THE PRACTICAL APPLICATION OF THEORETICAL CONCEPTS OF INTEGRATED ENVIRONMENTAL MANAGEMENT (IEM): A CASE STUDY OF A PROPOSED ROCK QUARRY IN A PERI-URBAN AREA.

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PREFACE

This dissertation was prepared by Ms J Larsen a part-time masters student in the Faculty of Science at the University of Cape Town. It forms part of the requirements for the degree of MSc in Environmental Science and was supervised by Professor R Fuggle, Head of Department of the Department of Environmental and Geographical Science.

The dissertation describes and examines the practical application of theoretical concepts of integrated environmental management (IEM) by analyzing a case study. The case study is the proposed development of a rock quarry in a peri-urban area near Johannesburg, South Africa.

The writer is an employee of the consultants who conducted the environmental study, and was closely involved with the case study from its inception to the receipt and compilation of comments on the draft environmental impact assessment (EIA) report. Subsequent to this, the writer has had limited involvement, but has remained in touch with the progress of the case study.

Professor Fuggle has been involved in the case study in the capacity of external review consultant, which included the review of the draft and final EIA reports. He is also the Chairman of the Council for the Environment's Committee for Environmental Management Systems.

The writer wishes to thank the following people for their contributions to this dissertation:

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SYNOPSIS

This dissertation forms part of the requirements for the degree of MSc in Environmental Science and was supervised by Professor R Fuggle, Head of Department of the Department of Environmental and Geographical Science. The dissertation describes and examines the practical application of integrated environmental management (IEM) by analyzing a case study.

IEM is a methodology developed in South Africa under the direction of the Council for the Environment, the purpose of which is to incorporate environmental considerations into all aspects of planning and development. A guideline document on the implementation of IEM was published in 1989 (Council for the Environment, 1989(A)), and later updated and a set of six guideline documents was published in 1992 (Department of Environment Affairs, 1992 (A) to (F)).

The case study is the proposed development of a rock quarry in a peri-urban area near Johannesburg, South Africa. It was implemented in accordance with the original version of IEM. The availability of the updated guidelines and the experience gained in the case study provided potential for comparison between the original and updated procedures. Other points of relevance regarding the case study are that the site is situated in a rapidly developing area, and could therefore cause significant social impacts; the study was conducted at the most detailed level of the original IEM procedure (Class 1); and involved public participation, which has been emphasised in the updated IEM procedure.

The case study reached the end of the assessment stage in November 1992, and was still in the decision stage in February 1993. Therefore the dissertation deals mainly with the initial part of the IEM procedure (proposal generation and assessment stages), and only briefly with the decision and implementation stages.

Aims and objectives

The purpose of the dissertation is to make information on the practical application of IEM in South Africa and an example of a case study available to those applying IEM to developments, with a view to disseminating such information and promoting and improving the use of IEM.

The overall aim of the project is to critically assess the implementation of IEM procedures by analyzing a case study. The intention is that the presentation and analysis of this case study will provide a useful example of the early implementation of IEM in South Africa. To contribute to this goal, practical difficulties experienced in applying the procedure are identified and described, and recommendations as to how such difficulties may be overcome in future projects are given.

The objectives are to analyze each stage of the case study in relation to the original and updated versions of IEM. The views of those involved in the study were obtained by means of a questionnaire, and used as a basis for drawing conclusions.

Case study

The case study is described to provide the reader with general background to the project being examined in the dissertation, and to familiarize the reader with the particular circumstances pertaining to it. The proposed development is an existing sand quarry, and the proposed action is to extend activities on the site to include quarrying of rock. The need of the proponent is the provision of a new source of aggregate to continue supplying established customers in the north western sector of the Witwatersrand. Major alternatives which could realistically meet this need were identified during the case study to be:

- Mine sand and rock at the existing sand quarry as proposed.
- Mine sand at the existing sand quarry site and rock elsewhere.
- Mine sand and rock at the existing sand quarry site as proposed, but locate the crusher off-site.

Comparison of original and updated versions of IEM

The IEM process is reviewed, firstly by describing the background to its development and then by comparing the original and updated versions of the process. The conclusion from the comparison is that the two versions of IEM are based on the same philosophy and for the most part the elements are common to both. However these elements appear in a different order, or

in a greater or lesser degree of detail. Thus they are essentially similar but with different emphases.

The significance of the above conclusion for the case study is that, although the case study was conducted according to the original IEM procedure, the publication of the amended version does not invalidate the case study in any way.

Questionnaire

A questionnaire was compiled and sent to individuals from the proponent and consulting company who were involved in the case study. The purpose of the questionnaire was to provide a set of data on the adequacy of the study independent of the writer, who was involved in the case study.

Those individuals from the proponent and the consultant who were meaningfully involved in the case study were chosen as potential respondents and asked to complete the questionnaire. The questionnaire was intended to gain the respondent's personal views on whether the case study was implemented according to the Council for the Environment's guidelines on IEM, whether the case study was successful, what practical difficulties were encountered and how these could possibly be overcome in future projects.

The questionnaire was compiled using the original IEM document as a basis, including the generic terminology of the document. Confidentiality of the respondents was maintained. Out of a total of nine questionnaires distributed, seven of these were returned, giving a response rate of 78%.

Analysis of questionnaire responses

The answers to the questions on the proposal generation and assessment stages were analyzed. The responses to the questionnaire are used to analyze the case study firstly in terms of its compliance with the original IEM guidelines, and secondly to compare it to the updated IEM procedure. The relative success of each step of the project was analyzed and recommendations were made by the respondents of ways in which difficulties experienced may be overcome in

future projects. These recommendations related to procedural changes or to the practical approach taken in the project.

Overall Conclusions and Recommendations

The case study did not satisfy the requirements of the original IEM procedure in the proposal generation stage, in fact the IEM procedure was only commenced for the case study after the proposal generation stage had passed. The requirements for the assessment stage were generally complied with. Modifications that were implemented during the case study were generally in line with the subsequent changes made to the IEM process, and recommendations supported the updated procedure overall.

Recommendations centred around the need for education of the various parties involved in IEM, namely developers, authorities and the public. If regulations are promulgated making IEM a legal requirement, it was recommended that an intensive education programme be undertaken as there is widespread ignorance of both the original and updated versions of IEM in all spheres.

The likelihood of the case study complying with the updated IEM requirements for the decision and implementation stages are high, if the recommended education of relevant authorities takes place.

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1 INTRODUCTION

1.1 Background to the Dissertation

Integrated Environmental Management (IEM) was developed under the auspices of the South African Council for the Environment and was first published in 1989. IEM is a procedure or methodology that aims to incorporate environmental considerations into all stages and aspects of planning and development, and was designed to apply to projects, plans and policies. The Council for the Environment requested companies, authorities, consultants and individuals to implement the procedure on a voluntary basis, and to provide feedback to the Council so that the process could be amended and improved and finally be adopted as a legislative requirement.

In response to the above request from the Council, the IEM process was applied to various projects and developments throughout South Africa. One of these was the proposed development of a rock quarry as an extension of an existing sand quarry in a peri-urban area. The IEM process was suggested by a firm of consultants to the developer (or proponent as termed in IEM), and was adopted for the remainder of the project, which reached the end of the assessment stage in November 1992.

Independent of this study, the Department of Environment Affairs commissioned a project to review and refine the IEM procedure, and the final reports containing the guidelines for the updated IEM procedure were published in July 1992.

This dissertation examines as a case study of the implementation of the IEM process, the proposed development described above . The purpose of the dissertation is to make information on the practical application of IEM in South Africa and an example of a case study available to those applying IEM to developments, with a view to disseminating such information and promoting and improving the use of IEM.

1.2 Background to the Study

The project under discussion is one of the first environmental studies that was undertaken in accordance with the South African IEM procedure, and is therefore of interest as an example of the application of IEM. Points of particular relevance are:

- The proposed rock quarry is situated in a rapidly developing area, and therefore has potentially significant impacts on the social environment.

- The study undertaken is at a Class 1 level, which is the most detailed level in the original IEM procedure. It is therefore a major environmental study, and a useful example to those undertaking studies of this scale.

- Public participation in development projects is a relatively new concept in South Africa, and discussion of the practicalities of involving the public will be of interest to those who undertake such studies in the future. This aspect of IEM has become more important in the updated version of IEM, as it now forms at least the initial part of every level of investigation.

- The EIA for the proposed rock quarry was undertaken in accordance with the 1989 IEM procedure, and therefore provides an interesting comparison between the application of the original version of the IEM procedure, and the updated version published in July 1992.

1.3 Statement of Objectives

The practical application of the IEM procedure, as presented in the Council for the Environment's document published in 1989, will be studied. Factors to be taken into account by those undertaking environmental studies and applying the principles of IEM will be discussed, and recommendations will be given as to how improvements may be achieved.

1.3.1 Overall Aim

The aim of the project is to critically assess the implementation of IEM procedures by analyzing a case study. Practical difficulties in applying the procedure will be identified and described, and recommendations as to how such difficulties may be overcome will be given. The intention is that the presentation and analysis of this case study will provide a useful example of the early implementation of IEM in South Africa.

1.3.2 Specific Objectives

Each stage of the case study, starting with the proposal generation stage and ending with the publication of the final EIA report, is analyzed in relation to the original and updated versions of IEM. The views of those involved in the study were obtained by means of a questionnaire, and used as a basis for drawing conclusions. The two versions of the IEM procedure will be analyzed in an integrated manner, and the specific aspects to be considered for each version are described further in Section 2 on methodology.

1.4 Scope of Dissertation

This dissertation forms part of the requirements for the masters degree in environmental science, and is allocated a time period of approximately one year for completion. The project deals primarily with the initial part of the IEM procedure, namely the first two stages of proposal generation and assessment as the case study has only progressed to this point to date (February 1993). Comments are made on how the remaining stages of decision and implementation are likely to progress, based on what has taken place during the initial stages.

1.5 Limitations or Constraints

As stated above in Section 1.4, the case study had only progressed as far as the end of the assessment stage at the time this dissertation was written, and therefore only the first two stages of the original IEM process have been analyzed in depth. The questionnaire was distributed to all those who had been meaningfully involved in the case study. Of the nine

eligible individuals (excluding the writer and the review consultant), only seven responded, and only two of the seven represented the perspective of the proponent. These factors indicate that inferential statistical analysis of the questionnaire responses is not desirable.

1.6 Plan of Development

This dissertation is divided into 11 Sections. The first section (Section 1) provides an introduction and is followed by a description of the methodology undertaken for the dissertation (Section 2). The case study itself is described in Section 3, giving the reader an understanding of the particular circumstances pertaining to it. Section 4 contains a review of the IEM process, including a background to its development and a comparison of the original and updated versions of the process. An outline of the way in which comments from those involved in the study were obtained by means of a questionnaire is given in Section 5. The rationale behind the decision to use a questionnaire, the way in which it was compiled, how potential respondents were selected and the response rate are all dealt with there. The following two sections (6 and 7) comprise the detailed analysis of the answers to the questions on the proposal generation and assessment stages respectively. They are then followed by Sections 8 and 9 in which a comment on how the decision and implementation stages are likely to progress is made. Section 10 contains the conclusions and recommendations of the dissertation as a whole, and Section 11 is the bibliography.

2 METHODOLOGY

This section contains a brief description of the method of investigation used for this dissertation. The main sections are set out and described in more detail below. The report is structured along the lines of the original IEM procedure (Council for the Environment, April 1989(A)), and each of the four stages of the process are examined separately. This is different from the updated IEM version (Department of Environment Affairs, 1992 (A) to (F)) which consists of three stages, as the first two stages of the original IEM process have been combined.

2.1 Outline of Case Study

The case study is described in Section 3 to provide the reader with general background to the project under scrutiny.

2.2 IEM Review

A background to the development of the IEM procedure is provided in Section 4, followed by a comparison of the original and updated versions of the process.

2.3 Comment from those Involved in the Study

A questionnaire was compiled and sent to individuals from the proponent and consultant who were involved in the case study. The purpose of the questionnaire was to gain the respondent's views on the adequacy of the study in comparison to the guidelines laid down for IEM, and thereby to provide a set of data independent of the writer, who was involved in the case study. The method of selection of respondents, the number of questionnaires sent and returned, and the method of analyzing the answers to the questionnaire are described in Section 5.

2.4 Analysis of Proposal Generation and Assessment Stages of the Study

The case study of the proposed development of a rock quarry in a developed area is reviewed from the proposal stage up to the end of the assessment stage, based on the questionnaire responses. The answers to the questionnaire are examined and analyzed, and in this way a comparison between what was done and what was expected is made. A further comparison is made by examining the questions related to the updated IEM procedure.

2.4.1 Comparison to what was intended (Original IEM)

Each stage of the project is compared to the requirements of the original IEM procedure. The analysis is based on the answers to the questionnaires returned by those involved in the case study. The conclusions drawn from this analysis will indicate that, either:

- the requirements were met, or
- they were not met, either because something was not done, or because something additional or different was done.

In addition, the relative success of each step of the project is analyzed and recommendations made by the respondents of ways in which difficulties experienced may be overcome in future projects. These recommendations relate to procedural changes or to the practical approach taken in the project.

2.4.2 Comparison to what IEM has become (Updated IEM)

A second stage of comparison is to compare each stage of the project to the updated version of the IEM procedure, and to evaluate whether the proposed new procedure:

- should itself be modified in the light of experience during this particular case study;

- offers an improvement which is supported by a recommendation arising from the case study;

- introduces an amendment which is not shown to be an improvement by this case study.

Where appropriate, the case study is also compared with theoretical criteria from the literature for a good EIA.

2.5 Comment on the Decision and Implementation Stages

As the project has not yet (February 1993) been through the decision or implementation stages, a comment will be made as to how they may be expected to proceed, based on what has been done in the first two stages.

2.6 Conclusions and Recommendations

Insights based on the findings of the dissertation are set out. Recommendations for future actions are made where appropriate.

3 OUTLINE OF CASE STUDY

This section outlines the case study, with the objective of providing the reader with a general description of the project before the detailed analysis commences. A brief overview of the case study is given in Section 3.1, and a detailed list of the steps taken during the case study are detailed in Table 3.1, along with the corresponding dates on which the steps took place. Further, more detailed, description of the case study related to IEM requirements is given in Section 3.2.

3.1 Overview of Case Study

Please refer to Table 3.1 for a detailed list of steps taken during the case study and the dates on which these steps were taken.

A South African company which supplies construction materials nationally (the proponent) operates a sand quarry near Johannesburg. They wish to extend their operation to quarry rock in addition to sand at the existing sand quarry site, and applied for and were granted a permit to do so from the Department of Mineral and Energy Affairs in 1987, subject to obtaining agreement from their neighbours. The IEM procedure was in the process of being developed at this stage but had not yet been published. The proponent did not develop the rock quarry at that stage, and subsequently decided to apply for a permit to quarry rock in a different, larger area of their property in 1990. By this stage IEM had been officially launched by the Council for the Environment, and guideline documents had been published in 1989 (Council for the Environment, 1989(A) and (B)). The proponent approached an environmental consultant for assistance in applying for a permit in March 1990.

The consultant recommended the adoption of the IEM process, although it was not a legal requirement. The proponent decided to follow IEM, as set out in the documents mentioned above, for the proposed development of the rock quarry. A Class 1 level of assessment was commenced, with a scoping study forming the first step. A draft, and then a final report on the scoping study was produced in June 1990 and November 1990 respectively. This was followed by an environmental impact assessment (EIA). The draft

TABLE 3.1: STEPS TAKEN DURING CASE STUDY

DATE	STEP
1957	Sand quarrying begins at the existing site.
1975	Proponent takes over the Sand Quarry on the existing site.
1979	Proponent acquires permit to mine sand within 50 m of boundary of the property.
1987	Proponent acquires permit to mine rock within 200 m of the boundary of the property, subject to liaison with and the approval of the local residents.
19 March 1990	Proponent contacts Consultants for advice regarding an application to the Department of Mineral and Energy Affairs for a permit to mine rock in a new area on the property.
3 April 1990	Consultants visit site and are briefed on Proponent's requirements. Consultants recommend undertaking a scoping study.
11 April 1990	Proposal to undertake scoping study issued to Proponent by consultants (SRK Proposal 180966).
2 May 1990	Proposal accepted by Proponent and consultants appointed to undertake scoping study.
6 June 1990	Mineral and Energy Affairs no longer requires Proponent to liaise with neighbours, but Proponent decides to continue with scoping study as planned.
14 June 1990	Invitations to public scoping meeting posted to 111 nearest neighbours.
26 June 1990	Public scoping meeting held.
17 July 1990	Draft report on scoping meeting issued (SRK Report 180966/1, dated June 1990).
July 1990	Motivation and request for capital for slimes dam and rock quarry to Board of Directors
12 October 1990	Final date for receipt of comments on draft report on scoping meeting.
14 August 1990	Meeting with local Town Council to discuss proposed quarry.
15, 22 August 1990	Local Ratepayers' Association (RA) submit petition with ± 3000 signatures objecting to the proposed quarry to Dept of Mineral and Energy Affairs and the State President.

TABLE 3.1: STEPS TAKEN DURING CASE STUDY (continued)

DATE	STEP
20 September 1990	Meeting with RA to discuss future public involvement in EIA.
6 November 1990	Proposal prepared for the EIA, based on requirements highlighted by scoping study (SRK Proposal 180966/2). Submitted to Proponent.
19 November 1990	Proposal for EIA accepted by Proponent.
28 November 1990	Final report on scoping meeting issued (SRK Report 180966/2).
Nov '90 to May '91	Environmental impact assessment undertaken.
January 1991	Approval from Board of Directors for the hard rock quarry.
22 January 1991	First Environmental Committee meeting.
3 April 1991	Draft EIA reviewed by external review consultant.
20 May 1991	Draft EIA report issued (SRK Report 180966/3).
1 July 1991	Final date for comment on Draft EIA Report.
August 1991	Comments on Draft EIA Report compiled.
November 1991	Proposal for further work submitted to Proponent (SRK Proposal 180966/3).
	Proposal for further work accepted by Proponent.
Oct '91 to May '92	Further work undertaken.
5 February 1992	Second Environmental committee meeting.
April 1992	Conceptual Rehabilitation plan issued to Government Mining Engineer (SRK Report 180966/4).
July 1992	Review of final report by review consultant.
July 1992	Final EIA issued to Department of Mineral and Energy Affairs (SRK Report 180966/5).
October 1992	Final EIA issued to Interested and Affected Parties (SRK Report 180966/5).

EIA report was issued in May 1991. Comments from interested and affected parties on the draft EIA report were received, and further work was done before the final EIA report was issued to the authorities in July 1992, and the interested and affected parties in October 1992.

3.2 Specific Details of the Case Study

IEM makes use of a number of generic terms to describe groups of people, actions or steps in the process. These are unique for every proposed development, and the specific details pertaining to these IEM terms for this case study are described in the sections that follow.

3.2.1 Proponent

IEM refers to the company, business or authority that wishes to undertake a development action (or proposed development, as it is termed) as the proponent. In the case study the proponent was a South African company that supplies construction material nationally. The proponent owns and operates the existing sand quarry on the site where they propose that the rock quarry be developed.

3.2.2 Authority

The Department of Mineral and Energy Affairs (DM&EA) (central government) has the responsibility of deciding whether or not to grant a permit for a rock quarry under then the Mines and Works Act (No 27 of 1956), now the Minerals Act (No 50 of 1991). They will consult the local authorities who have jurisdiction over various services in the area where the proposed development is situated. In the case study, the local Municipality (Roodepoort), and the bordering Municipality (Randburg), who was responsible for some of the roads bordering the site, were involved.

3.2.3 Purpose or Need

Every proposed development is formulated to meet a need which is identified by the proponent. The purpose or need of the case study is to provide a new source of crushed rock in the north western sector of the region.

Historically the source of crushed rock has been the waste rock dumps of the gold mines in the north west of the region. The drop in production of gold in recent years and the closure of many mines has lead to a decrease in the amount of waste rock generated. Increased use of waste rock in backfilling (a type of support system in underground mines) has also contributed to the decreased amount of waste rock available. In addition, some waste rock dumps are being re-processed to recover gold using more advanced technology than was previously available. These factors have contributed to mine waste rock becoming unreliable as a future source of aggregate, and the need to find a new source of rock in that area.

3.2.4 Alternatives

One of the fundamental aims of IEM is to search for and evaluate alternative ways of meeting the identified need of the developer so that a proposal acceptable to all parties concerned can be found. Therefore a course of action that will meet the need of the proponent, and meet the requirements of the interest groups that are potentially affected is sought.

In the light of the need described in Section 3.2.3, the proponent has six courses of action open to him. These are listed below in Table 3.2, which is adapted from Table 8.1 in the final EIA report prepared as part of the case study (SRK, July 1992, pg 153). Some of these courses of action will meet the identified need of the proponent and others will not. The latter are termed "no go" options. For each option an indication of whether or not it is realistic is given in Table 3.2.

TABLE 3.2 ALTERNATIVE COURSES OF ACTION OPEN TO PROPONENT

ALTERNATIVE	COMMENT	REALISTIC ALTERNATIVES
1. Mine sand and rock at existing sand quarry site as proposed.	-	Yes
2. Mine sand at existing sand quarry site and rock elsewhere.	-	Yes
3. Mine sand and rock at existing sand quarry site as proposed, but locate crusher off-site.	• Impacts of operation will be spread over a larger geographical area than alternative 1 because of the movement of traffic between the two sites. Furthermore, environmental management would be spread over two sites, which can make procedures difficult to implement and manage. • Noise, congestion and fumes from transport of raw material will be additional impacts. • Noise, dust and visual impacts from crushing operation will be displaced to off-site location of crusher. • Noise, congestion and fumes from transport of final product will be displaced from quarry site and centre around off-site location. • Traffic volume from the existing sand quarry site would increase by about 20% since waste products from the process would have to be transported to the off-site facility.	No
4. Mine sand and rock at existing sand quarry site in original permit area.	• Original permit area is not viable as it is partially covered by existing tailings dam. • Original permit is no longer recognised by DM&EA.	No
5. Mine sand only at existing sand quarry site and no rock elsewhere ("no-go" option).	• This is not a viable business decision for the proponent as they will lose their market share in the north-western sector of the region.	No
6. No mining at existing sand quarry site - convert to industrial, commercial, residential and recreational land-use ("no-go" option).	• This is not a real option as proponent will continue to exercise their existing rights to mine sand at the existing sand quarry site.	No

The first two alternatives are considered to be realistic, and were considered further as part of the IEM process. The remaining alternatives were not considered viable, as detailed in Table 3.2. Another IEM principle relates to the recognition of the need for development, and therefore the acceptance that a business which is in possession of rights that allow it to operate should exercise those rights if they do not impinge negatively on other groups to an unacceptable level. Therefore when considering alternative 6, one can say it is unreasonable to expect the proponent to close down the existing sand quarry on the site and change their line of business to property development.

The two alternatives which were considered further in the EIA will have similar environmental impacts, but they will take place in different geographical areas. The general nature of the impacts and differences considered in the EIA are summarised in Table 3.3 which was adapted from Table 8.2 in the final EIA report (SRK, July 1992, pg 154).

TABLE 3.3 EVALUATION AND COMPARISON OF REALISTIC ALTERNATIVES

ALTERNATIVES	REHABILITATION AND END USE	IMPACTS/EFFECTS
1. Mine sand and rock at existing sand quarry site as proposed.	• Open pit area will remain. • Land surrounding open pit will be available for development.	• Noise, dust, visual effects of blasting and crushing operations. • Traffic noise, congestion and fumes from transport to final product. • Potential drop in property values.
2. Mine sand at existing sand quarry site and rock elsewhere.	• The size of the pit is likely to be the same as that proposed at the existing sand quarry site. • There will be more waste stock piles (overburden/sand) because the sand market needs will continue to be met by the existing sand quarry. A greater area of land will require rehabilitation.	• Present impacts of sand quarry will continue. • Impacts as for alternative 1 will be displaced to another geographical area. • A rock quarry elsewhere will displace another land use, whereas at the existing site the proponent is already operating a sand quarry, and will continue to do so.

3.2.5 Proposed Action

The action proposed in the case study was to develop the existing sand quarry into a sand and rock quarry which corresponds to alternative 1 in Tables 3.2 and 3.3. There are a number of reasons why the proponent favours the proposed action above the alternative of developing a new rock quarry on a new site (alternative 2 in Tables 3.2 and 3.3). These reasons were discussed in the EIA report (SRK, July 1992, Section 7.12, pgs 140 to 151), and are summarized below:

- The existing property is large enough to allow sufficient space for a rock quarry to be developed and to leave a buffer zone of 100 to 200 m around the boundary of the property. The likelihood of locating and acquiring a property of similar size is low, and the cost would be prohibitive.

- The location of the existing site is ideal as it is close to established customers and therefore the transport component of the cost of the rock is suitably low. This is very important as aggregate has a relatively low unit price and is required in large quantities for construction ("high volume, low cost"), and therefore the distance it must be transported has a significant influence on the cost to the user (Van Schalkwyk, 1980). An alternative site would of necessity be located further from the customers than the existing site because less developed areas are further from them.

- Most of the overburden material in the area of the proposed rock quarry on the existing site has been removed as part of the sand quarrying operation. The small amount of overburden which remains to be removed and the existing infrastructure on the site would result in cost savings and therefore lower production costs. Waste stockpiles of overburden material will be minimal on the existing quarry site.

- The rock reserves at the existing site have been investigated and have been shown to be adequate, whereas investigations for a different site would have to be commenced.

- The time needed for development of a rock quarry at the existing sand quarry site will be relatively short because, as mentioned above, the presence of suitable reserves has been established, and most of the overburden has been removed.

- The existing site is already disturbed by the activities of the sand quarry.

- The existing site is situated such that the pit of the proposed rock quarry will not be visually intrusive because of the topography. Potentially visually intrusive elements will be the associated infrastructure, which are easier to render aesthetically pleasing through architectural design and screening.

4 COMPARISON BETWEEN THE ORIGINAL AND UPDATED VERSIONS OF IEM

This section contains a review of the available literature on IEM. First a background to the IEM procedure is given in Section 4.1. Then the two versions of IEM are compared in Section 4.2. The basic elements comprising IEM, such as screening, scoping, public participation and review and are dealt with in Sections 4.2.1 to 4.2.6, and a conclusion is drawn in Section 4.2.7.

4.1 Background to the IEM Process

In 1980 the South African government initiated an investigation of environmental conservation in the country, which culminated in the publication of a White Paper on a National Policy regarding Environmental Conservation (WP O-80). This lead to the Environmental Conservation Bill being published for comment in 1981, and promulgated the following year as the Environment Conservation Act (Act 100 of 1982).

The Council for the Environment was established in terms of this Act with the purpose of advising the Minister of Environment Affairs regarding environmental policy and related matters. The Council is supported financially and administratively by the Department of Environment Affairs (DEA). It operates through a number of committees consisting of individuals who are acknowledged as experts on particular subjects. Committee members need not be members of the Council.

The Committee for Environmental Impact Assessment (EIA) was formed in 1984 under the chairmanship of Professor R Fuggle. The purpose of the Committee is to provide advice, specifically with regard to national strategy on how environmental concerns can be introduced into decision making and development. The name of the Committee was changed to the Committee for Integrated Environmental Management in 1988. It will change again to the Committee for Environmental Management Systems in 1993, and will remain under the Chairmanship of Professor Fuggle.

The Committee commenced research which included reviewing the environmental and development expertise, policies and procedures available in South Africa, as well as

overseas. This was done through consultations, meetings and workshops, and other means. The methodology which emerged from the research was termed integrated environmental management (IEM). This term was chosen to convey the broad nature of the process which encompasses environmental planning, assessment and management, as opposed to the term environmental impact assessment (EIA), which is limited to assessment only. In addition, EIA has the reputation of being anti-development and un-constructive, as well as bureaucratic and inefficient (Fuggle, July 1988).

In the meantime, the Draft Bill on Environmental Conservation was published in October 1987, and promulgated in an amended form in 1989 as the Environment Conservation Act (Act 73 of 1989). The main points of the Act were to allow the Minister to publish regulations requiring EIA's to be carried out for certain activities. No such regulations have been passed to date (November 1992). However regulations concerning waste management and ambient sound levels have been promulgated in terms of this Act (Government Gazette, May 1991).

The Committee produced the document "Integrated Environmental Management in South Africa" (Council for the Environment, 1989(A)), in which IEM was described and put forward as a recommended methodology for including environmental concerns in all levels of decision making involved in development. In addition, another document "IEM: A Framework for Harmony Between Development And Environment" (Council for the Environment, 1989(B)), was compiled which provides a brief summary of the philosophy and codes of practice of IEM. The purpose of the latter document was to introduce the public to IEM, and it was presented in a "user friendly" form which made use of cartoons.

The two documents mentioned above were published and distributed as part of a campaign by the Council for the Environment to endorse and disseminate information about IEM for acceptance throughout South Africa. The documents contained a recommendation and request from the Council that "the concepts and procedures outlined ... be widely used and applied by decision-makers, professionals, developers and managers in South Africa" (Council for the Environment, 1989(A), pg 1). Feedback on the procedure was also requested so that IEM could be modified in the light of practical experience (Council for the Environment, 1989(B), pgs 39 and 40).

The documents also contain a recommendation to the Minister that "the government of South Africa adopt a national environmental policy to provide for effective protection and controlled utilization of the environment by applying the principles of integrated environmental management and adopting the general IEM procedure" (Council for the Environment, 1989(A), pg 2).

The next step for the Council was identified as being to "advise the Minister on appropriate regulations to be framed under Part V, the enabling clause titled "Control over the detrimental effect of activities on the environment" contained in the Draft Bill on Environment Conservation" (Council for the Environment, 1989(A), pg 1). The formulation of such regulations would make the application of the IEM procedure a statutory requirement.

In the publication mentioned in the preceding paragraph, the DEA was encouraged to participate in the promotion of IEM and its aims, namely by developing guidelines for applying IEM, preparing manuals on procedures and techniques, providing advice as needed, and commenting on proposed regulations before they are adopted (Council for the Environment, 1989(A), pg 31).

In response to the above recommendation, the DEA commissioned a study to update the IEM procedure and produce guidelines for its implementation. Modifications were made to the original IEM procedure as published in 1989 in the light of submissions to the Council in response to the request in the 1989 documents, as well as comments requested from interested and affected parties as part of the new study. A series of six guideline documents was published in 1992. These consist of one document which describes the procedure as a whole; three separate guideline documents for scoping, report requirements, and review; as well as a checklist of environmental characteristics; and a glossary of terms used in IEM (Department of Environment Affairs, 1992 (A) to (F)).

The preface to Guideline Document 1, which describes the IEM procedure (DEA, 1992(A)), states that the series of guideline documents is the first step in the process of formalising the IEM procedure so that it can be adopted as policy by government. Further steps are identified as:

- a policy statement in terms of Section 2 of the Environment Conservation Act, and

- the enactment of the provisions under Section 21, 22, 23 and 26 of the Act.

The need for the IEM procedure to be regularly reviewed and amended in the light of experience is identified in the documents (DEA, 1992 (A), pg 5).

The Environment Conservation Act was amended in June and July 1992 (Government Gazette, June and July 1992) to allow for the promulgation of regulations (by publication in the Government Gazette) making the application of IEM a legal requirement.

4.2 Comparison of the Two Versions of IEM

A schematic diagram illustrating the original IEM procedure is given in Figure 4.1, as it appeared in the document published in 1989 (Council for the Environment, 1989(A)), and Figure 4.2 shows the updated IEM procedure as given in Guideline Document 1 (DEA, 1992(A)). Details of the differences between the two versions of IEM are given in Table 4.1, and summarised in the discussion which follows.

4.2.1 Stages in the Process

The two procedures have one major difference in that the original procedure had four stages, while the updated procedure has three. The proposal and assessment stages have been combined into one stage termed "plan and assess proposal".

4.2.2 Public Participation

Along with the above change in the number of stages is the requirement that the authorities and interested and affected parties (IAP's) be identified and notified of the proposal as a first step. This differs from the original version in that the choice of involving IAP's was left to the proponent in the proposal stage, and was only a requirement in the assessment stage if a Class 1 level of study was being undertaken.

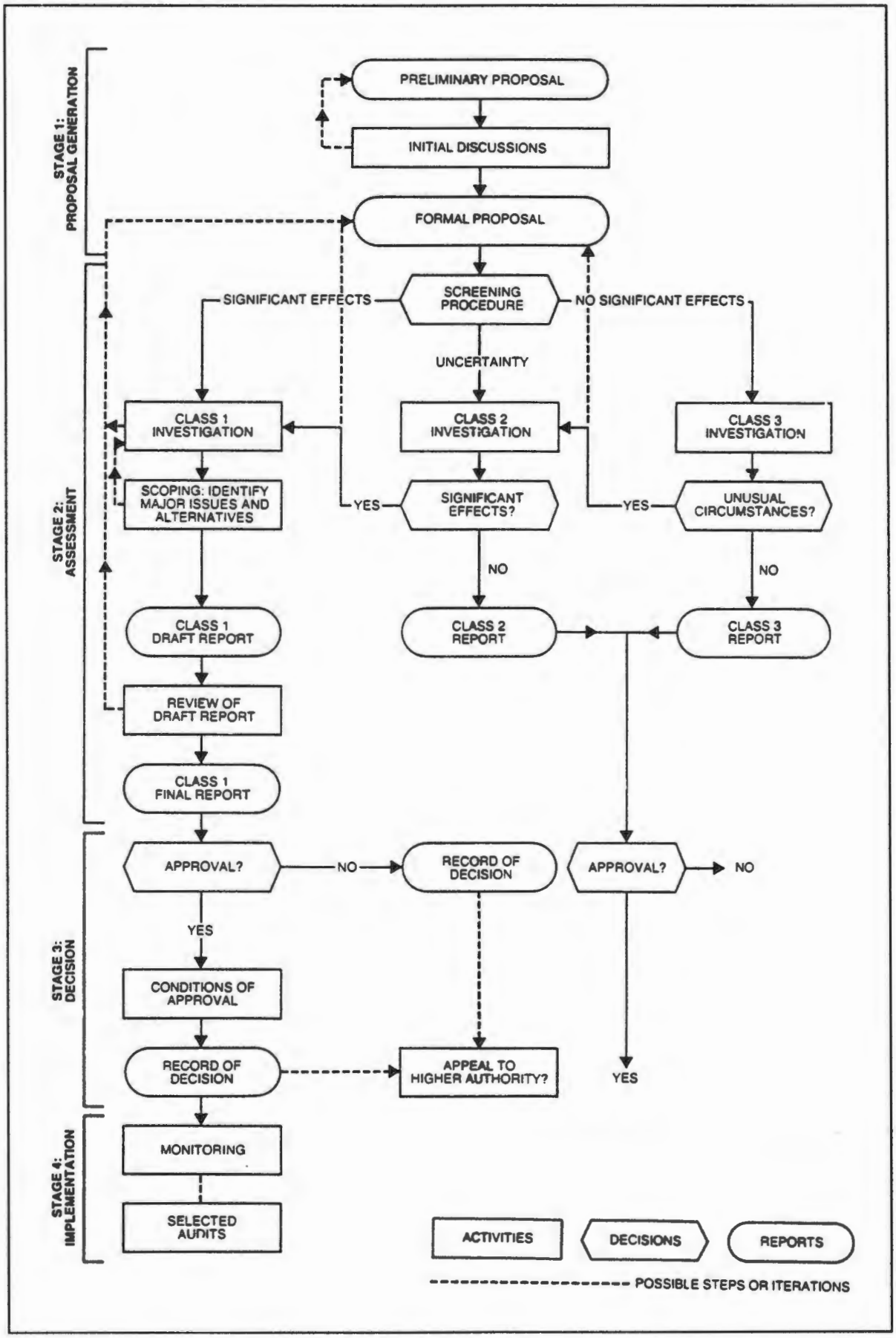


FIGURE 4.1: ORIGINAL IEM PROCEDURE
(Source: Council for the Environment, 1989(A), Figure 1, pg 9)

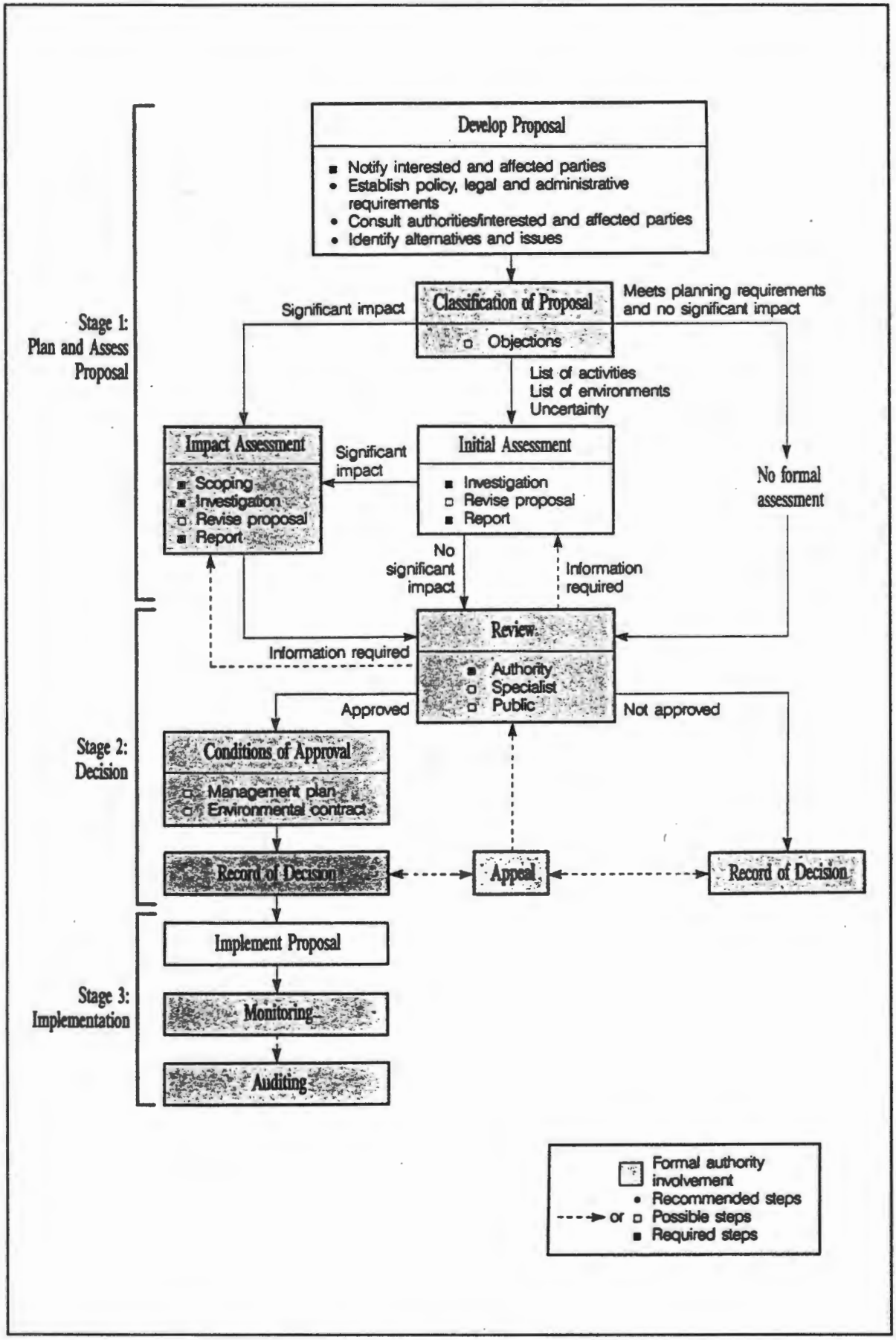


FIGURE 4.2: UPDATED IEM PROCEDURE
(Source: Department of Environment Affairs, 1992(A), Figure 1, pg 10)

TABLE 4.1: COMPARISON OF ORIGINAL AND UPDATED IEM PROCEDURES

ORIGINAL VERSION (Reference: Council for the Environment 1989(A) and (B))	UPDATED VERSION (Reference: DEA 1989(A) to (F))
OVERALL • Key terms are: - proposed action - alternatives - classes of assessment - stages 1 to 4 of the development process • Four stages	• Cental IEM requirements are: - list of activities - list of environments - summary list of environmental characteristics - identification of authorities and IAP's • Three stages. Proposal and Assessment stages integrated into one interative stage called "plan and assess proposal".
STAGE 1: PROPOSAL • Proponent may wish to consult with potentially affected parties, but it is not mandatory.	**STAGE 1: PLAN AND ASSESS PROPOSAL** • Notify IAP's as a required first step in all cases. Exceptions granted by authority if confidentiality an issue. • Onus is on developer to show that all IAP's have been informed about the proposal. (NB: permission of IAP's is NOT needed). • Consultation with authorities and IAP's to identify issues and alternatives a recommended step.
STAGE 2 ASSESSMENT • Public involvement required for Class 1 level of assessment only. • Kind of assessment and level of investigation necessary is decided by the relevant authorities by means of screening.	• Classification of proposal done by proponent and consultant in consultation with relevant authorities.

TABLE 4.1: COMPARISON OF ORIGINAL AND UPDATED IEM PROCEDURES (Continued)

ORIGINAL VERSION (Reference: Council for the Environment 1989(A) and (B))	UPDATED VERSION (Reference: DEA 1989(A) to (F))
STAGE 2 ASSESSMENT (continued)	**STAGE 1: PLAN AND ASSESS PROPOSAL (continued)**
• Three levels of assessment: - **Class 1** for when significant impacts are likely - **Class 2** for when there is uncertainty (similar to an initial assessment in updated version) - **Class 3** for when significant impacts are unlikely	• Three types of assessment form the classification of proposal stage: - **Impact Assessment** when the "develop proposal" stage showed significant impacts when answering the "summary list of environmental characteristics". - **Initial Assessment** for when proposal is in "list of activities" and/or "list of environments", or there is uncertainty when answering the "summary list of environmental characteristics". - **No Formal Assessment** when proposal meets planning requirements and (after reference to "summary list of environmental characteristics") there are no significant impacts.
	• Provision for objection to proposal by IAP's.
	• An "impact assessment" can vary in scope from a relatively brief assessment by a competent party to a very detailed assessment by a team of professionals.
Scoping	**Scoping**
• For Class 1 assessments only	• Mandatory only for "impact assessments". If an "initial assessment" is done and then upgraded, it will provide background to the scoping exercise in the "impact assessment".
	• Scoping forms one of the three principle components of an "impact assessment", ie it is a significant part of the study.
• **Object of Scoping:** - focus the assessment on major issues - search for viable alternatives or ways to make the proposed action more acceptable - provide guidance on how to proceed before expensive commitments are made.	• **Purpose:** Determines the extent of and approach to the investigation. - determines which issues and alternatives should be investigated, - determines procedure which should be followed, - determines report requirements, - considered to be the critical stage in the IEM procedure.
• **Confidentiality:** responsible authority must establish special procedures to handle potentially sensitive issues.	• **Confidentiality** is dealt with in the "develop proposal" stage.
• **Timing:** should be initiated early in the assessment stage.	• **Timing:** forms the first step of the "impact assessment".

TABLE 4.1: COMPARISON OF ORIGINAL AND UPDATED IEM PROCEDURES (Continued)

ORIGINAL VERSION (Reference: Council for the Environment 1989(A) and (B))	UPDATED VERSION (Reference: DEA 1989(A) to (F))
STAGE 2 ASSESSMENT (continued) **Scoping (continued)** **Types of scoping:** - public - authority • A written or taped account of public meetings must be made but this is not required to be made available to the public. **Investigation** Draft EIA report required for Class 1 level. Review of draft EIA report by IAP's required for Class 1. Final EIA report mandatory for Class 1 level of assessment.	**STAGE 1: PLAN AND ASSESS PROPOSAL (continued)** **Scoping (continued)** • Detailed guidelines to scoping are given in Document 2. Various different methods of involving the authorities and public are described. • It is recommended that an opportunity to object to the scoping procedure be provided. • Initial scoping document reporting on results of the initial scoping exercise should be available for public and authority review. **Investigation** • Draft report may be a requirement from scoping exercise • Public and/or specialist review may be required by scoping. • Final EIA report submitted to authorities (see Guideline Document 3). Particular report requirements may be required by scoping.
STAGE 3: DECISION	**STAGE 2: DECISION** • The word "review" is used to describe the first part of the decision phase where the proposal is looked at by the authority prior to a decision being made. • Types of review: - authority (mandatory) - specialist (optional, but strongly recommended if proponent is also decision-making authority. Scoping can also require this.). - public (optional, scoping may require this). • Aids for review have been developed.

TABLE 4.1: COMPARISON OF ORIGINAL AND UPDATED IEM PROCEDURES (Continued)

ORIGINAL VERSION (Reference: Council for the Environment 1989(A) and (B))	UPDATED VERSION (Reference: DEA 1989(A) to (F))
STAGE 3: DECISION (continued) • Conditions of approval only provided for Class 1 assessments. May require an environmental management plan. • **Record of decision (ROD)** - required for Class 1 assessment only. - short clear report written by authority recording decision and on what basis it was taken. - for public disclosure. • Provision for appeal is also only allowed for in a Class 1 level of assessment.	**STAGE 2: DECISION (continued)** • Conditions of approval are usual for all proposals. Examples of what these may include are: - Management Plans - Environmental Contracts, setting penalties for non-compliance. • **Record of decision (ROD)** - required for all decisions. - where appropriate, document how environmental considerations were taken into account and weighed against other considerations. • **Appeal** - provided for all decisions, - allowance also made for appeal to a court of law if malpractice suspected.
STAGE 4: IMPLEMENTATION • **Monitoring** only required for Class 1 level. • **Selected audits** only required for Class 1 level.	**STAGE 3: IMPLEMENTATION** • Conditions of approval may require that a Management Plan and/or an Environmental Contract be drawn up. • **Monitoring** should be required for all approved proposals. • **Audits** should be done for all approved proposals.

It is pertinent to note that although the updated procedure requires that IAP's be notified, their permission to go ahead with the proposed development is not required before continuing to the next step in the IEM procedure. Consultation with IAP's (as a further step to notification) during the "develop proposal" step of the "plan and assess proposal" stage is left to the proponent to decide, ie. it is not mandatory.

Further discussion on public involvement is given in the section on scoping (Section 4.2.4) below.

4.2.3 Screening/Classification

Another difference between the two versions of IEM is how the decision as to the appropriate level of assessment that should be undertaken is made, and who the decision is made by.

In the original IEM procedure, the screening decision was made by the relevant authority at their discretion, based on experience and the screening aids available to them at the time. The updated procedure has introduced definite screening guidelines on which to base the choice of assessment level. This means that the classification of the proposal is a more objective and standardised process, and it is done by the proponent and their consultant, in consultation with the relevant authorities.

The screening aids that have been developed are the List of Activities, List of Environments and the Summary List of Environmental Characteristics (DEA, 1992(A), Sections 4, 5, and 6).

There were three levels of assessment in the original version of IEM, namely Class 1, Class 2 and Class 3. As mentioned previously, the decision as to the kind of assessment that should be done and the level of investigation appropriate was made by the relevant authority, by means of screening. A Class 1 assessment was undertaken if the proposal was likely to result in one or more significant environmental impacts. If there was uncertainty as to whether the proposal would cause significant impacts, a Class 2

assessment was done in which just enough information was obtained to resolve this uncertainty. If significant impacts were highly unlikely, a Class 3 assessment was done.

The updated procedure is similar in that it still has three levels of assessment, but they are different from those in the original version. The basis for the classification is whether or not an "impact assessment" is necessary, with an "initial assessment" designed to establish this when there is uncertainty. If it has become clear during the "develop proposal" stage, that significant impacts are likely, then an "impact assessment" is done. If the proposal is included in the "list of activities" and/or the "list of environments", an "initial assessment" is mandatory. If the proposal does not appear on either of the lists, but there is uncertainty in answering the questions in the "summary list of environmental characteristics", an "initial assessment" is also undertaken. The "initial assessment" is very similar to a Class 2 level of assessment in the original IEM, in that it is aimed at obtaining just enough information to decide whether significant impacts are likely. "No formal review" is done if the proposal meets planning requirements, and answers to the questions in the "summary list of environmental characteristics" show no significant impacts are likely.

4.2.4 Scoping

In the original IEM document, scoping was only required for a Class 1 level of assessment. Scoping could include authority and/or public scoping at the choice of the proponent, ie, it was not mandatory. Scoping is also only mandatory for the most intensive level of survey, ie the "impact assessment" in the updated procedure. However it must be stressed that identification and notification of IAP's is a mandatory first step for all proposals, as discussed in Section 4.2.2. This means there is a minimal degree of "scoping" done for all proposals.

There is a slight difference in the purpose of scoping between the two versions. The updated version emphasises scoping, seeing it as a critical stage of IEM, and providing detailed guidelines on how it should be undertaken (DEA, 1992(B)). As set out in Table 4.1, the objectives are to set the specific requirements for the investigation in terms of which issues and alternatives should be investigated, which procedures should be

followed and what reporting is required. There is a sense of "tailor making" the investigation. This introduces more flexibility than the original IEM version, which rigidly required that a draft EIA report be provided for public comment in all Class 1 studies. Scoping in the original IEM procedure aims to focus the assessment on major issues, search for viable alternatives or ways to make the proposed action more acceptable. Thus the overall aim is similar ie to guide the process from then on, but the new IEM is focused more on streamlining the process to the specific circumstances under consideration.

A written record of the results of the initial scoping exercise is required to be made available for public and authority review in the updated IEM, but was not specified in the original version. In addition, the updated version makes a recommendation that opportunity to object to the scoping procedure be provided, which was also not allowed for in the original version.

4.2.5 Review

The updated IEM version has introduced a different interpretation of the word review. It is used to describe the first step in the decision phase and is done as a minimum by the authority concerned. Specialist and/or public review may be required, for example if specified as such during scoping.

Aids for review have been developed to provide structured guidelines for the authorities/individuals entrusted with this task. These are:

- List of environments (DEA, 1992(A));
- List of activities (DEA, 1992(A));
- Checklist of environmental characteristics (DEA, 1992(E));
- Guidelines for scoping (DEA, 1992(B));
- Guidelines for report writing (DEA, 1992(C)).

This is similar to the provision of more definite screening guidelines discussed in Section 4.2.3, and indicates a trend to standardize the procedure.

4.2.6 Conditions of Approval

Both the original and updated IEM versions allowed for conditions of approval to accompany a decision. However the original IEM version confined these to Class 1 assessments, and introduced the concept of an environmental management plan being required. The updated IEM procedure places more emphasis on conditions of approval, recommending that they should be used for all approved proposals. Environmental management plans are still favoured, but an additional measure, the environmental contract, has been introduced, which sets penalties for non-compliance with the conditions of approval.

4.2.7 Record of Decision (ROD)

A record of decision (ROD) was previously required only for a Class 1 level of assessment, whereas the updated procedure requires a ROD for every decision. In both cases the ROD is available to the public. The updated process stipulates that the conditions of approval should be reflected in the ROD.

4.2.8 Provision for Appeal

In the original IEM procedure, provision for appeal was only given in the case of a Class 1 study. In the updated procedure, provision is made for appeal against a proposal, the scoping procedure undertaken, as well as the record of decision. It is therefore essential that the proponent notify IAP's at the outset, if the provision for objection to a proposal is to function effectively. In addition it is recommended in the updated procedure that allowance also be made for appeal against a ROD to a court of law if malpractice is suspected.

4.2.9 Conclusion

In conclusion, the two versions of IEM are based on the same philosophy and for the most part the elements are common to both. However these elements appear in a different

order, or in a greater or lesser degree of detail. Thus they are essentially similar but with different emphases.

The significance of the above conclusion for the case study is that, although the case study was conducted according to the original IEM procedure, the publication of the amended version does not invalidate the case study in any way.

5 COMMENT FROM THOSE INVOLVED IN THE STUDY (OBJECTIVE DATA SET)

The purpose of the questionnaire, the methodology used in its compilation, the selection of potential respondents, and in the analysis of the responses received is given in the sections that follow.

5.1 Purpose of the Questionnaire

A set of data independent of the writer comparing the performance of the case study to the original IEM requirements was required for this dissertation. It was decided that this data set would be obtained from those people involved in carrying out the case study, and that the information would be obtained by means of a questionnaire. Therefore the purpose of the questionnaire is to provide an objective data set for analysis.

More specifically, the questionnaire was intended to gain the respondents' personal views on:

- Whether the case study complied with the Council for the Environment's guidelines on how IEM should be conducted. Of specific interest is the respondents' opinion of whether the IEM requirements were satisfied and, if not, whether the departure from the guidelines was deliberate or by omission.

- The success or otherwise of any stage of the project, irrespective of compliance with the guidelines.

- Practical difficulties experienced with the IEM guidelines and any recommendations on how these difficulties might be overcome.

- What, if anything, they would choose with hindsight to do differently.

5.2 Compilation of Questionnaire

The following guidelines were used as a basis for drawing up the questionnaire in order to achieve the objective data set.

- The questions were based on the procedure for investigating Class 1 proposals from the original IEM document, which consists of a flow diagram with accompanying text (Council for the Environment, 1989(A), Figure 4, pgs 22 and 23), and is given in Appendix A.

- The questions were worded to eliminate bias as far as possible. This was done by using the generic terminology of the available documentation.

- The names of the respondents would be confidential, and therefore only their positions within their organisations and their role in the case study would be referred to. For the purposes of discussion in this dissertation, respondents are assigned a reference number and the singular generic pronouns he/his/him etc. are used when referring to a particular respondent, regardless of gender.

- The questionnaire was not checked by means of a trial run, as it was considered preferable that the entire population of eligible individuals be used as respondents.

The questionnaires were sent to potential respondents with a covering letter in which it was stressed that the emphasis of the research project was on the process of IEM, and that the specific details of the case study are not of interest except where the application of the IEM process is demonstrated. The purpose of the questionnaire was also explained in the letter, as detailed in Section 5.1.

Copies of the Council for the Environment's 1989 document, flow charts of the original and updated IEM procedures, and a summary of the dates and steps taken in the case study were included with the questionnaire. A copy of the questionnaire and other documentation sent to the potential respondents is contained in Appendix B.

5.3 Selection of Potential Respondents

The potential respondents were chosen according to the following criteria:

- Individuals from the proponent and the consultants who had been significantly involved in the case study.
- A spread of people covering the entire life-span of the project.
- Individuals with different types of involvement in the various stages, for example individuals who were responsible for the overall management of the project, as well as individuals with a more immediate daily involvement.

5.4 Record of Questionnaires Sent and Returned

The number of questionnaires sent out and subsequently returned is recorded in Table 5.1 and discussed below.

TABLE 5.1 : RECORD OF QUESTIONNAIRES SENT AND RETURNED

CATEGORY	NUMBER SENT	NUMBER RETURNED	NUMBER NOT RETURNED	REASONS NOT RETURNED
Proponent	4 (100%)	2 (50%)	2 (50%)	• 1 lost in post • 1 respondent's personal time constraints.
Consultant	5 (100%)	5 (100%)	0 (0%)	
TOTAL	**9 (100%)**	**7 (78%)**	**2 (22%)**	

A total of nine questionnaires was distributed to individuals who met the criteria outlined in Section 5.3 above. Four of the total of nine were from the proponent and the remaining five were from the consultants who the proponent appointed to conduct the study. The questionnaires were sent off on the 6 and 9 July 1992. Respondents were asked to complete the questionnaire and return it by the 25 July 1992. A stamped, addressed

envelope was provided for this purpose. Responses were received over the period 3 August 1992 to 12 October 1992.

A total of seven completed questionnaires was returned, giving a total response rate of approximately 78%. Two of the individuals from the proponents returned completed questionnaires and two did not, giving a response of 50% for the proponents. The reasons for the two questionnaires not being returned were:

- one was lost in the post, and the respondent did not complete another questionnaire;

- the other respondent was unable to complete the questionnaire by the required date due to personal time constraints.

All five individuals from the consultants responded, giving a response of 100% for the consultants.

5.5 Method of Analyzing Responses to Questionnaire

Each person who completed the questionnaire was allocated a reference number which is maintained throughout the dissertation as a means of distinguishing between respondents and maintaining confidentiality. Respondents 1 and 2 are from the proponent, and respondents 3 to 7 are from the consultants.

Each respondent had a different level and period of involvement in the study and these are summarized in Table 5.2. The value and significance to be attached to the individual responses to particular questions in the questionnaire are thus different, depending on their role and level of involvement in that particular step. For example, a person who was intimately involved in only one stage of the project will answer questions on that stage with deeper insight and knowledge than questions on another stage, the answers to which will of necessity be more general. However they may also be more objective than if they had been involved, and may therefore be valuable.

TABLE 5.2 : LEVEL AND PERIOD OF INVOLVEMENT OF QUESTIONNAIRE RESPONDENTS

CATEGORY	RESPONDENT REFERENCE NUMBER	POSITION IN ORGANIZATION	PERIOD INVOLVED IN CASE STUDY		ROLE IN CASE STUDY	TRAINING IN/KNOWLEDGE OF	
			TIME PERIOD	STAGES COVERED		ORIGINAL IEM	UPDATED IEM
PROPONENT	(1)	Technical Manager	Throughout project	All stages	• Day to-day running project • Client liaison person with consultants	Good practical knowledge gained through experience	-
	(2)	Commercial Director	From after 20 May 1991 to date	After issue of draft EIA report	• Distant involvement from head office	Limited knowledge	-
CONSULTANTS	(3)	Director; Head of Environmental Department during period of involvement	From inception (March 1990) to July 1990	• Proposal stage • Scoping study and public scoping meeting	• Overall project management • Conducted public scoping meeting	Good knowledge	Good knowledge
	(4)	Director	From July 1990 to date	From issue of first scoping document onwards	• Overall project management	Good knowledge	Good knowledge
	(5)	Environmental Scientist	From inception (March 1990) to May 1991.	Up to issue of draft EIA report	• Air quality section • Advisory role	Good knowledge	Good knowledge
			May 1991 to date	From receipt of comments on draft EIA report	• Project leader		
	(6)	Environmental Scientist	June 1991 to date	From receipt of comments on draft report	• Collection of socio-economic data for further work after comments on draft EIA received	Fair knowledge through experience	Good knowledge
	(7)	Scientist	January 1992 to date	Mid-way through further work to finalise EIA	• Assisted in compilation of conceptual of Rehabilitation Plan • Editing and collation of final EIA report	Limited knowledge	-

The answers to the questionnaire are dealt with in Sections 6 and 7, Section 6 dealing with the proposal generation stage and Section 7 with the assessment stage. In each section, the steps comprising that stage are given in a table, and the level of involvement of each of the seven respondents corresponding to each step is shown (Table 6.1 and 7.1 respectively). Steps which each respondent was involved in are shaded, and steps in which they had no involvement are left unshaded. Where the degree of involvement was high, this is indicated by an asterisk and shading, while limited involvement is indicated only by shading.

In Section 6 and 7, the questions from the questionnaire are presented in a similar format to that of the questionnaire, along with the answers of the seven respondents to that question. The degree of involvement is indicated as described above for Tables 6.1 and 7.1. The answers to the questions have been transcribed exactly as written by the respondents on the original questionnaires returned by them except that generic terms were substituted to maintain confidentiality. For example "proponent", "consultant" and "existing site" were used in place of specific names and places. In cases where respondents referred to their answers given to previous questions, these have been repeated for ease of reference.

After the presentation of the question and corresponding answers, the answers are analyzed and discussed. At the end of each stage conclusions are drawn, and any points of summary relating to the stage as a whole are made.

5.6 Overall Comments on Responses to Questionnaire

A general comment regarding the responses to the questionnaires was that very few respondents were sufficiently familiar with the new IEM process to comment on how the case study compared with it.

6 ANALYSIS OF STAGE 1: PROPOSAL GENERATION

This section contains an analysis on the proposal generation stage of the case study, which is the first stage of the original IEM process. The requirements of the original IEM process as presented in the guideline documents (Council for the Environment, 1989(A) and (B)) are discussed in Section 6.1. The actual steps taken as part of the proposal generation stage are given in Section 6.2, and the answers to the questionnaire on this stage are given and analyzed in Section 6.3. Section 6.4 contains a summary of the conclusions and recommendations for the proposal generation stage as a whole

6.1 Original IEM Requirements for Proposal Generation Stage

In accordance with the original IEM procedure, the proposal generation stage is concerned with formulating a proposed action, as well as viable alternatives to the action, for meeting some purpose or need (Council for the Environment, 1989(A)). The two key parties involved in the proposal generation process are the proponent of the action and the responsible authority that will either grant or refuse permission for the proposed development. The proponent is defined as the individual or organization that is proposing taking some action which will use resources that are under the control of the government body. The relevant authority is the local, regional or central government body that is entrusted with the responsibility to decide whether or not to allow the proposed action.

The original IEM document states that the object of the proposal generation stage is to develop proposals that appear to be both feasible and desirable. It is broken down into four steps which are given below:

- **Step 1:** Define the purpose and need for the proposed action.
- **Step 2:** Identify alternative ways to meet the objective of the proponent.
- **Step 3:** Investigate the general environmental acceptability of the proposed action and its alternatives.

- **Step 4:** Formulate the most promising version of the proposed action and its alternatives so that they can be formally assessed.

The section of the flow diagram given in the original IEM procedure is reproduced as Figure 6.1 (Council for the Environment, 1989(A), extract from Figure 4, pg 22).

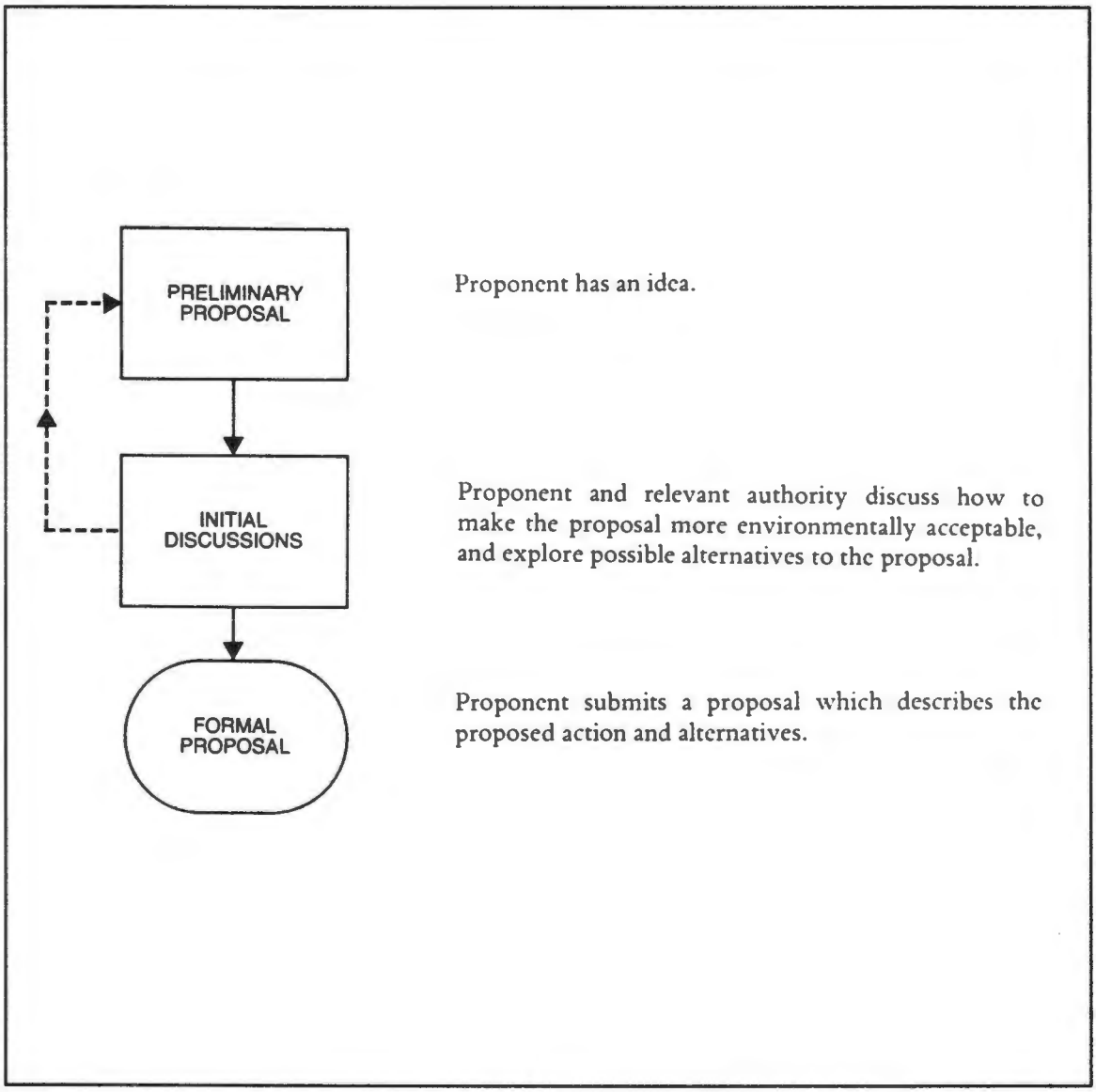


FIGURE 6.1: STAGE 1: PROPOSAL GENERATION
(Source: Council for the Environment, 1989(A), extract from Figure 4, pg 22)

The way in which the above-mentioned four steps fit into the schematic diagram (Figure 6.1) is described below.

A business or other organisation comes up with a way of meeting a particular need, and the idea is developed internally within the organisation. This is termed the "preliminary proposal", and the business or organisation is termed "the proponent".

The proponent will need to receive permission from the authority in charge of that particular activity and/or area, and will approach the authority and discuss the preliminary proposal with them. These "initial discussions" will be conducted with a view to defining the purpose and need of the proponent, coming up with alternative ways to meet that purpose, other than the proposed action, and making the proposal more environmentally acceptable. Thus the initial discussions phase encompasses all four steps listed above.

The initial discussions are conducted in confidence where necessary to safeguard the interests of the proponent, and to encourage the proponent to be open with the authorities about the intended course of action.

The final outcome of the proposal generation stage is a "formal proposal", which is submitted to the authority for consideration. This formal document takes into account the results of the initial discussions and describes the proposed action and one or more alternatives. It is expected that the proposal will be environmentally optimised as far as possible at this stage.

6.2 Case Study Description

Please refer to Table 6.1 for the steps which took place during the case study as part of the proposal generation stage.

TABLE 6.1: LEVEL OF INVOLVEMENT OF RESPONDENTS IN PROPOSAL GENERATION STAGE

STAGE	DATE	STEP IN PROPOSAL GENERATION STAGE	RESPONDENT REFERENCE NUMBER						
			1	2	3	4	5	6	7
STAGE 1: PROPOSAL GENERATION	1957	Sand quarrying begins at the existing site.							
	1975	Proponent takes over the Sand Quarry on the existing site.							
	1979	Proponent acquires permit to mine sand within 50 m of boundary of the property.							
	1987	Proponent acquires permit to mine rock within 200 m of the boundary of the property, subject to liaison with and the approval of the local residents.							
	March 1990	Proponent contacts Consultants for advice regarding an application to the Department of Mineral and Energy Affairs for a permit to mine rock in a new area on the property.	*		*				

Sand quarrying began at the existing site in the 1950's, and the proponents bought the quarry and mining rights in 1975. The proponent was granted a permit to quarry sand to within 50 m of the boundary of the existing site in 1979 as part of the Department of Mineral and Energy Affairs' (DM&EA) plan to permit all existing quarry sites in terms of the Mines and Works Act (No 27 of 1956).

The proponent applied for a permit to mine rock to within 200 m of the boundary of the existing site. This was granted in principle by the DM&EA in 1987, subject to liaison with and the approval of the local residents. The proponent did not follow through with the required public consultation at that stage, as there was no immediate need to develop the existing sand quarry into a rock quarry.

A few years later, the proponent identified a need to develop a new source of crushed stone in the area of the existing site. Various options for meeting this need were explored within the planning structures of the company and the potential for quarrying rock at the existing site was considered again. The area specified in the existing permit to quarry rock at the existing sand quarry site was not ideal, as it was partially covered by a slimes dam.

Also the area where the sand had been mined out would be more cost effective to quarry because the overburden removal would be minimal. Therefore the proponent decided to take the necessary steps to begin mining rock at the existing site.

The first step to undertake a new project in the internal procedure of the proponent's organisation was to prepare a motivation and request for capital for the project to the Board of Directors. The motivation was submitted in July 1990, and the decision to proceed with the project was given by the proponent's Board of Directors in January 1991.

In the light of the DM&EA's previous requirement that the proponent consult with neighbours, the proponent contacted consultants in March 1990 for advice regarding the application to the DM&EA for a permit to mine rock in a new area.

No formal proposal was submitted to the DM&EA at this point.

6.3 Analysis of Responses to the Questionnaire

As stated in Section 5.2, the questions in the questionnaire were based on the procedure for investigating Class 1 proposals from the original IEM document. The relevant part of the flow diagram was discussed in Section 6.1 and shown in Figure 6.1. The level of involvement of the questionnaire respondents is also shown in Table 6.1.

The proposal generation stage is dealt with in the first question in the questionnaire and is divided into six main sub-questions, namely Question 1.1 through to Question 1.6. In the sections that follow, each sub-question is presented along with the answers obtained from the seven respondents to that question. As mentioned in Section 5.5, the level of involvement of each respondent is shown by means of shading, as in Table 6.1. Shading with an asterisk indicates considerable involvement, while shading only indicates limited involvement, and no shading indicates that the respondent was not involved in the step at all. An analysis of the answers is then made, bearing in mind the relative involvement of each respondent in that step. Conclusions are drawn for the stage as a whole and recommendations made.

The reader is reminded that respondents 1 and 2 are from the proponent, and respondents 3, 4, 5, 6 and 7 are from the consultants. Respondent 1 was very involved in the proposal generation stage. None of the five respondents from the consultants was involved until the proponent approached the consultants, at which stage respondent 3 became very involved. Respondent 7 was not involved in the proposal generation stage at all and did not answer any of the questions in Question 1. Therefore only six replies are discussed in Sections 6.3.1 to 6.3.6.

6.3.1 Question 1.1: Did the required steps take place?

The different components of the proposal generation stage are listed in question 1.1, and the respondent is asked whether or not each step was undertaken as part of the proposal generation stage. The respondent answers "yes" or "no", and is asked to indicate why the step did not occur, if the previous answer was "no". There are eight such questions, one covering the "preliminary proposal" step, two covering the "initial discussions", one each for "amend proposal" and "iteration", and the remaining three covering the submission of a "formal proposal". These eight questions are presented and described individually below.

1.1.1	PRELIMINARY PROPOSAL: Was there a written formulation of the initial idea?	
*1	Yes	Contained in proponent's internal report "Request for Capital CV 1/90 - Slimes Dam and Hard Rock Quarry".
2	Yes	-
3	Yes	There must have been as part of the application to the Department of Mineral and Energy Affairs (DM&EA).
4	Yes	-
5	Don't know	Consultants involved in initial discussions with proponent but I don't know if they had written down a formal idea. I think they approached consultants as a result of a paper presented by consultants at a quarrying conference.
6	Yes	-
7	-	-

The respondent is asked whether or not there was a written formulation of the initial idea. Five out of the six respondents answered "yes" to this question, and the remaining respondent (5) answered that he did not know the answer.

Three of the respondents gave further explanation of their answers. Respondent 1 from the proponent, the only respondent very involved in this particular step, explained that the preliminary proposal was detailed in an internal report for submission to the Board of Directors and contained a motivation and request for capital for the proposed project.

The other comment was from respondent 3 from the consultants, who was not involved at this stage, but who said that there must have been a preliminary proposal as part of the submission of the permit application to DM&EA for the 1987 permit. Respondent 5, also from the consultants, and not involved at this stage answered that he did not know.

1.1.2	**INITIAL DISCUSSIONS: Did the proponent and relevant authority discuss how to make the proposal environmentally acceptable?**	
*1	No	The relevant authority (DM&EA) had already issued a mining permit. Also the relevant authority is not familiar with IEM procedure.
2	Not to my knowledge	-
3	Probably	Inferred from the DM&EA's requirement for local approval.
4	Yes	-
5	No	At least not to my knowledge. I doubt DM&EA would have thought to do so given that they had granted a permit already with no consultation. Proponent wanted to EIA I think - not the authorities.
6	Yes	-
7	-	-

The respondent is asked whether the proponent and relevant authority discussed how to make the proposal environmentally acceptable. Six respondents answered the question. Two of the respondents (4 and 6) answered "yes", one (respondent 3) answered "probably", two (1 and 5) answered "no", and the remaining respondent (2) answered "not to my knowledge".

Three comments were offered in response to the question. One from respondent 3, who said that there was probably some discussion, based his answer on the stipulation from DM&EA that the permit was conditional on local approval. The other two comments, from respondents 1 and 5 were similar. They stated firstly that DM&EA had already issued a mining permit and secondly that the idea of doing some form of environmental

assessment had come from the proponent, considering also that DM&EA is not familiar with IEM.

The conclusion drawn from the answers to this question is that there were no initial discussions with the relevant authority, as set out in the IEM procedure.

1.1.3	**INITIAL DISCUSSIONS: Were possible alternatives to the proposal explored?**	
*1	Yes and No	As part of the business planning cycle different alternatives have been looked at. The existing site was our best alternative and hence pursued.
2	N/A	Alternatives were explored to the extent of considering other locations, none of which were as suitable, but an alternative to a hard rock quarry was not considered.
3	Not known	-
4	No	I believe this only came later, during the EIA phase.
5	No	Not initially - client had to be educated. Ultimately the existing site is their only option - alternative of another site considered to show authorities what a completely new quarry would mean (as discussed with review consultant) rather than as a "real" option.
6	Yes	-
7	-	-

The respondent was asked whether possible alternatives to the proposal were explored. Respondent 6 answered "yes", respondent 1 answered "yes and no", respondents 4 and 5 "no", respondent 3 "not known", and respondent 2 "not applicable".

There were four explanations of these varying answers, with the common thread that alternatives were looked at from the proponent's business planning viewpoint, but not from an environmental perspective. The latter only came later during the assessment stage.

1.1.4	AMEND PROPOSAL: Was the proposal amended as a result of the initial discussions?	
*1	No	It was what we (the proponent) wanted and at this stage saw no reason to change it.
2	N/A	-
3	Not known	-
4	Yes	Proposal (from consultant to proponent) was drawn up after scoping study.
5	No	Lack of knowledge about IEM and no formal proposal produced anyway.
6	-	-
7	-	-

Two respondents (3 and 6) did not answer this question. Of the five who did, two respondents (1 and 5) answered that the proposal had not been amended, one (respondent 4) that it had been, and the remaining respondent (2) that it was not applicable.

The conflicting responses to this question are attributed to the fact that it is not that relevant, given that there was no initial discussion with the authorities that would have led to a possible amendment.

1.1.5	ITERATION: Was there repetition of any or all of the above steps?	
*1	No	See above: "It was what we (the proponent) wanted and at this stage saw no reason to change it".
2	No	N/A
3	Not known	-
4	Yes	-
5	No	As above: "Lack of knowledge about IEM and no formal proposal produced anyway".
6	-	-
7	-	-

Three respondents (1, 2 and 5) said there was no iteration, respondent 3 did not know, respondent 4 answered that there had been iteration, and respondent 6 did not answer. The only respondent (4) who believed that there was iteration was not involved in this step

at all and gave no further explanation as to why he holds this belief. The three definite "no" replies, including that of the only respondent who was involved in this step, lead to the conclusion that there was no iteration of the steps.

1.1.6	**FORMAL PROPOSAL: Did the proponent prepare a formal, written proposal?**	
*1	Yes	-
2	Yes	-
*3	No	Not as part of IEM process, but probably as part of permit application.
4	No	Yes if the question means the consultant on behalf of the proponent.
5	No	Lack of knowledge about IEM on the part of the authorities, so not required.
6	-	-
7	-	-

Respondents 1 and 2 answered "yes", respondents 3, 4 and 5 answered "no", and respondent 6 did not answer the question. The written proposal referred to by respondents 1 and 2 is the internal motivation to the Board of Directors. Therefore in the sense that the IEM procedure requires a formal, written proposal for submission to the authorities, this was not done.

1.1.7	**FORMAL PROPOSAL: Was a proposal submitted to the relevant authorities?**	
*1	No	Authority not familiar with IEM process and does not require the proposal to be submitted to him. However we should have done so.
2	No	Submitted for consideration of Board of Directors of proponent.
*3	No	See above: "Not as part of IEM process, but probably as part of permit application".
4	No	-
5	No	Lack of knowledge about IEM on the part of the authorities, so not required.
6	Yes	-
7	-	-

Respondents 1 to 5 answered "no", which supports the conclusion drawn in Question 1.1.6 that a formal written proposal was not prepared in that, if it had been prepared, it would most likely have been submitted to the authorities.

Respondent 6 believed that a proposal was submitted to the authorities. This is not taken as an authoritative answer, as the individual was not involved at this point, and did not answer the previous question (1.1.6) as to whether or not such a proposal had been prepared.

1.1.8	**FORMAL PROPOSAL: Did the proposal describe the proposed action and realistic alternatives?**	
*1	No	Mainly because, as a company using IEM for the first time, we did not know what to expect.
2	Yes No	Proposed action. Realistic alternatives.
*3	Not known	-
4	Yes Not sure	Proposed action. Realistic alternatives.
5	N/A	For the above reason. No realistic alternative for proponent.
6	Yes	-
7	-	-

This question proved to be irrelevant because answers to the two previous questions established that the formal proposal in the true IEM sense did not exist. However the respondents have picked up on the issue of whether or not alternatives were addressed, so that aspect is discussed further.

The overall response was that the proposed action was adequately described, but that alternatives were not looked at , mainly because the proponent was using IEM for the first time and did not know what was expected in this respect (respondent 1). This is compounded by the fact that the authorities were not knowledgeable about IEM, and a formal proposal was not required by them (respondent 5). The issue of alternatives for this particular case study is complex in that there is no realistic alternative from the proponent's viewpoint (respondent 5).

6.3.2 Question 1.2: Additional or alternate steps

1.2	Were any additional or alternate steps used during the proposal generation stage? (Answer YES or NO). If YES, please specify.	
*1	No	-
2	No	-
*3	No	-
4	Yes	Scoping study (public meeting with local Ratepayers Association (RA)).
5	No	-
6	-	-
7	-	-

Respondents answer "yes" or "no" to the above question, and are asked to specify the steps referred to if the previous answer was "yes". Four respondents (1, 2, 3 and 5) answered "no" and respondent 6 did not answer.

Respondent 4 believed that the scoping study, which included a public meeting and a meeting with the local ratepayers' association (RA), was an extra step in the proposal generation stage. This is in line with the updated IEM procedure which combines the proposal and assessment stages into one iterative stage. However, in the sense of the original IEM procedure, scoping forms part of the assessment stage, and therefore this answer is not taken to be correct.

The conclusion from the above discussion is that no additional or alternate steps were used in the proposal generation stage.

6.3.3 Question 1.3: Value of proposal generation stage

1.3	Do you regard the proposal generation stage as having been helpful, irrespective of compliance or otherwise with guidelines? (Answer YES or NO). Please explain further.	
*1	N/A	The company decided they wanted a rock quarry at the existing site. We did not go through a formal proposal generation stage. Our first step after we had made our decision and called in the consultants was to conduct a scoping study.
2	Yes	-
*3	No	The permit was issued during this stage (well before the IEM procedure was developed). The implementation of the IEM procedure came later when the proponent had already picked up problems with the local residents, antipathy towards the project had developed, and the consultants suggested the use of the IEM process.
4	Yes	Shortcoming was insufficient discussion with authorities (all, including DM&EA and DWA&F).
5	Don't know	Don't have the historical background to answer this question.
6	Yes	It provided the proponent with the required scope of work and investigation procedure to be followed.
7	-	-

Respondent 1 provides a good summary of the proposal generation stage for the case study. He states that the proponent decided that they wanted a rock quarry at the existing site. They called in the consultants, and then their first step after that was to conduct a scoping study. Therefore they did not go through a formal proposal generation stage.

Other comments were that the implementation of the IEM procedure came after the proposal generation stage. At that point the proponent had problems with the local residents and antipathy towards the project had developed (respondent 3).

Respondent 4 mentioned that a shortcoming in the stage was insufficient discussion with all the authorities, including the DM&EA as well as the Department of Water Affairs (DWA) (now the Department of Water Affairs and Forestry (DWA&F)). This substantiates conclusion drawn from Question 1.1.3, namely that initial discussions did not take place at all.

6.3.4 Question 1.4: Practical difficulties experienced, and how they may be overcome

Question 1.4 is concerned with practical difficulties, and is divided into two further sub-questions which are presented separately below:

1.4.1	PRACTICAL DIFFICULTIES: Were any practical difficulties experienced during this stage? (Answer YES or NO). If YES, please specify.	
*1	Yes	Ignorance of ourselves and the authorities (but mainly ourselves) as to what IEM was all about.
2	No	-
*3	Yes	The IEM process started too late in the life cycle of the project.
4	No	-
5	Don't know	-
6	-	-
7	-	-

The only two respondents (1 and 3) involved in the proposal generation stage both indicated that practical difficulties were experienced. The difficulties specified are different, one being lack of knowledge of the IEM process and the other being that the timing of implementing IEM was the problem. The two are related in that only when difficulties with neighbours arose did consultants became involved and suggest the implementation of IEM.

Two other respondents answered "no", but they were not involved in the stage at all and so their answers are taken to be nominal. One respondent (5) answered that he did not know, while the remaining respondents (6 and 7) did not answer.

1.4.2	**PRACTICAL DIFFICULTIES: What recommendations, if any, do you have that would overcome the specified difficulties for any future projects?**
*1	Greater education of companies embarking on IEM. Essential that authorities are familiar with IEM.
2	-
*3	The IEM process should be started very early in the life cycle of the project, but in practise this is not always practical because of the requirements for commercial confidentiality, and the fact that companies are (understandably) loath to go to public participation on "pie in the sky" projects which may not materialise. This could cause unnecessary negative publicity.
4	-
5	Try to create level of awareness within client body and authorities in early stages, perhaps through workshops.
6	-
7	-

The respondent is asked to provide any recommendations they may have that would overcome the difficulties specified in question 1.4.1 for any future projects.

Three respondents (1, 3 and 5) gave recommendations. One recommendation was education of companies and authorities, and the other was that IEM should be started early in the life cycle of the project. The point was raised that it is not always practical to involve the public at an early stage because of the need for confidentiality when negative publicity could be a problem.

6.3.5 Question 1.5: Would you do things differently?

1.5	Would you choose to carry out this stage differently if you had the opportunity of doing this project over again? (Answer YES or NO). If YES, please specify.	
*1	No	-
2	-	No comment - not sufficiently close to the coalface.
*3	Yes	Start IEM process earlier.
4	Yes	Generally more communication with public and authorities.
5	No	I think it was done pretty much as well as possible - perhaps include a wider base of IAP's and more streamlined - are 3 representatives from RA needed, for example?
6	No	-
7	-	-

Respondent 1 indicates that he would not change the way in which the stage was carried out, despite his answers to previous questions (1.4.1 and 1.4.2) that practical difficulties were experienced because of a lack of knowledge of IEM in both the proponent and the authorities.

Respondent 3 is consistent with previous replies in that he recommends that the IEM process be commenced earlier. Respondent 4 states that more communication with IAP's (including authorities) would be an improvement, despite his answer to previous questions that no practical difficulties were experienced. One must assume from this that some difficulty was experienced which would have been overcome if there had been more communication.

Respondent 5 contradicts himself by stating that he would not choose to do things differently, but then gives a recommendation as to how the interaction with IAP's could be streamlined and made more effective. The scoping process actually falls under the assessment stage according to the original IEM procedure, but this comment indicates the tendency to include some degree of public involvement in the proposal stage. This is now a requirement of the updated IEM process as proponents are required to identify and notify IAP's of their proposal at the outset.

6.3.6 Question 1.6: Comparison of case study with updated IEM

1.6	Are you familiar with the updated IEM procedure, published in draft form during 1992? (Answer YES or NO). If YES, please comment on how the updated procedure relates to the case study in the proposal generation stage.	
*1	No	-
2	No	-
*3	Yes	I think that the requirement for involving the public (IAP's) is required too early in the amended procedure (also see 1.4.2).
4	Yes	Relates very well.
5	Yes	-
6	Yes	-
7	-	-

The respondent is asked whether they are familiar with the updated IEM version, published in draft form during 1992 (The updated version was finalised and published after the issue of the questionnaires). If the respondent is familiar with the revised procedure, they are asked to comment on how it relates to the case study in the proposal generation phase.

The two respondents from the proponent are not familiar with the new IEM procedure. This is of concern and relates to points raised in the answers that there is a need for education of both proponents and authorities in IEM. The original IEM document has been in print since 1989, and there is still ignorance about it after three years. It seems essential that education about the updated IEM procedure be commenced as soon as possible.

6.4 Conclusions and Recommendations

The answers to Question 1.1 are summarised in Table 6.2 below.

TABLE 6.2: SUMMARY OF ANSWERS TO QUESTION 1.1

QUESTION			OVERALL ANSWER (Refer to Section 6.3.1)
Number	**Step**	**Description from Figure 6.1**	
1.1		Did the following steps take place as part of the proposal generation stage:	
1.1.1	Preliminary Proposal	Was there a written formulation of the initial idea?	Yes
1.1.2	Initial Discussions	Did the proponent and relevant authority discuss how to make the proposal environmentally acceptable?	No
1.1.3		Were possible alternatives explored?	No
1.1.4	Amend Proposal	Was the proposal amended as a result of the initial discussion?	No
1.1.5	Iteration	Was there repetition of any or all of the above steps?	No
1.1.6	Formal Proposal	Did the proponent prepare a formal, written proposal?	No
1.1.7		Was a proposal submitted to the relevant authorities?	No
1.1.8		Did the proposal describe the proposed action and realistic alternatives?	No

The overall outcome of the answers was obtained from the discussion of individual questions in Section 6.3.1 and entered in the last column of the table. Only one of the eight sub-questions was an overall affirmative one, and the answers to the remaining seven sub-questions were negative. In conclusion then, according to the questionnaire responses, the case study did not comply with the original IEM procedure.

Practical difficulties experienced were reported to be the lack of knowledge about IEM on the part of the proponent and the authorities, and the fact that the IEM process had started too late in the life cycle of the project. Practical recommendations as to how these difficulties could be overcome were:

- education of proponent and authority, possibly through workshops;
- commence IEM as early as possible in the life cycle of the project.

The authority is not set up to look at environmental impacts because of a number of reasons which include a lack of trained personnel, historic factors, lack of interest and lack of legislative power. The threat of public pressure was very likely the reason that the DM&EA required the proponent to liaise with neighbours initially. They then withdrew this requirement and it was the proponent that went ahead with scoping anyway.

The authority did not act constructively in the proposal generation stage as a consequence of IEM and their role in it. They should have been the leading party, ie. the authority guiding the proponent and not vice versa. This is the reason that no formal proposal was submitted.

The search for alternatives was not done initially to the required extent because the proponent was set in their ideas. After education and public pressure to look at alternatives, the proponent agreed to a more extensive consideration of alternatives. It would have been more effective and convincing if the alternatives had been looked at earlier at the proponent's initiative, as opposed to as a result of criticism from the public contained in the comments on the draft EIA that the alternatives had not been adequately looked at. This was a major shortfall of this case study.

Other recommendations given relate to the procedural matters. These support the changes that have been made to the original IEM process, and are reflected in the updated version of IEM. There was some confusion in delineating the proposal generation stage from the assessment stage, and some respondents referred to the scoping exercise as being part of the proposal generation stage. This is not the case for the original IEM procedure, but the updated version combines the proposal and assessment stages, bringing the public involvement forward in the process and making it more iterative. There was a recommendation that the public be involved at an earlier stage, and that there be more extensive interaction with them and the authorities. This supports the changes made to the IEM process in terms of combining the proposal and assessment stages and requiring that proponents first identify and notify IAP's, and then conduct scoping as well.

One respondent indicated a lack of support for the updated IEM process in that he believed that the involvement of IAP's was required too early in the process (identification

and notification of IAP's is a mandatory first step for all proposals). However the other respondents indicated that greater involvement of IAP's was desirable at an earlier stage in the process.

No recommendations were made for additional steps that have not been taken into account already by the updated IEM process.

7 ANALYSIS OF STAGE 2: ASSESSMENT

Section 7 deals with the second stage of the case study in a similar manner to which the first stage was dealt with in Section 6. The assessment stage forms the second stage of the original IEM process. The guidelines for the stage are given in Section 7.1, with reference to the documents published by the Council for the Environment in 1989. This is followed by a discussion of what steps actually took place in the case study in Section 7.2, and the presentation and analysis of the questionnaire answers in Section 7.3. Conclusions and recommendations for the assessment stage are given in Section 7.4.

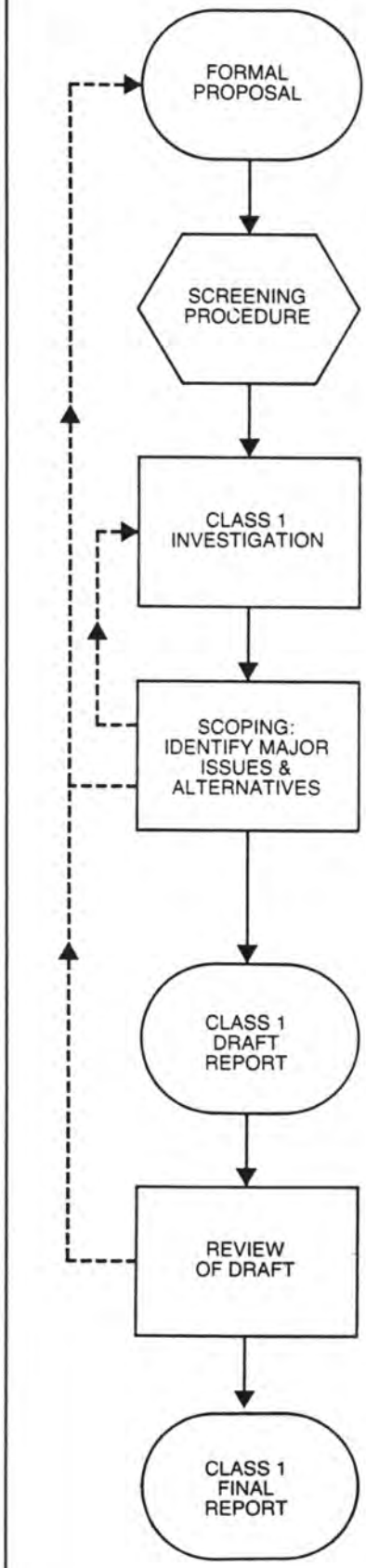
7.1 Original IEM Requirements for Assessment Stage

The original IEM document (Council for the Environment, 1992(A)) states that the assessment stage involves a systematic evaluation of the effect that the proposal and its alternatives will have on both the socio-economic and biophysical environments. A secondary aim is to find and suggest ways of reducing these impacts and thereby making the proposals more environmentally acceptable.

The assessment stage is broken down into four steps which are described below:

- **Step 1:** Deciding what level of assessment is appropriate.
- **Step 2:** Conducting an appropriate investigation.
- **Step 3:** Determining the scope and focus of the assessment.
- **Step 4:** Reviewing the draft environmental report.

The section of the flow diagram given in the original IEM procedure is reproduced as Figure 7.1 (Council for the Environment, 1989(A), extract from Figure 4, pgs 22 and 23). The four steps and the schematic diagram are discussed further under the Sections 7.1.1 to 7.1.4.



Proponent submits a proposal which describes the proposed action and alternatives.

Authority aided by screening guidelines determines that this action will have significant environmental effects and therefore a Class 1 assessment is necessary.

Environmental effects of proposed action and major alternatives are investigated.

Affected publics are asked what their concerns are. Officials from local, regional, provincial and central government help identify the important issues. Alternative proposals are solicited. Proponent may decide to modify the proposed action for resubmission.

Environmental effects or proposed action and major alternatives are documented.

The draft report is made available for public comment, and may be reviewed by an impartial body for adequacy and completeness. Proponent may decide to modify the proposed action for resubmission.

Report is revised in light of the comments received.

FIGURE 7.1: STAGE 2: ASSESSMENT
(Source: Council for the Environment, 1989(A), extract from Figure 4, pgs 22 and 23)

7.1.1 Screening Procedure

In the original IEM procedure the kind of assessment and level of investigation necessary is decided by the authority. This decision will be based on whether any of the proposed actions are likely to result in significant environmental impacts. The plan was that screening guidelines would be developed to streamline this process.

There are three classes of assessment in the original IEM procedure:

- **Class 1 assessments** apply to proposals likely to result in significant environmental impacts. This is the most detailed level of assessment and could require a year or more to complete and lead to a report of over 150 pages.

- **Class 2 assessments** apply to proposals where there is uncertainty as to whether significant environmental impacts are likely or not. Such an assessment would usually last for a maximum of two months, making use of readily available information. The output would be a report of between 15 and 20 pages.

- **Class 3 assessments** apply to proposals where there is little likelihood of significant environmental impacts resulting. The investigation would last a few days and the report would be two or three pages long.

7.1.2 Class 1 Investigation

The required level of environmental investigation is undertaken once the screening decision has been made. The potential environmental effects of the proposed action and its alternatives are examined. The emphasis of the investigation is on discovering ways in which adverse impacts can be avoided or mitigated. The results of the investigation are documented in an environmental report.

For all levels of assessment, similar kinds of information are sought and the basic format of the environmental report that will be produced is also similar. A list of the type of

information expected to be included in the EIA report was given in the original IEM document and is repeated here (Council for the Environment, 1989(A), pg 15):

- purpose and need of the proposal;
- modifications or viable alternatives to the propose action;
- activities associated with the proposed action (and those of any alternatives);
- the affected environment;
- the potential environmental impacts;
- groups of people that would be affected by these impacts;
- possible measures to avoid or mitigate adverse impacts and enhance beneficial impacts.

7.1.3 Scoping

As discussed in Section 4.2.4, scoping is only required for Class 1 levels of assessment in the original IEM procedure.

It is a procedure which brings interested and affected parties (IAP's) into the environmental assessment and hence the decision making process. IAP's include the public, specific interest groups (for example ratepayers' associations, non-governmental organisations (NGO's)) and government bodies that have control over aspects of the proposed action, or have expertise that may be of relevance.

The purposes of scoping are as follows:

- **Identification of significant issues**
  Major issues are defined so that the scope of the assessment can be confined to the potentially serious effects of the proposal.

- **Identification and selection of alternatives**
  Alternative ways of meeting the proponent's identified need, other than the proposed development, or ways to make the proposed action more acceptable are explored.

- **Determination of specific guidelines for EIA**
  The achievement of the above aims relies on scoping being commenced early in the assessment stage. An added benefit of the scoping process is that feedback on the acceptability of the proposed development is generated, and potential improvements to it can be made before financial commitment to a particular action is made.

There are two basic types of scoping, namely public and authority scoping. These are described below.

Public scoping

This involves special interest groups, representatives of public organizations, and members of the general public. Active public involvement and consultation is particularly useful in assessing potentially controversial proposals because the varying perceptions of the different interest groups can be ascertained. The proposal can be either improved in response to objections or the EIA report and the record of decision can provide explanations as to why suggestions from the scoping process are not viable. It is generally accepted that public scoping promotes understanding between the different parties involved, and aids in the eventual acceptance of the approved action.

Authority scoping

This involves all local, regional, provincial and central government bodies or para-statal organizations with responsibilities, interests or special expertise relevant to the proposal. Legal or administrative constraints are identified, and major concerns of the authorities are determined. The results of public scoping are also addressed. One possible way of continuing with authority scoping is to form a committee for ongoing guidance during study to keep assessment focused. This scoping committee would provide a forum for continuous, interactive assessment of environmental acceptability of various aspects of proposals as new information is obtained, and as major decision points are reached.

The general procedure includes the following elements:

- an initial meeting in which the proposed development is explained and concerns relating to it are obtained;

- initial scoping document which records the concerns expressed at the initial meeting and which is circulated to IAP's for comment;
- comments on the initial scoping document;
- final scoping document, which is modified in the light of the comments received.

The scoping process can be extended during the investigation to include further public involvement, or "ongoing scoping".

7.1.4 **Review of Draft EIA Report**

The draft environmental impact assessment (EIA) report is subjected to a review to ensure that all concerns have been addressed and the report is adequate. The draft report is circulated to all IAP's and comment in the draft report is actively sought. An external review by an independent, impartial person with the relevant expertise to assess the draft report for adequacy and completeness may be beneficial in some cases.

The purpose of this review is to ensure that all concerns have been heard, understood and addressed before final report goes to authority and decision is made. A final EIA report is prepared, taking into account the comments received. This is then formally submitted to the relevant authority and the decision making process begins.

7.2 Case Study Description

Please refer to Table 7.1 for the steps which took place during the assessment stage.

The assessment stage began in April 1990 and ended in October 1992, a period of two years and seven months.

7.2.1 Screening procedure

The proponent requested assistance from the consultants who visited the existing sand quarry site and were briefed on the proponent's requirements in April 1990. The consultants recommended adopting IEM and undertaking a scoping study. They submitted a proposal to undertake such a study to the proponent in May 1990. This essentially comprised the screening procedure, as only a Class 1 level of assessment requires scoping.

The decision that a Class 1 study was required was made by the proponent on the consultant's recommendation. No authorities were involved in the decision as to the level and kind of assessment required.

7.2.2 Scoping

The proponent lead the consultants to believe that there would be little public objection to the proposed rock quarry, in fact that the public would approve because the proponent was conducting an environmental investigation. However the consultants were sceptical and insisted that a scoping study form the first step, so that the true public perception could be discovered.

The DM&EA withdrew their previous requirement that the proponent liaise with neighbours in June 1990, but the proponent decided to continue with IEM and the scoping study as planned.

A date for an initial meeting was set for 26 Jun 1990. It was decided to invite neighbours who shared a common boundary with the proponent, and their immediate neighbours.

TABLE 7.1: LEVEL OF INVOLVEMENT OF RESPONDENTS IN ASSESSMENT STAGE

STAGE		DATE	STEP IN ASSESSMENT STAGE	RESPONDENT REFERENCE NUMBER						
				1	2	3	4	5	6	7
STAGE 2: ASSESSMENT	SCREENING PROCEDURE	April 1990	Consultants visit site and are briefed on Proponent's requirements. Consultants recommend undertaking a scoping study and submit a proposal to unertake such a study to the Proponent (SRK Proposal 180966).	*		*				
		May 1990	Proposal accepted by Proponent and consultants appointed to undertake scoping study.	*		*				
	SCOPING (Public and Authority)	6 June 1990	Mineral and Energy Affairs no longer requires Proponent to liaise with neighbours, but Proponent decides to continue with scoping study as planned.	*		*				
		14 June 1990	Invitations to public scoping meeting posted to 111 nearest neighbours.	*		*				
		26 June 1990	Public scoping meeting held.	*		*				
		17 July 1990	Draft report on scoping meeting issued (SRK Report 180966/1, dated June 1990).	*		*	*			
		July 1990	Motivation and request for capital for slimes dam and rock quarry to Board of Directors.	*			*			
		12 October 1990	Final date for receipt of comments on draft report on scoping meeting.	*			*			
		14 August 1990	Meeting with local Town Council to discuss proposed quarry.	*			*			
		15, 22 August 1990	Local Ratepayers' Association (RA) submit petition with ± 3000 signatures objecting to the proposed quarry to Dept of Mineral and Energy Affairs and the State President.	*			*			
		20 September 1990	Meeting with RA to discuss future public involvement in EIA.	*			*			
		6 November 1990	Proposal prepared for the EIA, based on requirements highlighted by scoping study (SRK Proposal 180966/2). Submitted to Proponent.	*			*			
		19 November 1990	Proposal for EIA accepted by Proponent.	*			*			
		28 November 1990	Final report on scoping meeting issued (SRK Report 180966/2).	*			*			

TABLE 7.1 (continued): LEVEL OF INVOLVEMENT OF RESPONDENTS IN ASSESSMENT STAGE

STAGE		DATE	STEP IN ASSESSMENT STAGE	RESPONDENT REFERENCE NUMBER						
				1	2	3	4	5	6	7
STAGE 2: ASSESSMENT	Class 1 Draft Report	Nov '90 to May '91	Environmental impact assessment undertaken.	*			*	*		
		January 1991	Approval from Board of Directors for the hard rock quarry.	*			*			
		22 January 1991	First Environmental Committee meeting.	*			*			
		3 April 1991	Draft EIA reviewed by external review consultant.	*			*			
		20 May 1991	Draft EIA report issued (SRK Report 180966/3).	*			*			
	Comment from IAP's	1 July 1991	Final date for comment on Draft EIA Report.	*			*			
		August 1991	Comments on Draft EIA Report compiled.	*			*	*		
	Further work	November 1991	Proposal for further work submitted to Proponent (SRK Proposal 180966/3).	*			*	*		
			Proposal for further work accepted by Proponent.	*			*	*	*	
		Oct '91 to May '92	Further work undertaken.	*			*	*	*	
		5 February 1992	Second Environmental committee meeting.	*			*	*	*	
		April 1992	Conceptual Rehabilitation plan issued to Government Mining Engineer (SRK Report 180966/4).	*			*	*		*
	Review	July 1992	Final EIA report reviewed by external review consultant.					*		
	Class 1 Final Report	July 1992	Final EIA issued to Department of Mineral and Energy Affairs (SRK Report 180966/5).	*			*	*	*	
		October 1992	Final EIA issued to Interested and Affected Parties (SRK Report 180966/5).	*			*	*	*	

This meant that the closest two "rows" of properties surrounding the existing sand quarry were invited. This came to a total of 111 households. Invitations to the public scoping meeting were posted on 14 June 1990.

At the meeting, the proposed development was described and the public were requested to state their concerns regarding the proposal. These concerns were written on pieces of card and pinned on a pinboard. The meeting was characterized by strong negative emotional response to the proposed development. Concerns expressed included dissatisfaction with the existing sand quarrying operation which contrasted with the proponent's expectations. Concern was also expressed that all the relevant interested and affected parties were not at the meeting.

The concerns expressed at the meeting were compiled into a document, referred to as the draft report on the scoping meeting (SRK Report 180966/1, June 1990). This was issued to those who attended the meeting, and the additional parties identified at the meeting. Approximately three months elapsed and then those people in receipt of draft scoping documents were informed that the 12 October 1990 had been set as a final date for receipt of comments. During these three months, the proponent submitted a motivation and request for capital for the proposed development to the Board of Directors in July 1990.

Further contact with IAP's took place in the form of a meeting with the local Town Council in August 1990 to discuss the proposed quarry. The local ratepayers' association (RA) submitted a petition with approximately 3 000 signatures to the DM&EA and the State President objecting to the proposed quarry. Subsequently a meeting with the RA was held in September 1990 to discuss future public involvement in the EIA. It was decided that an environmental committee consisting of representatives from the RA, other interest groups and authorities would be formed. Meetings would be held throughout the EIA to keep the committee informed of progress.

The final report on the scoping study (SRK Report 180966/2) was issued in November 1990, five months after the initial scoping meeting. A proposal for the EIA was prepared by the consultants based on the requirements highlighted by the scoping study. It was submitted to the proponent and accepted by them in November 1992.

7.2.3 Class 1 Investigation

The Class 1 environmental impact assessment investigation was undertaken from November 1990 to May 1991, a period of seven months. In January 1991 approval for the proposed hard rock quarry was given by the proponent's Board of Directors. The first environmental committee meeting took place on 22 January 1991.

7.2.4 Review of Draft EIA Report

The draft EIA report was reviewed by the external review consultant, and modified in response to his comments. The draft EIA report (SRK Report 180966/3) was issued to IAP's in May 1991, with a request for comments to be forwarded to the consultants.

The 1 July 1991 was set as a final date for receipt of comments, giving IAP's one and a half months to respond. The deadline was not strictly enforced, and a number of comments were received during July and August. The response from the DM&EA was the last set of comments received. The comments were compiled and analyzed during August 1992. It was clear from the comments that further work would be required to address the concerns of the IAP's, and a proposal to undertake this work was prepared (SRK Proposal 180966/2) and submitted to the proponent in November 1991. The proponent accepted the proposal and further work was undertaken during the eight month period from October 1991 to May 1992. During this time the second environmental committee meeting took place on 5 February 1992, and a conceptual rehabilitation plan (SRK Report 180966/4) was prepared and lodged with the Government Mining Engineer (DM&EA) in April 1992.

A final EIA report was prepared once the additional work was completed. This was reviewed by the external review consultant in July 1992, amended and issued to the DM&EA in July 1992 (SRK Report 180966/5). The final EIA report was subsequently issued to the IAP's in October 1992.

7.3 Analysis Of Responses To The Questionnaire

The level of involvement of each respondent in each step of the assessment stage is also shown in Table 7.1. The relevant part of the flow diagram of the original IEM process was discussed in Section 7.1 and is shown in Figure 7.1.

The assessment stage is covered in the second question of the questionnaire. The responses will be analyzed in a similar manner to that in Section 6 where answers to questions on the proposal generation stage were dealt with. That is, the question and corresponding answers will be presented and then analyzed. Once again the level of involvement of each respondent is indicated.

Question two is divided into six main sub-questions in a similar manner to question one, namely Question 2.1 through to Question 2.6.

7.3.1 Question 2.1: Did the required steps take place?

The different components of the assessment stage are listed, and for each the respondent is asked whether or not the step was undertaken. The respondent answers "yes" or "no", and if the step did not occur, the respondent is asked to indicate why.

There are thirteen such questions, two covering the screening procedure, one the Class 1 investigation, five scoping, one Class 1 draft report, two review of draft, one further work, and one Class 1 final report.

2.1.1	SCREENING PROCEDURE: Was a decision made as to the level of assessment that was appropriate to the proposed action (ie action will have significant environmental effects therefore Class 1 assessment)? (Answer YES or NO). If NO , please indicate why not.	
*1	Yes	-
2	Don't know	-
*3	Yes	-
4	Yes	-
5	Yes	-
6	Yes	-
7	Yes	-

Six of the seven respondents answered that such a decision was made. Respondent 2 did not know whether such a decision was made because he was not involved in that step. Therefore the conclusion drawn is that a screening decision was made.

2.1.2	SCREENING PROCEDURE: Did the relevant authority make the decision? (Answer YES or NO). If NO, please indicate why not, if possible.	
*1	No	Relevant authority "ignorant" of IEM. Company and consultant took decision.
2	No	-
*3	No	Consultants suggested that this procedure (which was then very new) should be followed.
4	No	Proponent on advice from consultant.
5	No	They don't have the expertise. Decision was made by consultant. In context of revised IEM, quarrying / mining are listed activities and would therefore be subject to a full EIA + (no more classes given).
6	Yes	They were also involved in the decision making.
7	Yes	-

\+ This is not correct - quarrying and mining are listed activities, but this does not automatically mean that a full EIA has to be done. If the activity is listed and significant impacts seem likely in answering the summary list of environmental characteristics, then a full EIA must be done. If significant impacts are not likely, or there is uncertainty, then an initial assessment must be done, which may or may not lead to a full EIA. It should also be noted however that the abovementioned list has no legal status at the present time.

The majority of the respondents answered that the relevant authority did not make the screening decision. The two respondents who believed that the authorities were involved

in the decision were not involved in the study at this stage and their answers are therefore not of significance. The overall conclusion is that the authority was not involved.

The answers indicate that the screening decision was taken by the proponent on the advice of the consultant. The reason given by two of the respondents (1 and 5), both of whom were involved in this step, that the authority was not involved is that the authority does not have the necessary knowledge of IEM and is therefore ignorant of their role in taking the screening decision.

The fact that the DM&EA withdrew their requirement that the proponent involve their neighbours before they would issue a permit indicates that they may not have stipulated a Class 1 investigation in any event.

2.1.3	**CLASS 1 INVESTIGATION: Were the environmental effects of proposed action and major alternatives investigated? (Answer YES or NO) If NO indicate why not, if possible.**	
*1	Yes and No	Major alternatives were not really investigated. We wanted to quarry at the existing site. It was either go or maybe no go.
2	Yes	-
*3	Yes	But to some extent after the fact.
4	Yes	-
*5	Yes	-
6	Yes	-
7	Yes	-

There was unanimous agreement that the environmental effects of the proposed action and major alternatives were investigated. Two of the respondents (1 and 3) who were very involved in the assessment qualified their answers saying that the effects of the proposed action were investigated but the effects of alternatives were only looked at at a later stage.

2.1.4	SCOPING - IDENTIFY MAJOR ISSUES & ALTERNATIVES: Were the affected publics asked what their concerns were? (Answer YES or NO) If NO indicate why not, if possible.	
*1	Yes	-
2	Yes	-
*3	Yes	-
*4	Yes	-
5	Yes	-
6	Yes	-
7	Yes	-

All seven respondents agreed that the affected publics were asked what their concerns were.

2.1.5	SCOPING - IDENTIFY MAJOR ISSUES & ALTERNATIVES: Did officials from local, regional provincial and central government help identify the important issues? (Answer YES or NO) If NO, please indicate why not, if possible.	
*1	Yes and no	Only local government (Municipality). Regional, provincial and central government not involved.
2	Yes	-
*3	Yes	-
*4	Yes	-
5	Yes	-
6	Yes	-
7	Yes	-

Once again all seven respondents agreed that officials were involved in scoping. However respondent 1 qualified his answer by stating that only local government, in the form of the local Municipalities was represented. This is not true because representatives from the DM&EA were involved. It may be that respondent 1 has a different understanding of the meaning of central government in that the representatives from DM&EA were local officials, however it is a central government department, and therefore this qualification is not valid.

2.1.6	SCOPING - IDENTIFY MAJOR ISSUES & ALTERNATIVES: Were alternative proposals solicited? (Answer YES or NO) If NO, please indicate why not, if possible.	
*1	No	See 2.1.3: "Major alternatives were not really investigated. We wanted a quarry at the existing site. It was either go or maybe no go".
2	Yes	-
*3	Yes	-
*4	No Yes	By proponent from another consultant? (Question not understood) Alternative project actions were considered.
5	Yes (?)	I think so, but there were no real practical, or realistic alternatives except in terms of project design eg location of exit and access route.
6	Yes	-
7	Yes	-

Respondent 4 answered both "yes" and "no" to this question. The note relating to the "no" part of his answer which indicates that he has not understood that the word "proposal" is used as an IEM term referring to the "proposed development". He has confused it with a consultant's proposal to a client to undertake work, and the "no" answer is therefore dismissed as irrelevant.

Taking the above point into account, the majority of the respondents stated that alternative proposals were solicited. Respondent 1 is the only respondent who is adamant that alternatives were not investigated. This reflects the stance of the proponent in the initial reluctance to explore alternatives.

Comments from the IAP's on the draft EIA report resulted in alternatives being looked at in more detail during the further work undertaken before the issue of the final EIA report.

2.1.7	**SCOPING - IDENTIFY MAJOR ISSUES & ALTERNATIVES: Did the proponent decide to modify the proposed action for resubmission? (Answer YES or NO) If NO, please indicate why not, if possible.**	
*1	Yes	Some modification did take place, but no very significant modifications. The main proposal remained a rock quarry at the existing site.
2	Yes	Not so much a modification as a more detailed investigation into the concerns of the public.
*3	No	The proposed project remained essentially the same.
*4	Yes	Modified in various but small ways.
5	No	Not required by authorities or anyone else for that matter.
6	Yes	Preliminary EIA was submitted to IAP's. After their concerns were identified, report was updated.
7	No	?

Three respondents said "no" and four said "yes", indicating a split in opinion. The reason for the split is clear from the explanations given, namely that there is overall agreement that changes were made, but the changes were generally small and therefore not significant enough to merit a resubmission of the proposal to the authority. The fact that there was never a formal submission of a proposal to the authority caused confusion because one cannot resubmit a document if it was never submitted previously.

The overall conclusion from the answers to this question is therefore that the proponent did introduce some small modifications to the proposal, but that the proposal was not resubmitted to the authority.

2.1.8	SCOPING - IDENTIFY MAJOR ISSUES & ALTERNATIVES: Were the results of scoping used to set scope of work for Class 1 investigation? (Answer YES or NO) If NO, please indicate why not, if possible.	
*1	Yes	-
2	Yes	-
3	Yes	-
*4	Yes	-
5	Yes	-
6	Yes	-
7	Yes	-

There was unanimous, unqualified agreement that this was done.

2.1.9	CLASS 1 DRAFT REPORT: Environmental effects of proposed action and major alternatives are documented? (Answer YES or NO) If NO, please indicate why not, if possible.	
*1	Yes	-
2	Yes	-
3	Yes	-
*4	Yes	-
5	Yes	-
6	Yes	-
7	Yes	-

Once again there was unanimous, unqualified agreement that this was done.

It should be noted that one of the criticisms contained in the comments on the draft report was that environmental effects of alternatives was not adequately covered. This was included in the further work, and alternatives were discussed in greater depth in the final EIA report.

2.1.10	REVIEW OF DRAFT: The draft report is made available for public comment, and may be reviewed by an impartial body for adequacy and completeness? (Answer YES or NO) If NO, please indicate why not, if possible.	
*1	Yes	-
2	Yes	-
3	Yes	-
*4	Yes	-
5	Yes	-
6	Yes	-
7	Yes	-

All seven respondents agreed that the draft report was reviewed by both the public and an impartial body.

2.1.11	REVIEW OF DRAFT: Proponent may decide to modify the proposed action for resubmission? (Answer YES or NO) If NO, please indicate why not, if possible.	
*1	No	No modifications to proposed action were made.
2	Yes	-
3	No	To the best of my knowledge some detail changes to the proposed project were made on an ongoing basis during the project, but these were not formally documented as changes to the proposal.
*4	Yes	-
5	No	Not needed, well it wasn't officially submitted to the authorities or formally submitted.
6	Yes	-
7	Yes	-

This question was confusing to some respondents for the same reason stated in the discussion on question 2.1.7, namely that the proposal was not formally submitted at the outset, and it can therefore not be resubmitted. The same conclusion can be drawn in question 2.1.7, that minor changes were made but an amended formal proposal was not resubmitted.

2.1.12	FURTHER WORK: Further work is undertaken? (Answer YES or NO) If NO, please indicate why not, if possible.	
*1	Yes	-
2	Yes	-
3	Yes	-
*4	Yes	-
*5	Yes	Further work done on basis of feedback on the report.
*6	Yes	-
7	Yes	-

All respondents agreed that further work was undertaken. Respondent 5 stipulates that the work required was based on the comments received from IAP's on the draft report.

2.1.13	CLASS 1 FINAL REPORT: Report is revised in light of comments received? (Answer YES or NO) If NO, please indicate why not, if possible.	
*1	Yes	-
2	Yes	-
3	Yes	-
*4	Yes	-
*5	Yes	-
*6	Yes	-
7	Yes	-

There was unanimous agreement that the report was revised in the light of comments received.

7.3.2 Question 2.2: Additional or alternate steps

2.2	Were any additional or alternate steps used during the assessment stage? (Answer YES or NO) If YES, please specify.	
*1	Yes	An environmental committee was established consisting of IAP's, local and central government. This committee was kept up to date as to what was being investigated and how these investigations were being conducted. This forum was also used to educate IAP's and authorities about IEM. Proved to be reasonably effective. However the public was sometimes suspicious as to why they were being involved.
2	No	Not to my knowledge.
3	Yes	More opportunity was required for IAP comments and feedback.
*4	Yes	It was identified that rehabilitation of the existing works had not been responsibly undertaken. A conceptual rehabilitation plan was prepared to attempt to deal with this and future requirements.
*5	No	-
6	No	-
*7	No	-

Three respondents stated that additional or alternate steps were used during the assessment stage. These were:

- the formation of an environmental committee which met during the course of the investigation; and

- the preparation of a conceptual rehabilitation plan for the existing operation and the proposed development.

It seems that respondent 3 misunderstood the question as asking for recommendations for additional or alternate steps. His recommendation was that more opportunities should be provided for contact with IAP's to gain their comments and give them feedback.

Four respondents stated that no additional or alternate steps were used. Respondent 2 qualified his answer by saying that he was not aware of any such steps.

The overall conclusion is that respondents were divided as to their opinion, but the two examples of additional steps given indicate that two additional steps were taken.

7.3.3 Question 2.3: Value of assessment stage

2.3	Do you regard the assessment stage as having been successful, irrespective of compliance or otherwise with guidelines? (Answer YES or NO) Please explain further.	
*1	Yes	Work was most comprehensive. However it was expensive and time-consuming.
2	Yes	-
3	Yes	-
*4	Yes	-
*5	Yes	I think it was successful in terms of the guidelines. It would have been easier if awareness within client body, authorities and public had been greater.
*6	Yes	All environmental impacts were identified and discussed.
7	Yes	-

There was unanimous agreement that the assessment stage was successful. Some disadvantages were highlighted by the two respondents (1 and 5) who were closely involved in the stage, namely:

- it was expensive and time-consuming; and

- difficulties were experienced because of the lack of awareness of the client body, authorities and the public of IEM.

7.3.4 Question 2.4: Practical difficulties experienced, and how they may be overcome

This question deals with practical difficulties experienced during the assessment stage. It is divided into seven further sub-questions, each dealing with a separate step in the process. In each sub-question, respondents are asked to indicate whether practical

difficulties were experienced or not. If they were, then the respondent is asked to specify the difficulty and make a recommendation as to how it may be overcome, if possible.

2.4.1	**SCREENING PROCEDURE: Were any practical difficulties experienced during this step comprising the assessment stage? (Answer YES or NO) Please specify and state any recommendations you may have as to how the specified difficulties could be overcome in any future projects.**		
*1	Yes	Authority did not make the decision to go Class 1.	Educate authorities, ESPECIALLY if IEM becomes a legal requirement.
2	Not to my knowledge	-	-
3	No	-	-
*4	No	-	-
*5	No	-	-
6	-	-	-
7	?	-	-

Only one respondent (1) indicated that a practical difficulty was experienced in the screening procedure. The difficulty was that the authority did not make the screening decision because of a lack of knowledge that this is their role in IEM. He recommended the authorities be educated to overcome this problem. This recommendation is especially relevant if IEM becomes a legal requirement.

2.4.2	**CLASS 1 INVESTIGATION: Were any practical difficulties experienced during this step comprising the assessment stage? (Answer YES or NO) Please specify and state any recommendations you may have as to how the specified difficulties could be overcome in any future projects.**		
*1	No	-	-
2	Not to my knowledge	-	-
3	Yes	In the IEM process, the Class 1 investigation comes before the scoping. The consultants modified this process (although it is interactive) by placing much more emphasis on the scoping before the Class 1 investigation really got under way.	More emphasis on scoping early in the process.
*4	Yes	Disagreement between consultant and client, who appointed sub-consultant to investigate extent etc of impacts relating to groundwater.	Sensitive negotiations. Communication.
*5	No	Perhaps client didn't "buy into" process (not all of them, but some of them).	Education NB.
6	No	-	-
7	?	-	-

The majority (four in total) of the respondents did not experience practical difficulties while two respondents (3 and 4), and one respondent (7) did not know as he was not involved in the step.

Respondent 3 does not describe a difficulty so much as an alternative step, namely that scoping was done as the first step of the investigation. This is a slight modification to the original IEM procedure, where scoping takes place during the investigation. It supports the updated procedure where scoping is the first step.

A practical difficulty experienced during the groundwater investigation is highlighted by respondent 4. The class 1 levels of assessment are detailed and therefore require specialist input from a number of sub-consultants. This has potential to lead to communication breakdowns and disagreement, and sensitive negotiations and communication are given as a recommended solution to this difficulty.

2.4.3	**SCOPING: Were any practical difficulties experienced during this step comprising the assessment stage? (Answer YES or NO) Please specify and state any recommendations you may have as to how the specified difficulties could be overcome in any future projects.**		
*1	Yes	It is not pleasant. The public are rude, emotional and generally a pain.	I wish I had some.
2	Not to my knowledge	-	-
*3	Yes	The consultants thought that all the IAP's had been identified, but this was not the IAP's perception and more people had to be involved in a number of steps which delayed the project.	More care in identification of IAP's and discussion with (local) authorities before public meetings to inform them of the proposals. The local authorities will not take part in discussions during public meetings.
*4	No	-	-
5	Yes	Some IAP's took non-negotiable stance and this is difficult to deal with or reason with. History of proponent resulted in"worms in the woodwork" creeping out, because it is an existing operation.	Understand client's history. Existing operations - perhaps undertake environmental auditing (EA) first and then EIA of changes / expansions.
6	No	-	-
7	?	-	-

Two of the respondents were not sure whether difficulties were experienced, and two believed that none were experienced. Three respondents (1, 3 and 5) indicated that difficulties were experienced in working harmoniously with the public. Strong negative emotion and mistrust of the proponent characterized all dealings with the public for the reasons given below:

- Perception that all IAP's had not been identified;
- Objections to existing operation.

The proposed development had potentially significant social impacts and was therefore vehemently opposed by most IAP's.

Despite the two respondents who believed no difficulties were experienced, the explanation given by others indicated that severe difficulty was experienced in establishing any kind of co-operative relationship with the public.

2.4.4	**CLASS 1 DRAFT REPORT: Were any practical difficulties experienced during this step comprising the assessment stage? (Answer YES or NO) Please specify and state any recommendations you may have as to how the specified difficulties could be overcome in any future projects.**		
*1	No	-	-
2	Not to my knowledge	-	-
3	-	-	-
*4	No	-	-
5	Yes	Conveyance of scientific data. Timing to get report out.	Written word should be as clear and concise as possible. Negotiate timing to be realistic.
6	No	-	-
7	?	-	-

Only one respondent (5) stated that practical difficulties were experienced. The difficulties were related to the actual writing of the report and the challenge of communicating scientific data to the layman, and the logistic problems involved in obtaining and collating the many specialist reports timeously.

2.4.5	**REVIEW OF DRAFT: Were any practical difficulties experienced during this step comprising the assessment stage? (Answer YES or NO) Please specify and state any recommendations you may have as to how the specified difficulties could be overcome in any future projects.**		
*1	Yes	Senior officials in company being unfamiliar with IEM did not know what they were involved in.	Education.
2	Not to my knowledge	-	-
3	-	-	-
*4	No	-	-
5	Yes	People didn't keep to deadline for comments. Hidden agendas.	Be more firm - if don't stick to deadline then it means that IAP's say everything OK. Do thorough social profile at outset of study on attitudes.
6	No	-	-
7	?	-	-

Respondents 1 and 5 described practical difficulties, while the other respondents either did not know of any or did not experience any themselves. The difficulties described were:

- the lack of response within the specified period; and
- obstructive behaviour by various parties who did not want to participate in a meaningful way because they did not want the rock quarry under any circumstances (hidden agendas).

Recommendations given to overcome or deal with these difficulties are:

- education of senior members of proponent's staff;
- make IAP's aware of consequences of missing deadlines and impose deadline for response strictly;
- conduct a thorough social profile of the IAP's at the outset so potential hidden agendas are known to the study team.

Once again the difficulties mainly related to dealing with the public.

2.4.6	**FURTHER WORK: Were any practical difficulties experienced during this step comprising the assessment stage? (Answer YES or NO) Please specify and state any recommendations you may have as to how the specified difficulties could be overcome in any future projects.**		
*1	No	-	-
2	Not to my knowledge	-	-
3	-	-	-
*4	No	See earlier comment on Class 1 investigation.	-
*5	Yes	No matter how much work one does, some IAP's will never be satisfied.	Determine that level of work complies with IEM requirements. Consult review consultant, which was done.
6	No	-	-
7	?	-	-

Only one respondent (5), who was closely involved with this step came up with a practical difficulty. This was that whatever additional work one undertakes, some IAP's will never be satisfied. This relates back to the issue of hidden agendas and obstructionist behaviour mentioned in the discussion of question 2.4.5. Some IAP's do not want the proposed development under any circumstances and use the IEM public participation process to try and stop the development.

This is in direct opposition to the aim of IEM which is to promote development, in an environmentally responsible way. Therefore it is not possible to solve this difficulty entirely, and the recommendation is pragmatic: do as much as the IEM guidelines, review consultant and authorities require and leave it at that. The decision-maker will have to judge whether the proposed development should go ahead or not.

2.4.7	CLASS 1 FINAL REPORT: Were any practical difficulties experienced during this step comprising the assessment stage? (Answer YES or NO) Please specify and state any recommendations you may have as to how the specified difficulties could be overcome in any future projects.		
*1	No	-	-
2	Not to my knowledge	-	-
3	-	-	-
*4	No	-	-
*5	Yes	As for Class 1 Draft Report: "Conveyance of scientific data and timing to get report out".	-
6	No	-	-
7	?	-	-

Once again, only one respondent indicated that practical difficulties were encountered, and these were the same as for question 2.4.4 for the Class 1 draft report.

7.3.5 Question 2.5: Would you do things differently?

2.5	Would you choose to carry out this stage differently if you had the opportunity of doing this project over again? (Answer YES or NO) If YES, please specify.	
*1	No	-
2	No	-
3	-	-
*4	No	-
*5	No	-
*6	No	-
7	No	-

None of the respondents would choose to carry out the assessment stage differently, given the opportunity. This seems to be a contradiction of the various recommendations given previously, but is taken to indicate that although there were some aspects that could have been more efficiently conducted, the overall result was effective.

7.3.6 Question 2.6: Comparison of case study with updated IEM

2.6	Are you familiar with the updated IEM version, as published in draft form during 1992? (Answer YES or NO) If YES, please comment on how the updated procedure links up with the experience of this case study in the assessment stage.	
*1	No	-
2	No	-
3	Yes	The updated process appears more logical overall, and would make the IEM procedure easier to understand, and explain.
*4	Yes	Relates very well - main procedures followed.
*5	Yes	Refer to question 2.1.2: " In context of revised IEM, quarrying / mining are listed activities and would therefore be subject to a full EIA(see +) (no more classes given)" and Section in the report (Final EIA): fill in
*6	Yes	First an initial assessment was conducted which was updated after comments were received from IAP's to a comprehensive Class 1 EIA (see + +).
7	-	-

\+ This is not correct - quarrying and mining are listed activities, but this does not automatically mean that a full EIA has to be done. If the activity is listed and significant impacts seem likely in answering the summary list of environmental characteristics, then a full EIA must be done. If significant impacts are not likely, or there is uncertainty, then an initial assessment must be done, which may or may not lead to a full EIA.

\+ + Wrong interpretation. A full Class 1 EIA was done right from the start. The further work and updating of the draft report after comments from IAP's were received formed part of that full EIA.

The answers to this question were varied and not very helpful as they were generally not specific enough. A discussion of how the assessment stage relates to the new IEM process is given in Section 7.4 when recommendations are discussed.

7.4 Conclusions and Recommendations

The answers to Question 2.1 are summarised in Table 7.2 below.

TABLE 7.2: SUMMARY OF ANSWERS TO QUESTION 2.1

QUESTION			OVERALL ANSWER (Refer to Section 7.3.1)
Number	**Step**	**Description from Figure 7.1**	
2.1		Did the following steps take place as part of the assessment stage:	
2.1.1	Screening Procedure	Was a decision made as to the level of assessment that was appropriate to the proposed action (ie action will have significant environmental effects therefore Class 1 assessment)?	Yes
2.1.2		Did the relevant authority make the decision?	No
2.1.3	Class 1 Investigation	Were the environmental effects of proposed action and major alternatives investigated?	Yes
2.1.4	Scoping: Identify major issues and alternatives	Were the affected publics asked what their concerns were?	Yes
2.1.5		Did officials from local, regional, provincial and central government help identify the important issues?	Yes
2.1.6		Were alternative proposals solicited?	Yes
2.1.7		Did the proponent decide to modify the proposed action for resubmission?	Yes and No
2.1.8		Were the results of scoping used to set scope of work for Class 1 investigation?	Yes
2.1.9	Class 1 Draft Report	Environmental effects of proposed action and major alternatives are documented.	Yes
2.1.10	Review of Draft	The draft report is made available for public comment, and may be reviewed by an impartial body for adequacy and completeness.	Yes
2.1.11		Proponent may decide to modify the proposed action for resubmission.	Yes and No
2.1.12	Further Work	Further work is undertaken.	Yes
2.1.13	Class 1 Final Report	Report is revised in light of comments received.	Yes

The overall outcome of the answers was obtained from the discussion of individual questions in Section 7.3.1 and entered in the last column of the table. Ten of the thirteen sub-questions were affirmative answers overall. The answer to one of the sub-questions was negative because of a lack of knowledge on the part of the authorities about their role in IEM. The remaining two answers were inconclusive because there was a difference of opinion amongst the respondents. These two questions both related to whether the respondent decided to modify the proposal for resubmission after the scoping exercise and then after the comments received on the draft EIA report. In both cases the disagreement stemmed from a different interpretation of what degree of modification qualified for the term "modify for resubmission". There was general agreement however that small changes were made but a revised version was not submitted to the authorities. In conclusion then, according to the questionnaire responses, the case study did comply with the original IEM procedure.

A summary of the practical difficulties experienced and practical recommendations as to how these could be overcome, as given in the answers to the questionnaire, are given in Table 7.3. An indication is given in the table as to how the recommendations relate to the updated IEM procedure.

Other recommendations given relate to the procedural matters, support the changes that have been made to the original IEM process, and are reflected in the updated version of IEM. For example, scoping was the first step in the assessment stage of the case study which is not in line with the original IEM process, but is in line with the updated process. This supports the changes made to the IEM process in terms of requiring that scoping be commenced before the investigation itself begins.

As pointed out in Table 7.3, objection to scoping may have been a useful aid to resolving the difficulty which arose when the IAP's involved perceived that other groups also needed to be involved. The availability of a formal structure would have facilitated things as it would have legitimised the fact that it is not unusual or unexpected that further IAP's will be identified during the course of scoping. The IAP's perceived that the other groups were intentionally left out as a strategy on the proponent's part to further the proposed rock

TABLE 7.3: SUMMARY OF PRACTICAL DIFFICULTIES AND RECOMMENDATIONS FOR ASSESSMENT STAGE

STEP	PRACTICAL DIFFICULTIES EXPERIENCED	PRACTICAL RECOMMENDATIONS TO OVERCOME DIFFICULTIES	RELATION TO UPDATED IEM PROCEDURE
Screening Procedure	• Authority did not make screening decision as to level of assessment required.	• Educate authorities, especially if IEM becomes a legal requirement.	Supports updated procedure in that proponent and consultant make decision using checklists in consultation with authority.
Class 1 Investigation	• Some of members of the proponent were not fully committed to the process, possibly because of ignorance about IEM. • Disagreement between a specialist sub-consultant, consultant and proponent.	• Education of all members of the proponent's team, especially at director level to ensure that they understand IEM and are committed to it. • Open and sensitive communication between all parties.	-
Scoping	• Difficulty in dealing with the public because of rudeness, emotionalism and the non-negotiable stance taken by some groups. • History of proponent's existing operation lead to lack of trust on part of public for proponent's environmental responsibility. • All IAP's were not identified at the outset, which caused delays as more people became involved during the course of the project.	• Try to understand the history of the existing operation so that one is prepared for the attitudes of the public. Look at the feasibility of conducting environmental audit (EA) on the existing operation, involving the public, before introducing the possibility of changes. • Take great care to identify all IAP's at the outset. • More discussion with authorities prior to public meetings. • More emphasis on scoping early in the process.	Supports new IEM in which: - first step is to identify and notify IAP's - objection to scoping introduced which may assist
Class 1 Draft report and Final report	• Difficulty in conveying scientific data so that the public can understand it. • Time constraints imposed on the issue of the draft report.	• The report should be written in as clear and concise a manner as possible. • Negotiate timing of issue of the draft report with the proponent and IAP's to be realistic.	-
Review of Draft	• IAP's did not keep to deadline for comments. • Some IAP's had hidden agendas which affected their perceptions of the impacts of the proposed rock quarry.	• Be strict about the consequences of not replying by the deadline, ie that will be taken to mean that the IAP's do not have any objections to the proposal. • Do a thorough investigation of the IAP's involved, including a social profile and a study on attitudes so that the study team is aware of hidden agendas at the outset.	-
Further Work	• No matter how much work one does, some IAP's will never be satisfied.	• Determine that level of work done complies with IEM requirements. Consult review consultant. If these two are adequate, don't worry about IAP's.	-

quarry, which was not true. The above point supports the introduction of an objection to scoping in the updated IEM procedure.

None of the respondents indicated a lack of support for the updated IEM process in any way.

Two additional steps were undertaken in the assessment stage, namely the formation of an environmental committee, and the preparation of a rehabilitation plan for the existing operation and the proposed development. The updated IEM procedure gives extensive guidelines for scoping, and includes the idea of forming an environmental committee. A rehabilitation plan would form part of an environmental management plan required by the authorities.

Therefore no recommendations were made for additional steps that have not been taken into account already by the updated IEM process.

8 COMMENT ON STAGE 3: DECISION

Comment is made on how the case study is expected to proceed through this phase of the IEM procedure. This will provide an opportunity to show how events in previous stages are likely to affect the later stages.

8.1 Original IEM Requirements for Decision Stage

The purpose of the decision stage is to identify and formally approve the proposed action or alternative that the authority believes is in the best overall interests of society. A secondary aim is to communicate that decision to IAP's so that there is a general understanding of how the decision was reached. There must also be opportunity for appeal against a decision.

The original IEM document (Council for the Environment, 1992(A)) sets out the following steps as comprising the decision stage:

- **Step 1:** Making the decision.
- **Step 2:** Specifying conditions of approval.
- **Step 3:** Recording the decision.
- **Step 4:** Providing for appeal.

Note that steps 2 to 4 are only applicable to Class 1 proposals. The four steps mentioned above are described in more detail in Sections 8.1.1 to 8.1.4, and represented in Figure 8.1.

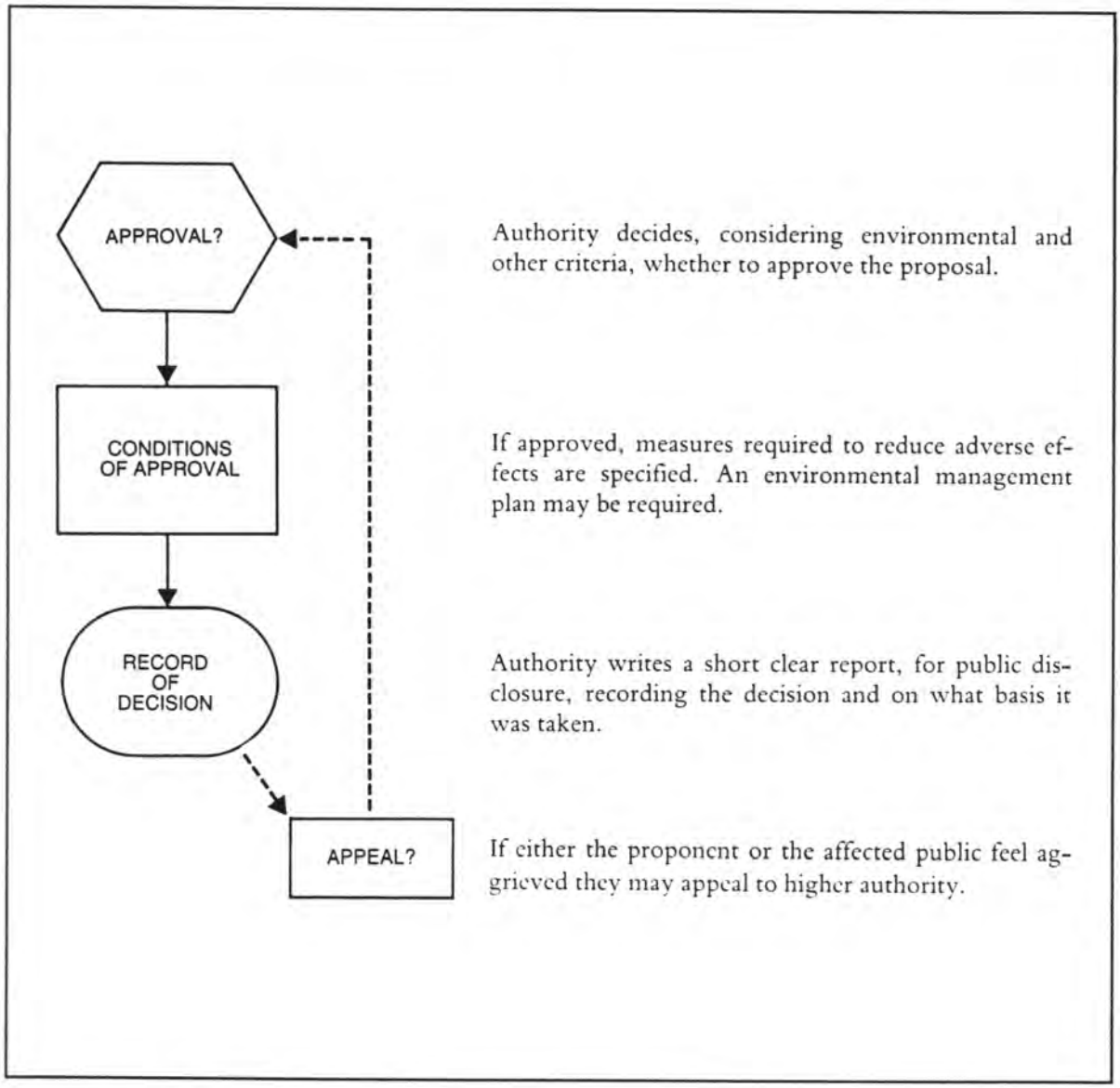


FIGURE 8.1: STAGE 3: DECISION
(Source: Council for the Environment, 1989(A), extract from Figure 4, pg 23)

8.1.1 **Decision**

The relevant authority examines the environmental and other reports and decides on one of the following, to:

- approve the proposed action;
- grant conditional approval; or

- reject the proposed action in favour of an alternative action, which could be to maintain the status quo.

8.1.2 Conditions of Approval

If the section option in Section 8.1.1 is chosen, ie. to grant conditional approval, the conditions should be clearly laid down and the way in which these conditions will be enforced should be stated. An environmental management plan may be requested which will detail exactly how the proposed development will be implemented and how the mitigation measures will be carried out. Conditions of approval might also include conditions for restoration of the site after decommissioning.

8.1.3 Record of Decision

A document or record of decision (ROD) must be prepared which is available to the public on request. The way in which the decision was made must be explained in the ROD.

8.1.4 Appeal

Either the proponent or any other party may wish to contest the decision, and therefore a formal procedure for appealing against the decision should be provided.

8.2 Comment on how Stage will Progress

The decision stage is basically all up to the initiative of the authorities. Therefore the lack of knowledge of IEM amongst the authorities is the most serious factor influencing the decision stage. The historic lack of participation of the authorities indicates that the stage is unlikely to comply with requirements. However the strong public opposition to this particular proposal, along with the education process that has occurred during the environmental committee meetings and other interaction with the authorities may prove those indications wrong.

9 COMMENT ON STAGE 4: IMPLEMENTATION

Comment is made on how the case study is expected to proceed through this phase of the IEM procedure. This will provide an opportunity to show how events in previous stages are likely to affect the later stages.

9.1 Original IEM Requirements for Implementation Stage

The purpose of the implementation stage is to develop a practical procedure to ensure that the development will proceed as approved, ie. in an environmentally acceptable manner.

The original IEM document (Council for the Environment, 1992(A)) sets out the following steps as comprising the implementation stage:

- **Step 1:** Monitoring conditions of approval.
- **Step 2:** Evaluating the IEM process.

Note that both of the above steps only apply to Class 1 proposals. The two steps mentioned above are described in more detail in Sections 9.1.1 to 9.1.2, and shown on Figure 9.1.

9.1.1 Monitoring

The relevant authority should develop and implement a monitoring programme to ensure compliance with the conditions of approval.

9.1.2 Selected Audits

The approved development should be audited as a means of evaluating the actual consequences of the action.

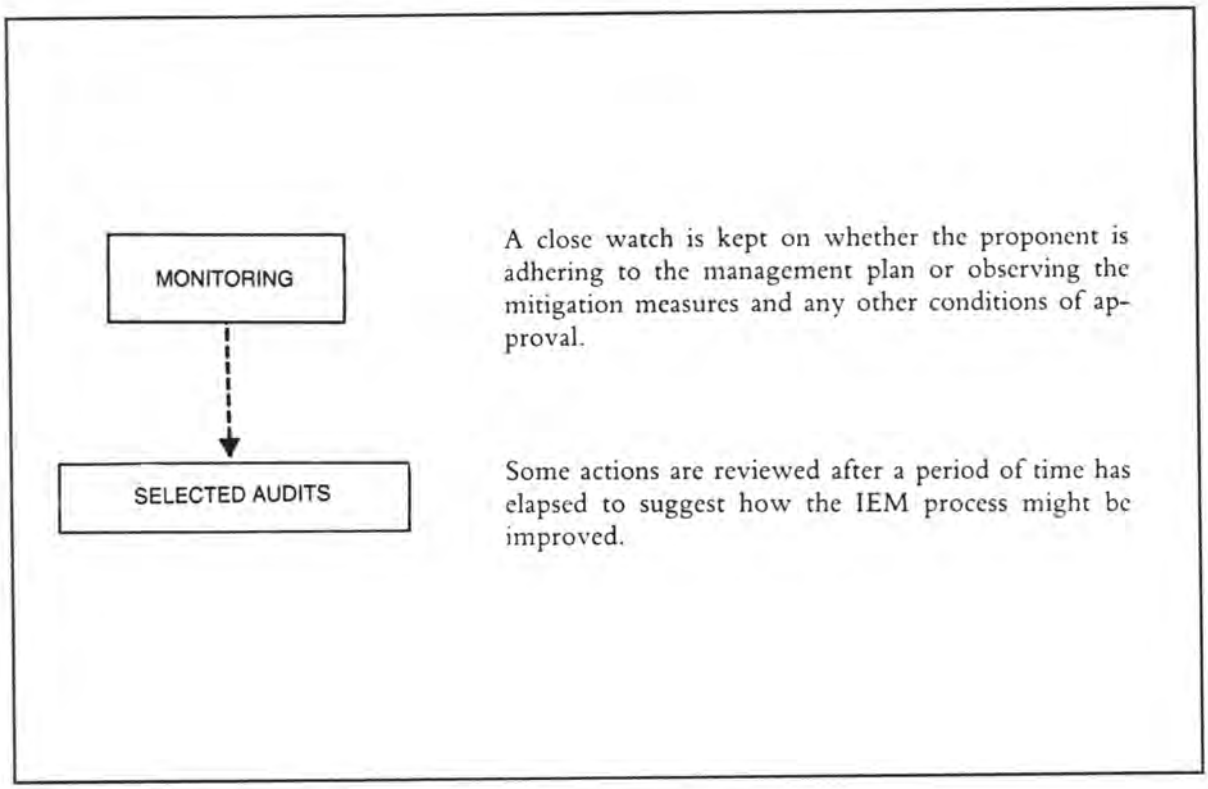


FIGURE 9.1 STAGE 4: IMPLEMENTATION
(Source: Council for the Environment, 1989(A), extract from Figure 4, pg 23)

9.2 Comment on how Stage will Progress

The same concern expressed in Section 8.2 holds for the implementation stage, namely that the lack of education of the authorities will influence the compliance of this stage with IEM requirements. Another factor is the shortage of manpower to police and enforce regulations.

However, once again the strong public pressure on the proponent to be environmentally responsible, along with a genuine intention on the part of the proponent to do so may result in the authorities' influence not being needed to any great extent. The proponent has indicated the intention of auditing their operation on a regular basis. This is borne out by the way in which the IEM process has been carried out this far at the instigation of the proponent, despite lack of support or direction from the authorities.

10 CONCLUSIONS AND RECOMMENDATIONS

10.1 Aims and Objectives

The overall aim of the project is to critically assess the implementation of IEM procedures by analyzing a case study. The intention was that the presentation and analysis of this case study will provide a useful example of the early implementation of IEM in South Africa. To contribute to this goal, practical difficulties experienced in applying the procedure were identified and described, and recommendations as to how such difficulties may be overcome in future projects were given.

The objectives were to analyze each stage of the case study in relation to the original and updated versions of IEM. The views of those involved in the study were obtained by means of a questionnaire, and used as a basis for drawing conclusions.

10.2 Major Elements of Case Study and Methodology

10.2.1 Case Study

The case study was described to provide the reader with general background to the project being examined in the dissertation, and to familiarize the reader with the particular circumstances pertaining to it. The proposed development is an existing sand quarry, and the proposed action is to extend activities on the site to include quarrying of rock as well as sand. The need of the proponent is the provision of a new source of aggregate to continue supplying established customers in the north western sector of the Witwatersrand. Major alternatives which could realistically meet this need were identified during the case study to be:

- Mine sand and rock at the existing sand quarry as proposed.
- Mine sand at the existing sand quarry site and rock elsewhere.
- Mine sand and rock at the existing sand quarry site as proposed, but locate the crusher off-site.

10.2.2 Comparison of Original and Updated Versions of IEM

The IEM process was reviewed, firstly by describing the background to its development and then by comparing the original and updated versions of the process. The conclusion from the comparison was that the two versions of IEM are based on the same philosophy and for the most part the elements are common to both. However these elements appear in a different order, or in a greater or lesser degree of detail. Thus they are essentially similar but with different emphases.

The significance of the above conclusion for the case study is that, although the case study was conducted according to the original IEM procedure, the publication of the amended version does not invalidate the case study in any way.

10.2.3 Questionnaire

A questionnaire was compiled and sent to individuals from the proponent and consultant who were involved in the case study. The purpose of the questionnaire was to gain the respondent's views on the adequacy of the study in comparison to the guidelines laid down for IEM, and thereby to provide a set of data independent of the writer, who was involved in the case study. The method of selection of respondents, the number of questionnaires sent and returned, and the method of analyzing the answers to the questionnaire are elaborated on below.

Those individuals from the proponent and the consultant who were meaningfully involved in the case study were chosen as potential respondents and asked to complete the questionnaire. The questionnaire was intended to gain the respondent's personal views on whether the case study was implemented according to the Council for the Environment's guidelines on IEM, whether the case study was successful, what practical difficulties were encountered and how these could possibly be overcome in future projects.

The questionnaire was compiled using the original IEM document as a basis, including the generic terminology of the document. Confidentiality of the respondents was maintained.

Out of a total of nine questionnaires distributed, seven were returned, giving a response rate of 78%.

10.2.4 Analysis of Questionnaire Responses

The answers to the questions on the proposal generation and assessment stages were analyzed. The responses to the questionnaire are used to analyze the case study firstly in terms of its compliance with the original IEM guidelines, and secondly to compare it to the updated IEM procedure. The relative success of each step of the project was analyzed and recommendations were made by the respondents of ways in which difficulties experienced may be overcome in future projects. These recommendations related either to procedural changes or to the practical approach taken in the project.

Comment was made on how the decision and implementation stages are likely to progress, as the case study had not completed these stages at the time of writing (February 1993).

10.3 Summary of Main Findings

10.3.1 Conclusions and Recommendations from Analysis of Responses to Questions on Proposal Generation Stage

The overall outcome of the answers to the questionnaire was that the case study did not comply with the original IEM procedure in the proposal generation stage.

Practical difficulties experienced were reported to be the lack of knowledge about IEM on the part of the proponent and the authorities, and the fact that the IEM process had started too late in the life cycle of the project. Practical recommendations as to how these difficulties could be overcome were:

- education of proponent and authority, possibly through workshops;
- commence IEM as early as possible in the life cycle of the project.

The controlling authority did not act constructively in the proposal generation stage. They should have been the leading party, ie. the authority guiding the proponent and not vice versa. This is the reason that no formal proposal was submitted.

The authority is not adequately equipped to consider environmental impacts. This is for a number of reasons: a lack of trained personnel, historic factors, lack of interest and lack of legislative power.

The search for alternatives was not done initially to the required extent because the proponent was set in their ideas. After education and public pressure to look at alternatives, the proponent agreed to a more extensive consideration of alternatives. It would have been more effective and convincing if the alternatives had been considered earlier at the proponent's initiative, as opposed to being a reaction to criticism from the public. (Public comments on the draft EIA were to the effect that alternatives had not been adequately considered.) This was a shortcoming in this case study.

Other recommendations relate to procedural matters. These support the changes that have been made to the original IEM process, and are reflected in the updated version of IEM. There was some confusion in delineating the proposal generation stage from the assessment stage, and some respondents referred to the scoping exercise as being part of the proposal generation stage. This is not the case for the original IEM procedure, but the updated version combines the proposal and assessment stages, bringing public involvement forward in the process and making it more iterative. There was a recommendation that the public be involved at an earlier stage, and that there be more extensive interaction with them and the authorities. This supports the changes made to the IEM process in terms of combining the proposal and assessment stages and requiring that proponents first identify and notify IAP's, and then conduct scoping as well.

One respondent indicated a lack of support for the updated IEM process in that he believed that the involvement of IAP's was required too early in the process (identification and notification of IAP's is a mandatory first step for all proposals). However the other respondents indicated that greater involvement of IAP's was desirable at an earlier stage in the process.

No recommendations were made for additional steps that have not been taken into account already by the updated IEM process.

10.3.2 Conclusions and Recommendations from Analysis of Responses to Questions on Assessment Stage

The overall outcome of the questionnaire responses on the assessment stage was that the case study complied with the original IEM procedure for the assessment stage.

The few answers that indicated otherwise were caused by a lack of knowledge on the part of the authorities about their role in IEM, or were inconclusive because there was a difference of opinion amongst the respondents. The disagreement stemmed from a different interpretation of what degree of modification qualified for the term "modify for resubmission". There was general agreement that small changes were made to the proposal, but that a revised version was not submitted to the authorities.

Practical difficulties experienced and practical recommendations as to how these could be overcome, as given in the answers to the questionnaire, were given in Table 7.3. These were:

- Education of authorities, especially if IEM becomes a legal requirement.
- Education of the proponent to ensure that IEM is understood, and that there is commitment to it at Director level.
- Where there is an existing operation, it is imperative to understand its history so that the attitudes of the public can be anticipated. It was recommended that the feasibility of conducting an environmental audit (EA) of the existing operation be looked at, before introducing the possibility of changes.
- Take great care to identify all IAP's at the outset.
- Undertake more discussion with authorities prior to public meetings.
- Place more emphasis on scoping early in the process.
- The report should be written in as clear and concise a manner as possible.
- Negotiate the timing of the issue of the draft report with the proponent and IAP's so as to meet realistic constraints.

- Enforce the deadlines for replies from IAP's to public documents.
- Investigate the IAP's involved by including a social profile and study of attitudes, so that the study team is aware of hidden agendas from the outset.
- Ensure in consultation with review consultant that the level of work done complies with IEM requirements.

Other recommendations relate to procedural matters, and support the changes that have been made to the original IEM process, and are reflected in the updated version of IEM. For example, scoping was the first step in the assessment stage of the case study - which is not in line with the original IEM process, but is in line with the updated process. This supports the changes made to the IEM process in terms of requiring that scoping be commenced before the investigation itself begins.

A formal structure providing for the opportunity to object to scoping was identified as a useful addition to the IEM procedure, as it would facilitate the inclusion of additional IAP's who for some reason may be omitted at the outset. This supports the introduction of an objection to scoping in the updated IEM procedure.

None of the respondents indicated a lack of support for the updated IEM process in any way.

Two additional steps were undertaken in the assessment stage, namely the formation of an environmental committee, and the preparation of a rehabilitation plan for the existing operation and the proposed development. The updated IEM procedure gives extensive guidelines for scoping, and includes the idea of forming an environmental committee. A rehabilitation plan would form part of an environmental management plan required by the authorities.

Therefore no recommendations were made for additional steps that have not been taken into account already by the updated IEM process.

10.3.3 Conclusions and Recommendations from Comment on Decision Stage

The responsibility for making the decision rests with the authorities. Therefore the lack of knowledge of IEM amongst the authorities is the most serious factor influencing the decision stage. The historic lack of participation of the authorities in the case study indicates that this stage is unlikely to comply with requirements. However the strong public opposition to this particular proposal, along with the education process that has occurred during the environmental committee meetings and other interaction with the authorities may result in the guidelines being complied with.

10.3.4 Conclusions and Recommendations from Comment on Implementation Stage

A similar concern to that expressed for the decision stage applies to the implementation stage, namely that the lack of education of the authorities will influence compliance with IEM requirements. Another factor is the shortage of manpower to police and enforce regulations.

However, once again the strong public pressure on the proponent to be environmentally responsible, along with a genuine intention on the part of the proponent to do so may result in the authorities' influence not being needed to any great extent. The proponent has indicated the intention of auditing their operation on a regular basis. This is borne out by the way in which the IEM process has been carried out this far at the instigation of the proponent, despite lack of support or direction from the authorities.

10.4 Overall Conclusions

The case study did not satisfy the requirements of the original IEM procedure in the proposal generation stage; in fact the IEM procedure was only adopted for the case study after the proposal generation stage had passed. The requirements for the assessment stage were generally complied with. The modifications that were implemented during the case study were generally in line with the changes made to the IEM process, and recommendations supported the updated procedure overall.

This study has indicated the need for education of the various parties involved in IEM, namely developers, authorities and the public. If regulations are promulgated making IEM a legal requirement, an intensive education programme will need to be undertaken, as there is widespread ignorance of both the original and updated versions of IEM in all spheres. The study has also shown the feasibility of a high level of compliance with the updated IEM requirements for the decision and implementation stages in practical projects, provided the recommended education of relevant controlling authorities takes place.

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APPENDIX A

COPY OF PROCEDURE FOR INVESTIGATING CLASS 1 PROPOSALS

(Source : Council for the Environment, 1989(A), pgs 22 and 23)

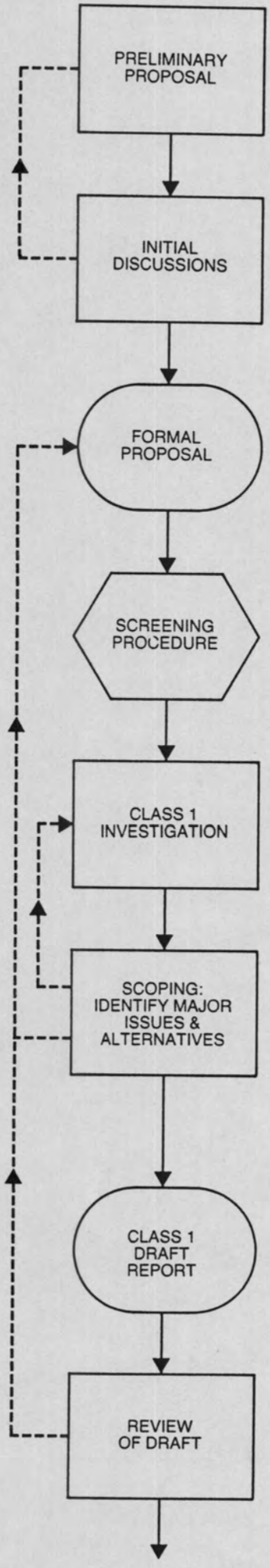


Figure 4 Procedure for investigating Class 1 proposals

Proponent has an idea.

Proponent and relevant authority discuss how to make the proposal more environmentally acceptable, and explore possible alternatives to the proposal.

Proponent submits a proposal which describes the proposed action and alternatives.

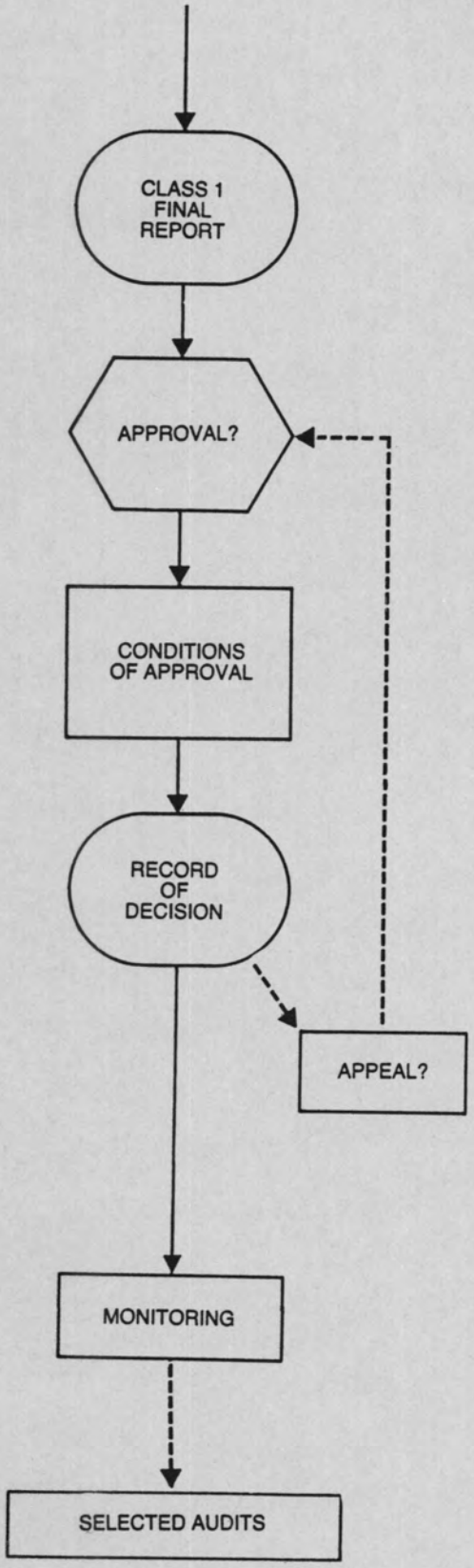
Authority aided by screening guidelines determines that this action will have significant environmental effects and therefore a Class 1 assessment is necessary.

Environmental effects of proposed action and major alternatives are investigated.

Affected publics are asked what their concerns are. Officials from local, regional, provincial and central government help identify the important issues. Alternative proposals are solicited. Proponent may decide to modify the proposed action for resubmission.

Environmental effects or proposed action and major alternatives are documented.

The draft report is made available for public comment, and may be reviewed by an impartial body for adequacy and completeness. Proponent may decide to modify the proposed action for resubmission.



Report is revised in light of the comments received.

Authority decides, considering environmental and other criteria, whether to approve the proposal.

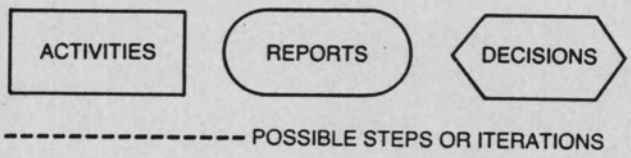
If approved, measures required to reduce adverse effects are specified. An environmental management plan may be required.

Authority writes a short clear report, for public disclosure, recording the decision and on what basis it was taken.

If either the proponent or the affected public feel aggrieved they may appeal to higher authority.

A close watch is kept on whether the proponent is adhering to the management plan or observing the mitigation measures and any other conditions of approval.

Some actions are reviewed after a period of time has elapsed to suggest how the IEM process might be improved.



APPENDIX B

COPY OF QUESTIONNAIRE AND OTHER DOCUMENTATION SENT TO POTENTIAL RESPONDENTS (ON 6 AND 9 JULY 1992)

UNIVERSITY OF CAPE TOWN

Department of Environmental and Geographical Science

University of Cape Town · Private Bag · Rondebosch 7700
Telephone: (021) 650-2873/4 · Telex: 5-22208
Fax: (021) 650-3791

6 July 1992

Mr X Xxxxxx
Xxxxxxxxxxxxxxxx
PO Box XXXXX
XXXXXXXX
XXXX

Dear Xxxx

RESEARCH PROJECT ON INTEGRATED ENVIRONMENTAL MANAGEMENT: QUESTIONNAIRE ON THE PROCEDURE USED FOR THE ENVIRONMENTAL ASSESSMENT OF THE PROPOSED ROCK QUARRY AT HONEYDEW

With reference to our telephone conversation on 2 July 1992, I enclose the questionnaire which you kindly agreed to complete. Thank you for your assistance in this research; I appreciate it and expect that it will be of benefit to those in the environmental field in this country. The estimated time for completing the questionnaire is between one and two hours. Please read this letter and, if necessary, the attached Appendices A, B and C before answering the questionnaire. Replies to the questionnaire will be treated as confidential.

As I explained, I am conducting research on the process of Integrated Environmental Management (IEM), looking at the Environmental Impact Assessment (EIA) of the proposed Honeydew Rock Quarry as a specific example of a study that has been carried out. This research project forms part of a Masters' Degree in Environmental Science, which I am undertaking under the supervision of Professor R Fuggle of the Department of Environmental and Geographical Science of the University of Cape Town.

The research project has its emphasis on the process of IEM, and therefore the specific details of the Honeydew study are not of interest except where the application of the IEM process is demonstrated.

The purpose of the questionnaire is to gain your personal views on:

- Whether the Honeydew Rock Quarry study complied with the Council for the Environment's guidelines on how Integrated Environmental Management (IEM) should be conducted. Of specific interest is your opinion of whether IEM requirements were satisfied and, if not, whether the departure from the guidelines was deliberate or by omission.

- The success or otherwise of any stage of the project, irrespective of compliance with the guidelines.

- Practical difficulties experienced with the IEM guidelines and any recommendations on how these difficulties might be overcome.

- What, if anything, you would choose with hindsight to do differently.

You may wish to refer to the document "Integrated Environmental Management in South Africa" (1989) by the Council for the Environment which sets out guidelines for undertaking a Class 1 IEM study. A copy of the document is enclosed. The flow chart summarising the process as it appears in these guidelines is appended as Appendix A for ease of reference.

Similarly, the dates and the steps taken in the Honeydew study are summarised for your reference in Appendix B.

In addition to the above, please comment on how the Honeydew project relates to the revised version of IEM. The amended IEM flow chart is appended as Appendix C for ease of reference.

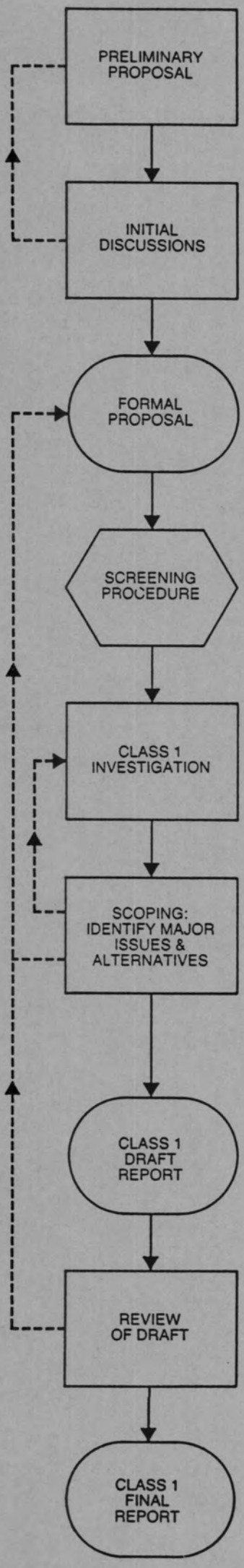
Please return your completed questionnaire to me by 25 July 1992. A stamped, addressed envelope is enclosed for this purpose.

Thank you once again for your input.

Yours sincerely

J LARSEN

APPENDIX A Procedure for investigating Class 1 proposals



Proponent has an idea.

Proponent and relevant authority discuss how to make the proposal more environmentally acceptable, and explore possible alternatives to the proposal.

Proponent submits a proposal which describes the proposed action and alternatives.

Authority aided by screening guidelines determines that this action will have significant environmental effects and therefore a Class 1 assessment is necessary.

Environmental effects of proposed action and major alternatives are investigated.

Affected publics are asked what their concerns are. Officials from local, regional, provincial and central government help identify the important issues. Alternative proposals are solicited. Proponent may decide to modify the proposed action for resubmission.

Environmental effects or proposed action and major alternatives are documented.

The draft report is made available for public comment, and may be reviewed by an impartial body for adequacy and completeness. Proponent may decide to modify the proposed action for resubmission.

Report is revised in light of the comments received.

(Ref: Figure 4, pgs 22 & 23, Council for the Environment, 1989)

APPENDIX B: DATES OF STEPS TAKEN DURING HONEYDEW PROJECT

DATE	STEP
1950	Sand quarrying begins at Honeydew.
	RMM takes over Honeydew Sand Quarry.
1979	RMM acquire permit to mine sand within 50 m of boundary of the property.
1987	RMM acquire permit to mine rock within 200 m of the boundary of the property, subject to liaison with and the approval of the local residents.
19 March 1990	RMM contacts SRK for advice regarding an application to the Department of Mineral and Energy Affairs for a permit to mine rock in a new area.
3 April 1990	SRK visits site and is briefed on RMM requirements. SRK recommends undertaking a scoping study.
11 April 1990	Proposal issued to RMM (SRK Proposal 180966).
2 May 1990	Proposal accepted by RMM.
6 June 1990	Mineral and Energy Affairs no longer requires RMM to liaise with neighbours, but RMM decide to continue with scoping study as planned.
14 June 1990	Invitations to public scoping meeting posted to 111 nearest neighbours.
26 June 1990	Public scoping meeting held.
17 July 1990	Draft report on scoping meeting issued (SRK Report 180966/1).
12 October 1990	Final date for receipt of comments on draft report on scoping meeting.
14 August 1990	Meeting with Roodepoort Town Council to discuss proposed quarry.
15, 22 August 1990	Honeydew Ratepayers' Association (HRA) submit petition with ± 3000 signatures to Dept of Mineral and Energy Affairs and the State President.

APPENDIX B: DATES OF STEPS TAKEN DURING HONEYDEW PROJECT (continued)

DATE	STEP
20 September 1990	Meeting with HRA to discuss future public involvement in EIA.
6 November 1990	Proposal prepared for the EIA, based on requirements highlighted by scoping study (SRK Proposal 180966/2). Submitted to RMM.
19 November 1990	Proposal accepted by RMM.
28 November 1990	Final report on scoping meeting issued (SRK Report 180966/2).
Nov '90 to May '91	Environmental impact assessment undertaken.
22 January 1991	First Environmental Committee meeting.
3 April 1991	Draft EIA reviewed by external review consultant.
20 May 1991	Draft EIA report issued (SRK Report 180966/3).
1 July 1991	Final date for comment on Draft EIA Report.
August 1991	Comments on Draft EIA Report compiled.
September 1991	Proposal for further work submitted to RMM (SRK Proposal 180966/3).
	Proposal accepted by RMM.
Oct '91 to May '92	Further work undertaken.
5 February 1992	Second Environmental committee meeting.
April 1992	Conceptual Rehabilitation plan issued to Government Mining Engineer (SRK Report 180966/4).
July 1992	Final EIA issued to Department of Mineral and Energy Affairs (SRK Report 180966/5).
August 1992	Final EIA issued to Interested and Affected Parties (SRK Report 180966/5).

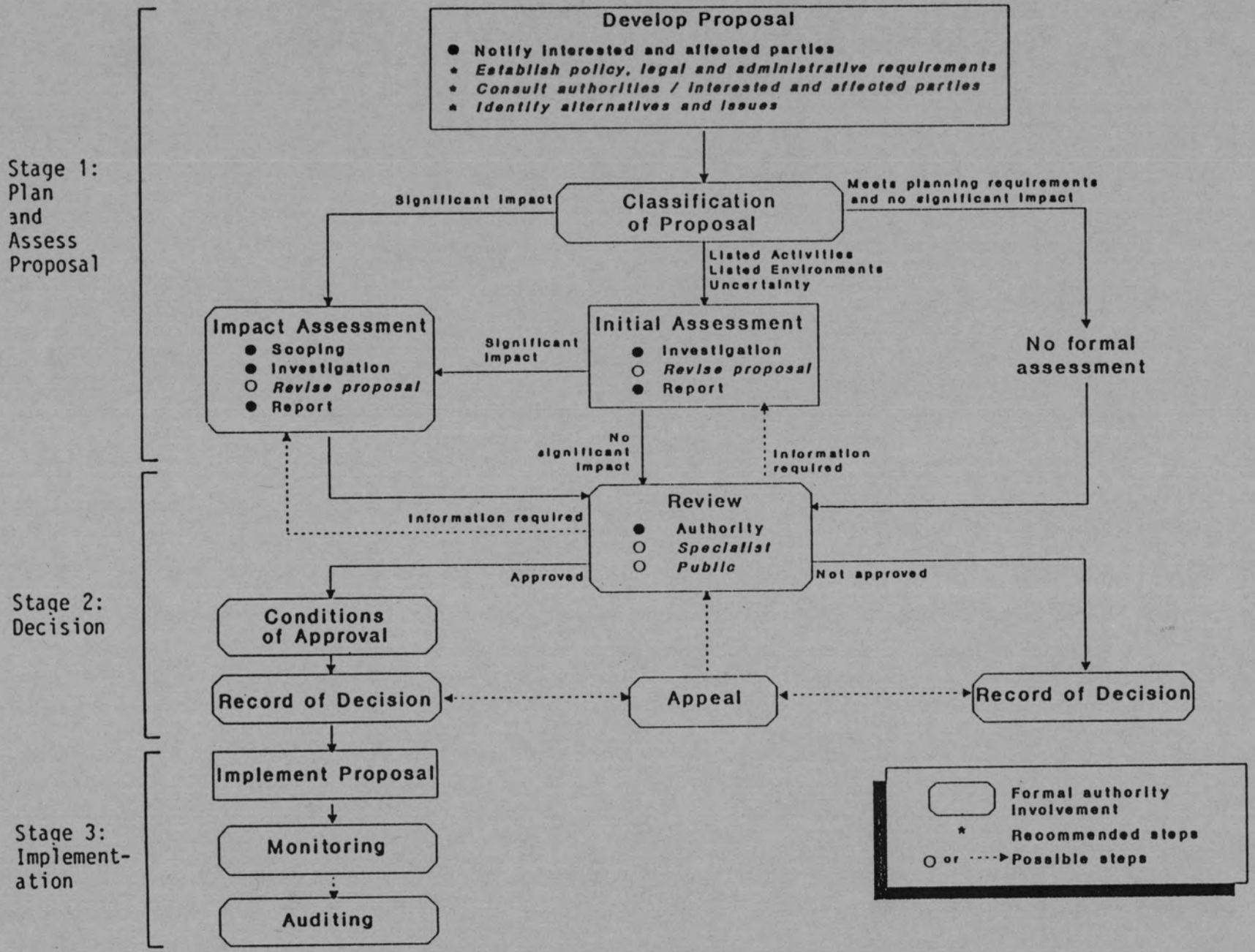


Figure 2: THE IEM PROCEDURE - DRAFT

(Ref: Environmental Evaluation Unit, 21 January 1992)

Please read the introductory letter, and Appendicies A, B and C before answering the questions that follow. Fill in your answers in the spaces provided. If you require additional space to complete your answer, please continue on the reverse side of the questionnaire, or add a sheet of paper.

1	**STAGE 1: PROPOSAL GENERATION**			
1.1	Did the following steps take place as part of the proposal generation stage? (Answer YES or NO in the appropriate column below). If NO, please indicate why not, if possible.			
	Step	**Description from Appendix A**	**YES/NO**	**If NO, then why not?**
1.1.1	PRELIMINARY PROPOSAL	Was there a written formulation of the initial idea?		
1.1.2	INITIAL DISCUSSIONS	Did the proponent and relevant authority discuss how to make the proposal environmentally acceptable?		
1.1.3		Were possible alternatives to the proposal explored?		

1.1 (cont)	Did the following steps take place as part of the proposal generation stage? (Answer YES or NO in the appropriate column below). If NO, please indicate why not, if possible.			
	Step	**Description from Appendix A**	**YES/NO**	**If NO, then why not?**
1.1.4	AMMEND PROPOSAL	Was the proposal ammended as a result of the initial discussions?		
1.1.5	ITERATION	Was there repetition of any or all of the above steps?		
1.1.6	FORMAL PROPOSAL	Did the proponent prepare a formal, written proposal?		
1.1.7		Was a proposal submitted to the relevant authorities?		
1.1.8		Did the proposal describe the proposed action and realistic alternatives?		

1.2	Were any additional or alternate steps used during the proposal generation stage? (Answer YES or NO in the space opposite)	
	If YES, please specify in the space below.	
1.3	Do you regard the proposal generation stage as having been helpful, irrespective of compliance or otherwise with guidelines? (Answer YES or NO in the space opposite)	
	Please explain further in the space provided below.	

1.4	**Practical Difficulties**	
1.4.1	Were any practical difficulties experienced during this stage? (Answer YES or NO in the space opposite)	
	If YES, please specify in the space below.	
1.4.2	What recommendations, if any, do you have that would overcome the specified difficulties for any future projects? Please answer in the space below	

1.5	Would you choose to carry out this stage differently if you had the opportunity of doing this project over again? (Answer YES or NO in space opposite)	
	If YES, please specify in the space below	
1.6	Are you familiar with the updated IEM version, published in draft form during 1992? (Answer YES or NO in the space opposite)	
	If YES, please comment on how the updated procedure relates to the Honeydew study in the proposal generation phase.	

2	**STAGE 2: ASSESSMENT**			
2.1	Did the following steps take place as part of the assessment stage? (Answer YES or NO in the appropriate column below) If NO, please indicate why not, if possible.			
	Step	**Description from Appendix A**	**YES/NO**	**If NO, then why not?**
2.1.1	SCREENING PROCEDURE	Was a decision made as to the level of assessment that was appropriate to the proposed action (ie action will have significant environmental effects therefore Class 1 assessment)?		
2.1.2		Did the relevant authority make the decision?		
2.1.3	CLASS 1 INVESTIGATION	Were the environmental effects of proposed action and major alternatives investigated?		

2.1 (cont)	Did the following steps take place as part of the assessment stage? (Answer YES or NO in the appropriate column below) If NO, please indicate why not, if possible.			
	Step	**Description from Appendix A**	**YES/NO**	**If NO, then why not?**
2.1.4	SCOPING: IDENTIFY MAJOR ISSUES & ALTERNATIVES	Were the affected publics asked what their concerns were?		
2.1.5		Did officials from local, regional, provincial and central government help identify the important issues?		
2.1.6		Were alternative proposals solicited?		

2.1 (cont)	Did the following steps take place as part of the assessment stage? (Answer YES or NO in the appropriate column below) If NO, please indicate why not, if possible.			
	Step	**Description from Appendix A**	**YES/NO**	**If NO, then why not?**
2.1.7		Did the proponent decide to modify the proposed action for resubmission?		
2.1.8		Were the results of scoping used to set scope of work for Class 1 investigation?		

2.1 (cont)	Did the following steps take place as part of the assessment stage? (Answer YES or NO in the appropriate column below) If NO, please indicate why not, if possible.			
	Step	**Description from Appendix A**	**YES/NO**	**If NO, then why not?**
2.1.9	CLASS 1 DRAFT REPORT	Environmental effects of proposed action and major alternatives are documented.		
2.1.10	REVIEW OF DRAFT	The draft report is made available for public comment, and may be reviewed by an impartial body for adequacy and completeness.		

2.1 (cont)	Did the following steps take place as part of the assessment stage? (Answer YES or NO in the appropriate column below) If NO, please indicate why not, if possible.			
	Step	**Description from Appendix A**	**YES/NO**	**If NO, then why not?**
2.1.11		Proponent may decide to modify the proposed action for resubmission.		
2.1.12	FURTHER WORK	Further work is undertaken.		
2.1.13	CLASS 1 FINAL REPORT	Report is revised in light of comments received.		

2.2	Were any additional or alternate steps used during the assessment stage? (Answer YES or NO in the space opposite)	
	If YES, please specify in the space below.	

2.3	Do you regard the assessment stage as having been successful, irrespective of compliance or otherwise with guidelines? (Answer YES or No in the space opposite)	
	Please explain further in the space provided below.	

2.4	Were any practical difficulties experienced during the steps comprising the assessment stage? (Answer YES or NO in the appropriate column below) If YES, please specify and state any recommendations you may have as to how the specified difficultes could be overcome in any future projects.			
	Step	**YES/NO**	**If YES, please specify**	**Recommendations**
2.4.1	SCREENING PROCEDURE			
2.4.2	CLASS 1 INVESTIGATION			
2.4.3	SCOPING			

2.4 (cont)	Were any practical difficulties experienced during the steps comprising the assessment stage? (Answer YES or NO in the appropriate column below) If YES, please specify and state any recommendations you may have as to how the specified difficultes could be overcome in any future projects.			
	Step	**YES/NO**	**If YES, please specify**	**Recommendations**
2.4.4	CLASS 1 DRAFT REPORT			
2.4.5	REVIEW OF DRAFT			
2.4.6	FURTHER WORK			
2.4.7	CLASS 1 FINAL REPORT			

2.5	Would you choose to carry out this stage differently if you had the opportunity of doing this project over again? (Answer YES or NO in space opposite)	
	If YES, please specify in the space below	
2.6	Are you familiar with the updated IEM version, as published in draft form during 1992? (Answer YES or NO in the space opposite)	
	If YES, please comment on how the updated procedure links up with the experience of this case study in the assessment stage.	

Thank you for completing this questionnaire. Please use the stamped, addressed envelope provided and return the completed questionnaire to Ms J Larsen, c/o Professor R Fuggle, Dept of Environmental and Geographical Science, University of Cape Town, Private Bag, Rondebosch 7700, by 25 July 1992.