CHAPTER 3

DESIGN AND METHODOLOGY OF THE EMPIRICAL RESEARCH

3.1 INTRODUCTION

Chapter 2 contains a discussion of the need to improve the management accounting systems pertaining to the rehabilitation of the natural environment after mining excavation activities in South Africa. The historical and existing mining rehabilitation practices that have led to the present managerial attitudes and performances were investigated.

In order to obtain a better insight into the views and attitudes of mining environmental managers in respect of their opinions on rehabilitation management issues, an empirical investigation was also conducted. These opinions contribute towards a better understanding of the present situation in South Africa. This would include the awareness levels of individual rehabilitation managers regarding sound environmental practice and their willingness to support improved evaluation strategies. Knowledge of these opinions would form a basis for future positive developments in managerial rehabilitation accounting strategies in the mining industry.

The major objectives of this chapter are to describe the approach, methodology and design of the empirical research that was undertaken to obtain the opinions of environmental managers on their experience of rehabilitation management. These objectives include an analysis of the reasons behind the empirical study, as well as an account of the choice of the method of data collection. These analyses and choices culminated in the development of a questionnaire. This development included the testing, refining and modifying of the contents of the questionnaire. Both the population for the survey and the method of distributing the questionnaire were determined.

Further analyses and interpretations of the opinions obtained from the survey follow in the next chapter.

3.2 REASONS FOR AND APPROACH TO THE EMPIRICAL RESEARCH

In addition to the literature study and observations, it was necessary to determine the opinions of environmental managers regarding the application of management accounting procedures to the rehabilitation of mining sites. Their views form an integral part of the future implementation and success of changed management accounting systems. In order to gather information on these attitudes, empirical research was conducted.

"Opinion", for the purposes of this research, is described as the "evaluation, impression, or estimation of the value or worth of a person or thing" (McLeod & Makins 1993:796). The "attitude" of rehabilitation management which was to be determined empirically, is described as "the way a person views something or tends to behave towards it, often in an evaluative way" (McLeod & Makins1993:67).

This empirical research forms part of the total research exercise, the object of which was to obtain knowledge and answers to questions. The Collins Shorter English Dictionary (McLeod & Makins 1993:986) describes research as a "systematic investigation to establish facts or collect information on a subject".

Opinions on the attitudes of environmental managers are therefore required as an integral part of the research exercise in order to find solutions to past and future problems, as

> Today's problems should have been solved in the 1950s, but in the 50s we were solving the problems of the 20s, in the 20s we were solving the problems of the 1880s...
> (S. Harris quoted by Chadwick et al 1984:32.)

Because there may be a certain element of subjectivity when a researcher is conducting a literature investigation, the empirical research component was added to provide objective information and an objective interpretation of the information. The empirical research would supply additional information on the attitudes of managers which is not readily available in the literature. Elements of the empirically collected information could then be compared with the views of other researchers in the field as reflected in the literature, and with those of the researcher.

The approach adopted in the empirical research is in accordance with the ethical code of

the HSRC (Kamper 1997:109). Its objective was to conduct research with scientific integrity and excellence, with social sensitivity and responsibility, and with regard to the dignity of the individual and basic human rights.

The basis of the empirical research was a desire to ultimately contribute towards better understanding, and to increase knowledge that could be utilised in the development of a strategy for solving the problem.

3.3 OBJECTIVES OF THE RESEARCH

Research for this study involved gaining an understanding of the problem of finding suitable management and management accounting systems for rehabilitation managers, and recommending proposals for improving existing systems. The objectives of the research were to describe and explain the problem in the first instance, and to compile a normative model (Abdel-Khalik & Ajinka 1979:22) for a solution to the problem. This research obtained confirmation of the existence of the problems regarding rehabilitation management accounting, and deduced what the reasons behind these problems were. A comprehensive strategy for the improvement of existing management accounting systems was then formulated. The acquisition and application of knowledge about the attitudes towards rehabilitation activities of mines, could be expected to lead to their improved functioning, and perhaps add to the improvement of the quality of life for humankind in general.

A literature study of the South African situation provides a background picture of the management environment for the development of a management accounting system for rehabilitation management in the mining industry. Empirical research was also conducted in South Africa to provide a broader spectrum of management opinions and attitudes on these issues. In addition, a brief literature study was undertaken to investigate the management and management accounting procedures in developed countries with regard to rehabilitation management. This literature study was expanded to include the African milieu of which South Africa forms an important part. These documented literature studies and the empirical research contributed to the development of a comprehensive strategy for management accounting for rehabilitation purposes. The availability of applicable, timely and quality management information for decisions on rehabilitation management is the fundamental aim in the development of this management accounting

strategy.

The major objectives of this empirical research were to obtain

- general background information for classification purposes
- opinions from mine managers on the relative importance of the environmental management accounting dimensions of quality, cost and time
- their opinions on the relative importance of the technical, behavioural and cultural attributes of a good rehabilitation management accounting system
- their opinions on the above-mentioned management accounting dimensions and attributes in relation to their own rehabilitation management approaches
- voluntary comments on any of the given statements in the questionnaire

The questionnaire was therefore compiled in an effort to ascertain these opinions. The ultimate objectives were that the conclusions reached from this empirical data collection project should have validity, an acceptable degree of precision and wide coverage (John & Quenouille 1977:12).

3.4 METHOD OF DATA COLLECTION

3.4.1 Introduction

In order to collect relevant data to form a more complete opinion of the views of mine managers, to support and add to the existing views on rehabilitation management, and to broaden the basis for the development of a management accounting strategy, various steps were followed. These steps included the following procedures:

- deciding on the method of data collection
- determining the type of data needed and the target population involved
- determining the number of potential respondents
- compiling and distributing the questionnaire
- deciding on the methods of processing the data obtained, and on the statistical services needed
- assessing the results, and drawing conclusions and making recommendations

The structured interview method was chosen for this research project. Various forms such as the formal interview, the mail questionnaire, the electronic mail (e-mail) questionnaire and the facsimile questionnaire were considered as a means of data collection. These methods for the collection of data were compared with the characteristics of the ideal method for the collection of data (Malan, Coetzee & v Breda 1992:41), which include reliability, validity, sensitivity (especially in this survey), suitability, objectivity, practicability and acceptability on ethical grounds. Cost and time implications were added to these qualitative characteristics.

3.4.2 Formal interview

The data-gathering research type of interview was considered, using a questionnaire as the interview schedule. The flexibility of an interview is probably its greatest advantage. Other advantages of the formal interview are that nonverbal behaviour can be included in the response and that the "uncertain" option can more easily be avoided. If a response is expected, answers to the questions will be obtained and therefore the chances of reliability are increased (Oppenheim 1979:30-33).

Disadvantages of the formal interview in general include the high cost that is incurred, the time spent on travelling and keeping appointments with busy people all over the country, the possibility of subjective reaction on the part of the interviewer, and the lack of standardisation for purposes of comparison (Eiselen, Greenacre, Grupel, Markan, Shultz, Steffens & Venter 1989:109-110). Inaccessibility as a result of security systems at mines makes it more difficult to find practicable and suitable methods of collecting data.

Apart from the general disadvantages associated with the personal interview, specific disadvantages for this kind of empirical research arise from the sensitive atmosphere in which the questions would be asked. Some of the respondents would prefer to be anonymous as visits to their offices on the sites would allow the researcher to observe malpractices such as a mine discard dump in a wetland, or water erosion scars indicating poor rehabilitation management practices. Under these circumstances the respondents would be unwilling to allow interviews, even if the interviews were aimed at ascertaining their opinions and preferences, as in this study, and not at determining what they actually did or do in respect of rehabilitation management.

The formal personal interview as a method of data collection is therefore unacceptable for this empirical research.

3.4.3 Mail questionnaire

A mail questionnaire, to be mailed to individual respondents together with a franchised envelope for the return of answers, was considered next. The mail questionnaire is generally cheaper than the personal interview and could be widely spread (Moser & Kalton 1977:257). There would be a better chance of an honest response in the case of potentially sensitive reactions to the questions, standardisation of answers, and objectivity. Questionnaires can be sent simultaneously to all respondents and respondents can complete them at a convenient time.

General disadvantages of the mail questionnaire include the relatively low response rate, which may lead to poor representation of the target population. Further disadvantages are that misunderstandings could occur if the questions are not kept straightforward and that there is no opportunity to check answers to questions. Mail questions might inhibit spontaneous answers, limit the independence of individual answers, fail to ensure that the intended person completes the questionnaire, and limit the comparison of observations with the answers (Moser & Kalton 1977:260). The omission of answers to important questions could lead to a 20% response to some questions, while the overall response rate could be 50%, or with an overall response rate of 50% only 10% might have answered all the questions (Eiselen et al 1989:115). These disadvantages have a strong negative effect on the practicability of this method of collecting data. The most important disadvantage of mail questionnaires in South Africa at the moment is the time that has to be allowed for the delivery of mail. After about three months follow-up letters and questionnaires can be mailed to the respondents as reminders in the case of non-responses. After a further three months these can be added to the first set of responses, giving a six months' period for the sending and receiving of questionnaires. Although the mail questionnaire is cheaper than the personal interview, it still costs a lot of money to process. The costs incurred in respect of this type of survey include postage, franchised envelopes for use by respondents, address labels and stationery and equipment for printing and duplication purposes.

This method of collecting of data has many disadvantages and better alternatives for the sending of questionnaires were considered.

3.4.4 Electronic mail (e-mail)

As most large and medium sized enterprises use computer technology quite extensively for their daily administrative tasks, this method for the distribution and return of questionnaires was also considered.

One of the major advantages of electronic mail is that it is time saving, which is certainly not the case when questionnaires are sent by ordinary mail. Apart from the time factor, there are cost savings on paper and postage, and the responses received are already keyed into the computer system. It would be possible for the respondents to complete the questionnaires on their computers and for the researcher to receive the answers to the questions within an hour. Messages sent by electronic mail are stored and forwarded quickly and easily by the recipient. It would not be necessary to re-key, as with a facsimile machine or to spend endless hours on the telephone trying to get through to a busy telephone user. It is possible to send a single entry to the whole target population simultaneously. A researcher would, however, need a few hours to send about 150 questionnaires during off-peak hours to the target respondents if they are not grouped together (Gallagher 1997:23).

In general the same advantages and disadvantages as for the printed questionnaire would be expected. Costs and expenses would be less than those of the mail questionnaire, as no duplication or postage would be required. The only cost for which provision should be made would be the cost of after-hours telephone time, which is less than the time needed to send similar messages by means of facsimile equipment.

One major drawback of electronic mail is the variety of incompatible electronic mail packages such as the GroupWise and Pegasus Mail that are in use, as well as the number of word processing packages available. Incompatibility does complicate matters. To expect that a hundred or more of the recipients of the questionnaire would be using the same electronic mail program and not only the same Wordprocessor, but also the same version, is somewhat unrealistic. The wordprocessors WordPerfect versions 5.1 to 8 are currently being used, as well as MSWORD versions 6 to 8.

These problems could be overcome to a large extent by both the researcher and the respondent by converting the electronic mail into a language such as ASCII before mailing. This computer "language" is then automatically converted into the current programme of the particular recipient, respondent as well as researcher, in most cases. As this is not a commonly applied computer procedure in most administrative sections, the application possibilities are limited to a few exclusive users. It is not possible to determine which enterprises are conversant with these conversion procedures. At least two of the largest mining companies in South Africa operating in Mpumalanga do not know why they sometimes receive "hieroglyphs", and put the blame on the senders of the e-mail messages.

A further factor which limits the application possibilities of electronic mail is that the electronic mail addresses are not readily available. Even the Minerals Bureau, which is the general provider of information on the mining industry in South Africa, does not have these addresses.

At this stage all the developments concerning electronic mail have not yet reached the administrative sections of the target population for this empirical study. Electronic mail therefore has a very limited application value and other methods for the collection of the empirical data have had to be considered.

3.4.5 Facsimile

Facsimile facilities are more widely used in business than electronic mail, and are mostly linked to the same cable as telephones. The application of this piece of equipment for communication purposes has been possible for many years and is acknowledged as a reliable method of sending information to interested parties. The facsimile was therefore the next option to consider for the sending of questionnaires to respondents and for the receiving of completed questionnaires.

In general this method of data collection has the same advantages and disadvantages as a printed questionnaire. The advantages are the same as those for electronic mail, especially in respect of the reduction of the period of time between sending the questions and receiving of the answers. Cost calculations would be similar to those for electronic mail as telephone time and the facsimile equipment and stationery would be the prime

cost items. Additional advantages of the facsimile facility are the easy availability of facsimile numbers, and the fact that the respondent would receive a printed questionnaire to complete which could be returned immediately.

The advantages of the facsimile facility as a method for the collection of data, together with practical considerations such as the exact type of questions, determined the choice of this method for the empirical study.

3.4.6 Conclusion

The personal interview, the mail questionnaire, the electronic mail questionnaire and the facsimile machine as a means of distributing and returning the questionnaire were considered for the survey of opinions. After comparing these methods for the collection of data with the characteristics of a suitable method, the researcher chose the facsimile facility.

3.5 DEVELOPMENT OF THE QUESTIONNAIRE

3.5.1 Introduction

The questionnaire was developed from the literature study and from on-site observations. An approach was followed in the preparation of the questionnaire in which various experts were consulted in order to gain optimum and quality response, as "no survey can be better than its questionnaire" (Moser & Kalton 1977:308). The ways in which the questionnaire was developed are described, as well as the reasons for the particular choices made. This development includes the choice of language and wording, the type and grouping of questions, the compilation of the covering letter, the geographical area investigated, the target population and sample, the preliminary investigation and the improvement and finalising of the questionnaire.

3.5.2 Wording

Although the people in the target group who were to answer the questions are well-educated and have tertiary qualifications, the wording chosen for the questionnaire was selected such that it would be easily understood. Provision had been made for the subject

terminology peculiar to management accounting.

An effort was made to compile the questions and statements in such a way that their meanings could be fairly easily understood in order to enable the respondents to respond fully (Oppenheim 1979:51; Hague 1993:64). Terminology typical of rehabilitation management issues, such as ISO9000, is explained briefly in brackets. The questionnaire and covering letter are in English, but it is mentioned that they are also available in Afrikaans on request. An attempt was made to find a compromise between the minimum number of pages for the questionnaire and a letter type large enough to be easily read.

The statements in the questionnaire are short, but not so cryptic that they are difficult to understand (Steenekamp 1984:36). Language usage is checked by a qualified English editor to improve the readability of the questions. In addition consultants from a statistical service (Statistical Consultation Service, Unisa) read through the questions to determine whether they were formulated in such a way that they would be easily understood by all respondents, and whether they were not too one-sided (Oppenheim 1979:51), and also whether they were user-friendly. Before finalising the questionnaire, preliminary test runs were conducted on experts who were not from the target group to ensure that the statements would be interpreted in the manner intended.

3.5.3 Type and grouping of questions

3.5.3.1 Introduction

The facsimile mail items that were sent to the respondents consist of a covering letter and a questionnaire. In the questionnaire, questions were asked and statements made to which the respondents were asked to express an opinion on the extent to which they agreed.

3.5.3.2 The covering letter

A short covering letter was used as a means of introducing the facsimile interview in the questionnaire that followed, to state the purpose and objectives of the survey (Berdie, Anderson & Niebuhr 1986:51), and to provide a brief background to the empirical research.

In the covering letter mine managers or their appointed environmental managers were encouraged to complete the questionnaire. The following strategies were followed to increase the number of responses:

- The covering letter and questionnaire were addressed to the most senior person at the mine, the mine manager. This left the mine manager with the choice of either answering the questions himself or of delegating the task to the environmental manager. It is more likely that the environmental manager would in fact complete the questionnaire if asked to do so by his senior.
- In the questionnaire the opinions of the managers were obtained. They were not asked what they actually did in the past, or presently do, in respect of rehabilitation management.
- The managers were assured that the information would be applied for research and statistical purposes only.
- The managers were offered a brief summary of the results of the survey of their opinions after the processing of the statistics if they were interested to compare their own opinions with those of the majority of rehabilitation managers, and knowing what use had been made of their responses (Berdie et al 1986:51; Hague 1993:106).
- In view of the possibility that environmental managers might experience some of the questions as sensitive, the request providing their addresses for a brief summary of the information obtained from the survey, could be returned separately by facsimile or by mail.
- It was stated that the completion of the questionnaire would not take more than fifteen minutes of their time.
- The covering letter was printed on the letterhead of the Department of Accounting of the University of Pretoria. The head of the department as well as the supervisor signed this letter to indicate their approval of this research project.

The covering letter is to be found in Annexure 3.1.

3.5.3.3 The questionnaire

Introduction

Because of the sensitivity surrounding direct questions and the importance of obtaining an adequate response of a high quality, direct questions as to the actual rehabilitation activities on mining sites were avoided. The majority of the questionnaire therefore consists of statements to which the respondents had to give their opinions.

The questions and statements were grouped into the following sections:

- general background information as to the type of commodity mined and the size of the mine
- opinions on strategic management accounting individually in respect of the dimensions of quality, cost and time
- opinions on the attributes of a good rehabilitation management accounting system, separately in respect of technical, behavioural and cultural aspects
- general opinions on awards, Act 50/1991/Chapter VI (as amended), and on the application of a combination of the major groups of cost management issues of the questionnaire in general and in their own rehabilitation environment.
- open-ended comments on the previously completed questions and statements

Provision was made for five categories of responses by the mine or environmental managers. They had to decide to what degree they personally agreed or disagreed with the statements. When the opinions of respondents are required, five or even seven categories are usually used (Steenekamp 1984:31; Oppenheim 1979:125,135). The five categories applied in this research were strongly agree (SA), agree (A), uncertain (U), disagree (D) and strongly disagree (SD). The "uncertain" option was added to diminish guessing and to provide for a lack of knowledge on the particular subject (Steenekamp 1984:26). The questionnaire had to be completed by marking the chosen option in the relevant space.

In order to reduce the effect of the "good guy" indicating "Strongly Agree" as the most popular option, four filter statements were included in the questionnaire in a random way. These statements were formulated in the negative mode as another means of control to

ensure that the respondents read through all the statements. Since questions and statements are more difficult to understand when they have a negative in them, short statements were selected for conversion into filter statements.

Instructions were given at the beginning of the questionnaire on how the boxes should be marked, when to comment and how to return the completed questionnaire. A column was added to provide for the capturing of data for purposes of statistical processing.

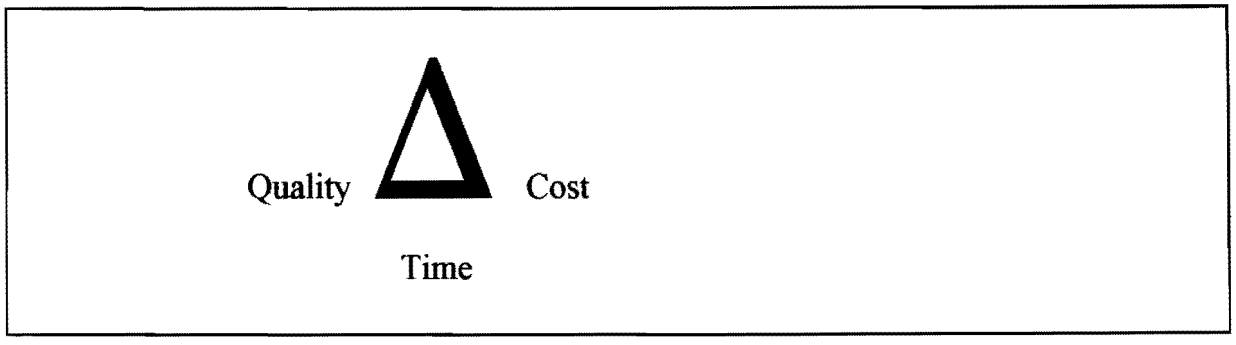
Section 1: Background information

The objectives of the first section are to obtain background information on the commodity mined at the particular mine or group of mines and the size of the mine, which is indicated in terms of the number of employees. This section forms the framework for the statistical matrices to be analysed and interpreted, and for the deductions made in respect of the questions that follow.

Section 2: Opinions on the strategic management accounting dimensions of quality, cost and time

The objectives of this second section are to determine the opinions of mine and environmental managers in respect of the strategy and purpose of management accounting. Successful enterprises should function simultaneously in the three dimensions of quality, cost and time (Ansari et al 1997c,b: SMA-5 & MMEC-2). Quality is a combination of the total experience of the stakeholders, whereas cost is a combination of all the elements in the value chain. The dimension of time entails a complete cycle from the beginning to the end of an activity. Smaller time cycles join up to form a life cycle which extends from the commencement of activities to the disposal stage at the end. These three dimensions of management accounting strategy are illustrated in the form of a triangle in Figure 3.1.

Figure 3.1 Strategy or purpose of management accounting



(Ansari et al 1997c: SMA-5 adapted.)

The objective of the first subsection in the quality dimension is to determine the opinions of the rehabilitation managers in respect of quality cost management strategies. They should be familiar with most of these concepts from the perspectives of their varied experience, as some of these managers are chemical engineers, geologists, mining engineers and civil engineers.

Some of the management accounting applications, such as those in Statements 2.2.11 to 2.2.14 in the subsection on cost, are quite new. These categories of environmental costs in which prevention, assessment, control and failure costs are identified, were recently formulated by Ansari et al (1997b: MMEC-9). Designing costs out (Statement 2.2.2) is another management cost concept identified by Ansari et al (1997d: TC-13) for the reduction of cost at the design stage for all activities. Since rehabilitation costs should form an integral part of long-term management accounting procedures, unnecessary costs should be designed out at the design stage. The costs of the extended enterprise (Statement 2.2.7) were formulated by Ansari et al (1997c: SMA-8) to identify management costs beyond the local operating boundaries, so that aspects such as environmental costs are included.

In Statement 2.2.8 the opinion asked concerns the separation of rehabilitation expenditure as part of the ongoing process, and rehabilitation expenditure to rehabilitate damage from previous generations. The aim of this opinion is to determine whether managers realise that value is added during the rehabilitation of past damage, whereas rehabilitation as an

ongoing process - now required by law- does not add value to the property.

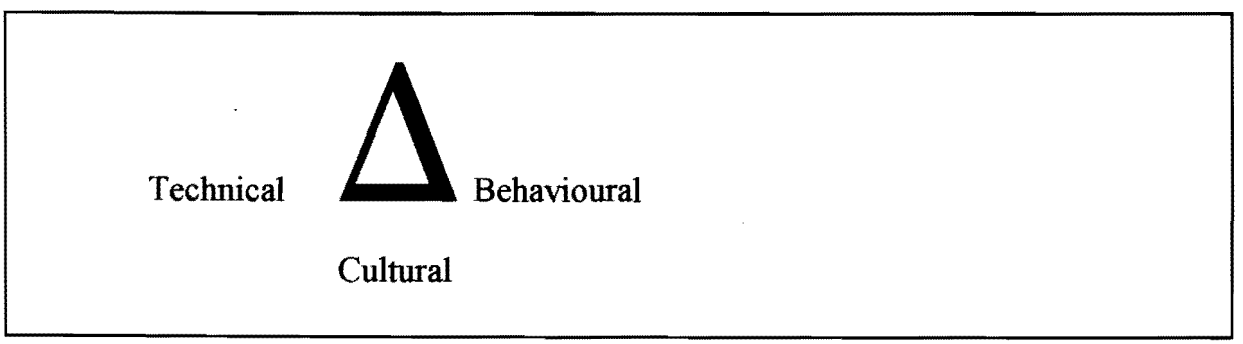
In the subsection on time, opinions are required on unplanned activities resulting from inherited environmental damage from past operations, and on planned time allowed for education and training.

These opinions should make a positive contribution towards a better understanding of attitudes on the fundamentals of quality, cost and time. This multi-dimensional approach to management accounting strategy is in the process of replacing the historical one-dimensional view of only operating to reduce cost with a view of differentiating through quality and to concentrate on the time factor pertaining to stakeholders (Ansari et al 1997c: SMA-4).

Section 3: Opinions on attributes of a good rehabilitation management accounting system: technical, behavioural and cultural

The aim of this section is to obtain opinions from mining and rehabilitation managers on the attributes of a good rehabilitation management accounting system. These interdependent attributes include technical, behavioural and cultural aspects (Ansari et al 1997c,b: SMA-9 & MMEC-14). This interdependency is illustrated in Figure 3.2 by means of a triangle.

Figure 3.2 Attributes of a good management accounting system



(Ansari et al 1997c: SMA-9, adapted.)

Technical attributes are utilised for the measurement of qualities to be included in the information provided for decision-making purposes. The major function is to provide information that would improve and positively change existing decisions, such as information on the application of ISO9000 for rehabilitation purposes. Other functions include the understanding of processes, such as the organisation of work schedules.

Management accounting procedures have a behavioural influence on the people in the enterprise. These behavioural attributes include power and leadership (CIMA Paper 16 1996:43), as well as the ability to change perceptions, for example by assessing environmental costs to emphasise their importance in decision making (Ansari et al 1997b:MMEC-16).

Cultural attributes are to be found in the beliefs and values which form an integral part of management accounting. Knowledge of integrity, ethical values, group thinking, sensitivity to the environment and the political views of the various components of society, as well as a knowledge of the internal values of the enterprise, could improve management decision making (CIMA Paper 16 1996:25).

The opinions on the technical, behavioural and cultural attributes of management accounting provide new insights into the awareness levels of rehabilitation managers.

Section 4: *General opinion*

The last section requires general opinions in respect of rehabilitation management applications, as indicated in the previous questions. In the last question the importance of these applications in their particular mine or group of mines is requested. At the end provision is made for open-ended statements on any additional comments the respondent might wish to make on any of the previous questions. The open-ended questions are placed at the end because they do not usually elicit a good response. Since the target population does not exceed 150 answering points, and as this is an optional question, the

response could be processed relatively easily. The aim of these statements is to investigate some attitudes and opinions that could not be discovered by means of the foregoing responses.

Summary and conclusion

The questionnaire commences with general, impersonal questions in an attempt to engender confidence in the respondents. Statements that are likely to be more difficult to response to, as well as the open-ended questions, are placed at the end of the questionnaire. The statements that could possibly be experienced as sensitive, such as those on the actual applicability of the management accounting strategies mentioned in respect of environmental rehabilitation in their own situation are placed at the end (Brownell 1995:37).

After the sections where graded responses and general comments are required, provision is made for interested mine and rehabilitation managers to request a brief summary of the information obtained in the survey. Owing to the sensitivity some respondents might experience, the sections on mining rehabilitation are separated from this request.

One questionnaire was prepared and sent to all mine managers in the predetermined industry groups. Two weeks after the issue of the questionnaire, follow-up questionnaires and reminders were sent to all units in the target group in an effort to increase the response rate. The follow-up letter to accompany the questionnaire is found in Annexure 3.5. The first questionnaire was sent out during the first week in May 1998, and the follow-up questionnaire at the end of May 1998. The questionnaire is to be found in Annexure 3.2.

3.5.4 Investigation area, target population and sample

3.5.4.1 Investigation area

The investigation area could be regarded as homogeneous because information was obtained from mines operating in South Africa only. A distinction was made, however, because factors such as the type of commodity mined as well as the number of employees were considered.

It was deduced from the literature study and from observations that not all types of mining activities cause major pollution of the air, water and soil. Diamond mines for instance produce muddy water as the main effluent, but then it should be remembered that major erosion of river banks does occur and the surrounding mining population could cause severe pollution. There are only a few large diamond mines in the country. Most diamond mining operations are still performed by short-term individual fortune-seekers who cannot be traced in the records. The same arguments could for example be advanced for the mining of aggregate and sand, salt, phosphates and various types of stone such as limestone. Mines which are self-employed and those with only a small number of employees are more likely to be unable to answer the questions as a result of a lack of adequate knowledge on and interest in rehabilitation and management accounting issues. They would not be able to contribute significantly towards this empirical research programme.

The investigating area was therefore reduced to include only the major mining sectors in South Africa, mining a limited number of commodities. These mines and groups of mines have the potential to become leaders in rehabilitation management in their own industrial environment as well as countrywide.

3.5.4.2 Target population

Observations were made that some of the mines which are geographically situated on adjourning farms are grouped together with only one mine manager and one rehabilitation manager. The number of units in the target population are therefore less than the number of operating mines. The survey would have produced duplicate answers and opinions if questionnaires had been sent to all the mines in the identified sectors. The correction in respect of the number of units was made by identifying mines with the same telephone and facsimile numbers, and by grouping them together. All mines in the identified sectors are therefore either directly or indirectly included in the survey.

The individual selected mining sectors, as well as the number of units identified in each, are the following:

Gold, platinum, silver	58
Coal	55
Asbestos	3
Chromium	13
Vanadium	6
Iron	7
Total	142

This grouping was deduced from the directory of the Minerals Bureau of South Africa (Department of Minerals & Energy 1997).

3.5.4.3 Sample

Sampling procedures are recommended when conducting surveys of large populations. But as the total target population consists of a relatively small group of 142 units, no sampling was considered. Questionnaires were therefore sent to all potential respondents

in this population study.

3.5.5 Preliminary investigation and finalisation

As the quality of the information and data is primarily determined by the quality of the questionnaire (Pietersen & Lubbe 1986:88), care should be taken to prepare and design a suitable questionnaire. In order to obtain a high standard of response, preliminary testing was conducted. Commentaries received from the test run were applied to improve the design and to finalise the questionnaire.

Preliminary testing helped to eliminate unforseen problems regarding the administration of the questionnaire. Aspects of user-friendliness, such as wording, order of questions, structure, instructions, contents and format were evaluated to determine whether the design was feasible (Pietersen & Lubbe 1986: 90). The value of the results depends to a large extent on preliminary trials and improvements to prepare questions that are clear and will have the same meaning for all respondents (Berdie et al 1986:29).

A draft of the complete questionnaire and of the covering letter was circulated among experts who were not from the target group, in an effort to determine technical shortcomings (Brownell 1995:38). About six people are required to see if and how a questionnaire is working (Hague 1993:95), but as some of them were colleagues, it was decided to include ten people in the preliminary survey. This group consisted of a variety of individuals who were asked to consider the content and layout of the draft questionnaire from their different perspectives. The questionnaire was sent by facsimile to these people and they were asked to complete the questionnaire and return it by facsimile. The list of names of people who were asked to evaluate the preliminary questionnaire, together with particulars on their field of expertise, is provided in Annexure 3.3. The covering letter to the specialist group requesting their inputs in testing the questionnaire, is enclosed in Annexure 3.4.

After the preliminary testing procedure had been conducted, the questionnaire was finalised. The final questionnaire was then sent to the target population with a request to participate in the investigation.

3.5.6 Summary

The questionnaire was developed by paying careful attention to the wording, contents of the covering letter, type and grouping of the questions and statements, as well as by determining the area to be investigated, the target population and the sample. A preliminary investigation was conducted in order to make final improvements and adjustments to the questionnaire.

3.6. SUMMARY AND CONCLUSION

The reasons for and approach to the empirical research have been determined. After considering the formal interview and the mail and electronic mail questionnaire as a means of collecting information on the opinions of environmental managers, the researcher rejected these methods in favour of facsimile correspondence. Time, cost and a higher possible response rate were the major factors in the decision to utilise the latter approach.

The questionnaire was developed from the literature study and from conversations and observations. Aspects of wording, type and grouping of questions and statements, the area investigated and the target population were considered when preparing the questionnaire. Preliminary investigations by a variety of experts were conducted before the questionnaire was finalised.

The questionnaire was sent by facsimile to all units in the target population. In the following chapter the opinions collected are evaluated and assessed.

ANNEXURE 3.1
COVERING LETTER TO ACCOMPANY THE QUESTIONNAIRE- ENGLISH

ATTENTION THE MINE MANAGER

(or Environmental manager)

Number of pages (this one included): 7

Date: 5 May 1998

Dear Sir

Rehabilitation management in the mining sector is increasingly gaining importance, especially after the promulgation of Act 50/1991/Chapter VI (amended by Act 103/1993).

As part of my doctoral studies at the University of Pretoria, I need a more complete overview of the opinions of mine managers or their environmental managers on rehabilitation management. The focus of my doctoral research project is to devise a strategy that the management accountant can use to include all relevant costs when comparing inputs and outputs concerning rehabilitation management issues.

Accompanying this letter you will find a questionnaire that is calculated to take approximately 15 minutes of your time to complete. You will notice that a brief summary of the results of the opinion survey will be available to all interested persons. If you want to keep your answers separate from the request for the results, please detach the last section of the questionnaire and return it separately by facsimile or by mail.

All answers will be treated as strictly confidential and will be used for statistical and research purposes only.

Should you require information for the completion of the questionnaire, do not hesitate to contact me at 012-664-0825 during office hours, or at PO Box 14919, LYTTELTON, 0140.

Kindly **return** the completed questionnaire by **fax** to **012-664-0825** (a private temporary number).

Indien u die begeleidende brief en die vraelys in Afrikaans verkies, skakel of stuur asseblief 'n boodskap per faks na 012-664-0825.

Your kind cooperation is appreciated.

Yours sincerely

.....
Cecilia Beukes

Approved by

.....
PROFESSOR DAAN GOUWS (supervisor)

.....
PROFESSOR QUINTUS VORSTER
(Head of the Department of Accounting)

COVERING LETTER TO ACCOMPANY THE QUESTIONNAIRE - AFRIKAANS

AANDAG: DIE MYNBESTUURDER(of Omgewingsbestuurder)

Aantal bladsye (hierdie een ingesluit): 7

Datum: 5 Mei 1998

Geagte Meneer

Rehabilitasiebestuur in die mynbousektor is besig om steeds belangriker te word, veral na die uitvaardiging van Wet 50/1991/Hoofstuk VI (soos gewysig deur Wet 103/1993).

Aangesien rehabilitasiebestuur 'n onderdeel van my doktorale studies aan die Universiteit van Pretoria uitmaak, het ek 'n vollediger oorsig nodig van die menings van mynbestuurders of van hulle omgewingsbestuurders. Die fokus van my doktorale navorsingsprojek is om 'n strategie te ontwikkel wat die bestuursrekenmeester kan gebruik om al die relevante koste in te sluit wanneer insette en uitsette ten opsigte van rehabilitasiebestuursaspekte vergelyk word.

Tesame met hierdie brief kry u 'n vraelys wat na raming ongeveer 15 minute sal neem om te voltooi. U sal ook merk dat 'n kort opsomming van die resultate van die opname beskikbaar sal wees aan alle persone wat belangstel. Indien u die antwoorde afsonderlik wil hou van die versoek vir die resultate, verwyder dan asseblief die laaste gedeelte van die vraelys en stuur dit afsonderlik terug per faks of met die pos.

Alle antwoorde word streng vertroulik behandel en sal slegs vir statistiese en navorsingsdoeleindes gebruik word.

Indien u enige inligting benodig met die voltooiing van die vraelys, moet u nie huiwer om met my in aanraking te kom nie by (012)664-0825 gedurende kantoorure, of by Posbus 14919, LYTTELTON, 0140.

Stuur asseblief die voltooide vraelys so gou as moontlik per **faks terug** na **(012)664-0825** ('n privaat tydelike nommer).

U vriendelike samewerking word waardeer.

Vriendelike groete

.....
Cecilia Beukes

Goedgekeur deur

.....
PROFESSOR DAAN GOUWS (studieleier)

.....
PROFESSOR QUINTUS VORSTER
(Hoof Departement Rekeningkunde)

ANNEXURE 3.2

QUESTIONNAIRE USED IN THE SURVEY OF OPINIONS - ENGLISH

QUESTIONNAIRE TO MINE MANAGERS (for environmental managers) ◯◯◯

All answers will be treated as strictly confidential and will be used for statistical purposes only.

QUESTIONNAIRE ON REHABILITATION MANAGEMENT ACCOUNTING

☐ Please indicate the *most appropriate option* by marking it with a cross in *black* ink.

◯ Please *ignore*, for processing purposes only.

... Please indicate your own personal view.

☎ Please **return** as soon as possible to fax number **012-664-0825**.

1. Background information

1.1 Please specify the mining commodity of your mine/s.

1☐ Platinum, gold, silver or uranium 2☐ Coal 3☐ Asbestos

4☐ Chromium 5☐ Vanadium 6☐ Iron ◯4

7☐ Other (please specify).....

1.2 The number of employees at the mine/s specified above is

1☐ 1-100 2☐ 101-500 3☐ 501-1 000 4☐more than 1 000 ◯5

Opinions:

To what extent do you personally agree or disagree with the following statements?

SA - Strongly agree A - Agree
U - Uncertain D - Disagree
SD - Strongly disagree

2. Opinions on strategic management accounting dimensions of quality, cost and time focussing on environmental and rehabilitation issues

2.1 Quality

		1	2	3	4	5	
2.1.1	A total approach ranging from impact assessment to	**SA**	**A**	**U**	**D**	**SD**	◯6

	aftercare should be adopted.		
2.1.2	A category for prevention costs should be introduced to reduce future rehabilitation costs such as failure costs.	**SA A U D SD**	7
2.1.3	A balance matrix should be developed to determine the degree of environmental management equilibrium.	**SA A U D SD**	8
2.1.4	Strategic management planning for long term rehabilitation management and aftercare should exist.	**SA A U D SD**	9
2.1.5	The management accountant should function with the support of cross-functional teams and experts (a botanist, chemical engineer, actuary, geologist, civil engineer, hydrologist, community leaders, etc.) through all the phases from design to disposition during rehabilitation activities.	**SA A U D SD**	10
2.1.6	Benchmarking (investigating, identifying and using best practices) should be used by management in the same mining sector and/or region.	**SA A U D SD**	11
2.1.7	Benchmarking should not be utilised over the whole spectrum of rehabilitation from design to aftercare.	**SA A U D SD**	12
2.1.8	An awareness should exist of the continuous search for best practices in order to improve processes and activities.	**SA A U D SD**	13
2.1.9	Feedback to management on successful rehabilitation operations is important for management decision-making purposes.	**SA A U D SD**	14
2.1.10	Feedback on failures in rehabilitation management is necessary for management decision-making purposes.	**SA A U D SD**	15
2.1.11	Financial results of rehabilitation inputs are disclosed to stakeholders.	**SA A U D SD**	16
2.1.12	Non-financial rehabilitation results are measured.	**SA A U D SD**	17
2.1.13	Non-financial rehabilitation inputs and gains (eg. future savings in work hours and machine hours, as well as pollution levels of water) are disclosed to stakeholders.	**SA A U D SD**	18
2.1.14	Financial issues form an integral part of the procedure to find a balancing position in respect of environmental cost management.	**SA A U D SD**	19
2.1.15	Issues on the natural environment form an integral part of the procedure to find a balancing position regarding environmental cost management.	**SA A U D SD**	20
2.1.16	Leadership factors form an integral part of the procedure	**SA A U D SD**	21

	to find a balancing position regarding environmental cost management.		
2.1.17	Issues pertaining to the implementation of environmental rehabilitation form an integral part of the procedure to find a balancing position in respect of environmental cost management.	**SA A U D SD**	22
2.1.18	Measurable is tantamount to manageable in rehabilitation management.	**SA A U D SD**	23
2.2	**Cost**		
2.2.1	Environmental costs and expenses should be integrated routinely into management decision making.	**SA A U D SD**	24
2.2.2	Designing costs out (reducing future costs at the design stage) in respect of rehabilitation management should form an integral part of strategic management.	**SA A U D SD**	25
2.2.3	Monetary investments in education and training of the whole workforce in environmental preservation would improve strategic management policies.	**SA A U D SD**	26
2.2.4	Monetary provision should be made for long-term rehabilitation management and aftercare.	**SA A U D SD**	27
2.2.5	Monetary provision should be made for contingencies (eg. flooding).	**SA A U D SD**	28
2.2.6	Life cycle costs of the commodity mined should not be not determined in terms of the value chain.	**SA A U D SD**	29
2.2.7	The costs of the extended enterprise (on aftercare, consultants, R&D, contractors, suppliers, security, natural environment) should be determined.	**SA A U D SD**	30
2.2.8	Expenditure to rehabilitate on an ongoing basis as part of the operating process should be separated from expenditure to rehabilitate damage from the past.	**SA A U D SD**	31
2.2.9	Differentiate between internal rehabilitation value-added and non-value-added environmental cost categories (eg. process design, acquisition or modification of equipment, location).	**SA A U D SD**	32
2.2.10	Differentiate between internal and external value-added and non-value-added expenditure.	**SA A U D SD**	33
2.2.11	Prevention costs (eg. R & D) are separated from other environmental cost categories.	**SA A U D SD**	34
2.2.12	Assessment costs (eg. monitoring, reporting) are	**SA A U D SD**	35

separated from other environmental cost categories.

2.2.13	Control costs (eg. handling of harmful materials) are separated from other environmental cost categories.	SA	A	U	D	SD	36
2.2.14	Failure costs (eg. fines) are separated from other environmental cost categories.	SA	A	U	D	SD	37
2.2.15	All major groups of rehabilitation costs (2.2.9 - 2.2.14) incurred, are disclosed to stakeholders.	SA	A	U	D	SD	38

2.3 Time

2.3.1	Heritage (of badly rehabilitated land) is an important factor for strategic management.	SA	A	U	D	SD	39
2.3.2	Investments of time in education and training of the whole workforce in environmental preservation contribute towards better management results.	SA	A	U	D	SD	40

3. Opinions on attributes of a good rehabilitation management accounting system: technical, behavioural and cultural

3.1 Technical

3.1.1	Application of ISO9000 (international standards on quality management) should be encouraged.	SA	A	U	D	SD	41
3.1.2	Application of ISO14000 (international standards on environmental management) should be encouraged.	SA	A	U	D	SD	42
3.1.3	Contingency planning should exist for unforeseen disasters (eg. flooding).	SA	A	U	D	SD	43
3.1.4	Experience of other countries does not have a positive influence locally.	SA	A	U	D	SD	44
3.1.5	Thorough knowledge of the present local and national regulations, laws and fines on rehabilitation issues is an attribute of good management policy.	SA	A	U	D	SD	45
3.1.6	Sound knowledge of present taxation policies supports decisions on rehabilitation costs and expenses.	SA	A	U	D	SD	46

3.2 Behavioural

3.2.1	Local and internal attitudes towards rehabilitation management should be considered for decision-making purposes.	SA	A	U	D	SD	47
3.2.2	The enterprise's mission statement and objective statement have a positive influence on rehabilitation policies to the	SA	A	U	D	SD	48

	extent that they deal with environmental issues.						
3.2.3	Impact assessments are not important at the commencement of mining operations.	**SA**	**A**	**U**	**D**	**SD**	49
3.2.4	Monetary rehabilitation inputs are disclosed to stakeholders.	**SA**	**A**	**U**	**D**	**SD**	50
3.2.5	If there were no laws, regulations and inspections, mine managers would still operate according to an ethic of responsibility to preserve the natural environment.	**SA**	**A**	**U**	**D**	**SD**	51
3.2.6	Positive changes in behaviour towards rehabilitation and environmental management are attained by means of education and training.	**SA**	**A**	**U**	**D**	**SD**	52
3.2.7	True profits are recognised only when none of the stakeholders incur losses from the process of profit generation.	**SA**	**A**	**U**	**D**	**SD**	53
3.3	**Cultural**						
3.3.1	Cultural differences influence the process of rehabilitation management decision-making.	**SA**	**A**	**U**	**D**	**SD**	54
3.3.2	People in the communities surrounding mines are dependant on the natural environment.	**SA**	**A**	**U**	**D**	**SD**	55
3.3.3	More expensive processes are preferable when the surrounding community is better informed and educated about the natural environment.	**SA**	**A**	**U**	**D**	**SD**	56
General opinion							
4.1	Awards to encourage improved and successful rehabilitation management policies are important (similar to awards for safety hours).	**SA**	**A**	**U**	**D**	**SD**	57
4.2	Awards for green reporting enhance the awareness of cost management for rehabilitation purposes.	**SA**	**A**	**U**	**D**	**SD**	58
4.3	Act 50/1992/Chapter VI (amended by Act 103/1993) significantly influenced rehabilitation management for land disturbed by mining.	**SA**	**A**	**U**	**D**	**SD**	59
4.4	The strategic management accounting dimensions of quality, cost and time (Section 2) should be combined for general rehabilitation management purposes.	**SA**	**A**	**U**	**D**	**SD**	60
4.5	The attributes of a successful management accounting system of technology, behaviour and culture (Section 3) should be combined to the benefit of rehabilitation management in general.	**SA**	**A**	**U**	**D**	**SD**	61
4.6	To obtain maximum results the relationship between these	**SA**	**A**	**U**	**D**	**SD**	62

strategic dimensions (Section 2) and attributes of good management accounting (Section 3) should be flexible.

4.7	The strategic management accounting dimensions of quality, cost and time (Section 2) are combined in the interest of rehabilitation management in <u>your</u> mine/s.	**SA A U D SD** ◯ [63]
4.8	The technological, behavioural and cultural attributes of a successful management accounting system (Section 3) are combined to serve the best interest of rehabilitation management in <u>your</u> mine/s.	**SA A U D SD** ◯ [64]

Comments: (especially on SA and SD responses)

Statement no. .....
Statement no. .....

In general .....

Please return this questionnaire to facsimile number ***012-664-0825.***

✂.....

Address (or Fax no.) if you are interested in a brief summary of the results of the survey (Return separately if you wish.)

.....
.....
.....

QUESTIONNAIRE USED IN SURVEY OF OPINIONS - AFRIKAANS

VRAELYS AAN MYNBESTUURDERS (vir omgewingsbestuurders) ◯1 ◯2 ◯3

Alle antwoorde word streng vertroulik behandel en word slegs vir statistiese doeleindes gebruik.

VRAELYS OOR REHABILITASIEBESTUURSREKENINGKUNDE

☐ Dui asseblief die *gepaste keuse* aan deur dit met 'n kruisie in *swart* ink te merk.

◯ *Ignoreer* asseblief; slegs vir verwerkingsdoeleindes.

... Dui asseblief u eie persoonlike mening aan.

☎ **Stuur** asseblief so gou as moontlik **terug** na faksnommer **012-664-0825**.

1. Agtergrondinligting

1.1 Spesifiseer asseblief die ontginde kommoditeit van u myn/e.

1☐ Platinum, goud, silwer of uraan 2☐ Steenkool 3☐ Asbes

4☐ Chroom 5☐ Vanadium 6☐ Yster ◯4

7☐ Ander (Spesifiseer asseblief).....

1.2 Die aantal werknemers op die myn/e wat hierbo gespesifiseer word, is

1☐ 1-100 2☐ 101-500 3☐ 501-1 000 4☐meer as 1 000 ◯5

Menings:

In watter mate sou u persoonlik saamstem of verskil van die volgende stellings?

SS - Sterk saamstem	***S - Saamstem***
O - Onseker	***V - Verskil***
SV - Sterk verskil	

2. Menings oor die dimensies van strategiese bestuursrekeningkunde van gehalte, koste en tyd gefokus op omgewings- en rehabilitasie-aspekte

		1	2	3	4	5	
2.1	**Gehalte**						
2.1.1	'n Totale benadering wat strek van impakberaming tot nasorg behoort gevolg te word.	**SS**	**S**	**O**	**V**	**SV**	◯6

2.1.2	'n Kategorie vir voorkomende koste behoort ingestel te word om toekomstige rehabilitasiekoste soos mislukkings-koste te verminder.	**SS S O V SV**	7
2.1.3	'n Balansmatriks moet ontwikkel word om die mate van ewewig van omgewingsbestuur te bepaal.	**SS S O V SV**	8
2.1.4	Strategiese bestuursbeplanning vir langtermynrehabilitasie-bestuur en -nasorg moet bestaan.	**SS S O V SV**	9
2.1.5	Die bestuursrekenmeester moet funksioneer met die ondersteuning van multidissiplinêre spanne en deskundiges ('n botanis, chemiese ingenieur, aktuaris, geoloog, siviele ingenieur, hidroloog, gemeenskapsleiers, ens.) deur al die fases van ontwerp tot wegdoening tydens rehabilitasie-aktiwiteite.	**SS S O V SV**	10
2.1.6	Benchmarking (ondersoek, identifisering en aanwending van die beste praktyke) moet deur die bestuur in dieselfde mynbousektor en/of -streek toegepas word.	**SS S O V SV**	11
2.1.7	Benchmarking moet nie benut word oor die hele spektrum van rehabilitasie van ontwerp tot nasorg nie.	**SS S O V SV**	12
2.1.8	'n Bewustheid van die voortdurende soeke na die beste praktyk om prosesse en aktiwiteite te verbeter, moet bestaan.	**SS S O V SV**	13
2.1.9	Terugvoering aan die bestuur van geslaagde rehabilitasie-bedrywighede is belangrik vir bestuursbesluitnemings-doeleindes.	**SS S O V SV**	14
2.1.10	Terugvoering oor mislukte rehabilitasiebestuur is nood-saaklik vir bestuursbesluitnemingsdoeleindes.	**SS S O V SV**	15
2.1.11	Finansiële resultate van rehabilitasie-insette word aan die belanghebbendes openbaar.	**SS S O V SV**	16
2.1.12	Nie-finansiële rehabilitasieresultate word gemeet.	**SS S O V SV**	17
2.1.13	Nie-finansiële rehabilitasie-insette en -voordele (bv. toe-komstige besparings van werk- en masjienure, asook besoedelingsvlakke van water) word aan die belang-hebbendes openbaar.	**SS S O V SV**	18
2.1.14	Finansiële sake maak 'n integrerende deel uit van die proses om 'n balanserende posisie te kry ten opsigte van omgewingsbestuursrekeningkunde.	**SS S O V SV**	19
2.1.15	Sake rakende die natuurlike omgewing maak 'n integre-rende deel uit van die prosedure vir die verkryging van 'n balanserende posisie betreffende omgewingskostebestuur.	**SS S O V SV**	20

2.1.16	Leierskapfaktore maak 'n integrerende deel uit van die prosedure vir die verkryging van 'n balanserende posisie betreffende omgewingskostebestuur.	SS S O V SV	21
1.17	Sake rakende die implementering van omgewingsrehabilitasie maak 'n integrerende deel uit van die prosedure vir die verkryging van 'n balanserende posisie betreffende omgewingskostebestuur.	SS S O V SV	22
2.1.18	Meetbaar kom neer op bestuurbaar met rehabilitasiebestuur.	SS S O V SV	23
2.2	**Koste**		
2.2.1	Omgewingskoste en -uitgawes moet gereeld opgeneem word in bestuursbesluitneming.	SS S O V SV	24
2.2.2	Koste-uit-ontwerp (vermindering van toekomstige koste in die ontwerpstadium) by rehabilitasiebestuur moet 'n integrerende deel uitmaak van strategiese bestuur.	SS S O V SV	25
2.2.3	Monetêre investering in opvoeding en opleiding van die hele werkerskorps vir omgewingsbehoud sal die strategiese bestuursbeleid verbeter.	SS S O V SV	26
2.2.4	Monetêre voorsiening moet gemaak word vir langtermyn-rehabilitasiebestuur en -nasorg.	SS S O V SV	27
2.2.5	Monetêre voorsiening moet gemaak word vir onvoorsiene gebeurlikhede (bv. oorstromings).	SS S O V SV	28
2.2.6	Lewensikluskoste van die kommoditeit wat ontgin word, moet nie in terme van die waardeketting vasgestel word nie.	SS S O V SV	29
2.2.7	Die koste van die uitgebreide onderneming (aan nasorg, konsultante, navorsing & ontwikkeling, kontrakteurs, verskaffers, sekuriteit, natuurlike omgewing) moet bepaal word.	SS S O V SV	30
2.2.8	Uitgawes om op 'n deurlopende basis as deel van die bedryfsproses te rehabiliteer, moet geskei word van uitgawes om skade van die verlede te rehabiliteer.	SS S O V SV	31
2.2.9	Onderskei tussen interne kategorieë vir omgewingsrehabilitasiekoste wat <u>waarde toevoeg</u> en <u>nie waarde toevoeg nie</u> (bv. prosesontwerp, verkrygings of vernuwings van toerusting, ligging).	SS S O V SV	32
2.2.10	Onderskei tussen <u>interne</u> en <u>eksterne</u> uitgawes wat waarde toevoeg en nie waarde toevoeg nie.	SS S O V SV	33
2.2.11	Voorkomingskoste (bv. navorsing en ontwikkeling) word onderskei van ander omgewingskostekategorieë.	SS S O V SV	34

2.2.12	Beramingskoste (bv. monitering, verslaglewering) word onderskei van ander omgewingskostekategorieë.	**SS S O V SV**	35
2.2.13	Kontrolekoste (bv. hantering van skadelike materiaal) word onderskei van ander omgewingskostekategorieë.	**SS S O V SV**	36
2.2.14	Mislukkingskoste (bv. boetes) word onderskei van ander omgewingskostekategorieë.	**SS S O V SV**	37
2.2.15	Al die vernaamste groeperings vir rehabilitasiekoste (2.2.9-2.2.14) wat aangegaan word, word aan die belanghebbendes openbaar.	**SS S O V SV**	38
2.3	**Tyd**		
2.3.1	Erfenis (van onbevredigende gerehabiliteerde grond) is 'n belangrike faktor in strategiese bestuur.	**SS S O V SV**	39
2.3.2	Investering van tyd vir opvoeding en opleiding van die hele werkerskorps in omgewingsbehoud, dra by tot beter bestuursresultate.	**SS S O V SV**	40
3.	**Menings oor die hoedanighede van 'n goeie rehabilitasiebestuursrekening-kundige stelsel: tegnies, gedrag en kultuur**		
3.1	**Tegnies**		
3.1.1	Die toepassing van ISO9000 (internasionale standaarde oor gehaltebestuur) moet aangemoedig word.	**SS S O V SV**	41
3.1.2	Die toepassing van ISO14000 (internasionale standaarde oor omgewingsbestuur) moet aangemoedig word.	**SS S O V SV**	42
3.1.3	Gebeurlikheidsbeplanning moet bestaan vir onvoorsiene rampe (bv. oorstromings).	**SS S O V SV**	43
3.1.4	Ervaring van ander lande het nie plaaslik 'n positiewe uitwerking nie.	**SS S O V SV**	44
3.1.5	'n Deeglike kennis van die huidige plaaslike en nasionale regulasies, wette en boetes oor rehabilitasie-aangeleenthede is 'n hoedanigheid van goeie bestuursbeleid.	**SS S O V SV**	45
3.1.6	'n Goeie kennis van die huidige belastingbeleid ondersteun besluite oor rehabilitasiekoste en -uitgawes.	**SS S O V SV**	46
3.2	**Gedrag**		
3.2.1	Plaaslike en interne houdings jeens rehabilitasiebestuur moet oorweeg word vir besluitnemingsdoeleindes.	**SS S O V SV**	47

3.2.2	Die onderneming se missie- en die doelwitstelling het 'n positiewe invloed op rehabilitasiebeleid in die mate waarin hulle omgewingsaspekte aanspreek.	**SS S O V SV**	48
3.2.3	Impakberamings is nie belangrik tydens die aanvang van mynbedrywighede nie.	**SS S O V SV**	49
3.2.4	Monetêre rehabilitasie-insette word aan die belanghebbendes openbaar.	**SS S O V SV**	50
3.2.5	Indien daar geen wette, regulasies en inspeksies was nie, sou mynbestuurders steeds bedryf het volgens die etiek van hulle verantwoordelikheid om die natuurlike omgewing te behou.	**SS S O V SV**	51
3.2.6	Positiewe veranderings in die gedrag jeens rehabilitasie en omgewingsbestuur word verkry deur middel van opvoeding en opleiding.	**SS S O V SV**	52
3.2.7	Ware winste word verky alleenlik wanneer geeneen van die belanghebbendes verliese ly in die proses van winsnajaging nie.	**SS S O V SV**	53
3.3	**Kultuur**		
3.3.1	Kulturele verskille beïnvloed die proses van rehabilitasie-bestuursbesluitneming.	**SS S O V SV**	54
3.3.2	Mense in die gemeenskappe aanliggend tot myne is afhankilk van die natuurlike omgewing.	**SS S O V SV**	55
3.3.3	Voorkeur word verleen aan duurder prosesse indien die omliggende gemeenskap beter ingelig en opgevoed is oor die natuurlike omgewing.	**SS S O V SV**	56
Algemene mening			
4.1	Toekennings om verbeterde en geslaagde rehabilitasie-bestuursbeleid aan te moedig, is belangrik (soortgelyk aan toekennings vir veiligheidsure).	**SS S O V SV**	57
4.2	Toekennings vir groen verslaglewering verhoog die bewustheid van kostebestuur vir rehabilitasiedoeleindes.	**SS S O V SV**	58
4.3	Wet 50/1992/Hoofstuk VI (gewysig deur Wet 103/1993) het rehabilitasiebestuur van grond wat beskadig is deur mynbou, beduidend beïnvloed.	**SS S O V SV**	59
4.4	Die dimensies van strategiese bestuursrekeningkunde van gehalte, koste en tyd (Afd 2) moet gekombineer word vir doeleindes van algemene rehabilitasiebestuur.	**SS S O V SV**	60
4.5	Die hoedanighede van 'n geslaagde bestuursrekening-kundige stelsel van tegnologie, gedrag en kultuur (Afd 3)	**SS S O V SV**	61

moet gekombineer word tot die voordeel van algemene rehabilitasiebestuur.

4.6	Ten einde die maksimum resultate te verkry, moet die verhouding tussen die strategiese dimensies (Afd 2) en goeie hoedanighede van bestuursrekeningkunde (Afd 3) buigsaam wees.	**SS S O V SV**	◯ 62
4.7	Die dimensies van strategiese bestuursrekeningkunde van gehalte, koste en tyd (Afd 2)word gekombineer in die belang van rehabilitasiebestuur in u myn/e.	**SS S O V SV**	◯ 63
4.8	Die tegnologiese, gedrags- en kulturele hoedanighede van 'n geslaagde bestuursrekeningkundige stelsel (Afd 3) word gekombineer om tot voordeel van rehabilitasiebestuur in u myn/e te dien.	**SS S O V SV**	◯ 64

Kommentaar: (Veral van SS- en SV-responsies)

Stelling nr. .....
Stelling nr. .....

Algemeen .....

Stuur asseblief hierdie vraelys terug na faksnommer ***(012)664-0825.***

✂.....

Adres (of Faksnommer) indien u belangstel in 'n kort samevatting van die resultate van die opname (Stuur afsonderlik terug indien u dit verkies.)

.....
.....
.....

ANNEXURE 3.3

LIST OF PEOPLE APPROACHED TO EVALUATE THE QUESTIONNAIRE

1. Professor Daan Gouws, University of Pretoria, supervisor

2. Blanché Postma, Department of Water Affairs, Pretoria, geologist, inspector

3. Gabriel Hough, Department of Water Affairs, Bloemfontein, civil engineer

4. Daniel Hough, Receiver of Revenue, Sandton, chartered accountant

5. Mattie Kruger, Honeydew, private consultant on management

6. Joyce Jordaan (and Ben, auditor husband), Department of Statistics, University of SouthAfrica

7. Prof. Frans Vermaak, Management Accounting, Department of Accounting, University of Pretoria

8. Prof. Charl de Villiers, CA, Department of Accounting, University of Pretoria, environmental reporting

9. Christo Cronjé, CA, Department of Accounting, University of Pretoria, green accounting

10. Dr André Niemand, Head Department of Management Accounting, Pretoria Technicon

ANNEXURE 3.4

COVERING LETTER TO THE PEOPLE APPROACHED TO EVALUATE THE QUESTIONNAIRE

Vir die aandag van:

Aantal bladsye (hierdie een ingesluit):

Datum:

Boodskap:

Beste

Met verwysing na ons onlangse telefoongesprek, stuur ek die voorlopige vraelys en die begeleidende brief sodat jy dit kan evalueer en per faks aan my terugstuur.

Die gehalte van die resultate van die empiriese navorsing word grootliks bepaal deur voorlopige toetsing en verbeterings ten einde 'n vraelys saam te stel uit vrae en stellings wat duidelik is en dieselfde betekenis het vir alle respondente.

Ek sal dit op prys stel as jy krities sal let op die aspekte van die ontwerp van die vraelys soos gebruiksvriendelikheid, bewoording, volgorde en struktuur, instruksies, inhoud en formaat. Indien jy verdere kommentaar wil lewer, sal ek dit beslis oorweeg in die proses om die vraelys moontlik te verbeter.

Stuur asseblief die ingevulde vraelys en jou kommentaar so gou as moontlik na my toe terug (faks **012-664-0825**). Hierdie nommer is ook my telefoonnommer indien jy navrae het oor die hantering van die vraelys of 'n gesprek wil voer oor die onderwerp.

Jou samewerking in verband met hierdie empiriese navorsing word opreg waardeer.

Vriendelike groete

.....
Cecilia Beukes

ANNEXURE 3.5
FOLLOW-UP LETTER TO ACCOMPANY THE QUESTIONNAIRE- ENGLISH

ATTENTION: THE MINE MANAGER

(or: Environmental manager)

30 April 1998

Dear Sir

If you have already responded and returned the following questionnaire, please ignore this correspondence.

Rehabilitation management in the mining sector is gaining increasingly importance, especially after the promulgation of Act 50/1991/Chapter VI (amended by Act 103/1993).

As part of my doctoral studies at the University of Pretoria, I need a more complete overview of the opinions of mine managers or their environmental managers on rehabilitation management. The focus of my doctoral research project is to devise a strategy that the management accountant can use to include all relevant costs when comparing inputs and outputs concerning rehabilitation management issues.

Accompanying this letter you will find a questionnaire that is calculated to take approximately 15 minutes of your time to complete. You will notice that a brief summary of the results of the opinion survey will be available to all interested persons. If you want to keep your answers separate from the request for the results, please detach the last section of the questionnaire and return it separately by facsimile or by mail.

All answers will be treated as strictly confidential and will be used for statistical and research purposes only.

Should you require information for the completion of the questionnaire, do not hesitate to contact me at 012-664-0825 during office hours, or at PO Box 14919, LYTTELTON, 0140.

Kindly **return** the completed questionnaire by **fax** to **012-664-0825** (a private temporary number).

Indien u die begeleidende brief en die vraelys in Afrikaans verkies, skakel of stuur asseblief 'n boodskap per faks na 012-664-0825.

Your kind cooperation is appreciated.

Yours sincerely

.....
Cecilia Beukes

Approved by

.....
PROFESSOR DAAN GOUWS (supervisor)

.....
PROFESSOR QUINTUS VORSTER
(Head of the Department of Accounting)

FOLLOW-UP LETTER TO ACCOMPANY THE QUESTIONNAIRE - AFRIKAANS

VIR DIE AANDAG VAN: DIE MYNBESTUURDER (Omgewingsbestuurder)

30 April 1998

Geagte Meneer

Indien u reeds reageer het op die volgende vraelys en dit teruggestuur het, ignoreer asseblief die volgende korrespondensie.

Rehabilitasiebestuur in die mynbousektor is besig om steeds belangriker te word, veral na die uitvaardiging van Wet 50/1991/Hoofstuk VI (soos gewysig deur Wet 103/1993).

Aangesien rehabilitasiebestuur 'n onderdeel van my doktorale studies aan die Universiteit van Pretoria uitmaak, het ek 'n vollediger oorsig nodig van die menings van mynbestuurders of van hulle omgewingsbestuurders. Die fokus van my doktorale navorsingsprojek is om 'n strategie te ontwikkel wat die bestuursrekenmeester kan gebruik om al die relevante koste in te sluit wanneer insette en uitsette ten opsigte van rehabilitasiebestuursaspekte vergelyk word.

Tesame met hierdie brief kry u 'n vraelys wat na raming ongeveer 15 minute sal neem om te voltooi. U sal ook merk dat 'n kort opsomming van die resultate van die opname beskikbaar sal wees aan alle persone wat belangstel. Indien u die antwoorde afsonderlik wil hou van die versoek vir die resultate, verwyder dan asseblief die laaste gedeelte van die vraelys en stuur dit afsonderlik terug per faks of met die pos.

Alle antwoorde word streng vertroulik behandel en sal slegs vir statistiese en navorsingsdoeleindes gebruik word.

Indien u enige inligting benodig met die voltooiing van die vraelys, moet u nie huiwer om met my in aanraking te kom nie by (012)664-0825 gedurende kantoorure, of by Posbus 14919, LYTTELTON, 0140.

Stuur asseblief die voltooide vraelys per **faks terug** na **(012)664-0825** ('n privaat tydelike nommer).

U vriendelike samewerking word waardeer.

Vriendelike groete

.....

Cecilia Beukes

Goedgekeur deur

.....

PROFESSOR DAAN GOUWS (studieleier)

.....

PROFESSOR QUINTUS VORSTER
(Hoof Departement Rekeningkunde)