THE QUALITY OF ENVIRONMENTAL IMPACT REPORTS IN THE NORTH WEST PROVINCE, SOUTH AFRICA.

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Expression of thanks

A special word of thanks to:

- My husband, my family, for constant support, motivation and love.
- My supervisor, Dr Luke Sandham, for whose guidance in the study and assistance to improve the dissertation I have much appreciation. Thank you for persevering with me.

This study is dedicated to my beloved TW.

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Abstract

In October 2000 the Department of Environmental Affairs and Tourism commenced a program to streamline environmental assessment legislation and administration to address certain limitations in the Environmental Impact Assessment (EIA) process, which had been mandatory in South Africa since 1998 in terms of regulations promulgated in terms of the Environment Conservation Act in 1997. These new EIA regulations were published on 21 April 2006 and came into effect on 1 July 2006. To determine the effectiveness of these changes in the EIA process, it is important to determine the quality of the Environmental Impact Reports (EIRs) performed under the old EIA system as a baseline study, and compare these results against the quality of the EIRs under the new EIA system. The aim of this study was to develop a review package to determine the quality of EIRs conducted under the 1997 regulations in the North West Province of South Africa. This review package was based on a review package developed by Lee *et al.* in 1999. Each review topic's applicability to South African circumstances was evaluated and adapted or changed to compile the South African review package. The South African review package was tested on a number of case studies and further changes were made to the review package. The final review package was applied to a second group of case studies. The results showed that Review Area 1 – Description of the Development, has been generally well defined with a satisfactory rating of 75%. Review Area 2 - The Identification and Evaluation of Results (72%) and Review Area 3 – Alternatives and Mitigation (66%) were the two review areas with the lowest frequency of satisfactory scores and Review Area 4 – Communication and Results were the best of all the areas with a (94%) satisfactory score. The final result shows that 81% of the EIRs submitted in the North West Province of South Africa are generally of satisfactory quality, although many shortcomings were observed.

Opsomming

Die Departement van Omgewingsake en Toerisme het in Oktober 2000 'n program geloods om die omgewingsassessering wetgewing en administrasie aan te spreek en om oplossings te vind vir beperkings binne die Omgewings Impak Bepalings (OIB) proses in Suid-Afrika. Hierdie nuwe OIB regulasies is gepubliseer op 21 April 2006 en het op 1 Julie 2006 inwerking getree. Om die effektiwiteit van hierdie veranderinge in die OIB proses te bepaal, is dit belangrik om die kwaliteit van die omgewingsimpakverslae (OIV) of beter bekend as die "Environmental Impact Reports (EIR)" te bepaal onder die ou OIB regulasies om 'n basislyn studie te doen en dan later die resultate te vergelyk met die kwaliteit van omgewingsimpakverslae onder die 2006 OIB regulasies. In Suid-Afrika was OIB's gedoen volgens spesifieke regulasies en die OIB Riglyn Dokument. Die doel van hierdie studie was om 'n evalueringspakket te ontwikkel om die kwaliteit van die OIV's in Suid-Afrika (meer spesifiek die Noord-wes Provinsie) te bepaal. Hierdie evauleringspakket is gebaseer op die evalueringspakket wat ontwikkel is deur Lee *et al.* in 1999. Elke Oorsig Onderwerp (Review Topic) se toepaslikheid tot Suid-Afrikaanse toestande is getoets op 'n eerste groep gevallestudies en aanpassings en veranderinge is gemaak aan die pakket. Die finale evalueringspakket is toegepas op 'n tweede groep gevallestudies. Die resultate dui daarop dat Oorsig Area 1 – Beskrywing van die Ontwikkeling, goed gedefinieerd is met 'n evalueringspersentasie van 75%. Oorsig Area 2 – Die Identifisering en Evaluering van die Resultate (72%) en Oorsig Area 3 – Alternatiewe en Mitigering (66%) was die twee areas met die laagste frekwensie evalueringstellings met Oorsig Area 4 – Kommunikasie en Resultate wat die beste gedoen het (94%). Die finale resultate dui daarop dat 81% van die OIV's wat ingedien word in die Noord-wes Provinsie van Suid-Afrika oor die algemeen van 'n bevredigende kwaliteit is, ten spyte van baie tekortkominge wat waargeneem is.

Preface

The article format is used for this dissertation and the text consists of the following sections:

Chapter 1 – Introduction and problem statement

Chapter 1 is an introduction to the theory underpinning this study. Establishing effectiveness is an integral theme of research in Environmental Impact Assessment and therefore the concept of what effectiveness means in connection with EIAs is discussed. Evaluation and review are key issues in this particular study and are explained in more detail in this chapter. The objective of EIR Review is to determine the quality of the statements and therefore quality is discussed. Various review packages have been developed over the world and some examples are given. The starting point in developing a review package is to determine the current situation in South Africa. Regulations and legislation pertaining to EIAs are discussed and shortcomings in the South African process are identified. South Africa is currently in the second phase of EIA with the second set of regulations, which came into effect on 1 July 2006. To determine if these new regulations are really addressing these shortcomings and making a difference in environmental protection, the quality of the EIRs under the first regulations (1997-2006) must be determined to serve as a baseline, to compare the quality of the EIRs under the new regulations. This identifies a definite need for quality and effectiveness assessment in South Africa.

Chapter 2 – A quality review package for EIA Reports in South Africa

Chapter 2 is the first of two article manuscripts presented in this dissertation. The applicability of the Lee-Colley EIR review package for the South African EIA context was evaluated in terms of the South African EIA regulations. The results of the evaluation were used to adapt the package for the South African EIA system. The new package was tested and adapted iteratively until a final review package was derived. The prominence of the scoping phase in South Africa, as well as the cost of EIA, caused many EIRs to become "beefed-up" scoping reports - requiring additional information e.g. plan of study, public participation, mitigation and consideration of alternatives. To allow for review of these "beefed-up" scoping reports a number of review sub-categories were added. Other differences between UK and South African requirements necessitated deletion of certain categories and sub-categories. The final

review package consists of 61 review sub-categories, 16 review categories and 4 review areas. It is intended that this manuscript be submitted to *The South African Geographical Journal* for publication.

Note: For improved reader-friendliness, the figures and tables have been inserted in the texts of the manuscripts in the appropriate locations, rather than appended as required for journal submissions. In all other respects the manuscripts meet submission requirements. See Appendix F for the author's details and editor's instructions.

Chapter 3 – Evaluation of EIRs in the North West Province of South Africa

Chapter 3 is the second manuscript. This chapter reports the findings of the application of the review package to 32 case studies. Overall, 81% of the EIRs in the sample were at least satisfactory regarding the regulatory and procedural yardsticks in EIA practice. However, none of them were rated as A, only 25% were rated B and the remaining 56% were rated as C, i.e. only just satisfactory. This article will be submitted to *The South African Geographical Journal* for publication.

Note: For improved reader-friendliness, the figures and tables have been inserted in the texts of the manuscripts in the appropriate locations, rather than appended as required for journal submissions. In all other respects the manuscripts meet submission requirements. See Appendix F for the author's details and editor's instructions.

Chapter 4 – Summary and Conclusion

Chapter 4 - The application of the review package brings objectivity and rigour to the review of EIRs, and can be seen as a step on the path to the optimal utilisation of EIA for sustainable development. To the extent that this sample represents EIA practice, and to the extent that quality of EIR represents EIA effectiveness, it appears that EIA can hardly be regarded as highly effective in the North West Province of South Africa.

This is not an article and serves to conclude the dissertation.

Appendixes

Due to the amount of detail included in the sub-categories data set, they are not discussed in the text but are included in ***Appendix A.***

Appendix B explains the steps in conducting an EIA review using the review package.

Appendix C consists of a list of all the review topics explained in more detail. This is added to assist the reviewer the first few times when using the review package. If he/she is not exactly sure what is meant in the review package he/she can always use the full description of the review topics.

The review package developed for this study is included in ***Appendix D***.

A list of the EIA projects used in this study is given in ***Appendix E.***

The Author's details and Editor's instructions are given in ***Appendix F.***

Appendix G consists of the terms and definitions used in this dissertation.

Chapter 1: Introduction and Problem statement

1. Introduction

Environmental Assessment (EA) is defined as a systematic process of evaluating and documenting information on the potential, capacity, and function of natural systems and resources in order to facilitate sustainable development planning and decision-making in general, and to anticipate and manage the adverse effects and consequences of proposed undertakings in particular (Beale, 1980; Glazewski, 2000; Spaling, 2001). In principle, because of its position at the heart of the development decision-making process, Environmental Assessment should provide one of the most powerful tools for achieving sustainable development. The substantive purposes of Environmental Assessment are twofold. First, the *immediate aim* is to facilitate sound, integrated decision-making in which environmental considerations are explicitly included. The EA process does so by providing clear, well organized information on the environmental effects, risks, and consequences of development options and proposals. Secondly, the EA process is usually (but not universally) directed towards achieving or supporting the *ultimate goals* of environmental protection and sustainable development (Dorais, 1995).

Environmental Impact Assessment (EIA) is an instrument designed to aid decision-making (Cashmore *et al.* 2004; Clark & Richards, 1999; Gilpin, 1996; Glasson *et al*, 1999; Sadler, 1996; Weston, 2000). This instrument does not provide decision makers with ready-made answers, but should provide understandable information on which to base a decision.

A review of EIA systems around the world indicates a number of ways in which the process is applied to decision-making (Glasson *et al*, 1999; Retief, 2005; Sadler, 1996; Weston, 2000). In the large majority of cases, EIA takes place under formal institutional arrangements and forms the basis for authorization of a proposal and the establishment of terms and conditions for its implementation. These arrangements typically comprise of a national or equivalent framework of the laws, regulations, procedures, and guidelines, which set out the rules, steps, and activities by which assessments are undertaken. The aim is to follow a systematic procedure to ensure that specified proposals identified as having potentially significant effects, are subject to EIA. The process is applied in accordance with requirements and the information is

submitted (in the form of an Environmental Impact Report) for a decision in advance of a final choice of a proposal. Depending on jurisdictional arguments, the EIA process may be advisory or regulatory.

Evaluation of significance involves making value judgements about the importance of predicted impacts that are directed at project acceptability and conditionality (Sadler, 1996; Spaling, 2001; Weston, 2000). The use of EIA cannot eliminate the necessity of having to take a decision which, however carefully considered, will affect the environment for decades to come. However, it can ensure that the decision will be carefully considered (Benson, 2003; Wood, 1988).

There are a number of institutional checks and balances built into the EIA process that work towards ensuring the information provided is essential or appropriate to what is expected from the EIA. Most significantly, a number of countries provide for public involvement and for independent (agency or public) EIA review of major proposals. However, this role varies. In some cases, the review process is restricted to providing objective, technical commentary on the adequacy of assessment e.g. the Netherlands (Glasson *et al,* 1999). In other cases, the process results in recommendations on project justification, alternatives, and terms and conditions (e.g. Canada and Australia), including provisions for monitoring and follow-up. Certain EIA processes have significant decision-making powers with regard to major projects (Dorney, 1989; Lee & George, 2000; Wood & Barker, 1999; Wood *et al,* 2000). The majority of assessments are relatively straightforward and lead to routine decisions on proposals by a competent authority. Under most government systems, these decisions are "delegated" to the administrative levels by a responsible minister or an equivalent political authority (Barrow, 1997; Dorais, 1995; Glasson *et al*, 1999; South Africa, 1998a).

2. Establishing EIA effectiveness

2.1.Effectiveness

A concern with effectiveness is an overarching and integral theme of Environmental Impact Assessment (EIA) theory and practice (Cashmore *et al*, 2004; Fuller, 1999; Leu *et al*, 1996; Sadler, 1996; Wood, 1999). EIA specialists make numerous professional judgments daily regarding the effectiveness of procedures and activities.

Critical analysis of the state of the art of EIA, in general, and its application in particular countries and circumstances, also forms an integral part of the literature in the field. Effectiveness, quality and best practice are all expressions in common use in EIA. While not interchangeable, they are all concerned with the goal of ensuring that the EIA maximizes its potential as an environmental management tool (Fuller, 1999; Sadler 1996). The question arises: Is the effort put into EIAs worth it or is it a waste of time? "EIA systems themselves have been premised on the principle of prevention through the identification and prediction of impacts, therefore the evaluation of the influence of EIA on the action undertaken provides for little understanding of the effectiveness of the process and of mitigation measures" (Petts, 1999:6). According to Sadler (1996) the term "effectiveness" refers to whether something works as intended and meets the purpose(s) for which it is designed. When the definition is applied to EIA effectiveness, it means if the EIA meets the purpose for which it is designed; it can help in reaching better decisions regarding environmental issues.

The process of evaluating effectiveness can be expensive. The purpose of EIA effectiveness review is problem solving rather than faultfinding. It is directed towards process development by highlighting the means for improved quality control and the basis for better practice and management (Sadler, 1996). "Nevertheless, it is possible to identify principles, which constitute good practice and can act as a template for the enhancement of EIA processes and practice" (Fuller, 1999:82). Sadler (1996) identified four aspects of effectiveness namely:

a) The quality of the reports
b) The effect on decision-making
c) The effectiveness of prediction and management of the impacts
d) Monitoring and post-auditing

The quality of the reports is one indication of effectiveness (Leu *et al*, 1996). For the EIA to meet its purpose it is important for the report to be of good quality.

2.2.Evaluation and Review

EIA review is the principal quality control function within any EIA system. Review is the evaluating of documentation to determine its adequacy for consultation and decision-making (Fuller, 1999; Lee & George, 2000; Weston, 2002). Review serves

to ensure that the EIA is comprehensive and accurate. In addition review serves other important functions in the EIA process including:

- Identifying technical problems or unresolved issues;
- Ensuring that the EIA is cost effective by uncovering technical problems and inconsistencies at an early stage in the process;
- Enhancing the credibility of the EIA by ensuring that it is scientifically and technically sound;
- Ensuring that the EIA presents a fair opportunity for all stakeholders to raise concerns and issues and to have these addressed;
- Ensuring that the EIA provides a sound basis for decision-making; and
- Identifying additional information sources that may have been overlooked in the assessment (DEAT, 2004).

The quality review of an EIR involves evaluating how well a number of assessment tasks have been performed (Lee & George, 2000, DEAT, 2004). It provides the ultimate sanction of delaying or potentially refusing consent for a project until adequate information on the environmental effects is provided and adequate measures for minimizing them are designed (Fuller, 1999). Through the review of EIRs, the compliance of the document with the legal requirements can be established (Harrop & Nixon, 1999; DEAT, 2004). The European Union EIA Review guidance, a guideline document for compiling an EIR, aims to help developers and their consultants prepare better quality Environmental Impact Reports and competent authorities and other interested parties to review them more effectively, so that the best possible information is made available for decision making (European Commission, 2001). This will enable better-targeted guidance, training and review in order to achieve the needed improvements in assessment practice (Geraghty, 1996; Lee et al, 1999).

EIR reviews usually commence once a report has been completed. The objectives of a review are usually defined in terms of the qualities required of an EIR (Fuller, 1999). Performance standards and approaches vary according to country and jurisdiction. Reviews must establish a set of quality criteria to be met as well as a minimum standard for achieving these. An essential component of review is the opportunity for additional information or further mitigation measures to be requested and for those

responsible for preparing the EIA to be under an obligation to provide such information (Fuller, 1999).

The actual review procedure may be referred to and be conducted by an invited panel of experts who may also make provision for public comment (Harrop & Nixon, 1999). An evaluation panel's major responsibility is to determine whether an EIA is sufficient to go forward for public discussion, and to prepare a report, with recommendations (Sadler, 1996), that is sufficient for informed decision making.

2.3.Quality of EIR

The quality of EIRs has to be assessed taking into account the regulatory and procedural context in which they are prepared (Lee & George, 2000). A single quality or effective EIA system does not exist. A system appropriate to the social, political and economic context in which it has to operate should be considered. A good EIA is one which represents, in a form appropriate to its intended users, findings covering all assessment tasks employing appropriate methods of information collection, analysis and reporting (Lee & George, 2000). Based on this common understanding of good practice, it is possible to construct a review checklist or package to assist in the systematic and objective review of EIR quality.

2.4.Existing review packages

In terms of reviewing the quality of EIRs, various review packages and guidelines have been developed over the world (Retief, 2005; Weston, 2000). Review packages were also developed to review specific aspects of reports. Some examples are given below.

2.4.1. An Evaluation Model for EIAs in Taiwan.

Leu et al (1996) introduce a framework of fundamental components of an effective EIA system and quality control mechanisms. This framework was adopted as the basis for the development of an EIA evaluation model. All of the fundamental components can be classified into two categories, domestic factors and international factors, which affect the EIA system. All of the sub-factors considered can be grouped into seven categories. Based on these categories, an EIA evaluation model (a matrix)

was developed. Essentially, the model sets a series of questions that can be used to evaluate the level of adoption and implementation of the component activities of a country's EIA system. The levels of adoption and implementation of EIA are fully, partially and nonexistent. For some questions, absolute and clear-cut answers can be given, whereas answers to other questions are less easy to define. Using this model may provisionally assess the strengths and weaknesses of each fundamental aspect of the existing EIA systems. This is a very comprehensive review system and it goes much broader than EIR quality.

2.4.2. EIS Review Checklist for the European Communities

This checklist is designed for users who wish to review the quality of EIS (that is, the environmental information provided by developers) to check their adequacy for decision-making and consultation. It is organized in seven sections:

- Description of the project
- Alternatives
- Description of the environment likely to be affected by the project
- Description of the likely significant effects of the project
- Description of Mitigating Measures
- Non Technical Summary
- Quality of presentation

Within each section there are numbered Review Questions. For some questions notes are provided to assist the reviewer. This process includes answering Review Questions in different columns and determining whether the question is relevant to the specific project or not (European Commission, 2001).

2.4.3. The Lee and Colley review package

In 1992, Lee and Colley developed a review package for the review of EIA reports in the UK (Lee *et al,* 1999). This package has been widely used to undertake reviews of project level environmental impact statements (EIS). The package consists of a set of hierarchically arranged review topics under four review areas.

The review areas are:

1. Description of the development, the local environment, and the baseline conditions
2. Identification and evaluation of key impacts
3. Alternatives and mitigation of impacts
4. Communication of results (Lee *et al,* 1999)

In the ongoing development of the Lee and Colley review package the minimum requirements of the draft European Union (EU) Strategic Environmental Assessment (SEA) Directive; UK guidelines for EIA and examples of best international practice were used to develop and refine the different topics of review.

The reviewer commences the review at the lowest level (Figure 1), i.e. the base of the pyramid, which contains simple criteria relating to specific tasks and procedures in the EIA process. These are referred to as sub-categories. Then, drawing upon these assessments, he/she progressively moves upwards from one level to another in the pyramid applying more complex criteria to broader tasks and procedures in the process until the overall assessment of the EA statement has been completed.

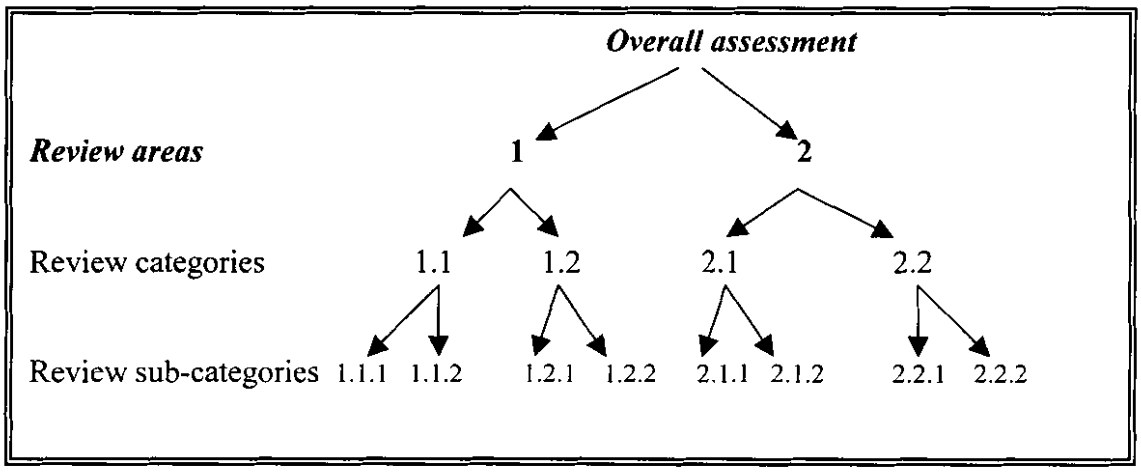

Figure 1: The hierarchical structure of the Lee and Colley review package (Lee et al, 1999)

Using a list of assessment symbols the reviewers record the assessment resulting from the application of each criterion on the Collation Sheet. The Collation Sheet is not only used to record the assessment symbols, but also as a brief summary of the principal strengths and weaknesses of the statement that has been assessed. This discourages over-mechanical reviews (Harrop & Nixon 1999; Lee *et al*, 1999). The

time required to conduct the review will, of course, be dependent upon the nature and complexity of the study, the overall length of the report and the experience of the review team (Harrop & Nixon, 1999).

Because of the structural and methodological clarity of the Lee-Colley package and its familiarity to many professionals in the field of project level EIA, this review package has been developed and adapted to the EIA procedures of many countries (Ibrahim 1992; Lee *et al*, 1999; Mwalyosie and Hughes, 1998; Rout, 1994; Rzeszot, 1999; Sandham *et al,* 2005; Simpson, 2000). Reference is made by Lee *et al* (1999) to the large volume of literature available that describes the effectiveness of this particular review package in assessing quality of EIR. Many case studies have been conducted in different countries - Belgium, Denmark, Germany, Greece, Ireland, Portugal and Spain - and all show that the Lee and Colley review package is one of the better review packages developed (Lee *et al,* 1999). A number of the other packages are based on Lee and Colley's review package, for example the Oxford-Brookes review package and Bonde and Simpson's (1998) review package for assessing the quality of environmental appraisal reports for land use (development) plans.

2.4.4. The Oxford-Brookes review package

This package is better known as the Impact Assessment Unit (IAU) review package and was developed for a research project by Glasson and his colleagues at Oxford University into the changing quality of EISs, which was funded by the Department of the Environment of the Scottish and Welsh Offices in 1995-96. The package has since been used, by researchers and consultants, to review well over 200 EISs. From the experience of its application to a wide range of project types it has been developed and reformed into a robust mechanism for systematically reviewing EISs. The full review package includes 92 criteria, not all of which will be relevant to all projects, and has been updated to combine the requirements of the Amending Directive 97/11/EC, Schedule 4 of the 1999 Regulations. This review package is similar to the Lee and Colley review package, consisting of a hierarchical system of eight categories, each divided into sub-categories (Glasson *et al*, 1999), but with only three levels in the hierarchy. Each criterion is graded on the basis of the quality of the material provided and each section is then awarded an overall grade. From the grades given to each section an overall grade for the ES is arrived at. The IAU review grades

are based upon the grading system developed by Lee and Colley (1992) for their review package. A collation mark is given to each category and an overall mark is calculated (Glasson *et al*, 1999; Weston, 2000).

2.4.5. Review Checklist for South Africa

An example of the review checklist used by the Southern African Institute for Environmental Assessment (SAIEA) is briefly described below. The SAIEA checklist is subdivided into the following eight sections: (DEAT, 2004)

1) Methodology utilized in compiling the EIA report
2) Description of the project
3) Assessment of alternatives to the project
4) Description of the environment
5) Description of impacts
6) Consideration of measures to mitigate impacts
7) Non-technical summary
8) General approach

This is a one level review checklist for reviewing the completeness of an EIA, and is therefore less effective in reviewing the quality of information that is presented (DEAT, 2004). This checklist is an updated version of the first checklist developed in the IEM system in South Africa in 1992 (Department of Environmental Affairs, 1992).

2.4.6. South African wetlands review package

Moloto (2005) developed a review checklist for evaluating the quality of environmental impact reports specifically regarding wetlands in South Africa. The Lee and Colley model was adapted for use in South Africa and modified for wetlands.

2.4.7. Review Collation Sheet to assess the status of SIAs in South Africa

Du Pisani (2005) also adapted parts of the Lee and Colley model to South African circumstances to determine the status of practice regarding Social Impact Assessment (SIA) in the EIA. Like the review package for wetlands (Moloto, 2005) this review method is based on the hierarchical system used by Lee and Colley.

3. EIA in South Africa

Environmental assessment has been practiced extensively in South Africa for over two decades in circumstances where there was no legal obligation to do so. The Environment Conservation Act 73 of 1989 contained provisions to give EIA the force of law, though these lay dormant until 1997, when EIA regulations were promulgated in terms of Sections 21, 22 and 26 of the Act. These were in force from September 1997 until 30 June 2006. On 1 July 2006, extensively revised new regulations came into effect in terms of the National Environmental Management Act (NEMA). However, since the EIRs resulting from the new EIA process will only become available by September 2006, and in view of the need to establish a quality baseline against which EIR quality under the new regulations can be measured, this research focuses on EIRs produced in the first eight years of EIA practice.

The regulations requiring compulsory environmental impact assessment cover both the EIA process and the outcome of that process in sections 21, 22 and 26 of the Environment Conservation Act, 1989 and associated regulations. The Development Facilitation Act 65 of 1995; National Water Act, 36 of 1998; Mineral and Petroleum Resources Development Act 28 of 2002; National Environmental Management: Air Quality Act, 39 of 2004; National Environmental Management: Biodiversity Act, 10 of 2004 and the National Environmental Management Act, 107 of 1998 also provide for EIA to be undertaken.

An EIA Guideline document was published in April 1998 for use by consultants and the authorities (South Africa, 1998a). This document complements the regulations and clarifies the regulatory procedures, which must be followed to ensure compliance with the requirements of the EIA procedure. Most of the typical generic steps of the EIA process are covered i.e. there are provisions relating to the initiation of the EIA process, alternatives, screening, scoping, public participation, preparation and submission of the EIR, and decision-making (South Africa, 1998a). These are shown in Table 1.

3.1.Brief description of South Africa's 1997 EIA procedure

The South African 1997 EIA procedure contained most of the typical generic steps as can be seen in Table 1, with the exception of monitoring.

Generic steps in international EIA procedure	Steps in the South African EIA procedure
Screening	List of activities; Pre-application consultation
Scoping	A Plan of study for scoping and a Scoping report; Issues and alternatives that require further investigation are identified
Impact Assessment	Environmental impact report (EIR) is submitted after the Plan of study for EIR is approved.
Scrutiny of findings	Authority and public review
Decision on proposal	Record of decision
Implementation	Implementation
Monitoring	Absent

Table 1: Typical generic EIA procedure (Barrow, 1997) vs. the South African 1997 EIA procedure (South Africa, 1998a)

In the Government Gazette of 5 September 1997, the Minister of Environmental Affairs identified a List of Activities and Regulations for EIAs in terms of sections 21, 22 and 26 of the Environment Conservation Act, 1989 (South Africa, 1998b). This list of activities is used as the approach to screening. After the scoping procedure has been complied with, the authority may decide that it is sufficient for a decision to be made on the proposal in question. Alternatively, the authority may decide that it should be supplemented by an environmental impact assessment. In the latter case, the applicant must submit a further "plan of study" containing prescribed detail for an environmental impact assessment. The actual impact assessment can only go ahead once the plan is approved. Upon submission of the environmental impact report, consideration will be given to authorising the activity in question (South Africa, 1998a).

3.2. EIA – shortcomings in South Africa

Although South Africa's EIA system was relatively strong there were still a few shortcomings in the process. EIA reports were produced at different stages of the planning process and at different levels (Provincial and National Departments). While the EIA process in South Africa required firstly a Scoping Report and secondly an EIA Report, as shown above, the reality was that a majority of the assessments that were conducted in South Africa ended at scoping report level (Kruger & Chapman, 2005; Sandham *et al.*, 2002; Siphugu, 2003; Tshivandekano, 2003; Wood, 1999). It usually occurred that the practitioners extended the content of the scoping report beyond what is required by the regulations to what is informally known as a "beefed-up" scoping report or a mini - EIA. This report then normally contained more than what is needed for a scoping report, but less than what is needed for a complete EIA report (Sandham *et al*, 2005). It seems that the consultants tend to anticipate the requirements of the relevant authority as they gained experience. By incorporating these elements into the scoping reports, far beyond the formal requirements of the 1997 Regulations, their applications were approved without the time constraints of going through the full EIA process. Environmental Officials requesting the beefed-up scoping also supported this practice. In this scoping phase the relevant authority could already determine whether or not the consultant is concerned about the environment or in getting the project approved for economic or individual advantage. The 1992 IEM series (Department of Environmental Affairs, 1992) suggested detailed review guidelines – but these suggestions were not incorporated into the 1997 regulations. This practice has been addressed in the 2006 regulations by the division of the list of activities requiring EIA into those (smaller activities) requiring only a "basic assessment" (i.e. beefed up scoping), and the larger activities requiring a "full assessment" (South Africa, 2006).

Another weakness was the absence of requirements for monitoring and enforcing compliance. The EIA regulations legislated only the scoping and EIA portions of the integrated environmental management (IEM) procedure. This was a major limitation of the 1997 regulations (South Africa, 1998a).

In October 2000 the Department of Environmental Affairs and Tourism commenced a program to streamline environmental assessment legislation and administration in order to address these limitations. The National Environmental Management Act 107 of 1998 (NEMA) contains provisions for EIA under Section 50. The initial legal drafting work on the amendments to NEMA and the new regulations was undertaken in this time. In December 2004 a 9-page 'Briefing Note' on the EIA regulations was sent out for comment to a list of fifty selected institutions and individuals. The Briefing Note document was formalised into a concept document, which was used as the basis for the drafting of the regulations.

Various drafts were developed by the consultants working with DEAT officials and were internally assessed. Meetings and workshops were held throughout the process with a wide range of relevant role players and stakeholders to obtain comments on the drafts. The regulations were published on 25 June 2004 in the Government Gazette for comment. Through the editing and re-drafting process a second draft was completed in early November 2004. This draft was submitted to Cabinet, which approved it on 1 December 2004. The regulations could not be published, however, as they were subject to the NEMA Amendment Bill which had not yet been assented to by the President. The president signed the necessary documentation on 18 December 2004 and the publication and coming into force of the NEMA Amendment Bill took place on 7 January 2005. On 14 January 2005 the Department of Environmental Affairs and Tourism published the new Amended draft EIA regulations. Comments were received again and amendments and structural changes were made and approved by the Minister in July 2005. The revised regulations were promulgated in April 2006 for implementation for all activities except mining on 1 July 2006, and for mining activities on 1 April 2007 (South Africa, 2006).

3.3.Need for quality and effectiveness assessment in South Africa

The underlying, if not central, purpose of Environmental Impact Assessment (EIA) is to provide decision makers, and the public, with a systematic, comprehensive and objective assessment of the environmental consequences of an action. The purpose of this assessment is seen as a proactive measure to identify and mitigate significant adverse environmental effects and thus to allay public fears over the consequences of an action (Weston, 2004). A lack of review of the process can mean that EIA could be

found to be inadequate and defeats the purpose of ensuring sustainable development and the protection of the environment and more importantly an undermining of the credibility of the EIA practice. Following from the discussion on EIA effectiveness and quality review, the following question can be posed: Is the quality of the EIA reports in South Africa of such a standard to facilitate sound and optimal decision making regarding the environment and sustainable development? The need for effective EIA is pressing, since this is a developing nation where the pressure for economical development frequently enjoys priority over environmental issues, and this while the economy is dependent on these natural resources.

Only a limited amount of research in this area has been conducted in South Africa (Du Pisani, 2005; Kruger & Chapman, 2005; Moloto, 2005) hence it is clear that an appropriate EIA review package is required to assist in the assessment of the quality of environmental reports in South Africa. Work on the quality of EIR has been done by Moloto (2005), focusing specifically on Wetlands EIR. Hence, there is a need for a generic review package for EIR quality under the 1997 EIA system, in order to establish the quality baseline, and ultimately to assess more objectively to what extent the new regulations have contributed to improved quality of EIR and hence, EIA effectiveness. Some work has also been done on procedural compliance to the 1997 EIA system in the North West, Free State and Limpopo provinces (Kruger & Chapman, 2005; Sandham *et al*, 2002 and 2005; Siphugu, 2003; Tshivandekano, 2003), as well as on social issues (Du Pisani, 2005).

4. Problem statement

The aim of this study was to develop a review package to assess the quality of Environmental Impact Reports conducted in South Africa in terms of the 1997 EIA regulations.

4.1 Objectives:

1) To investigate the applicability of the existing UK review package to South African EIA.
2) To design a review package for the South African EIA system, test the package and develop a final review package.

3) Evaluate the quality of EIRs by applying the review package to a sample in the North West Province of South Africa.

4.2 Methodology:

1) Applicability of the UK EIR review package

The applicability of each review area, category and sub-category of the Lee and Colley review package was assessed for adoption into the South African review package.

2) Development of the review package for the South African 1997 EIA system.

The package is based on the concept of the review package that was developed by Lee and Colley (1992). Firstly a theoretical model or review package was developed and tested on 12 case studies. This model was constructed using the evaluation method of Lee and Colley and the structure of their review topics together with the requirements of the 1997 regulations and guideline document pertaining to EIAs in South Africa and best (world) practice. Three reviewers participated in the first round of case studies. Each reviewer (trained in the use of the EIA review package) reviewed the report independently and recorded instances of confusion, duplication, and ambiguity within the review topics. Reviewers also recorded any additions and amendments they felt should be made to the review topics. After the problem areas were identified, changes were made to finalize the package.

3) Evaluating the quality of EIRs

The final review package was used to evaluate the quality of a number of EIRs from the North West Province in South Africa. Conclusions and recommendations were drawn from interpretation of the results of the analysis.

Results on objectives 1 and 2 are presented in Chapter 2, and results for objective 3 in Chapter 3.

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Chapter 2: A quality review package for EIA Reports in South Africa

This chapter is presented as a manuscript for submission to the South African Geographical Journal.

Abstract

EIA review is one of the principal quality control functions within any EIA system. Once the quality of an Environmental Impact Report (EIR) has been assessed it can be used as one indication of the effectiveness of the EIA process. The South African EIA system has many limitations, for example the absence of requirements for monitoring and enforcing compliance and the current practice regarding the approval of extended scoping reports as a mini-EIR. On 21 April 2006, the Department of Environmental Affairs and Tourism (DEAT) published the new Amended EIA regulations, which come into affect on 1 July 2006. With the new regulations in effect it is necessary to determine the quality of the EIRs produced according to the 1997 EIA regulations in order to establish a baseline to determine to what extent the new regulations are improving EIR quality - and hence EIA effectiveness. Lee and Colley developed a review package in 1992 to assess the quality of EISs (EIR in South Africa) in Europe. This review package was subsequently adapted and changed by various role players to suit different EIA systems. A review package was developed for South Africa by assessing the applicability of the Lee and Colley review package for the 1997 South African EIA system. Changes were made and the package tested on a number of EIRs in the North West province of South Africa. As a result of identified problem areas, appropriate changes were made and a final review package was derived. The final package was applied to a further sample of EIRs and results showed that 81% of these EIRs are satisfactory regarding the regulatory and procedural yardsticks for EIA practice.

Keywords

Quality, Effectiveness, Environmental Impact Assessment (EIA), Review package, South Africa, North West Province.

1. Introduction

Environmental Impact Assessment (EIA) is a tool that seeks to ensure sustainable development through the evaluation of those impacts arising from a major activity that are likely to have significant environmental effects (Wood, 1999). In September 1997 EIA regulations were promulgated in South Africa in terms of sections 21, 22 and 26 of the Environment Conservation Act (73 of 1989). Since then EIAs have been conducted according to these regulations, which are explained in a Guideline document published in April 1998 (South Africa, 1998). This Guideline document is an interpretation and explanation of the regulations, and has no legal standing, but played a very strong role in shaping EIA practice and EIR quality in South Africa. The Department of Environmental Affairs and Tourism started a program to renew the EIA regulations through the National Environmental Management Act: Second Amendment Bill that was published in August 2003 and which came into force on 7 January 2005. In the Amendment of section 24 this Bill makes particular reference to:

- The environment likely to be significantly affected
- The potential impact
- Mitigation measures
- Independent review of EIR
- Reporting on gaps in knowledge, the adequacy of predictive methods and underlying assumptions
- Identification of environmental attributes.

All of the above were incorporated into the long awaited new regulations that were published on 21 April 2006 and came into effect on 1 July 2006 (South Africa, 2006).

The South African 1997 EIA system consisted of the following main steps:

- Pre-application consultation
- Plan of study for scoping
- Scoping report (including public involvement)
- Plan of study for EIA
- Environmental Impact Report (EIR) (including public involvement)
- Authority review
- Record of decision (including conditions of approval)

The question in the mind of many Environmental Impact Assessment practitioners, academics and policy makers was stated by Dorais in 1993: "*Has Environmental assessment achieved its goal of helping to reach better decisions? This is the fundamental question that all practitioners must begin to address systematically*" as quoted by Sadler (1996:1). This question can be answered by examining the effectiveness of EIA, where effectiveness refers to whether something works as intended and meets the purpose(s) for which it is designed (Cashmore *et al*, 2004; Fuller, 1999; Retief, 2005; Sadler, 1996; Wood, 1999; Weston, 2000). If the EIA report meets the purpose for which it is designed, it can contribute towards better decision-making regarding environmental issues. The quality of the reports is one aspect of the effectiveness of the EIA process (DEAT, 2004; Fuller, 1999; Leu *et al*, 1996; Sadler, 1996).

The concern over effective EIA systems is very real in South Africa and therefore the need exists to develop a review package to assess the quality of EIA reports in South Africa as a contribution to determining the effectiveness of the South African EIA process. With the advent of the new regulations the review package provides the means to establish a base line for quality of Environmental Impact Reports and EIA practice in the first eight years of mandatory EIA in South Africa.

All over the world different methods of determining the quality of EIRs have been used and developed. Some countries prefer a checklist, for example the European Commission (European Commission, 2001); others prefer a matrix system, for example Taiwan (Leu *et al*, 1996) but the method that is most commonly used is a review package for the evaluation of the quality of EIRs, e.g. the IAU (Impact Assessment Unit) review package. This package is divided into eight sections; with each section containing a number of individual review criteria, which are graded on the basis of the quality of the material provided, and each section is then awarded an overall grade. From the grades given to each section an overall grade for the EIR is arrived at. This specific method or hierarchical system is used in most of the review packages. In 1992 Lee and Colley developed a four-tier package for the review of Environmental Impact Statements (EIS) in the UK. The package consists of a set of hierarchically arranged review topics grouped under four review areas, which are then used to assess the quality of project EISs submitted in terms of the 1988 UK

Environmental Assessment Regulations. The reviewer evaluates specific aspects of the EIS against the review criteria by working up through the various levels of the hierarchy (Lee & Colley, 1992). Moloto (2005) developed a review checklist/review package for evaluating the quality of EIRs for projects with the potential of affecting wetlands in South Africa, by adapting the Lee and Colley model for use in South Africa and modified for wetlands. In 2005, Du Pisani (2005) adapted parts of the Lee and Colley model to South African circumstances to determine the status of practice regarding Social Impact Assessment (SIA) as part of EIA in the North West Province of South Africa.

As can be seen from the existing review packages the review package developed by Lee and Colley (1992) has been developed and changed to be appropriate to the EIA procedures of a number of countries, institutions or specific fields (Du Pisani, 2005; Glasson *et al*, 1999; Ibrahim, 1992; Lee *et al*, 1999; Moloto, 2005; Mwalyosie and Hughes, 1998; Rout, 1994; Rzeszot, 1999). Many of the case studies have been conducted in different countries - Belgium, Denmark, Germany, Greece, Ireland, Portugal and Spain - and all show that the Lee and Colley review package is one of the best review packages (Lee *et al,* 1999), thus the reasons for using the Lee and Colley package to develop the review package for South Africa.[1]

When using the Lee and Colley package, the review is conducted by a team of two individuals who are sufficiently familiar with the requirements of the EA process and who ideally have technical competencies related to the particular nature of the environmental study. Working independently, the findings of the review are recorded on a collation sheet. The review commences at the lowest level (Figure 1). Scores for higher levels of the hierarchy are not determined by numerical averages, but by an overall performance score per category.

[1] Having motivated why the package is necessary for SA, all further reference to the SA EIA will be to the 1997 system

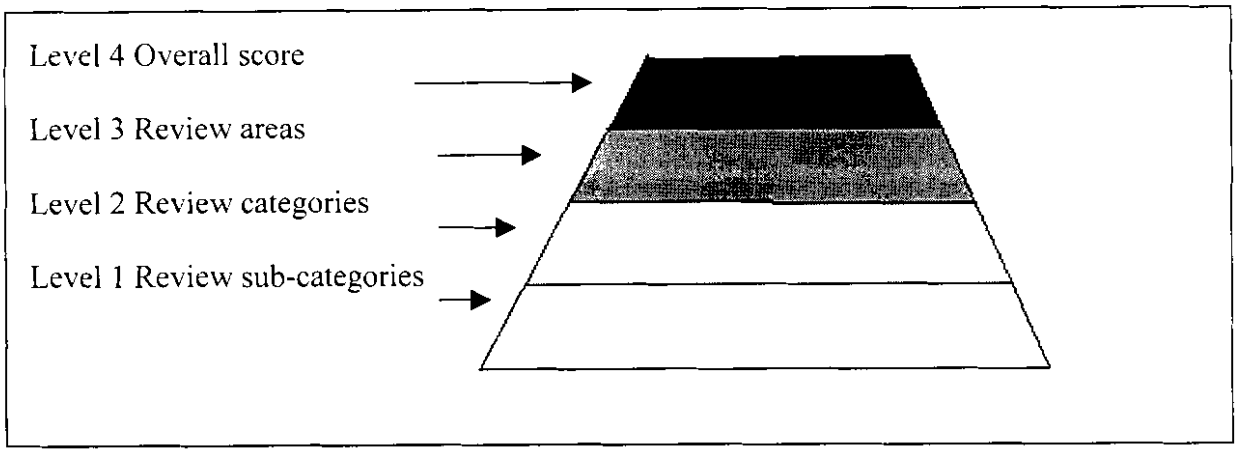

Figure 1: Hierarchical structure of the Lee and Colley (1992) ES review package. *Level 4 – Overall assessment ES; Level 3 – Assessment of review areas; Level 2 – Assessment of review categories; Level 1 – Assessment of review sub-categories.*

The final evaluation score is given after the two reviewers have discussed their evaluations and attempted to reach consensus at every level. The assessment symbols are shown in Table 1. Alphabetical symbols were deliberately chosen to discourage addition or subtraction, which can distort results (Lee *et al*, 1999). These symbols do not allow for a "neutral" assessment - at any level of review performance is either satisfactory or not satisfactory.

Table 1 List of assessment symbols of the Lee-Colley review criteria (Lee et al, 1999)

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

An abbreviated list of criteria used in the Lee and Colley review package is shown in Table 2.

Table 2: EIR review criteria (Adapted from Lee et al (1999). *1. Review area; 1.1 Review category; bullet - review sub-category.*

1. Description of the development	**3. Alternatives and mitigations**
1.1. Description of the development	*3.1. Alternatives*
• The purpose and objectives	• Alternative sites
• Scale and design	• Alternative processes, designs and operating conditions
• Physical presence and appearance	• Rejected alternatives considered again if needed
• Nature of production process	*3.2. Mitigation*
• Quantities of raw materials	• All significant adverse impacts
1.2 Site description	• Mitigation methods considered
• The area of land taken up by development	• To what extent will the mitigation methods be effective.
• Uses to which land will be put	*3.3. Commitment to mitigation*
• Estimated duration time of phases	• Details of the commitment to mitigation measures.
• Number of workers involved	• Monitoring arrangements
• Means of transport	
1.3 Residuals	**4. Communication of results**
• The types and quantities of waste matter	*4.1. Layout*
• The methods used to make these estimations	• Introduction briefly describing the project
• Methods by which the quantities were obtained	• Information should be logically arranged
1.4 Environmental description	• Chapter summaries
• Environment expected to be affected	• Original sources should be acknowledged
• Significant effects away from the immediate site	*4.2 Presentation*
1.5 Baseline Conditions	• Comprehensible to non-specialist
• Important components of the affected environment	• Technical terms should be defined
• Existing data sources must be used	• Presented as an integrated whole
• Local land use plans and policies	*4.3 Emphasis*
	• Emphasis to severe impacts
2. Identification and evaluation of key impacts	• Statement should be unbiased
2.1. Definition of impacts	*4.4 Non-technical summary*
• Description of effects of the project	• Non-technical summary
• Investigation and description of the above types of effects	• Summary should cover main issues
• Non-standard operating conditions	
• Impacts determined as the deviation form baseline conditions	
2.2. Identification of impacts	
• Identification methods of impacts	
• Description of the identification methods used	
2.3. Scoping	
• Attempt to contact public	
• Arrangements to collect opinions and concerns	
• Key impacts identified and investigated more	
2.4. Prediction of impact magnitude	
• Data used to estimate magnitude must be sufficient	
• Methods used to predict impact magnitude	
• Predictions of impacts	
2.5. Assessment of impact significance	
• Significance to affected community	
• Significance of an impact	
• Choice of standards uses to assess significance	

2. The development of the North West University (NWU) review package

In view of the fairly widespread use and utility of the Lee-Colley review package, and the limited research on and use of review packages in South Africa, it was regarded as an appropriate choice as starting point for a South African[2] review package to assess the quality of the EIRs. The hierarchical pyramid structure of the review topics and review areas and the symbolic assessment methods developed by Lee *et al* (1999)[3] were used in the development of the NWU package. The review areas, categories and sub-categories were compared to the requirements of the South African EIA system (South Africa, 1998). The applicability of each review area, category and sub-category was assessed according to the evaluation criteria in Table 3 for adoption into the NWU review package[4]. The upper tiers of the package (i.e. review areas and categories) were found to be applicable to the South African EIA system, without any changes. However, at the lower tiers of the package (sub-categories) there were differences in some cases. Some examples are given to illustrate the methodology used.

Table 3: Evaluation criteria for applicability of the Lee and Colley review areas, -categories and sub–categories to the South African EIA system.

APN	Applicable, can be used without any changes
CSC	Can be used with some changes
NU	Cannot be used

Example 1:

Sub-category 1.1.2 in the Lee and Colley package reads as follows:

The design and size of the development should be described. Diagrams, plans or maps will usually be necessary for this purpose.

[2] Since this package was developed at the Potchefstroom Campus of the North West University it will be referred to as the NWU review package.

[3] The reference to Lee *et al* (1999) is to the Occasional Paper number 55 - *Reviewing the quality statements and environmental appraisals* by Lee, Colley, Bonde & Simpson, 1999 in which Simpson and Bonde adapted the original 1992 review package of Lee and Colley for SEA.

[4] The assessment was done by the author and then checked by two independent reviewers who are well trained in the EIA process in South Africa.

- In the South African EIA regulations the activity to be undertaken must be described in the following manner: description of the site, design, size, scale and all relevant phases of the proposed development (South Africa, 1998).

Evaluation:	***CSC***

For the purpose of the NWU package a slight change was required as follows:

1.1.4 The site, design, size, scale and all relevant phases of the proposed development should be described. Diagrams, plans or maps will usually be necessary for this purpose.

Notice that the number of the sub-category also changed due to the fact that the South African EIA regulations require other information before referring to this particular issue.

Example 2:

Sub-category 1.3.3. in Lee and Colley:

.3.1 The methods by which the quantities of residuals and wastes were obtained should be indicated. If there is uncertainty this should be acknowledged and ranges of confidence limits given where possible.

- The SA regulations do not specify anything regarding the methods nor the quantities by which the residuals and wastes were obtained.

Evaluation:	***NU***

This sub-category was left out since it is not required in the South African regulations.

Using these evaluation criteria the entire Lee and Colley package was evaluated in terms of its applicability to the SA system. The applicability results for the entire package are presented in Table 4.

Table 4: Evaluation of the applicability of the Lee and Colley review topics to the South African EIA system.

Review Area	Review Category	Review Sub-categories	Applicability assessment
Review Area 1	1.1	1.1.1	CSC
		1.1.2	APN
		1.1.3	CSC
		1.1.4	CSC
		1.1.5	CSC
	1.2	1.2.1	APN
		1.2.2	CSC
		1.2.3	CSC
		1.2.4	CSC
		1.2.5	CSC
	1.3	1.3.1	CSC
		1.3.2	CSC
		1.3.3	NU
	1.4	1.4.1	APN
		1.4.2	CSC
	1.5	1.5.1	CSC
		1.5.2	CSC
		1.5.3	NU
Review Area 2	2.1	2.1.1	CSC
		2.1.2	CSC
		2.1.3	CSC
		2.1.4	CSC
	2.2	2.2.1	CSC
		2.2.2	CSC
	2.3	2.3.1	CSC
		2.3.2	CSC
		2.3.3	CSC
	2.4	2.4.1	CSC
		2.4.2	CSC
		2.4.3	APN
	2.5	2.5.1	CSC
		2.5.2	APN
		2.5.3	CSC
Review Area 3	3.1	3.1.1	CSC
		3.1.2	CSC
		3.1.3	CSC
	3.2	3.2.1	CSC
		3.2.2	APN
		3.2.3	CSC
	3.3	3.3.1	NU
		3.3.2	NU
Review Area 4	4.1	4.1.1	CSC
		4.1.2	CSC
		4.1.3	NU
		4.1.4	NU
	4.2	4.2.1	APN
		4.2.2	NU
		4.2.3	APN
	4.3	4.3.1	APN
		4.3.2	APN
	4.4	4.4.1	NU
		4.4.2	NU

APN-Applicable, can be used without any changes (n=10)

CSC-Can be used with some changes (n=33)

NU - Cannot be used (n=9)

Refer to Table 2 for a detailed description of the Review Areas, Review Categories and Sub-Categories. As can be seen in Table 4 the number of APN is 10, CSC is 33 and NU is 9.

2.1 Evaluation of the NU symbols

An explanation of the evaluation of the NU symbols follows below. As explained in the example above, sub-category 1.3.3 is evaluated as a NU, because the South African EIA system has no specification regarding the quantities or the methods by which the residuals and waste were obtained. Sub-category 1.5.3 *(Local land use plans and policies should be consulted and other data collected as necessary to assist in the determination of the "baseline" conditions)* received a NU, because the South African EIA system is very vague on this issue and refers to the effects on human health, socio-economic conditions, physical and cultural resources but not in any sense to the baseline conditions (South Africa, 1998). The "do-nothing" scenario is referred to as the "No-go" alternative in the South African EIA system and is often used as a base case against which to measure the relative performance of the other alternatives. The relative impacts of the other alternatives are expressed as changes to the base case. The option not to act might also be taken forward in its own right for evaluation against the other alternatives (South Africa, 1998). The baseline conditions should be included into the review package and it must be an essential part of the starting point for any EIA. The baseline conditions play a major role in the "No-go" option and this is why the no-go option might be moved from an alternative to part of the description of the baseline conditions.

Review-category 3.3 (Commitment to mitigation), including sub-categories 3.3.1 *(There should be a clear record of the commitment of the developer to the mitigation measures presented in the Statement. Details of how the mitigation measures will be implemented and function over the time span for which they are necessary should also be given)* and 3.3.2 *(Monitoring arrangements should be proposed to check the environmental impacts resulting from the implementation of the project and their conformity with the predictions within the Statement. Provision should be made to adjust mitigating measures where unexpected adverse impacts occur. The scale of these monitoring arrangements should correspond to the likely scale and significance of deviations from expected impacts)* received an applicability assessment symbol of NU, since the South African EIA system does not require any form of information or records of the commitment of the developer to mitigation measures. The South African EIA system also does not include the monitoring of either mitigation

measures or the check on environmental impacts resulting from the implementation of the project.

Sub-category 4.1.3 (*Unless the chapters themselves are very short, there should be chapter summaries outlining the main findings of each phase of the investigation.*) was assessed with a NU symbol, since the South African regulations do not require any specific manner in which to write/present the reports. Sub-category 4.1.4. (*When data, conclusions or quality standards from external sources are introduced, the original source should be acknowledged at that point in the text*) also received a NU symbol because the South African regulations do not include a form of report writing, and discretion is left to the author of the EIR.

Sub-category 4.2.2 (*Technical terms, acronyms and initials should be defined)* was assessed with a NU symbol because the South African regulations do not require that the technical terms, acronyms and initials should be defined. Review category 4.4 *(Non-technical summary),* including sub-categories 4.4.1 (*There should be a non-technical summary of the main findings and conclusions of the study)* and 4.4.2 (*The summary should cover all main issues discussed in the Statement and contain at least a brief description of the project and the environment, an account of the main mitigation measures to be undertaken by the developer, and a description of any significant residual impacts)* received an applicability assessment symbol of NU, since the South African EIA system does not require a non-technical summary of the main findings and conclusions.

2.2 Evaluation of the CSC symbols

In some cases the categories or sub-categories changed substantially. One example is review category 2.3 (*Scoping: Key impacts should be identified),* which has three sub-categories in the Lee and Colley package. Due to the extensive Public participation requirements of the South African EIA system (South Africa, 1998) it was expanded to 11 sub-categories in the NWU package (Table 5).

Table 5: Review category 2.3 in the NWU review package. *The scoping process in South Africa requires public participation. This is the reason for the additional sub-categories, shown with grey shading.*

Review category 2.3: Scoping: Not all impacts should be studied in equal depth. Key impacts should be identified, taking into account the views of interested parties, and the main investigation centred on these.	
2.3.1	There should be a genuine attempt to contact the general public and special interest groups – clubs, societies, etc. – to apprise them of the project and its implications.
2.3.2	A description of the public participation process that must be undertaken by the developer and the consultant and must include a list of the interested parties and their comments.
2.3.3	The parties that will be affected by the proposed activity or development must be identified.
2.3.4	The parties that have an interest in the proposal(s) or the environment(s) under consideration must be identified.
2.3.5	The establishment and record of the procedure by which the identified and non-identified interested and affected parties were afforded the opportunity to participate at all appropriate stages of the preparation of the environmental impact report must be described.
2.3.6	The provision for interested and affected parties to express their views (within a stated time period so that the decision-making process is not delayed) about the scope of the environmental impact report, including alternatives and issues that were investigated, must be described.
2.3.7	A list of issues that were identified as being of concern to interested and affected parties must be included.
2.3.8	Notification criteria, which entail the reason for their participation in the various stages of the process, where the report can be obtained, where it can be examined (libraries), where and to whom the comments on such reports should be sent to, the specified period for receiving comments must be included.
2.3.9	A record of all the views of and correspondence with interested and affected parties is to form an addendum to the report.
2.3.10	It is required that the public should conduct a public review where their opinions and comments can be given and evaluated (this may involve an assessment of the procedure followed and a review of the scoping report)
2.3.11	Key impacts should be identified and selected for more intense investigation. Impact areas not selected for thorough study should nevertheless be identified and the reasons they require less detailed investigation should be given in the Plan of Study for EIA. Methods that can be used to assist the consultant are e.g. consultation with specialist consultants, rating or ranking techniques or existing criteria (e.g. water quality criteria).

The first draft of the NWU review package showed many similarities to the Lee and Colley review package (Lee *et al*, 1999), with differences in the sub-categories as can be seen in Table 6 and discussed in more detail in Section 4. The NWU review package collation sheet was based on the Lee and Colley two-page sheet, allowing for the changed number of sub-categories.

3. First round of case studies

The draft NWU review package was tested through application to twelve case studies in the North West Province of South Africa. The North West Province was chosen, as this is the home province of the North West University and since an established collaborative relationship with the provincial Department of Agriculture, Conservation and Environment allowed ready access to the EIRs. The twelve EIRs

were selected at random from the EIA archives of the Provincial Environmental department. Three reviewers participated in the first round of case studies. Each reviewer (trained in the use of the EIA review package[5]) was asked to review the report independently and record instances of confusion, duplication, and ambiguity within the review topics. Reviewers were also asked to record any additions and amendments they felt should be made to the review topics.

Some areas of duplication, inconsistency, and ambiguity were identified, mainly due to the fact that the majority of the reports being assessed were scoping reports and not complete EIAs. This was identified as a considerable problem since the package was developed for complete EIAs and required the review of various aspects that were catered for in the review sub-categories, but are not expected in a scoping report. This phenomenon is known in South Africa as "beefed-up" scoping reports or mini- EIAs. A beefed-up scoping report is a scoping report that includes more information than usually required for a scoping report, and is more like a "mini-EIA". This practice developed in order to save money and time (Sandham *et al.* 2005; Wood, 2003). Consequently, the review categories were adapted to accommodate these beefed-up scoping reports, in accordance with the regulations and the guideline document (South Africa, 1998).

One example of the changes is in Review Area 3 (Alternatives and mitigation). A scoping report does not require mitigation measures or a detailed description of the alternatives. These two categories were added in the review package because these are important requirements if a scoping report is the only submitted document and an informed decision must be made about the development and potential impacts[6], based upon the scooping report.

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[5] See Appendix B for the steps in conducting a review. This approach is similar to the approach followed by Lee and Colley and was adapted to coincide with the sub-categories added or taken away from the NWU review package.

[6] The "validity" of this practice has been formalise in the new 2006 regulations where a "Basic Assessment" process has been implemented for the activities, which were formerly dealt with in the beefed-up scoping.

4. Final NWU review package

The issues raised above were used to amend the review package. The number of review sub-categories was increased in some cases and other sub-categories were removed, as can be seen in Table 6. These changes were incorporated into the review topics and the collation sheet.

Practical considerations in the review exercise suggested some other changes to the collation sheet. The review topic descriptions were incorporated into the collation sheet, as opposed to the Lee and Colley collation sheet, which is essentially an empty table. This resulted in the number of pages changing from two to nine. In the longer collation sheet the sub categories can be seen together per category, enhancing the overall impression for the assessment of the category. A reviewer can now use the collation sheet independently from the list of review topics. Although the collation sheet is longer, it can be completed more rapidly because it eliminates the need for the reviewer to work from two sets of paper i.e. the collation sheet and the list of review topics.

In Table 6 a comparison between the Lee and Colley review package, the first draft review package and the final NWU review package is given, where the changes from the Lee and Colley review package to the final NWU package can be seen. Appendix D the NWU review package collation sheet, contains even more detail information on the final NWU package.

Table 6 A comparison between the Lee and Colley review package, the first NWU review package and the final NWU review package.

Sub-categories removed,

Sub-categories added.

Review Area	Review Category	Lee & Colley Review Package	Draft NWU Review Package	Final NWU Review Package
Review Area 1	1.1	1.1.1	1.1.1	1.1.1
		1.1.2	1.1.2	1.1.2
		1.1.3	1.1.3	1.1.3
		1.1.4	1.1.4	1.1.4
		1.1.5	1.1.5	1.1.5
			1.1.6	1.1.6
				1.1.7
				1.1.8
				1.1.9
	1.2	1.2.1	1.2.1	1.2.1
		1.2.2	1.2.2	1.2.2
		1.2.3	1.2.3	1.2.3
		1.2.4	1.2.4	1.2.4
		1.2.5	1.2.5	1.2.5
				1.2.6
	1.3	1.3.1	1.3.1	1.3.1
		1.3.2	1.3.2	1.3.2
		1.3.3	1.3.3	
	1.4	1.4.1	1.4.1	1.4.1
		1.4.2	1.4.2	1.4.2
				1.4.3
				1.4.4
				1.4.5
	1.5	1.5.1	1.5.1	1.5.1
		1.5.2	1.5.2	1.5.2
		1.5.3	1.5.3	
Review Area 2	2.1	2.1.1	2.1.1	2.1.1
		2.1.2	2.1.2	2.1.2
		2.1.3	2.1.3	2.1.3
		2.1.4	2.1.4	2.1.4.
	2.2	2.2.1	2.2.1	2.2.1
		2.2.2	2.2.2	2.2.2
			2.2.3	
	2.3	2.3.1	2.3.1	2.3.1
		2.3.2	2.3.2	2.3.2
		2.3.3	2.3.3	2.3.3
			2.3.4	2.3.4
Review Area 2	2.3		2.3.5	2.3.5
			2.3.6	2.3.6
			2.3.7	2.3.7
			2.3.8	2.3.8
			2.3.9	2.3.9
			2.3.10	2.3.10
			2.3.11	2.3.11
	2.4	2.4.1	2.4.1	2.4.1
		2.4.2	2.4.2	2.4.2
		2.4.3	2.4.3	
	2.5	2.5.1	2.5.1	2.5.1
		2.5.2	2.5.2	2.5.2
		2.5.3	2.5.3	2.5.3
Review Area 3	3.1	3.1.1	3.1.1	3.1.1
		3.1.2	3.1.2	3.1.2
		3.1.3	3.1.3	3.1.3
			3.1.4	3.1.4
	3.2	3.2.1	3.2.1	3.2.1
		3.2.2	3.2.2	3.2.2
		3.2.3	3.2.3	3.2.3
				3.2.4
	3.3	3.3.1	3.3.1	
		3.3.2	3.3.2	
Review Area 4	4.1	4.1.1	4.1.1	4.1.1
		4.1.2	4.1.2	4.1.2
		4.1.3	4.1.3	4.1.3
		4.1.4	4.1.4	
	4.2	4.2.1	4.2.1	4.2.1
		4.2.2	4.2.2	4.2.2
		4.2.3	4.2.3	
	4.3	4.3.1	4.3.1	4.3.1
		4.3.2	4.3.2	4.3.2
	4.4	4.4.1		
		4.4.2		

5. Second round of case studies

The revised NWU review package was tested on another twenty-six case studies. The original 12 case studies were reviewed again with the final review package, giving a total of 38 EIA reports used in the study. Six of these were granted exemption from the EIA process, hence were not used in the final evaluation of the EIA reports. This brought the total to 32 EIAs which were assessed. Significant differences in the assessment of particular review topics were systematically examined to see whether or not they could be resolved. In the cases were the evaluation couldn't be resolved the two collation sheets (of the two different reviewers) were compared. Although there where differences in the sub-categories it didn't have a major effect on the symbol attained for the specific category, and differences in the categories didn't have any effect on the overall evaluation of the EIA as such. A summary of the results pertaining to the case studies can be seen in Table 7, and percentages in Figure 2.

Table 7: Summary of the results gained from the application of the review package. *Keys to codes are: A - Well performed, B –Generally satisfactory, C – Just satisfactory, D – Unsatisfactory, E – Poor attempt, F – Did not attempt.*

	SUMMARY OF ALL REVIEW AREAS	A	B	C	D	E	F
1	Description of Project	1	9	14	6	2	0
2	Identification and Development of key impacts	0	9	14	7	2	0
3	Alternatives and Mitigation	1	6	14	6	4	1
4	Communication of results	3	22	5	1	1	0
	FINAL GRADE REVIEW FOR EIR	0	8	18	5	1	0

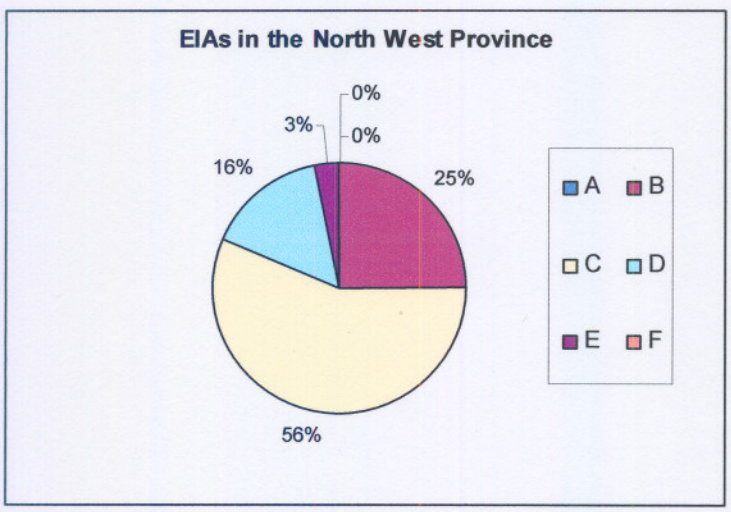

Figure 2: Final grades for EIRs. *A - Well performed, B – Generally satisfactory, C – Just satisfactory, D – Unsatisfactory, E – Poor attempt, F – Did not attempt*

6. Findings

As shown in Table 7 and Figure 2, none of the reports could be described as well performed (A), and 25% of the reports contain minor omissions and inadequacies (B) implying that there is a lack of important information in the EIA process. All the EIAs used in this study have been approved by the authorities however according to the assessment 56% of the reports attained a grade C, indicating a lack of important information or that the information given is of poor quality and does not answer questions that are needed to make effective optimal decisions. Of the remaining reports 16% were unsatisfactory (D) and 3% were poorly attempted (E).

7. Discussion of EIR performance per review area

A comprehensive discussion of the evaluation and quality of the EIRs in the North West Province in South Africa is presented in Chapter 3 (Pretorius, 2006). In terms of value for decision-making the scores were combined into two main groupings i.e. satisfactory (A-C) or unsatisfactory (D-F). The frequency of satisfactory ratings is presented in Table 8.

Table 8: Summary of the performance of the different review areas. *These percentages are the total of the three satisfactory symbols A, B and C.*

	SUMMARY OF ALL REVIEW AREAS	%A-C
1	Description of Project	75
2	Identification and Development of key impacts	72
3	Alternatives and Mitigation	66
4	Communication of results	94
	FINAL GRADE REVIEW FOR EIA	**81**

Review area 1 deals with the description of the development, the local environment and the baseline conditions. The satisfactory rating in this review area is 75%. Omissions and deficiencies reported in this area included the provision of extensive and over-technical detail relating to the project design but insufficient coverage of all of the phases of the development, limited coverage of waste produced by the development and too narrow a definition of the environment affected.

In Review area 2 covering the identification and evaluation of the projects, 72% of the reports received a satisfactory grading. The following omissions /deficiencies were observed in this area:

- Limited details of scoping methods and coverage mainly confined to direct impacts,
- Details of methods used for prediction and evaluation often not provided, and
- Limited explanation given both to quantitative estimation of magnitude of impacts and to assumptions and value judgements used in the evaluation of impacts.

Alternatives and Mitigation or Review area 3 was the least well-performed area with a rating of 66%. Where alternatives were covered, they mainly related to site selection. Mitigation measures were not always described in the reports and, where they were, details provided about their implementation and effectiveness was often limited. This most likely reflects the fact that EIA is seldom part of the life cycle of the project (Wood, 2003).

Review area 4 reporting on the communication of results was one of the best-performed review areas, with 94% of the overall proportion of the reports being judged to be of satisfactory quality. Notwithstanding these conclusions, in some of the cases the emphasis of the statement is not always independent and this appears to be clear evidence of lobbying for a particular point of view, usually in favour of the development.

It can therefore be concluded that 81 % of the reports investigated in the North West Province of South Africa are generally satisfactory, although there is much important information lacking in the reports. The better performances in Review area 1 (the description of the development), and Review area 4 (communication of results), lifted the overall ratings. Since it is acknowledged (Retief, 2005) that certain review areas are more significant in influencing the effectiveness than others; it would be desirable to prioritise or weigh the relevant importance of each review area. For example: Review area 2 and 3 should preferably be of a higher priority or carry more weight than review areas 1 and 4, which are the easier sections in the evaluation process and

tend to raise the overall rating and hence misrepresent the actual quality of the report. The issue of weighting is an area requiring more research, and falls beyond the scope of this study.

8. Conclusion

Judging by the quality of the EIRs alone, the effectiveness of the EIA process in the North West Province of South Africa can be regarded as acceptable, but with room for improvement. Because of the importance of the process it is imperative that improvements be made. With the help of this review package the quality of reports can be determined in the different provinces in South Africa.

The review package sets a high standard for the content of EIA reports, and can be used to compare standards across sectors and over time. Although much of the Lee *et al* (1999) package was used in the development of the South African package, the new package is unique for the 1997 South African EIA system with regard to the different situations it has to consider in practice.

With the new EIA regulations having become effective on 1 July 2006, the review package will have to be adapted to the new regulations in order to investigate the quality of the EIR produced under the new regulations. The results from both packages can then be compared to determine the extent to which the new regulations are improving the quality of the reports and in turn improving the quality of environmental protection.

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Chapter 3: Evaluation of EIRs in the North West Province, South Africa

This chapter is presented as a manuscript for submission to the South African Geographical Journal.

Abstract

EIA reports from one provincial environmental authority in South Africa are reviewed using a review package specifically designed for this purpose. As performance standards and EIA requirements vary between countries and different jurisdictions, the guidelines and requirements for EIA in South Africa were used as the basis for the review package. This paper reports the findings of the application of this review package to 38 case studies. In general the first review area, Review Area 1 (Description of the development), has been generally well defined with a satisfactory rating of 75%. Some important issues for the environment such as the description of the site were not as well performed as would be expected with a satisfactory rating of 47%, indicating that there is considerable room for improvement. Review Area 2 (The identification and evaluation of results) (72%) and Review Area 3 (Alternatives and mitigation) (66%) were the two review areas with the lowest frequency of satisfactory scores. The final conclusion is that 81% of the reports submitted in the North West Province of South Africa are satisfactory, though there is much important information lacking in the reports.

Keywords

Environmental Impact Assessment (EIA), Review package, South Africa, North West Province.

1. Introduction

The regulations requiring compulsory environmental impact studies were promulgated in 1997 under the Environment Conservation Act 73 of 1989 (South Africa, 1989). In April 1998 a complementary guideline document or minimum requirement for the South African Environmental Impact Assessment (EIA) procedure was released (South Africa, 1998). This was the first phase of EIA in South Africa. The second phase started in October 2000 when the Department of Environmental Affairs and Tourism started a program to improve the EIA regulations. The revised regulations were promulgated in April 2006 for implementation for all activities except mining on 1 July. For the purpose of this study the regulations in force from 1997 to 2006 were used to develop a review package to determine the quality of Environmental Impact Reports (EIRs) to use as a baseline for EIR quality. When the EIRs submitted in terms of the new regulations become available, the package can be adapted to the new regulations and the two sets of results can be compared, to investigate whether EIR quality has improved, which is one of the stated aims of the new regulations.

According to the 1997 regulations, EIA reports were produced at different stages of the planning process and at different government levels (Provincial and National Departments). The first requirement in the EIA process in South Africa is a Scoping Report, which is followed by an EIA report. In practice more than 90 % of the assessments conducted in South Africa have been approved at the scoping report level (Sandham et al, 2002; Siphugu, 2003; Tshivandekano, 2003; Wood, 1999). What happened frequently was that the practitioners extended the content of the scoping report beyond what is required by the regulations to what is informally known as a "beefed-up" scoping report or a mini - EIA. These reports then contained more than what was needed for a scoping report, but less than what is needed for a complete EIA report. It seemed that the consultants tended to anticipate the requirements of the relevant authority as they gained experience. By incorporating these elements into the scoping reports, far beyond the formal requirements of the 1997 Regulations, their applications were approved without the time constraints of going through the full EIA process.

With the new regulations in force it could be expected that the EIA system in South Africa is performing well and that EIRs in South Africa are making a contribution to the protection of the environment and in particularly to sustainable development. It is therefore important to determine the quality of EIRs conducted since the introduction of EIA in 1998 in order to establish a baseline of EIR quality for assessment of effectiveness and then determine the quality of the EIRs under the new regulations to establish the extent of improved practice and effectiveness under the new regulations. With this in mind it becomes evident that a tool is required to assist in determining the quality of the reports and that therefore an EIR quality review package must be developed for EIA in South Africa.

In order to develop such a review package for South Africa, the 1997 regulations and guideline document pertaining to EIAs in South Africa were used as quality criteria for the review package. The review package is based on that developed by Lee *et al* (1999) for EIR in the UK. The development of the review package is discussed in detail by Pretorius (2006).

2. Applying the review package

The purpose of the review package is to arrive at a single, overall assessment of the quality of each EIA report. In order to achieve this, 4 review areas are considered in each case, relating to 4 key performance areas of each EIA.

The review areas are:

1. Description of the development, the local environment, and the baseline conditions
2. Identification and evaluation of key impacts
3. Alternatives and mitigation of impacts
4. Communication of results.

The review package consists of a set of 4 hierarchically arranged review topics under four review areas. Level 1 is the overall assessment, level 2 the four review areas mentioned above, level 3 is the categories and level 4 is the sub-categories. The reviewer commences the review at the lowest level, i.e. the sub-categories, which contain simple criteria relating to specific tasks and procedures. Then, drawing upon these assessments, he/she progressively moves upwards from one level to another in

the hierarchy applying more complex criteria to broader tasks and procedures in the process until the overall assessment of the EIR has been completed. Each review area consists of review categories, which in turn consists of review sub-categories.

Example:

Review area 1 consists of 5 categories, 1.1 – 1.5, and review category 1.1 consist of 5 review sub-categories, 1.1.1 – 1.1.5. The assessment is done by means of the assessment symbols described in Table 1.

Table 1 List of assessment symbols: *Generally, A, B and C can be regarded as satisfactory, and D, E and F as unsatisfactory (Lee et al, 1999)*

Symbol	Explanation
A	Generally well performed, no important tasks left incomplete
B	Generally satisfactory and complete, only minor omissions and inadequacies.
C	Can be considered just satisfactory despite omissions and/or inadequacies.
D	Parts are well attempted but must, as a whole, be considered unsatisfactory because of omissions or inadequacies.
E	Poorly attempted because of significant omissions or inadequacies
F	Not attempted at all
N/A	Not applicable. The review topic is not applicable or irrelevant in the context of this EIA report.

In order to conduct an EIR review, two reviewers first independently conduct a review of the EIR[7]. The two reviewers then compare their review findings as recorded on their separate collation sheets. Where differences in their assessments of the review topics occur (at sub-category, category, area or overall levels), the reviewers jointly re-examine them with a view to reconciling their findings on a common collation sheet. The overall assessment is supplemented with a brief synopsis (one or two paragraphs) of the environmental impact report's strengths and weaknesses, highlighting, in particular, any key deficiencies which require correction to bring the report up to an overall satisfactory ('C' or above) standard.

[7] See Appendix B for the relevant steps in conducting a review.

3. Analysis and Interpretation

The results from the study are discussed below. Due to the amount of detail included in the sub-categories, they are not all discussed in the text but are included in Appendix A of Pretorius (2006). Note that regarding the Sub-categories a boundary value of 50% is used in terms of regarding a particular sub-category as being of a satisfactory standard, and the values below 50% are indicated in grey (Appendix A, Pretorius, 2006). Anything below 50% is regarded in this study as an indication that a particular sub-category is not described well enough to be used in any decision-making processes regarding the environment. The discussion will commence at the category level as this gives the optimal indication of the overall assessment of the study. The data in Table 2 (see next page) represent the average grades per review category for the 32 case studies (Six of the 38 cases were granted exemption from the EIA process, hence were not used in the final evaluation of the EIA reports, thus bringing the total to 32 case studies). The results are discussed by review area and category. When considering the assessment symbols A – well performed, B – satisfactory and complete, and C – just satisfactory, all three symbols reflect differing degrees of "satisfactoriness", therefore the assessment symbols A-C, were grouped together for broad interpretation purposes.

Table 2 An overview of the results from the case studies. *Keys to codes are: A - Well performed, B – Generally satisfactory, C – Just satisfactory, D – Unsatisfactory, E – Poor attempt, F – Did not attempt. % Satisfactory (A-C)*

	Category							
	SUMMARY OF PRELIMINARY GRADES	**A**	**B**	**C**	**D**	**E**	**F**	**%A-C**
1.1	Description of development	**6**	**11**	**12**	**2**	**0**	**1**	91
1.2	Site plan	**0**	**4**	**11**	**10**	**5**	**2**	47
1.3	Waste	**0**	**10**	**8**	**8**	**3**	**2**	58
1.4	Environmental description	**5**	**8**	**12**	**5**	**2**	**0**	78
1.5	Baseline condition	**2**	**11**	**8**	**7**	**3**	**1**	66
2.1	Definition of impacts	**1**	**8**	**12**	**10**	**1**	**0**	66
2.2	Identification of Impacts	**5**	**10**	**5**	**7**	**2**	**2**	65
2.3	Scoping	**4**	**8**	**12**	**5**	**3**	**0**	75
2.4	Prediction of impact magnitude	**2**	**8**	**12**	**5**	**4**	**1**	69
2.5	Assessment of impact significance	**2**	**8**	**8**	**6**	**5**	**2**	58
3.1	Feasible alternatives should have been considered	**3**	**6**	**11**	**4**	**5**	**3**	63
3.2	Scope and effectiveness of mitigation measures	**1**	**8**	**9**	**10**	**2**	**2**	56
4.1	Layout of statement	**4**	**17**	**8**	**1**	**2**	**0**	91
4.2	Presentation	**6**	**16**	**8**	**1**	**1**	**0**	94
4.3	Emphasis	**6**	**14**	**7**	**3**	**1**	**0**	87
	SUMMARY OF ALL REVIEW AREAS	**A**	**B**	**C**	**D**	**E**	**F**	**%A-C**
1	**Description of Project**	**1**	**9**	**14**	**6**	**2**	**0**	75
2	**Identification and Development of key impacts**	**0**	**9**	**14**	**7**	**2**	**0**	72
3	**Alternatives and Mitigation**	**1**	**6**	**14**	**6**	**4**	**1**	66
4	**Communication of results**	**3**	**22**	**5**	**1**	**1**	**0**	94
	FINAL GRADE REVIEW FOR EIA	**0**	**8**	**18**	**5**	**1**	**0**	**81**

3.1. Review area 1 – Description of the development, the local environment and the baseline conditions.

The goal of describing the development is to determine the kind of possible impacts that are associated with the specific activity. The purpose of this review area is to get a holistic picture of the proposed development within the current environment and baseline conditions. Review Area 1 is divided into 5 review categories, as can be seen in Table 2.

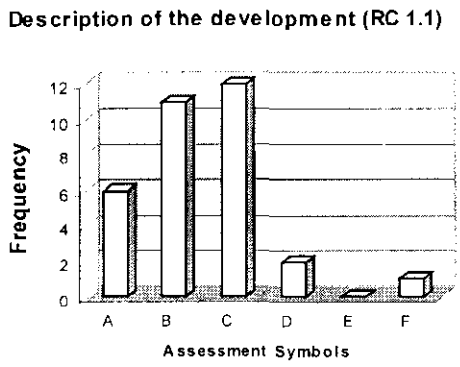

Figure 1.1: Results of Review Category 1.1
Description of the development

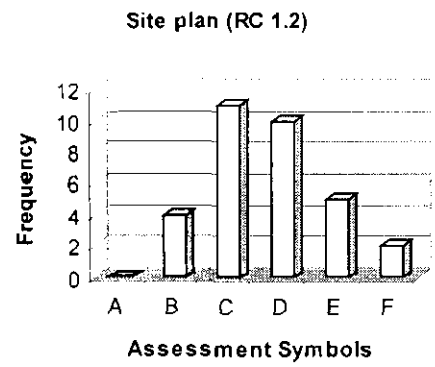

Figure 1.2: Results of Review Category 1.2
Site plan

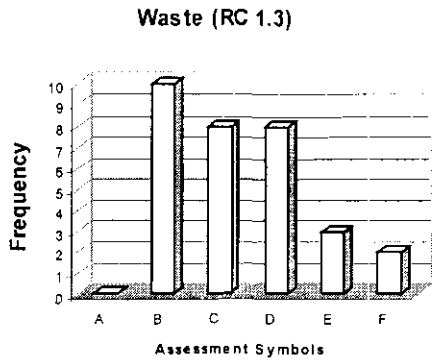

Figure 1.3: Results of Review Category 1.3
Waste

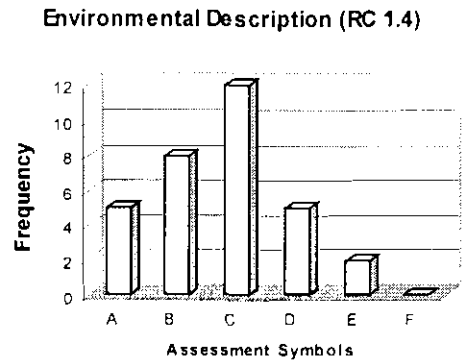

Figure 1.4: Results of Review Category 1.4
Environmental Description

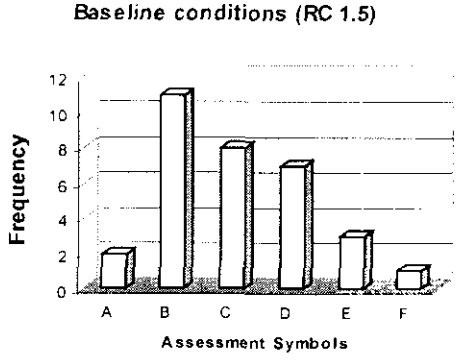

Figure 1.5: Results of Review Category 1.5
Baseline conditions

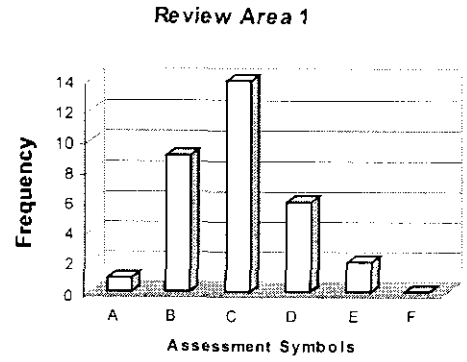

Figure 1.6: Results of Review Area 1

Figure 1 Results of the categories in Review Area 1. *Description of the development, the local environment and the baseline conditions . RC'= Review Category*

Figures 1.1-1.5 are the results of the data for review categories 1.1- 1.5 in Table 2, and Figure 1.6 represents the average data for Review Area 1.

Review Area 1 requires a description of the development, the local environment and the baseline conditions. In general these requirements have been well defined. This can be seen in Table 2, which shows that 75 % of the reviewed EIRs were satisfactory. In review category 1.1, 91% of the cases were found to have satisfactory descriptions of the development. When considering the sub-categories, (Appendix A, Pretorius, 2006) it is clear that review category 1.1 is not a problem area in the EIA documentation, considering that none of the sub-categories' satisfactory ratings were below 50%.

Table 2 shows that only 47% of the description of the site (review category 1.2) was satisfactory (Figure 1.2). Sub-categories 1.2.3, 1.2.4 and 1.2.5 which include the estimated duration of the different phases, number of workers entering the development and their access to the site and likely means of transport, were in most of the cases not even attempted. The infrastructure required for servicing the project and means of transporting raw materials and products to and from the site and the approximate quantities involved (Sub-category 1.2.6) received a satisfactory percentage of 45%. This is a big issue for the environment as this is one of the steps in the development that can cause significant damage if not managed correctly.

In review category 1.3 (Waste) (Figure 1.3), 58% of the EIRs were completed to a satisfactory level, which in this case is a matter of concern due to the importance of the content of the category. Waste is a very important aspect in any development due to the severe impacts that can develop through time, which in the end determine the extent of mitigation required and have significant financial implications as well. Ideally, in at least 80% of EIRs, this category should be performed at a satisfactory level.

Review categories 1.4 and 1.5, Environmental description and Baseline conditions, 78% and 66% respectively were satisfactory, with none of their sub-categories of poor quality (Figures 1.4 and 1.5). This seems to indicate that adequate planning and study goes into these categories.

As can be seen in Table 2 and Figure 1.6, the review area as a whole is well performed, with 75% of EIRs rated as satisfactory (A-C). However, only one EIR received an A rating, indicating that most of the 75% satisfactory reports were in fact only just satisfactory, and that there is considerable room for improvement.

3.2. *Review Area 2 – Identification and evaluation of key impacts*

The process of scoping or identification of key impacts is that of deciding, from all of the project's possible impacts and from all the alternatives that could be addressed, which are the significant ones. According to the EIA regulations in South Africa (South Africa, 1997) a significant impact means an impact that by its magnitude, duration, intensity or probability of occurring may have an effect on an important aspect of the environment. An initial scoping of possible impacts may identify those impacts thought to be potentially significant, those thought to be not significant and those whose significance is unclear. Further studies should examine impacts in the various categories. Those confirmed by such a study to be not significant are eliminated; those in the uncertain category are added to the initial category of other potentially significant impacts (DEAT, 2004a; Glasson *et al*, 1999; Sadler, 1996). When reviewing the effectiveness of an EIR the following criteria are considered regarding scoping. Is the scoping process completed and has it resulted in:

- Priority issues and relevant impacts being identified,
- Key actors being involved,
- Reasonable alternatives established, and
- Terms of reference/study guidelines prepared.

Scoping should also ensure that only significant issues and reasonable alternatives are examined (DEAT, 2004a).

In review category 2.1 (Definition of impacts), 66% of the cases were found to be satisfactory (A-C) (Figure 2.1). But when considering that D is the second highest score in that category, we can suggest that a small improvement in this category will change the statistics dramatically and also contribute to a better quality report. Sub-categories 2.1.3 and 2.1.4 of category 2.1 were fairly poorly addressed with a score of respectively only 48% and 40% (Appendix A). In many cases non-standard operating conditions are not considered, due to the fact that these kinds of assessments have a

low priority to many developers. The impacts should be determined as a deviation from the baseline conditions. Since development in any form is encouraged in South Africa, the baseline conditions are not the determining factor.

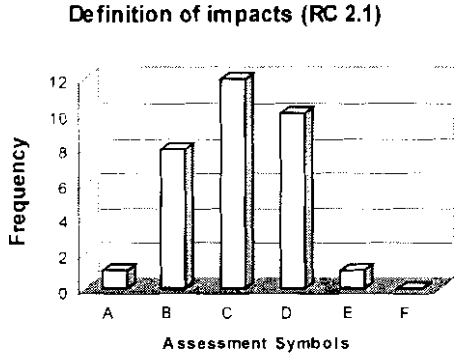

Figure 2.1: Results of Review Category 2.1 Definition of impacts.

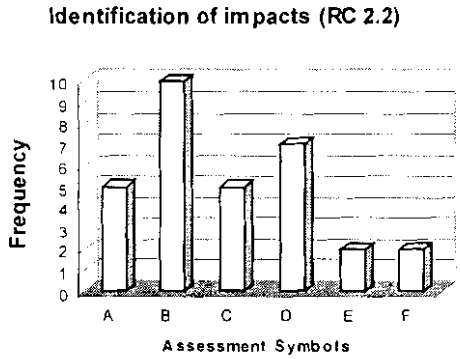

Figure 2.2: Results of Review Category Identification of impacts.

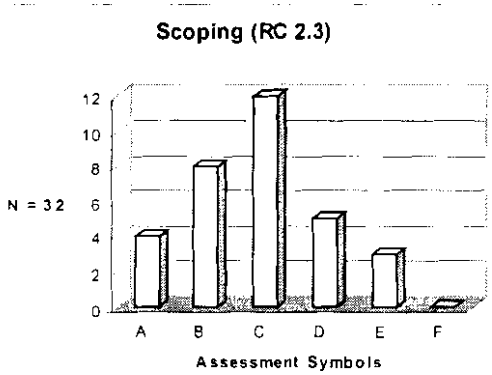

Figure 2.3: Results of Review Category 2.3 Scoping.

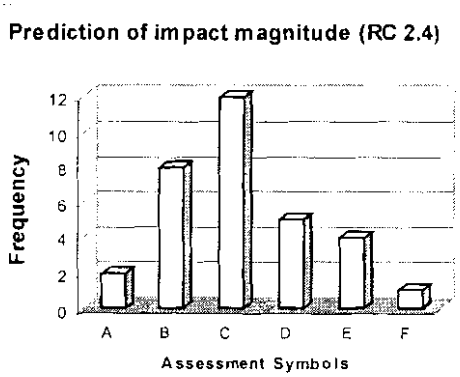

Figure 2.4 : Results of Review Category 2.4 Prediction of impact magnitude

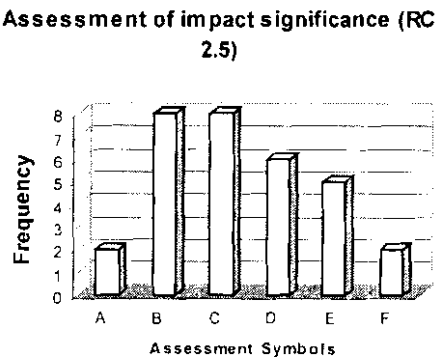

Figure 2.5: Results of Review Category 2.5 Assessment of impact significance

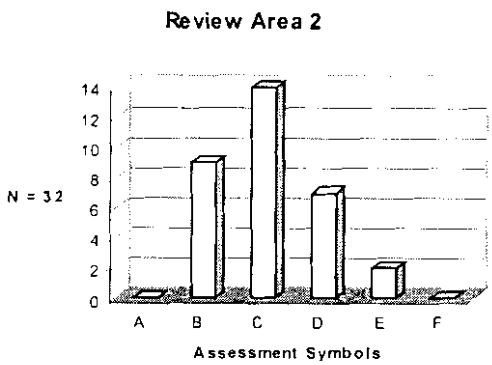

Figure 2.6: Results of Review Area 2

Figure 2: Results of the categories in Review Area 2. *Identification and evaluation of key impacts. RC= Review Category*

Review category 2.2 (Figure 2.2) performed to a satisfactory level of 65% in the EIRs, while in 35% of the EIRs this was poorly attempted or not attempted at all. In many cases the impacts are identified for the project as a whole, though the regulations require that the project must be divided into the different phases of the project and from there the impacts (of each phase) can be identified.

Review category 2.3 (Figure 2.3) contains one of the most important parts of the requirements in the guidelines and that is scoping. In Table 2 it is clear that the scoping process is done fairly well, with 75% of the reports being satisfactory. This is much likely due to the strength of scoping in EIA practice in South Africa, and the fact that many of the EIAs are beefed-up scoping reports. As mentioned above, sometimes the practitioners extend the content of the scoping report beyond what is required by the regulations to what is informally known as a "beefed-up" scoping report or a mini - EIA. This report then normally contains more than what is needed for a scoping report, but less than what is needed for a complete EIA report. This has been found to be the case in many different studies done in South Africa including Kruger and Chapman (2005), Sandham *et al* (2002) and Wood (2003).

In 31% of EIRs a poor or no attempt at all was made to conduct the activities assessed in review category 2.4. which entails the prediction of impact magnitude. Sub-category 2.4.1 states that the standard method – provided in the guideline document concerning the nature of the impact, extent, duration, intensity and probability – or other criteria used to predict impact magnitude should be described and sub-category 2.4.2 states that where possible, predictions of impacts should be expressed in measurable quantities with ranges or confidence limits as appropriate (with the help of the criteria provided in the guideline document). The description for these two sub-categories comes directly from the guideline document for EIA in South Africa. The question arises: If these two sub-categories come out of the guideline document, which is an interpretation of the EIA regulations, why is it not even attempted or very poorly done in practice? The answer to this question reiterates the reality that many EIAs never go beyond the point of a scoping report. These requirements are only requested in the content of a full EIA. It is thus evident that if the EIA regulations are being followed and conducted in the prescribed manner, or according to international

best practice, these kinds of weak spots can be eliminated and it could improve the overall quality of EIAs in South Africa significantly.

Review category 2.5 includes the estimation of the expected significance that the projected impacts will have for society. The sources of quality standards, together with the rationale, assumptions and value judgements used in assessing significance, were assessed satisfactorily in 58% of cases (Figure 2.5). Category 2.5 should ideally have at least an 80% satisfactory level since the anticipated impact on the local society can determine if a project is approved or not.

3.3. Review Area 3 – Alternatives and Mitigation

The manner in which an EIA addresses alternatives will influence its relation to the subsequent decision-making process. A discussion of alternatives ensures that the developer has considered both other approaches to the project and the means of preventing environmental damage. Mitigation seeks to find better ways of doing things, minimize or eliminate negative impacts, enhance project benefits and protect public and individual rights to compensation. The fact is that in South Africa (as elsewhere) EIA often comes too late in the life cycle of the project for alternatives to be considered – hence their neglect.

As shown in Figure 3.3, 66% of the reports were rated as generally satisfactory in this review area. The rest of the reports did not or only poorly attempted to comply with any of the sub-categories. The 66% that were done satisfactorily again confirmed that many scoping reports are beefed-up scoping reports since mitigation measures and alternatives are strictly only requested in a full EIA. 56% of the reports included mitigation measures (category 3.2, Figure 3.2). Only 2 of the 32 EIRs evaluated were the result of a full EIA process.

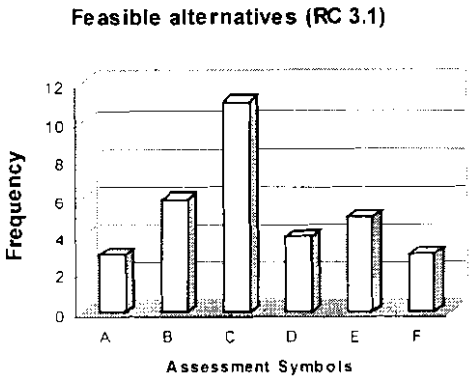

Figure 3.1: Results of Review Category 3.1
Feasible alternatives

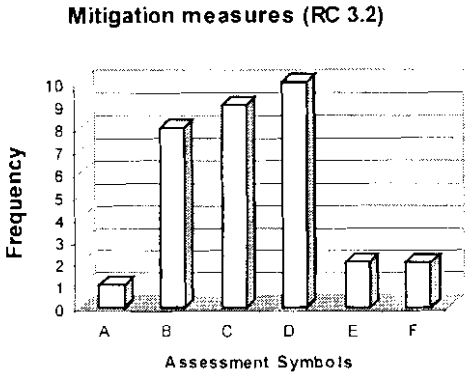

Figure 3.2: Results of Review Category 3.2
Mitigation measures

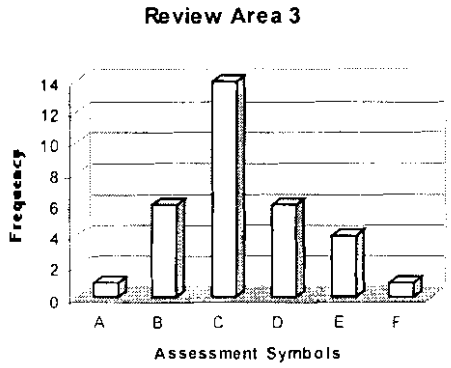

Figure 3.3: Results of Review Area 3

Figure 3: Results of the categories in Review Area 3. *Alternatives and mitigation.*

The worst assessment was for sub-category 3.2.4, which includes an indication of the effectiveness of these measures, with only 34% of the reports rated as being on a satisfactory standard. Mitigation measures must be clearly defined and then an indication of the effectives of these measures must be given. Twelve of the reports (over 30%) did not attempt this at all, which can be due to the fact that it is not actually required for a scoping report but only for a full EIA. Sixty three percent of the reports had satisfactory information on alternatives (review category 3.1, Figure 3.1). Three of the sub-categories, 3.1.2, 3.1.3 and 3.1.4 were satisfactory in 58%, 52% and 65% of the reports respectively. Since the regulations do not require mitigation measures in the scoping report, it appears that this is also one of the weak spots in the EIA system and if this review area receives the attention it requires according to the regulations, the quality of EIAs in South Africa are likely to improve significantly.

3.4. Review Area 4 - Communication and Results

Glasson *et al* (1999) stated that, although the UK EIA regulations specify the minimum contents required in an EIR, they do not give any standard for the presentation of this information. The communication or presentation of an EIA is indirectly a public relations exercise, and an EIA can be seen as a publicity document for the developer. Good presentation can convey a concern for the environment, a rigorous approach to the impact analysis and a positive attitude to the public. Bad presentation, in turn, suggests a lack of care, and perhaps a lack of financial backing. Similarly, good presentations can help to convey information clearly, whereas bad presentation can negatively affect even a well-organized EIR. It is critical that the findings of the EIR are successfully communicated to decision-makers and stakeholders. Little is achieved if the "so what" question of data and information is not addressed, and if the findings of the EIA are not interpreted in the context of the broader policy, legal, planning and sustainable development framework (DEAT, 2004b). According to Sadler (1996), when reviewing the quality of the EIRs according to the communication of results, the following question can be asked: "Is the information:

- Complete — informed decision can be made?
- Suitable — right type of information included?
- Understandable — easily apprehended by decision maker?
- Reliable — meets established professional and disciplinary standards?
- Defensible — risks and impact are qualified as to proposal uncertainties?
- Actionable — provides clear basis for choice and condition setting?"

Review Area 4 includes the communication of results. The reports in this study were generally of high quality and received a 94% satisfactory assessment. Review categories 4.1, 4.2 and 4.3 (Figure 4.1- 4.3) were completed to a generally satisfactory standard as reflected by the ratings in all of the sub-categories. With the results obtained from the reports it is clear that the consultants are submitting good reports in regards to layout, presentation and emphasis, although the absence of that large numbers of A scores indicates room for improvement. The reason for this is most likely that the regulations, but more specifically the guideline document for EIA in

South Africa, request specific information in each of the four different documents for submission i.e. the plan of study for scoping, the Scoping report, the plan of study for EIA and then the full EIR. Although it does not recommend a specific style or order, each document can be set up in a professional way by means of word-processing and printing facilities. Moreover, as long as all the necessary information is included, the style will not exert a significant effect on whether a project is approved or not. Unfortunately this sometimes appears to be an attempt to cover up weaknesses in Review Areas 2 and 3.

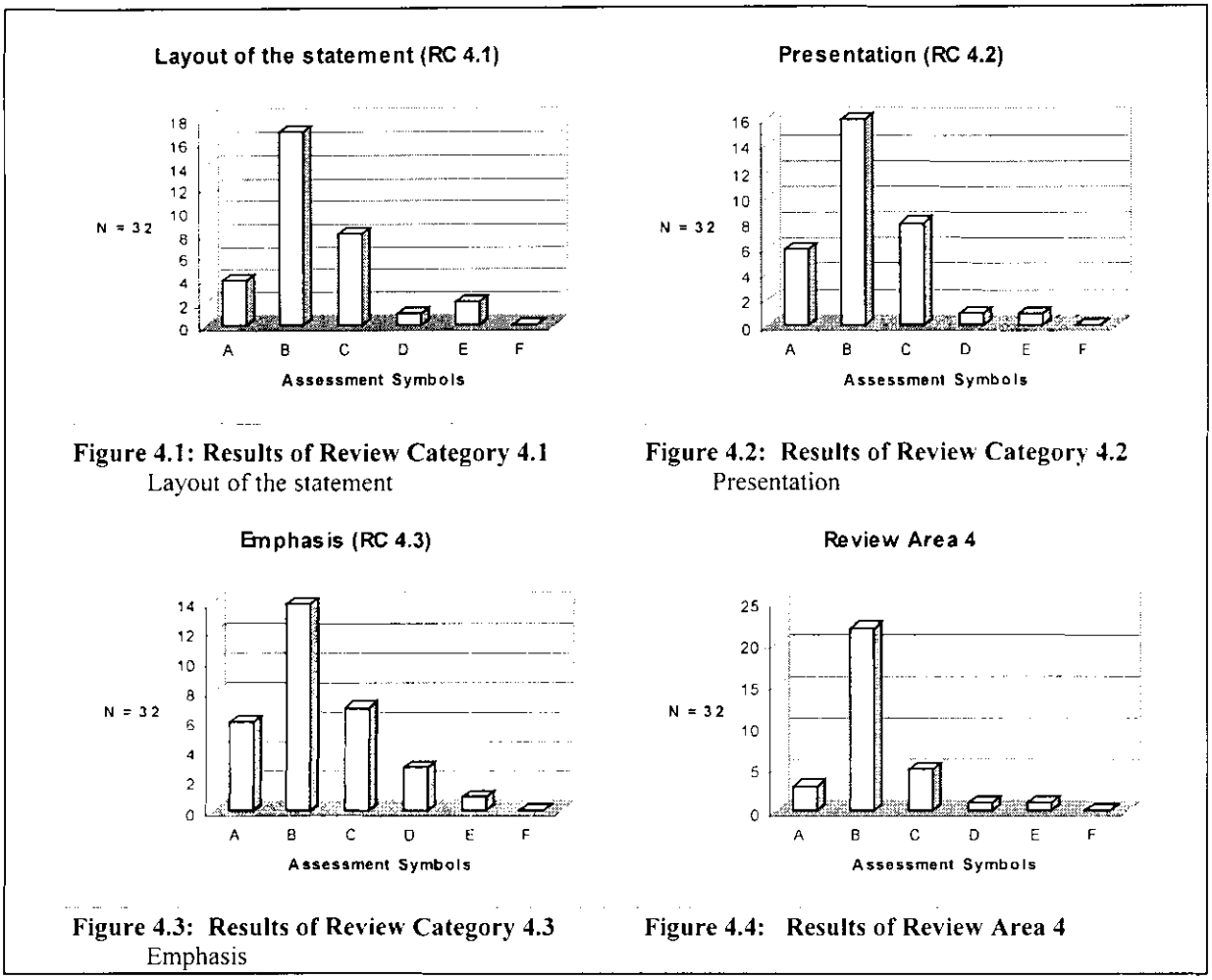

Figure 4.1: Results of Review Category 4.1 Layout of the statement

Figure 4.2: Results of Review Category 4.2 Presentation

Figure 4.3: Results of Review Category 4.3 Emphasis

Figure 4.4: Results of Review Area 4

Figure 4: Results of the categories in review area 4. *Communication of results. RC = Review Category*

3.5. Overall assessment

A summary of the results pertaining to the case studies can be seen in Table 3, which is a repeat of the bottom section of Table 2 with the percentages of all the review areas added in the last column. As stated above, the percentages of the assessment

symbols A-C were calculated together to give an indication of the overall degree to which EIRs are broadly satisfactory.

Table 3: Summary of the results gained from the application of the review package. *Keys to codes are: A - Well performed, B –Generally satisfactory, C – Just satisfactory, D – Unsatisfactory, E – Poor attempt, F – Did not attempt.*

	SUMMARY OF ALL REVIEW AREAS	A	B	C	D	E	F	%A-C
1	Description of Project	1	9	14	6	2	0	75
2	Identification and Development of key impacts	0	9	14	7	2	0	72
3	Alternatives and Mitigation	1	6	14	6	4	1	66
4	Communication of results	3	22	5	1	1	0	94
	FINAL GRADE REVIEW FOR EIA	0	8	18	5	1	0	81

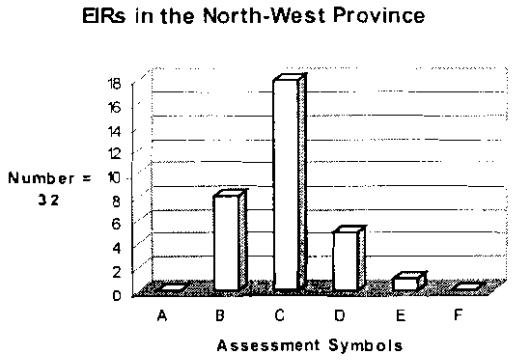

Figure 5: Results of the quality of EIRs in the North West Province.

In Table 3 it is clear that Review Area 2 (72%) and Review Area 3 (66%) were the two review areas with the lowest frequency of satisfactory scores. These two areas can be regarded as the most important review areas in the package (and also in the EIA process) since the most important issues needed to make informed decisions are to be addressed in these two areas. Therefore the final conclusion is that 81% (Table 3) of the reports submitted in South Africa are satisfactory, though there is much important information lacking in the reports. If the description of the development (Review Area 1) and the communication of results (Review Area 4), were not relatively better performed the overall assessment of the reports would have been much worse. Also, although a majority of the reports were satisfactory, 18 of the 32 (i.e. 56%) were only just satisfactory, and none were well performed, indicating that there is room for significant improvement.

In comparison to other countries, South Africa is not in a good position. As part of a 1996 European Commission review of EIA quality in Europe, eight EIA reports from Belgium, Denmark, Greece, Ireland and Portugal were selected for review together with 24 EIA reports from Germany, Spain and the United Kingdom, giving a total of 112 EIA report quality assessments. The main review mechanism employed by the different Member State reviewers was the Lee and Colley (1992) Review Package. The overall proportion of satisfactory EIA reports sampled was 71%. This increased from 50% in the years 1990 and 1991 (European Commission, 1996), showing that the use of a review package to assess the quality of the reports can not only help to get an holistic picture of the EIA process, but can also help in improving the quality of EIRs leading to improved environmental protection and sustainable development.

4. Conclusion

The fact that 90% of the reports submitted to authorities in South Africa are beefed-up scoping reports (Wood, 2003) was evident in this study in the fact that the review package had to be changed to include certain review categories (example 2.4 and 2.5) and sub-categories (example 2.3.1-2.3.11), which in a normal EIA would not be part of the review package. Kruger and Chapman (2005) recommended that in order to improve the quality of EIA reports and its ability to act as a tool for sustainable development, more detailed guidelines or regulations must be provided, or that the EIA process in South Africa reverts to the "traditional" scoping report, which involves a thorough identification of issues. They argue that due to scoping reports being regarded as "mini-EIAs", the quality of EIA practice is severely affected. This "shortened" process has resulted in poor quality baseline studies, lack of consideration of alternatives and inadequate public involvement, and has made it easier to "whitewash" some issues.

In many cases, for example review category 2.1, 2.2 and 2.3, small changes in these categories can lead to considerable changes in the overall quality of the reports. Ultimately, the quality or effectiveness of an EIA is tested by whether it "makes a difference", i.e. whether the EIA results in improved decision making and ultimately improved environmental protection. The research presented shows that some important aspects of an EIA report were not thoroughly addressed, yet the EIAs were approved. The question therefore arises as to the contribution to environmental

protection and sustainable development of EIRs that do not address certain important aspects, yet are still approved. With this question in mind it must be remembered that the quality of EIR is only one indication of the effectiveness of the EIA system. The role of the other aspects such as the effect on decision-making, the effectiveness of prediction and management of the impacts and monitoring and post-auditing must also be assessed to determine the effectiveness of the EIA system as a whole in the North West Province and also in South Africa. The objective of this article was to determine the quality of EIRs in the North West province in South Africa, and the final evaluation reveals that 81% of the reports submitted are indeed satisfactory, although much important information is lacking in the reports.

The new regulations, which have come into effect on 1 July 2006, clearly specify two kinds of reports – a basic assessment report for smaller sized projects (something like the beefed-up scoping) and a thorough assessment report for larger projects (full EIA) (South Africa, 2006). With this the problems of the beefed-up scoping may well be resolved. The review package developed in this study can now be used to determine the quality of a greater number of EIRs under the 1997 regulations to serve as a baseline for quality and then in the future it must be adapted to the new regulations to determine the extent to which EIR quality has improved, if at all. The challenge that lies ahead for all environmental managers in South Africa is to adapt to the new regulations and improve environmental protection in this country with the help of the new EIA system.

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Chapter 4: Summary and Conclusion

This research project focused on two main aims i.e. to develop a review package for the South African 1997 EIA system, and to assess the quality of a sample of EIRs in the North West Province of South Africa. Both of these aims were achieved.

The review package is a useful quality control tool, sets a high standard for the content of EIRs, and can be used to compare standards across sectors and over time. As an additional benefit, the review package can also be useful in teaching situations, i.e. to give students a practical overview of what is required in an EIA by conducting a review themselves.

According to the standards of the review package, the quality of the reviewed EIRs was largely satisfactory, and an overall "C" symbol was awarded. However, due to the limited scope of this research, it was not possible to review a sufficiently sized sample to conclusively state that the majority of EIRs in the North West province of South Africa are of satisfactory quality. It is recommended that the review package be used to undertake further research on a larger sample of Environmental Impact Reports, including those from the other provinces of South Africa. However, the results have confirmed anecdotal evidence from officials and consultants regarding the quality of reports and related effectiveness of the EIA system as it has developed in the first eight years of mandatory EIA in South Africa.

Ultimately, the quality or effectiveness of an EIA is tested by whether it "makes a difference", i.e. whether the EIA results in improved environmental protection and sustainable development. It is clear that some important aspects of an EIA report were not thoroughly addressed; yet the EIAs were approved. This concern raises the question of whether these reports can contribute to improved environmental protection and hence sustainable development without addressing some important aspects in an EIR. Clearly, an assessment of the quality of EIRs alone cannot adequately answer this question. However, an assessment of the effectiveness of EIA requires *inter alia* an assessment of the quality of EIRs, and it is to this aspect the effectiveness of EIA that this study has striven to contribute.

APPENDIX A: SUB-CATEGORIES

Due to the amount of detail included in the sub-categories, they are not discussed in the text but are included in this Appendix. The percentage of satisfactory scores (A-C) is given in the last column for each review sub-categories Please note that the percentage is calculated only with the number of valid responses for each sub-category. There are a number of sub-categories. which were rated N/A due to the nature of the development and are therefore not used in these calculations. For the purpose of this study a boundary value of 50% is used in terms of regarding a particular sub-category as being of a satisfactory standard, and the values below 50% are indicated in grey. Anything below 50% is regarded as an indication that a particular sub-category is not described well enough to be used in any decision-making processes regarding the environment. The first table follows on the next page.

Table 1 Sub-category scores for Review Area 1 - Description of the development.

	Review Category	Review Sub-Category		Well performed	Satisfactory, minor omissions	Satisfactory, om, inadequacies	Unsatisfactory	Poor Attempt	Did not attempt	% Satisfactory (A-C)
			Description	**A**	**B**	**C**	**D**	**E**	**F**	
Review Area 1	**1.1**	**1.1.1**	Identification of Applicant	**20**	**8**	**3**	**1**	**0**	**0**	97
		1.1.2	Purpose and objectives of Development	**16**	**5**	**9**	**2**	**0**	**0**	94
		1.1.3	Description and nature of activity/development	**14**	**7**	**10**	**1**	**0**	**0**	97
		1.1.4	Description of the site	**10**	**12**	**6**	**3**	**0**	**1**	88
		1.1.5	Proposed Location	**9**	**7**	**11**	**2**	**1**	**2**	84
		1.1.6	Description of Processes and Technology employed	**3**	**3**	**7**	**0**	**0**	**8**	62
		1.1.7	Expected rate of production	**3**	**1**	**4**	**1**	**0**	**5**	57
		1.1.8	Raw materials used during different phases	**2**	**5**	**6**	**3**	**1**	**6**	57
		1.1.9	Source and availability of water and materials	**2**	**7**	**6**	**1**	**5**	**3**	63
	1.2	**1.2.1**	Site Plan	**8**	**16**	**6**	**0**	**2**	**0**	94
		1.2.2	Description and demarcation of Land use areas	**9**	**14**	**5**	**3**	**1**	**0**	88
		1.2.3	Estimated duration of different phases	**2**	**2**	**6**	**1**	**3**	**17**	32
		1.2.4	Expected number of workers and Visitors	**0**	**0**	**1**	**0**	**1**	**27**	3
		1.2.5	Access to site and likely means of transport	**0**	**3**	**5**	**5**	**1**	**15**	28
		1.2.6	Infrastructure required to	**0**	**4**	**10**	**7**	**7**	**3**	45
	1.3	**1.3.1**	Estimated types and quantities of waste and disposal routes	**1**	**8**	**8**	**6**	**4**	**4**	55
		1.3.2	Proposed handling and disposal of wastes and residuals	**4**	**8**	**7**	**7**	**3**	**2**	61
	1.4	**1.4.1**	Indication of likely area to affected	**10**	**9**	**8**	**3**	**0**	**2**	84
		1.4.2	Biophysical description of the site :	**11**	**11**	**8**	**2**	**0**	**0**	94
		1.4.3	Biological Description of.	**7**	**8**	**6**	**1**	**6**	**2**	70
		1.4.4	Social characteristics:	**6**	**6**	**7**	**7**	**3**	**1**	63
		1.4.5	Cumulative impacts should be included.	**1**	**9**	**7**	**5**	**3**	**6**	55
	1.5	**1.5.1**	Important components of the affected environment	**5**	**12**	**6**	**5**	**3**	**1**	72
		1.5.2	Interaction and effect of project activities on the environment	**4**	**7**	**4**	**6**	**4**	**3**	54

Table 2 Sub-category scores for Review Area 2 –Identification and evaluation of impacts.

Review Area 2	Review Category	Review Sub-Category		Well performed	Satisfactory, minor omissions	Satisfactory, om, inadequacies	Unsatisfactory	Poor Attempt	Did not attempt	% Satisfactory (A-C)
			Description	**A**	**B**	**C**	**D**	**E**	**F**	
	2.1	**2.1.1**	Description of effects of project on environment	**3**	**3**	**18**	**5**	**2**	**1**	75
		2.1.2	Identify and describe the effect and interaction of effects on	**4**	**9**	**16**	**3**	**0**	**0**	91
		2.1.3	Impacts arising from non-standard operating procedure	**2**	**8**	**4**	**4**	**2**	**9**	48
		2.1.4.	Impacts arising from deviation from Base Line conditions	**1**	**4**	**7**	**5**	**2**	**11**	40
	2.2	**2.2.1**	Assess Impacting activities from 4 distinct phases	**7**	**7**	**4**	**0**	**4**	**9**	58
		2.2.2	All the possible impacts from each phase must be identified	**8**	**8**	**7**	**4**	**1**	**3**	74
	2.3	**2.3.1**	Supply example of notice published in media	**18**	**6**	**2**	**2**	**3**	**1**	81
		2.3.2	Onsite Notice	**11**	**4**	**2**	**1**	**4**	**9**	55
		2.3.3	Identify people affected by proposed development	**9**	**8**	**2**	**2**	**2**	**3**	73
		2.3.4	Identify people that have an interest in	**8**	**8**	**6**	**1**	**5**	**3**	71
		2.3.5	Describe Procedures whereby affected parties can participate	**13**	**9**	**1**	**4**	**1**	**3**	74
		2.3.6	Provision for I&A parties to express their views	**12**	**7**	**0**	**1**	**3**	**8**	61
		2.3.7	List of issues identified as of concern to	**10**	**7**	**1**	**1**	**2**	**9**	60
		2.3.8	Notification criteria which entails	**2**	**6**	**8**	**1**	**5**	**7**	55
		2.3.9	A record of all the views as an addendum to the report	**4**	**5**	**4**	**2**	**1**	**7**	57
		2.3.10	Evidence that	**2**	**6**	**6**	**5**	**2**	**8**	48
		2.3.11	Key impacts	**4**	**13**	**5**	**3**	**1**	**5**	71
	2.4	**2.4.1**	Prediction of impact magnitude	**2**	**9**	**15**	**2**	**3**	**1**	81
		2.4.2	Express predictions of impact in	**3**	**6**	**8**	**2**	**3**	**8**	57
	2.5	**2.5.1**	Description of significance of impact on affected community	**2**	**4**	**6**	**2**	**4**	**9**	44
		2.5.2	Significance of impact	**3**	**7**	**7**	**4**	**6**	**3**	57
		2.5.3	Proposed method of assessing significance	**4**	**8**	**6**	**3**	**1**	**9**	58

Table 3 Sub-category scores for Review Area 3 – Alternatives and Mitigation.

Review Area 3	Review Category	Review Sub-Category		Well performed	Satisfactory, minor omissions	Satisfactory, omm, inadequacies	Unsatisfactory	Poor Attempt	Did not attempt	% Satisfactory (A-C)
			Description	**A**	**B**	**C**	**D**	**E**	**F**	
	3.1	**3.1.1**	Description of methods used to identify alternatives	**1**	**7**	**5**	**3**	**4**	**12**	41
		3.1.2	Description of analyses of range of alternatives	**4**	**5**	**9**	**0**	**5**	**8**	58
		3.1.3	Minimum of two (2) alternatives should be investigated	**6**	**4**	**6**	**3**	**3**	**9**	52
		3.1.4	Discussion and reasons for final choice	**3**	**7**	**10**	**2**	**5**	**4**	65
	3.2	**3.2.1**	Description of mitigation measures and it's influence on	**3**	**11**	**9**	**6**	**1**	**1**	74
		3.2.2	Mitigation measures considered should include	**1**	**9**	**12**	**4**	**3**	**2**	71
		3.2.3	Mitigation measures must be clearly defined ito	**2**	**8**	**7**	**7**	**1**	**7**	53
		3.2.4	Indication of effectiveness of these measures	**2**	**4**	**5**	**1**	**4**	**12**	34

Table 4 Sub-category scores for Review Area4 –Communication and results

Review Area 4	Review Category	Review Sub-Category		Well performed	Satisfactory, minor omissions	Satisfactory, omm, inadequacies	Unsatisfactory	Poor Attempt	Did not attempt	% Satisfactory (A-C)
			Description	**A**	**B**	**C**	**D**	**E**	**F**	
	4.1	**4.1.1**	Introduction	**4**	**19**	**6**	**1**	**2**	**0**	91
		4.1.2	Arrangement of information	**8**	**14**	**8**	**0**	**2**	**0**	94
		4.1.3	External Sources	**8**	**8**	**4**	**1**	**2**	**9**	63
	4.2	**4.2.1**	Presentation of information	**5**	**18**	**6**	**3**	**0**	**0**	91
		4.2.2	Statement as an integrated whole	**9**	**12**	**8**	**2**	**1**	**0**	91
	4.3	**4.3.1**	Prominence and emphasis given to	**5**	**13**	**9**	**1**	**3**	**0**	87
		4.3.2	Statement must be unbiased	**6**	**13**	**5**	**6**	**1**	**0**	77

APPENDIX B: CONDUCTING A REVIEW

Select two reviewers to assess the environmental appraisal report. In order to conduct a review, each should first independently undertake the following steps:

1. Read through the **List of Review Topics** (Areas, Categories and Sub-categories) and familiarize himself with them as well as the type of information required from the environmental impact report in order to appraise its quality.

2. Briefly read through the environmental impact report noting the layout and the whereabouts of essential information.

3. Re-read the first review category (1.1) and its component Sub-categories (1.1.1 – 1.1.9). Remember that the Sub-categories refer to tasks, which must be undertaken in order that tasks described by the Category are performed fully and well. Interpret them in this context.

4. Assess each of the Sub-categories (1.1.1-1.1.9) referring closely to the environmental impact report. Make use of the (yes/no) spaces where the sub-categories are divided into more detail. *Be aware that the required information will not all be located in the same place for any one Review Topic.* It will probably be necessary to make notes. Carefully read the **List of Assessment Symbols**, explained on the first page. Before deciding on the symbols it may be helpful to refer once more to the (yes/no) answers of the review sub-category and to recall the strategy of review explained above. The appropriate assessment symbol should be chosen based on the way the tasks relating to the Review Sub-category are performed in the environmental impact report. The symbol should be marked with a 1, or X under the appropriate symbol.

5. Decide which assessment symbol is appropriate for each Sub-category and record it on the **Collation Sheet**. Avoid using split symbol (e.g. 'C/D') and be prepared to make use of the full range of assessment symbols 'A'-'F'. Record 'N/A' where it is considered that the Review Topic is not applicable or irrelevant in the case of the particular environmental impact report under review. Note that a task should be assessed as having been satisfactorily handled (i.e. within the range 'A'-'C') if

there is sufficient information of the appropriate quality provided in the environmental impact report on the Review Topic concerned to allow a decision-maker to make an informed decision without having to seek further advice. It is the appropriateness and quality, and not the volume, of information provided which is the relevant consideration.

6. Use the assessments of sub-categories 1.1.1-1.1.9 and any other information gained from the environmental impact report which you considered relevant, to assess the Review Category 1.1 in the space next to Preliminary grade, under the appropriate symbol. Your evaluation of the relative importance of these Sub-categories should also be taken into account.

7. Proceed to the next Review Category 1.2 and evaluate it in the same way as Review Category 1.1. Continue until all the Review Categories in the Review Area have also been assessed in the same manner.

8. Your evaluation of these Review Categories can now be used to assess the Review Area 1 in the same way in which they themselves were derived from the Review Sub-category assessments. Thus, for example, the assessment of Review Area 1 is to be based on the assessments of Review Categories 1.1-1.5. This assessment symbol is to be marked in the space next to FINAL GRADE REVIEW AREA 1. Again a simple averaging of the assessments of the component Sub-categories should not derive the assessment of the Review Category.

9. Assess Review Areas 2, 3 and 4 in the same manner as Review Area 1. When all Review Areas have been assessed the environmental impact report as a whole can be assigned an assessment symbol. The final assessment symbol is to be marked in the space next to FINAL GRADE REVIEW FOR EIA, under the appropriate symbol.

10. The two reviewers should then compare their review findings as recorded on their separate Collation Sheets. Where differences in their assessments of the Review Topics occur (at Sub-category, Category, Area and overall levels), the reviewers

should jointly re-examine them with a view to reconciling their findings on a common Collation Sheet. The overall assessment should be supplemented with a brief synopsis (one or two paragraphs) of the environmental impact report's strengths and weaknesses, highlighting, in particular, any key deficiencies which would require correction to bring the Report up to an overall satisfactory ('C' or above) standard.

APPENDIX C: REVIEW TOPICS

Review area 1 : Description of the development, the local environment and the baseline conditions.

Review category 1.1: Description of the development: The purpose(s) of the development should be described as should the physical characteristics, scale and design. Quantities of materials needed during construction and operation should be included and, where appropriate, a description of the production processes.

1.1.1 The name of the applicant and address must be included.

1.1.2 The purpose(s) and objectives of the development should be explained.

1.1.3 A description and nature of the activity or development must be included.

1.1.4 A description of the site, design, size, scale and all relevant phases of the proposed development should be described. Diagrams, plans or maps will usually be necessary for this purpose.

1.1.5 There should be information regarding the proposed location on a map at an appropriate scale, showing boundaries of the proposed site, major existing infrastructure, adjacent land uses, and any important environmental features (e.g. rivers).

1.1.6 Where appropriate, the nature of the production processes and technology, intended to be employed, in the completed development should be described with the means of a schematic drawing.

1.1.7 The expected rate of production should be included.

1.1.8 The nature and quantities of raw materials needed during both the construction and operational phases should be described;

1.1.9 In regard to the raw materials an indication of its sources and availability especially of water should also be included.

Review category 1.2: Site description: The on site land requirements of the development should be described and the duration of each land use.

1.2.1 A site plan of the project illustrating the location of existing buildings and facilities, proposed components of the project, and any infrastructure required to service the project (roads, rails, etc.) must be clearly shown on a map

1.2.2 The uses to which this land will be put should be described and the different land use areas demarcated.

1.2.3 The estimated duration (start and completion date) of the construction phase, operational phase and, where appropriate, decommissioning phase should be given.

1.2.4 The number of workers and/or visitors entering the development site during both construction and operation should be estimated.

1.2.5 Their access to the site and likely means of transport should be given.

1.2.6 The infrastructure required servicing the project and means of transporting (e.g. roads, rails, etc) raw materials and products to and from the site and the approximate quantities involved should be described.

Review category 1.3: Wastes: The types and quantities of wastes which might be produced should be estimated, and the proposed disposal routes to the environment described.

[NB: Wastes include all residual process materials, effluents and emissions. Waste energy, waste heat, noise etc, should also be considered.]

1.3.1 The types of solid waste, liquid effluent, and gaseous emissions should be estimated.

1.3.2 The ways in which it is proposed to handle and/or treat these wastes and residuals should be indicated.

Review category 1.4: Environmental description: The area and location of the environment likely to be affected by the development proposals should be described.

1.4.1 The environment, expected to be affected, by the development should be indicated with the aid of a suitable map of the area.

A description of the following is required:

1.4.2 Biophysical description of the site, including the physical (relevant physical features and characteristics, such as landscape features, dynamics and patterns)

1.4.3 Biological (such as ecological processes and functions, species presence and seasonality, species interrelationships, and habitat)

1.4.4 Social characteristics (such as patterns of land use, resources use, present land uses and patterns of other human disturbance).

Note: Only the environmental elements within the study area that is relevant to the project need to be identified and evaluated.

1.4.5 Cumulative impacts should be included in the report. These may be caused by, for example, the dispersion of pollutants, infrastructural requirements of the project, traffic, effects on human health, socio-economic conditions, physical and cultural resources etc.

Review category 1.5: Baseline conditions: A description of the affected environment as it currently is and as it could be expected to develop if the project were not to proceed, should be presented.

1.5.1 The important components of the affected environments should be identified and described.

1.5.2 Using the basic information on the project and the existing environment, potential links between them should be identified, the question "how, where and when could the project's activities interact and affect the environment" should be answered.

Review area 2 : Identification and evaluation of key impacts

Review category 2.1: Definition of impacts: Potential impacts of the development on the environment should be investigated and described. Impacts should be broadly defined to cover all potential effects on the environment and should be determined as the predicted deviation from the baseline state.

2.1.1 A description should be given of the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project.

2.1.2 The above types of effect should be investigated and described with particular regards to identifying effects on or affecting; human beings, flora and fauna, soil, water, air, climate, landscape, material assets, cultural heritage (including architectural and archaeological heritage) and the interactions between these.

2.1.3 Consideration should not be limited to events, which will occur under design operating conditions. Where appropriate, impacts, which might arise from non-standard operating conditions, due to accidents, should also be described.

2.1.4 The impacts should be determined as the deviation from baseline conditions, i.e. the difference between the conditions, which would obtain if the development were not to proceed and those predicted to prevail as a consequence thereof.

Review category 2.2: Identification of impacts: Methods should be used which are capable of identifying all significant impacts.

2.2.1 The project must be divided into four phases (Pre-construction-, Construction-, Operational- and Decommissioning phase) from which impacting activities can be identified. Note that all four phases is not always applicable to al the kinds of development but this must be indicated very clearly.

2.2.2 All the possible significant impacts from each phase must be identified.

Review category 2.3: Scoping: Not all impacts should be studied in equal depth. Key impacts should be identified, taking into account the views of interested parties, and the main investigation centred on these.

2.3.1 There should be a genuine attempt to contact the general public and special interest groups, this must be done through a notice/ advertisement in the local or national paper, an example of the notice must be included in the report.

2.3.2 In the report there must also be a description of the onsite notice that was placed on the proposed development site.

2.3.3 The parties that will be affected by the proposed activity or development must be identified for example people who will loose their water supply during construction.

2.3.4 The parties that have an interest in the proposal(s) or the environment(s) under consideration must be identified for example the Department of Labour or Health.

2.3.5 The establishment and record of the procedure by which the identified and non-identified interested and affected parties were afforded the opportunity to participate at all appropriate stages of the preparation of the environmental impact report must be described.

2.3.6 The provision for interested and affected parties to express their views (within a stated time period so that the decision-making process is not delayed) about

the scope of the environmental impact report, including alternatives and issues that were investigated must be described.

2.3.7 A list of issues that were identified as being of concern to interested and affected parties must be included.

2.3.8 Notification criteria, which entails the reason for their participation in the various stages of the process, where the report can be obtained, where it can be examined (libraries), where and to whom the comments on such reports should be send to, the specified period for receiving comments must be included.

2.3.9 A record of all the views of and correspondence with interested and affected parties is to form an addendum to the report.

2.3.10 Were the interested parties requested comments within a stated time period could be found.

2.3.11 Key impacts should be identified and selected for more intense investigation.

Review category 2.4: Prediction of impact magnitude: The likely impacts of the development on the environment should be described in exact terms wherever possible.

2.4.1 The standard method – provided in the guideline document concerning the nature of the impact, extent, duration, intensity and probability – or other criteria used to predict impact magnitude should be described.

2.4.2 Where possible, predictions of impacts should be expressed in measurable quantities with ranges and/or confidence limits as appropriate (with the help of the criteria provided in the guideline document e.g. Nature of the impact, Extent, Duration, Intensity and Probability)

Review category 2.5: Assessment of impact significance: The expected significance that the projected impacts will have for society should be estimated. The sources of quality standards, together with the rationale, assumptions and value judgements used in assessing significance, should be fully described.

2.5.1 The significance of the impacts on the affected community and the society in general should be described; these descriptions may include the effects on public health or risk of life and the size of the affected community.

2.5.2 The significance of an impact should be assessed; account should be taken of the nature, duration, intensity, extent and probability of the impact in conjunction with national and local societal values.

2.5.3 A description of the proposed method of assessing the significance of the impacts should be given thus the rating and ranking of impacts to attach values to impacts.

Review area 3: Alternatives and mitigation

Review category 3.1: Alternatives: Feasible alternatives to the proposed project should have been considered. These should be outlined in the Statement, the environmental implications of each presented, and the reasons for their rejection briefly discussed, particularly where the preferred project is likely to have significant, adverse environmental impacts.

3.1.1 The method used to identify the alternatives must be clearly described for example informal discussions with authorities, overlay maps that indicate different environmental and socio-economic factors, brainstorming or the Delphi technique or others.

3.1.2 An analysis of the range of alternatives (processes, demand, activity, scheduling, input and no-go) should be undertaken to decide which ones should be carried out for further investigation and which ones should be discarded. This analysis must be described.

3.1.3 A minimum of two alternatives should be investigated in further detail.

3.1.4 The main environmental advantages and disadvantages, the extent and significance, the possibility for mitigation of these alternatives should be discussed and the reasons for the final choice given.

Review category 3.2: Scope and effectiveness of mitigation measures: All significant adverse impacts should be considered for mitigation. Evidence should be presented to show that proposed mitigation measures would be effective when implemented.

3.2.1 Mitigation measures and the extent to which it will influence the significance and status of each impact must be described.

3.2.2 Mitigation methods considered, should include for instance: alternative ways of meeting the need, improving monitoring and management, monetary

compensation, replacing of e.g. wetlands by constructing other wetlands, relocating villages or people displaced by projects and rehabilitating sites, changes in planning and design and the provision of alternative facilities as well as pollution control.

3.2.3 It should be clear when and how mitigating measures should be done.

3.2.4 An indication of the effectiveness of these measures must be included.

Review area 4: Communication of results.

Review category 4.1: Layout: The layout of the Report should enable the reader to find and assimilate data easily and quickly. External data sources should be acknowledged.

4.1.1 There should be an introduction briefly describing the project, the aims of the environmental assessment and how those aims are to be achieved.

4.1.2 Information should be logically arranged in sections or chapters and the whereabouts of important data should be signalled clearly.

4.1.3 When data, conclusions or quality standards from external sources are introduced, the original source should be acknowledged at that point in the text and in a reference.

Review category 4.2: Presentation: Care should be taken in the presentation of information to make sure that it is accessible to the non-specialist.

4.2.1 Information should be presented so as to be comprehensible to the non-specialist. Tables, graphs and other devices should be used as appropriate. Unnecessarily technical or obscure language should be avoided.

4.2.2 The statement should be presented as an integrated whole. Summaries of data presented in separately bound appendices should be introduced in the main body of text.

Review category 4.3: Emphasis: Information should be presented without bias and receive the emphasis appropriate to its importance in the context of the EIR.

4.3.1 Prominence and emphasis should be given to potentially severe adverse impacts as well as to potentially substantial favourable environmental impacts.

4.3.2 The Statement should be unbiased; it should not lobby for any particular point of view. Adverse impacts should not be disguised by euphemisms or platitudes.

APPENDIX D: REVIEW PACKAGE COLLATION SHEET

COLLATION SHEET

Project : .....

Sub Category			Well performed	Satisfactory, minor omissions	Satisfactory, omm, inadequacies	Unsatisfactory	Poor Attempt	Did not attempt	Not Applicable
	Review Area 1	**Yes/no**	**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
1.1	**DESCRIPTION OF THE DEVELOPEMENT**								
1.1.1	Identification of Applicant								
	Name								
	Address								
1.1.2	Purpose and objectives of Development								
	Purpose								
	Objectives								
1.1.3	Description and nature of activity/development								
	Description								
	Nature								
1.1.4	Description of the site								
	Plans								
	Design								
	Size and scale								
	All relevant phases								
1.1.5	Proposed Location								
	Existing Infrastructure								
	Adjacent land uses								
	Important enviromental features								
1.1.6	Diagramatic description of Processes and Technology employed								
	Processes								
	Technology								
1.1.7	Expected rate of production								
1.1.8	Raw materials used during different phases								
	Construction Phase : Nature of raw material								
	Quantity of raw material								
	Production Phase: Nature of raw material								
	Quantity of raw material								
1.1.9	Source and availability of water and materials								
	Raw Materials : Sources								
	Availability								
	Water : Sources								
	Availabilty								
	TOTAL		**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Preliminary Grade								

COLLATION SHEET

Project : .....

	Review Area 1	Yes/no	A	B	C	D	E	F	N/A
1.2	**SITE DESCRIPTION : Description of on site land requirements and duration of each land use**								
1.2.1	**Site Plan**								
	Location of exist buildings & facilities								
	Proposed components								
	Infrastructure								
1.2.2	**Description and demarcation of Land use areas**								
	Description of land use								
	Demarcation of different land use areas								
1.2.3	**Estimated duration of different phases**								
	Construction phase								
	Production Phase								
	Decommissioning Phase								
1.2.4	**Expected number of workers and Visitors**								
	Number of workers : Construction phase								
	Production Phase								
	Number of visitors : Construction phase								
	Production Phase								
1.2.5	**Access to site and likely means of transport**								
	Workers : Access to site								
	Means of transport								
	Residents : Access to site								
	Means of transport								
1.2.6	**Infrastructure required to**								
	Service the project								
	Means of transporting raw material & products								
	Approximate quantities								
	TOTAL		0	0	0	0	0	0	0
	Preliminary Grade								

1.3	**WASTES :**								
1.3.1	**Estimated types and quantities of waste and disposal routes**								
	Solids : Household								
	Industrial								
	Liquid effluent : Contaminated								
	Sewerage								
	Gaseous emmissions								
	Wasted energy								
	Wasted heat								
	Noise								
1.3.2	**Proposed handling/treatment and disposal of wastes and residuals**								
	Handling								
	Ttreating								
	Disposal								
	TOTAL		0	0	0	0	0	0	0
	Preliminary Grade								

COLLATION SHEET

Project : .....

	Review Area 1	Yes/no	A	B	C	D	E	F	N/A
1.4	**Environment description: Area and location likely to be affected by development**								
1.4.1	**Indication of likely area to affected**								
	Map								
	Location shown								
	Area shown								
1.4.2	**Biophysical description of the site :**								
	Landscape features								
	Dynamics (Geology, Soil, Topography)								
	Patterns (Climate, Hidrology)								
1.4.3	**Biological Description of:**								
	Ecological processes and functions								
	Species presence and seasonality								
	Habitat								
1.4.4	**Social characteristics:**								
	Resources use								
	Present land uses								
	Patterns of other human disturbance								
1.4.5	**Cumulative impacts should be included.**								
	Caused by : Dispersion of pollutants								
	Infrastructural requirements								
	Traffic								
	Effects on human health								
	Socio-economic conditions								
	Physical resources								
	Cultural resources								
	TOTAL		0	0	0	0	0	0	0
	Preliminary Grade								
1.5	**Baseline conditions**								
1.5.1	**Important components of the affected environment**								
	Identified								
	Described.								
1.5.2	**Interaction and effect of project activities on the environment**								
	Identify potential links between project and exist environment								
	How do activities interact								
	Where will activities interact								
	When will they interact								
	Effect on environment								
	TOTAL		0	0	0	0	0	0	0
	Preliminary Grade								

	SUMMARY OF PRELIMINARY GRADES - REVIEW AREA 1	A	B	C	D	E	F
1.1	Description Of development	0	0	0	0	0	0
1.2	Site plan	0	0	0	0	0	0
1.3	Waste	0	0	0	0	0	0
1.4	Environmental description	0	0	0	0	0	0
1.5	Base Line condition	0	0	0	0	0	0
	FINAL GRADE REVIEW AREA 1						

COLLATION SHEET

Project : .....

Review Area 2		A	B	C	D	E	F	N/A
2.1 Definition of impacts:								
2.1.1	**Description of effects of project on environment**							
	Direct effects							
	Indirect							
	Secondary							
	Cumulative							
	Short term							
	Medium term							
	Long term							
	Permanent							
	Temporary							
	Positive							
	Negative							
2.1.2	**Identify and describe the effect and interaction of effects on**							
	Human beings							
	Flora and fauna							
	Soils							
	Water							
	Air							
	Climate							
	Landscape (Aesthetics)							
	Material assets							
	Cultural heritage							
	Architectural heritage							
	Archaeological heritage							
2.1.3	**Impacts arising from non-standard operating procedure**							
	Accidents							
	Adverse weather							
2.1.4	**Impacts arising from deviation from Base Line conditions**							
	Difference between conditions if development don't proceed							
	Those predicted to prevail as a consequencis of it							
TOTAL		0	0	0	0	0	0	0
Preliminary Grade								
Review Area 2		A	B	C	D	E	F	N/A
2.2	**Identification of Impacts (all significant impacts must be identified)**							
2.2.1	**Assess impacting activities from 4 distinct phases**							
	Pre-Construction Phase							
	Construction -							
	Operational -							
	Decommisioning --							
2.2.2	**All the possible impacts from each phase must be identified**							
	Pre-Construction Phase							
	Construction -							
	Operational -							
	Decommisioning --							
TOTAL		0	0	0	0	0	0	0
PRELIMINARY GRADE								

COLLATION SHEET

Project : .....

	Review Area 2		A	B	C	D	E	F	N/A
2.3	**Scoping**								
2.3.1	**Supply example of notice published in media**								
	Description of the advertisement								
2.3.2	**Onsite Notice**								
	Description of onsite Notice								
2.3.3	**Identify people affected by proposed development**								
2.3.4	**Identify people that have an interest in**								
	Proposals								
	Environment								
2.3.5	**Describe Procedures whereby affected parties can participate**								
	Opportunities to participate								
2.3.6	**provision for interested and affected parties to express their views**								
	Stated time period								
2.3.7	**List of issues identified as of concern to**								
	Interested & affected parties								
2.3.8	**Notification criteria which entails**								
	Reasons for participation in various stages of the process								
	Where the report can be obtained								
	Where it can be examined								
	Where and to whom comments on reports should be send								
	Specified period for receiving comments								
2.3.9	**A record of all the views as an addendum to the report**								
	Views of and correspondence with interested parties								
	Views of and correspondence with affected parties								
	Addendum to the report.								
2.3.10	**Evidence that**								
	Interested parties were approached for comments								
	Was done within the stated period								
2.3.11	**Key impacts**								
	Should be identified								
	Should be selected for more intense investigation.								
	TOTALS		0	0	0	0	0	0	0
	PRELIMINARY GRADE								

	Review Area 2		A	B	C	D	E	F	N/A
2.4	**Prediction of impact magnitude** (should be described in exact terms where possible)								
2.4.1	**Prediction of impact magnitude**								
	Standard method - (guideline document)								
	Other criteria								
2.4.2	**Express predictions of impact in**								
	Measurable quantities								
	TOTAL		0	0	0	0	0	0	0
	PRELIMINARY GRADE								

COLLATION SHEET

Project : .....

	Review Area 2	A	B	C	D	E	F	N/A
2.5	**Assessment of impact significance**							
2.5.1	**Description of significance of impact on affected community**							
	Effects on public health							
	Size of affected community							
2.5.2	**Significance of impact in terms of local and national societal values**							
	Assessed							
	Account should be taken of nature, duration, intensity extend and probability							
2.5.3	**Proposed method of assessing significance**							
	Rating and ranking of impacts to attach Impact values							
	TOTAL	0	0	0	0	0	0	0
	PRELIMINARY GRADE							

	SUMMARY OF PRELIMINARY GRADES- REVIEW AREA 2	A	B	C	D	E	F
2.1	Definition of impacts:	0	0	0	0	0	0
2.2	Identification of Impacts	0	0	0	0	0	0
2.3	Scoping	0	0	0	0	0	0
2.4	Prediction of impact magnitude	0	0	0	0	0	0
2.5	Assessment of impact significance	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0
	FINAL GRADE REVIEW AREA 2						

	Review Area 3	A	B	C	D	E	F	N/A
3.1	**Feasible alternatives should have been considered**							
3.1.1	**Description of methods used to identify alternatives**							
	Discussions with authorities (examples)							
	Overlay maps							
	Brainstorming							
	Delphi technique							
	Others							
3.1.2	**Description of analyses of range of alternatives**							
	Has a range of alternatives been given							
	Analysis must be described							
3.1.3	**Minimum of two (2) alternatives should be investigated**							
	In further detail							
3.1.4	**Discussion and reasons for final choice**							
	Main environmental advantages and disadvantages							
	Extent and significance							
	Posibility for mitigation of these alternatives							
	Reasons for final choice							
	TOTAL	0	0	0	0	0	0	0
	PRELIMINARY GRADE REVIEW AREA 3.1							

COLLATION SHEET

Project : .....

	Review Area 3		A	B	C	D	E	F	N/A
3.2	**Scope and effectiveness of mitigation measures**								
3.2.1	**Description of mitigation measures and it's influence on**								
	Significance of each impact								
	Status of each impact								
3.2.2	**Mitigation measures considered should include**								
	Alternative ways of meeting the need								
	Improving monitoring and management								
	Monetary compensation								
	Replacing of eg wetlands by constructing others								
	Relocating villages or displaced people								
	Rehabilitating sites								
	Changes in planning and design								
	Provision of alternative facilities								
	Pollution control								
3.2.3	**Mitigation measures must be clearly defined**								
	When								
	How it should be done								
3.2.4	**Indication of effectiveness of these measures**								
	TOTAL		0	0	0	0	0	0	0
	PRELIMINARY GRADE REVIEW AREA 3.2								

	SUMMARY OF PRELIMINARY GRADES- REVIEW AREA 3	A	B	C	D	E	F
3.1	Feasible alternatives should have been considered	0	0	0	0	0	0
3.2	Scope and effectiveness of mitigation measures	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0
	FINAL GRADE REVIEW AREA 3						

	Review Area 4	Yes/no	A	B	C	D	E	F	N/A
4.1	**Layout of the report**								
4.1.1	**Introduction**								
	Briefly describing the project								
	The aims of the environmental assesment								
	How aims are to be achieved								
4.1.2	**Arrangement of information**								
	Logically in sections/ chapters								
	Whereabouts of important data clearly defined								
4.1.3	**External Sources**								
	Original source must be acknowledged at that point in text								
	and in reference								
	TOTAL		0	0	0	0	0	0	0
	PRELIMINARY GRADE REVIEW AREA 4.1								

COLLATION SHEET

Project : .....

	Review Area 4	Yes/no	A	B	C	D	E	F	N/A
4.2	**Presentation**								
4.2.1	**Presentation of information**								
	Comprehensible to non specialist								
	Appropriate tables, graphs and other devices								
	Unneccessary technical language avoided								
	Unneccessary obscure language avoided								
4.2.2	**Statement as an integrated whole**								
	TOTAL		0	0	0	0	0	0	0
	PRELIMINARY GRADE REVIEW AREA 4.2								

	Review Area 4	Yes/no	A	B	C	D	E	F	N/A
4.3	**Emphasis (Info should be represented without bias)**								
4.3.1	**Prominence and emphasis given to**								
	Potentially severe and adverse impacts								
	Substantially favourable environmental impacts								
4.3.2	**Statement must be unbiased**								
	Should not lobby for any particular point of view								
	Adverse impacts should not be disguised by Euphemisms or platitudes								
	TOTAL		0	0	0	0	0	0	0
	PRELIMINARY GRADE FOR REVIEW AREA 4.3								

	SUMMARY OF PRELIMINARY GRADES- REVIEW AREA 4	A	B	C	D	E	F
4.1	Layout of statement	0	0	0	0	0	0
4.2	Presentation	0	0	0	0	0	0
4.3	Emphasis	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0
	FINAL GRADE REVIEW AREA 4						

	SUMMARY OF ALL REVIEW AREAS	A	B	C	D	E	F
1	**Description of Project**	0	0	0	0	0	0
2	**Identification and Development of key impacts**	0	0	0	0	0	0
3	**Alternatives and Mitigation**	0	0	0	0	0	0
4	**Communication of results**	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0
	FINAL GRADE REVIEW FOR EIA						

COLLATION SHEET

Project : .....

Comments :

APPENDIX E: LIST OF EIA PROJECTS USED IN THE STUDY.

First round of case studies:

No	Ref. No	Description/ Title	Date (year)
1.	EIA 21/2001 NW	Eskom: Construction of a new substation and power line. Garankuwa Westglass Substation.	2001
2.	EIA 103/99	Exemption: Township Brits Extension 76 development.	1999
3.	EIA 132/2000	EIA for Process for JCM Oil distributors Rustenburg.	2000
4.	EIA 211/99	Application for authorization: For the building rights for a service station development on a portion of portion 53 Bernaum 674. Vryburg district	1999
5.	EIA 91/2000	Application for authorization: Proposed Diesel Depot at Christina.	2000
6.	EIA 99/1754	Water development in Hartbeespoort.	1999
7.	EIA 100/99	Land use change: Portion 90 of the farm Kroondal 304 JQ Rustenburg district.	1999
8.	EIA 221/99	Application for exemption of new proposed power lines and substation replacing the existing power lines and substation at Impala Plats.	1999
9.	EIA 270/99	Proposed Boschoek/ Amplats Residential Development on a farm Boschoek 103 JQ.	1999
10.	EIA 29/2000	Main outfall sewer, sewerage pump station and rising main. Jouberton	2000
11.	EIA 29/2000	Main outfall sewer, sewerage pump station and rising main. Jouberton	2000
12.	EIA 299/2001	Draft scoping report: A portion of a portion 519 of the farm Vyfhoek 428 IQ, North West Province. Rezoning from agriculture to business.	2000

Second round of case studies:

No	Ref. No	Description	Date (year)
1.	EIA 84/2001 NW	Baillie Park Base station – Vodacom telecommunication tower.	2001
2.	EIA 91/2000 NW	Diesel Depot, Christiana	2000
3.	EIA 225/2000 NW	Eskom power line, Vaal Reefs	2000
4.		Portion of remainder of portion 45 of the farm Krokodildrift 446 JQ	
5.	EIA 100/2001 NW	Underground hexane tank, Brits.	2001
6.	EIA 46/2000 NW	Filling station Klerksdorp	2000
7.	EIA 190/2001	Construction small office Bakgatla Gate.	2001

8.	EIA 100/99 NW	Temporary accommodation camp for mine labourers. Kroondal.	1999
9.	EIA 103/99 NW	Establishment of proposed township. Brits.	1999
10.	EIA 125/2001 NW	Bulk water main and outfall sewer. Freedom Park.	2001
11.	EIA 76/2001 NW	Underground fuel storage tank. Bourbon street Brewery. Potchefstroom.	2001
12.	EIA 67/2000 NW	Upgrading waste water treatment facility. Stilfontein.	2000
13.	EIA 137/2001 NW	Police station, Klipgat.	2001
14.	EIA 109/2001 NW	New powerline, Caribbean Beach Holiday Resort, Hartebeespoort.	2001
15.	EIA 185/2001 NW	Cell C cellular rooftop antennas and base station. Potchefstroom.	2001
16.	EIA 189/2001 NW	Establishment of proposed township, Jouberton.	2001
17.	EIA 52/2001 NW	Water Supply. Boshoek.	2001
18.	EIA 60/2001 NW	Raw water supply. Borolelo.	2001
19.	EIA 240/2000 NW	Eskom powerlines. Venterdorp area.	2000
20.	EIA 86/2001 NW	Vodacom base station. Odi.	2001
21.	EIA 118/2001 NW	Establishment of proposed township, Boitekong.	2001
22.	EIA 102/2001 NW	Upgrading filling station. Boikhutso.	2001
23.	EIA 61/2001 NW	Temporary fuel storage facility. Platinum Highway, Brits.	2001
24.	EIA 44/2001 NW	MTN telecommunication mast, Marikana.	2001
25.	EIA 003/2002 NW	Integrated energy centre, Dithakong.	2002
26.	EIA 006/2001 NW	Casino and hotel complex. Klerksdorp.	2001

APPENDIX F: AUTHOR'S DETAILS AND EDITOR'S INSTRUCTIONS.

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Editors instructions:

The South African Geographical Journal considers publication of original material on all aspects of geography, both physical and human, with particular relevance to southern Africa. Material published includes peer-reviewed research papers, review articles on specific topics of geographical interest and short research notes, and book reviews. The major requirement for publication is the significance and value of the work for the development for geography and geographers. Authors receive a complimentary copy of the Journal and 25 reprints free of charge; additional reprints may be ordered.

Full-length articles should not normally exceed 7 500 words in length. Manuscripts should be typed double-spaced with wide margins, and must be submitted in triplicate. The title, the author's name(s) and affiliation(s) should appear on a separate sheet.

Original photographic positives of all figures, together with photocopies of figures to accompany the two reviewer copies of the text, must accompany all submissions. All

figures should be sized to fit either a double or single column of the Journal when reproduced full-size, or reduced by a factor or two. Computer drawn graphics are acceptable only if they are of comparable quality of those produced conventionally; linework must be clear and readily reproducible, and computer characters should be replaced with typeset lettering. Figures will be reviewed by our Cartographic Advisor, and those not meeting our standards will be returned for revision. Figure captions should not accompany the figures, but be typed on a separate sheet.

Tables should be included at the appropriate point in the text.

Layout and referencing MUST follow the style of the Journal. Incorrectly referenced papers will be returned to the authors for correction.

Submissions must be accompanied by an indication of the word length, and by a statement that the paper has not been and will not be submitted concurrently for publication elsewhere.

Detailed instructions and a Guide for Authors are obtainable from The Editor.

APPENDIX G: DEFINITIONS AND TERMS

- **Alternatives** – A possible course of action, in place of another, that would meet the same purpose and need (of proposal). Alternatives can refer to any of the following but are not limited thereto: alternative sites for development, alternative projects for a particular site, alternative site layouts, alternative designs, alternative processes and materials. In Integrated Environmental Management the so-called 'no-action' alternative may also require investigation in certain circumstances (South Africa, 1998).

- **Decision-making** – One of the main purposes of EIA is to help make better decisions, and it is therefore important to assess the performance of EIA to date in relation to this purpose (Glasson, 1999). The decision under consideration in an EIA process is whether an agency should approve, permit, or fund a proposal. A decision maker takes factors into consideration in making his or her decision of which environmental impact is only one. (Kreske, 1996)

- **EIA authorities** – The provincial environmental authorities have been designated as the relevant authority and will receive all applications for consideration. Where local authority has been designated as the relevant authority, the application must be submitted to that authority. In certain instances (mentioned in the Guideline document) the relevant provincial authority will refer the applications to the national Department of Environmental Affairs and Tourism, although applications must still be lodged with the relevant provincial authorities. (South Africa, 1998)

- **Environmental Assessment (EA)** – a systematic process of evaluating and documenting information on the potentials, capacities, and functions of natural systems and resources in order to facilitate sustainable development planning and decision-making in general, and to anticipate and manage the adverse effects and consequences of proposed undertakings in particular (Glazewski, 2000). Kreske (1996) defined EA as a concise public document that analyses the environmental impacts of a proposed federal action and provides sufficient evidence to determine the level of significance of the impacts.

- **Environmental Impact Assessment (EIA)** - Fuggle and Rabie (1999) define environmental impact analysis as "... a process contained in environmental impact assessment by which the environmental effects of a project are determined and analysed". The South African Guideline document for EIAs refers to it as a process of examining the environmental effects of development. (South Africa, 1998)

- **Environmental Impact Report (EIR)** – A report describing the process of examining the environmental effects of a development proposal, the expected impacts and the proposed mitigating measures (South Africa. 1998).

- **Environmental Impact Statements (EIS)** – The environmental impact statement documents the information and estimates of impacts derived from the various steps in the process. Prevention is better than cure; an EIS revealing many significant unavoidable adverse impacts would provide valuable information that could contribute to the abandonment or substantial modification of a proposed development action. Where adverse impacts can be successfully reduced through mitigation measures, there may be a different decision. (Glasson, 1999).

- **Environmental Management Programme (EMP)** – An "environmental management programme" can be described as a dynamic set of objectives, targets, actions and responsibilities prepared for the management of a particular project or area. The mining industry in South Africa is not included in the conventional EA process but has developed its own environmental management procedure. The carrying out of prospecting and mining activities is according subject to the compilation of Environmental Management Programme Reports (EMPRs). (Glasson, 1999)

- **Evaluation of significance** – The process of weighing information, the act of making value judgments or ascribing values to data in order to reach a decision. (South Africa, 1998). Criteria for the significance include the magnitude and likelihood of the impact and its special and temporal extent, the likely degree of

the affected environment's recovery, the value of the effected environment, the level of public concern, and political repercussions. (Glasson, 1999:140)

In South Africa the term Environmental Impact Report (EIR) is used for the same purpose as the term EIS in the UK.

- **Integrated Environmental Management (IEM)** – IEM (it is a process) provides an integrated approach for environmental assessment, management, decision making and to promote sustainable development and the equitable use of resources. Principles underlying IEM provide for a democratic, participatory, holistic, sustainable, equitable and accountable approach (South Africa, 1998).

- **Key Issues** – Key issues are identified in the scoping phase of an EIA, the process of scoping is that of deciding, from all of a project's possible impacts and from all the alternatives that could be addressed, which are significant ones (Glasson, 1999). These significant ones are known as the key issues.

- **Mitigation & impact management** – Measures designed to avoid, reduce or remedy adverse impacts. (South Africa. 1998). It is also defined as methods used to mitigate, or reduce, adverse impacts to the environment. The proposed project itself may contain features that result in mitigation of potential environmental impacts. (Kreske, 1996)

- **Public participation** – One of the aims of the EIA process is to provide information about a proposal's likely environmental impacts to the developer, public and decision-makers, so that a better decision may be made. Consultation with the public and statutory consul tees in the EIA process can help to ensure the quality, comprehensiveness and effectiveness of the EIA, as well as to ensure that the various groups' views are adequately taken into consideration in the decision-making process (Glasson, 1999).

- **Record of decision (ROD)** – when the review of the EIR is completed, the relevant authority will decide to either issue an authorisation with or without conditions, or reject the application. A Record of Decision will be issued for this

purpose (South Africa, 1998). Kreske (1996) describes a record of decision as a public document signed by the agency decision maker at the time of a decision. The ROD states the decision, alternatives considered, the environmentally preferable alternative or alternatives, factors considered in the agency's decision, mitigation measures that will be implemented, and a description of any applicable enforcement and monitoring programs.

- **Relevant Authority (RA)** –The environmental authority on national, provincial or local level entrusted in terms of the Constitution and in terms of the designation of powers in Notice No. R.1184 of 5 September 1997 with the responsibility for granting approval to a proposal or allocating resources (South Africa, 1998).

- **Scoping** – the process of identifying the significant issues, alternatives and decision points which should be addressed by a particular EIR, and may include a preliminary assessment of potential impacts (South Africa, 1998).

- **Screening** – - to determine whether or not a proposal should be subject to EIA and, if so, at what level of detail (IAIA, 1999)

- **Strategic Environmental Assessment (SEA)** – SEA expands EIA from projects to policies, plans and programmes (Glasson, 1999).