al*, 2013a). These EIR packages provide the main point of departure for the development of the review methodology for this research, as described in the following sections.

2.1 Review of literature

A complete literature study is presented in Chapter 3. In the literature study, comparative studies on the quality of EMPRs and EIRs were searched and assessed. Results from these studies were evaluated along with the results of this research to draw a comparative conclusion on what the quality of EMPRs is in the Coal Mining Sector in South Africa.

2.2 Development of the EMPR Quality Evaluation Package

For this research, the approach used by Lee and Colley (1999) was chosen as the foundation for the development of a review package to conduct a quality evaluation of EMPRs within the Coal Mining Sector in South Africa.

The view that quality should be assessed in the context of regulatory and procedural requirements (Sandham, *et al*, 2013b; Lee, 2000) creates the opportunity for a review package with greater focus on the legislative requirements of South Africa, rather than the best practice principle as suggested by the Lee and Colley review package. However, best practice will be considered, and much of the EIA/EMPR process has been developed accordingly.

The Lee and Colley review package suggests a hierarchical pyramid structure of the review areas, review categories, and review topics (Lee &Colley, 1999; Lee & Colley, 1992) that form the building blocks of their review package, and were used for the EMPR Quality Evaluation Package[2] (Figure 2-1).

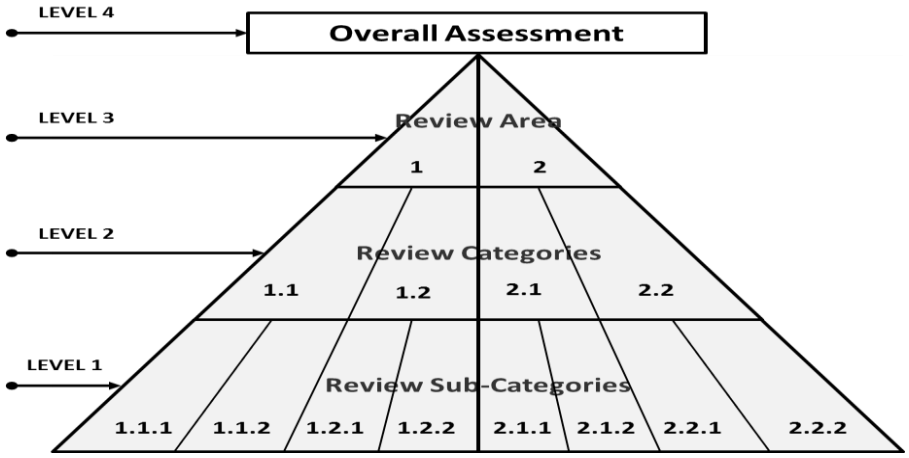

Figure 2-1: Hierarchical structure of the Lee and Colley (1999) EIR review package used for this EMPR Quality Evaluation review package. Level 4 – overall assessment of the EMPR; Level 3 – assessment of Review Areas as per the South African Legislated guidelines; Level 2 – assessment of review categories; Level 1 – assessment of review sub-categories.[3]

[2] This will be the term used for the review package developed for this research and will be used throughout this dissertation.
[3] The figure was developed from hierarchical structure presented by Lee and Colley (1999).

The review areas, review categories and review sub-categories were selected in accordance with the South African Department of Minerals Resources' (DMR) guidelines for the development of an EMPR. These guidelines were published in accordance with the requirements of the Minerals and Petroleum Resource Development Act (MPRDA) (28 of 2002) Regulations[4]. None of the review topics from the Lee and Colley (1999) review package were incorporated into the EMPR Quality Evaluation Package. The reason for this is that the Lee and Colley (1999) review package focusses on the quality of Environmental Impact Statements (EIS), and therefore the review topics reflected fall more in line with the international best practice guidelines of undertaking an EIA and not an EMPR. However, valuable insight was gained by studying Lee and Colley (1999), and the EMPR Quality Evaluation Package was developed on the same principles used (Table 2 1).

2.3 Selection of sample

EMPRs that were already published within the public domain for review were obtained and mining companies were directly contacted and asked if they would be interested in participating in this study. As a result, a total of thirteen (13) EMPRs related to mining rights applications from the Coal Mining Sector were obtained for this research. The mining locations for these EMPRs are widely spread through both the Mpumalanga and Limpopo Provinces of South Africa.

2.4 Evaluation criteria and conducting a review

This EMPR Quality Evaluation Package (Table 2-1) that was developed for this research focusses more on the development of good quality EMPRs within the Coal Mining Sector in South Africa. Apart from the MPRDA (28 of 2002) legislative requirements that form the foundation of this EMPR Quality Evaluation Package, additional categories and sub-categories were developed and incorporated into each Review Area (where necessary) to reflect quality requirements of the coal mining industry specifically. These additional categories and sub-categories looked at applicability and practicality of action plans and commitments presented in the EMPRs that were evaluated.

[4] GN R 572 of 2004 – MPRDA Regulations (South Africa, 2004).

Table 2-1: EMPR Quality Evaluation Criteria

No.	Description of criteria for the Review Areas (No 1 to 9), review categories and review sub-categories
1	**Environmental objectives and goals – mine closure and environmental impacts**
1.1	Pre-environmental conditions and measurements
1.1.1	There must be a list of aspects describing the pre-environment; and
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post-closure.
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:
1.2.1	There must be a list identifying all impacts that will require monitoring;
1.2.2	There must be a list that identifies the source activities causing the impacts that require to be managed;
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.
2	**Environmental objectives and goals – socio-economic, historical and cultural impacts**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, which could potentially be impacted; and
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine, which may impact on communities and interested and affected parties identified.

No.	Description of criteria for the Review Areas (No 1 to 9), review categories and review sub-categories
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:
2.2.1	There must be a list of objectives and goals in respect of historical and cultural aspects identified.
3	**Technical and management options**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and
3.1.2	Technical and management options must be practical and implementable.
4	**EMPR action plans**
4.1	Provide action plans to achieve the objectives and specific goals:
4.1.1	Action plans must be practicable and implementable;
4.1.2	Action plans must specify who would be responsible to execute them;
4.1.3	Action plans must be audible to ensure compliance; and
4.1.4	Actions plans must manage impacts identified.
5	**Environment-related emergencies and remediation**
5.1	An Environmental Emergency Plan should be included:
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential ‘environmental emergencies’ are detected early to reduce the risk of them occurring or to avoid them completely; and

No.	Description of criteria for the Review Areas (No 1 to 9), review categories and review sub-categories
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.
6	**Planned monitoring and environmental management programme performance assessment**
6.1	Description of planned monitoring of all identified environmental aspects:
6.1.1	There must be a defined list of environmental aspects that will be monitored;
6.1.2	There must be a description of how monitoring will be conducted;
6.1.3	Frequency of monitoring must be specified; and
6.2	Description of the EMPR Performance Assessment:
6.2.1	Specify the frequency of performance assessments to be conducted.
7	**Financial provision in relation to the execution of the environmental management programme**
7.1	Mining Plan:
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.
7.2	Rehabilitation Plan:
7.2.1	The rehabilitation plan should specify closure objectives; and
7.2.2	Closure objectives should be realistic and implementable.
7.3	Financial Provision:
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and

No.	Description of criteria for the Review Areas (No 1 to 9), review categories and review sub-categories
7.3.2	Proof of financial provision available for mine closure must be included.
8	**Environmental Awareness Plan**
8.1	Employee Environmental Awareness:
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;
8.1.2	The Environmental Awareness Plan must describe how the abovementioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and
8.1.3	The Environmental Plan must specify general environmental awareness training that the mine proposes to present on dealing with environmental emergencies and the remedy thereof.
9	**Undertaking of the EMPR**
9.1	A mine representative must sign the EMPR to ensure that the mine accepts and agrees to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.

The Lee and Colley (1992) review methodology has been widely used to undertake reviews of EIRs around the globe (Marais *et al*, 2015; Sandham *et al*, 2013b; Baker, 2013; Lee, 2000; Lee & Colley, 1999; Lee & Colley, 1992). Lee and Colley (1999) assigned assessment symbols (in Table 2-2) according to which each level in the hierarchical review structure within a review package is assessed. The symbols assess the level of satisfaction against the review topic. The higher the level of satisfaction in terms of achieving the requirements of each review topic, the better the grading is in terms of the quality.

Table 2-2: Assessment symbols and their explanation (Lee *et al*, 1999)

Symbol	Explanation
A	Relevant tasks well performed, no important tasks left incomplete.
B	Generally satisfactory and complete, only minor omissions and inadequacies.
C	Can be considered just satisfactory despite omissions and/or inadequacies.
D	Parts are well attempted but must, as a whole, be considered just not satisfactory because of omissions or inadequacies.
E	Not satisfactory, significant omissions or inadequacies.
F	Very unsatisfactory, important task(s) poorly done or not attempted.
NA	Not applicable. The Review Topic is not applicable or is irrelevant in the context of this statement.

The review methodology for the assessment of each EMPR followed the approach of Lee and Colley (1999), commencing at the lowest level (Level 1). The review findings were recorded on a collation sheet using the assessment symbols shown in Table 2-2. These symbols do not allow for a 'neutral' assessment, i.e. at any level of review the performance will be either satisfactory or not satisfactory (Sandham *et al*, 2013b; Lee & Colley, 1999). Furthermore, the assessment for higher levels of the hierarchy are not determined by numerical averages, but rather by an overall performance grade per review category, and then again for the Review Area. Thus during application, initial grading was made for the review sub-categories (Level 1) only.

3 Literature study

The development of today's modern society is structured around the need to fill a gap left by the demand for goods and services, therefore industries must evolve and adapt to be able to provide and bring those products to market (Castilla-Gómez & Herrera-Herbert, 2014; Kogel

et al, 2006). The first step in the process of supplying goods and services is the supplying of raw materials for further processing and transformation (Castilla-Gómez & Herrera-Herbert, 2014). Mining is facing one of the greatest challenges that might arise in any industrial activity – that it is negatively impacting the environment (Castilla-Gómez & Herrera-Herbert, 2014). Mining operations can affect local environments in a number of ways. The physical environment of air, land and water can be affected by dust, exhaust pollutants, land-use changes, pollutant leakages from tailings and slag, acid mine drainage, and other leachates (Burke, 2006). The social impact of mining on people living and/or working near the mine is closely linked with these environmental impacts. Therefore, it is nothing new that discussions on environmental management in the mining sector often take a negative turn (Burke, 2006). Thus, the need to develop and adapt the concept of 'sustainable development' in mining is born (Castilla-Gómez & Herrera-Herbert, 2014). The concept of sustainable development requires that human activities should be carried out in such a manner that will not reduce environmental options for future generations. According to the National Environmental Management Act (NEMA) (107 of 1998), sustainability can be defined as a means for the integration of social, economic and environmental factors into planning, implementation and decision making to ensure that development serves present and future generations (South Africa, 1998). Thus, economic development must not compromise environmental integrity (Castilla-Gómez & Herrera-Herbert, 2014; Hilson and Murck, 2000).

The development of the EIA process as a key component of environmental management over the last 40 years has coincided with the increasing recognition of the nature, scale and implications of environmental change brought about by human actions (Morgan, 2012). During that time, EIA has evolved and changed as a result of the influence of the changing needs of decision makers and the decision-making process, and through the experience gained in practice over the years (Morgan, 2012; 1998).

Voluntary EIAs have been conducted in South Africa since the early 1970s (Sandham, *et al*, 2013b; Sowman *et al*, 1995), but only became mandatory in September 1997 upon promulgation of regulations in terms of the Environment Conservation Act (ECA) (73 of 1989). These regulations enforced compulsory EIA practice in South Africa, and were replaced in July 2006 and July 2010 by new regulations promulgated in terms of Section 24 of the NEMA (107 of 1998).

The International Study of the effectiveness of the EIA concluded that EIAs have achieved the goal of helping society to reach better decisions (Kidd & Retief, 2009; Hill, 2000; Sadler, 1996). According to Hill (2000) the South African EIA model, also called IEM, has highlighted another important purpose, namely to use an EIA to resolve, mitigate and manage impacts

identified, and to enhance the benefits of a proposed activity. Thus, the findings made during an EIA is implemented through a tool called the EMP or EMPR.

In terms of the MPRDA (28 of 2002) an applicant must submit an EMP when applying for a prospecting mining right or mining permit and submit an EMPR when applying for a mining right. The EMP or EMPR has to be included with the submission of an EIA.

3.1 Research on EMPR quality

According to Zhang *et al.* (2012), EIA has been adopted worldwide in different jurisdictions as an effective tool to assist identifying impact on the environment, associated with developments. Therefore, EIA is expected to have an impact on planning and decision making. After decades of development and debate on the EIA process (which includes the development of an EMPR in the South African mining context), the gap between high expectations and poor practical performance is still significant (Zhang *et al*, 2012; Nykvist & Nilsson, 2009).

3.1.1 The need for an EMPR

According to Hill (2000), factors that influence the case for the need of an EMPR include the conditions when monitoring is necessary. One of the potential weaknesses in an EIA process is the allocation of responsibility for environmental management (Hill, 2000). According to the DMR guidelines (DMR, 2004) on developing an EIA and EMPR, assigning responsibility to each action in the EMPR action plan is a requirement and therefore this weakness in the EIA process could be strengthened by the need to develop an EMPR.

Combined with a need to satisfy the demands of communities and external stakeholder groups, more organisations realise that it is in the best interest of mining operations to ensure that environmental impacts are minimised (Hilson & Nayee, 2002). An important feature of the International Standards Organisation's (ISO) international standard ISO14001:2004 is its requirement that impacts should not only be controlled, but also reduced, with specific targets and action plans defined by the organisation, who must implement them (DEAT, 2004; George, 2000).

According to Wing-Hung Lo *et al*. (2010), over the past few decades corporations have been called upon by multiple stakeholders – governments, shareholders, employees, the public, non-governmental organisations (NGOs) and others – to uphold responsibilities beyond profitmaking alone. One important way that organisations are able to demonstrate their responsiveness to these calls is through the adoption of EMPRs that not only improve their environmental practices but also communicate to knowledgeable stakeholders about their commitment to environmental and social responsibilities.

3.1.2 Methods to evaluate the quality of an EIA and EMPR

During the literature study, it was found that most methods developed were to review the quality of Environmental Statements (ES) or EIRs.

According to Simpson (2001), the Lee and Colley (1992) package has been widely used to undertake quality reviews of project EIA statements. During 1989, Colley developed a review package that was used to assess the quality of ES submitted in response to the UK planning regulations at the time (Lee & Colley, 1999; Colley, 1989; Department of Environment, 1989). As ES are the main mechanisms through which impacts are reported, the review of the quality of ES has become an established mechanism for evaluating legitimacy (Baker & Jones, 2013; Lee, 2000; Tzoumis & Finegold, 2000; Weston, 2000).

Since the EIR is an important element of the EIA process, the quality of the EIR can contribute and influence better decision making regarding environmental issues (Sandham *et al*, 2008; DEAT, 2004; Fuller, 1999; Leu *et al*, 1996; Sadler, 1996; Wood, 2003;). In the South African context, a good quality EIR from an EIA process could have a direct impact on the quality of an EMPR. Although this research focusses on the quality of EMPRs in the Coal Mining Sector of South Africa, more research is needed in order to determine the impact of EIA quality on development of a good quality EMPR.

3.1.3 Conclusion from the literature study

From the literature study, it is evident that little academic research exists on the quality of EMPRs in the mining sector (especially in a South African context). Most research is on the quality of the EIA process and the EIR itself and how it influences the decision-making process. The current South African legislation in place enforces the need to conduct an EIA and develop and EMPR for mining activities. With the EMPR being developed from the results of the EIA, one could conclude that the quality of an EMPR would be highly depended on the quality of the EIA. However, almost no studies exist that specifically focus on the quality of EMPRs in the mining sector and therefore a recommendation could be made that warrants for more research in this area.

4 Results and analysis

The following sections provide a discussion of the review results per Review Area for the sample of EMPRs reviewed.

4.1 Review Area 1: Environmental objectives and goals – mine closure and environmental impacts

Figure 4-1 depicts the percentage distribution of the scoring of EMPRs under Review Area 1. Looking at environmental objectives and goals relating to the pre-environmental baseline conditions, 54% of the EMPRs were found to be just satisfactory (scoring C) despite omissions and inadequacies being found. Some of the omissions noted relate to out-of-date information sources used when compiling the pre-environmental conditions section in the EIA for a project area. Thirty-one percent (31%) of the EMPRs were found to be generally satisfactory (scoring B) on determining environmental goals and objectives, with only minor omissions and inadequacies found. For 8% of the EMPRs, the task was found to be performed well (scoring A), and 8% of the EMPRs were found to be not satisfactory (scored E) due to major omissions and inadequacies found with pre-environmental information and the mine closure objectives and goals presented. Some of these omissions and inadequacies include leaving out certain environmental aspects, such as ground and surface water, and incomplete or outdated information for fauna and flora and climate change. These inadequacies and omissions were found in the EMPRs that dated 10 years or more back.

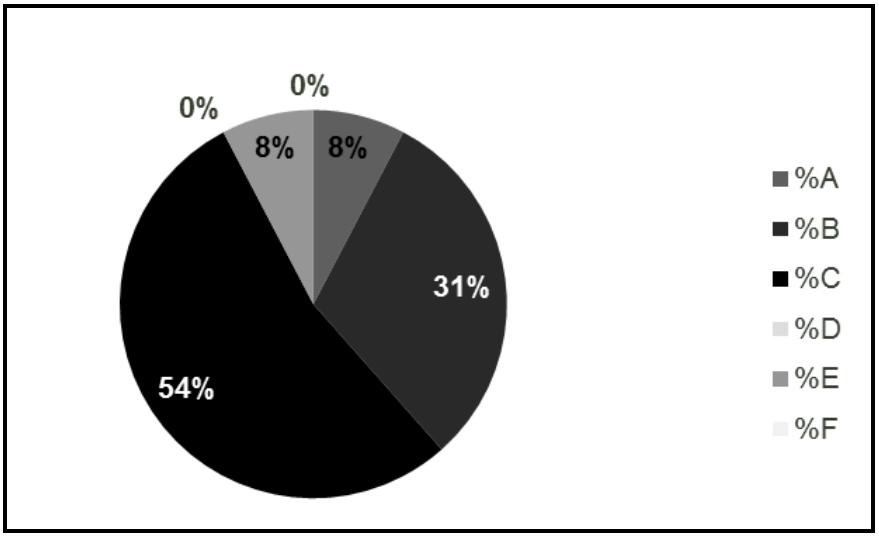

Figure 4-1: Percentage distribution of the Quality scoring in Review Area 1

4.1.1 Gaps identified in Review Area 1

Pre-development environmental conditions play an important role in any EIA. It is used to analyse and obtain a baseline from an area before any activity goes ahead. This information is used to determine potential impacts and from there mitigation and management measures are formulated that form the framework for the EMPR. However, it was found that – especially for climate change – data on air quality were fairly old, dating back five to ten years and, in

some cases, older. Although it was not part of the scope of this study, most EMPRs referred to the EIA section for a list of environmental impacts that need to be managed and mitigated. It was, however, difficult to find some clear link between the actual EMPR and the impacts identified in some of the EMPRs and thus difficult to justify some of the remedies and monitoring aspects presented. In some of the EMPRs, and from the evidence presented, one could argue whether this section could have been treated as a tick box exercise in obtaining a mining right and therefore lacks the depth and clarity needed to ensure that all potential impacts are properly managed.

4.1.2 Strengths identified in Review Area 1

Apart from the omissions and inadequacies, some EMPRs performed well under Review Area 1. Some of the strengths noted during the quality evaluation were complete and fairly up to data sources used with the compilation of the pre-development environmental data. Providing mine rehabilitation plans and objectives can be challenging before the construction phase of a mine commences, however it was found that in the EMPRs that scores an A and B under this Review Area were well presented. These EMPRs made a valuable effort in presenting a fairly detailed rehabilitation plan, and objectives that were related to the planned mining activities. Lists of impacts identified were well presented and could be linked with the pre-development environmental conditions.

4.2 Review Area 2: Socio-economic, historical and cultural impacts

Figure 4-2 depicts the percentage distribution of the scoring of EMPRs under Review Area 2. The EMPRs scored fairly satisfactory in this Review Area, with 31% being generally satisfactory with minor omissions and inadequacies (scoring B) and 38% being just satisfactory despite omissions and inadequacies (scoring C). The omissions and inadequacies found were due to the socio-economic, historical and cultural impacts identified being too generic (although still applicable to the project or mining activity). Eight percent (8%) of the EMPRs were well attempted, however, as a whole could be considered not satisfactory due to omissions or inadequacies found (scoring D). These omissions and inadequacies included very little management measures for both socio-economic and historical/cultural impacts identified. During the evaluation of this Review Area, it was also found that mitigation measures were too generic, and not specific to the mining activity applicable. Fifteen percent (15%) of the EMPRs were not satisfactory due to significant omissions and inadequacies (scoring E) and 8% of the EMPRs were very unsatisfactory due to important task poorly attempted (scoring F). The reason for the poor scoring was due to some EMPRs not having any socio-economic or historical/cultural impacts identified, despite the fact that the EIA part provided baseline information on these aspects. Mitigation measures that were actually

recorded in some of these EMPRs were considered to be inadequate to manage the impacts identified.

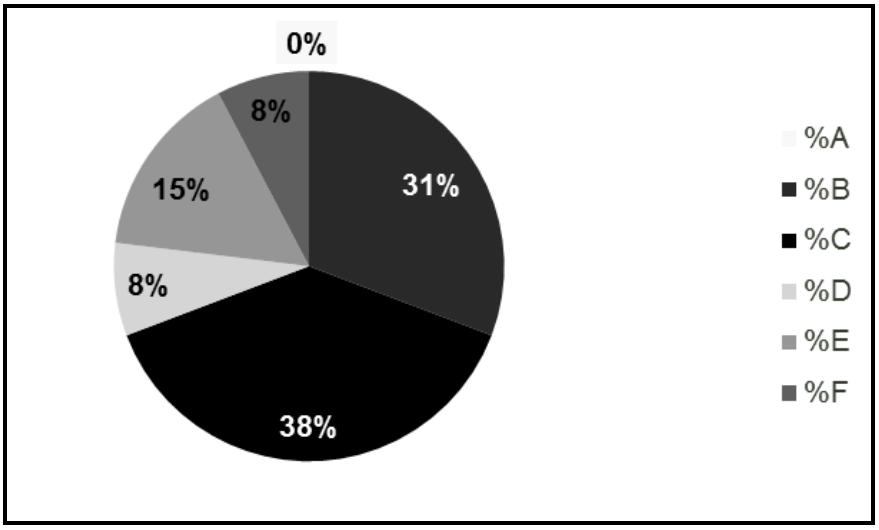

Figure 4-2: Percentage distribution of the Quality scoring in Review Area 2

4.2.1 Gaps identified in Review Area 2

Under this Review Area 2, the results went back and forth between satisfactory and not satisfactory. The overall results showed that the majority of the EMPRs were in fact satisfactory. The socio-economic and historical/cultural aspects are an area that is becoming one of the main legs of an EIA as the process evolves globally. In South Africa, socio-economic and historical/cultural aspects are required to be reviewed under the national legislation[5] and therefore should be part of all EMPRs in the mining industry. However, omissions still existed and were found to be quite major throughout the EMPRs reviewed. When looking at the EMPRs that measured not satisfactory in this particular Review Area, major issues of concern included either a lack of social-economic objectives being presented, or goals and objectives were just poorly developed and did not at all aim at managing and mitigating potential impacts. It was also difficult in some of the EMPRs to make a direct connection between the social-economic goals and objectives and the actual baseline information presented in the EIA section. Some of the impacts identified were also found to be just too generic and therefore mitigation measures presented to manage and mitigate impacts identified were just too broad and not narrowed down to the respective mining activities under review.

[5] National Heritage Resources Act, of 1999 (Act No. 25 of 1999) ; National Environmental Management Act, of 1998 (Act 107 of 1998); Mineral and Petroleum Resource Development Act, 2002 (Act 28 of 2002)

4.2.2 Strengths identified in Review Area 2

None of the EMPRs evaluated scored an A under this Review Area, however despite some minor omissions and inadequacies, strengths were noted. Some of the strengths included well presented lists of socio-economic impacts that could be associated with the mining development assessed. Some of the EMPRs evaluated also provided good remedies that will manage all socio-economic impacts identified.

4.3 Review Area 3: Technical and management options

Figure 4-2 depicts the percentage distribution of the scoring of EMPRs under Review Area 3. The overall quality performance of the EMPRs in Review Area 3 were average, with the majority of the EMPRs (38%) being just satisfactory despite omissions and inadequacies (scoring C). The omissions and inadequacies were mainly due to the difficulty of finding technical and management options that were identified to manage impacts. One can argue that the EMPRs as a whole consist of technical and management options, however, when applying it to what is legally required, finding these options was a challenge. However, they do exist and therefore could still be acceptable to the public and decision-making authority, hence the reason for still regarding these EMPRs as just satisfactory. Fifteen percent (15%) of the EMPRs were found to be generally satisfactory (scoring B) despite minor omissions and inadequacies found. Thirty-one percent (31%) of the EMPRs reviewed were well attempted in this Review Area, but as a whole was not satisfactory due to the omissions and inadequacies noted (scoring D). Omissions and inadequacies found were due to the confusion factor – by not being able to identify if certain aspects could be considered as technical and management options. It was difficult to understand what these EMPRs tried to achieve, with certain lists that could potentially be regarded as technical and management options. After the review, the perception is that this Review Area was attempted; however, the person who compiled the EMPR did not really understand the requirement of technical and management options. Lastly, 15% of the EMPRs were found to have significant omissions and inadequacies in this Review Area (scoring E). These included technical and management options not identified in the EMPR or, where an attempt was made, it was poorly executed to what is required.

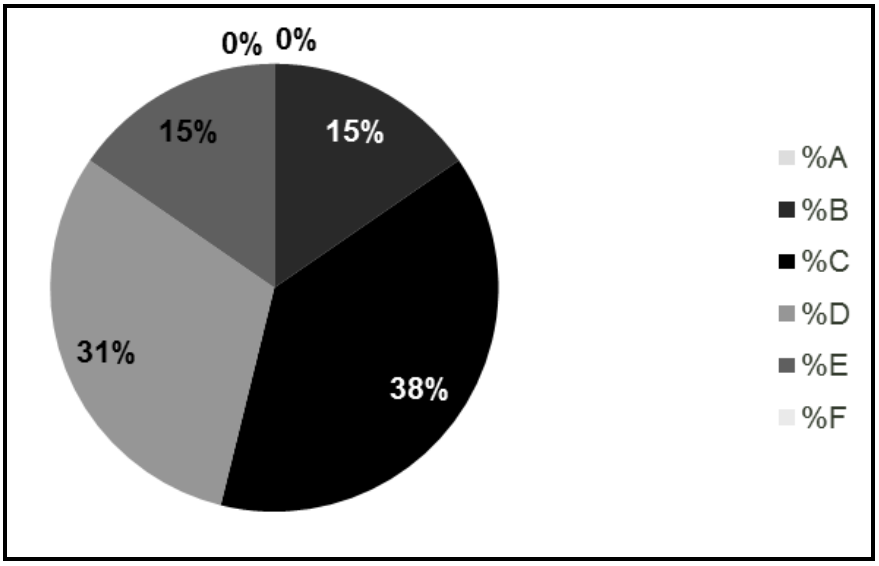

Figure 4-3: Percentage distribution of the Quality scoring in Review Area 3

4.3.1 Gaps identified in Review Area 3

Despite the majority EMPRs (by a very small margin) being found as satisfactory, one distinct conclusion that could be drawn from all the EMPRs reviewed is that there was confusion of what is actually required when the guidelines ask for technical and management options. Based on this study's results, one could argue that the majority of the EMPRs were satisfactory under this Review Area, however, there were still major concerns noted overall. In some of the EMPRs the EAP presented technical and management options for the person responsible for implementing various parts of the EMPR. For some of the EMPRs, one could consider that all technical and management options were incorporated into the overall EMPR action plan, however, reviewing this particular Review Area was challenging. It was also found that some of the EMPRs reviewed only applied technical and management options to the environmental aspects, leaving out the socio-economic and historical/cultural components. This was an area that was found to be very poorly executed and not very clear, and some of these challenges could be due to a lack of clear instructions on what is actually required from the DMR guidelines.

4.3.2 Strengths identified in Review Area 3

Fifteen percent (15%) of the EMPRs evaluated did provide technical and management options in separate sections, linking them directly to the impacts identified. Overall, not many strengths could be identified under this Review Area.

4.4 Review Area 4: EMPR action plan

Figure 4-4 depicts the percentage distribution of the scoring of EMPRs under Review Area 4. During the review, the majority of EMPRs were satisfactory, with 46% being generally

satisfactory despite minor omissions and inadequacies (scoring B) and 23% being just satisfactory despite omissions and inadequacies (scoring C). The omissions and inadequacies related more to a minor exclusion of responsibility and a few action plans that could be difficult to execute, manage and implement. Despite the majority of EMPRs measuring satisfactory in terms their actions plans, a high number of EMPRs were still found to be not satisfactory, with 31% being classified as having parts that were well attempted, but as a whole, not satisfactory (scoring D) and 8% being not satisfactory due to significant omissions or inadequacies (scoring E). During the review, it was difficult to establish what the action plans were in some of the EMPRs. Where an action plan was present, determining who would be responsible for implementation and the practicality of the action plans were unclear. Action plans should be in place to manage all potential impacts identified; which was not the case for the EMPRs that measured not satisfactory. Some EMPRs had made a good attempt at what is required, however, as a whole were still confusing and one could not determine what the EMPRs wanted to achieve.

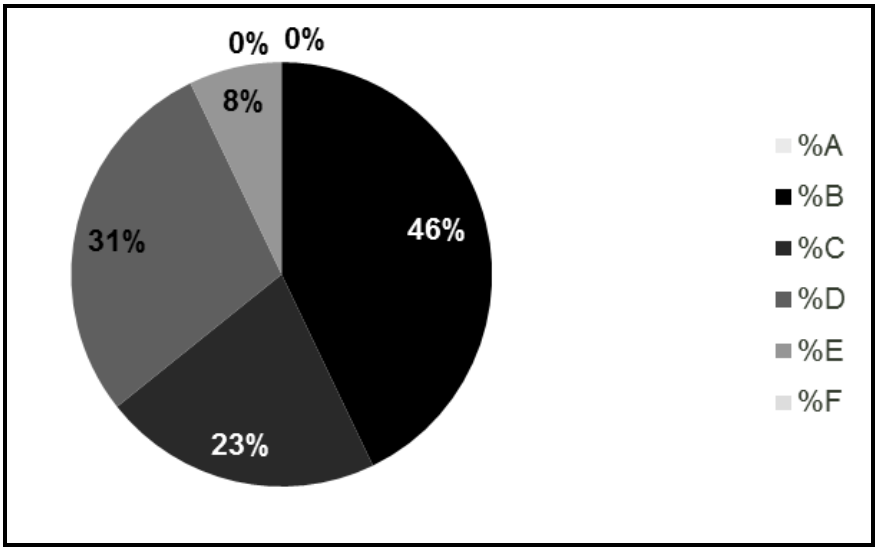

Figure 4-4: Percentage distribution of the Quality scoring in Review Area 4

4.4.1 Gaps identified in Review Area 4

The EMPR action plans could be regarded as the main foundation from where the EMPRs will be executed and therefore, once approved by the DMR, these action plans become legally binding commitments that the mine must implement to ensure that all environmental, socio-economic and historical/cultural impacts are properly managed. Results in Section 4.3.1 show that the majority of the EMPRs were satisfactory despite omissions and inadequacies identified. Other EMPRs were also found to be not satisfactory and some of the main reasons for these ratings were due to action plans not directly having a connection to and managing the impacts identified. It is important to assign responsibility to action plans to ensure that they

will be implemented and executed, and some of the EMPRs were found completely lacking in this regard. Some action plans were found to be too unclear to make a conclusion as to why and how it will manage respective impacts. Furthermore, some of the action plans were found to be impracticable or not implementable and would therefore be impossible to comply with once it becomes a legally binding obligation. From the results of this study, one could easily conclude that little or no thought was put into some of the action plans presented and therefore a list of generic commitments was put forward. Some of the EMPRs that obtained either a just satisfactory or unsatisfactory rating did present actions plans, however, from a reviewer's point of view the EMPRs lacked structure and, as a result, it was difficult to determine or find actions plans because they were scattered throughout the document.

4.4.2 Strengths identified in Review Area 4

Some of the strengths under this Review Area noted were that action plans presented was clear and understandable. The EMPRs that scored an A or B had their objectives for the action plan clearly set. It was easy to understand what impacts each action was assigned to and who is responsible to see the actions through. Actions evaluated were practicable and could be easily implemented. The table format used to present action plans in some of the EMPRs was found to be a very good approach. It organises the action according to the impacts identified. This table format approach is well-structured and should allow mines to easily do internal performance assessments on their commitments.

4.5 Review Area 5: Environment-related emergencies and remediation

Figure 4-5 depicts the percentage distribution of the scoring of EMPRs under Review Area 5. During the review, it was found that the majority of EMPRs were satisfactory with regard to the Emergency Response Plans and associated procedures provided. Fifteen percent (15%) of the EMPRs had relevant tasks well performed, no important tasks left incomplete (scoring A); 31% were generally satisfactory despite minor omissions and inadequacies (scoring B); and 23% were just satisfactory despite omissions and inadequacies (scoring C). The minor omissions and inadequacies found included slightly incomplete descriptions of how environmental emergencies would be monitored and some procedures could have been thought through more thoroughly. Thirty-one percent (31%) of the EMPRs in total were not satisfactory; with 15% having parts well attempted, but was inadequate as a whole (scoring D); 8% being not satisfactory due to major omissions and inadequacies (scoring E); and 8% were found to have tasks poorly performed, and major omissions and inadequacies (scoring F). The major omissions and inadequacies included no descriptions or procedures for any potential environmental emergencies and poorly written Environmental Emergency Response procedures.

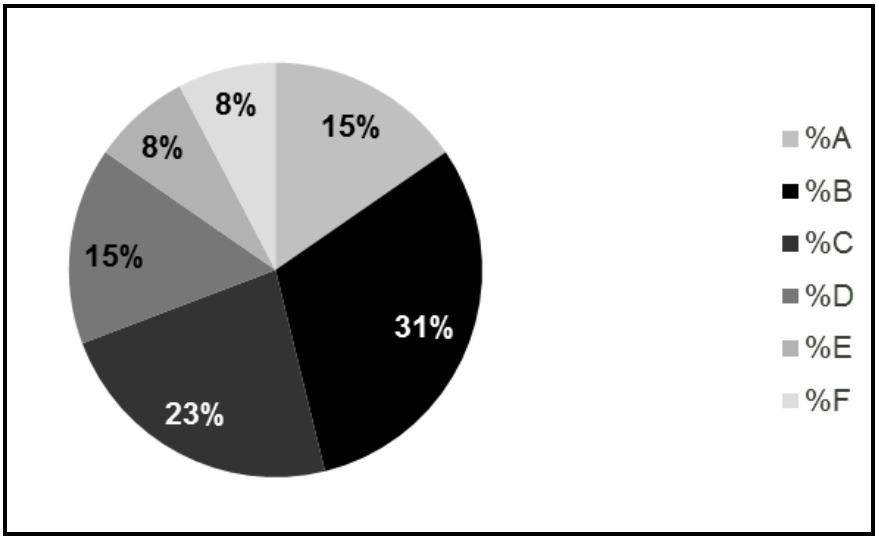

Figure 4-5: Percentage distribution of the Quality scoring in Review Area 5

4.5.1 Gaps identified in Review Area 5

Environmental Emergency and Response Plan is an important area and the overall quality in this Review Area was found to be satisfactory among the EMPRs reviewed. The EMPRs that were found to be unsatisfactory were mainly due the Environmental Emergency and Response Plan being either completely missing or poorly written procedures for implementation. One of the main challenges for not being able to properly identify what an 'Environmental Emergency' is may be due to the South African National Legislation not clearly providing a proper definition of an 'Environmental Emergency'. During this study, it was also noted that nowhere in the DMR guidelines is any definition or guidance provided on what an Environmental Emergency is. Thus, although it is a requirement to put into the EMPR, much discretion is left to the mining company and EAP to determine what an 'Environmental Emergency' is and this could therefore lead to this section still experiencing many challenges and lacking to satisfy any reviewer. One could argue that an oil spill could be an obvious example of an 'Environmental Emergency'; however, it is still difficult to determine where one would draw the line and say it is an emergency and act accordingly. This was an area that was still found to be very challenging, and although some of the EMPRs were found to provide what one could consider as an excellent Environmental Emergency Response Plan, one would be understanding if this is an area where compliance could be found to be poor due to improper guidance from the legislation and guidelines used by EAPs.

4.5.2 Strengths identified in Review Area 5

Despite the challenges noted during the evaluation of this section, some of the EMPRs made a valuable effort in providing a proper Emergency Response Plan. One of the strengths found was that the EAP made an effort to identify potential emergency risks that could be associated

with the mining development, and developed a response plan around these. Some of the EMPRs provided some procedures that mining staff and contractors will have to follow in case of an emergency.

4.6 Review Area 6: Planned monitoring and environmental management programme performance assessment

Figure 4-6 depicts the percentage distribution of the scoring of EMPRs under Review Area 6. During the review of Review Area 6, it was found that the majority of the EMPRs measured not satisfactory. Fifty-four percent (54%) of the EMPRs were not satisfactory due to major omissions and inadequacies (scoring E). Omissions that were found mainly related to complete lack in describing environmental aspects that should be monitored. Eight percent (8%) of the EMPRs attempted parts well, but as a whole (in the perspective of Review Area 6) measured not satisfactory (scoring D). However, all was not lost, as some of the EMPRs (23%) measured just satisfactory despite omissions and inadequacies (scoring a C), with 8% being generally satisfactory despite minor omissions and inadequacies. Again the omissions could be related to the quality of the description of monitoring and also to leaving out information such as monitoring frequencies, etc. It was also found that very few of the EMPRs actually provided a frequency on the performance assessment of the EMPR itself. Although the MPRDA regulation 55 (South Africa, 2004) specifies that external EMPR performance assessments should be conducted every two years, this does not exempt mining companies from committing to do internal performance assessments against the commitments made in their EMPRs. Eight percent (8%) of the EMPRs were reported to have the tasks under Review Area complete and well performed (scoring A).

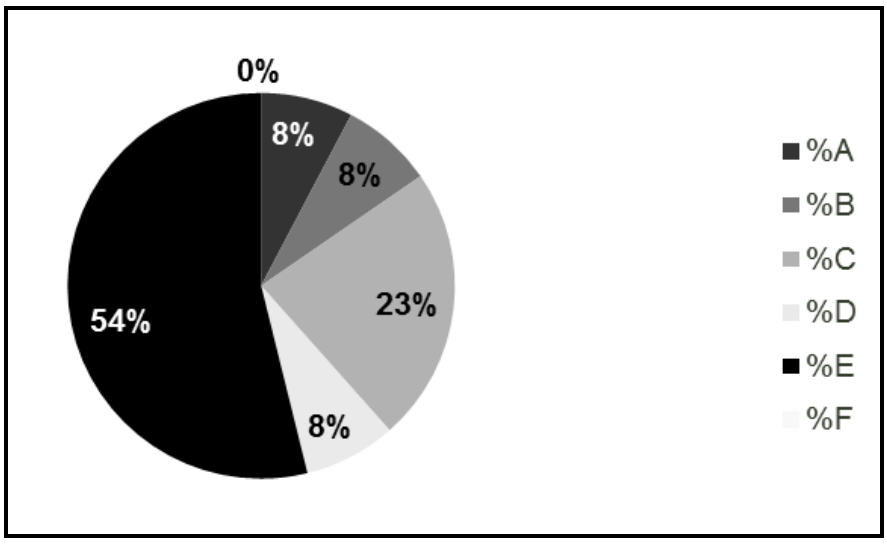

Figure 4-6: Percentage distribution of the Quality scoring in Review Area 6

4.6.1 Gaps identified in Review Area 6

Apart from the EMPR action plans, planned monitoring per environmental aspect is also very important. Environmental impacts tend to evolve over time and if aspects are not monitored properly, impact can escalate and have a major negative impact on the environment (water management is a good example). In this area, the majority EMPRs were found to be not satisfactory, mainly due to the list of environmental aspects that should be monitored being completely missing. A general trend could be drawn from all the EMPRs that the EAP saw the EMPR action plan to be the correct section in the EMPR to serve as the list of aspects that also need to be monitored. However, although both requirements provide commitments in terms of execution, each served a separate function in the EMPR. Some of the EMPRs made an attempt to provide a list of aspects to be monitored, however, it was not clear what exactly should be monitored and how monitoring would be achieved.

One aspect under this specific Review Area related to the frequency of performance assessments to be conducted. During the review of the EMPRs, it was found that this requirement was not clearly understood. The MPRDA regulations (South Africa, 2004) require external performance assessment to be done on the EMPRs every two years, however, this particular requirement under review requires the mining company to ensure that they will do internal monitoring of the performance on their EMPR. Some of the EMPRs actually made the commitment, but in the majority of the EMPRs, this was either left out or referred to the regulated process, which is not the aim of this requirement.

4.6.2 Strengths identified in Review Area 6

Not many strong points could be drawn from this Review Area. Some of the EMPRs (8%) did score an A, and this was due to a proper monitoring plan that was presented in the EMPR. What made this particular case strong was that the EAP presented the planned monitoring in a separate section. The EMPR clearly indicated what environmental aspects needed to be monitored and also specified the interval of monitoring.

4.7 Review Area 7: Financial provision in relation to the execution of the environmental management programme

Figure 4-7 depicts the percentage distribution of the scoring of EMPRs under Review Area 7. Overall quality performance in Review Area 7 was satisfactory, with 15% of the EMPRs reported to have all tasks well performed (scoring A); 38% being generally satisfactory despite minor omissions and inadequacies (scoring B) and 23% being just satisfactory despite omissions and inadequacies (scoring C). Omissions and inadequacies found were mainly

contributed to some of the closure objectives being too generic, and the map of the mining activities not being clear. Also, proof of financial provision being available was also found to be excluded in two EMPRs. Nonetheless, the reason for the majority of EMPRs being satisfactory in this area could be that the DMR normally uses the financial provisions as one of the main focus points for making their decision and, from past experiences in the field, a few times it was found that mining right applications got rejected solely on poor attempts at presenting the financial provision. However, there were still EMPRs found to be not satisfactory under Review Area 7, with 15% having part of a section well attempted, but as a whole did not make the cut (scoring D). Eight percent (8%) of the EMPRs were reported to having the task poorly performed and lacking what was required to fulfil the requirements (scoring F) .

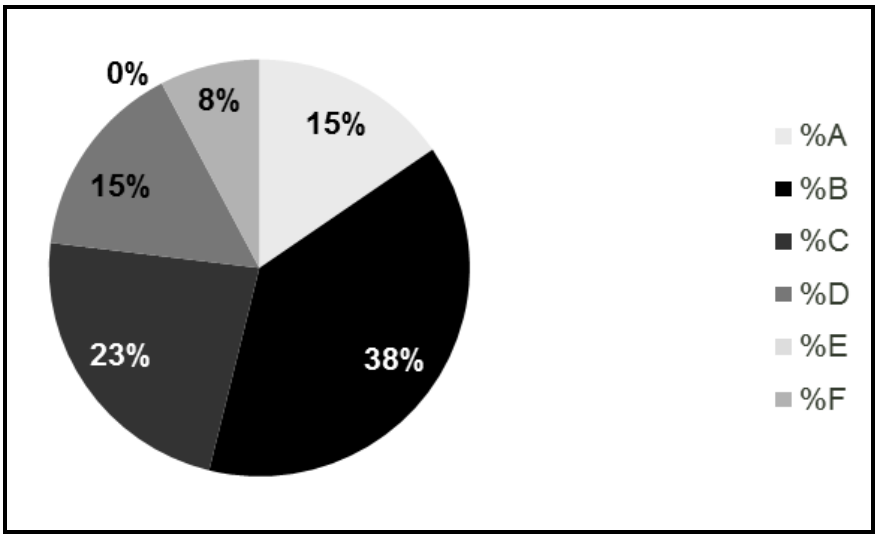

Figure 4-7: Percentage distribution of the Quality scoring in Review Area 7

4.7.1 Gaps identified in Review Area 7

Some EMPRs rated as not satisfactory in this Review Area. This was mainly due to a poor rehabilitation plan, generic and impractical closure objectives and goals, and poorly calculated financial provisions.

4.7.2 Strengths identified in Review Area 7

Most of the EMPRs evaluated were satisfactory despite other sections of the EMPRs being not satisfactory. One could see that a lot of thought, detail and information were presented under this Review Area and from all the EMPRs evaluated, one could detect a clear trend which shows that most of the EAPs focussed more on the financial provision and closure objectives.

4.8 Review Area 8: Environmental Awareness Plan

Figure 4-8 depicts the percentage distribution of the scoring of EMPRs under Review Area 8. Most of the EMPRs were found to be satisfactory under this Review Area, with 23% having tasks well performed and completed (scoring A); 23% being generally satisfactory despite omissions and inadequacies (scoring B); and 8% being just satisfactory despite omissions and inadequacies (scoring C). Omissions and inadequacies found in these EMPRs related to some minor gaps in the description of Environmental Awareness procedures, and in some instances explaining how staff would be trained on Environmental Awareness was unclear. Fifteen percent (15%) were found to attempt certain areas of the Environmental Awareness Plan well, but as a whole, failed to provide a proper plan or description of the mine towards this required cause (scoring D). Thirty-one percent (31%) of the EMPRs were found to poorly execute and present an Environmental Awareness Plan (scoring F). On one occasion, the Environmental Awareness Plan was left out completely and in the other cases, the plan was poorly written, either not making sense at all or not really showing any commitment towards training staff to be more aware of the environment during their daily tasks.

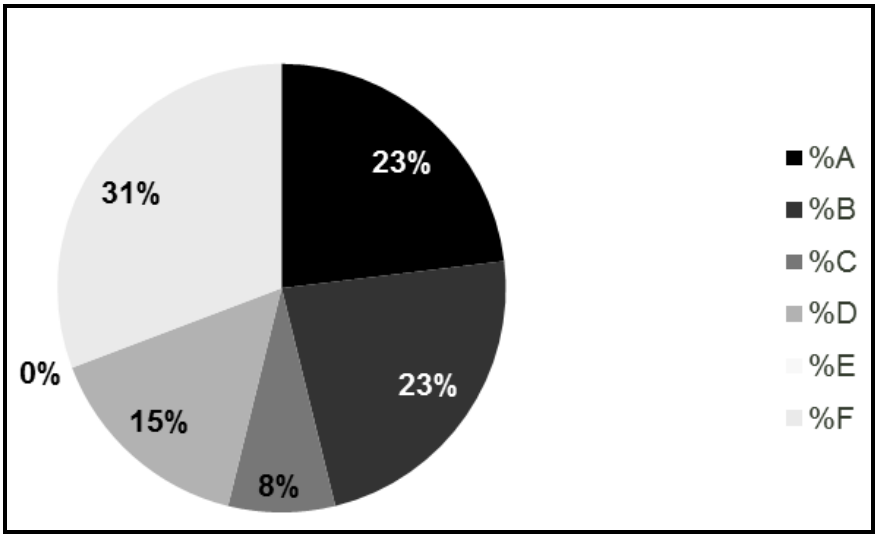

Figure 4-8: Percentage distribution of the Quality scoring in Review Area 8

4.8.1 Gaps identified in Review Area 8

Just like the Environmental Emergency Response Plans, the Environmental Awareness Plan was found to be switching between satisfactory and not satisfactory, with some EMPRs found to have an excellent Environmental Awareness Plan and some found to either have no plan or a very poorly written and developed Environmental Awareness Plan. Once again, it was found that this was just one of those sections included to tick the box. The Environmental Awareness Plan is actually very important. This is where a mining company makes a

commitment to provide proper training to its staff to ensure that they are always aware of the environment when performing their daily tasks. It should be seen as an opportunity where a mine can successfully manage its impact simply by making their staff aware of how they could contribute in making a difference.

4.8.2 Strengths identified in Review Area 8

Some of the strengths found related to EMPRs presenting well-developed procedures and steps that the mine will take in creating Environmental Awareness to staff and contractors. In some of the Environmental Awareness Plans evaluated, the mine clearly stated its commitment towards Environmental Awareness.

4.9 Review Area 9: Undertaking of the EMPR

Figure 4-9 depicts the percentage distribution of the scoring of EMPRs under Review Area 9. Undertaking of the EMPR is a commitment that mining companies need to make and they should therefore sign-off on an EMPR, declaring this commitment. During the review, it was found that 77% of the EMPRs had a section where a mine representative signed and declared the mine's commitment in undertaking the commitments in the EMPR (scoring A). However, 23% of the EMPRs excluded this section and no evidence of the mine's commitment in undertaking of the EMPR was available (scoring F). This was found for older EMPRs (seven years and older) and as such, might not have been a requirement to present in the EMPR.

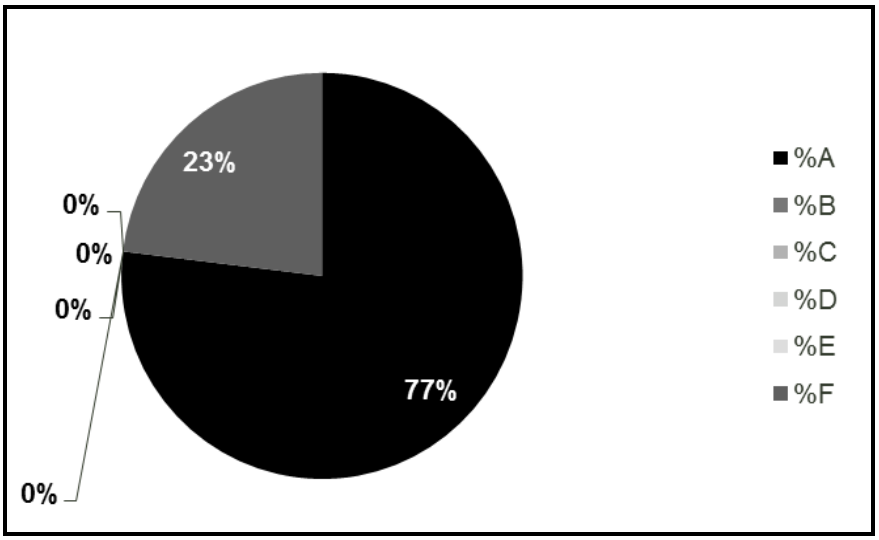

Figure 4-9: Percentage distribution of the Quality scoring in Review Area 9

4.9.1 Gaps identified in Review Area 9

The majority of the EMPRs have a section undersigned by a mining representative that reflects on the mine's commitment in the undertaking of the EMPR. EMPRs that were rated as not satisfactory were due to this section being completely missing.

4.10 Overall quality of the EMPRs reviewed

Figure 4-10 depicts the overall results of the EMPRs quality reviews based on the Quality Evaluation Criteria's Review Areas and sub-categories presented in Table 2-1. The data for each case study is attached as Appendix 1.

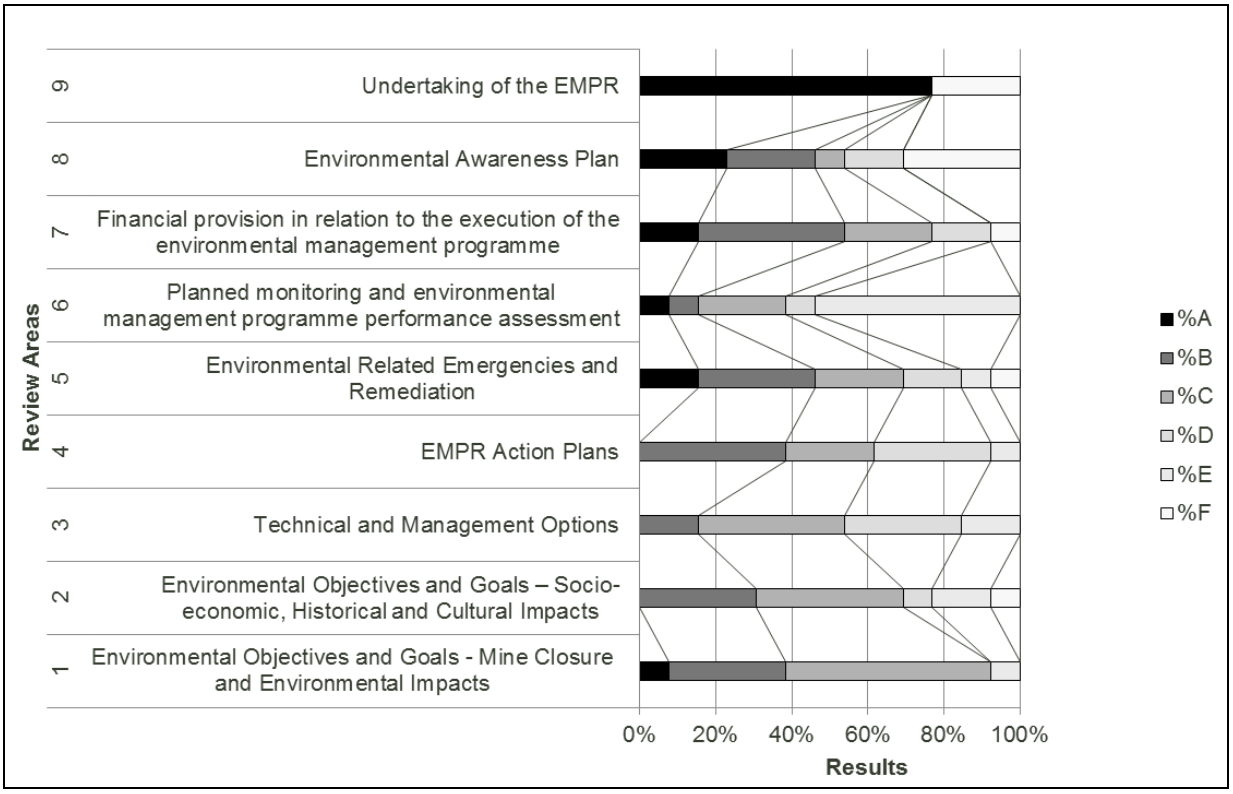

Figure 4-10: Performance of the EMPRs per Review Area

After reviewing each EMPR, an overall rating in terms of the assessment symbols in Table 2-2 was given. Figure 4-10 and Figure 4-11 is a representation of the overall quality of all the EMPRs. None (0%) of the EMPRs had an overall rating of A, having relevant tasks well performed, and no important tasks left incomplete. Fifteen percent (15%) of the EMPRs obtained an overall rating of B and were found to be generally satisfactory overall despite minor omissions and inadequacies (discussed in the Chapter 4). The majority of the EMPRs (46%) were just satisfactory overall, despite some omissions and inadequacies, thus were rated a C. Thirty-one percent (31%) of the EMPRs were found to be just not satisfactory and

got an overall D rating. Parts of these EMPRs were found to be well attempted, however, the majority of the EMPRs were lacking important information and certain sections were poorly executed and therefore the whole EMPR could be regarded as not satisfactory. Eight percent (8%) of the EMPRs had major omissions and inadequacies throughout and as a result were found to be not satisfactory, rating an E overall. None (0%) of the EMPRs obtained an overall rating of F (very unsatisfactory, important task(s) poorly done or not attempted).

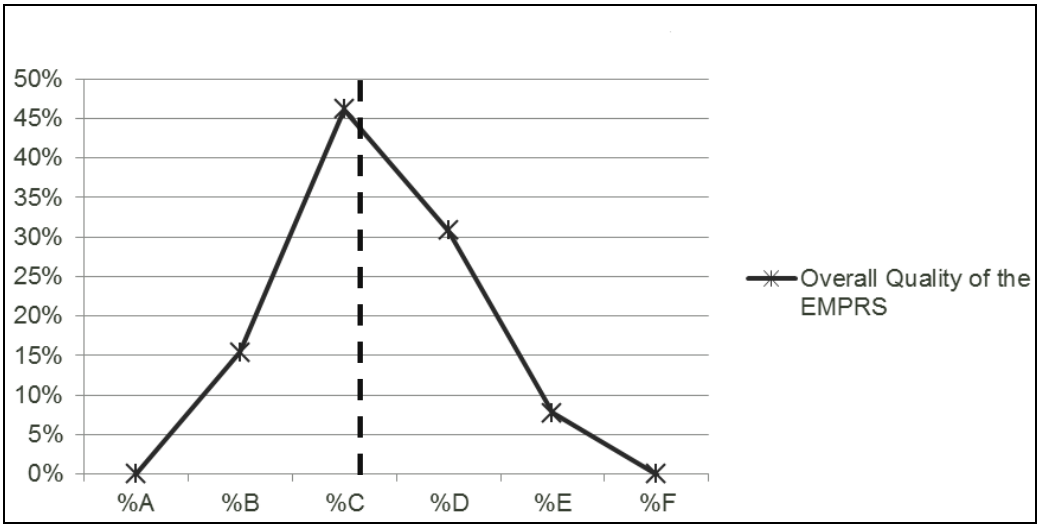

Figure 4-11: Overall quality of all the EMPRs that was reviewed.

5 Discussion

From the results presented in Chapter 4, it is concluded that the majority (62%) of the EMPRs were overall satisfactory as evaluated against the quality criteria presented, although omissions and inadequacies were still found. However, 38% of EMPRs were considered unsatisfactory.

5.1 Critical comparison between the research results and results from previous studies

According to the study done by Van Schalkwyk (2012), more than 50% of the sample of EMPRs reviewed scored unsatisfactory grades compared to the 38% of this research. The main differences in the results could be due to the sectors that were chosen for each study respectively. Van Schalkwyk (2012) chose a sample of EMPRs from four main sectors namely Residential, Infrastructure, Transport and Linear Developments. This research focussed on a sample of EMPRs from the Coal Mining Sector in South Africa only. Each study's research is governed by a different set of legislation in South Africa, and this could be the main influence to the differences in results. Both studies did conclude that EMPRs should be regarded as an

important tool to ensure that all negative impacts are managed properly and positive impacts enhanced.

5.2 Overall challenges that could influence the quality of the EMPRs

The years 2013 and 2014 were very influential in the mining legislation with the proclamation of the enactment of the MPRDA Amendment Act (49 of 2008) and the draft MPRDA Amendment Bill 2013, currently lying in Parliament for review. With the enactment of the Amendment Act, the sections specifically pertaining to the Environmental Management are very grey. The ongoing battle between the DMR and the Department of Environmental Affairs (DEA), on who the decision-making authority should be for accepting EIAs and approving EMPRs, also poses its challenges that could affect the quality of EMPRs. This created doubt and confusion on the proper procedure for conducting an EIA and developing an EMPR in the mining sector, and due to this lack of guidance EAPs are unsure in terms of guidance on developing proper EMPRs. The sections below explain more of the challenges identified during this research with reference to the results presented in Chapter 4.

5.2.1 Sourcing outdated data or a lack thereof

Section 4.1.1 results showed that 8% of the EMPRs evaluated were found to be not satisfactory. Reasons for this grading was that certain pre-development environmental data (e.g. climate change and surface and/or groundwater) data were found to be very old (dating back seven years and older) or were found not to be presented at all. Pre-development environmental data is very important to an EIA process and would assist in developing a baseline from where impacts are identified. From here action plans are developed in the EMPR that would have to be implemented to manage the impacts identified, thus a lack of data or using outdated data could pose the risk of missing potential impacts and/or identifying the wrong impacts. This could have a major influence on the EMPR quality.

5.2.2 EMPRs should not be too generic

The results in Sections 4.2 and 4.4 found that 31% and 39% of the EMPRs were found not to be satisfactory respectively for each Review Area. The main reason for this scoring was due to socio-economic impact, mitigation measures and EMPR action plans found to be too generic. If compared to the mining operation being assessed, it was difficult to make the connection on how these action plans could manage the impacts identified. Once the decision-making authority approves an EMPR, the commitments, action plans and mitigation measures presented becomes legally binding obligations that a mine will have to comply with. The risk of presenting generic action plans and mitigation measures could result in them being

impractical and impossible to implement. This would have a major impact on the quality of the EMPR as it would not be able function as it should in terms of implementation.

5.2.3 Lack of legislative guidance

As explained in Section 2.1 of this study, the EMPR Quality Evaluation Packages were mainly based on the legislative requirements for an EMPR and therefore a thorough review was also done on the DMR guidelines. The research results presented in Sections 4.3 and 4.4 indicated that there was some confusion as to what exactly is expected from the DMR Guidelines. However, after a thorough review of the DMR's guideline document for the compilation of an EIA and EMPR in the mining sector (DMR, 2004); it was found that part of the guidance provided by the DMR could have an influence on the quality of EMPRs. The document can steer an EAP in a direction when compiling an EMPR (it might not necessarily be the correct direction), however, certain sections could still be regarded as confusing and it was therefore difficult to understand how to present and execute some of the requirements that must be included in an EMPR.

5.2.4 Do mining companies see the EMPR process as a burden?

According to Figure 4-11 and the results in Chapter 4, a total af 38% of the overall EMPRs were found to be not satisfactory in terms of quality and 46% to be just satisfactory. These results do not fall in the favour of quality and from these results one could argue whether the process is taken serious, and/or whether the process might be seen as a burden and is rushed just to tick the box of requirements to obtain the mining right. However, more studies will need to be conducted to see if this hypothesis could be confirmed.

5.2.5 Independency vs quality

During the review of the EMPRs, it became evident that some of the EAPs did not understand the proposed mining operations and this was reflected in the quality of EMPRs developed (referring to the results in Sections 4.3 and 4.4).

The legislation of South Africa requires that an EIA and EMPR process is conducted by an external and independent EAP to ensure the process is fair and objective. For the EIA, this is understandable and to ensure that an objective opinion regarding potential environmental impacts is provided, this requirement is feasible in principle. However, when it comes to developing the EMPR, a lack of technical knowledge of the mining operation from the EAP (Section 4.3) could have an influence in the quality of the EMPR being developed. It is one thing to be an Environmental Specialist, but asking such a person to provide alternatives and solutions to a mining process could arguably pose some challenges for providing a good quality EMPR. It is a recommendation from the research that with the compilation of the

EMPR, mining companies become more involved in developing an EMPR that could be used to manage impacts identified for their processes and operations. The EAP could still provide an independent contribution by facilitating the process and ensuring that action plans and commitments presented are feasible in managing the impacts they identified in the EIA.

5.2.6 All sections of the EMPR should be regarded as important.

Figure 5-1 depicts the percentage comparison between satisfactory (A-C) and not satisfactory (D-F) per Review Area and the overall Quality of the EMPRs. Although the majority of the EMPRs were rated satisfactory in most of the Review Areas, certain Review Areas such as Area 6 and Area 8 were found to be poorly presented overall. Other Review Areas such as Area 1, Area 7 and Area 9 were found to be well-presented, and considering the level of detail and structure provided in these Review Areas, they could be regarded as fair to good quality. Both Review Area 1 and Area 7 relate to mine closure objectives and financial provisions for rehabilitation (which is one of the main requirements when applying for a mining right). From the results presented in Chapter 4 and Figure 5-1, a trend can be found in terms of what Review Areas EAPs focused more on, and although the results are not conclusive in this regard, an argument can be initiated to whether the decision-making authorities tend to not focus more on these areas when approving mining right applications.

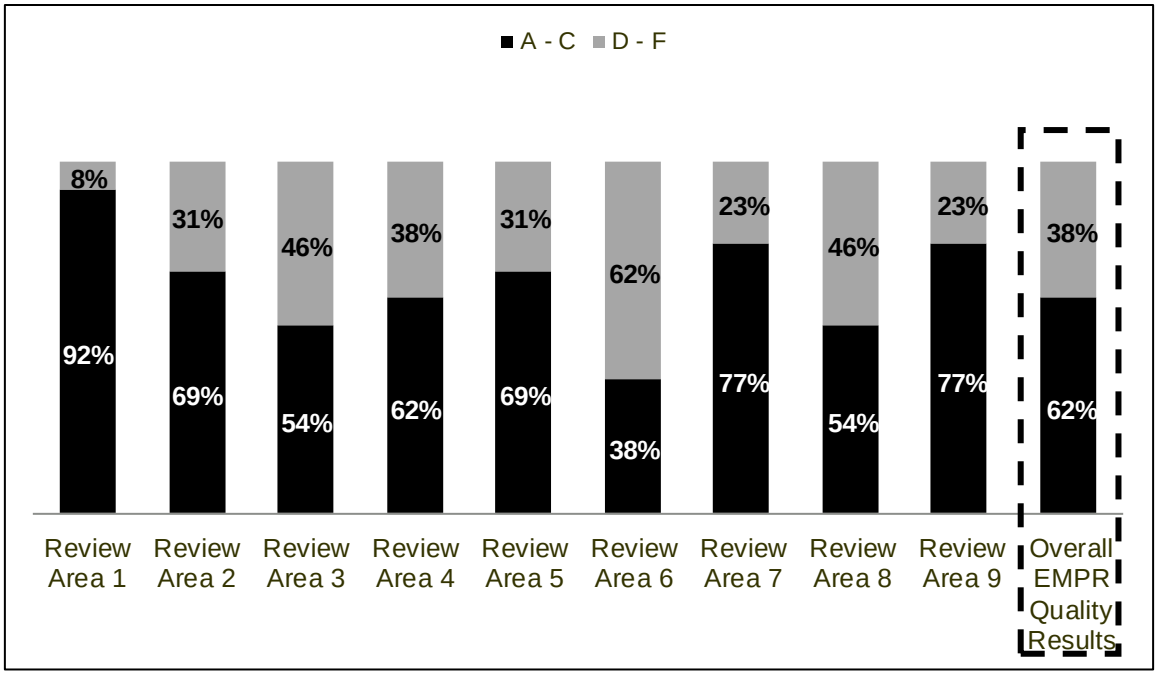

Figure 5-1: Percentage comparison between satisfactory (A-C) and not Satisfactory (D-F)

5.3 The way forward

In their study on the quality of EIA reports in the North West province of South Africa, Sandham *et al.* (2013b) that certain Review Areas are more significant in influencing EIA effectiveness than others, and that it would be desirable to prioritise or weigh the relevant importance of each Review Area. From the results of this research (Figure 4-10 and Figure 5-1); it was found that certain Review Areas bare more weight in terms of their quality:

1. Review Area 1- Environmental objectives and goals – mine closure and environmental impacts;
2. Review Area 7 - Financial provision in relation to the execution of the environmental management programme;
3. Review Area 9 - Undertaking of the EMPR;
4. Review Area 2 - Environmental objectives and goals – socio-economic and historical/cultural impacts;
5. Review Area 5 - Environment-related emergencies and remediation;
6. Review Area 4 - EMPR action plans;
7. Review Area 3 - Technical and management options;
8. Review Area 8 - Environmental Awareness Plan;
9. Review Area 6 - Planned monitoring and environmental management programme performance assessment.

Little academic research has been done on the Quality of EMPRs, especially in the mining sector of South Africa, and more research needs to be done on the different mining sectors to broaden the understanding of the quality of EMPRs.

The South African Mining legislation could also provide more guidance on what is expected in a good quality EMPR when a company appliesfor a mining right. Certain tools are provided by the DMR, such as an EIA/EMPR template and guideline, however, much more thought needs to be provided by the government if they want to drive the successful and responsible management of impacts on the environment in the mining sector.

During the study it also became evident that mining companies that have the technical mining knowledge should be more involved in the compilation of the EMPR with the facilitation and guidance of an independent EAP. This could provide the opportunity for mining companies to also appreciate the environmental management process more and give them an opportunity to provide valuable insight and share ideas on how effectively they could manage potential

impacts associated with their mining operations. Hopefully this would start the process of change in mindset and attitude towards Environmental Management.

Lastly, the decision-making authority needs to develop more depth in terms of their knowledge and capacity to process and review EMPRs and make informed decisions on the quality of the EMPR they review. Certain EMPRs that were rated not satisfactory, was in fact accepted and approved by the DMR. From the results of this research, a trend was noted to what Review Areas the EAPs tend to focus on more. This could set the precedence of what EAPs might focus on more when compiling EMPRs. One could say that this potential 'narrow' mindset of EMPR-review could threaten the quality of EMPRs.

6 Conclusion

To get a more holistic view of how effective the EIA process is in South Arica, the opportunity does exist to do a comparative study on the results of all research done on the effectiveness of the various components of the EIA process.

The objective of this research was to determine the quality of a sample of EMPRs in the Coal Mining Sector in South Africa, and the final evaluation reveals that 62% of the EMPRs submitted are indeed satisfactory, although omissions and inadequacies were found. Thirty-eight percent (38%) of the EMPRs evaluated were found to be not satisfactory due to major omissions and inadequacies. From the results presented above, the overall quality of EMPRs evaluated were of an acceptable level. However, EMPRs of overall poor quality were also found, although being approved by the DMR.

Over the last two years, the mining industry in South Africa started undergoing major transitions; with amendments made to the legislation and factors (such as labour unrest and external investors pulling out of South Africa) influencing the way the mining sector is currently managed. Some of the guidelines provided under the legislation were found to be confusing, and without the prober legislative guidance, the quality of EMPRs is threatened.

The whole EMPR document should be regarded as an important tool for properly managing the impacts identified on the environment. When EAPs tend to focus more on certain areas, the overall quality of the EMPR will be influenced.

From the overall results presented in Chapter 4, gaps were still found in each Review Area of the EMPR, and although the majority of EMPRs were found to be satisfactory, more work needs to be done by the EAPs, mining companies and the decision-making authority, to ensure that the quality of EMPRs are upheld.

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Appendix 1 – Sample Study Results

Sample 1 – Overall grade B

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**B**
1.1	Pre-environmental conditions and measurements	B
1.1.1	There must be a list of aspects describing the pre-environment; and	B
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	A
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	B
1.2.1	There must be a list identifying all impacts that will require monitoring;	B
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	B
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	A
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	A
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**C**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	C
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	C
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	C
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	N/A
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	N/A
3	**Technical and Management Options**	**C**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	C
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	C
3.1.2	Technical and management options must be practical and implementable.	C
4	**EMPR Action Plans**	**B**
4.1	Provide Action plans to achieve the objectives and specific goals	B
4.1.1	Action plans must be practicable and implementable;	B
4.1.2	Action Plans must specify who would be responsible to execute them;	A
4.1.3	Action plans must be audible to ensure compliance; and	A
4.1.4	Actions plans must manage impacts identified	B
5	**Environmental Related Emergencies and Remediation**	**A**
5.1	An Environmental Emergency Plan should be included:	A
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential “environmental emergencies” are detected early to reduce the risk of them occurring or avoiding them completely; and	A
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	A
6	**Planned monitoring and environmental management programme performance assessment**	**A**
6.1	Description of planned monitoring of all identified environmental aspects:	A
6.1.1	There must be a defined list of environmental aspect that will be monitored;	A
6.1.2	There must be a description on how monitoring will be conducted;	A
6.1.3	Frequency of monitoring must be specified; and	B
6.2	Description of the EMPR Performance Assessment:	A
6.2.1	Specify the frequency of performance assessments to be conducted.	A
7	**Financial provision in relation to the execution of the environmental management programme**	**A**
7.1	Mining plan:	A
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	A
7.2	Rehabilitation Plan:	B
7.2.1	The rehabilitation plan should specify closure objectives; and	B
7.2.2	Closure objectives should be realistic and implementable.	B
7.3	Financial provision:	A
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	A
7.3.2	Proof of financial provision available for mine closure must be included.	A
8	**Environmental Awareness Plan**	**A**
8.1	Employee Environmental Awareness:	A
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	A
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	A
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	A
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A

Sample 2 – Overall grade C

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**A**
1.1	Pre-environmental conditions and measurements	A
1.1.1	There must be a list of aspects describing the pre-environment; and	A
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	B
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	A
1.2.1	There must be a list identifying all impacts that will require monitoring;	A
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	A
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	B
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor	A
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**B**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	B
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	B
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	B
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	C
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects	C
3	**Technical and Management Options**	**C**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	C
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	C
3.1.2	Technical and management options must be practical and implementable.	C
4	**EMPR Action Plans**	**C**
4.1	Provide Action plans to achieve the objectives and specific goals	C
4.1.1	Action plans must be practicable and implementable;	B
4.1.2	Action Plans must specify who would be responsible to execute them;	D
4.1.3	Action plans must be audible to ensure compliance; and	B
4.1.4	Actions plans must manage impacts identified	C
5	**Environmental Related Emergencies and Remediation**	**E**
5.1	An Environmental Emergency Plan should be included:	E
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential “environmental emergencies” are detected early to reduce the risk of them occurring or avoiding them completely; and	F
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	E
6	**Planned monitoring and environmental management programme performance assessment**	**D**
6.1	Description of planned monitoring of all identified environmental aspects:	E
6.1.1	There must be a defined list of environmental aspect that will be monitored;	A
6.1.2	There must be a description on how monitoring will be conducted;	E
6.1.3	Frequency of monitoring must be specified; and	E
6.2	Description of the EMPR Performance Assessment:	B
6.2.1	Specify the frequency of performance assessments to be conducted.	B
7	**Financial provision in relation to the execution of the environmental management programme**	**C**
7.1	Mining plan:	E
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	E
7.2	Rehabilitation Plan:	B
7.2.1	The rehabilitation plan should specify closure objectives; and	A
7.2.2	Closure objectives should be realistic and implementable.	B
7.3	Financial provision:	A
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	A
7.3.2	Proof of financial provision available for mine closure must be included.	A
8	**Environmental Awareness Plan**	**B**
8.1	Employee Environmental Awareness:	B
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	B
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	B
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	C
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A

Sample 3 – Overall grade D

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**C**
1.1	Pre-environmental conditions and measurements	B
1.1.1	There must be a list of aspects describing the pre-environment; and	A
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	C
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	C
1.2.1	There must be a list identifying all impacts that will require monitoring;	C
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	C
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	D
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	C
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**E**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	E
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	E
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	E
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	E
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	E
3	**Technical and Management Options**	**D**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	D
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	D
3.1.2	Technical and management options must be practical and implementable.	D
4	**EMPR Action Plans**	**C**
4.1	Provide Action plans to achieve the objectives and specific goals	C
4.1.1	Action plans must be practicable and implementable;	C
4.1.2	Action Plans must specify who would be responsible to execute them;	D
4.1.3	Action plans must be audible to ensure compliance; and	C
4.1.4	Actions plans must manage impacts identified	C
5	**Environmental Related Emergencies and Remediation**	**C**
5.1	An Environmental Emergency Plan should be included:	C
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential "environmental emergencies" are detected early to reduce the risk of them occurring or avoiding them completely; and	E
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	B
6	**Planned monitoring and environmental management programme performance assessment**	**E**
6.1	Description of planned monitoring of all identified environmental aspects:	E
6.1.1	There must be a defined list of environmental aspect that will be monitored;	D
6.1.2	There must be a description on how monitoring will be conducted;	C
6.1.3	Frequency of monitoring must be specified; and	F
6.2	Description of the EMPR Performance Assessment:	F
6.2.1	Specify the frequency of performance assessments to be conducted.	F
7	**Financial provision in relation to the execution of the environmental management programme**	**F**
7.1	Mining plan:	A
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	A
7.2	Rehabilitation Plan:	F
7.2.1	The rehabilitation plan should specify closure objectives; and	F
7.2.2	Closure objectives should be realistic and implementable.	F
7.3	Financial provision:	F
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	F
7.3.2	Proof of financial provision available for mine closure must be included.	F
8	**Environmental Awareness Plan**	**D**
8.1	Employee Environmental Awareness:	D
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	C
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	D
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	D
9	**Undertaking of the EMPR**	**F**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	F

Sample 4 – Overall grade B

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**B**
1.1	Pre-environmental conditions and measurements	B
1.1.1	There must be a list of aspects describing the pre-environment; and	A
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	C
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	B
1.2.1	There must be a list identifying all impacts that will require monitoring;	B
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	B
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	A
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	A
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**B**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	C
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	C
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	B
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	A
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	A
3	**Technical and Management Options**	**B**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	B
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	B
3.1.2	Technical and management options must be practical and implementable.	B
4	**EMPR Action Plans**	**B**
4.1	Provide Action plans to achieve the objectives and specific goals	B
4.1.1	Action plans must be practicable and implementable;	C
4.1.2	Action Plans must specify who would be responsible to execute them;	A
4.1.3	Action plans must be audible to ensure compliance; and	A
4.1.4	Actions plans must manage impacts identified	B
5	**Environmental Related Emergencies and Remediation**	**B**
5.1	An Environmental Emergency Plan should be included:	B
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential "environmental emergencies" are detected early to reduce the risk of them occurring or avoiding them completely; and	C
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	B
6	**Planned monitoring and environmental management programme performance assessment**	**B**
6.1	Description of planned monitoring of all identified environmental aspects:	B
6.1.1	There must be a defined list of environmental aspect that will be monitored;	A
6.1.2	There must be a description on how monitoring will be conducted;	B
6.1.3	Frequency of monitoring must be specified; and	A
6.2	Description of the EMPR Performance Assessment:	A
6.2.1	Specify the frequency of performance assessments to be conducted.	A
7	**Financial provision in relation to the execution of the environmental management programme**	**A**
7.1	Mining plan:	A
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	A
7.2	Rehabilitation Plan:	A
7.2.1	The rehabilitation plan should specify closure objectives; and	A
7.2.2	Closure objectives should be realistic and implementable.	A
7.3	Financial provision:	A
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	A
7.3.2	Proof of financial provision available for mine closure must be included.	A
8	**Environmental Awareness Plan**	**A**
8.1	Employee Environmental Awareness:	A
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	A
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	A
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	A
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A

Sample 5 – Overall grade E

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**E**
1.1	Pre-environmental conditions and measurements	C
1.1.1	There must be a list of aspects describing the pre-environment; and	B
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	D
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	E
1.2.1	There must be a list identifying all impacts that will require monitoring;	D
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	E
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	F
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	E
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**F**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	F
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	F
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	F
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	F
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	F
3	**Technical and Management Options**	**E**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	E
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	E
3.1.2	Technical and management options must be practical and implementable.	F
4	**EMPR Action Plans**	**E**
4.1	Provide Action plans to achieve the objectives and specific goals	E
4.1.1	Action plans must be practicable and implementable;	D
4.1.2	Action Plans must specify who would be responsible to execute them;	E
4.1.3	Action plans must be audible to ensure compliance; and	D
4.1.4	Actions plans must manage impacts identified	E
5	**Environmental Related Emergencies and Remediation**	**F**
5.1	An Environmental Emergency Plan should be included:	F
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential "environmental emergencies" are detected early to reduce the risk of them occurring or avoiding them completely; and	F
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	F
6	**Planned monitoring and environmental management programme performance assessment**	**E**
6.1	Description of planned monitoring of all identified environmental aspects:	D
6.1.1	There must be a defined list of environmental aspect that will be monitored;	D
6.1.2	There must be a description on how monitoring will be conducted;	D
6.1.3	Frequency of monitoring must be specified; and	E
6.2	Description of the EMPR Performance Assessment:	F
6.2.1	Specify the frequency of performance assessments to be conducted.	F
7	**Financial provision in relation to the execution of the environmental management programme**	**C**
7.1	Mining plan:	C
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	C
7.2	Rehabilitation Plan:	D
7.2.1	The rehabilitation plan should specify closure objectives; and	D
7.2.2	Closure objectives should be realistic and implementable.	D
7.3	Financial provision:	C
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	C
7.3.2	Proof of financial provision available for mine closure must be included.	C
8	**Environmental Awareness Plan**	**F**
8.1	Employee Environmental Awareness:	F
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	F
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	F
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	F
9	**Undertaking of the EMPR**	**F**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	F

Sample 6 – Overall grade D

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**C**
1.1	Pre-environmental conditions and measurements	B
1.1.1	There must be a list of aspects describing the pre-environment; and	B
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	C
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	C
1.2.1	There must be a list identifying all impacts that will require monitoring;	B
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	B
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	C
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	D
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**E**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	D
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	D
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	D
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	F
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	F
3	**Technical and Management Options**	**D**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	D
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	D
3.1.2	Technical and management options must be practical and implementable.	D
4	**EMPR Action Plans**	**C**
4.1	Provide Action plans to achieve the objectives and specific goals	C
4.1.1	Action plans must be practicable and implementable;	C
4.1.2	Action Plans must specify who would be responsible to execute them;	C
4.1.3	Action plans must be audible to ensure compliance; and	C
4.1.4	Actions plans must manage impacts identified	C
5	**Environmental Related Emergencies and Remediation**	**B**
5.1	An Environmental Emergency Plan should be included:	B
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential "environmental emergencies" are detected early to reduce the risk of them occurring or avoiding them completely; and	B
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	B
6	**Planned monitoring and environmental management programme performance assessment**	**C**
6.1	Description of planned monitoring of all identified environmental aspects:	C
6.1.1	There must be a defined list of environmental aspect that will be monitored;	B
6.1.2	There must be a description on how monitoring will be conducted;	C
6.1.3	Frequency of monitoring must be specified; and	A
6.2	Description of the EMPR Performance Assessment:	E
6.2.1	Specify the frequency of performance assessments to be conducted.	E
7	**Financial provision in relation to the execution of the environmental management programme**	**D**
7.1	Mining plan:	C
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	C
7.2	Rehabilitation Plan:	D
7.2.1	The rehabilitation plan should specify closure objectives; and	D
7.2.2	Closure objectives should be realistic and implementable.	D
7.3	Financial provision:	D
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	B
7.3.2	Proof of financial provision available for mine closure must be included.	F
8	**Environmental Awareness Plan**	**F**
8.1	Employee Environmental Awareness:	F
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	F
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	F
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	F
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A

Sample 7 – Overall grade D

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**C**
1.1	Pre-environmental conditions and measurements	B
1.1.1	There must be a list of aspects describing the pre-environment; and	A
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	B
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	D
1.2.1	There must be a list identifying all impacts that will require monitoring;	B
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	B
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	F
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	F
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**D**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	D
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	D
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	D
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	D
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	D
3	**Technical and Management Options**	**C**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	C
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	C
3.1.2	Technical and management options must be practical and implementable.	C
4	**EMPR Action Plans**	**D**
4.1	Provide Action plans to achieve the objectives and specific goals	D
4.1.1	Action plans must be practicable and implementable;	D
4.1.2	Action Plans must specify who would be responsible to execute them;	D
4.1.3	Action plans must be audible to ensure compliance; and	E
4.1.4	Actions plans must manage impacts identified	D
5	**Environmental Related Emergencies and Remediation**	**C**
5.1	An Environmental Emergency Plan should be included:	C
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential "environmental emergencies" are detected early to reduce the risk of them occurring or avoiding them completely; and	C
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	C
6	**Planned monitoring and environmental management programme performance assessment**	**E**
6.1	Description of planned monitoring of all identified environmental aspects:	E
6.1.1	There must be a defined list of environmental aspect that will be monitored;	B
6.1.2	There must be a description on how monitoring will be conducted;	E
6.1.3	Frequency of monitoring must be specified; and	C
6.2	Description of the EMPR Performance Assessment:	
6.2.1	Specify the frequency of performance assessments to be conducted.	F
7	**Financial provision in relation to the execution of the environmental management programme**	**B**
7.1	Mining plan:	A
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	A
7.2	Rehabilitation Plan:	C
7.2.1	The rehabilitation plan should specify closure objectives; and	B
7.2.2	Closure objectives should be realistic and implementable.	C
7.3	Financial provision:	A
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	A
7.3.2	Proof of financial provision available for mine closure must be included.	A
8	**Environmental Awareness Plan**	**C**
8.1	Employee Environmental Awareness:	C
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	C
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	C
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	C
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A

Sample 8 – Overall grade D

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**C**
1.1	Pre-environmental conditions and measurements	B
1.1.1	There must be a list of aspects describing the pre-environment; and	A
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	B
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	C
1.2.1	There must be a list identifying all impacts that will require monitoring;	A
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	B
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	D
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	D
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**C**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	C
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	C
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	C
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	C
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	C
3	**Technical and Management Options**	**E**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	E
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	D
3.1.2	Technical and management options must be practical and implementable.	E
4	**EMPR Action Plans**	**D**
4.1	Provide Action plans to achieve the objectives and specific goals	D
4.1.1	Action plans must be practicable and implementable;	D
4.1.2	Action Plans must specify who would be responsible to execute them;	D
4.1.3	Action plans must be audible to ensure compliance; and	D
4.1.4	Actions plans must manage impacts identified	D
5	**Environmental Related Emergencies and Remediation**	**D**
5.1	An Environmental Emergency Plan should be included:	D
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential “environmental emergencies” are detected early to reduce the risk of them occurring or avoiding them completely; and	D
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	D
6	**Planned monitoring and environmental management programme performance assessment**	**C**
6.1	Description of planned monitoring of all identified environmental aspects:	C
6.1.1	There must be a defined list of environmental aspect that will be monitored;	C
6.1.2	There must be a description on how monitoring will be conducted;	C
6.1.3	Frequency of monitoring must be specified; and	C
6.2	Description of the EMPR Performance Assessment:	F
6.2.1	Specify the frequency of performance assessments to be conducted.	F
7	**Financial provision in relation to the execution of the environmental management programme**	**B**
7.1	Mining plan:	A
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	A
7.2	Rehabilitation Plan:	C
7.2.1	The rehabilitation plan should specify closure objectives; and	C
7.2.2	Closure objectives should be realistic and implementable.	C
7.3	Financial provision:	A
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	A
7.3.2	Proof of financial provision available for mine closure must be included.	A
8	**Environmental Awareness Plan**	**E**
8.1	Employee Environmental Awareness:	E
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	D
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	E
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	E
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A

Sample 9 – Overall grade C

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**B**
1.1	Pre-environmental conditions and measurements	C
1.1.1	There must be a list of aspects describing the pre-environment; and	C
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	B
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	B
1.2.1	There must be a list identifying all impacts that will require monitoring;	B
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	B
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	B
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	A
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**B**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	C
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	B
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	C
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	A
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	A
3	**Technical and Management Options**	**B**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	B
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	B
3.1.2	Technical and management options must be practical and implementable.	A
4	**EMPR Action Plans**	**B**
4.1	Provide Action plans to achieve the objectives and specific goals	B
4.1.1	Action plans must be practicable and implementable;	B
4.1.2	Action Plans must specify who would be responsible to execute them;	A
4.1.3	Action plans must be audible to ensure compliance; and	A
4.1.4	Actions plans must manage impacts identified	B
5	**Environmental Related Emergencies and Remediation**	**A**
5.1	An Environmental Emergency Plan should be included:	A
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential "environmental emergencies" are detected early to reduce the risk of them occurring or avoiding them completely; and	A
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	A
6	**Planned monitoring and environmental management programme performance assessment**	**C**
6.1	Description of planned monitoring of all identified environmental aspects:	B
6.1.1	There must be a defined list of environmental aspect that will be monitored;	A
6.1.2	There must be a description on how monitoring will be conducted;	A
6.1.3	Frequency of monitoring must be specified; and	C
6.2	Description of the EMPR Performance Assessment:	E
6.2.1	Specify the frequency of performance assessments to be conducted.	E
7	**Financial provision in relation to the execution of the environmental management programme**	**D**
7.1	Mining plan:	E
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	E
7.2	Rehabilitation Plan:	C
7.2.1	The rehabilitation plan should specify closure objectives; and	C
7.2.2	Closure objectives should be realistic and implementable.	C
7.3	Financial provision:	D
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	B
7.3.2	Proof of financial provision available for mine closure must be included.	F
8	**Environmental Awareness Plan**	**F**
8.1	Employee Environmental Awareness:	F
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	F
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	F
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	F
9	**Undertaking of the EMPR**	**F**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	F

Sample 10 – Overall grade C

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**C**
1.1	Pre-environmental conditions and measurements	C
1.1.1	There must be a list of aspects describing the pre-environment; and	C
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	C
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	C
1.2.1	There must be a list identifying all impacts that will require monitoring;	B
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	C
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	C
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	C
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**B**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	C
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	C
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	B
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	B
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	B
3	**Technical and Management Options**	**D**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	D
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	D
3.1.2	Technical and management options must be practical and implementable.	D
4	**EMPR Action Plans**	**B**
4.1	Provide Action plans to achieve the objectives and specific goals	B
4.1.1	Action plans must be practicable and implementable;	B
4.1.2	Action Plans must specify who would be responsible to execute them;	A
4.1.3	Action plans must be audible to ensure compliance; and	A
4.1.4	Actions plans must manage impacts identified	B
5	**Environmental Related Emergencies and Remediation**	**B**
5.1	An Environmental Emergency Plan should be included:	B
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential “environmental emergencies” are detected early to reduce the risk of them occurring or avoiding them completely; and	B
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	B
6	**Planned monitoring and environmental management programme performance assessment**	**C**
6.1	Description of planned monitoring of all identified environmental aspects:	B
6.1.1	There must be a defined list of environmental aspect that will be monitored;	B
6.1.2	There must be a description on how monitoring will be conducted;	B
6.1.3	Frequency of monitoring must be specified; and	C
6.2	Description of the EMPR Performance Assessment:	F
6.2.1	Specify the frequency of performance assessments to be conducted.	F
7	**Financial provision in relation to the execution of the environmental management programme**	**B**
7.1	Mining plan:	A
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	A
7.2	Rehabilitation Plan:	B
7.2.1	The rehabilitation plan should specify closure objectives; and	B
7.2.2	Closure objectives should be realistic and implementable.	B
7.3	Financial provision:	A
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	A
7.3.2	Proof of financial provision available for mine closure must be included.	A
8	**Environmental Awareness Plan**	**A**
8.1	Employee Environmental Awareness:	A
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	A
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	A
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	A
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A

Sample 11 – Overall grade C

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**C**
1.1	Pre-environmental conditions and measurements	B
1.1.1	There must be a list of aspects describing the pre-environment; and	A
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	B
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	C
1.2.1	There must be a list identifying all impacts that will require monitoring;	A
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	B
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	D
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	D
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**C**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	C
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	C
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	C
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	C
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	C
3	**Technical and Management Options**	**D**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	D
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	D
3.1.2	Technical and management options must be practical and implementable.	E
4	**EMPR Action Plans**	**D**
4.1	Provide Action plans to achieve the objectives and specific goals	D
4.1.1	Action plans must be practicable and implementable;	D
4.1.2	Action Plans must specify who would be responsible to execute them;	D
4.1.3	Action plans must be audible to ensure compliance; and	D
4.1.4	Actions plans must manage impacts identified	D
5	**Environmental Related Emergencies and Remediation**	**D**
5.1	An Environmental Emergency Plan should be included:	D
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential “environmental emergencies” are detected early to reduce the risk of them occurring or avoiding them completely; and	D
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	D
6	**Planned monitoring and environmental management programme performance assessment**	**C**
6.1	Description of planned monitoring of all identified environmental aspects:	C
6.1.1	There must be a defined list of environmental aspect that will be monitored;	C
6.1.2	There must be a description on how monitoring will be conducted;	C
6.1.3	Frequency of monitoring must be specified; and	C
6.2	Description of the EMPR Performance Assessment:	F
6.2.1	Specify the frequency of performance assessments to be conducted.	F
7	**Financial provision in relation to the execution of the environmental management programme**	**B**
7.1	Mining plan:	A
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	A
7.2	Rehabilitation Plan:	C
7.2.1	The rehabilitation plan should specify closure objectives; and	C
7.2.2	Closure objectives should be realistic and implementable.	C
7.3	Financial provision:	A
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	A
7.3.2	Proof of financial provision available for mine closure must be included.	A
8	**Environmental Awareness Plan**	**D**
8.1	Employee Environmental Awareness:	D
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	D
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	E
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	E
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A

Sample 12 – Overall grade C

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**B**
1.1	Pre-environmental conditions and measurements	B
1.1.1	There must be a list of aspects describing the pre-environment; and	A
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	B
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	B
1.2.1	There must be a list identifying all impacts that will require monitoring;	B
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	C
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	C
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	A
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**C**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	C
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	C
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	C
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	D
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	D
3	**Technical and Management Options**	**C**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	C
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	C
3.1.2	Technical and management options must be practical and implementable.	C
4	**EMPR Action Plans**	**B**
4.1	Provide Action plans to achieve the objectives and specific goals	B
4.1.1	Action plans must be practicable and implementable;	B
4.1.2	Action Plans must specify who would be responsible to execute them;	A
4.1.3	Action plans must be audible to ensure compliance; and	B
4.1.4	Actions plans must manage impacts identified	B
5	**Environmental Related Emergencies and Remediation**	**B**
5.1	An Environmental Emergency Plan should be included:	B
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential “environmental emergencies” are detected early to reduce the risk of them occurring or avoiding them completely; and	B
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	B
6	**Planned monitoring and environmental management programme performance assessment**	**C**
6.1	Description of planned monitoring of all identified environmental aspects:	C
6.1.1	There must be a defined list of environmental aspect that will be monitored;	B
6.1.2	There must be a description on how monitoring will be conducted;	C
6.1.3	Frequency of monitoring must be specified; and	C
6.2	Description of the EMPR Performance Assessment:	B
6.2.1	Specify the frequency of performance assessments to be conducted.	B
7	**Financial provision in relation to the execution of the environmental management programme**	**B**
7.1	Mining plan:	B
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	B
7.2	Rehabilitation Plan:	B
7.2.1	The rehabilitation plan should specify closure objectives; and	B
7.2.2	Closure objectives should be realistic and implementable.	B
7.3	Financial provision:	A
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	A
7.3.2	Proof of financial provision available for mine closure must be included.	A
8	**Environmental Awareness Plan**	**B**
8.1	Employee Environmental Awareness:	B
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	B
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	B
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	B
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A

Sample 13 – Overall grade C

No.	Working Package Criteria	Quality evaluation Score
1	**Environmental Objectives and Goals - Mine Closure and Environmental Impacts**	**C**
1.1	Pre-environmental conditions and measurements	C
1.1.1	There must be a list of aspects describing the pre-environment; and	B
1.1.2	There must be a list of measures to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post closure.	C
1.2	Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation:	B
1.2.1	There must be a list identifying all impacts that will require monitoring;	B
1.2.2	There must be a list that identifies the source activities that are the cause of the impacts which requires to be managed;	B
1.2.3	There must be list of management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually and/or periodically in order to control any action, activity or process which causes pollution or environmental degradation; and	C
1.2.4	Roles and responsibilities must be defined to ensure the proper execution of the defined monitor programme.	B
2	**Environmental Objectives and Goals – Socio-economic, Historical and Cultural Impacts**	**C**
2.1	Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan:	C
2.1.1	There must be a list identifying the various social-economic aspects within the vicinity of the mine, that could potentially be impacted; and	B
2.1.2	There must be a list objectives and goals to control, remedy or stop potential impacts emanating from the mine which may impact on communities and interested and affected parties identified.	C
2.2	Description of environmental objectives and specific goals for historical and cultural aspects:	
2.2.1	2.2.1. There must be a list of objectives and goals in respect of historical and cultural aspects identified.	B
3	**Technical and Management Options**	**C**
3.1	Describe the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspect in each phase of the mining operation:	C
3.1.1	There must be a list of technical and management options chosen to manage each environmental, socio-economic and historical impact identified; and	C
3.1.2	Technical and management options must be practical and implementable.	C
4	**EMPR Action Plans**	**B**
4.1	Provide Action plans to achieve the objectives and specific goals	B
4.1.1	Action plans must be practicable and implementable;	B
4.1.2	Action Plans must specify who would be responsible to execute them;	B
4.1.3	Action plans must be audible to ensure compliance; and	B
4.1.4	Actions plans must manage impacts identified	B
5	**Environmental Related Emergencies and Remediation**	**C**
5.1	An Environmental Emergency Plan should be included:	C
5.1.1	There must be a description of ongoing monitoring and measures to ensure that the potential "environmental emergencies" are detected early to reduce the risk of them occurring or avoiding them completely; and	C
5.1.2	Procedures should be developed and be in place to ensure preparedness for an environmental emergency.	B
6	**Planned monitoring and environmental management programme performance assessment**	**C**
6.1	Description of planned monitoring of all identified environmental aspects:	C
6.1.1	There must be a defined list of environmental aspect that will be monitored;	B
6.1.2	There must be a description on how monitoring will be conducted;	C
6.1.3	Frequency of monitoring must be specified; and	C
6.2	Description of the EMPR Performance Assessment:	C
6.2.1	Specify the frequency of performance assessments to be conducted.	C
7	**Financial provision in relation to the execution of the environmental management programme**	**C**
7.1	Mining plan:	C
7.1.1	The plan must show all planned mining activities to be included in the calculation of the financial provision.	C
7.2	Rehabilitation Plan:	B
7.2.1	The rehabilitation plan should specify closure objectives; and	B
7.2.2	Closure objectives should be realistic and implementable.	B
7.3	Financial provision:	B
7.3.1	The financial amount needed for mine closure must be confirmed and specified; and	B
7.3.2	Proof of financial provision available for mine closure must be included.	B
8	**Environmental Awareness Plan**	**B**
8.1	Employee Environmental Awareness:	B
8.1.1	The Environmental Awareness Plan must describe how it will create awareness to the mine employees of the potential environmental risks associated with their daily job tasks;	B
8.1.2	The Environmental Awareness Plan must describe how the above mentioned risk can be avoided or dealt with to ensure pollution or degradation of the environment is prevented; and	B
8.1.3	The Environmental Plan must specify general environmental awareness training the mine proposes to present on dealing with environmental emergencies and the remedy thereof.	B
9	**Undertaking of the EMPR**	**A**
9.1	A mine representative must sign the to ensure that the mine accept and agree to undertake, implement and manage the environment in terms of the commitments, management measures, actions plans and monitoring programmes as specified in the EMPR once approved by the DMR.	A