The quality of Environmental Authorisations in the Mpumalanga Province

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ABSTRACT

Environmental Impact Assessment (EIA) has been identified as a management tool to achieve sustainability goals. The concept of sustainability broadly encompasses decisions and actions that will support and protect life sustaining systems on earth to provide for our current population and future generations in terms of social, economic and environmental needs.

A broad definition of the purpose of EIA is to inform the decision making process in development projects. The EIA system follows the Deming cycle (plan, do, check, act) and includes elements such as environmental impact assessment reports (EIAR), environmental management plans/programmes (EMPs), implementation of EMPs, authorisation conditions, follow-up (audits), and corrective action after follow-up. One way to measure the effectiveness of an EIA system is through evaluating EIAR quality. Environmental authorisations (EAu) together with EIA are part of the Deming cycle where environmental performance objectives are determined at project start-up. Previous studies showed that EAu conditions have an influence on environmental management practices.

Although the quality of EIA has been assessed to a large extent in South Africa over the past 10 years, very little research has been done to assess the quality of EAu. Therefore, in this dissertation the focus is on evaluating the quality of EAu through developing a suitable quality review package, assessing a sample of EAu in the Mpumalanga province and comparing quality over time and across sectors.

The main aim of the research has been achieved and all research objectives answered. A suitable quality review package was developed building on the work of Caddick (2015) and Lee & Colley (1992).

The results of the EAu review quality indicates that RA 1, 2 and 4 are areas of strength in all four regulatory regimes and showed improved performance over time since the start of mandatory EIA in the ECA era up the NEMA 2014 era. RA 3 showed the weakest performance.

Performance across sectors showed the best performing sector overall is linear construction, followed by construction, agriculture and lastly the mining sector. All sectors performed to a satisfactory level in RA 1, 2 and 4 and their respective categories, reflecting the results of the overall quality status. The performance on sectors in RA 3 shows mixed results across categories, but performed weak overall on RA level.

KEYWORDS

Environmental Authorisation
Environmental performance
EIA report quality
Effectiveness of EIA system
Quality review package

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LIST OF ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
BAT	Best Available Techniques
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DEFRA	Department of Environment Food Resources and Agriculture
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
ECA	Environment Conservation Act
ECO	Environmental Control Officer
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
EAu	Environmental Authorisation
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FAO	Food and Agriculture Organisation
I&AP	Interest and Affected Parties
IEM	Integrated Environmental Management
MPRDA	Mineral and Petroleum Resources Development Act, 2002
NEMA	National Environmental Management Act, 1998
OECD	Organisation for Economic Cooperation and Development
PAJA	Promotion of Administrative Justice Act
PPP	Public Participation Process
RA	Review Area
SEA	Strategic Environmental Assessment

1 INTRODUCTION AND PROBLEM STATEMENT

The concept of sustainability has been increasingly included on political and government agendas around the world, specifically around the times of the Earth summits in Rio in 1992 and Johannesburg in 2002 (Bond & Morrison-Saunders, 2011; Morrison-Saunders & Retief, 2010) and Rio 20+ in 2012. Environmental Impact Assessment (EIA) has been adopted as an environmental management tool globally and elevated in status through the Rio Earth Summit: Rio Principle 17 that advocates EIA as a tool to execute sustainability goals.

The effectiveness of an EIA system refers to whether it achieves its objectives, such as promotion of sustainable development and sound decision making in terms of environmental issues. An important aspect of the effectiveness is the quality of EIA reports, while other aspects include effectiveness of the Public Participation Process (PPP), procedural requirements, compliance, follow up (Sandham, et al., 2013; Sandham & Pretorius, 2008; Cashmore, et al., 2004 and Jay, et al., 2007) and the quality of Environmental Authorisations (EAu). The quality of EIA has been assessed and researched to quite a large extent in South Africa in the past 10 years (Sandham & Pretorius, 2008; Sandham, et al., 2008a; Sandham, et al., 2008b, Sandham, et al., 2010 and Sandham, et al.2013).

In South Africa, through the decision making mandate under the National Environmental Management Act, 107 of 1998 (NEMA), EIA is well placed to address sustainable outcomes as provided for under the NEMA (Morrison-Saunders & Retief, 2012). The EIA authorisation process in South Africa is a driver for environmental compliance and authorisation. EAu (also termed permits or licences) are documents prepared by the Regulator or Competent Authority, which stipulate conditions that have to be adhered to in order to prevent possible negative impacts on the environment during a project. Adherence to EAu conditions could contribute significantly to successfully control and prevent the use of hazardous materials, the management of waste products and waste water, the protection of endangered species and addressing pollution issues (Nel, 2009). Therefore, the quality of EAu documents is seen as an important link to achieve effective environmental management measures. The analysis of the quality of EAu can contribute to strengthen the EIA system and improve the performance of EIA processes (Lee & Colley, 1992).

1.1 Problem Statement

Several authors across the globe (Dipper, et al.., 1998; Wood, 2003 and Craigie et al., 2009) identified EIA follow up as a weakness in the EIA system. Poor environmental governance was also highlighted as a contributor to these weaknesses in developing countries. In South Africa one of the main problems in the EIA system is the monitoring and enforcement of EAu conditions (Wessels, 2015). Factors exacerbating this problem are the quality of and unclear conditions in EAu documents as well as poor coordination between authorities (Wessels, 2015). Jennings (2011) also drew similar conclusions indicating confusion in conditions relating to auditing, different interpretation of legislation and conditions in the EAu that are not relevant to the application and proposed development.

In South Africa a number of studies have been conducted regarding EIA report quality, using the Lee and Colley (1999) review package as a basis for EIA report quality review. The ideal for an EIA system to work effectively is to follow the Deming management cycle (Figure 1.1) (South Africa, 2014a). EAu documents together with the EIA report form part of the cycle as it is the place where environmental performance objectives and targets are set at the beginning of a project. In essence an environmental authorisation stipulates the conditions of approval for an EIA application and is the link between the EIA (planning phase) and the environmental performance (do phase) of a project (Tinker et al., 2005). Dik & Morrison-Saunders (2002) have shown that authorisation approval conditions have an influence on the environmental management practices of EIA applicants and hence on EIA follow up.

The authorisation approval conditions are used by environmental managers to justify environmental management approaches in a business unit. They are also the reference against which environmental performance is assessed. Approval conditions can also in addition address issues that were not recognised by the applicant and can give direction as to where the applicant should focus on environmental management efforts. Therefore, the EAu has an important place in the EIA system, as it not only links the plan and do phases, but also governs compliance in the check phase of the Deming management cycle (see Figure 1.1).

Apart from the work of Dik & Morrison-Saunders (2002) and Caddick (2015) very little research has been conducted on the quality of EAu's in South Africa. The Caddick review package was adapted due to some shortcomings that were identified. Therefore, to review EIA performance more fully, one of the aspects that has to be evaluated is the quality of environmental authorisations (EAu).

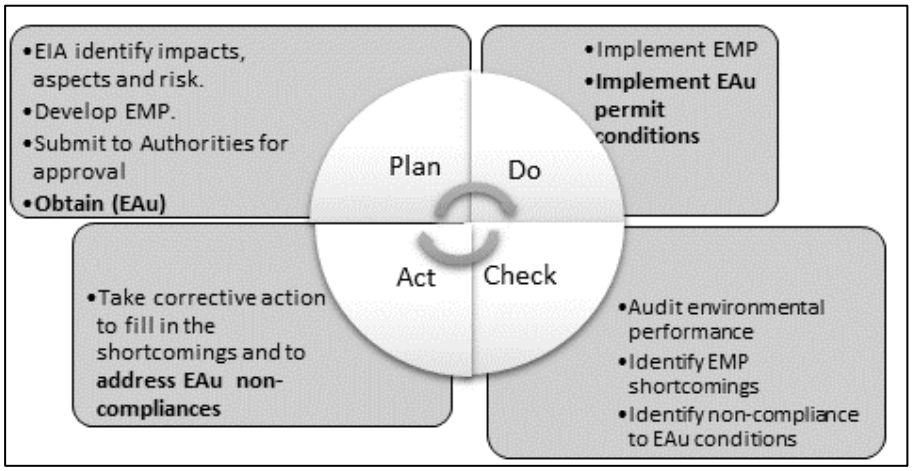

Figure 1.1: Deming cycle for environmental management (Adapted from Nel, 2014)

1.2 Aim and Objectives

The aim of the study is to investigate the quality of environmental authorisations issued in the Mpumalanga Province of South Africa.

The objectives are to:

1. Develop an appropriate quality review package;
2. Investigate the quality of a sample of environmental authorisations in Mpumalanga; and
3. Compare quality across sectors and time.

The outline of the study is presented in the next section (1.3).

1.3 Dissertation Outline

In Chapter 2 a review of the theory and available academic literature regarding EIA systems and environmental authorisations is presented. The design of the quality review package for environmental authorisations is described in Chapter 3, along with the sampling strategy and application of the review package.

The analysis and interpretation of the review results are presented in Chapter 4 as well as the assessment results of EAu quality across sectors and over time. Lastly the conclusion will focus on the findings of the research in Chapter 5.

Having introduced the theme, problem statement, aim and objectives of the study and the outline, the dissertation will now continue with the literature review in Chapter 2.

2 LITERATURE REVIEW

For the purpose of this dissertation the literature review chapter is subdivided into two sections to discuss (1) the EIA regimes in South Africa and (2) the research done abroad and in South Africa regarding EIA system effectiveness and quality.

2.1 Environmental Impact Assessment Review

The EIA system in South Africa has undergone many significant changes over the past two decades as a result of changes in legislation. These legislative changes had an influence on how environmental authorisation (EAu) decisions were made and issued and accordingly it is important to understand the background of EIA, especially since the promulgation of NEMA in 1998.

2.1.1 Era of voluntary EIA in South Africa

EIA practices started around 1974 in South Africa, but these were not legally compulsory and were practised mostly in reaction to environmental awareness in the media. Then in 1989 the Environment Conservation Act (Act 73 of 1989) (ECA) was promulgated (Strydom and King, 2009.eds). An EIA committee was established that developed evaluation procedures for the environment in South Africa of which the product was an Integrated Environmental Management (IEM) report (Van Heerden, 2010). This report was published parallel to the promulgation of ECA which allowed for legal leverage of EIA, but this was not used until 1998, when the first EIA regulations came into effect in January 1998.

2.1.2 First mandatory application of the law to conduct EIA

In 1997 the first regulations that were promulgated under the ECA were (1) Regulation 1182 which dealt with listed activities that required EIA; (2) Regulation 1183 which stipulated how and what should be included in EIAs; and (3) Regulation 1184 which outlined the competent authority (South Africa, 1997c). The EIA guidelines (DEAT, 1998) published in 1998 were used in conjunction with the 1997 regulations. The National Environmental Management Act (Act 107 of 1998) (NEMA) was promulgated on 27 November 1998, but the 1997 regulations were still used until new regulations were promulgated under NEMA in 2006. These regulations introduced mandatory EIA in South Africa. The implementation of mandatory EIA however had its problems especially with the authorisation process in terms of long periods of time for authorities to grant a record of decision (RoD) as there were not enough trained staff during this era to assess EIA applications and grant

authorisations responsibly. To address this issue, authorities embarked on a process that only required a "beefed up" scoping report for applications where activities did not pose significantly detrimental impacts on the environment (South Africa, 2006c). This changed with the introduction of the EIA regulations under NEMA in 2006.

2.1.3 Mandatory EIA under the NEMA 2006 regulations

The most significant change for EIA in South Africa was the new Regulations under NEMA which came into effect in July 2006 i.e. (1) Regulation 385 which dealt with the EIA procedural aspects (South Africa, 2006a), Regulation 386 which listed activities that could be applied for with a basic assessment report (BAR) (South Africa, 2006b) and (3) Regulation 387 which listed activities that should be applied for with a full EIA process (South Africa, 2006c). These regulations were effective until 2010, when again a new set of regulations was promulgated.

The changes in the regulations that were published in 2006 implied that two different EA processes could be followed. The first is a basic assessment (BA) process for activities that do not have any significant impacts on the environment, as listed in Regulations 386 (Listing Notice 1). The second is a full EIA process where significant impacts on the environment are expected, as published in Regulation 387 (Listing Notice 2). The listed activities in the new 2006 regulations also included mining activities, which did not form part of previous regulations (South Africa, 2006c)[1]. Furthermore the 2006 regulations specified timeframes for the authorities to process applications, detailed the roles and responsibilities of different parties in the application process and also clarified what it means to be an independent environmental consultant. Much more attention was also given to compliance enforcement and administrative follow up procedures such as the transfer, review and withdrawal of applications (Shubane, 2005). Notwithstanding the fact that many improvements were made during the transition to the 2006 regulations there were still issues identified in the EIA authorisation processes which lead to the development of the regulations published and promulgated in 2010.

2.1.4 Mandatory EIA under the NEMA 2010 regulations

The new set of regulations that was promulgated in 2010 included improvements on the 2006 regulations and allowed for the recognition of sensitive environments and amendments to listed

[1] While prospecting and mining activities were identified in Listing Notices 1 and 2, the requirement to follow the EIA process for these activities was suspended.

activities previously published in Regulations 386 and 387, especially to deal more efficiently with activities that posed low significance impacts to the environment (Van Heerden, 2010). Regulations 385, 386 and 387 were replaced by Regulations 543, 544 and 545 respectively and an additional Listing Notice in Regulation 546[2] was added under NEMA (South Africa, 2010d).

A significant shortcoming in the 2006 and 2010 Regulations was that although prospecting and mining activities were identified in the Listing Notices, the provisions of the Regulations did not immediately apply, principally due to a dispute between the Departments of Environmental Affairs (DEA) and Mineral Resources (DMR) as to which department should be the regulator of such activities. This dispute was finally resolved in 2013, following which a new set of Regulations was promulgated in December 2014.

2.1.5 Mandatory EIA under the NEMA 2014 regulations (current era)

The purpose of the new NEMA 2014 Regulations is to work towards a "Single Environmental System" (South Africa, 2014c) attempting to reduce duplication of work submitted to different authorities e.g. DEA and DMR. The reason for this is that previously legislative requirements for mining activities that included, for example, the disposal of waste, would be duplicated in the MPRDA process of submitting an EMP and the NEMA EIA process. Apart from lodging an EIA application, mines and possibly other industries had to submit separate applications to the DEA regional offices for air emission quality permits and waste management licences, making the red tape overwhelming to obtain the correct environmental authorisations. Collaboration and streamlining of these parallel processes was a necessity.

Further changes were made to the Listing Notices under Regulations 983, 984 and 985,[3] with emphasis on the most relevant competent authority for each activity and the EIA procedural processes now stipulated in Regulation 982 with the most significant changes about Environmental Assessment Practitioners (EAPs) and changes to the timeframes of assessment procedures (Gunn, 2015). Additional regulations were promulgated for exemption of EIA (Regulation 994) and for appeals (Regulation 993) (Gunn, 2015).

[2] Regulation 546 related to activities identified within particular provinces in South Africa
[3] These Regulations were amended in certain respects in April 2017 but the Regulation numbers remain the same.

2.1.6 Summary of EIA Regimes in South Africa

Table 2.1 presents a summary of EIA regimes, capturing the essence of this evolving legislation in South Africa.

Table 2.1: Summary of EIA Regimes in South Africa

EIA Regime	Relevant Act	Relevant Regulations	Significant changes
Voluntary EIA	Environment Conservation Act (Act 73 of 1989) **(ECA)**	None, EIA were conducted on voluntary basis	None
First Mandatory EIA	Environment Conservation Act (Act 73 of 1989) **(ECA)**	• Regulation 1182; • Regulation 1183; and • Regulation 1184.	• Activities that required EIA were listed; • Rules for how and what should be included in EIAs were published; and • An outline of the competent authority is given.
EIA under 2006 Regulations	The National Environmental Management Act (Act107 of 1998) **(NEMA)**	• Regulation 385; • Regulation 386; and • Regulation 387.	• Changes to EIA procedural aspects – timeframes were set for submission and approval of EAs; • Activities that could be applied for with a BAR were listed; • Activities that should be applied for with a full EIA process were listed; and • Mining activities, previously not covered under environmental legislation, were added to the listed activities.
EIA under 2010 Regulations	The National Environmental Management Act (Act107 of 1998) **(NEMA)**	• Regulation 543; • Regulation 544; • Regulation 545; and • Regulation 546.	• Activities requiring BAR are listed in R.544 & R.546 (additional regulations); • Activities requiring an integrated S&IER process were listed in R544, which should include a submission of application to authorities, scoping phase and full EIA process; and • Allowance is made for geographical areas where sensitive environments exist to upgrade from a BAR to S & EIR process.
EIA under 2014 Regulations	The National Environmental Management Act (Act107 of 1998) **(NEMA)**	• Regulation 982; • Regulation 983; • Regulation 984; • Regulation 985; • Regulation 993; and • Regulation 994.	• Changes to the EIA process regulations allowing under R.982 more time for authorities to process applications; • Changes to listing notices (now R.983, R.984 & R.985) with emphasis on the most relevant competent authority for each activity; and • New regulations for appeals (R.993) and exemptions (R.994), which were previously, included in the EIA process regulations.

With a broad understanding of the history of environmental legislation in South Africa, the following section focuses on EIA research done abroad and locally in South Africa on the topic of EIA effectiveness and quality.

2.2 EIA effectiveness

The Oxford English Dictionary (2017) defines effectiveness as "*The degree to which something is successful in producing a desired result*". The effectiveness of EIA can thus be explained as the degree to which EIA as a tool (as in the OED definition *something which is successful*) contributes to environmental sustainability (in the case of the definition the *desired result*) or as Sadler (2004) defined EIA effectiveness as the degree to which an EIA system measures up to the intended purpose it was created for.

Many studies have been conducted to investigate the effectiveness of EIA systems in developed as well as developing countries (Van Heerden, 2010 and Cele, 2016), with Wood (1999) at the spearhead of these studies since she developed review criteria to measure the effectiveness of EIA systems in 1999. The criteria used by Wood included consideration of the different stages throughout the EIA lifecycle and are mainly focussed on the effectiveness of the EIA process and procedures (Cele, 2016). Apart from the criteria used by Wood, EIA effectiveness can also be measured through other aspects such as determining the quality of EIA reports (Van Heerden, 2010 and Cele, 2016) the compliance to conditions set in authorisation documents, the status of EIA follow-up (Cele, 2016), the quality of the S&EIA and integrity of practitioners (Hilderbrandt, 2012), the public participation process (Mnengwane, 2014) and approval conditions in environmental authorisations (Dik & Morrison-Saunders, 2002).

The main outcomes of the studies regarding EIA effectiveness indicated that there are constraints in both developed and developing countries (Georgeades, 2012 and Van Heerden, 2010) of which the most prominent are a lack of follow-up actions and mechanisms in developed countries (Georgeades, 2012 and Venter, 2015) to inadequate legal mandate for EIA, the lack of human & other resources to implement and manage the EIA system in developing countries and insufficient or lack of plans and policies (Van Heerden, 2010 and Cele, 2016).

Although Wood (1999) viewed the quality of EIA in South Africa to be on a satisfactory level, other studies conducted locally (Jennings, 2011; Kruger & Chapman, 2005; Sandham et al., 2008a; Pretorius & Sandham, 2008; Sandham et al. 2010; Sandham, et al. 2013 and Wessels, 2015;)

revealed that the constraints in EIA effectiveness in South Africa include the lack of human capacity and environmental information, the lack of EIA to influence decision making and poor EIA follow-up. Kruger & Chapman (2005) found that there was poor integration of EIA findings in the decisions drafted by authorities in the Free State Province. Similar findings were also made by Sandham, Siphugu & Tshivhandekano (2005) for the Limpopo Province. Both the abovementioned studies conducted in South Africa in 2005 indicated that the biggest problem for EIA efficiency is non-compliance due to shortcomings in the system.

To summarise the meaning of EIA effectiveness it can be said that EIA effectiveness is the measure of how well it performs in terms of the intended purpose for EIA. The effectiveness of EIA can be measured using different aspects such as EIA process and procedures, quality of EIA reports, compliance to conditions set in authorisation documents, status of EIA follow-up, integrity of EAPs, public participation and approval conditions in environmental authorisations.

The conclusion from studies investigating EIA effectiveness globally is that the constraints to EIA effectiveness include an inadequate legal mandate for EIA, the lack of human & other resources to implement and manage the EIA system, the lack of EIA to influence decision making, poor integration of EIA findings in the decisions drafted by authorities, a lack of follow-up actions and mechanisms. The findings of studies in South Africa indicated that the biggest problem to EIA effectiveness in South Africa is that of non-compliance.

While EIA effectiveness refers to how well a system performs in terms of its intended purpose, the term quality is an indication of how good or close a result is to the set target. EIA quality is therefore a yardstick of the effectiveness of an EIA system and is discussed in greater detail below.

2.3 EIA quality

Research to date in terms of an EIA system quality was mostly focussed on EIA reports (planning phase) and follow up (check and act phases). See Table 2.2 for a sample of the research that has been conducted regarding EIA report quality and EIA follow up. The results of the research from these sources are discussed under sections 2.3.1 and 2.3.2 below.

Table 2.2: Research contributions towards EIA report quality and follow up.

Author/s	Year of publication	EIA research area
EIA Report Quality		
Kruger, E. and Chapman, A.	2005	EIA report quality in the Free State Province
Lee, N. and Colley, R.	1992	Quality of Environmental Statements (UK)
Lee, N., Colley, R., Bond, J. and Simpson, J.	1999	Quality of Environmental Statements and Appraisals (UK)
Peterson, K.	2009	Quality of Environmental Impact Statements
Sandham L.A., Hofmann, A.R., and Retief, F.P.	2008	Quality of EIA reports in the mining sector in South Africa
Sandham L.A., Moloto, M.J., and Retief, F.P.	2008	Quality of EIA reports with specific reference to projects where wetlands are affected
Sandham, L.A., and Pretorius, H.M.	2008	EIA report quality in the North West Province
Sandham, L.A., Van Heerden, A.J., Jones, C.E. and Morrison-Saunders, A.N.	2013	Regulation and EIA report quality
Van Heerden, A.J.	2010	EIA report quality in different EIA regimes in South Africa (before and after 2006)
Van Schalkwyk, E	2012	Quality of EMPs in South Africa
EIA follow up		
Arts, J. and Morrison-Saunders	2004	Lessons for EIA follow-up
Alers, A.	2016	Review package for EIA follow-up performance
Dipper, B., Jones, C. and Wood, C.	1998	Monitoring and post auditing (follow-up) in EIA
Graigie, F., Snijman, P. and Fourie, L.J.	2009	Environmental compliance and enforcement in South Africa
Jennings, P.	2011	Evaluation of permit conditions and implications for compliance monitoring (follow-up)
Wessels, J.A.	2015	ECOs or EIA follow-up verifiers in South Africa
Wood, W.	2003	EIA: a comparative review

Author/s	Year of publication	EIA research area
Quality of EAu		
Caddick, A.B.	2015	Critical review of the quality of Environmental Authorisations in South Africa
Dik, H. & Morrison-Saunders, A.	2002	The influence of EIA Approval Conditions on Environmental Practices

2.3.1 International research

In terms of EIA quality, the Lee & Colley Review Package was designed to help authorities and people involved in environmental assessment (EA) to determine the quality of EAs (Lee, et al.., 1999). Good quality assessments play a key role to assist authorities and decision makers to improve the EIA process as a whole (Lee, et al., 1999) and to assist in better informed decision making towards environmental sustainability. The package is discussed in greater detail in Chapter 3. Further research used for this investigation is focussed on what constitutes good quality EIA and best practice in terms of EAu conditions.

Research regarding the quality and/or validity of conditions and recommendations in the EIA system proposes that conditions to mitigate environmental impacts have to be monitored and enforced (Wood, 2003). The conditions have to be aligned and relevant to the development. Furthermore, some conditions will first require actions to be taken prior to the commencement of a development and secondly controls what will have to be implemented throughout the life of the development or project (Tinker, et al., 2005). In the United Kingdom (UK) it was found that most conditions do not cover all aspects of the environmental impacts caused by a development, but that authorities rather prioritise conditions and measures that are considered to have the most desirable outcome for the environment and the development (Tinker, et al., 2005). These conditions are focussed mainly to reduce impacts and are used more often than mitigation types such as avoidance, rehabilitation and compensation, leaving a gap for authorities/planners to convert mitigation measures into enforceable conditions that clearly state measurable targets, objectives and monitoring requirements (Arts, et al., 2004 and Tinker, et al., 2005).

As far as what the elements of an environmental authorisation should consist of and what will improve the quality of authorisations, the OECD (2007) and Trotta & Suhr (2016) are clear that the following elements should be in an authorisation/permitting system:

1) Sufficient opportunity for public participation and easy access to information,
2) High level of involvement of stakeholders,
3) Clear responsibilities of authorities and staff responsible for auditing and follow-up,
4) Clear responsibility of the applicant about their obligations in the permit,
5) The validity of the timeframe of the permit,
6) Technical guidance, where necessary,
7) Integrated approach, and
8) Close consultation of the EIA.

Furthermore, the OECD (2007) guidelines work from the basis that the goal of environmental permitting is to have a legally binding document that will ensure the health and safety of the environment (humans and nature). It also promotes an integrated approach where the impacts of all environmental aspects i.e. air, water, land and humans should be considered together. This integrated approach also encompasses best available techniques (BAT) (OECD, 2007 and FAO, 2002).

More specific to improve the quality of conditions in an authorisation that will ultimately contribute to sustainability goals, it was found that the conditions should be enforceable and definitive, limits to pollution levels should be set (OECD, 2007; DEFRA, 2013 and Trotta & Suhr, 2016), monitoring and reporting requirements should be clearly outlined (IAEA, 1995 and Trotta & Suhr, 2016) and measurable objectives should be set (DEFRA, 2013 and Trotta & Suhr, 2016).

To conclude this section, it was found that according to global sources key indicators of good EAu quality are conditions that are enforceable and definitive, set limits to pollution levels, clear monitoring and reporting requirements and measurable objectives. While global research focussed on what constitutes good EAu quality, the research done in South Africa focussed more on the weaknesses of EAu quality in the South African EIA system.

2.3.2 South African research

Jennings (2011) conducted a study that focussed on the assessment/quality of environmental authorisation conditions in enabling compliance monitoring in EIA follow-up. Some of the major

findings of the study highlighted several weaknesses in the sample of environmental authorisation conditions that were reviewed. These include weak quality control due to the number of conditions not relevant or useful to the application, poor language use i.e. grammar and spelling errors, different interpretations of parts of the legislation, poor indication of the exact locality of the activity applied for in the applications, no clear rules regarding the transfer of rights or responsibilities during change of ownership of the land or the development (Jennings, 2011). Further weaknesses include; confusion of requirements for submission of audit reports, confusion in the roles of independent auditors and Environmental Control Officers (ECO), no clear conditions regarding the amendment of EAs and only one EAu had a condition that required baseline environmental monitoring before the onset of the development (Jennings, 2011).

The said weaknesses are most likely to have negative consequences further in the EIA cycle e.g. misinterpretation of the conditions can lead to wrong efforts to comply with the authorisation or misguide efforts towards sustainability and in the end lead to non-compliance for the applicant (Caddick, 2015) as well as a failure of EIA in the sense that it is not effective.

A study was conducted by Venter (2015) to investigate the relation between the recommendations made in geotechnical and geohydrological specialist reports and the relevant conditions reflected in the EIA reports and environmental authorisations. The outcome of this study showed that 8% of the reviewed authorisations included recommendations or decisions that did not form part of the specialist report, which could result in poor decisions (Venter, 2015). However, it could also mean that other factors had to be taken into account during the drafting of environmental conditions. This outcome reveals that authorities utilise the information presented to them in the EIA application reports to a large extent and subsequently that EIA reports have a definite influence on the decision making process. The study also showed that the majority (79%) of specialist reports were represented to a high degree in authorisation conditions and that a good decision was made despite weak specialist reports in 13 % of the reviewed sample. The opposite where poor decisions were made despite high quality specialist reports were observed in 5% of the reviewed sample.

Caddick completed a study in 2015 that investigated the quality of EAu in South Africa. His findings revealed that 36 % of the reviewed authorisations for EIA applications were of poor quality and 31% of the reviewed authorisations for Basic Assessment Report (BAR) applications were of poor quality (Caddick, 2015), but authorisations adhered to the Department of Environmental Affairs and Tourism (DEAT) guidelines and NEMA requirements (Caddick, 2015). The criteria against which

the quality reviews were conducted took into account the Lee and Colley review package (Lee, et al. 1999), the DEAT guidelines for EAu review (Taylor & Bodenstein, 2007) and the EIA process requirements according to NEMA.

2.3.3 Summary of EIA quality research

While EIA effectiveness refers to how well a system performs in terms of its intended purpose, EIA quality is a yardstick of the effectiveness of an EIA system. One way to measure EIA system quality is to evaluate EIA reports. Good quality EIA reports play a key role to assist authorities and decision makers to improve the EIA process and EAu permit conditions which is a driver towards responsible environmental management and sustainability. The quality of EAu permit conditions is another way to measure EIA system quality.

Research done globally concur that the following are key indicators of good EAu quality; conditions that are enforceable and definitive, set limits to pollution levels, clear monitoring and reporting requirements and measurable objectives.

Research in South Africa found that there are several weaknesses in EAu e.g. conditions not relevant or useful to a specific application, grammar and spelling errors, different interpretations of parts of the legislation, confusion of requirements for submission of audit reports, confusion in the roles of independent auditors and ECOs and no clear conditions regarding the amendment of EIAs. Another study by Caddick (2015) found that 36% of the reviewed authorisations for EIA applications and 31% for BARs were of poor quality. This could have negative consequences further in the EIA cycle e.g. misinterpretation of the conditions can lead to wrong efforts to achieve sustainability as well as a failure of the EIA system in the sense that it is not effective.

The review package used in this study by Caddick (2015) took in consideration the Department of Environmental Affairs and Tourism (DEAT) guidelines and NEMA requirements for EAu. In this research going forward a review package is developed that will also include other aspects to evaluate EAu quality.

2.4 Conclusion

The EIA system in South Africa has undergone many significant changes over the past two decades as a result of changes in legislation. These legislative changes had an influence on how EAu decisions were made and issued. It is therefore important to understand these legislative changes.

Formal procedures for EIA were first developed under ECA with the promulgation of the first EIA regulations 1997, which became effective in January 1998. ECA was replaced by new environmental legislation generally known as NEMA with the intention to improve environmental policy in South Africa. NEMA has been amended several times of which the first big changes related to EIA were in 2006 with the promulgation of new EIA regulations. Through a process of continual improvement, the EIA regulations were amended in 2010 and again in 2014 with the main purpose to make EIA more effective.

EIA effectiveness is the measure of how well the EIA system performs in terms of the intended purpose for EIA. The effectiveness of EIA can be measured using different aspects such as: EIA process and procedures, quality of EIA reports, compliance to conditions set in authorisation documents, status of EIA follow-up, integrity of EAPs, public participation and approval conditions in environmental authorisations. Research shows that global constraints to EIA effectiveness includes inadequate legal mandate for EIA, the lack of human & other resources to implement and manage the EIA system, the lack of EIA to influence decision making, poor integration of EIA findings in the decisions drafted by authorities and a lack of follow-up actions and mechanisms. These constraints are also valid in the South African context, but local research indicated that the biggest problem to EIA effectiveness in South Africa is that of non-compliance.

While EIA effectiveness refers to how well a system performs in terms of its intended purpose, the term quality is an indication of how good or close a result is to the set target. EIA quality is therefore a measure of the effectiveness of an EIA system. One way to measure EIA system quality is to evaluate EIA reports. Good quality EIA reports play a key role to assist authorities and decision makers to improve EAu conditions that is a driver towards responsible environmental management and sustainability and thus the quality of EAu permit conditions is another way to measure EIA system quality.

Global research indicate key indicators of good EAu quality include conditions that are enforceable and definitive, set limits to pollution levels, clear monitoring and reporting requirements and measurable objectives. In South Africa research identified several weaknesses in EAu e.g. conditions not relevant or useful to a specific application, grammar and spelling errors, different interpretations of parts of the legislation, confusion of requirements for submission of audit reports, confusion in the roles of independent auditors and ECOs and unclear conditions regarding the amendment of EIAs.

A study about EAu quality, conducted by Caddick (2015) found at least 30% of EAu were of poor quality. This could have negative consequences further in the EIA cycle e.g. misinterpretation of the conditions can lead to wrong efforts to achieve sustainability as well as a failure of the EIA system in the sense that it is not effective. The review package used in this study by Caddick (2015) took in consideration the DEAT guidelines and NEMA requirements for EAu. In this research going forward a review package is developed that also include other aspects, led by the literature review, to evaluate EAu quality. The review methods and data are the focus of Chapter 3.

3 REVIEW DESIGN AND METHODOLOGY

The aim of this study is to investigate the quality of environmental authorisations issued in the Mpumalanga Province, with the first objective to develop an appropriate quality review package.

Not many EAu quality reviews have been conducted previously. In South Africa an EAu review package was developed by Caddick (2015) using the structure of the Lee and Colley (1999) review package and incorporated content from the DEAT guidelines for issuing EAu's (Taylor & Bodenstein, 2007) and the EIA process requirements according to NEMA. The categories used in the Caddick review package were limited (see section 3.1.2), hence the decision to build on it and develop a more detailed EAu review package (section 3.2).

This chapter provides an overview of existing quality review packages for EIA reports and EAu's and then explains the newly developed EAu review package.

3.1 Existing review packages for EIA report quality

3.1.1 The Lee and Colley methodology

In 1989 Lee and Colley developed a package to review the quality of environmental statements (ES)[4] that were submitted to comply with new planning regulations in the UK at the time. The new regulations required that environmental assessments had to be done before commencement of new developments. Since 1989 the package has been revised slightly, but the fundamental principles remained unchanged (Lee, et al., 1999). The design of the Lee and Colley review package contain three elements or components (Lee, et al., 1999). These are:

- Advice to reviewers;
- A list of review criteria or topics; and
- A collation sheet corresponding to the review criteria on which the findings of the review can be recorded.

The **advice to reviewers'** component includes for example the information and knowledge required to understand the review package and how to use the review criteria (Lee, et al., 1999).

The **list of review criteria** follows a hierarchy where the lowest level of the simplest criteria is reviewed first then followed by more complex and inclusive criteria or topics to the most complex

[4] Review of ES in the UK is the equivalent to EIA in SA. The term EIA will be used going forward.

criteria being reviewed last (Lee, et al., 1999) as illustrated in Figure 3.1. The overall quality assessment (top of the hierarchy) would typically include the review areas. Each of these areas is divided into review categories, that are again subdivided into review sub-categories (Lee, et al., 1999) which are formulated as actual questions and statements regarding the EIA. The Lee and Colley package has also been developed to make provision for the review of environmental appraisals and also larger scale assessments such as strategic environmental assessments (SEA).

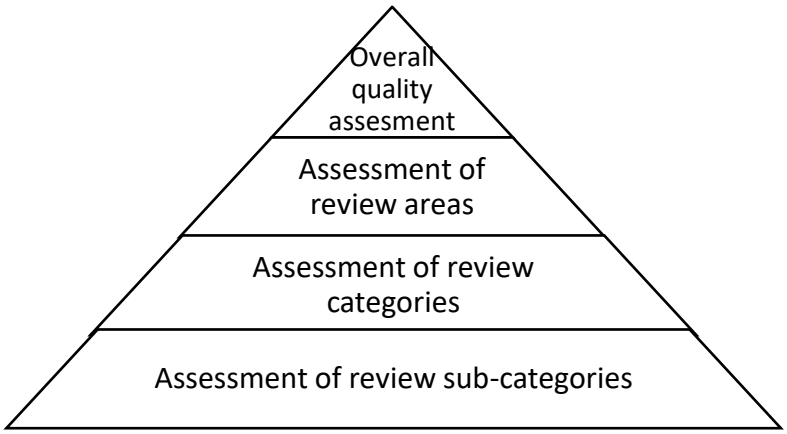

Figure 3.1: Hierarchical structure of assessment criteria (Lee, *et al.*, 1999)

The hybrid package and collation sheet is structured to correspond with the hierarchal assessment criteria structure with the main heading: Overall assessment, headings level 1 representing the review areas, subheadings level 2 representing the review categories and subheadings level 3 representing the review sub-categories. An example is provided in Table 3.1.

The package is designed to make use of alphabetical symbols to grade each topic and/or statement. Clear descriptions of what each symbol represents are given; for example, a symbol A is awarded if all the tasks are well performed and complete. The symbols are graded down in alphabetical order to symbol F for tasks that are left out or conducted in a very poor manner. Figure 3.1 gives a description of what each symbol means as given by Lee, et al. (1999) and is listed below:

- A – Relevant tasks well performed, with not tasks left incomplete;
- B – Tasks are well performed, with minor omissions and/or inaccuracies;
- C – Satisfactory, despite omissions and/or inaccuracies;
- D – Unsatisfactory due to omissions and/or inaccuracies, although some parts performed well;
- E – Not satisfactory due to major omission and inaccuracies; and
- F – Very unsatisfactory as important tasks performed poorly and/or were omitted.

The symbol N is assigned if a question is not applicable to a particular topic.

Table 3.1: Example of EIAR quality review sheet

	Overall assessment	
1	**Review Area 1: Baseline description**	**Assessment Symbol**
1.1	Definition of impacts	
1.1.1	*Clear description of impacts should be given*	*A*
1.1.2	*Impacts should be determined against baseline conditions*	*B*
2	**Review Area 2: Key impacts**	**Assessment Symbol**
2.1		
2.1.1		
2.1.2		
3	**Review Area 3: Mitigation & Alternatives**	**Assessment Symbol**
3.1		
3.1.1		
4	**Review Area 4: Communication of results**	**Assessment Symbol**
4.1		
4.1.1		
4.2		

The results as recorded on the collation sheet are interpreted to arrive at the findings of the overall review and to determine whether an EIAR is of satisfactory quality or lacks some or most important information requirements to support environmentally sustainable decisions.

The package initially developed by Lee and Colley has been adapted for use in South Africa through the inclusion of sub-categories that allow for South African EIA system and legal requirements (Alers, 2016; Sandham et al.., 2008 and Sandham & Pretorius, 2008), none of which refer to EAu quality.

3.1.2 Caddick review package

In order to review EAu quality, a review package for EAu was developed by Caddick (2015), which incorporated the DEAT guidelines for EAu review (Taylor & Bodenstein, 2007) and the EIA process requirements according to NEMA, using the structure and outline of the Lee and Colley review package.

The review areas were renamed in Caddick's methodology as (1) DEAT guidelines, (2) NEMA requirements and (3) Additional questions. Following this Review Area 1 has eight categories,

Review Area 2 six categories and Review Area 3 has seven categories. The Caddick EAu review package did not have a fourth tier i.e. sub-categories.

The review package developed by Caddick (2015) is presented in Annexure 1 and an abbreviated version is shown in Table 3.2.

Table 3.2: Abbreviated EAu review criteria – Caddick review package

1. DEAT Guidelines	*2.4 Validity of authorisation*
1.1 Are the conditions reasonable?	*2.5 Management, monitoring and reporting throughout lifecycle of development*
1.2 Are conditions too general in nature?	*2.6 Transfer of rights and responsibilities*
1.3 Monitoring and enforcement	
1.4 Responsibilities for implementation of conditions	
1.5 Language use, spelling and grammar	**3. Additional questions**
1.6 Sufficiency of technical conditions	*3.1 Location of activity*
1.7 Conditions re further investigation	*3.2 Jurisdiction of the competent authority*
1.8 Priorities of conditions	*3.3 Auditing of conditions*
	3.4. Rehabilitation conditions
2. NEMA Process	*3.5 Authorities' engagement with applicant*
2.1 Identification of applicant	*3.6 Appeals procedures*
2.2 Description of activity	*3.7 Evaluation of alternatives*
2.3 Development property description	

1. Review area; *1.1 Review category.*

The assessment results of the each of the categories in the different review areas are captured in a spreadsheet which functions as a collation sheet. The grading of the results is presented as symbols from A to F, with A being the best result and F the worst result, similar to the Lee and Colley rating system described above.

3.2 Adapted EAu review package

The decision to adapt the Caddick review package is to improve on Caddick's work and address some of the shortcomings. The first shortcoming is that Caddick only had a two tier package consisting of review areas and review categories. The questions posed in the review categories are mostly high level questions, lacking in more specific detail. The Caddick review package also did not address some information required in EAu's in South Africa and the information flow in the package did not correspond to EAu's. Changes and improvements to the Caddick review package are:

1. The review areas and categories were re-arranged into a more logical flow which correspond to EAu's in South Africa;
2. Review sub-categories were included for a more detailed assessment of EAu's; and

3. Assessment of additional information in EAu's was included.

The adapted review package includes topics and criteria that are of relevance internationally but also specific to South African legislation and guidelines. The review areas were selected according to authorisation templates. The authorisation templates usually consist of a cover letter, the authorisation document itself and an appendix which explains the reason for the decision. The authorisation documents are divided into the following main headings, namely, Decision, Authorised activities and Conditions. The review categories and subcategories were selected based on the content and themes presented in the EAu conditions and the weaknesses in EAu's exposed in previous studies. This content for example includes administrative details, decision, management conditions, monitoring conditions, reporting, follow-up and language and formatting. Under each category, questions are formulated to investigate in detail the quality of each category selected and thereby necessitates the use of sub-categories. For example, under the category for follow-up, questions are asked to evaluate the capacity for audit of conditions, the frequency of auditing, responsibilities of auditors and ECOs and procedures for changes to the conditions as a result of corrective actions after auditing. Refer to Table 3.3 below and the full package in Annexure 2.

3.2.1 Adapted review structure

The review structure and assessment rating system of Lee and Colley (1999) were used as a starting point to adapt the EAu review package. In the adapted EAu review package four Review Areas emerged i.e. (1) Decision, (2) Authorised activities, (3) Conditions of the Authorisation and (4) Technical quality. Each review area is divided into Review Categories which are in turn sub-divided into Review Sub-categories. An abbreviated version of the package is presented in Table 3.3, with the Caddick review topics shaded in grey.

The additional information in the new EAu review package that was absent from Caddicks' review package addressed the following topics: the decision, authorised activities, some of the administrative conditions, management measures, reporting to authorities, follow-up, some of the legal aspects and formatting. Reasons for adding these topics are explained below.

The **decision** (Review Area 1) is one of the most important parts of the authorisation for the applicant and has to be communicated clearly by the authority. The reasons for the decision have to be provided in the light of administrative law under the Promotion of Administrative Justice Act (Act 3 of 2000) (PAJA) and to assess whether the decision is reasonable in terms of the application or not.

Table 3.2: Abbreviated EAu criteria – new review package

1 Decision	3.2.6 Use of loose terms such as "adequate", "relevant" and "appropriate"
1.1 Administrative information	
1.1.1 Applicant and DEAT references	3.2.7 Further investigations
1.1.2 Authorisation holder identification	3.2.8 Environmental management measures for the life cycle of the project
1.1.3 Location and property description	
1.2 Decision	3.2.9 Rehabilitation conditions
1.2.1 Clarity and effective communication of decision	***3.3 Monitoring conditions***
1.2.2 Reasons for the decision presented and reasonable	3.3.1 Monitoring and record keeping of monitoring results
2 Authorised activities	3.3.2 Measurability of monitoring objectives
2.1 Activities authorised	3.3.3 Emission and discharge limits for pollution sources
2.1.1 Description of the project	3.3.4 Sampling location, collection method and monitoring frequencies
2.1.2 List of activities authorised	
2.1.3 Reference of applicable activities to EIA regulations	***3.4 Reporting conditions***
2.1.4 Authorised activities alignment to project description	3.4.1 Clarity regarding the frequency and content of reporting
3 Conditions of the authorisation	
3.1 Administrative conditions	3.4.2 Reporting conditions re notification of exceedances, emergencies or accidents causing environmental impacts
3.1.1 Timeframe for which the authorisation is valid	
3.1.2 Responsible party for compliance to EAu	3.4.3 Instructions re submission of reports (place & receiving official)
3.1.3 Timeframes and notification of I&APs re ROD	***3.5 Follow up***
3.1.4 Responsibilities and actions of authorisation holder for appeals	3.5.1 Conditions for auditing frequency and submission of audit reports
3.1.5Achievable, reasonable conditions	
3.1.6 Conditions re amendment of the EAu	3.5.2 Responsibilities of internal and external auditors and ECO's
3.1.7 Conditions re transfer of rights and obligations	
3.1.8 Other authorisation requirements	3.5.3 Procedures for changes in the monitoring and management measures after auditing
3.2 Management conditions	**4 Technical quality**
3.2.1 Measurement, auditing and clarity of conditions	***4.1 Language and formatting***
3.2.2 Prioritising management activities	4.1.1 Logic flow of information
3.2.3 Timeframes to implement management activities	4.1.2 Correct language, grammar and spelling
3.2.4 Flexibility of methods used to achieve management Targets	4.1.3 Consistent formatting and numbering
3.2.5 Integrated management approach	

1 Review area, ***1.1 Review category***, 1.1.1 Review sub-category

Grey shading: questions also used in the Caddick review package

Authorised activities (Review Area 2) were only addressed partially in the Caddick review package, nevertheless it was considered important to allow for more detailed assessment and the following sub-categories were included, presentation of a full list of the activities authorised in the permit (sub-category 2.1.2), reference of listed activities to relevant EIA regulations (sub-category 2.1.3) and correct alignment of authorised activities with the project description (sub-category 2.1.4).

The first new category (3.1) under Review Area 3 is more administrative in nature and is included to evaluate communication of the outcome of the decision to I&APs.

Caddick's review package was also very vague in terms of **conditions** addressed under environmental management (category 3.2), reporting (category 3.4) and follow-up (category 3.5). To have a closer look at the conditions, new categories, as indicated in brackets above, were identified and sub-categories were created to conduct a better evaluation of the quality of conditions in EAu's.

Environmental management sub-categories (3.2.3 - 3.2.6) were added to evaluate the measurability of management conditions, the timeframes within which management measures have to be implemented, the flexibility in methods to reach set management targets and an integrated management approach under category 3.2.

Evaluation of conditions regarding reporting to authorities were limited in the Caddick package, but it is important for the applicant to know the following information (added as category 3.4): which parameters to report on and the frequency of reporting this to the authority; the procedures to follow when the applicant exceeds permitted levels of pollution or experiences an emergency spill which impact on the environment; and to which office and officials reports have to be submitted.

Follow-up is seen as a weak performing area in the EIA system by several authors and therefore the new package drilled down into more detail (sub-category 3.5.2 and 3.5.3) than what was covered in the Caddick review package. Evaluation of the responsibilities of internal and external auditors and ECO's and procedures to follow to effect changes in the monitoring and management plans after audit recommendations were included as the lines can easily get blurry regarding these conditions if they are not clearly stipulated in the EAu. These were added under category 3.5 of Review Area 3.

Caddick only included one question to assess **technical quality** (Review Area 4) i.e. regarding the correctness of spelling and grammar. This question alone is not regarded as adequate to assess document quality. In the new review package, therefore, sub-categories to assess the logical flow of information (4.1.1) and consistency in the document formatting (4.1.3) such as fonts and numbering were added.

3.2.2 Review criteria

The focus of the discussion about the review package structure above was on the changes to the structure. A discussion of each Review Area, Category and Sub-category is provided for overview and some background on each Review Area. The discussion is not necessarily in the form of a question for review but focus on the requirements for the reviewer. The actual questions as they appear in the review package in Annexure 2 are presented in brackets and italic font after the discussion of each sub-category.

Review Area 1: Decision

1.1 Application references

This is information necessary to include in the document, but which does not relate directly to an environmental impact, such as the authorisation application number, reference number, the authorisation holders' name, project location and property details to ensure that there is no confusion with regards to the responsible entity for the project on the designated property.

1.1.1 The application number and National Department of Environmental Affairs reference number has to be indicated on the front page of the decision to ensure that the decision given is correct when referenced to the application. [*Are the application number, and NDEA reference number indicated clearly on the first page of the authorisation document?*]

1.1.2 The name of the authorisation holder has to be indicated to ensure that the decision is issued to the correct applicant. [*Is the authorisation holder's name indicated on the first page?*]

1.1.3 The property deeds information has to be indicated to ensure that the authorisation is granted on the correct property as lodged in the application. [*Are the location and property details indicated correctly as per title deed description?*]

1.2 Decision

This is an important part of the authorisation as it tells whether authorisation to proceed with the development has been granted or not. The decision has to be clearly communicated and also include the authorisation holders' name and contact details in full as well as a reasonable explanation for the decision.

1.2.1 The authorisation has to be clearly communicated without phrases that could have double meaning in order to avoid misinterpretation thereof by the applicant/authorisation holder. [*Is the decision clearly communicated and without phrases that could have double meaning or be interpreted in different ways*?]

1.2.2 Reasons for the authorisation have to be reasonable and justifiable against the application information and documents submitted. [*Are reasons for the decision provided in the document?*]

Review Area 2: Authorised activities

2.1 Activities authorised

The authorised activities have to be provided in context of the application and project description. It also has to bear reference to the EIA regulations of listed activities. Failure to do so may lead to project delays and/or non-compliance for the authorisation holder if the project activities are not authorised correctly.

2.1.1 A project description should be provided explaining all project activities e.g. the size of the project and activities, project schedule and a model/description of the anticipated completed project. [*Is a description of the project provided?*]

2.1.2 A list of the authorised activities has to be provided to confirm the activities that are authorised. [*Is the list of activities authorised included in the authorisation?*]

2.1.3 Activities should be referenced against the EIA regulations under which they are authorised. [*Are the activities listed in the authorisation referenced to the applicable list of activities in the EIA EIA Listing Notices?*]

2.1.4 The authorised activities have to be consistent with the project description and activities. [*Do the authorised activities align with the project description?*]

Review Area 3: Conditions of the authorisation

3.1 Administrative conditions

Administrative conditions are necessary to include in the document, but do not relate directly to an environmental impact. This informs the authorisation holder about the timeframe for which the authorisation is valid, the responsible party for compliance to the EAu, conditions about I&APs and

the appeals process, the responsibility of implementation of conditions, procedures for amendments of the EA and transfer of rights and obligations.

3.1.1 The timeframe of validity of the authorisation has to be stipulated and the authority has to consider which conditions are relevant to the construction/development phase of the project and which conditions are relevant for the lifetime of the project and closure. [*Do the conditions include the timeframe for which the authorisation is valid?*]

3.1.2 The responsible party for compliance to the EAu has to be nominated in the authorisation conditions. Where more than one party (e.g. in a joint venture) is involved in a project some responsibilities may be delegated to the different parties involved. Alternatively, the main party in whose name the application is authorised will be held responsible for compliance and this party has to see that others working at/on the project have to comply with the conditions of the authorisation. [*Do the conditions stipulate the responsible party for compliance to the EA?*]

3.1.3 NEMA is clear that I&APs must be informed of the outcome of the EAu within a set timeframe if an I&AP wishes to appeal the decision made by the competent authority. [*Do the conditions clearly stipulate the timeframes and notification of I&APs regarding the outcome of the decision*?]

3.1.4 The authorisation holder has to inform registered I&APs of the appeals process and the stipulated procedure to follow when they wish to lodge an appeal against the authorisation. The relevant authorities' contact details and address for submission of appeals has to be provided also. [*Do the conditions clearly stipulate the responsibilities of the authorisation holder to inform I&APs regarding the appeals process?*]

3.1.5 Conditions in the authorisation must have achievable objectives which can be monitored and audited to measure compliance and environmental performance. [*Are the conditions stipulated achievable?*]

3.1.6 Should an EAu be amended for some reason, the amendment process and tasks that the authorisation holder has to follow must be explained in the authorisation. [*Are clear conditions set in terms of the amendment of the EAu?*]

3.1.7 The transfer of rights and obligations if and when change of ownership of the property or activity will take place have to be stipulated as the new owner will take over the

authorisation responsibilities. [*Do conditions stipulate the transfer of rights and obligations if and when change of ownership of the property or activity will take place?*]

3.1.8 In terms of other authorisation requirements (i.e. water use licence or waste licence applications) that have to be legally complied with regarding the project, the DEAT authorisation manual (Taylor & Bodenstein, 2007) is clear that "Where different types of authorisations are required for the same activity, there is no legal requirement that a particular authorisation must be in place before another authorisation is issued*."* However, the granting of an EAu does not exempt the applicant from his obligations in terms of other legislation. [*Does the authorisation refer to other authorisation requirements (i.e. water use license or waste license applications?) that have to be complied with regarding the activity?*]

3.2 Management conditions

Management conditions refer to the requirements to manage impacts on the environment for the whole duration of the project. Best practice according to the DEAT guideline document (South Africa, 2004) is setting of measurable targets, flexibility in the methods to achieve targets, having a clear link between the project description and conditions, responsibilities clearly assigned to the authorisation holder, avoiding conditions that require further investigations and drafting conditions that can be audited and monitored with the necessary infrastructure and human capacity in place.

3.2.1 Management conditions have to be clearly stipulated and have measurable/auditable objectives. This is best practice across the globe. [*Are the conditions clearly stipulated and do they have measurable/auditable objectives?*]

3.2.2 It is best practice for management measures relating to the highest environmental risk to be prioritised. [*Do conditions prioritise management of activities with the highest environmental risk?*]

3.2.3 Timeframes within which certain management measures have to be implemented must be stipulated e.g. certain management measures have to be implemented during construction, before the onset of the operational phase. [*Do conditions stipulate timeframes within which certain management activities have to be implemented?*]

3.2.4 The authorisation holder has to be allowed to be flexible in the methods they use to achieve the monitoring targets. With the rapid development of technologies and science it will allow the authorisation holder to use more effective methods when they become

available. [*Do the conditions allow the authorisation holder to be flexible in the methods they use to achieve the monitoring targets set?*]

3.2.5 It is best practice and can save time and cost to have conditions which encourage an integrated management approach. [*Do conditions show an integrated management approach?*]

3.2.6 Loose terms such as "adequate", "relevant" and "appropriate" can have different meanings to different people and therefore have to be clearly defined in terms of what it means to the activity. [*Are loose terms such as "relevant" and "appropriate" clearly defined in terms what it means to the activity?*]

3.2.7 Conditions which allow for further investigation can be problematic. The authorisation must clearly stipulate the steps to monitor management measures and compliance where further investigation is required. Best practice is to issue an authorisation only when all substantive reports are submitted. [*Are there conditions included which allow for further investigation?*]

3.2.8 The conditions in the authorisation should require environmental management measures during all the phases (life cycle) of the project. [*Do conditions allow for environmental management during all the phases of the project?*]

3.2.9 Rehabilitation of activities and impacts on the environment have to be feasible, in other words the applicant has to be capable to carry out rehabilitation. [*Have conditions to address rehabilitation been included and are they achievable?*]

3.3 Monitoring conditions

Monitoring conditions have to be clearly set out in terms of the monitoring method, frequency, parameters to monitor and analyse, record keeping and include the target pollution limits for emissions and discharges.

3.3.1 Monitoring conditions must inform the authorisation holder clearly on how to record and report monitoring results. [*Do conditions clearly stipulate monitoring and record keeping of monitoring results?*]

3.3.2 Monitoring conditions must have objectives that can be measured. [*Are monitoring objectives measurable?*]

3.3.3 Pollution limits for emissions and discharges have to be stipulated to the authorisation holder for comparison to monitoring results to determine the compliance status. [*Are emission and discharge limits set for pollution sources?*]

3.3.4 Monitoring conditions have to include the sampling location, sampling collection method and monitoring frequency for each monitoring point. [*Do monitoring conditions include the sampling location, sampling collection method and monitoring frequency methods?*]

3.4 Reporting conditions

Monitoring, auditing and incidents must be reported to the competent authority. The conditions on how to, when and to whom have to be included in the authorisation.

3.4.1 Reporting conditions must clearly outline which parameters to report on and the frequency of reporting to the authority. [*Are reporting conditions clearly outlined regarding which parameters to report on and the frequency of reporting?*]

3.4.2 Reporting conditions regarding notifying the authority about exceedance of permitted levels of pollution, emergency spills and/or accidents causing environmental impacts have to be clearly stipulated. [*Are reporting conditions outlined to notify the authority about exceedance of permitted levels of pollution, emergency spills and/or accidents causing environmental impacts?*]

3.4.3 The contact details of the office and responsible official to which reports must be submitted have to be included in the conditions. [*Do conditions stipulate to which office reports must be submitted?*]

3.5 Follow up

Follow up refers to the actions that take place after an authorisation is granted and the project and environmental measures are implemented. It includes auditing, corrective measures and changes to existing management measures as part of the cycle of continual improvement in terms of environmental management.

3.5.1 Conditions for auditing frequency and submission of audit reports have to be included in the authorisation. It might seem that there is an overlap between sub-category 3.4.1 and 3.5.1, but where 2.4.1 refers to all reporting to the department of water and

sanitation (DWS), 3.5.1 is specific to the audit conditions. [*Are clear conditions stipulated for auditing frequency and submission of audit reports?*]

3.5.2 The responsibilities of internal and external auditors and ECO's have to be clearly outlined in the conditions. [*Do conditions clearly outline the responsibilities of internal and external auditors and ECO's?*]

3.5.3 Conditions must also stipulate the procedures to follow with regard to changes in the monitoring and management plan as a result of corrective actions or any other reason. [*Do conditions stipulate the procedures to follow with regard to changes in the monitoring and management plan as a result of corrective actions after auditing recommendations?*]

Review Area 4: Technical quality

4.1 Language and formatting

Technical quality of the authorisation refers to the physical appearance of the authorisation document with regards to the layout, language use and logical flow of information. The language has to be grammatically correct and without spelling errors, and formatting should be consistent throughout the document in order to avoid confusion to the authorisation holder and auditors.

4.1.1 Information should be presented in a logical order so that the authorisation holder and other readers of the document can easily find information pertaining to a certain topic/part of the authorisation. [*Does the authorisation have a logical flow of information?*]

4.1.2 It is important to use the correct language, grammar and spelling throughout the authorisation document in order to avoid misinterpretation of conditions. [*Have the correct language, grammar and spelling been used throughout the authorisation document?*]

4.1.3 The fonts, formatting and numbering have to be correct/consistent throughout the authorisation document to avoid confusion when referencing to certain parts of the authorisation. It also looks professional. [*Are the fonts formatting and numbering consistent throughout the authorisation document?*]

This section concludes the rationale behind and development of an improved quality review package for EAu's. The overview and discussion of Review Areas, Categories and Sub-categories serve to give the reviewer a better understanding of the package.

The next step after developing an appropriate quality review package was to apply the package to a sample of EAu's and analyse the results of the review to determine the quality of EAu's in the Mpumalanga Province.

3.3 Sample Selection

The Mpumalanga Province is home to significant mineral resources and large farming areas and has a rich natural biodiversity. The quality of EAu's is therefore an important link in the environmental management chain and can play an important role towards achieving sustainability in the Province, as environmental compliance is largely driven by EIA legislation in South Africa. A sample of 30 EAu's was randomly selected from the Mpumalanga Province in South Africa to conduct the review, as no quality reviews of EAu's had been carried out in Mpumalanga previously and a number of EAu's was already available for review. Additional samples were obtained from the public domain.

The sample is fairly well distributed across sectors and over time (Table 3.4). The distribution of the sample timeline was to cover all EIA regulatory regimes to look for temporal trends. No EAu has yet been issued under the EIA 2014 Regulations as amended in April 2017.

Sector	**No. of permits**	**ECA era**	**NEMA 2006**	**NEMA 2010**	**NEMA 2014**
Mining	7	2	1	4	
Construction: Non-Linear	7	2	2	2	1
Construction: Linear	13	2	6	2	3
Farming	3			3	
Totals	**30**	**6**	**9**	**11**	**4**

3.4 Conducting the review

The review was done using the four-tier system used by Lee & Colley, beginning with sub-categories at the lowest level and moving up through categories and review areas up to authorisation as a whole. A pilot sample was first reviewed to test the functionality of the review questions and to familiarise the reviewer with the review package. After completion of the pilot review, changes were made to the formulation of some of the review questions. The selected sample of 30 EAu's was then reviewed and the results recorded on the collation sheets and analysed. The analysis of results is described in the paragraphs below. A full set of scores at all levels is attached in Annexure 3.

3.5 Quality review and awarding of grades

Grading was done by making use of assessment symbols from A to F (Table 3.5) and graded where the symbol A represents the best/highest grading and symbol F represents the lowest or totally unsatisfactory grading. The Lee & Colley grading descriptions were used (Chapter 3.1.1) and is repeated in Table 3.4. To determine the quality of the EAu's, grading symbols A – C are used to represent areas, categories and sub-categories that are of satisfactory quality and symbols D – F for unsatisfactory quality. Further analysis was done to identify the strength and weaknesses in EAu quality, where grading A and B represent the best performing areas (strengths) and grading E and F represent worst performing areas (weaknesses).

Table 3.3: Review grading system: abbreviated terms

Grading symbol	Grading description
A	Very well performed
B	Satisfactory
C	Just satisfactory
D	Just unsatisfactory
E	Unsatisfactory
F	Very poor or not addressed at all
N	*Question not applicable to the conditions in the EAu*

3.6 Conclusion

The first objective of this study, to develop an appropriate quality review package for EAu's was discussed in this chapter. The methodology that was followed to develop the review package started with the review of existing quality review packages i.e. Lee & Colley and Caddick's review package. The use of the package to review the quality of a sample of Eau's in Mpumalanga is presented in Chapter 4.

4 RESULTS AND DISCUSSION

The results from the EAu quality review are presented and interpreted in Chapter 4. The content of the results focus on the extent to which the EAu's quality are satisfactory, addressing the second objective of the research. The strengths and weaknesses observed in the overall assessment (Section 4.1) are also discussed. Furthermore, a comparative analysis over time (Section 4.2) and across sectors (Section 4.3), addressing the third objective of the research, are presented.

4.1 Assessment results

The quality of EAu's in the Mpumalanga Province are discussed in this section. Similar to the review structure, the results are discussed for the four review areas (RA) and respective categories for all the samples reviewed. Sub-categories are only discussed in certain cases to highlight specific issues. The assessment symbols A to C are grouped together to determine the RAs and categories which are completed to a satisfactory level. The assessment symbols A and B are used to identify RAs and categories which are seen as strengths, whereas assessment symbols E and F are used to identify RAs and categories which are seen as weaknesses.

4.1.1 Quality of Review Areas

The results (Table 4.1) for the overall quality for **RA 1: Decision** shows that 99% of EAu's were graded as satisfactory (A–C) and 95% were graded as being well performed (A-B).

The results for **RA 2: Authorised activities** show that 99% of EAu's were graded as satisfactory (A-C), 92 % as being well performed (A-B) and 1% were graded as unsatisfactory (D-F). More detail about this is provided in section 4.1.2.

The results for **RA 3: Conditions of the authorisation** show that only 66% of EAu's performed to a satisfactory level, while 47% performed very well (A-B). Furthermore, of the 34% of EAu's which were graded as unsatisfactory (D-F) for RA 3, 22% performed very poorly (E-F). Further investigation into category level performances indicates that the poor performances (D-F) in RA 3 are most prominent in Categories **3.3 Monitoring** (82%), **3.4 Reporting** (40%), **3.5 Follow-up** (38%) and **3.2 Management** (36%).

Table 4.1: Summary of results: Review Areas and Categories

		% A–C Satisfactory	%D–F Unsatisfactory	%A–B Strengths	%E–F Weaknesses
RA 1	**Decision**	**99**	**1**	**95**	**1**
1.1	Administrative information	98	2	94	1
1.2	Decision	100	0	97	0
RA 2	**Authorised activities**	**99**	**1**	**92**	**1**
2.1	Activities authorised	99	1	92	1
RA 3	**Conditions of the authorisation**	**66**	**34**	**47**	**22**
3.1	Administrative conditions	95	5	80	3
3.2	Management conditions	64	36	38	19
3.3	Monitoring conditions	18	82	5	66
3.4	Reporting conditions	60	40	28	11
3.5	Follow up	62	38	58	32
RA 4	**Technical quality**	**99**	**1**	**79**	**0**
4.1	Language and formatting	99	1	79	0

RA 4: Technical quality performed to a satisfactory level in 99% of the samples, with 79% of the samples performing very well (A-B), indicating an area of strength in the EAu review sample.

Figure 4.1 illustrates the comparison of performances between the review areas. RA 1 show the best performance with the highest percentage A and B grades followed by RA 2 and RA 4. RA3 shows the weakest performance with the highest percentage F (very poor) grading. Furthermore RA 3 also shows the most divergent grading distribution of all the review areas. This shows an inconsistency in the quality of the conditions in EAu's across the board.

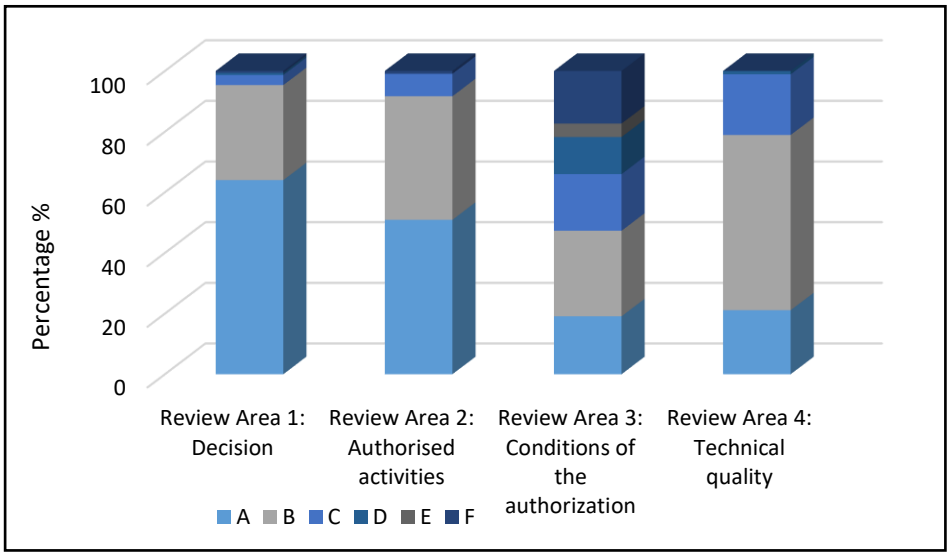

Figure 4.1: Grades for Review Areas

4.1.2 Quality of Categories

Under RA 1, 98% of the sample scored C or higher (Table 4.2) which indicates that the RA is conducted to a high satisfactory level and is also an area of strength (A-B grading of 94%). **Category 1.1 Administrative information**, performed very well with 98% of the sample completed to a satisfactory level and only 2% scoring an unsatisfactory grading in sub-categories 1.1.1 Applicant and DEAT references and 1.1.3 Location and property description. The effective communication (1.2.1) and reasons for the decision (1.2.2) under **Category 1.2 Decision** performed so well that it is labelled as an area of strength (100% satisfactory (A-C) and 97% graded A-B.

Table 4.2: Results for Categories under Review Area 1

	Review Area 1: Decision	**% A–C** Satisfactory	**%D–F** Unsatisfactory	**%A–B** Strengths	**%E–F** Weaknesses
1.1	**Administrative information**	**98**	**2**	**94**	**1**
1.1.1	Applicant and DEAT references	97	3	97	3
1.1.2	Authorisation holder identification	100	0	100	0
1.1.3	Location and property description	97	3	87	0
1.2	**Decision**	**100**	**0**	**97**	**0**
1.2.1	Clarity and effective communication of decision	100	0	100	0
1.2.2	Reasons for the decision presented and reasonable	100	0	93	0

RA 2, **Category 2.1 Authorised activities** showed that 99% of the sample were satisfactory i.e. grading C or higher (Table 4.3). The only grading below C (unsatisfactory) was for sub-category 2.1.3 which assessed the correct reference of project activities to listed activities in the EIA regulations. With a grading of 92% of samples scoring A-B, Category 2.1 is labelled an area of strength in the EAu review sample.

Table 4.3: Results for Categories under Review Area 2

	Review Area 2: Authorised activities	**% A–C** Satisfactory	**%D–F** Unsatisfactory	**%A–B** Strengths	**%E–F** Weaknesses
2.1	**Activities authorised**	**99**	**1**	**92**	**1**
2.1.1	Description of the project	100	0	85	0
2.1.2	List of activities authorised	100	0	93	0
2.1.3	Reference of applicable activities to EIA regulations	96	4	96	4
2.1.4	Authorised activities alignment to project description	100	0	93	0

Only 66% of EAu's were done to a satisfactory level (A-C), while 34% of EAu's which were graded as unsatisfactory (D-F) under RA 3 (Table 4.1), Categories 3.2 to 3.5 were the worst performing categories of all (Table 4.4).

Category 3.1 Administrative conditions performed to a satisfactory level (A-C) in 95% of the sample. The 5% performing unsatisfactory (D-F) is mostly due to poor performances in sub-categories 3.1.6 assessing the conditions related to amendment of EAu's and 3.1.7 related to conditions about the transfer of rights and obligations.

Only 64% of **Category 3.2. Management conditions** performed to a satisfactory level (A-C) with 36% of the grading (A-B) performing very well. Of the 36% of category 3.2 performing unsatisfactory (D-F), 19% of management conditions were weak (E-F). The unsatisfactory performance in this category is mostly due to poor performances (grading D and lower) of sub-categories 3.2.1 measurement, auditing and clarity of conditions (45%), 3.2.2 prioritising management conditions (79%), 3.2.6 definition of loose terms (83%) and 3.2.9 rehabilitation conditions (55%). These were also the conditions with the weakest (E-F) scores. The strongest scores (A-B) were achieved for sub-categories 3.2.4 flexibility of methods to achieve management targets (93%) and 3.2.7 further investigations (82%).

In **Category 3.3 monitoring conditions** performance was poor with only 17% of the sample scoring C or higher (satisfactory). This is the weakest category identified in the EAu's review sample. The poor grading (90% D-F) is due to lack of measurable monitoring objectives (sub-category 3.3.2), the absence of pollution limits for emissions and discharges (sub-category 3.3.3) and the absence of complete information regarding sampling locations, collection methods and monitoring frequencies in the conditions. One may argue that these are included in the separate specialist license conditions such as water use licences (WUL), air emission licences (AEL) and waste management licenses (WML), but reference to these are also poorly indicated. In the EAu's issued to the mining sector, references are made to the approved environmental management programme (EMPr) documents. The quality of monitoring conditions in these documents did not form part of the scope of this study.

Table 4.4: Results for Categories under Review Area 3

Review Area 3: Conditions of the authorisation		% A–C Satisfactory	%D–F Unsatisfactory	%A–B Strength	%E–F Weakness
3.1	**Administrative conditions**	**95**	**5**	**80**	**3**
3.1.1	Timeframe for which the authorisation is valid	93	7	83	3
3.1.2	Responsible party for compliance to EAu	100	0	97	0
3.1.3	Timeframes and notification of I&APs re ROD	100	0	100	0
3.1.4	Responsibilities and actions for appeals	97	3	93	3
3.1.5	Achievable, reasonable conditions	100	0	86	0
3.1.6	Conditions re amendment of the EAu	90	10	31	3
3.1.7	Conditions re transfer of rights and obligations	85	15	56	11
3.1.8	Other authorisation requirements	96	4	96	4
3.2	**Management conditions**	**64**	**36**	**38**	**19**
3.2.1	Measurement, auditing and clarity of conditions	55	45	0	21
3.2.2	Prioritising management activities	21	79	3	45
3.2.3	Timeframes to implement management activities	68	32	43	7
3.2.4	Flexibility of methods used to achieve targets	93	7	93	7
3.2.5	Integrated management approach	75	25	25	18
3.2.6	Use of loose terms such as “adequate”, “relevant” and “appropriate”	17	83	17	33
3.2.7	Further investigations	82	18	82	18
3.2.8	Environmental management measures for the life cycle of the project	83	17	48	10
3.2.9	Rehabilitation conditions	45	55	21	24
3.3	**Monitoring conditions**	**18**	**82**	**5**	**66**
3.3.1	Monitoring and record keeping of monitoring results	55	45	17	17
3.3.2	Measurability of monitoring objectives	10	90	0	66
3.3.3	Emissions and discharge limits for pollution sources	0	100	0	96
3.3.4	Sampling location, collection method and monitoring frequencies	4	96	0	92
3.4	**Reporting conditions**	**60**	**40**	**28**	**11**
3.4.1	Clarity regarding the frequency and content of reporting	52	48	21	7
3.4.2	Notification of exceedances, emergencies or accidents causing environmental impacts	76	24	45	21
3.4.3	Instructions re submission of reports (place & receiving official)	52	48	17	7
3.5	**Follow up**	**62**	**38**	**58**	**32**
3.5.1	Conditions for auditing frequency and submission of audit reports	83	17	79	7
3.5.2	Responsibilities of internal and external auditors and ECO's	82	18	79	18
3.5.3	Procedures for changes in the monitoring and management measures after auditing	19	81	15	74

The performance of **Category 3.4 reporting conditions** shows a 60% satisfactory level (A-C), with sub-category 3.4.2 notification of exceedances, emergencies or accidents causing environmental impacts showing a 76% satisfactory level. Sub-categories 3.4.1 clarity regarding the frequency and content of reporting and 3.4.3 instruction regarding the submission of reports i.e. to which office and to whom (official), were not that clear and was unsatisfactory (D-F) in 48% or more of the sample for each respective sub-category.

The performance of conditions under **Category 3.5 follow up** fared fairly well despite a satisfactory level (A-C) of only 62%. Sub-categories 5.3.1 auditing frequency and submission of audit reports and 5.3.2 responsibilities of internal and external auditors and ECO's were satisfactory in 83% and 82% of the review sample respectively, but sub-category 5.3.3 procedures for changes in the monitoring and management measures after auditing were poorly addressed (D-F) in 81% of the sample, making this sub-category also identified as a weakness. This is an aspect that needs more attention for two reasons. First to improve on management measures as more information becomes available about the success and failures of existing measures and secondly environmental management is still driven by compliance and regulation in South Africa to a large extent.

Table 4.5: Results for Categories under Review Area 4

Review Area 4: Technical quality		% A–C Satisfactory	%D–F Unsatisfactory	%A–B Strengths	%E–F Weaknesses
4.1	**Language and formatting**	**99**	**1**	**79**	**0**
4.1.1	Logic flow of information	97	3	47	0
4.1.2	Correct language, grammar and spelling	100	0	90	0
4.1.3	Consistent formatting and numbering	100	0	100	0

Under RA 4, 99% of the grading were satisfactory, i.e. scoring C or higher (Table 4.5). **Category 4.1 Language and formatting**, shows and overall satisfactory grading of 99%. Only one sub-category i.e. 4.1.1 logic flow of information had 3% of the sample scoring an unsatisfactory grading (D-F), but no weak (E-F) grading. This category is an area of strength in the review sample.

4.1.3 Conclusion

RA 1, 2 and 4 are areas of strength and received grading's that are satisfactory (A-C) for nearly 100% of the complete review sample. RA 3 showed the weakest performance with only 66% of EAu's that were done to a satisfactory level (A-C). Drilling down to category level, the 4 categories

that performed the weakest fall under RA 3. These categories are 3.2 Management, 3.3 Monitoring, 3.4 Reporting and 3.5 Follow-up. Further breakdown and detail on the performance across EIA regulatory regimes are presented in section 4.2.

4.2 Assessment of results across different EIA Regulatory regimes

The performance and trends across the EIA regulatory regimes are discussed below. The four regulatory regimes are (1) the ECA, (2) the NEMA 2006, (3) the NEMA 2010 and (4) the NEMA 2014 eras. Since no authorisations have been issued after the changes in 2017 yet, this regulatory era does not form part of the quality review and assessment.

The comparison of results was done for the four review areas (RA) and respective categories over time. The full results are presented in Annexure 3.2.

4.2.1 Quality of Review Areas across EIA regulatory regimes

A comparison of the results (Figure 4.2) for RA 1 Decision shows an increase in A and B grades, regime on regime since the ECA era. This is due to improvements in the adminstration and effective communication of the decision to applicants.

The same trend is observed for RA 2 Authorised activities, but with the distinct difference that the A grades show an increase of more that 20% between the ECA and NEMA 2006 era and the NEMA 2010 and NEMA 2014 era. This could be due to any number of reasons such as officials and applicants getting familiar with the EIA notices and listings over time and improved document formats for both BA and EIA reports. The implementation of the DEAT authorisation manual for assessing and issuing environmental authorisations (Taylor & Bodenstein, 2007) could also be a contributing factor to the improved grades observed for RA 2

The trend observed for RA 3 is fairly similar with the exception of a decrease in F grades from ECA to NEMA 2006 era and a noticeable increase in A grades in the NEMA 2014 era. This can be ascribed to slightly better performances across the five categories in RA 3 from the ECA to the NEMA 2006 era and a significant improvement in category 3.5 Follow-up in the NEMA 2014 sample (Table 4.6).

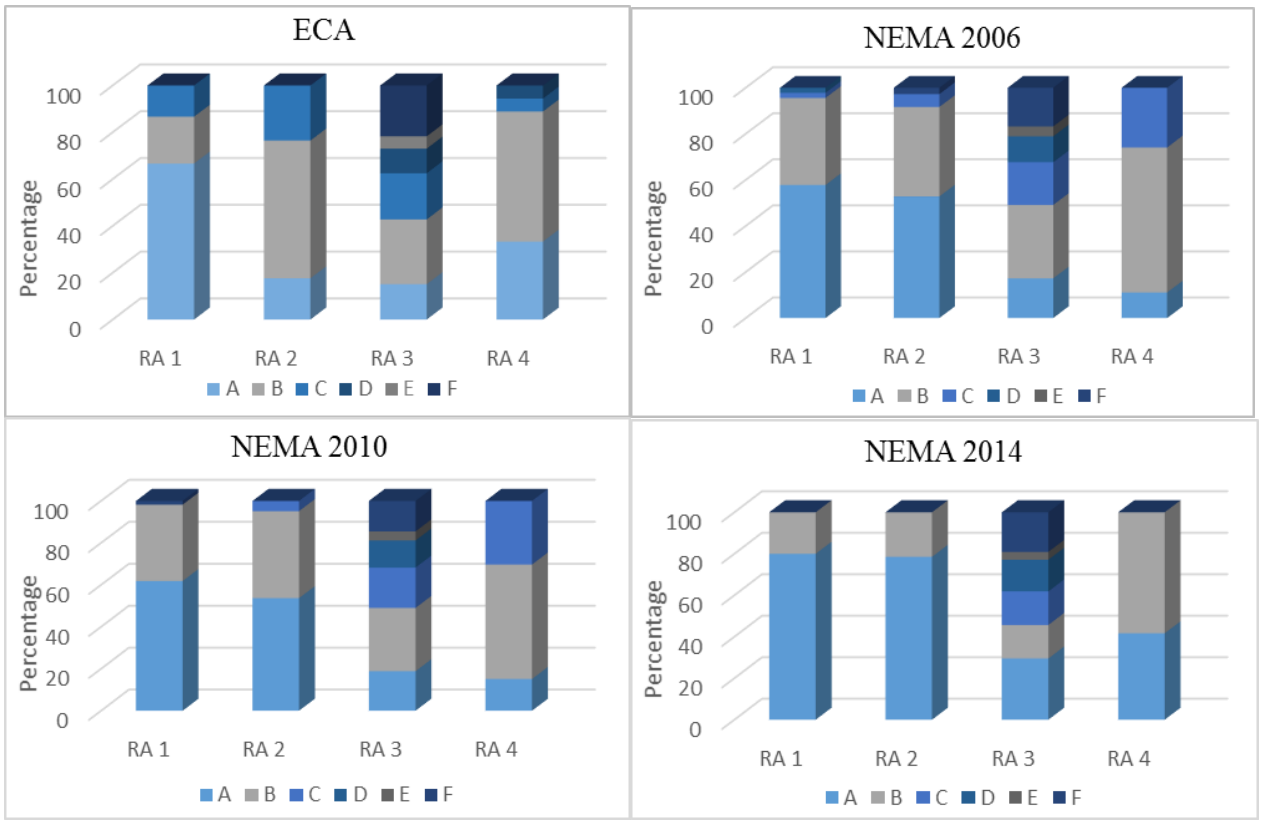

Figure 4.2: Comparison of grades between EIA regulatory regimes

RA 4 technical quality performed well in the ECA sample with nearly 80% A and B grades compared to NEMA 2006 and NEMA 2010 where the percentage A and B grades decreased to just above 60%. In the NEMA 2014 era, performance of technical quality is excellent with 100% A and B grades. The NEMA 2014 sample only consist of four EAu's, but the percentage increase in A grades is more than 20% and grades lower than B decreased to zero, which is still indicative of an improvement of RA 4 in the NEMA 2014 era.

4.2.2 Quality of Categories across EIA regulatory regimes

The results (Table 4.6) for the overall quality for RA 1 Decision, shows that 98% of EAu's across the EIA regimes were graded as satisfactory (A–C) with only 2% unsatisfactory (D-F), which is ascribed to partial omissions in sub-category 1.1 administrative information in one of the NEMA 2006 and one of the NEMA 2010 samples. RA 1 is an area of strength in EAu's across all regulatory regimes.

The results for category 2.1 Activities authorised show that 100% of EAu's were graded as satisfactory (A-C) in the ECA, NEMA 2010 and NEMA 2014 eras while those in the NEMA 2006 were awarded a 97% satisfactory level grade. The A and B grades shows total improvement over time making RA 2 also an area of strength since the NEMA 2006 era, however listed activities under EIA regulations were new and was only effective since January 1998 during the ECA era.

Table 4.6: Summary of results: Review Areas and Categories across EIA regulatory eras

EIA Regulatory era		**ECA**			**NEMA 2006**			**NEMA 2010**			**NEMA 2014**		
		A–C	**A–B**	**E–F**	**A–C**	**A–B**	**E–F**	**A–C**	**A–B**	**E–F**	**A–C**	**A–B**	**E–F**
RA1	**Decision**	**100**[5]	**87**	**0**	**98**	**96**	**0**	**98**	**98**	**2**	**100**	**100**	**0**
1.1	Administrative information	100	89	0	96	93	0	97	97	3	100	100	0
1.2	Decision	100	83	0	100	100	0	100	100	0	100	100	0
RA2	**Authorised activities**	**100**	**76**	**0**	**97**	**92**	**3**	**100**	**95**	**0**	**100**	**100**	**0**
2.1	Activities authorised	100	76	0	97	92	3	100	95	0	100	100	0
RA3	**Conditions of the EAu**	**63**	**43**	**27**	**68**	**49**	**21**	**68**	**49**	**19**	**62**	**46**	**23**
3.1	Administrative conditions	87	66	11	97	87	1	100	86	0	91	72	3
3.2	Management conditions	73	44	20	63	38	22	68	39	12	42	30	30
3.3	Monitoring conditions	17	13	75	17	3	61	24	3	62	13	0	75
3.4	Reporting conditions	56	33	11	74	30	4	43	20	20	75	33	8
3.5	Follow up	39	28	39	67	63	33	59	59	41	92	92	0
RA4	**Technical quality**	**94**	**89**	**0**	**100**	**74**	**0**	**100**	**70**	**0**	**100**	**100**	**0**
4.1	Language and formatting	94	89	0	100	74	0	100	70	0	100	100	0

The results for RA 3 Conditions of the authorisation show an improvement from 63% satisfactory level (A-C) in the ECA era to 68% in the NEMA 2006 and NEMA 2010 eras and a decrease again to 62% in the NEMA 2014 era. RA 3 is subdivided into 5 categories.

The performance for category 3.1 Administrative information and category 3.5 Follow-up shows an improving trend from the ECA to the NEMA 2014 era. Category 3.2 Management conditions shows a slightly decreasing trend in performance from the ECA era to the NEMA 2010 area and a sharper decrease by almost 40% to the NEMA 2014 era. A possible explanation for this trend is that more specific management conditions are omitted from the environmental authorisation but included in more detail in the specific licenses (WUL, AEL and WML) under more recent regulatory regimes. Category 3.3 Monitoring conditions showed the weakest performance of all categories in all four the regulatory regimes, with the highest satisfactory grading (A-C) for the NEMA 2010 era (24%)

[5] Values are presented as percentages (%)

and the lowest satisfactory grading for the NEMA 2014 era (13%). Category 3.4 Reporting showed mixed results over time with the highest satisfactory grades (A-C) for the NEMA 2006 (74%) and the NEMA 2014 (75%) eras and the weakest grading observed for the NEMA 2010 era (43%).

The trends observed for categories 3.2 Management conditions and 3.3 Monitoring almost seem in contradiction with one of the purposes of the NEMA 2014 regulations to create a "One Environmental System" and reduce duplication of work. Instead of having one licence document for a project, an applicant now has to undergo several licensing processes in parallel i.e. a fully functioning coal fired power station will have to apply for an EAu, WUL, AEL and WML for one project and in return will receive four different pieces of environmental authorisations at least, each with their own conditions.[6]

RA 4 technical quality showed an improvement in grading scores with 100% of the sample for the NEMA 2006, 2010 and 2014 eras being satisfactory (A-C).

4.2.3 Conclusion

RA 1, 2 and 4 showed improved performance over time since the start of mandatory EIA in the ECA era up the NEMA 2014 era. Performance of these RAs are areas of strengths in all four regulatory regimes.

RA 3 showed a significant improvement in category 3.5 Follow-up, especially from the NEMA 2010 to the NEMA 2014 era. Performances of categories 3.1 Administration and 3.4 Reporting were mixed over time with little change in trends from the ECA to the NEMA 2014 era. The weakest performance were observed for categories 3.2 Management conditions and 3.3. Monitoring conditions. The performance of these categories over time remained weak and even decreased to the lowest satisfactory levels in the NEMA 2014 era.

4.3 Assessment results across sectors

The performance and trends across sectors are discussed below. The four sectors which are compared to each other are (1) mining, (2) agriculture, (3) construction and (4) linear construction. The distinction between construction and linear construction is made due to the difference in geographical footprint between the two and therefore different environmental management

[6] The DMR is the Competent Authority for the mining right, EAu,and WML so to that extent there is a rationalisation in the application process

measures which might be applicable to them. Linear construction includes construction of roads, pipelines and powerlines. The four review areas (RA) and respective categories are compared across sectors. The complete results are presented in Annexure 3.3

4.3.1 Quality of Review Areas across sectors

Figure 4.3 presents a comparison of the performance of the RAs between sectors.

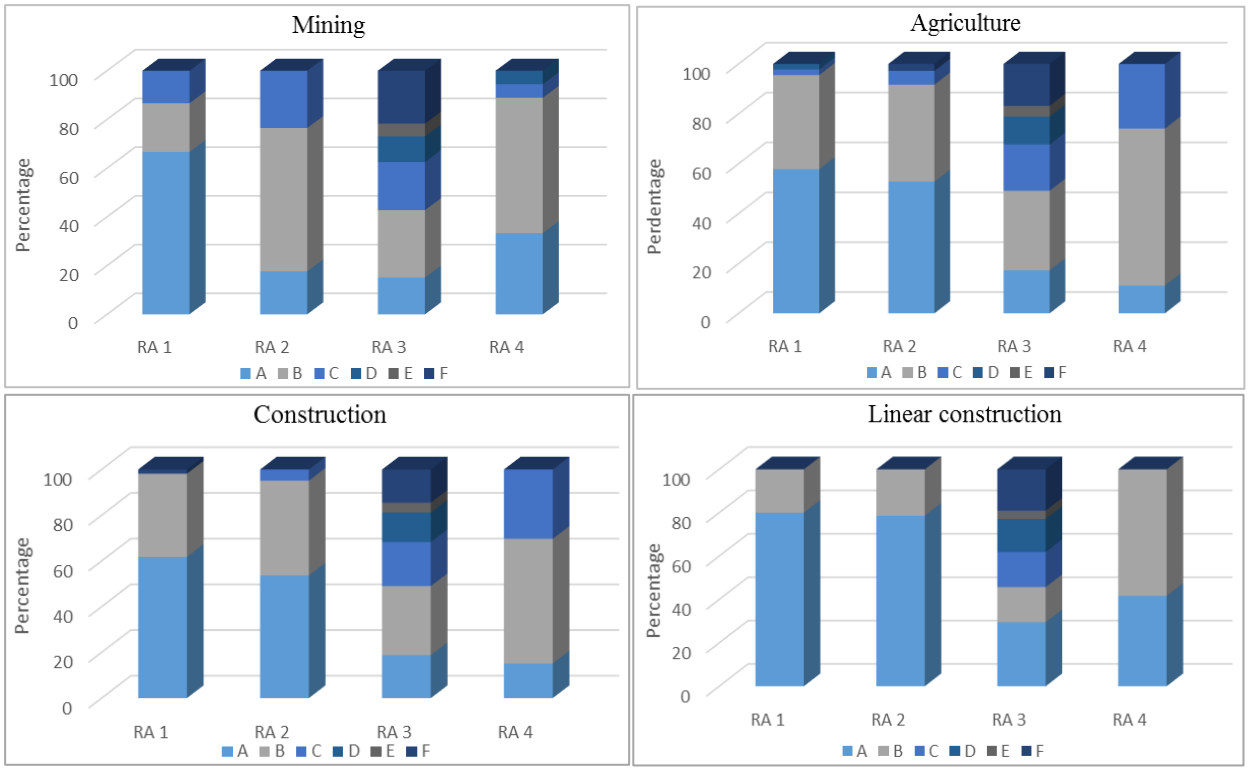

Figure 4.3: Comparison of grades between sectors

The best performing sector under RA 1 is linear construction with the highest A-B grades followed by construction with similar high A-B grades, but less A grades. Shortly behind construction is the mining sector and lastly the agriculture sector with the least A grades.

In RA 2 the best performing sector is also linear construction followed by the construction and agricultural sectors with both high A-B grades (> 90%) and a small percentage (< 5%) C grades and D grades (3%) in the agriculture sector. The mining sector, although still maintaining a 100% satisfactory (A-C) grading, is the weakest performer in RA 2 due to the low A grades and a higher percentage C grades than the other sectors.

RA 3 is the worst performing with a much higher unsatisfactory grading (D-F) across sectors than the other RAs. The sectors with the highest satisfactory score (A-C) is construction and agriculture, but agriculture has the most F grades. The mining and linear construction has satisfactory grades (A-C) of only 63% and 62% respectively, however the F grades are much higher for the mining sector, therefor making is the worst performing sector in RA 3.

The performance of RA 4 is at a 100% satisfactory level (A-C) in the linear construction, agriculture and construction sectors. The mining sector has a 96% satisfactory grading which is still good, but again the worst when compared to the other sectors.

4.3.2 Quality of Categories across sectors

In RA 1 the satisfactory grading (A-C) is slightly better for category 1.2 Decision than 1.1 Administrative information in all sectors. Refer to Table 4.7 for category results.

Table 4.7: Summary of results: Review Areas and Categories across sectors

Sector		**Mining**			**Agriculture**			**Construction**			**Linear construction**		
		A–C	**A–B**	**E–F**	**A–C**	**A–B**	**E–F**	**A–C**	**A–B**	**E–F**	**A–C**	**A–B**	**E–F**
RA1	**Decision**	**100**[7]	**87**	**0**	**98**	**96**	**0**	**98**	**62**	**2**	**100**	**100**	**0**
1.1	Administrative information	100	89	0	96	93	0	97	70	3	100	100	0
1.2	Decision	100	83	0	100	100	0	100	50	0	100	100	0
RA2	**Authorised activities**	**100**	**76**	**0**	**97**	**92**	**3**	**100**	**59**	**0**	**100**	**100**	**0**
2.1	Activities authorised	100	76	0	97	92	3	100	59	0	100	100	0
RA3	**Conditions of the EAu**	**63**	**43**	**27**	**68**	**49**	**21**	**68**	**38**	**19**	**62**	**46**	**23**
3.1	Administrative conditions	87	66	11	97	87	1	100	59	0	91	72	3
3.2	Management conditions	73	44	20	63	38	22	68	39	12	42	30	30
3.3	Monitoring conditions	17	13	75	17	3	61	24	21	62	13	0	75
3.4	Reporting conditions	56	33	11	74	30	4	43	23	20	75	33	8
3.5	Follow up	39	28	39	67	63	33	59	11	41	92	92	0
RA4	**Technical quality**	**94**	**89**	**0**	**100**	**74**	**0**	**100**	**45**	**0**	**100**	**100**	**0**
4.1	Language and formatting	94	89	0	100	74	0	100	45	0	100	100	0

The linear construction sector performed best with 100% satisfactory grading in both categories. In category 1.1 the mining sector also scored a 100% satisfactory grading followed by the construction

[7] Values are presented as percentages (%)

sector (97% A-C) and the agricultural sector (96% A-C), however the agricultural sector had a higher A-B grading (93%) compared to the construction sector (70%). In category 1.2 all the sectors achieved a 100% satisfactory (A-C) grading, but the A-B grading for the mining sector is only 83% and 50% for the construction sector.

RA 2 only consist of 1 category 2.1 Activities authorised, which subsequently reflect the same comparison across sectors as given above in section 4.3.1 i.e. the best performer being the linear construction sector followed in order by construction, agriculture and mining.

RA 3 is the worst performing with all categories under this RA having a higher unsatisfactory grading (D-F) across sectors than the other categories. The category with the strongest performance is category 3.1 Administrative conditions and the weakest performing category is 3.3 Monitoring conditions.

In category 3.1 Administrative conditions the construction sector achieved the highest satisfactory grading (A-C) of 100% and is followed by agriculture (97%), linear construction (91%) and mining (87%). The only strong performing sector in this category is agriculture with an A-B grading of 87%. The weakest performing sector is mining with and E-F grading of 11%.

Category 3.2 Management conditions achieved average satisfactory grades (A-C) i.e. mining (73%), construction (68%), agriculture (63%) and linear construction (42%). The results did not indicate any strong performances (A-B) in any of the sectors. The weakest performing sector is linear construction with 30% E-F grades.

Category 3.3 is weak in all sectors with satisfactory grades (A-C) in all sectors below 25%. The weakest performing sectors are linear construction and mining both with 75% E-F grades with construction (62% E-F) and agriculture (61% E-F) grades performing a little better, but still weak.

Category 3.4 Reporting conditions achieved average satisfactory grades (A-C) i.e. linear construction (75%), agriculture (74%), mining (56%) and construction (43%). The results did not indicate any strong performances (A-B) in any of the sectors. The weakest performing sector is construction with 20% E-F grades

In category 3.5 Follow-up, the linear construction sector performed very well with 92% satisfactory (A-C) grades and 92% A-B grades. The remainder of the sectors did not so well. The satisfactory grading (A-C) for agriculture is 67% followed by the construction sector 59% and lastly the mining

sector 39%. These three sectors also shows weaknesses in category 3.5 with E-F grades between 33 % for agriculture to 41% for construction.

RA 4 also only consist of 1 category 4.1 Language and formatting, which subsequently reflect the same comparison across sectors as given above in section 4.3.1 i.e. 100 % satisfactory level (A-C) in the linear construction, agriculture and construction sectors and 96%. (A-C) in the mining sector. The construction and agricultural sectors still have room for improvement in this category with strong (A-B) grades of only 74% for agriculture and 45% for construction.

4.3.3 Conclusion

The best performing sector overall is linear construction, followed by construction, agriculture and lastly the mining sector. All sectors performed to a satisfactory level in RA 1, 2 and 4 and their respective categories. The performance on sectors in RA 3 categories shows mixed results in categories 3.2 Management conditions and 3.4 Reporting conditions. In category 3.5 Follow-up linear construction was the only strong performing sector, while mining, agriculture and construction had fairly high (33%-41%) unsatisfactory (E-F) grades. All sectors performed satisfactory in category 3.1 Administrative conditions and very unsatisfactory in category 3.3. Monitoring conditions.

5 CONCLUSION

In South Africa many legislative changes regarding EIA occurred over the past 20 years and influenced how EIA reports were compiled and also how decisions were made by authorities. In order to better understand these influences, one needs to have an overview of the development of EIA legislation in South Africa. The first procedures for EIA were developed in 1997 with the promulgation of EIA regulations under ECA. In 1998 ECA was replaced by NEMA. In 2006 new EIA regulations was promulgated under NEMA, these regulations were amended again in 2010 and in 2014 with the main intention to make EIA more effective

The effectiveness of EIA refers to how well the system performs against the purpose it was created for. Effectiveness can be measured, amongst other aspects, by EIA report quality, and compliance to conditions in EAu. Quality refers to how good or close a result is to the set targets and objectives. One way to measure EIA system quality is to evaluate EIA reports, another is to evaluate EAu conditions. Although the quality of EIA reports are well researched, the quality of EAu has not been researched to a great extent in the past.

One previous study about EAu quality was conducted by Caddick (2015). The findings of his research indicated that approximately one third of EAu's were of poor quality. This is largely attributed to weaknesses identified for conditions related to rehabilitation, monitoring and enforcement, priorities of management measures and management measures during the full life cycle of a project. In order to build on Caddick's work and evaluate the quality of EAu in more detail an appropriate quality review package was developed.

5.1 Objective 1 - Develop an appropriate quality review package

The first objective of this dissertation was to develop and appropriate quality review package. The review structure of Lee and Colley (1999) was used as a starting point to develop the EAu package. The adapted EAu review package consists of four Review Areas i.e. Decision, Authorised activities, Conditions of the authorisation and Technical quality. Each review area was divided into categories and sub-categories. Additional information in the adapted EAu review package, that was absent in the Caddick review package, are included in categories addressing the decision, authorised activities, administrative conditions, management conditions, reporting, follow-up and technical aspects. After finalising the adapted EAu review package the next step was to apply the package to a sample of EAu's in the Mpumalanga Province.

5.2 Objectives 2 and 3 - Investigate the quality of a sample of environmental authorisations in Mpumalanga and to compare quality across sectors and time

The results of the EAu review quality indicates that RA 1, 2 and 4 are areas of strength and received grading's that are satisfactory (A-C) for nearly 100% of the complete review sample. RA 3 showed the weakest performance with only 66% of EAu's that were done to a satisfactory level (A-C). Drilling down to category level, the 4 categories that performed the weakest fall under RA 3. These categories are 3.2 Management, 3.3 Monitoring, 3.4 Reporting and 3.5 Follow-up.

Performance of these RAs 1, 2 and 4 are areas of strength in all four regulatory regimes and showed improved performance over time since the start of mandatory EIA in the ECA era up the NEMA 2014 era.

Over time RA 3 showed a significant improvement in category 3.5 Follow-up, especially from the NEMA 2010 to the NEMA 2014 era. Performances of categories 3.1 Administration and 3.4 Reporting were mixed over time with little change in trends from the ECA to the NEMA 2014 era. The weakest performance were observed for categories 3.2 Management conditions and 3.3. Monitoring conditions. The performance of these categories over time remained weak and even decreased to the lowest satisfactory levels in the NEMA 2014 era. These weaknesses were also highlighted in the results of the Caddick review (Caddick, 2015).

Performance across sectors showed the best performing sector overall is linear construction, followed by construction, agriculture and lastly the mining sector. All sectors performed to a satisfactory level in RA 1, 2 and 4 and their respective categories, reflecting the results of the overall quality status. The performance on sectors in RA 3 categories shows mixed results in categories 3.2 Management conditions and 3.4 Reporting conditions. In category 3.5 Follow-up, linear construction was the only strong performing sector, while mining, agriculture and construction had fairly high (33%-41%) unsatisfactory (E-F) grades. All sectors performed satisfactory (A-C) in category 3.1 Administrative conditions and very unsatisfactory (E-F) in category 3.3. Monitoring conditions.

5.3 Closing remark

"Be a yardstick of quality. Some people aren't used to an environment where excellence is expected" (Steve Jobs).

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ANNEXURES

ANNEXURE 1: CADDICK REVIEW PACKAGE

Review area 1: (DEAT guidelines)	
1	*Are the conditions set in the EAu reasonable in the context of the listed activity?*
2	*Are the conditions too general in nature?*
3	*Is the monitoring and enforcement stipulated?*
4	*Are responsibilities for the implementation of conditions stipulated?*
5	*Are spelling and grammar up to standard?*
6	*Are sufficient technical conditions included in the EAu?*
7	*Do conditions require further investigation?*
8	*Are the priorities of conditions been distinguished?*
Review Area 2 (NEMA process)	
1	*Is the name, address and telephone number of the authorisation holder included?*
2	*Does the EAu include a detailed description of the activity?*
3	*Is the property description of the property where the activity will take place included?*
4	*Does the EAu stipulate the period for which the EAu is valid?*
5	*Do conditions for the management, monitoring and reporting address the impacts of the activity for the whole life cycle of the project?*
6	*Do conditions include a stipulation of the transfer of rights and responsibilities, should a change of ownership of the property occur?*
Review Area 3 (Additional questions)	
1	*Are the farm portions and location of the activity recorded accurately?*
2	*Is the authorisation granted for activities under the jurisdiction of the competent authority only?*
3	*Can the conditional requirements for the activities be audited?*
4	*Are rehabilitation conditions included?*
5	*Did the authority engage with the applicant and conducted a site visit to the property where the proposed activities will take place?*
6	*Do the EAu stipulate the procedure for the applicant and interested and affected parties to submit an appeal, if they wish to do so?*
7	*Do the EAu include and evaluation of an alternative to the proposed activity/ies?*

ANNEXURE 2: NEWLY DEVELOPED REVIEW PACKAGE FOR EAU'S

OVERALL ASSESSMENT			
1	**Review Area 1: Decision**	**Yes/No**	**Assessment Symbol**
1.1	***Administrative information***		
1.1.1	Are the application number, and NDEA reference number indicated clearly on the authorisation document?		
1.1.2	Is the authorisation holders' name indicated correctly?		
1.1.3	Are the location and property details indicated correctly as per title deed description?		
1.2	***Decision***		
1.2.1	Is the decision clearly communicated and without phrases that could have double meaning or interpreted in different ways?		
1.2.2	Are reasons for the decision provided in the document?		
2	**Review Area 2: Authorised activities**	**Yes/No**	**Assessment Symbol**
2.1	***Activities authorised***		
2.1.1	Is a description of the project provided?		
2.1.2	Are the list of activities authorised included in the authorisation?		
2.1.3	Are the activities listed in the authorisation referenced to the applicable list of activities in the EIA regulations of listed activities?		
2.1.4	Do the authorised activities align with the project description?		
3	**Review Area 3: Conditions of the authorisation**	**Yes/No**	**Assessment Symbol**
3.1	***Administrative conditions***		
3.1.1	Do the conditions include the timeframe for which the authorisation is valid?		
3.1.2	Do the conditions stipulate the responsible party for compliance to the EA?		
3.1.3	Do the conditions clearly stipulate the timeframes and notification of I&APs regarding the outcome of the Decision?		
3.1.4	Do the conditions clearly stipulate the responsibilities of the authorisation holder to inform I&APs regarding the appeals process?		
3.1.5	Are the conditions stipulated achievable?		
3.1.6	Are clear conditions set in terms of the amendment of the EA?		
3.1.7	Do conditions stipulate the transfer of rights and obligations if and when change of ownership of the property or activity will take place?		

OVERALL ASSESSMENT			
3.1.8	Does the authorisation refer to other authorisation requirements (i.e. water use license or waste license applications?) that have to be complied with regarding the activity?		
3.2	***Management conditions***		
3.2.1	Are the conditions clearly stipulated and do they have measurable/auditable objectives?		
3.2.2	Do conditions prioritise management of activities with the highest environmental risk?		
3.2.3	Do conditions stipulate timeframes within which certain management activities have to be implemented?		
3.2.4	Do the conditions allow the authorisation holder to be flexible in the methods they use to achieve the monitoring targets set?		
3.2.5	Do conditions show and integrated management approach?		
3.2.6	Are loose terms such as “adequate”, “relevant” and “appropriate” clearly defined in terms what it means related to the activity?		
3.2.7	Are there conditions included which allows for further investigation?		
3.2.8	Do conditions allow for environmental management all the phases of the project?		
3.2.9	Have conditions to address rehabilitation been included and are they achievable?		
3.3	***Monitoring conditions***		
3.3.1	Do conditions clearly stipulate monitoring and record keeping of monitoring results?		
3.3.2	Are monitoring objectives measurable?		
3.3.3	Are emission and discharge limits set for pollution sources?		
3.3.4	Do monitoring conditions include the sampling location, sampling collection method and monitoring frequency methods?		
3.4	***Reporting conditions***		
3.4.1	Are reporting conditions clearly outlined regarding which parameters to report on and the frequency of reporting?		
3.4.2	Are reporting conditions outlined to notify the authority about exceedance of permitted levels of pollution, emergency spills and/or accidents causing environmental impacts?		
3.4.3	Do conditions stipulate to which office reports must be submitted?		
3.5	***Follow up***		
3.5.1	Are clear conditions stipulated for auditing frequency and submission of audit reports?		
3.5.2	Do conditions clearly outline the responsibilities of internal and external auditors and ECO's?		

OVERALL ASSESSMENT			
3.5.3	Do conditions stipulate the procedures to follow with regard to changes in the monitoring and management plan as a result of corrective actions after auditing recommendations?		
4	**Review Area 4: Technical quality**	**Yes/No**	**Assessment Symbol**
4.1	***Language and formatting***		
4.1.1	Does the authorisation have a logical flow of information?		
4.1.2	Have the correct language, grammar and spelling being used throughout the authorisation document?		
4.1.3	Are the fonts formatting and numbering consistent throughout the authorisation document?		

ANNEXURE 3

3.1 REVIEW DATA: ALL RESULTS

	GRADING SYMBOLS	%A	%B	%C	%D	%E	%F	% A–C	% A–B	% E–F
1	**Review Area 1: Decision**	**64**	**31**	**3**	**1**	**0**	**1**	**99**	**95**	**1**
1.1	***Administrative information***	***71***	***23***	***3***	***1***	***0***	***1***	***98***	***94***	***1***
1.1.1	Are the application number, and NDEA reference number indicated clearly on the authorisation document?	97	0	0	0	0	3	97	97	3
1.1.2	Is the authorisation holders' name indicated correctly?	87	13	0	0	0	0	100	100	0
1.1.3	Are the location and property details indicated correctly as per title deed description?	30	57	10	3	0	0	97	87	0
1.2	***Decision***	***53***	***43***	***3***	***0***	***0***	***0***	***100***	***97***	***0***
1.2.1	Is the decision clearly communicated and without phrases that could have double meaning or interpreted in different ways?	90	10	0	0	0	0	100	100	0
1.2.2	Are reasons for the decision provided in the document and are they reasonable?	17	77	7	0	0	0	100	93	0
2	**Review Area 2: Authorised activities**	**51**	**41**	**7**	**0**	**0**	**1**	**99**	**92**	**1**
2.1	***Activities authorised***	***51***	***41***	***7***	***0***	***0***	***1***	***99***	***92***	***1***
2.1.1	Is a description of the project provided?	15	70	15	0	0	0	100	85	0
2.1.2	Are the list of activities authorised included in the authorisation?	62	31	7	0	0	0	100	93	0
2.1.3	Are the activities listed in the authorisation referenced to the applicable activities as set out in the EIA legal regulations of listed activities?	74	22	0	0	0	4	96	96	4
2.1.4	Do the authorised activities align with the project description?	55	38	7	0	0	0	100	93	0
3	**Review Area 3: Conditions of the authorisation**	**19**	**28**	**19**	**12**	**4**	**17**	**66**	**47**	**22**
3.1	***Administrative conditions***	***40***	***40***	***15***	***2***	***1***	***2***	***95***	***80***	***3***
3.1.1	Do the conditions include the timeframe for which the authorisation is valid?	31	52	10	3	0	3	93	83	3
3.1.2	Do the conditions stipulate the responsible party for compliance to the EA?	62	34	3	0	0	0	100	97	0
3.1.3	Do the conditions clearly stipulate the timeframes and notification of I&APs regarding the outcome of the Decision?	87	13	0	0	0	0	100	100	0
3.1.4	Do the conditions clearly stipulate the responsibilities of the authorisation holder to inform I&APs regarding the appeals process?	77	17	3	0	3	0	97	93	3
3.1.5	Are the conditions stipulated achievable?	0	86	14	0	0	0	100	86	0

	GRADING SYMBOLS	%A	%B	%C	%D	%E	%F	% A–C	% A–B	% E–F
3.1.6	Are clear conditions set in terms of the amendment of the EA?	3	28	59	7	0	3	90	31	3
3.1.7	Do conditions stipulate the transfer of rights and obligations if and when change of ownership of the property or activity will take place?	11	44	30	4	0	11	85	56	11
3.1.8	Does the authorisation refer to other authorisation requirements (i.e. water use license or waste license applications?) that have to be complied with regarding the activity?	46	50	0	0	4	0	96	96	4
3.2	***Management conditions***	***12***	***26***	***25***	***17***	***8***	***12***	***64***	***38***	***19***
3.2.1	Are the conditions clearly stipulated and do they have measurable/auditable objectives?	0	0	55	24	10	10	55	0	21
3.2.2	Do conditions prioritise management of activities with the highest environmental risk?	0	3	17	34	17	28	21	3	45
3.2.3	Do conditions stipulate timeframes within which certain management activities have to be implemented?	0	43	25	25	0	7	68	43	7
3.2.4	Do the conditions allow the authorisation holder to be flexible in the methods they use to achieve the monitoring targets set?	11	82	0	0	0	7	93	93	7
3.2.5	Do conditions show and integrated management approach?	0	25	50	7	7	11	75	25	18
3.2.6	Are loose terms such as “adequate”, “relevant” and “appropriate” clearly defined in terms what it means related to the activity?	17	0	0	50	17	17	17	17	33
3.2.7	Are there conditions included which allows for further investigation?	79	4	0	0	18	0	82	82	18
3.2.8	Do conditions allow for environmental management all the phases of the project?	3	45	34	7	3	7	83	48	10
3.2.9	Are conditions to address rehabilitation been included and are they achievable?	3	17	24	31	3	21	45	21	24
3.3	***Monitoring conditions***	***1***	***4***	***14***	***15***	***7***	***59***	***18***	***5***	***66***
3.3.1	Do conditions stipulate monitoring and record keeping of monitoring results clearly?	3	14	38	28	0	17	55	17	17
3.3.2	Are monitoring objectives measurable?	0	0	10	24	10	55	10	0	66
3.3.3	Are emission and discharge limits set for pollution sources?	0	0	0	4	8	88	0	0	96
3.3.4	Do monitoring conditions include the sampling location, sampling collection method and monitoring frequency methods?	0	0	4	4	12	81	4	0	92
3.4	***Reporting conditions***	***5***	***23***	***32***	***29***	***5***	***7***	***60***	***28***	***11***
3.4.1	Are reporting conditions clearly outlined regarding which parameters to report on and the frequency of reporting?	0	21	31	41	7	0	52	21	7

	GRADING SYMBOLS	%A	%B	%C	%D	%E	%F	% A–C	% A–B	% E–F
3.4.2	Are reporting conditions outlined to notify the authority about exceedance of permitted levels of pollution, emergency spills and/or accidents causing environmental impacts?	3	41	31	3	0	21	76	45	21
3.4.3	Do conditions stipulate to which office reports must be submitted?	10	7	34	41	7	0	52	17	7
3.5	***Follow up***	***20***	***38***	***4***	***6***	***1***	***31***	***62***	***58***	***32***
3.5.1	Are clear conditions stipulated for auditing frequency and submission of audit reports?	31	48	3	10	0	7	83	79	7
3.5.2	Do conditions clearly outline the responsibilities of internal and external auditors and ECO's?	21	57	4	0	4	14	82	79	18
3.5.3	Do conditions stipulate the procedures to follow with regard to changes in the monitoring and management plan as a result of corrective actions after auditing recommendations?	7	7	4	7	0	74	19	15	74
4	**Review Area 4: Technical quality**	**21**	**58**	**20**	**1**	**0**	**0**	**99**	**79**	**0**
4.1	***Language and formatting***	***21***	***58***	***20***	***1***	***0***	***0***	***99***	***79***	***0***
4.1.1	Does the authorisation follow a logical flow of information?	17	30	50	3	0	0	97	47	0
4.1.2	Are the correct language, grammar and spelling being used throughout the authorisation document?	20	70	10	0	0	0	100	90	0
4.1.3	Are the fonts formatting and numbering consistent throughout the authorisation document?	27	73	0	0	0	0	100	100	0

3.2 REVIEW DATA: RESULTS ACROSS EIA REGIMES

EIA Regime	ECA							NEMA 2006					
Grading	**A**	**B**	**C**	**D**	**E**	**F**		**A**	**B**	**C**	**D**	**E**	**F**
1 Decision	**20**	**6**	**4**	**0**	**0**	**0**		**26**	**17**	**1**	**1**	**0**	**0**
1.1 Administrative information	***12***	***4***	***2***	***0***	***0***	***0***		***19***	***6***	***1***	***1***	***0***	***0***
1.1.1 Applicant and DEAT references	6							9					
1.1.2 Authorisation holder identification	4	2						9					
1.1.3 Location and property description	2	2	2					1	6	1	1		
1.2 Decision	***8***	***2***	***2***	***0***	***0***	***0***		***7***	***11***	***0***	***0***	***0***	***0***
1.2.1 Clarity and effective communication of decision	6							7	2				
1.2.2 Reasons for the decision presented and reasonable	2	2	2						9				
2 Authorised activities	**3**	**10**	**4**	**0**	**0**	**0**		**19**	**14**	**2**	**0**	**0**	**1**
2.1 Activities authorised	***3***	***10***	***4***	***0***	***0***	***0***		***19***	***14***	***2***	***0***	***0***	***1***
2.1.1 Description of the project	1	4	1					2	6	1			
2.1.2 List of activities authorised	1	3	1					6	2	1			
2.1.3 Reference of applicable activities to EIA regulations								6	2				1
2.1.4 Authorised activities alignment to project description	1	3	2					5	4				
3 Conditions of the authorisation	**23**	**42**	**30**	**16**	**8**	**33**		**40**	**74**	**43**	**26**	**10**	**39**
3.1 Administrative conditions	***13***	***18***	***10***	***1***	***2***	***3***		***25***	***36***	***7***	***1***	***0***	***1***
3.1.1 Timeframe for which the authorisation is valid	3	2	1					1	5	2			1
3.1.2 Responsible party for compliance to EAu	1	4	1					5	4				
3.1.3 Timeframes and notification of I&APs re ROD	3	3						8	1				
3.1.4 Responsibilities and actions of authorisation holder for appeals	3	1	1		1			5	4				
3.1.5Achievable, reasonable conditions		4	2						9				
3.1.6 Conditions re amendment of the EAu		1	3	1		1		1	4	4			
3.1.7 Conditions re transfer of rights and obligations	1	1	2			2		1	4	1	1		
3.1.8 Other authorisation requirements	2	2			1			4	5				
3.2 Management conditions	***6***	***14***	***13***	***3***	***3***	***6***		***8***	***19***	***18***	***11***	***4***	***12***
3.2.1 Measurement, auditing and clarity of conditions			5			1				5	3		1
3.2.2 Prioritizing management activities			3	1		2			1	1	4	1	2
3.2.3 Timeframes to implement management activities		3	1	1		1			4	3	1		1
3.2.4 Flexibility of methods used to achieve management targets	2	3						1	7				1
3.2.5 Integrated management approach		2	2		1				2	3	2	1	1

EIA Regime	ECA							NEMA 2006					
Grading	**A**	**B**	**C**	**D**	**E**	**F**		**A**	**B**	**C**	**D**	**E**	**F**
3.2.6 Use of loose terms such as "adequate", "relevant" and "appropriate"													
3.2.7 Further investigations	3	1			1			7				2	
3.2.8 Environmental management measures for the life cycle of the project		4	1		1				3	3	1		2
3.2.9 Rehabilitation conditions	1	1	1	1		2			2	3			4
3.3 Monitoring conditions	***1***	***2***	***1***	***2***	***0***	***18***		***0***	***1***	***5***	***8***	***6***	***16***
3.3.1 Monitoring and record keeping of monitoring results	1	2		2		1			1	5	2		1
3.3.2 Measurability of monitoring objectives			1			5					4	2	3
3.3.3 Emission and discharge limits for pollution sources						6					1	2	6
3.3.4 Sampling location, collection method and monitoring frequencies						6					1	2	6
3.4 Reporting conditions	***0***	***6***	***4***	***6***	***2***	***0***		***2***	***6***	***12***	***6***	***0***	***1***
3.4.1 Clarity regarding the frequency and content of reporting		2		2	2				2	3	4		
3.4.2 Reporting conditions re notification of exceedances, emergencies or accidents causing environmental impacts		3	2	1				1	4	3			1
3.4.3 Instructions re submission of reports (place & receiving official)		1	2	3				1		6	2		
3.5 Follow up	***3***	***2***	***2***	***4***	***1***	***6***		***5***	***12***	***1***	***0***	***0***	***9***
3.5.1 Conditions for auditing frequency and submission of audit reports	2			3		1		2	6	1			
3.5.2 Responsibilities of internal and external auditors and ECO's	1	1	1		1	2		3	6				
3.5.3 Procedures for changes in the monitoring and management measures after auditing		1	1	1		3							9
4 Technical quality	6	10	1	1	0	0		3	17	7	0	0	0
4.1 Language and formatting	***6***	***10***	***1***	***1***	***0***	***0***		***3***	***17***	***7***	***0***	***0***	***0***
4.1.1 Logic flow of information	1	3	1	1				1	2	6			
4.1.2 Correct language, grammar and spelling	2	4						1	7	1			
4.1.3 Consistent formatting and numbering	3	3						1	8				

EIA Regime	NEMA 2010							NEMA 2014					
Grading	**A**	**B**	**C**	**D**	**E**	**F**		**A**	**B**	**C**	**D**	**E**	**F**
1 Decision	**34**	**20**	**0**	**0**	**0**	**1**		**16**	**4**	**0**	**0**	**0**	**0**
1.1 Administrative information	***23***	***9***	***0***	***0***	***0***	***1***		***10***	***2***	***0***	***0***	***0***	***0***
1.1.1 Applicant and DEAT references	10					1		4					
1.1.2 Authorisation holder identification	9	2						4					
1.1.3 Location and property description	4	7						2	2				
1.2 Decision	***11***	***11***	***0***	***0***	***0***	***0***		***6***	***2***	***0***	***0***	***0***	***0***
1.2.1 Clarity and effective communication of decision	10	1						4					
1.2.2 Reasons for the decision presented and reasonable	1	10						2	2				
2 Authorised activities	**22**	**17**	**2**	**0**	**0**	**0**		**11**	**3**	**0**	**0**	**0**	**0**
2.1 Activities authorised	***22***	***17***	***2***	***0***	***0***	***0***		***11***	***3***	***0***	***0***	***0***	***0***
2.1.1 Description of the project	1	7	2						2				
2.1.2 List of activities authorised	8	3						3	1				
2.1.3 Reference of applicable activities to EIA regulations	7	3						4					
2.1.4 Authorised activities alignment to project description	6	4						4					
3 Conditions of the authorisation	**48**	**77**	**49**	**33**	**11**	**37**		**31**	**17**	**17**	**16**	**4**	**20**
3.1 Administrative conditions	***36***	***33***	***11***	***0***	***0***	***0***		***18***	***5***	***6***	***2***	***0***	***1***
3.1.1 Timeframe for which the authorisation is valid	2	8						3			1		
3.1.2 Responsible party for compliance to EAu	10							2	2				
3.1.3 Timeframes and notification of I&APs re ROD	11							4					
3.1.4 Responsibilities and actions of authorisation holder for appeals	11							4					
3.1.5Achievable, reasonable conditions		10							2	2			
3.1.6 Conditions re amendment of the EAu		3	7							3	1		
3.1.7 Conditions re transfer of rights and obligations		6	4					1	1	1			1
3.1.8 Other authorisation requirements	2	6						4					
3.2 Management conditions	***9***	***24***	***24***	***17***	***8***	***2***		***5***	***5***	***4***	***9***	***3***	***7***
3.2.1 Measurement, auditing and clarity of conditions			6	3	1						1	2	1
3.2.2 Prioritising management activities			1	4	3	2					1	1	2
3.2.3 Timeframes to implement management activities		4	2	4					1	1	1		
3.2.4 Flexibility of methods used to achieve management targets		10							3				1
3.2.5 Integrated management approach		3	7							2			2
3.2.6 Use of loose terms such as “adequate”, “relevant” and “appropriate”	1			2	1						1		1

EIA Regime	NEMA 2010							NEMA 2014					
Grading	**A**	**B**	**C**	**D**	**E**	**F**		**A**	**B**	**C**	**D**	**E**	**F**
3.2.7 Further investigations	8				2			4					
3.2.8 Environmental management measures for the life cycle of the project		5	5					1	1	1	1		
3.2.9 Rehabilitation conditions		2	3	4	1						4		
3.3 Monitoring conditions	***0***	***1***	***7***	***5***	***1***	***20***		***0***	***0***	***2***	***2***	***1***	***11***
3.3.1 Monitoring and record keeping of monitoring results		1	4	2		3				2	2		
3.3.2 Measurability of monitoring objectives			2	3		5						1	3
3.3.3 Emission and discharge limits for pollution sources						7							4
3.3.4 Sampling location, collection method and monitoring frequencies			1		1	5							4
3.4 Reporting conditions	***0***	***6***	***7***	***11***	***2***	***4***		***2***	***2***	***5***	***2***	***0***	***1***
3.4.1 Clarity regarding the frequency and content of reporting		2	3	5						3	1		
3.4.2 Reporting conditions re notification of exceedances, emergencies or accidents causing environmental impacts		4	2			4			1	2			1
3.4.3 Instructions re submission of reports (place & receiving official)			2	6	2			2	1		1		
3.5 Follow up	***3***	***13***	***0***	***0***	***0***	***11***		***6***	***5***	***0***	***1***	***0***	***0***
3.5.1 Conditions for auditing frequency and submission of audit reports	2	7				1		3	1				
3.5.2 Responsibilities of internal and external auditors and ECO's	1	6				2		1	3				
3.5.3 Procedures for changes in the monitoring and management measures after auditing						8		2	1		1		
4 Technical quality	5	18	10	0	0	0		5	7	0	0	0	0
4.1 Language and formatting	***5***	***18***	***10***	***0***	***0***	***0***		***5***	***7***	***0***	***0***	***0***	***0***
4.1.1 Logic flow of information	1	2	8					2	2				
4.1.2 Correct language, grammar and spelling	2	7	2					1	3				
4.1.3 Consistent formatting and numbering	2	9						2	2				

3.3 REVIEW DATA: RESULTS ACROSS SECTORS

Sector	Mining							Agriculture					
Grading	**A**	**B**	**C**	**D**	**E**	**F**		**A**	**B**	**C**	**D**	**E**	**F**
1 Decision	**20**	**6**	**4**	**0**	**0**	**0**		**26**	**17**	**1**	**1**	**0**	**0**
1.1 Administrative information	***12***	***4***	***2***	***0***	***0***	***0***		***19***	***6***	***1***	***1***	***0***	***0***
1.1.1 Applicant and DEAT references	6							9					
1.1.2 Authorisation holder identification	4	2						9					
1.1.3 Location and property description	2	2	2					1	6	1	1		
1.2 Decision	***8***	***2***	***2***	***0***	***0***	***0***		***7***	***11***	***0***	***0***	***0***	***0***
1.2.1 Clarity and effective communication of decision	6							7	2				
1.2.2 Reasons for the decision presented and reasonable	2	2	2						9				
2 Authorised activities	**3**	**10**	**4**	**0**	**0**	**0**		**19**	**14**	**2**	**0**	**0**	**1**
2.1 Activities authorised	***3***	***10***	***4***	***0***	***0***	***0***		***19***	***14***	***2***	***0***	***0***	***1***
2.1.1 Description of the project	1	4	1					2	6	1			
2.1.2 List of activities authorised	1	3	1					6	2	1			
2.1.3 Reference of applicable activities to EIA regulations								6	2				1
2.1.4 Authorised activities alignment to project description	1	3	2					5	4				
3 Conditions of the authorisation	**23**	**42**	**30**	**16**	**8**	**33**		**40**	**74**	**43**	**26**	**10**	**39**
3.1 Administrative conditions	***13***	***18***	***10***	***1***	***2***	***3***		***25***	***36***	***7***	***1***	***0***	***1***
3.1.1 Timeframe for which the authorisation is valid	3	2	1					1	5	2			1
3.1.2 Responsible party for compliance to EAu	1	4	1					5	4				
3.1.3 Timeframes and notification of I&APs re ROD	3	3						8	1				
3.1.4 Responsibilities and actions of authorisation holder for appeals	3	1	1		1			5	4				
3.1.5Achievable, reasonable conditions		4	2						9				
3.1.6 Conditions re amendment of the EAu		1	3	1		1		1	4	4			
3.1.7 Conditions re transfer of rights and obligations	1	1	2			2		1	4	1	1		
3.1.8 Other authorisation requirements	2	2			1			4	5				
3.2 Management conditions	***6***	***14***	***13***	***3***	***3***	***6***		***8***	***19***	***18***	***11***	***4***	***12***
3.2.1 Measurement, auditing and clarity of conditions			5			1				5	3		1
3.2.2 Prioritising management activities			3	1		2			1	1	4	1	2
3.2.3 Timeframes to implement management activities		3	1	1		1			4	3	1		1
3.2.4 Flexibility of methods used to achieve management targets	2	3						1	7				1
3.2.5 Integrated management approach		2	2		1				2	3	2	1	1

Sector	**Mining**							**Agriculture**					
Grading	**A**	**B**	**C**	**D**	**E**	**F**		**A**	**B**	**C**	**D**	**E**	**F**
3.2.6 Use of loose terms such as "adequate", "relevant" and "appropriate"													
3.2.7 Further investigations	3	1			1			7				2	
3.2.8 Environmental management measures for the life cycle of the project		4	1		1				3	3	1		2
3.2.9 Rehabilitation conditions	1	1	1	1		2			2	3			4
3.3 Monitoring conditions	***1***	***2***	***1***	***2***	***0***	***18***		***0***	***1***	***5***	***8***	***6***	***16***
3.3.1 Monitoring and record keeping of monitoring results	1	2		2		1			1	5	2		1
3.3.2 Measurability of monitoring objectives			1			5					4	2	3
3.3.3 Emission and discharge limits for pollution sources						6					1	2	6
3.3.4 Sampling location, collection method and monitoring frequencies						6					1	2	6
3.4 Reporting conditions	***0***	***6***	***4***	***6***	***2***	***0***		***2***	***6***	***12***	***6***	***0***	***1***
3.4.1 Clarity regarding the frequency and content of reporting		2		2	2				2	3	4		
3.4.2 Reporting conditions re notification of exceedances, emergencies or accidents causing environmental impacts		3	2	1				1	4	3			1
3.4.3 Instructions re submission of reports (place & receiving official)		1	2	3				1		6	2		
3.5 Follow up	***3***	***2***	***2***	***4***	***1***	***6***		***5***	***12***	***1***	***0***	***0***	***9***
3.5.1 Conditions for auditing frequency and submission of audit reports	2			3		1		2	6	1			
3.5.2 Responsibilities of internal and external auditors and ECO's	1	1	1		1	2		3	6				
3.5.3 Procedures for changes in the monitoring and management measures after auditing		1	1	1		3							9
4 Technical quality	**6**	**10**	**1**	**1**	**0**	**0**		**3**	**17**	**7**	**0**	**0**	**0**
4.1 Language and formatting	***6***	***10***	***1***	***1***	***0***	***0***		***3***	***17***	***7***	***0***	***0***	***0***
4.1.1 Logic flow of information	1	3	1	1				1	2	6			
4.1.2 Correct language, grammar and spelling	2	4						1	7	1			
4.1.3 Consistent formatting and numbering	3	3						1	8				

Sector	Construction							Linear construction					
Grading	**A**	**B**	**C**	**D**	**E**	**F**		**A**	**B**	**C**	**D**	**E**	**F**
1 Decision	**34**	**20**	**0**	**0**	**0**	**1**		**16**	**4**	**0**	**0**	**0**	**0**
1.1 Administrative information	***23***	***9***	***0***	***0***	***0***	***1***		***10***	***2***	***0***	***0***	***0***	***0***
1.1.1 Applicant and DEAT references	10					1		4					
1.1.2 Authorisation holder identification	9	2						4					
1.1.3 Location and property description	4	7						2	2				
1.2 Decision	***11***	***11***	***0***	***0***	***0***	***0***		***6***	***2***	***0***	***0***	***0***	***0***
1.2.1 Clarity and effective communication of decision	10	1						4					
1.2.2 Reasons for the decision presented and reasonable	1	10						2	2				
2 Authorised activities	**22**	**17**	**2**	**0**	**0**	**0**		**11**	**3**	**0**	**0**	**0**	**0**
2.1 Activities authorised	***22***	***17***	***2***	***0***	***0***	***0***		***11***	***3***	***0***	***0***	***0***	***0***
2.1.1 Description of the project	1	7	2						2				
2.1.2 List of activities authorised	8	3						3	1				
2.1.3 Reference of applicable activities to EIA regulations	7	3						4					
2.1.4 Authorised activities alignment to project description	6	4						4					
3 Conditions of the authorisation	**48**	**77**	**49**	**33**	**11**	**37**		**31**	**17**	**17**	**16**	**4**	**20**
3.1 Administrative conditions	***36***	***33***	***11***	***0***	***0***	***0***		***18***	***5***	***6***	***2***	***0***	***1***
3.1.1 Timeframe for which the authorisation is valid	2	8						3			1		
3.1.2 Responsible party for compliance to EAu	10							2	2				
3.1.3 Timeframes and notification of I&APs re ROD	11							4					
3.1.4 Responsibilities and actions of authorisation holder for appeals	11							4					
3.1.5Achievable, reasonable conditions		10							2	2			
3.1.6 Conditions re amendment of the EAu		3	7							3	1		
3.1.7 Conditions re transfer of rights and obligations		6	4					1	1	1			1
3.1.8 Other authorisation requirements	2	6						4					
3.2 Management conditions	***9***	***24***	***24***	***17***	***8***	***2***		***5***	***5***	***4***	***9***	***3***	***7***
3.2.1 Measurement, auditing and clarity of conditions			6	3	1						1	2	1
3.2.2 Prioritising management activities			1	4	3	2					1	1	2
3.2.3 Timeframes to implement management activities		4	2	4					1	1	1		
3.2.4 Flexibility of methods used to achieve management targets		10							3				1
3.2.5 Integrated management approach		3	7							2			2
3.2.6 Use of loose terms such as “adequate”, “relevant” and “appropriate”	1			2	1						1		1

Sector	Construction							Linear construction					
Grading	**A**	**B**	**C**	**D**	**E**	**F**		**A**	**B**	**C**	**D**	**E**	**F**
3.2.7 Further investigations	8				2			4					
3.2.8 Environmental management measures for the life cycle of the project		5	5					1	1	1	1		
3.2.9 Rehabilitation conditions		2	3	4	1						4		
3.3 Monitoring conditions	***0***	***1***	***7***	***5***	***1***	***20***		***0***	***0***	***2***	***2***	***1***	***11***
3.3.1 Monitoring and record keeping of monitoring results		1	4	2		3				2	2		
3.3.2 Measurability of monitoring objectives			2	3		5						1	3
3.3.3 Emission and discharge limits for pollution sources						7							4
3.3.4 Sampling location, collection method and monitoring frequencies			1		1	5							4
3.4 Reporting conditions	***0***	***6***	***7***	***11***	***2***	***4***		***2***	***2***	***5***	***2***	***0***	***1***
3.4.1 Clarity regarding the frequency and content of reporting		2	3	5						3	1		
3.4.2 Reporting conditions re notification of exceedances, emergencies or accidents causing environmental impacts		4	2			4			1	2			1
3.4.3 Instructions re submission of reports (place & receiving official)			2	6	2			2	1		1		
3.5 Follow up	***3***	***13***	***0***	***0***	***0***	***11***		***6***	***5***	***0***	***1***	***0***	***0***
3.5.1 Conditions for auditing frequency and submission of audit reports	2	7				1		3	1				
3.5.2 Responsibilities of internal and external auditors and ECO's	1	6				2		1	3				
3.5.3 Procedures for changes in the monitoring and management measures after auditing						8		2	1		1		
4 Technical quality	**5**	**18**	**10**	**0**	**0**	**0**		**5**	**7**	**0**	**0**	**0**	**0**
4.1 Language and formatting	***5***	***18***	***10***	***0***	***0***	***0***		***5***	***7***	***0***	***0***	***0***	***0***
4.1.1 Logic flow of information	1	2	8					2	2				
4.1.2 Correct language, grammar and spelling	2	7	2					1	3				
4.1.3 Consistent formatting and numbering	2	9						2	2				