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Environmental management in the city: electricity supply in Hillsboro, Bloemfontein

Environmental management necessitates a holistic view of the environment and how we, as human beings, impact on that environment. To apply environmental management, any one of a number of tools may be employed. Environmental impact assessment (EIA), as one of these tools, refers to the assessment of the likely environmental impacts arising from a major project or any other actions that will significantly affect the natural or man-made environment. The ultimate objective of an EIA is to provide decision-makers with an indication of the likely consequences of a proposed project. The South African EIA was developed in such a way as to be applicable to large-scale as well as smaller projects. This article focuses on environmental impact assessment (EIA), the legislation governing it, and applying the process to a small case study, while examining the various stages of an EIA and briefly touching on public participation. The main findings are that an EIA can be applied quite successfully to smaller projects and that an effective public participation process will help consultants and developers to identify key issues and alternatives.

Omgewingsbestuur in die stad: die geval van elektrisiteitsvoorsiening in Hillsboro, Bloemfontein

Omgewingsbestuur vereis 'n holistiese siening van die omgewing en hoe ons as mense op daardie omgewing impakteer. Daar is verskeie hulpmiddels wat gebruik kan word om omgewingsbestuur toe te pas. Omgewingsimpakbepaling (OIB) is so 'n hulpmiddel. Dit verwys na die bepaling van die moontlike omgewingsimpakte wat kan voortspruit uit 'n groot projek of enige ander aktiwiteit wat die natuurlike en mensgemaakte omgewing noemenswaardig sal beïnvloed. Die einddoel van 'n OIB is om aan die besluitnemer moontlike gevolge van die voorgestelde projek uit te wys. Die Suid-Afrikaanse OIB is op so 'n wyse ontwikkel dat dit op beide omvangryke en kleiner projekte toegepas kan word. Hierdie artikel fokus op omgewingsinvloedbepaling (OIB); die wetgewing wat dit reguleer, asook die toepassing van die proses. 'n Klein gevallestudie illustreer die verskillende fases van 'n OIB en raak ook publieke deelname kortliks aan. Daar is primêr bevind dat OIB redelik suksesvol op kleiner projekte toegepas kan word en dat 'n proses van effektiewe publieke deelname konsultante en ontwikkelaars kan help om sleutelaspekte en alternatiewe te identifiseer.

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Environmental management is usually primarily associated with wildlife conservation parks and the recycling of waste material as well as the big, ugly mine-dumps which scar the natural landscape in and around cities like Johannesburg. Some people may include the larger industries, for example, the SASOL refineries and the ESCOM power stations or even the mining industry. But how often is environmental management considered in relation to everyday occurrences like switching on the lights in our homes or offices? Yet this, together with other infrastructure and municipal services, calls for environmental management in the city.

Environmental management involves a holistic view of the environment and how we, as human beings, impact on that environment. Over the past decade it has evolved from being the new “in” topic to a scientifically grounded, usable toolkit including such tools as the environmental management system, environmental auditing, environmental impact assessments and even a whole new branch of environmental law, to name but a few.

The National Environmental Management Act (NEMA), act no 107 of 1998, was published on 27 November 1998 and forms the framework legislation for environmental management in South Africa. This act largely replaces the Environment Conservation Act (ECA), act no 73 of 1989, although certain sections and regulations published under this act are still in effect, including the regulations¹ published under section 21, concerning activities which are harmful to the environment and must be approved by the Minister of Environmental Affairs before any such project may be undertaken. This approval is given in the form of a Record of Decision (ROD) after careful review by means of an Environmental Impact Assessment (EIA). This, together with section 24(7) of the NEMA (which describes the principles of an EIA) provides the background for environmental impact assessments.

This paper aims to illustrate the process of an EIA on smaller projects by applying such an assessment to a case study. In order to

1 Regulations GN R 1182 and 1183 published in *Government Gazette* no 18261, 5 Sept. 1997, and amended by GN R 1355 of 1997-10-17, GN R 448 of 1998-03-27 and GN R 670 of 2002-05-10.

achieve this aim, the paper first considers what an EIA is. Background information regarding the case study is given, whereafter the various steps in an EIA are theoretically grounded and then applied to the case study for further illustration.

1. What is an environmental impact assessment?

Environmental impact assessment refers to the assessment of the likely environmental impacts arising from a major project or other actions (*ie* legislation, a policy, or a plan) that will significantly affect the natural and man-made environment. It is a systematic and integrative process — first developed in the USA in 1970 — for considering possible impacts and reporting on them, before a proposal is approved (cf Wood 1999). In simple terms, an EIA gathers facts, analyses and interprets these facts, and tries to predict or presuppose the outcome of an impact. Its purpose is to assemble and evaluate existing information and to facilitate good management decision-making.

The EIA process allows for interactive, incremental decision-making, in contrast to an approach where one complete application is evaluated and finally approved by one or more officials, without the benefit of input from either the applicant or the people affected by the decision. This latter type of restricted process is unreliable in view of the multidisciplinary nature of environmental decision-making.

In contrast to many countries in the world, EIAs in South Africa are process-based, rather than substantive-based. The regulations for conducting compulsory EIAs cover both the product and the process. Certain reports are required on which to base decisions. In order to expedite decision-making and to ensure that the reports cover the most significant issues and provide high-quality content, they are preceded by specific processes (cf Lengoasa 1997).

In various parts of the world, investigations conducted into the impact of specific projects on the environment are known as environmental impact assessments (EIAs), environmental impact reports (EIRs), environmental impact statements (EISs), or planned analyses (the term used in the general environmental policy).

The ultimate objective of an EIA is to provide decision-makers with an indication of the likely consequences of a proposed project.

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It aims to define and assess the potential physical, biological, socio-economic and health effects of an activity in a form that facilitates a logical and rational decision. Adverse impacts of activities could include effects on the physical environment, or on the health and safety of people, together with social impacts such as effects on local employment prospects and the quality of life, or on cultural heritage. An EIA should provide sufficient supporting argument, in an intelligible format, to show how technical analyses and social judgements lead to a conclusion about choosing one alternative over another. It should furthermore ensure that a proposal is optimised so as to offer the greatest benefit to those affected, while at the same time minimising undesirable consequences, by finding possible alternative sites and/or processes. As such, EIAs can improve the efficiency of decision-making and planning (cf Andrews 1999; Barnard 1999; Fuggle 1992; Kalan 1999).

EIAs function better as preventative measures than as cures. An EIA must therefore be implemented at the project planning and design stage and form part of the whole decision-making process in the project planning cycle, which has a number of decision points. This means that there must be continuous feedback between EIA findings, the project design and the selection of locations. During the early stages of project design, an EIA can be used to investigate and avoid harmful impacts, as well as to increase likely benefits. It can also help to test alternative designs and to choose the design with the greatest benefit and fewest harmful effects. The EIA must also be an integral part of the overall environmental management plan in order to reduce adverse impacts before proposals reach the authorisation phase (cf Kalan 1999).

Sometimes an EIA is treated as an “add-on” once the planning has been finalised. If major environmental problems are identified at this stage, it may be time-consuming and expensive to integrate mitigation measures. The identification of potential problems early in the project planning process may result in a considerable saving on finance and time. Early changes in design may also reduce the need for expensive modifications once a project becomes operational (cf Kalan 1999).

2. EIA and the city

“Environmental management” means different things to different people. To some it entails the simple task of separating the garbage into natural and non-natural products, while to others it is saving the rhinoceros. All variants are correct to some degree, but it is the effects of the environment on our day-to-day lives (and *vice versa*) that are of crucial concern.

It is only recently that the interconnectedness of environmental and social factors has been realised. Most environmental problems we face today are caused by human lifestyles and living conditions. Mines, for example, are there for our comfort — iron is used for building material, gold for jewellery and coal for electricity. This is especially true where a concentration of people is found, namely in urban environments. These effects are felt not only within the immediate boundaries of the city, but also throughout the region (cf United Nations Environmental Programme 2000).

The explosive growth of urban areas has had several negative effects. Both environmental and social issues are involved, eg a lack of drinking water, housing, waste disposal, electricity supply, etc. Because social issues play such a major role in most environmental problems and because people are always involved when dealing with an urban problem, it is of the utmost importance to communicate with the community when planning any new development (cf United Nations Environmental Programme 2000).

EIAs may be done voluntarily. However, the majority of EIAs are done to fulfil explicit or implicit statutory requirements for specific circumstances or in general (cf Barnard 1999). EIAs are specifically required by section 24 of the National Environmental Management Act, by section 22 of the Environmental Conservation Act and by section 39(5) of the Minerals Act. They are also implicitly required in many other cases (cf Barnard 1999).

The NEMA does not specify an area or industry, but lists guidelines for environmental management that can be applied to any situation. Similarly the regulations of the ECA do not specify any industry or sector, but list activities that may have a detrimental effect on the environment and for which an EIA is required. Although laws

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exist to effect interaction and participation among the various role-players, these are not always adequately exercised on the part of local government or the public.

Many aspects of infrastructure and services, such as electricity, roads, water supply, and treatment of sewerage are listed activities under the ECA regulations.

3. The EIA process as applied to Hillsboro, Bloemfontein

3.1 Background

It was planned to lay a 33-kV power line from the Bayswater power station, through Dan Pienaar, to Hillsboro. This was seen as indispensable, since the existing line (laid in 1959) was old and damaged beyond repair. The backup supply from Spitskop to Dan Pienaar was also unreliable. This area services Dan Pienaar, Bayswater and parts of Pentagon Park, Helicon Heights and Rayton, as well as two smaller business centres. In spite of this, a good deal of opposition was generated during the EIA procedure, especially in the Gilles van der Wall Street area where 22 property owners objected to the power line passing only five meters from their properties (cf Cebo Environmental Consultants 2000). An extensive public participation process was entered into, during which alternative routes and methods were discussed. Unfortunately most of these had additional cost implications. Two of the alternatives were the following (see map):

- To upgrade the existing power line in the Dan Pienaar-Bayswater area. This would have taken a lot longer to complete, increased costs, and inconvenienced 153 home-owners whose sidewalks and driveways would have been dug up. The increase in costs would also have resulted in a tariff increase for all electricity users in Bloemfontein.
- To lay the power line underground. Again, this would have increased the costs dramatically and was not deemed a viable option (Claasen 2000b).

According to Mr Kritzinger, Head of the Bloemfontein Electricity Planning Department, everything possible had already been done to

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make the power line as environmentally friendly as possible (cf Claassen 2000b).

3.2 Stage 1: Appointment of an independent consultant

The EIA regulations promulgated under the ECA stipulate that an applicant who wants to carry out any listed activities must appoint an independent consultant to assist in a number of tasks set out in the regulations. These tasks include preparing the reports on which the competent authority will base its decision. The consultant is also responsible for running the public participation process. As a result, the regulations require a consultant to be an expert in the area of environmental concern involved, and to have no financial interest in it. In South Africa, the reliability and objectivity of an EIA is, or is perceived to be, directly proportional to the independence of the applicant and the consultant. The public tends to feel that he who pays the piper calls the tune (cf Barnard 1999).

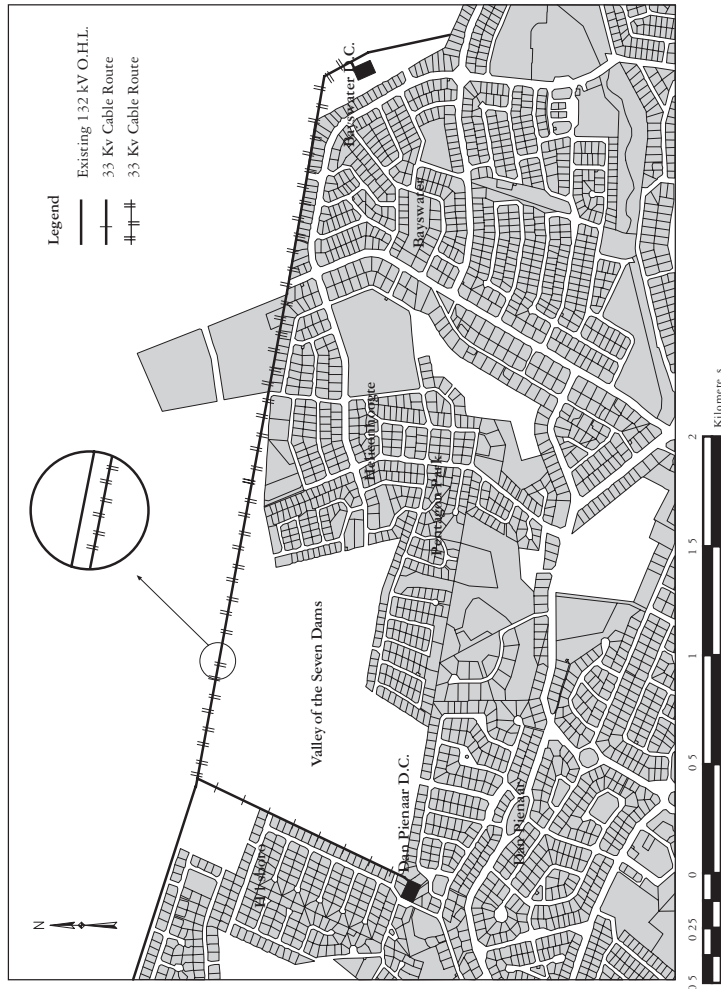
In the Hillsboro case, this stage was complied with. An independent consultant was appointed to assist in the tasks as set out in the EIA regulations, as well as to run the public participation process. The consultant had an impressive track record demonstrating his ability and expertise in the field of EIA and other environmental concerns.

3.3 Stage 2: Screening

Screening is the important process which determines whether an EIA is necessary. Without screening, many actions would be assessed unnecessarily while actions with significant adverse impacts might not be assessed. To ensure effective screening operations, the proposer should be required to submit information to assist the relevant authorities in determining whether an EIA is necessary in any particular case. Whatever screening procedure and level of participation are adopted, it needs obviously to ensure that only those actions with significant impacts are assessed and that decisions are made within a specified period of time, without causing undue expense to any of the participants in the process (cf Wood 1995).

In principle, South Africa has a two-stage screening process. The initial screening is done during the application phase. The guideline

Map 1: Locations of the alternative routes for the proposed electricity cable



document (South Africa DEAT 1998a) requires the applicant (and/or consultant) to discuss the application informally with the relevant authority in a pre-application consultation before launching the application. This consultation may take the form of a formal meeting, a telephonic conversation or correspondence by means of facsimile or electronic mail. The purpose of such consultation is to determine whether the proposed activity needs to comply with legislative requirements in terms of the ECA, as well as to clarify the requirements of the regulations and procedures to be followed (cf Lengoasa 1997).

When the proposed activity needs to comply with legislative requirements, an application for authorisation to undertake the identified activity has to be submitted to the relevant authority, which must register the application. The formal launching of the application is its submission to the provincial authority, which will either hear the application or refer it to another level of government. It is a general requirement that the application consist of only one page (cf Barnard 1999; South Africa, 1997a, 1997b; South Africa DEAT 1998a).

Since electricity supply is directly listed in Regulation 1182 under section 21 of the ECA, it was necessary to do an EIA for Hillsboro, to be submitted to the Department of Environmental Affairs in Bloemfontein for approval. The appropriate application forms were thus completed and submitted after a pre-application consultation.

3.4 Stage 3: Scoping (initial assessment)

After receiving the application to perform a scheduled activity, the relevant authority has to decide what expert reports are necessary and the level of detail required. In order to make these decisions, the relevant authority consults its own experts. The level of impact assessment will depend on the nature and extent of the proposal, its complexity, the sensitivity of the environment, and other issues identified during the scoping process. Some investigations have to be done in depth, while others can be more superficial (cf Barnard 1999; Lengoasa 1997).

Scoping is the process of determining the extent of and approach to the investigation; of *identifying the issues*² to be considered in an

2 Terms and phrases in italics are used to illustrate the application of EIA in the Hillsboro case in sections 3.4.1-3.4.4.

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EIA as well as identifying and *selecting alternatives* to the proposed activity. During this stage it is important to determine the focus of the EIA, *who should be involved*, and the optimal process to be followed. Essentially, it is a procedure designed to establish the *terms of reference* for an EIA. The proposer and his/her consultant, in consultation with the relevant authorities and interested and affected parties, determine which alternatives and significant issues should be investigated, the procedure that should be followed, and the reporting requirements (cf South Africa DEAT 1992a, 1992b).

Scoping has historically been a strong feature of EIA in South Africa. The provisions for the advertisement of applications prior to scoping and for a plan of study, as well as the emphasis placed on scoping in the EIA guidelines, indicate that scoping is still considered crucial (cf Wood 1999).

An EIA need not investigate every possible impact. Once a broad range of issues has been identified, it is necessary to evaluate them and highlight significant issues for investigation and assessment. The only impacts that need to be assessed are those that may affect the decisions that have to be taken or influence the management of activities. The procedure laid down in Regulation 1183 makes provision for a useful planning process for timeous identification of significant issues. The proposed project should first be discussed with the appropriate official, mainly in order to establish guidelines regarding the impacts to be assessed. The plan of study for scoping must be prepared to further narrow this field. Even where an official does not provide guidance, an intelligent appraisal of the issues at stake will give some indication of the impacts that should be addressed (cf Barnard 1999).

The relevant authority can decide to allow the activity to go ahead without any further requirements. Exemption from the application of any provision of the EIA regulations can be granted in terms of section 28A of the ECA, which states that any person, local authority or government institution may apply in writing for exemption, with reasons. Such an application will normally be made when it is clear that the proposed activity will have no environmental impact. The application may be refused or the exemption granted for all or some of the provisions of the applicable regulation, notice or direction, with or without specific conditions. An exemption may, however, be

reviewed from time to time and withdrawn if any condition is not being met (cf Barnard 1999).

3.4.1 Nature and extent of the Hillsboro project proposal

Specific information regarding the development centred around the 33kV line and the actual route will now be provided.

The structures that have to carry the 33kV conductors are concrete poles. The total height of the poles is 15.6m. The lowest conductor would be mounted 11m above ground and would therefore have a relatively low visual impact. The poles are to be erected in a concrete foundation two metres deep. The height of the pole above the ground is 13.6m. The poles carry six structures, to which the insulators are attached. The earth cable is attached to the top of the pole and the distance between poles is 220m.

The 33kV power line has a total length of ± 4 km. Access roads and gates to specific areas would have to be constructed. The proposed route for the new transmission line was as follows:

From the Bayswater distribution centre the route will follow the servitude of the existing 132kV line up to a point directly north of the Dan Pienaar distribution centre. From there the line will pass a row of houses to the east of Gilles van der Wall Street to the Dan Pienaar distribution centre (Cebo Environmental Consultants 2000).

Issues considered when the route was chosen were numerous and included:

- taking the shortest suitable route between the start and end points, as this reduces costs and environmental impacts,
- avoiding physical aspects such as habitation, boreholes, inaccessible areas and intensive cultivation,
- avoiding areas of thick vegetation and unique or scarce vegetation,
- keeping as close to infrastructure such as roads as possible, since the access roads need to be maintained,
- avoiding archaeological, historical and burial sites on the route,
- allowing access for construction and maintenance, and
- considering the public interest.

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Construction activities which could cause environmental or social impacts were identified. Construction workers usually improve local economic activity, but stress may also be caused by noisy or unacceptable behaviour. The use of heavy machinery can damage vegetation, cause soil disturbance and increase dust and noise pollution. The acquisition of construction materials such as sand and rock can also pose a problem. The blasting of the dolerite can cause noise and dust pollution, or even structural damage to properties, especially when blasting takes place. Waste and sanitation management on the line route must be implemented. Gates must be installed in fences and kept closed when not in use.

3.4.2 Terms of reference of the Hillsboro project

The objective of the study, as with any EIA, was to determine if any environmental factors (various aspects of the natural and social environment) would either be influenced by, or have an influence on the selection of the electricity line, the distribution line routes or the locality of the substation. The following were specifically required:

- a description of the natural environmental setting, with reference to its aesthetic status,
- a description of the potential impacts to the fauna and flora, and
- the identification of measures to be taken to minimise these impacts.

Preliminary alternatives identified were:

- to continue with the proposed development along the proposed routes and with the proposed site for the substation,
- to continue with the development along alternative routes and with an alternative site for the substation, or
- not to continue with any development in the area.

The scope of the work included site visits to determine the setting, visual character and land-uses of the area. It was surveyed in order to identify any flora and fauna populations that could be affected by the development. Discussions were held with the developer (Bloemfontein Electricity) to identify specific aspects of the development which could affect the environment. Due communication was entered into with the local community who might be affected by the

development, and their comments were noted. Ultimately, the aim was to present guidelines for the mitigation of the impacts identified during the scoping exercise.

3.4.3 Issues identified in relation to the Hillsboro project

After a comprehensive public participation process, several negative issues were raised, by both the specialists and the public, including the following:

- The route of the power line and other infrastructures (which resulted in several alternatives being proposed):

A 132kV/33kV substation is situated in Bayswater. This substation receives 132kV power from the 132kV line crossing the Valley of the Seven Dams. Here the 132kV power is transformed to 33kV power. This substation acts as a distribution centre and supplies 33kV power to the northern and north-eastern parts of the city.

The Dan Pienaar distribution centre is a 33kV/11kV substation and is situated in Gilles van der Wall Street in Dan Pienaar. This distribution centre receives its 33kV power from the Bayswater distribution centre via an underground cable. Here the 33kV power is transformed to 11kV power which is distributed to the suburbs of Hillsboro and parts of Dan Pienaar and Heuwelsig.

The 132kV line comes from the Harvard Distribution centre in the west of Bloemfontein and supplies the Bayswater substation with 132kV, which is then transformed to 33kV. Three 33kV cables are connected to the Dan Pienaar distribution centre. One of these cables, the one feeding Dan Pienaar from Bayswater, was laid in 1959 and was damaged beyond repair. The backup supply cable from Spitskop to the Dan Pienaar distribution centre was laid in 1989 and was the only reliable cable.

It was the route of the new cables that caused the most concern among the public, the main objection being to the visual impact. Alternative routes and methods were proposed (see paragraph 3.4.4), from which the final decision was made.

- Protected plant species in the area

During a site visit a vegetation survey was conducted. The corridor through which the proposed line was planned and the sur-

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rounding area were surveyed. At the time of the survey no Red Data plants were found. Populations of a few protected plant species occurred on the rock sheets including: *Aloe grandidentata*, *Haemanthus humilis*, *Boophane disticha*, *Ammocharis coranica*, *Anacampseros filamentosa*, and *Avonia ustulata*.

It was recommended that officers of the Department of Environmental Affairs and Tourism or the Free State Botanical Garden remove as many protected plants as possible before the development started. These plants could be temporarily housed at the Karee Nature Reserve nursery until they could be transplanted to a suitable site.

- Possible historical, cultural and archaeological sites

During the survey the corridors were scanned but no sites of archaeological or cultural importance were found. Due to the point-impact nature of the poles, it was felt that the likelihood of a pole's being situated on an archaeological site was very low.

However, it was recommended that the contractor be requested to be on the lookout for any artifacts unearthed during the excavation of the holes for the structures. If artifacts were discovered the contractor was obliged to cease operations temporarily and contact the National Museum's archaeologist to investigate. During the surveying of the routes, the surveyor was requested to avoid graveyards as well as sites of individual graves.

- Geology, soil type and associated erosion

The northern parts of Bloemfontein rest on a thick dolerite sill whose uneven surface influences the topography in the form of hills, ridges and sheets of rock.

The soil depth varies from 10mm on the sheets of rock to 100cm. Four major soil types occur in the area. On the high-lying areas, deeper sandy soils of the Hutton form occur. Towards the drainage lines the soils become very clayey and the Arcadia form is typical. On the perimeter of the dolerite outcrops, as well as areas where shallow soils occur, the Glenrosa and Mispah soil forms were found.

Potential issues included the blasting of rock, which was to be avoided as far as possible due to high cost and the danger of possible structural damage to houses, as well as noise. The best

route to minimise blasting therefore needed to be chosen. The whole area has a high erosion potential and measures to prevent erosion would be vital.

- Visual impact and property value

The visual impact of the proposed development on the landscape is a function of several factors of which the viewing distance, visual absorption capacity and landform are measurable. Other factors are difficult to quantify because they are subjective. The visual character of an area involves various elements that provide an overall perceived ambience. In considering the visual character of a site, it is important to include not only the internal land use, but that of the surrounding area as well. In the Hillsboro case it did not really matter which site was chosen, since the relatively flat topography meant that the visual impact would have had the same effect on the observer at all sites.

The power line and the support structures in particular, which would have been situated behind the houses in Gilles van der Wall Street, would have had a medium-to-high visual impact. It was recommended that other options and alternatives be investigated (see section 3.4.4).

- The presence of workers on the property

The presence of workers during the construction phase was a given impact. It was decided that the final placing of the routes and gates would be negotiated with landowners on an individual basis, as would access to properties.

Positive issues raised by specialists and the public included the following:

- Future land use (an area was planned for a new retirement village)

The main land use classifications for the affected area were open space and residential. The area between Hillsboro in the west, Pentagon Park in the east, and Dan Pienaar in the south was to be developed into a retirement village with about 332 residential units, 41 flats, a unit for the disabled and a community centre.

The proposed overhead line would have been situated between the houses on the eastern side of Gilles van der Wall Street and

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the proposed retirement village. The final placing of the routes and gates would be negotiated with landowners on an individual basis, as would access to properties.

- Economic development due to a reliable electricity source
Developments such as these can create various job opportunities during the construction phase. The strengthening of the electricity supply would also have a positive impact on the economic development of the area as a whole.

Of the issues listed, the first, fifth and sixth were of greatest concern to the public. With regard to the presence of workers on private property, guidelines were set to deal with permission, access to property, waste, sanitation, noise and dust issues. These were covered in section 8 of the scoping report.

The visual impact was of the utmost importance to the public, especially to the property owners in the Gilles van der Wall Street area. This also influenced the final position and route of the power line.

The scoping process and report thus focussed on these issues, which were further investigated for inclusion in the final scoping report.

3.4.4 Alternatives to the Hillsboro project

Six alternatives were identified (cf Table 1):

- A - a new underground cable along the existing route through Bayswater & Dan Pienaar (4.6km),
- B - a new 132kV distribution centre and underground cable or overhead line to the Dan Pienaar distribution centre,
- C - an overhead power line,
- D - an overhead power line to a point north of Hillsboro and then an underground cable to the Dan Pienaar distribution centre,
- E - a new underground cable through Pentagon Park and the Valley of the Seven Dams, and
- F - a no-go option.

Alternatives A, B and E were considered secondary alternatives since they were either too expensive or would have a higher impact than alternatives C and D. The no-go alternative (F) was discarded

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since there were a number of reasonable alternatives and because the need for the project was recognised by both the proposer and the affected parties.

The remaining options were C and D, with their main issues being visual impact and cost, respectively. In the case of alternative D both the proposer and the interested and affected parties agreed that the most suitable route for the cable would be along the eastern pavement of Gilles van der Wall Street.

Alternatives C and D were recommended for evaluation by the Free State Department of Environmental Affairs and Tourism.

3.5 Stage 4: Environmental impact evaluation

The actual detailed investigation of environmental impacts, as well as potential alternatives and mitigation measures, is carried out during this phase. After receiving the scoping report, the relevant authority can call for an impact assessment, which is a more detailed investigation of the impacts identified in the scoping report. In South Africa this happens in approximately 10% of applications, when the scoping report contains insufficient information or if the potential environmental impacts identified are significant. If the scoping report reveals aspects that should be investigated in more detail, these are dealt with in a way that ensures that important aspects are investigated without unnecessary work. For this purpose, a procedure similar to that used at the scoping stage is followed. In this case, a plan of study for an environmental impact assessment is called for. This is a detailed plan indicating how the applicant will go about identifying and assessing the significance of impacts. The plan of study will ensure that the relevant alternatives are investigated further and that the critical issues are carried forward into future processes (cf Andrews 1999; Barnard 1999; Lengoasa 1997; South Africa DEAT 1998a, 1998b; Wood 1999).

This stage was not necessary for Hillsboro, since the project was approved on the basis of the information in the scoping report.

Table 1: Summary of alternatives to the electricity cable, as presented to the Department of Environmental Affairs and Tourism

Alternative	A	B	C	D	E	F
Visual impact	Zero			Medium to high	Zero	Zero environ-mental impacts
Radiation impact	Zero	Zero - under-ground Very low - overhead		Low - overhead Zero - under-ground	Zero	
Costs			Relatively low (R1.5m)			
Construction phase			Levels of inconvenience low (2-3 months) Total route through undeveloped area	Levels of inconvenience low (2-3 months)		
Costs	Relatively high (R3.6m)	Very high (R15m)		Relatively high (R3m)	High (>R4m)	High costs to find and repair damaged section
Visual impact		Zero - under-ground Medium to high - overhead line	Medium to high			

Table 1: Summary of alternatives to the electricity cable, as presented to the Department of Environmental Affairs and Tourism (continued)

Alternative	A	B	C	D	E	F
Construction phase	High levels of inconvenience to public (4-5 months)	High levels of inconvenience to public (4-5 months)		75% of route through undeveloped area	High levels of inconvenience to public (6-8 months); interference with retirement village	No back-up supply and long power failures
Radiation impact			Low			
Property values			Decrease			

3.6 Stage 5: Approval

Largely, but not exclusively, on the basis of the information contained in the EIR, the activity may be approved, subject to certain conditions, or permission may be refused. When it becomes apparent after the initial application that substantial changes to the proposal are required, it may be referred back to the application stage for amendment. It may also be referred back to the scoping stage if it is found that substantial issues were omitted from the original scoping report or if there was insufficient consultation (cf Lengoasa 1997; South Africa DEAT 1998a).

The EIA guidelines (South Africa DEAT 1998a) provide no detail about the factors which ought to be considered in reaching the decision, or about the weighting of various factors. As a result, the decision to grant authorisation is sometimes made by overwhelmed provincial staff, on grounds relating narrowly to nature conservation or other, rather than on the full range of factors normally considered in internationally recognised good EIA practice. As a consequence of this (and of the overwhelming pressure for development), the number of applications rejected in South Africa is very small, probably less than 2% (cf Wood 1999).

The establishment of the conditions in terms of which an activity will be allowed to take place is the main focus of an EIA process. This is done when the relevant authority issues a Record of Decisions (ROD) to the applicant and to any other interested party, after considering an EIA. This record sets out the details of the proposed project and the decision taken by the relevant authority about it, including details of measures to control, mitigate or manage negative environmental impacts, rehabilitate the environment, or enhance benefits. There is provision for anyone to lodge an appeal against the decision within 30 days of issue of the ROD (cf Andrews 1999; Hill 2000; Lengoasa 1997; South Africa DEAT 1998a; Wood 1999).

The information and recommendations given in the scoping report for Hillsboro (see section 3.4) were deemed sufficient and the project was approved. An ROD was supplied, stipulating that approval of the project was conditional upon the choice of Alternative D (the combination of above-ground and underground cable). This

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option required additional blasting of the dolerite sill found in the area and an additional stipulation was made in the ROD that blasting must be done in such a way as to cause no damage to houses.

Other stipulations set out in the ROD included fire prevention measures; rules on access to private property, proper conduct by site workers and damage to property; suitable waste management measures (waste bins and dumping sites for scrap metal, oil, diesel and other chemicals), and proper sanitation measures.

3.7 Stage 6: Post-authorisation activities

The implementation phase of a project — which includes details of design, procurement, construction, commissioning, operation and decommissioning — is particularly important when impact management is a goal of the EIA process, as required by IEM. Without effective implementation and environmental management during the construction, operational and decommissioning phases of a development, the value of environmental impact assessment is significantly undermined. Broadly speaking, effective implementation and management depend on the enforcement of the environmental conditions attached to the approval, monitoring, auditing and corrective actions prescribed (cf Brownlie 1996; Hill 2000).

A limited view of the basic character of an EIA as a predictive exercise, undertaken before decisions are made, often leads to the absence of EIA mechanisms for implementation from the conditions of approval. This limited view is illustrated by the fact that the 1992 IEM Guideline Documents provide much less detail on implementation than on the preceding stages. Although these documents stipulate that the conditions of approval may require that an environmental management plan and an environmental contract be prepared, little guidance is provided with regard to what such a plan and contract should contain. Furthermore, the 1997 EIA regulations, which make provision for compulsory EIA of specified activities, focus exclusively on the role of EIA in decision-making. Similarly, the 1998 Guideline Document on the implementation of these regulations provides no guidance on post-decision implementation (cf Hill 2000).

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Monitoring has long been recognised as a crucial component of environmental management in South Africa. The ECA empowered the Minister to make regulations concerning the procedures to be followed in the course of and after completion of the activity or alternative activities, in order to substantiate the estimations of the environmental impact report and to provide for any preventative or additional actions deemed necessary or desirable. The IEM guidelines were also very specific about the necessity of monitoring and auditing. It is therefore surprising that neither the EIA regulations nor the EIA guidelines refer to monitoring (Wood 1999). However, in Chapter 5, which deals with IEM, the situation was addressed in the follow-up requirements of the NEMA with regard to EIA procedures. Section 24(7)(f) requires that EIA procedures developed under the Act must ensure the “investigation and formulation of arrangements for the monitoring and management of impacts, and the assessment of the effectiveness of such arrangements after their implementation”.

Although no formal post-authorisation activities were performed at Hillsboro, the following results of the project could be determined:

- Protected plant species in the area

The scoping report recommended that these species be removed to a suitable habitat. It was, however, later decided that the Botanical Society had enough representative samples of these species and that the area affected was very small in comparison to the total habitat area. The plants were therefore destroyed during construction.

- Possible historical, cultural and archaeological sites

No historical, cultural or archaeological sites were found during construction (or to date).

- Soil type and associated erosion

A post-construction inspection of the affected site was done by the consultants responsible for the EIA process to determine any negative effects. Since the area where the underground cable was laid was blasted and refilled with soil, limited erosion could be found during the inspection. Recommendations were made and berms installed in order to curb erosion.

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- Visual impact and property value
No negative visual impact is present, since part of the cable (900m) is underground. Any impact on property value was not researched, but should be limited.
- The presence of workers on the property
Neither the developer nor the consultant received any complaints. During blasting, one window of a house was broken and a fence damaged. The window was immediately replaced and the fence repaired.³

3.8 Interested and affected parties

The danger that the legitimacy or credibility of an EIA might be questioned should be neutralised at the start when structuring the EIA process. The success of a report will depend on how involved the public is and how transparent the report's preparation is. It will also depend on the inclusion of affected parties in structuring both the process and the research parameters; the way in which the final report is evaluated, and how the possibility of bias has been excluded (cf Bamard 1999). Public consultation and participation aim to ensure the quality, comprehensiveness and effectiveness of the process (cf Lengoasa 1997).

There needs to be a concerted effort to involve a wide range of people in the scoping process. The public must participate in identifying basic impacts, issues and alternatives to ensure that the issues of most concern are incorporated into the EIA. Although the term "the public" is not clearly defined in the EIA regulations, mandated representatives need to be identified. The authorising authority may not always be able to identify the environmental issues that the public perceives important and may also lack the detailed local knowledge that the public possesses. Participation gives the public an opportunity to indicate how an activity will affect the environment in ways that the state or developer may not have identified. As such, public involvement is an integral part of any EIA process. However, public

3 Verbal communication with P J du Preez, Department of Botany, University of the Free State, Bloemfontein, the author and project manager of the Scoping Project for Cebo Environmental Consultants on 6 September 2002.

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participation is a process of consultation rather than negotiation with civil society (cf Kalan 1999).

In order to ensure that all interested parties are afforded an opportunity to comment on development projects, applications submitted in terms of sections 21, 25 and 26 of the ECA must be publicly advertised, both on site and in the press. The form of advertising proposed by the developer should be described in the scoping plan and approved by the relevant authority. Onsite advertising should consist of a notice board placed at a visible location on the development site. Press advertising should involve at least one regional or local newspaper of the predominant language group for one day. Additional advertising via notices at libraries, civic centres, and the like, or extended press advertising may be required for sensitive or contentious projects. It is important to note that advertising must be carried out at the beginning of the scoping process (cf South Africa DEAT 1998a).

Regulation 1183 specifically requires a public participation process to ensure that all interested parties are given the opportunity to participate in all the relevant procedures. Both the scoping report and the EIA report are required to detail the public participation process followed, and to include a list of interested and affected parties, with their comments. Barnard (1999) argues that it is the duty of both the authorities responsible for making the final decision and the applicant to ensure effective participation by the public.

Regulation 1183 does not, however, define the roles and responsibilities of the affected parties. It only stipulates that any interested party who wishes to participate in the public participation process must respond within the time agreed to by the relevant authority and the applicant.

A comprehensive public participation process was followed at Hillsboro, including newspaper advertising, onsite advertising, notices and three public meetings.

The first meeting to inform the public of the proposed project was held at very short notice (cf Cebo Environmental Consultants 2000). Perhaps because of this, the public, and especially the property owners in the Gilles van de Wall Street area, reacted very strongly against the project — so much so that the story was covered in two

consecutive issues of a local newspaper, with previous similar projects being rehashed (cf Claasen 2000a, 2000b).

A second meeting was held during which the public proposed several alternatives, mainly to the position and route of the power line. These alternatives all had additional cost implications, as well as additional public inconvenience (cf Cebo Environmental Consultants 2000). It is perhaps interesting to note that the additional inconvenience to property owners did not deter them from proposing these alternatives; their comfort was less important to them than the visual impact and perceived decrease in property value.

A third meeting was held to determine the viable options and to reach a compromise. The cable was set up above ground as far as possible and converted to an underground cable for the distance affecting the 22 houses in Hillsboro. Unfortunately, this increased the cost by more than one million rand, which caused tariff increases for electricity and also meant that the money could not be spent on more pressing issues, for example providing electricity to the disadvantaged.

4. Conclusion

It is obvious that the EIA procedure as promulgated in 1997 has come a long way. Projects can be screened from the outset and proposers know immediately what procedure will be followed. If the project has major environmental implications, it will go the full EIA route, while smaller projects — like electricity cables in suburbs — exit the process at the scoping stage.

Public participation, although negatively perceived by proposers and developers, can prove advantageous, as illustrated in the case study. Public participation identifies the issues which need to be dealt with and the EIA can be streamlined to focus only on those issues and not waste time and money on insignificant matters. Public participation also provides the developer and the authorities with alternatives to the original proposal. These may represent improvements on the original plan. All alternatives will have advantages and disadvantages, and the process becomes a matter of finding the most acceptable combination of factors associated with each alternative.

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Although EIAs are publicly perceived as pertaining only to major developments, commonplace activities such as improving the electricity supply educate and inform the community about the environmental management taking place in their midst.

Bibliography

ANDREWS R

1999. *Public participation and the law: an environmental activist's guide*. Cape Town: Environmental Monitoring Group.

BARNARD D

1999. *Environmental law for all: a practical guide for the business community, the planning professions, environmentalists and lawyers*. Pretoria: Impact Books.

BROWNLIE S

1996. Is there life after EIA? Sound decision-making in environmental management. *Bulletin for the South African Institute of Ecologists and Environmental Sciences* 15(3): 15-6.

CEBO ENVIRONMENTAL

CONSULTANTS

2000. Scoping report for the proposed 33kV line between Bayswater and Dan Pienaar distribution centres. Unpubl document. Bloemfontein.

CLAASEN C

2000a. Vonke spat oor kragdraad. Inwoners van Hillsboro spreek kommer uit. *Volksblad Bloemnuus* 16 Junie: 1.

2000b. Ondergrondse kabel is te duur en ontwrigtend. *Volksblad Bloemnuus* 23 Junie: 8.

FUGGLE R F

1992. Environmental evaluation. Fuggle & Rabie (eds) 1992: 762-80.

FUGGLE R F & M A RABIE (eds)

1992. *Environmental management in South Africa*. Cape Town: Juta.

HILL R C

2000. Integrated environmental management systems in the implementation of projects. *South African Journal of Science* 96: 50-4.

KALAN H

1999. Debunking environmental impact assessments: a guide for communities. Andrews 1999: Annexure B.

LENGOASA J

1997. Implementation of EIA regulations. *Environmental Impact Management* 1: 4-5 (August). Pretoria: South Africa DEAT.

REPUBLIC OF SOUTH AFRICA (RSA)

1989. *Environment Conservation Act, No 73 of 1989*. Pretoria: Government Printer.

1997a. Environment Conservation Act, 1989. The identification under Section 21 of activities which may have a substantial detrimental effect on the environment. *Government Gazette* No 18261, 5 September. Pretoria: Government Printer.

Kruger/Environmental management in the city

1997b. Environment Conservation Act, 1989. Regulations regarding activities identified under Section 21(1). *Government Gazette* No 18261, 5 September. Pretoria: Government Printer.

1998. *National Environmental Management Act, No 107 of 1998*. Pretoria: Government Printer.

REPUBLIC OF SOUTH AFRICA, DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM (DEAT)

1992a. *The integrated environmental management procedure*. Integrated environmental management guideline series: Guideline document 1. Pretoria: Government Printer.

1992b. *Guidelines for scoping*. Integrated environmental management guideline series: Guideline document 2. Pretoria: Government Printer.

1998a. *EIA Regulations: implementations of sections 21, 22 and 26 of the Environment Conservation Act*. Guideline document. Pretoria: Government Printer.

1998b. *A national strategy for integrated environmental management in South Africa*. Discussion document. Pretoria: Government Printer.

UNITED NATIONS ENVIRONMENT PROGRAMME

2000. *The ecosystems approach to urban environmental management*. <<http://www.unep.or.jp/ietc/focus/ecoapproach/ecol.asp>> (accessed on 2 June 2002).

WOOD C

1995. *Environmental impact assessment: a comparative review*. Malaysia: Longman Scientific and Technical.

1999. Pastiche or postiche? Environmental impact assessment in South Africa. *South African Geographical Journal* 81: 52-9.