INFORMATION REQUIREMENTS FOR THE INTEGRATION OF ENVIRONMENTAL IMPACT ASSESSMENT IN THE GREATER FLORIDA LAKE DEVELOPMENT AREA

BY

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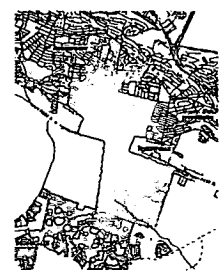

ABSTRACT

The city of today is a major performer for the secondary sector of the economy. Manufacturing and processing facilities not only provide the city with the essential commodity inputs but also provide the means of living for the populace. Of late, ad-hoc decisions for industrial development have led to an adverse impact on the local environment at costs which are much higher than the benefits actually accrued. In view of the deteriorating environmental conditions in and around industrial townships, it has become necessary to account for the environment while planning for such areas.

South African EIA regulations promulgated in 1997 require that environmental parameters are to be taken into consideration with proposed development. To enable the equitable evaluation of the assessments, the same base information would need to be used for all proposals. This study aims to identify the information requirements and responsibilities at local government level to enable equitable evaluation of EIA's as part of their development impact assessment process for proposed development.

The information requirements are illustrated at hand of the Proposed Greater Florida Lake Urban Development Plan adopted by the Western Metropolitan Local Council of the Greater Johannesburg Metropolitan Council.

OPSOMMING

Die hedendaagse stad kan gesien word as 'n groot rolspeler in die sekondêre sektor van die ekonomie. Vervaardigings en-verwerkingsaanlegte voorsien nie slegs in die noodsaaklike verbruikersmiddele nie, maar verskaf ook lewensnoodsaaklikhede vir die bevolking. Onlangse ad-hoc besluite het gelei tot negatiewe impakte op die omgewing wat buite verhouding groot is in vergelyking met die voordele wat verwesentlik kon word. In die lig van die agteruitgang van die omgewing in en om die nywerheidsgebiede het dit noodsaaklik geword om die omgewing in berekening te bring by die beplanning van sulke areas.

Suid-Afrikaanse Omgewings Impak Analise (OIA) Regulasies wat in 1997 vrygestel is vereis dat omgewingsparameters in berekening gebring moet word met die beplanning van voorgestelde ontwikkelings. Om die voorstelle op 'n regverdige wyse met mekaar te kan vergelyk is dit noodsaaklik om van dieselfde basisdata gebruik te maak. Hierdie studie poog om die inligtinsvereistes en verantwoordelikhede op plaaslike owerheidsvlak vas te lê, om regverdige evaluasie van OIA voorstelle moonlik te maak as integrale deel van die normale proses van ontwikkelings-impakanalise wat deur die plaaslike owerheid uitgevoer word.

Hierdie inligrtingsvereistes word aan die hand van die voorgestelde Stedelike Ontwikkelingsplan vir Floridameer uitgelig.

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1 INTRODUCTION AND BACKGROUND

1.1 GENERAL PROBLEM

Internationally, there is a trend towards introducing national Environmental Impact Assessment (EIA) systems through legal instruments such as specific laws or regulations under existing composite or framework environmental laws. A number of countries initially introduced EIA systems via administrative and policy decisions. Often, later, these countries formalised the EIA systems by introducing a law or regulation. Ron Bisset (1996) stated that: "Having a law/regulations is a necessary foundation for EIA systems, but it does not ensure effective implementation".

Most recently the National Environmental Management Act, 107 of 1998 provides in Chapter 8 that the Minister and every provincial government and local authority may enter into environmental management co-operation agreements with any person or community for the purpose of promoting compliance with the principles of integrated environmental management laid down in the Bill.

Provisions have also been made in the regulations issued in terms of the Environmental Conservation Act, 73 of 1989 for the relevant Provincial Authorities, designated in the Government Gazette of 5 September 1997 (Notice No. R. 1184) by the National Minister of Environmental Affairs and Tourism (EA&T) as a competent authority to identify local authorities that could be designated to act as a competent authority and thus have to evaluate the environmental effect of proposed activities as envisaged by the Environmental Conservation Act, 1989.

An official of the Western Metropolitan Council Mr. Jan Erasmus, stated that: "In 1990 the former Roodepoort City Council initiated a development plan for the Florida Lake area, with the focus on realising the full economic potential of the Roodepoort City. Following up on this, the Constantia Basin Development Plan and the Florida Development Axis Structure Plan were approved by the former Council in 1991. These plans then set the pace for rapid economic advancement along the north-south development axis. This created pressure on the Florida Lake area to provide a southern node to act as a much needed stimulus in the corridor. Within this context the Florida Lake Development Plan was compiled and approved by the Roodepoort City Council in late 1994."

He concluded that "the Florida Lake Development Plan (1994) provides only development opportunities within the jurisdiction of the political boundaries of the previous Roodepoort City Council. The Land Development Objectives process proposed that this corridor be extended to link and extend this corridor southwards to Meadowlands, to integrate these two areas separated by the mining belt. The main focus of this initiative is thus to establish a north-south development axis with emphasis being placed, within the constraints, on the socio-economic development of the south side of the axis." (Van Der Merwe, 1998, p.1). The further development of the Greater Florida Lake Development Plan and the subsequent adoption thereof paved the way for developers to submit proposals for development within this framework.

Subsequent EIA regulations require that environmental parameters are to be taken into consideration with proposed development. To enable the equitable evaluation of the assessments, the same base information would need to be used for all proposals. This study aims to identify the information requirements and responsibilities at local government level to enable equitable evaluation of EIA's as part of their development impact assessment process for proposed development.

1.2 THE NEED FOR ENVIRONMENTAL IMPACT ASSESSMENT

The city of today is a major performer for the secondary sector of the economy. Manufacturing and processing facilities not only provide the city with the essential commodity inputs but also provide the means of living for the populace. Of late, ad-hoc decisions for industrial development have led to an adverse impact on the local environment at costs that are much higher than the benefits actually accrued. In view of the deteriorating environmental conditions in and around industrial townships, it has become necessary to account for the environment while planning for such areas.

EIA is a relatively new planning and decision-making tool that was first enshrined in the United States' National Environmental Policy Act of 1969. It is a formal research process used to predict the environmental consequences of any development project. EIA thus ensures that the potential problems are foreseen and addressed at an early stage in project planning and design.

Environmental Assessment enables us in carrying out Environmental Cost-Benefit Analysis of projects at an initial stage. It is thus a pre-cursor to detailed analysis of environmental impacts, which are taken up only if a need for the same is established. It gives a view of the actors involved in the development-environment linkages. This is required because the community at large is always at a loss in terms of deterioration of the living environment that accompanies industrial development. Based on Environmental Assessment, the regulatory measures can be identified and the roles of concerned agencies defined for achieving more efficient environmental management and development.

Because development is an ever growing process, its impact on the environment is also ever increasing, leading to rapid deterioration in environmental conditions. As such Environmental Assessment provides a rational approach to sustainable development.

1.2.1 DEFINING EIA & INFORMATION NEEDS

Some measures are required to be taken to reduce the anticipated environmental degradation. Before starting a major project, it is essential to assess the present environment without the project, and the likely impact of the project on the environment, when it is completed. Therefore, an Environment Impact Assessment has to be made before starting a project. For analysis of environmental impacts, many professions and disciplines have to be involved. Like economic and engineering feasibility studies, Environmental Impact Assessment is a management tool for officials and managers who make important decisions about major development projects. The Environmental Impact Assessment should have the following objectives:

- Predict environmental impact of projects;
- Find ways and means to reduce adverse impacts;
- Shape a project to suit the local environment; and
- Present the predictions and options to the decision-makers.

The phrase "Environmental Impact Assessment" comes from Sec. 102 (2) of the National Environmental Policy Act (NEPA), 1969, USA. Some rudiments of EIA are implicit even in early examples of environmental legislation. Napoleon issued a decree which divided noxious occupations into categories: those which must be far removed from habitations, those which may be permitted on the outskirts of towns, and those which can be tolerated even close to habitations, having regard to the importance of the work and the importance of the surrounding dwellings.

EIA, in brief, extrapolates from scientific knowledge to assess the problem consequences of some human interventions on nature. Although EIA uses the techniques of science, it differs from ordinary scientific inquiry, because it is dealing with events that have not yet occurred, may not occur, and whose chances of occurrence may be changed by the very statement that they may occur.

Innes (1998) states that "analogy can help us understand how information plays a part in communicative planning. Just *as* manufacturers "informatize" products by adding computer chips, memories, sensors, and programmed instructions, so too communicative action "informatizes' planning, and in the process transforms the participants. Information influences planning and public action by becoming embedded in the thought, practices, and institutions of a community, and thereby influencing actions. *When information is most influential, it is also most invisible.* That is, it influences most when it is part of' policy participants' assumptions and their problem definitions, which they rarely examine. Thus, rather than saying that policy makers consciously apply information to make a choice, it is more accurate to say that information frames, or in other words limits the available choices in the first place. It points the way to and defines the nature of the reality that decision makers confront. Information acts more as a lens than as a bottom-line finding."

The requirements in California for preparing and publicly discussing a detailed environmental impact assessment for each major development proposal created new data sources that are widely used (Innes, 1998). Public interest organisations with expertise on environmental matters were given special attention in public hearings and were routinely quoted in the newspapers about reviewing these reports. Such groups thus became powerful, because if they could show that the environmental reports were inadequate methodologically or contained inaccurate information, they could sue, which would stop or delay development projects.

Twenty years of the state conducting environmental impact reporting has made it normal and expected for Californians to consider the environmental dimensions of all projects, even if the possible consequences are minor. They do not always decide for the more pro-environment perspective, but environmental issues have become much more salient in decisions. The most important effect occurs long before the impact analysis is even complete, during preparing the report, or in even in

anticipating the report. Developers agree, in these early stages, to modify their proposals because of negative effects that have been discovered (Landis and Pendall, 1994), to avoid public controversies and lengthy delays.

These results have occurred although the California Environmental Quality Act requires nothing more of public officials than measuring and *considering* the effects. It does not say that where there will be a significant negative effect a project cannot be built; it says only that the decision-making body must have a good reason to build in spite of the effects. Like the Country Reports, the environmental impact statement is merely a compendium of information, a set of background data, and not an answer to a policy question. It is, however, integrated into a long-term planning activity for which the decision about whether to build a project is just the final step. The environmental reporting requirement creates the conditions under which this "decision" crystallises. The *process of* producing information shapes perceptions that become part of the assumptions and given knowledge – and that frame the choices.

From the above it is clear that the integrity, scope and quality of "base" data is of the utmost importance if equitable EIA's are to be carried out. To enable the equitable comparison of alternatives the same base data are therefore needed.

1.2.2 SOUTH AFRICAN BACKGROUND

Before the promulgation of environmental impact assessment regulations by Dr Pallo Jordan, Minister of Environmental Affairs and Tourism, in August 1997, South Africa was not on par with other countries in the developed world where environmental impact assessments (EIAs) form an essential part of environmental management. These are generally conducted because mandatory regulations, acts or statutes demand them. They are seldom conducted voluntarily.

With the promulgation of these regulations, Minister Jordan has provided teeth to legislation that has for long been criticised as being weak. It also illustrates the importance that the government attaches to Integrated Environmental Management (IEM) as an important process for sustainable development.

The promulgation of these regulations, follows a long, arduous, but equally informative process of public participation. A provisional list of activities, along with draft regulations for environmental impact reports, was published for comment in the Government Gazette of 4 March 1994. Publication of a revised set of requirements followed on 1 November 1996. The final product reflects the most significant proposals and the drafting team attempted to include as many of the useful comments as possible.

The Constitution provides for both national and provincial departments of Environmental Affairs to be concurrently responsible for the environment. As a consequence, the regulations will be implemented by both spheres of government. Where capacity exists, it could even be implemented by local

authorities under certain circumstances. A guideline document dealing with the implementation of these regulations will be published by the Department of Environmental Affairs and Tourism.

These regulations introduced a change in paradigm, but what is more important, layd the foundation for the further development of a contemporary IEM approach, which will combine regulatory, self-regulatory and market-based approaches to the management of the environment. The latter will not succeed unless there is a regulatory benchmark, which in this instance will be provided by the notices and regulations in terms of sections 21, 22 and 26 of the Environmental Conservation Act (No. 73 of 1989). This will further ensure that environment and development is linked to achieve sustainable development.

The regulations will have major implications for industry, for planners, developers and policy makers, as well as for the government. They will force those that previously ignored environmental concerns in the planning and development of projects to take cognisance of the environmental impact of their activities. This will ensure standardisation of process and product, which can be applied uniformly for all proposed developments.

1.3 LOCAL GOVERNMENT'S RESPONSIBILITY

Whilst the scale of impact can in general be related to the level of government responsible for its regulation, each level of government has potential delegated powers in terms of the constitution that enable the implementation of regulations to be enacted at the most appropriate level of government.

Visser et al (1998, p.3) states that "In fulfilling its obligations towards the implementation of the EIA regulations the provincial department," from the Gauteng Government, "responsible for such implementation, must recognise the important jurisdictional roles and responsibilities of other governmental institutions in the environmental management field." These potential role players are identified as:

- National Departments such as Water Affairs and Forestry, Environmental Affairs and Tourism, Minerals and Energy, Agriculture. Housing, etc;
- other provincial departments such as Roads, Planning, Agriculture, Housing, etc;
- other Directorates of the Department, Agriculture & Nature Conservation; and
- Local Authorities designated by the Minister of Environmental Affairs and Tourism in terms of Section 22(1) of the Environment Conservation Act No 73 of 1998.

These authorities should be involved and be consulted in all the decision making processes regarding the implementation of the EIA regulations,

1.4 RESEARCH PROBLEM

Although the legal requirements for EIA's are well established at National Level, the responsibilities at Local Government level are unclear. The future designation of Local authorities as competent authorities, in terms of Section 22(1) of the Environment Conservation Act No 73 of 1998, implies

that the evaluation of EIA's would rest at local level. From the Californian experience it is clear that the same base data is to be used if any equitable comparisons are to be drawn from alternative proposals for development.

This study then aims to identify the information requirements and responsibilities of the Western Metropolitan Local Council to enable the equitable evaluation of EIA's as part of their development impact assessment process for proposed development with special reference to the Greater Florida Lake Development Area.

The study follows the framework as set out in figure 1 and the principal phases are discussed in the following section.

1.5 RESEARCH FRAMEWORK

The study can be demarcated into the following principal phases:

- information collection and problem definition;
- data evaluation;
- data analysis; and
- conclusion and recommendations.

To establish the relevant information requirements it is necessary to explain the EIA process in general and place it into the context of the development process in general. This is done at hand of a

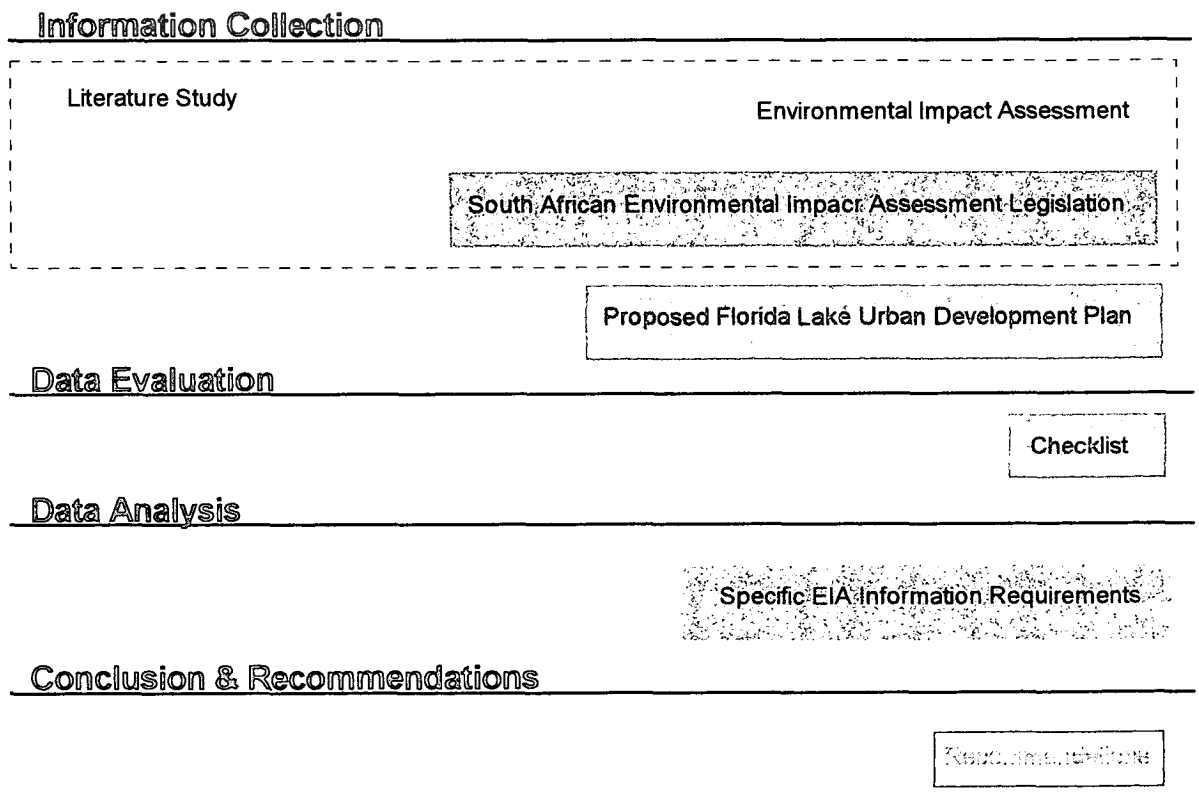

Figure 1: Research framework

literature study in Sections 3 to 5. The most widely used EIA methods are also discussed to establish which method would be the most suitable for local government use.

The South African Environmental Legislative Framework is discussed to identify relevant laws and regulations that would be applicable to the study area. The legal requirements are then extracted from:

- International Conventions and Agreements;
- The South African Constitution; and
- The Environmental Conservation Act 73 of 1989.

In Section 6 the Florida Lake Urban Development Plan is taken as an example of a typical local development proposal that would be assessed by local government in terms of EIA legislation.

"Inputs" or environmental characteristics that are needed for the assessment of proposals as identified in the literature study are established for the purpose. The impact of the different levels of information requirements can be seen as illustrated in figure 2.

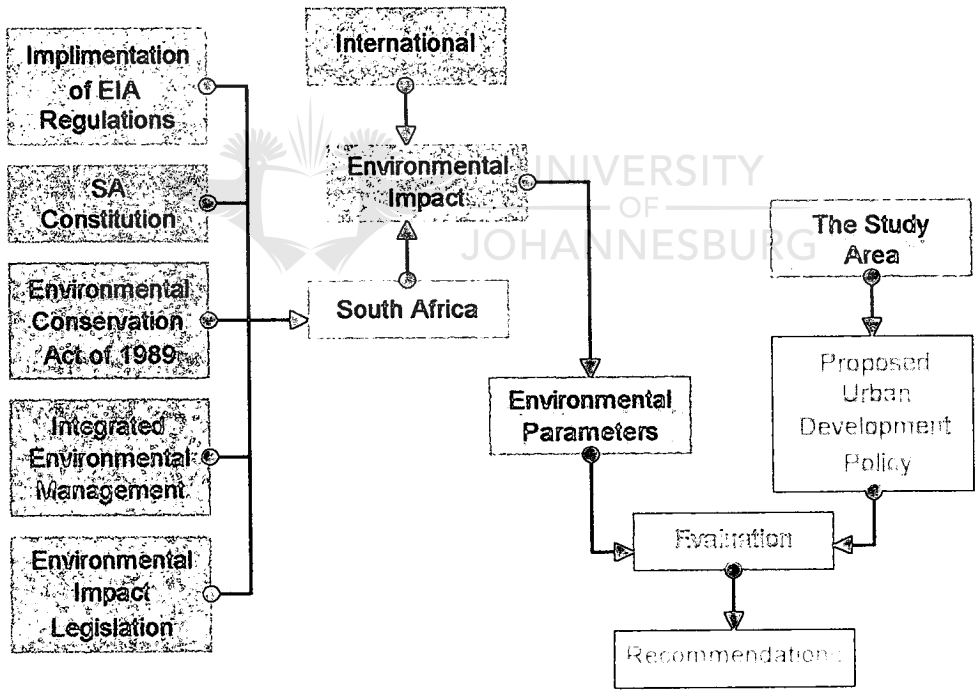

Figure 2: Data framework

From the requirements established in the literature study, a Development Specific Checklist for environmental parameters is established to enable the measurement of adequacy of information available at the WMLC in Section 7.

The specific EIA information requirements are established and the actions to be taken noted. Thus the required EIA "inputs" from the literature study and the general development impact "inputs" of the WMLC are identified and consolidated into a single Information Checklist.

The conclusion and recommendations are discussed in Section 8.

2 ENVIRONMENTAL ASSESSMENT PROCESS

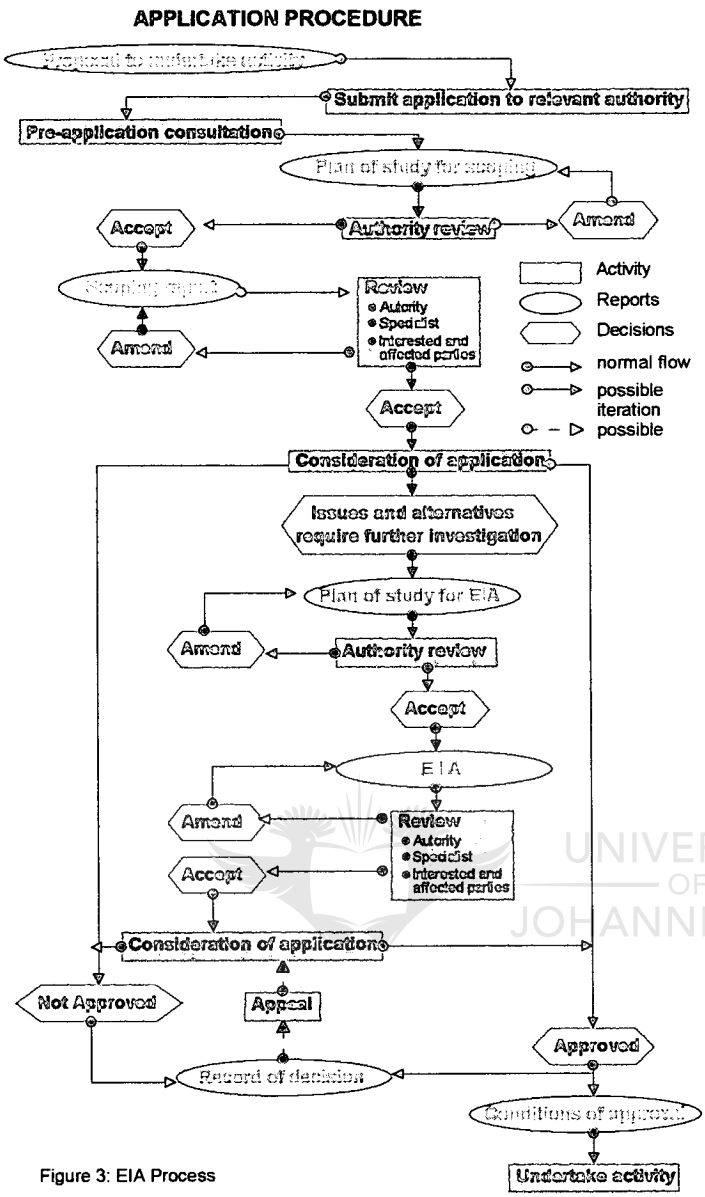

Figure 3: EIA Process

As stated in the introduction the most important aim of EIA is to introduce a systematic consideration of environmental issues into all important decision-making stages on specific proposed development activities. Virtually all proposed developments are subject to an authorisation process whereby a formal decision, or a series of decisions, is made by an official body on the 'future' of the proposal. Without the appropriate permit, licence or approval a project may not proceed. The authorising agency(ies) takes a variety of factors into account when deciding whether to issue an approval based on several reports that are to be presented to them. The role of EIA is to ensure that the environment is to be one of the factors which is considered in decision-making. The proposals and answers are communicated with a series of reports from the applicant and the authority.

2.1 REPORTS

The three main reports that are required are a **scoping report**; an **environmental impact report** and a **record of decision report.** These reports are each preceded by a specific process to ensure quality of content and to expedite decision making. The process is illustrated in figure 3. The National EIA process starts with a consultation phase that enable the applicant to establish if an EIA would be required or not.

The initial phase, mainly consultative, is the application phase. This may involve a pre-application consultation with the provincial department responsible for environmental management. The consultation may take the form of a formal meeting, a telephonic conversation or correspondence by means of facsimile or electronic mail. The purpose is to clarify the requirements of the regulations

and procedures to be followed. This will also allow the authority to register the application (by opening a file or capturing the information on computer). The competent authority engages in pre-application consultation only for general guidance purposes and does so without prejudicing the subsequent exercising of its statutory powers.

2.1.1 SCOPING REPORT

The level of an impact assessment will depend on the nature and extent of the development proposal; its complexity; the sensitivity of the environment; and issues identified during the scoping process. Depending on the nature and location of the activity, the relevant authority may request a plan of study for scoping. This plan of study is important in ensuring that where public consultation is required, all the relevant parties that may have an interest in the application, including other government departments, are identified. Time frames for the submission of comments by interested and affected parties will be decided during this phase. Public consultation and participation aim to assure the quality, comprehensiveness and effectiveness of the process. It also ensures that the views and concerns of all interested and affected parties are taken into consideration. The responsibilities of the various parties are clearly explained in the regulations.

Once the plan of study is deemed adequate, the applicant will proceed with the scoping exercise, which will culminate in a scoping report. The scoping report should reflect all the alternatives identified during the scoping process, as well as all the issues raised by interested and affected parties and how these will be addressed. It is important that the information in this report be as comprehensive as possible. A decision regarding whether the project should go ahead or not and whether an EIA is required to investigate issues and alternatives, will be made on the evaluation of this report. In many cases where there are no major issues identified, the scoping report will be sufficient for a decision to be made and no further studies will be required.

Should the decision be that an EIA needs to be undertaken, the applicant will be required to submit a plan of study for the EIA. This plan of study will ensure that the relevant alternatives are investigated further and that the critical issues are carried forward into further processes.

2.1.2 ENVIRONMENTAL IMPACT REPORT

After accepting the plan of study, the applicant will be expected to submit an environmental impact report. The importance of the clarity of this document cannot be over-emphasised. If new issues were raised and addressed during the EIA process, these must be added as an addendum to the initial scoping report submitted. The decision regarding the activity will be based largely, but not exclusively, on this document.

The drafting of an environmental impact report is merely a stage in the EIA process wherein the information, arguments, impacts and alternatives are documented. It can, however, not serve this purpose if the document is not open for review and scrutiny. Thus all interested and affected parties

should be involved in reviewing the document, which involves a systematic appraisal of the quality and adequacy of the assessment, as a contribution to the decision-making process.

2.1.3 RECORD OF DECISION REPORT

A record of decision report will be issued after evaluation of the Impact Report. This report must clearly state the conditions of approval or the reasons for non approval to enable the applicant to appeal against the decision. The applicant will also receive a copy, and it will be made available to any interested and affected party on request.

2.2 CHARACTERISTICS OF AN EIA

The primary purpose of an EIA is thus to aid decision-making by providing comprehensive and detailed information on the environmental consequences of development. The relationship between the assessment and decision-making is often misunderstood. An EIA is a process to gather and evaluate environmental information, to provide sufficient supporting arguments to evaluate the overall impacts, consider alternative options, and make a value judgement in choosing one development alternative instead of another. Such an assessment should never be a decision-making process in itself.

2.2.1 PROJECT MANAGEMENT TOOL

One of the main strengths of environmental assessment (EA) is its flexibility. All projects have a planning process in which EA can be integrated. Given its sensitivity to the social and economic as well as environmental impacts of projects, the EA process can be used in a project to accomplish many different objectives. EA can be effectively employed by project managers to compensate for shortcomings in the project planning process. For example, a project that failed to adequately consult the community at the outset can take advantage of the EA to involve the community in a necessary exchange of ideas and views. The EA can help establish and strengthen decision-making and communication mechanisms within a project. It can also pave the way for introducing innovations.

An EA may reveal sound environmental, social or economical reasons for shifting a project's direction. In view of the primacy accorded to the opinions and aspirations of local people, the EA process may also function as a project control mechanism. While the EA should not be expected to correct all the weakness' of a flawed planning process, when properly designed and executed, it can be a valuable tool for project implementation.

When the role of the EA is more restricted, the situation can work in reverse. Other project planning activities can be used to gather necessary information for the EA and to create support for the EA process. Each project manager must decide how much importance to accord each planning activity.

2.2.2 THE BENEFITS OF ENVIRONMENTAL ASSESSMENT

Most governments and donor agencies acknowledge the contribution of EA to improved project design. The weakness of EA in the past has been largely due to poor techniques and the failure to pay attention to findings at the implementation stage (Fedra et al, 1991). A review of current

environmental practices found the major benefits of the EA process for project sponsor to be (Fedra et al from ESSA Technologies, 1994, p16):

- reduced cost and time of project implementation;
- cost-saving modifications in project design;
- increased project acceptance;
- avoided impacts and violations of laws and regulations;
- improved project performance; and
- avoided treatment/clean up costs.

The benefits to local communities when applying environmental assessments include:

- a healthier local environment (forests, water sources, agricultural potential, recreational potential, aesthetic values, and clean living in urban areas);
- improved human health;
- maintenance of biodiversity;
- decreased resource use;
- fewer conflicts over natural resource use; and
- increased community skills, knowledge and pride.

2.2.3 THE COST OF ENVIRONMENTAL ASSESSMENT

Given the dearth of research in the field, it is not surprising that there is little information on the cost of carrying out EAs on community development projects. However, we can look at the experience with large projects for some indication of the costs involved. According to the World Bank (1991a, p.20), the cost of an EA rarely exceeds one percent of the total project cost. Mitigation measures usually account for three to five percent of total project cost (World Bank, 1991a, p.20). These figures do not include the cost of environmental damage caused by a project which has not undergone an EA.

In large projects, the availability of related data and studies can help to lower the cost of an EA. Given the modest budgets of most community development projects, it is imperative to find ways to limit costs. Over time, many believe that the costs of assessing small projects will eventually become proportionate to those of larger ones. Cost may be minimised by the following:

- incorporate the EA into other project planning activities such as feasibility studies;
- seek the technical and financial assistance of government departments and other partners;
- avoid the high costs associated with hiring technical specialists and building material by promoting community involvement; and
- costs usually diminish with experience and with the appropriate EA support mechanisms.

2.2.4 THE TIMING OF THE ENVIRONMENTAL ASSESSMENT

A golden rule for EA is to carry out the assessment at the earliest possible stage in a project's development and in relation and proportion to other project planning activities. The ultimate goal is to ensure that the relationship between a project and its physical, economic and social environment is clearly understood at the outset.

It is much easier to resolve a problem that threatens a project's objectives early on in a project. Always try to avoid a situation in which social and economic factors have to be re-examined toward the end of a project because an environmental analysis undertaken too late in the process may uncover new interpretations and impacts (World Bank 1991a).

An early and timely EA is fostered by an open and continuous exchange of information between the EA team, the project management team and the local community. Additional EA activity may be required later on in the project.

2.2.5 THE DURATION OF THE ENVIRONMENTAL ASSESSMENT

An EA done at the start of a project should take no longer to complete than the project design phase. In fact, unless the EA proves to be highly complicated, this is probably more time than necessary. However, this does not include the time required to implement and monitor the mitigation measures proposed by the EA The time needed to complete an EA will also hinge on:

- the size and complexity of the proposed project;
- the extent of co-operation received from the project sponsor and third parties such as local government;
- the level of interest and support demonstrated by the community;
- the ability of the project team to sustain interest in the EA;
- the skills of the EA team; and
- the EA techniques employed.

2.3 ENVIRONMENTAL IMPACT ASSESSMENT METHODS

Methods for the assessment of environmental impacts range from simple checklists and qualitative impact matrices to much more complex computer-based approaches using, for example, simulation modelling and optimisation, geographical information systems (GIS), or expert systems techniques. The methods of assessment also ought to include some of the more important aspects, such as legal, procedural and institutional components, that may differ widely from country to country and from project to project.

The scientific literature on environmental impact assessment is very large and is growing rapidly. A more recent survey was compiled, in the form of a bibliography with abstracts, in Clark, Gilad, Bisset et al., 1984. A survey of impact assessment is given in Munn, 1979; and a recent summary with special reference to developing countries can be found in Biswas and Geping (1987). According to Fedra et al, Greenberg concentrate on industrial production and impacts of noise, water and air pollution, and solid waste in their book on industrial environmental impact.

Fedra et al (1991) states that: methods that do have a track record of repeated use, and have been described in the respective literature, include, for example:

- Graphic overlay methods;
- USGS Matrix
- Network Analysis;
- Cross-impact Simulation;
- EES: Environmental Evaluation System;
- HEP: Habitat Evaluation Procedures;
- Decision Analysis;
- WRAM: Water Resources Assessment;
- EQA: Environmental Quality Assessment;
- METLUND Landscape Planning Model;
- Goals Achievement Matrix;
- WES: Wetland Evaluation System;
- AEAM: Adaptive Environmental Assessment;
- EQEP: Environmental Quality Evaluation Procedure;
- CBA: Cost--Benefit Analysis and related methods;
- Interactive Systems Analysis and Decision Support; and
- Expert Systems.

Methods are based on checklists or questionnaires, cross-impact matrices, or complex network analysis involving second- and higher-order effects and response. In terms of formats, they range from narrative and qualitative descriptions to various attempts at quantification and formalisation, from monetisation to graphical methods. With procedures, they may involve experts or expert teams and panels, workshops or public hearings, to court proceedings. In terms of tools, they may be based on guidelines and manuals or involve computer-based tools. Usually, any practical impact assessment involves a combination and mixture of several such components.

EIA procedures and approaches are often organised around checklists of data collection and analysis components. Basic components of the assessment process are a description of the:

- current environment, which usually includes such elements as rare or endangered species, special scenic or cultural components;
- proposed project or activity, covering technological, socio-economic, and administrative and managerial aspects;
- expected impacts, with emphasis on irreversible change and the consideration of mitigation strategies and project alternatives, including the alternative to not undertake the project; and,
- depending on the mandate given, a comparative evaluation of options.

While a large number of impact assessment methods have been developed and successfully applied world-wide, most of the available techniques are ecological and resource oriented, designed to evaluate a given project or a set of alternatives. They are not, as a rule, designed to provide substantive input to the planning and design phase of a development project, which should be the ultimate goal of environmental impact assessment techniques.

Some of the most flexible and universal tools of impact assessment are certainly models and related information and decision support systems, implemented on computers. The use of computers as a

major tool for EIA is nowhere near as common as it could or should be. Problems, in developing countries in particular, range from the availability of the necessary computer hardware to the expertise in developing, maintaining, and using more or less complex software systems. Further, lack of quantitative data is often cited as a reason for not using computers and simulation models.

However, the availability of increasingly powerful and affordable computers grows rapidly, and so does computer literacy among technical professionals. Even very powerful super-micro computers have become somewhat more affordable, and technical workstations are approaching the price class of personal computers. Many of the reasons cited for not using computers in environmental assessment are in fact problems that the computer can help overcome. The most widely used methods are described in more detail In the following section.

2.3.1 AD HOC METHODS

Ad hoc methods provide little, if any, formal guidance for an impact assessment. While varying considerably with the team of experts, they usually identify a broad area of impact rather than define specific parameters which should be investigated or attempt a quantitative assessment. A major advantage, however, is in their ease of use and the possibility to tailor them to the specific circumstances of a given assessment problem without the constraints of a rigid formalism. As a consequence, however, they depend very much on the background, expertise and experience of the people undertaking them. While fast, and possible to conduct with minimal effort, they do not include any assurance of completeness or comprehensiveness, they may lack consistency in the analysis due to lack of guidance and a specific formalism, and they require the identification as well as the assembly of an appropriate group of experts for each new assessment.

2.3.2 CHECKLISTS AND MATRICES

Checklists consist of a list of environmental parameters to be investigated for potential impacts. They therefore ensure complete coverage of the environmental aspects to be investigated. Checklists may or may not include guidelines about how impact-relevant parameters are to be measured, interpreted, and compared. A typical checklist might contain entries on aspects such as:

- Earth: mineral resources, construction material, soils, land form, force fields and background radiation, unique physical features;
- Water: surface (rivers, lakes and reservoirs, estuaries), coastal seas and ocean, underground; quality, temperature, recharge, snow, ice, and permafrost;
- Atmosphere: quality (gases, particles), climate (micro, macro), temperature;
- Flora: trees, shrubs, grass, crops, microflora, aquatic plants, endangered species, barriers, corridors;
- Fauna: birds, land animals including reptiles, fish and shellfish, benthic organisms, insects, microfauna, endangered species, barriers, corridors;
- Land use: wilderness and open space, wetlands, forestry, grazing, agriculture, residential, commercial, industrial, mining and quarrying; and
- Recreation: hunting, fishing, boating, swimming, camping and hiking, picnicking, resorts.

Obviously, checklists do carry a geographical and cultural bias or, if universal in intent, carry a large number of mutually exclusive categories. They are usually also implicitly oriented towards certain categories of projects, related to the history of their development. Further, their elements may be interrelated (for example, the categories of water bodies and their relevant properties in the example above) to such an extent that the linear presentation in the listing has to be interpreted as a hierarchical or even multi-dimensional system in many cases.

Fedra et al (1991) identify various sub-categories of approaches based on checklists:

- Simple checklists, consisting of a simple list of environmental parameters;
- Descriptive checklists, including guidelines on the measurement of parameters;
- Scaling checklists, including information basic to the (subjective) scaling of parameter values. Important concepts include the threshold of concern, the duration of an impact, and whether it is reversible or irreversible;
- Questionnaire checklists, containing a series of linked questions, which guide the user through the process. The possible answers are provided as multiple-choice, making the process easy to use even for less experienced persons;
- Environmental Evaluation System (EES): Checklist based, including scaling and weighting.
- Multi-attribute Utility Theory similar to the weighting method used in the EES procedure, developed by Batelle Columbus Laboratories in the USA, it is basically a decision support (weighting) method that can also be used in conjunction with other approaches to derive the impacts.

Impact matrices combine a checklist of environmental conditions likely to be affected with a list of project activities with the two lists arranged in the form of a matrix. The possible cause-effect relationships between activities and environmental features are then identified and evaluated cell by cell. Matrices can be very detailed and large. The classical Leopold matrix contains 100 by 88 cells, and is thus somewhat cumbersome to handle. As a consequence, numerous extensions and modifications have been developed for almost each practical application. In a more strategic approach, project planning matrices are used to structure and guide the assessment procedures.

2.3.3 OVERLAYS

Overlay methods use a set of physical or electronic maps of environmental characteristics and with the possible project impact overlaid upon them. These overlays are used to produce a composite of spatial characterisation of the project consequences (McHarg, 1968). Geographical information systems such as ArcView, developed by ESRI, use graphic workstations to implement overlay techniques using digital cartographic material and the more versatile logical interactions between spatial features.

2.3.4 NETWORKS AND DIAGRAMS

Networks are designed to explicitly consider higher order, i.e., secondary and even tertiary consequences in addition to the primary cause-effect relations addressed by the methods above. They consist of linked impacts including chained multiple effects and feedback.

2.3.5 COST-BENEFIT ANALYSIS

Cost-benefit analysis (CBA), in a narrow sense, is an attempt to monetise all effects for direct comparison in monetary terms. While providing a clear answer and basis for the comparison of alternatives, the monetisation of many environmental problems is sometimes extremely difficult and thus can affect the usefulness of the method considerably.

Numerous approaches to help monetise environmental criteria have been developed. Some of the more frequently used include the cost of repair, i.e., the estimated cost to restore an environmental system to its original state, or the willingness to pay, based on direct or indirect (e.g., travel cost) approaches to assess the value, for example, of park land or wilderness.

Examples of cost-benefit approaches to environmental impact assessment include the UNEP Test Model of extended cost-benefit analysis (Bisset, 1996), mainly oriented towards the natural resource base of a project. The basic format of the approach includes:

- essential project description setting the physical and economic parameters for the analysis;
- itemising resources used in the project, those indirectly affected, and residues created;
- resources exhausted, depleted, enhanced or that have deteriorated;
- required additional project components;
- formulation of the integrated cost--benefit presentation, summary and conclusions; and
- the cost--benefit analysis of natural system assessment.

2.3.6 MODELLING

Systems analysis and modelling are among the few techniques that allow consideration of multi-dimensional problems that involve multiple (and usually conflicting) objectives, multiple criteria, multiple purposes and users, as well as interest groups.

Modelling attempts to replicate a real-world situation, so as to allow experimentation with the replica in order to gain insight into the expected behaviour of the real system. Models, implemented on computers, are extremely powerful tools of analysis, though they are often demanding and complex. Modelling has been used extensively in developed countries, but its use for impact assessment in developing countries has been rather limited because of constraints on resources, especially in expertise and data.

Environmental impact assessment usually deals with rather complex problems that touch upon many disciplines, and rarely will an individual or a small group of individuals have all the necessary expertise at their disposal. The expert systems component of an EIA system can help to fill this gap and at the same time take over the role of a tutor.

2.3.7 EXPERT SYSTEMS FOR EIA

Expert systems, an emerging technology in information processing and decision support, are becoming increasingly useful tools in numerous application areas. Expert systems are man-machine systems that perform problem-solving tasks in a specific domain. They use rules, heuristics, and

techniques such as first-order logic or semantic networks, to represent knowledge, together with inference mechanisms, in order to derive or deduce conclusions from stored and user-supplied information.

Application- and problem-oriented systems, rather than methodology-oriented ones, are more often than not hybrid or embedded. Elements of artificial intelligence (AI) technology, and expert systems technology in particular, are combined with the more classical techniques of information processing as well as the approaches used in operations research and systems analysis. Here traditional numerical data processing is supplemented by symbolic elements, rules and heuristics, in the various forms of knowledge representation.

Expert systems, or Knowledge Based Systems, are a loosely defined class of computer software within the more general area of AI, that go beyond the traditional procedural, algorithmic, numerical, and mathematical representations or models, in that they contain largely empirical knowledge, for example, in the form of rules or heuristics, and inference mechanisms for utilising this form of information to derive results by logical operations. They are fashioned along the lines of how an expert would go about solving a problem, and are designed to provide expert advice. Like any other model, they are sometimes extreme simplifications and caricatures of the real thing, i.e., the human expert. An expert system must perform at a level comparable to that of a human expert in a non-trivial problem domain.

Artificial Intelligence and expert systems technology are certainly an intriguing new development in computer science that hold great promise for better applications. However, like any other method, they do not offer universal solutions and need a thorough understanding of their requirements and limitations for proper use.

2.4 CONCLUSION

Of the above systems and methods used, the checklist system is deemed to be the most relevant method for this study as it provides for:

- the use of available data;
- ease of transfer of data from and to other methods like overlay maps; and
- ease of transfer from manual methods to computer systems.

The following section investigates the South African Environmental Legislation that would be applicable to local government.

3 SOUTH AFRICAN ENVIRONMENTAL LEGISLATION FRAMEWORK

As the implementation of environmental legislation at local government level is dependant on the framework of legislation set at higher levels of government, it is necessary to investigate Environmental legislation at different levels of government influence. The nature and framework of environmental legislation in South Africa is underpinned by four main components, namely:

- International commitments (conventions and agreements);
- the Constitution (Act No 108 of 1996);
- the Environmental Conservation Act (Act 73 of 1987); and
- Environmental policy initiatives such as the White Paper on Environmental Management of 15 May 1998.

3.1 INTERNATIONAL COMMITMENTS

Chapter 6 (International Obligations and Agreements) of the National Environmental Bill sets out a procedure for giving effect to international agreements to which the Republic is a party. The procedure includes, where necessary, the enactment of an agreement into law by national legislation.

Subject to the provisions of the Constitution, the Minister may after consultation with relevant government departments, participate in international environmental meetings on instruments and matters related thereto. He may after consultation with the Department of Foreign Affairs and other relevant government departments, authorise other persons to participate in meetings concerning international environmental instruments as part of the government delegation.

Where the Republic is not a party to an international environmental instrument, the Minister may make a recommendation to Cabinet and Parliament regarding accession to an international environmental instrument, which shall deal with the following:

- available resources to ensure implementation;
- views of interested and affected parties;
- benefits to the Republic;
- disadvantages to the Republic;
- the estimated date when the instrument is to come into effect;
- the estimated date when the instrument will become binding on the Republic;
- the minimum number of states required to sign the instrument in order for it to come into effect;
- the respective responsibilities of all government departments involved;
- reservations to be made, if any; and
- any other matter which in the opinion of the Minister is relevant.

Where the Republic is a party to an international environmental instrument the Minister shall, after compliance with the procedures set out in section 231(2) and (3) of the Constitution, publish the provisions of the international environmental instrument in the Gazette and any amendment or addition to such instrument. The Minister may also make such regulations as may be necessary for giving effect to an international environmental instrument to which the Republic is a party regarding:-

- the co-ordination of the implementation of the instrument;
- the allocation of responsibilities in terms of the instrument, including those of other organs of state;
- the gathering of information, including for the purposes of compiling and updating reports required in terms of the instrument and for submission to Parliament;
- the dissemination of information related to the instrument and reports from international meetings;
- initiatives and steps regarding research, education, training, awareness raising and capacity building;
- ensuring public participation;
- implementation of and compliance with the provisions of the instrument, including the creation of offences where applicable; and
- any other matter necessary to give effect to the instrument.

This chapter also applies to any international environmental instrument whether the Republic became a party to it before or after the coming into force of this Act. All local development is subject to the International agreements of Government and as such relevant International Commitments should be taken into account when evaluating local development. A summary of International Conventions and Agreements on Environmental Issues and the roles of Provinces in the enactment thereof are attached in Annexure A.

Those agreements that might need consideration within the field of urban development are extracted from the general summary and noted in chapter 5 of this study.

3.2 CONSTITUTION

The Constitution as the supreme source of law in South Africa provides a baseline for environmental regulations in that all policies and laws must be drafted in accordance with its provisions. Four of the rights contained in the Bill of Rights are of importance for the purpose of this study. These are the environmental right, property rights, the *locus standi* clause and the access to information clause. The clauses on Co-operative Government must also be noted as it formalises the devolution of enactment of Environmental Legislation.

3.2.1 THE "ENVIRONMENTAL RIGHT"

A key human right that is enshrined within the Bill of Rights of South Africa's Constitution is the so-called "environmental right".

It states that: "24. Everyone has the right -

(a) to an environment that is not harmful to their health and well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

Part (a) of this clause grants a substantive environmental right ensuring that legislation which is potentially harmful or which may have harmful environmental consequences can be repealed. This clearly has important implications with regard to conserving biodiversity, and minimising adverse environmental impacts.

Part (b) is less clear, in that it represents more of a directive principle than a right, and in many ways underscores the status quo. Although it imposes a positive obligation on the state to pass legislation which supports environmental protection, an individual would not be able to use the clause to claim any rights. Thus, while supportive of the objectives of the policies articulated in this document, the clause is limited.

The Constitution further provides everyone the right to an environment that is not harmful to a person's health and well-being in Section 24(a) and in Section 24 (b) to have the environment protected through reasonable legislative and other measures. The implementation of sections 21, 22 and 26 of the Environment Conservation Act, 1989 is such a legislative measure to protect the environment.

Section 36 places a "limitation" on all the rights in the Bill of Rights as it measures such individual rights against the greater democratic society based on dignity, equality and freedom.

3.2.2 PROPERTY RIGHTS

The recognition of property rights has been a historical cornerstone of South African common law, and has recently found expression in the Bill of Rights of the Constitution. Because much of South Africa's biodiversity falls within private ownership, it is crucial to consider the property clause of the Bill of Rights.

Section 25 provides for these property rights. The Constitution makes provision for both property rights and the right to a healthy environment. A situation may arise in extreme cases where there is a conflict due to rejecting an application for a listed activity from taking place. In such cases it will be up to the court to decide whether the interest of the community (right to a healthy environment) weighs heavier than the right of the individual.

Historically, under South African common law, the state has had authority to regulate and control the manner in which any property, including biological resources, is conserved and exploited. The property clause of the Bill of Rights reinforces this common law position, but provides that no-one may be "deprived" of property unless this is in terms of a law of general application and is not arbitrary. The section further stipulates that compensation is only payable if there is expropriation, and does not refer to the situation where there is only deprivation. This implies that the state through legislation is

empowered to introduce regulations on properties to achieve the conservation and sustainable use of biodiversity.

3.2.3 LOCUS STANDI

Section 8(2) of the "Bill of Rights" provides locus standi or the "right to get involved" to any member of the public. This means that any member of the public has the right to take appropriate action to prevent environmental damage. This may include taking action against the relevant authority for failing to perform its duties in preventing environmental damage or an individual or authority who is in the process of undertaking listed activities in terms of section 21 of the Environment Conservation Act, 1989, without the necessary authorisation to undertake such activities.

3.2.4 ACCESS TO INFORMATION

Section 32 provides the right to access information. The lack of information is one of the major obstacles in environmental impact management. Provision has been made in the regulations in terms of section 26 of the Environment Conservation Act, 1989 that any report submitted becomes a public document.

3.2.5 CO-OPERATIVE GOVERNMENT

Section 41 of the Constitution provides principles for co-operative governance and intergovernmental relations. The Constitution allocates legislative authority as well as executive and administrative powers to all three levels of government. The functional areas of government are determined by Schedules 4 and 5. The environment is a cross-sectoral matter and it is therefore important that co-operation between government on all levels is necessary. While Section 100 provides for national government to intervene should a province not fulfil its obligations with regard to an environmental function, Section 125 provides for the executive authority of Provinces and inter alia for implementing national legislation within the functional areas listed in Schedule 4 and 5.

Section 126 provides for Provinces to assign any power or function to local governments, and in terms of Section 139 provincial government are to intervene should a local government not fulfil its obligations with regard to an environmental function.

Should there be conflict between national and provincial legislation falling within the functional area listed in Schedule 4 of the Constitution, Section 146 provides for national legislation to prevail over provincial legislation under specific conditions while Schedule 4 provides for the concurrent competence of functional areas such as the environment, pollution control, regional planning and development as well as soil conservation.

As the Constitution states clearly that "This Constitution is the supreme law of the Republic; law or conduct inconsistent with it is invalid, and obligations imposed by it must be fulfilled", all sections thereof should be used as a measurement of performance and behaviour towards the public when administering EIA regulations or *administrative decision-making may result in actions that render the*

environment harmful to human health or well being" (Gauteng Department of Agriculture, Conservation and Environment, 1999, p3).

3.3 ENVIRONMENT CONSERVATION ACT, 1989

South Africa has a substantial body of law regulating the conservation and use of biodiversity. However, as is the case for several other areas of environmental policy, environmental conservation cuts across many diverse sectors and areas of public administration. The result is an extremely high degree of fragmentation, with legislation being spread across many different departments, at both national and provincial levels. Exacerbating the problem is the lack of national norms and standards from which legislation can be harmonised.

Also of concern is the fact that legislation is often conflicting, a problem heightened by the fact that a number of the government departments responsible for enforcing compliance with environmental regulations are also charged with promoting the activities that they are supposed to regulate. This situation has resulted in many calling for national norms and standards to be set and regulated outside of the department promoting the activity. Various mechanisms have been suggested to accomplish this, including the establishment of an independent inspectorate. Critical is the need to obtain clarity on the roles and responsibilities of different government agencies. Such clarity will be forthcoming from the general national environmental policy.

Part III of the Act provides for the declaration of a protected natural environment and special nature reserves in sections 16 to 18, while Part V section 23 provides for the declaration of limited development areas. The protection of any of these may by default rest on the local authority in terms of the general provisions in Part VIII of the Act.

3.3.1 LEGAL CONTEXT FOR ENVIRONMENTAL ASSESSMENT

Part V of the Environment Conservation Act, No 73 of 1989 provides for the "Control of Activities Which May Have Detrimental Effect on the Environment". Under this Part the following section of the Act are very important for the comprehension of control measures and procedures:

- Section 21 empowers the Minister of Environmental Affairs and Tourism: to identify (by notice in the *Gazette)* those activities, which in his opinion, may have a substantial detrimental effect on the environment. Furthermore, this section lists the categories of activities, which the Minister may identify.; and
- Section 22 prohibits the activities identified in terms of section 21 from being undertaken without the written authorisation of the environmental aspects and issues.

The provisions in section 21, 22 and 26 of the Act have the following objectives:

- to promote sustainable development, thereby achieving and maintaining an environment which is not harmful to people's health or well-being;
- to ensure that the environmental effects of activities are taken into consideration before decisions in this regard are taken;

- to ensure that identified activities which are undertaken do not have a substantial detrimental effect on the environment; and
- to prohibit those activities that will;
- to ensure public involvement in the undertaking of identified activities; and
- to regulate the process and reports required to enable the Minister or his designated competent authority to make informed decisions on activities.

This legislative process should be applied as early in the proposed activity's planning stages as practicable and before irrevocable decisions can be made and to ensure that environmental considerations are pro-actively incorporated into decisions taken. Applicants are accountable for the potential impacts of activities being undertaken as well as managing these impacts. Decision-makers are accountable for decisions taken with regard to authorising identified activities. The principle of open and participatory approach will only be realised if the public is involved in decisions taken with regard to the undertaking of identified activities.

Although a substantial amount of environmental legislation is in place in South Africa, poor enforcement renders much of it ineffectual. Compounding the problem are the often inappropriate penalties imposed for infringing legislation, and the lack of capacity within government agencies to monitor infringements. These constraints have serious implications for the effective implementation of the policies articulated in this document.

In fulfilling his obligation towards the effective implementation of the EIA Regulations the Minister of Environmental Affairs and Tourism from time to time issues amendments to regulations in terms of the Act.

3.4 RECENT ENVIRONMENTAL IMPACT ASSESSMENT LEGISLATION

To give effect to his powers in terms of Sections 21, 22, 26 and 28 of the Act, the Minister promulgated Government Notices R.1182, R.1183 .and R.1184 in Government Gazette No 18261 of 5 September 1997. The salient provisions of these regulations are summarised in the following paragraphs.

The activities requiring Environmental Impact Assessments (EIAs) are further described in the *EIA Regulations Guideline Manual* produced by the Department of Environment and Tourism (DEAT).

3.4.1 GOVERNMENT NOTICE R.1182

These regulations promulgated in terms of Section 21 of the Act, list the activities which are subject to the consideration and authorisation requirements of Section 22 of the Act. The activities are contained in Schedule 1 of the regulations while Schedule 2 contains the date of commencement for the regulations taking effect with regard to the different activities. For this study all the listed activities are deemed to be subject to the Regulations.

SCHEDULE 1

1. The construction or upgrading of -

(a) facilities for commercial electricity generation and supply;

(b) nuclear reactors and installations for the production, enrichment, reprocessing and disposal of nuclear fuels and wastes;

(c) transportation routes and structures, and manufacturing, storage, handling or processing facilities for any substance which is dangerous or hazardous and is controlled by national legislation;

(d) roads, railways, airfields and associated structures outside the borders of town planning schemes;

(e) marinas, harbours and all structures below the high-water mark of the sea;

(f) cableways and associated structures;

(g) structures associated with communication networks, other than telecommunication lines and cables, as well as access roads leading to these structures;

(h) racing tracks for motor-powered vehicles and horse racing, excluding indoor tracks;

(i) canals and channels, including diversions of the normal flow of water in a river bed and water transfer schemes between water catchments and impoundment;

(j) dams, levees or weirs affecting the flow of a river;

(k) reservoirs for public water supply;

(l) schemes for the abstraction or utilisation of ground or surface water for bulk supply purposes;

(m) public and private resorts and associated infrastructure;

(n) sewage treatment plants and associated infrastructure; and

(o) buildings and structures for industrial and military manufacturing and storage of explosives or ammunition or for testing or disposal of such explosives or ammunition.

2. The change of land use from-

(a) residential use to industrial or commercial use;

(b) light industrial use to heavy industrial use;

(c) agricultural or undetermined use to any other land use;

(d) use for grazing to any other form of agricultural use; and

(e) use for nature conservation or zoned open space to any other land use

3. The concentration of livestock in a confined structure for the purpose of mass commercial production.

4. The intensive husbandry of, or importation of, any plant or animal that has been declared a weed or an invasive alien species.

5. The release of any organism outside its natural area of distribution that is to be used for biological pest control.

6. The genetic modification of any organism with the purpose of fundamentally changing the inherent characteristics of that organism.

7. The reclamation of land below the high-water mark of the sea and in inland water including wetlands.

8. The disposal of waste in terms of section 20 of the Environment Conservation Act, 1989.

9. Scheduled processes listed in the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965).

3.4.2 GOVERNMENT NOTICE R.1183

The Minister of Environmental Affairs and Tourism promulgated this set of regulations in terms of Sections 26 and 28 of the Act. They spell out the processes, requirements and administrative demands of Environmental Impact Reports regarding the activities listed under GN R.1182 above. The most important points under these regulations are summarised in Table 1 below:

Table 1: Section 26 & 28 Regulations

Regulation	Description
Reg... 1:	Definitions
Reg... 2:	Application of regulations
Reg... 3:	Responsibilities in terms of regulations: The responsibilities of applicants, consultants, authorities and interested parties are defined.
Reg.. 4:	Application for authorisation to undertake activity. The administrative rules for an application and the designation of authorities to consider the applications are defined under this regulation.
Reg.. 5	Plan of study for scoping: The regulation specifies the requirements for and contents of a scoping study plan,
Reg.. 6:	Scoping report. The administration, requirements for and contents of the scoping report are specified.
Reg. 7:	Plan of study for environmental impact assessment (EIA). This regulation spells out the requirements for and administrative processes involved in the compilation of an EIA study plan prior to undertaking an EIA.
Reg. 8:	Submission of environmental impact report (EIR): The regulation defines the requirements for an EIA and the process for submission of such an EIR.
Reg. 9:	Consideration of application: Powers of the authority to make decisions.
Reg. 10:	Record of decision: The regulation specifies the requirements for the record of decision after the authority has considered the application and has decided on it.
Reg. 11:	Manner of appeal: The process for appeals in terms of Section 35(3) of the Act is provided for.
Reg. I2:	Access to information
Reg. 13:	Commencement (see Schedule 2 of GN R.1182).

3.4.3 GOVERNMENT NOTICE R.1184:

This Government Notice designates the competent authority (the province) as the government institution which has the power to issue authorisations for undertaking activities listed under GN R.1182.

3.4.4 INSTITUTIONAL CONTEXT

The Department of Environmental Affairs and Tourism (DEAT) is the lead agent for all matters pertaining to EIA's and EIR's in terms of the Environment Conservation Act, No 73 of 1989. Gauteng Province may only act under powers delegated to it in terms of this Act.

Thus the implementation of Government Notices R.1182 and R.1183 (above) has been delegated to the province under GN R.1184, except for certain instances where, logically, the DEAT must retain the overall authority as explained above.

In fulfilling its obligations towards the implementation of the EIA regulations the provincial department, responsible for such implementation, must recognise the important jurisdictional roles and responsibilities of other governmental institutions in the environmental management field. These potential role players are the following:

- National Departments such as Water Affairs and Forestry, Environmental Affairs and Tourism, Minerals and Energy, Agriculture. Housing, etc.;
- provincial departments such as Roads, Planning, Agriculture, Housing, etc.;
- Directorates of the Department Agriculture & Nature Conservation; and
- Local Authorities designated by the Minister of Environmental Affairs and Tourism in terms of Section 22(1) of the Environment Conservation Act No 73 of 1998.

These authorities, as indicated in figure 4, should be involved and be consulted in all the decision making processes regarding the implementation of the EIA regulations if the relevant proposal for development falls within their spheres of responsibilities,

3.5 IMPLEMENTATION OF EIA REGULATIONS

Environmental impact management should play a more significant role in all spheres of society. As determined in Schedule 4 of the Constitution of South Africa, 1996, the environment is a concurrent function of the relevant national and provincial departments. For the national and provincial environmental departments, a major role is inter alia to set specific regulatory norms and standards for impact management and to ensure that individuals and organisations meet these.

Draft legislation for implementing compulsory environmental impact assessments (EIAs) in South Africa was published for comment on 1 November 1996. A participatory process to finalise this draft legislation for promulgation has been completed. Comprehensive comments have been received from interested parties and various workshops have been held in order to address the issues and concerns raised in this regard. A Comments and Response Report has been published and is available on request. One of the major recommendations was that a Guideline Document be published to provide the various role players with a uniform basis for implementing sections 21, 22 and 26 of the Environment Conservation Act, 1989.

The regulations for conducting compulsory environmental impact assessments (EIAs) cover both product and process. Certain reports are required and there is a process which will ensure that the reports on which decisions will be based cover the most significant issues.

COMMON GOAL

The implementation will be simplified if each participant adheres to their responsibilities, as set out in the guideline document provided by the Department of Environmental Affairs and Tourism. The purpose is overall to ensure sustainable, environmentally sensitive development. The regulations, as well as the accompanying guidelines, have therefore been designed to assist all parties concerned with the environment in achieving this common purpose and goal.

3.6 CONCLUSION

The legislative requirements can be seen to filter down through the different tiers of government, for example all development is subject to the requirements set by International Conventions and Agreements while only some development will be affected by National legislation.

The same "delegation" of compliance exists between Provincial and Local Government as illustrated in figure 4. Some International conventions and agreements like the Law of the Sea Convention has got minimal influence over inland Provinces and by implication on Local Government in these provinces as well. Only the Conventions and Agreements with direct compliance implications are thus of interest for this study. The delegation also implies that no Bylaws may contravene Provincial and National legislation.

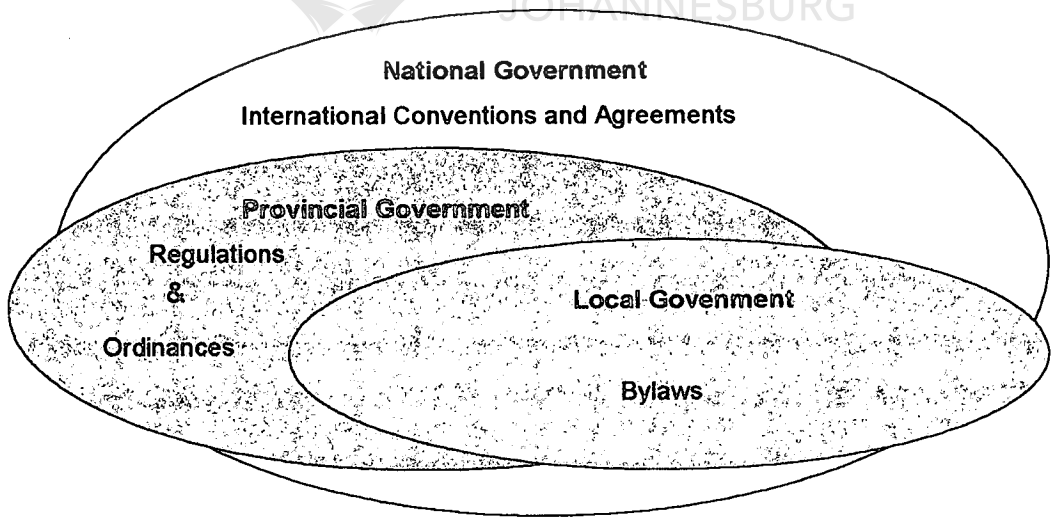

Figure 4: Legislative delegation of compliance.

This concludes the establishment of the legislative requirements for an EIA. Before discussing the specific information requirements it is necessary to look at the study area and the proposed Urban Development Plan for Florida Lake in more detail.

4 GREATER FLORIDA LAKE URBAN DEVELOPMENT PLAN

Historically the township of Florida emerged from the mining camps established when gold was discovered on the Witwatersrand. There are a number of historic structures in the Florida area including the Government Block as well as a number of privately owned houses. The township of Meadowlands, located south of the mining belt, established prior to 1965 during the apartheid era as a black township under the old Group Areas Act, has been incorporated into the Western Metropolitan Local Council after the 1994 elections as part of the Greater Johannesburg Metropolitan Council.

4.1 THE GREATER FLORIDA LAKE DEVELOPMENT AREA

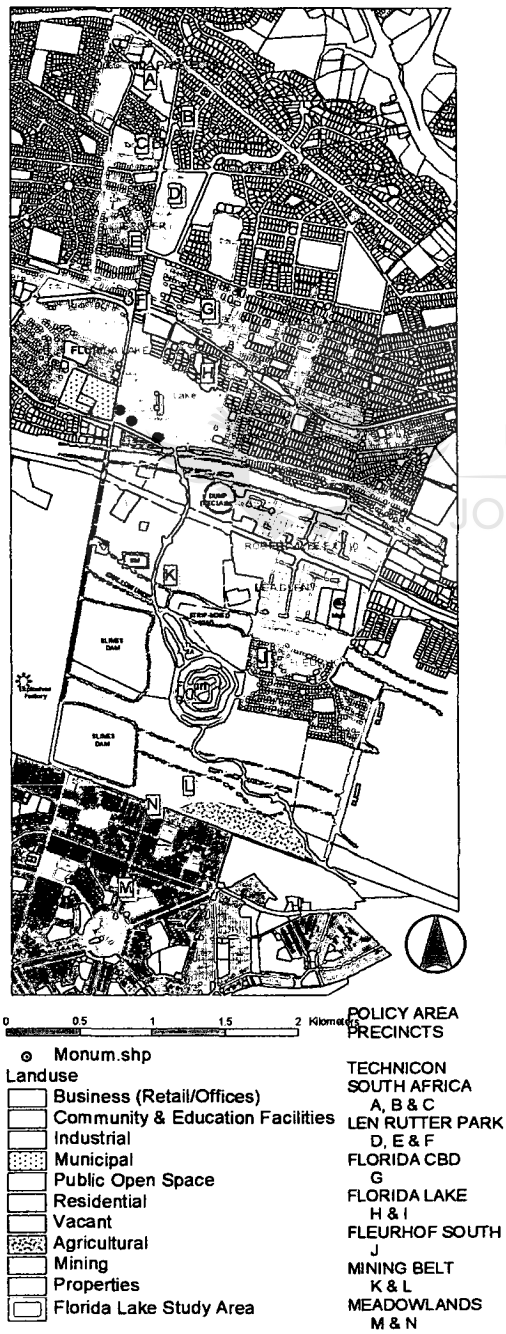

Figure 5: The Florida Lake Urban Development Plan (also displayed in an enlarged format on the back fold out page)

The study area of the Greater Florida Water based UDP, as indicated on figure 5, stretches from Meadowlands in the south to Ontdekkers Road in the north and includes the urban environments around Florida Lake and Fleurhof Dam.

The northern boundary of the study area is formed by one of the major east-west metropolitan arterial routes, being Ontdekkers Road. The eastern and western boundaries are located along major transportation routes, or where such routes are absent, incorporate significant economic development or potential for such development such as the area surrounding the existing WMLC Civic Centre. Southwards the eastern and western boundaries are determined by existing physical constraints. In both instances these constraints being mining related.

The southern boundary of the study area only incorporates a portion of Meadowlands and in particular Heckroodt Circle and the urban area to the north thereof. In this instance it should be noted that the inclusion of this portion of Meadowlands is primarily to establish an area of overlap with a parallel process, the Dobsonville/ Meadowlands UDP Initiative,

also being undertaken by the WMLC. This specific area will be addressed in greater detail through the Dobsonville/Meadowlands Initiative and the inclusion thereof into the Greater Florida Lake study area is for co-ordination purposes and to focus on the economic and environmental corridor as identified through the Land Development Objectives (LDO) process.

The demarcation of the study area focused on a number of criteria and these include the following:

- Location of existing nodal points, where each nodal point would consist of a zone with the highest intensity of urban development and sphere of influence;
- Population concentration patterns where existing and future population settlement patterns not only exert pressure on urban development and associated physical infrastructure, but also require employment opportunities, consumer goods and services;
- Transport infrastructure which include existing and potential transportation infrastructure providing for accessibility and mobility in a widest possible sense and should become one of the corner stones of urban development;
- Economic linkages being the nature and extent of the flow of goods, services and employment between nodal points and which determine the level of linkages that exist between geographical areas, population concentrations and centres of economic activity; and
- Physical constraints which includes the slimes dams on the mining land and provide for physical barriers in terms of the future development of an area.

A Status Quo Report was completed in Phase 1 of this project by consultants and relevant information was extracted therefrom as needed. The status quo information presented highlights the major characteristics of the study area.

Eight functional areas were identified for planning purposes. These areas as indicated in figure 5, each display a very distinctive character. The following table (Table 2) describes each of these areas' character and future development potential.

Table 2: Functional Areas

FUNCTIONAL AREA	CHARACTER	USES
MEADOWLANDS PRECINCT	This is the specific focus of a separate initiative. Proposals to be linked to this project. Mixed use area along Westlake Extension link with Heckroodt Circle.	Establishment of transportation network, identification of economic nodes and corridors, social and recreational facilities, redevelopment and infill. Upgrading also to be considered.
MINING LAND PRECINCT	Urban Spine along the proposed Westlake Extension and economic activity along Main Reef Road similar to the existing development which is combined with and supplemented by recreational uses. Extension of the Florida Lake activities southwards.	Residential, retail (formal and informal), mixed uses, recreation, sports (enlarge the Fleurhof dam to accommodate international water sport activities), urban farming, theme parks, entertainment, markets, Council depot, education, cultural, fish farming.

FUNCTIONAL AREA	CHARACTER	USES
FLEURHOF PRECINCT	Residential and all the related uses.	Alternative housing forms with an increase in density from Fleurhof southwards towards Meadowlands and the integration of such development. Complement the Fleurhof environment and Dam with recreational uses.
FLORIDA LAKE PRECINCT	**The HUB of activity** "Natural waterfront development". Entertainment area for the south, attracting people on a regional basis, variety and speciality.	Optimise the existing retail, offices, hotels, conference facilities, recreation, mixed uses, theme parks, festival site (Jhb pops, jazz), residential, movement (existing train to be upgraded), child minding, entertainment (incl. movies), cycling/ running tracks, restaurants, cultural facilities, marina, showrooms, parking facilities. Security needs to be addressed. NOT A MALL!
FLORIDA CBD PRECINCT	CBD functions to be retained and upgrading encouraged.	All business type uses.
BIRD SANCTUARY PRECINCT	Publicly accessible bird sanctuary with a "natural" (green) link with the Florida Lake Precinct.	Sanctuary, environmentally compatibly restaurants, environmental education centre, low intensity residential, exhibition centre, fish holding.
LEN RUTTER PARK PRECINCT	Transition from the TSA Precinct to the Florida Lake Precinct. Activate the edge of the green space. Combine residential and low key employment uses with a focus on its relationship with the green space.	Medium density residential, offices, recreation (secondary to Florida Lake). Open space to be actively used. Relocation of Council lapa's.
TECHNIKON SA PRECINCT	Office park environment with a strong focus on the educational (TSA) components. In all of this the green space needs to be incorporated and integrated.	Offices and tertiary education with retail, entertainment (restaurants) and residential (integrated with office uses/staff housing for Technikon SA) uses as supporting functions.

Extracted from Van der Merwe, 1998

The proposed land use changes would be accommodated within the normal process of rezoning available land to enable the proposed development to take place. Rezoning proposals are circulated to various departments for comment on services and infrastructure that might need to be upgraded.

The measurement of requirements for upgrading of services and infrastructure is done with an informal development impact assessment by the Local Council. This study would also identify the environmental information from the EIA process that can be integrated with the development impact assessment process with specific reference to the Greater Florida lake Development Area.

From the analysis, draft development and design concepts and the comments received from stakeholders and interested parties an Urban Development Plan (UDP) was formulated during a technical workshop held on 2 June 1998. This UDP consists of a plan, development controls and design guidelines. The Greater Florida Water based UDP is reflected in figure 5 (see back fold out page also) and indicates the proposed zoning of land within the UDP area.

4.2 UDP VISION, GOALS AND OBJECTIVES

The basic point of departure in the formulation of the vision, goals and objectives for the Greater Florida Water based Development Project has been the guiding principles which have been set out in Chapter 1 (Section 3) of the Development Facilitation Act, 1995.

Phase 1 of the planning process entailed the identification of issues, opportunities and constraints affecting the development potential of the Greater Florida Lake area. Issues identified will be investigated in the policy and action planning phases and this will result in the formulation of policies and action projects to secure and enhance the identified structuring elements, as well as the policies and actions promoting the generation of complementary built and natural environments.

The overall vision of the proposed development plan has been summarised by Van Der Merwe (1998, p. 15) as follows: to provide "a vibrant, sustainable and accessible economic, cultural and recreational hub, where living and employment opportunities can be fostered and generated and the natural and built environment and the developable land be optimised to the benefit of the WMLC and the communities at large" .

The project goals and objectives as listed in Annexure B were translated into development controls and design guidelines.

4.3 ZONING, DEVELOPMENT CONTROL MECHANISMS AND POLICY

The zonings, development control mechanisms and policies in respect of the Greater Florida UDP were also formulated during the series of technical workshops held from 2 June 1998 to 11 June 1998. The zoning for properties were established as a first step after which development controls and policy statements were developed. These zonings were based on the original development options which were prepared and commented on by the community, the comments and input submitted by the community and general principles of town planning and urban dynamics. The aim was always to establish the most appropriate and ideal use for which land should be utilised while taking cognisance of the surrounding areas, environmental impact and future traffic generation. In all instances the zonings, development controls and policy statements have been done on the basis of the functional areas as identified in the analysis as indicated on figure 5. Area specific zoning, development controls and additional requirements are summarised in Annexure C.

4.4 DESIGN CRITERIA

The vision for this area is that it should be an area dominated by fauna and flora and the waterway. All developments linked to or visible from this area should therefore respond to this vision in design and character.

The landscaping should enhance local bird and other animal live and only indigenous trees, plants and ground covers should be planted. Drainage of sites should be done in such away that normal runoffs will be maintained as much as possible and concentrations be avoided. The development

must therefore also be sustainable with the minimum of impact on the environment and future maintenance cost or burden to the taxpayer should be minimised.

The general character and existing uses is that of low-rise (1 to 3 storeys) developments that dominates this area with the Civic Centre and Technikon as exceptions. The uses should be predominantly residential with low impact small businesses in generous recreation and public open spaces as is currently typical of the area in general.

These design guidelines were translated into more specific design guidelines and the UDP area were thus divided into different nodes according to the prevailing characteristics of each node and criteria relates to these areas marked A to N on figure 5.

4.5 DESIGN GUIDELINES

The design guidelines that have been formulated were based on the following principles:

- to maximise the economic potential while enhancing the natural and architectural appeal of the study area;
- manage and protect natural assets while facilitating development;
- maximise the recreational potential of various nodes in an economically and environmentally sustainable manner;
- reinforce the waterways and the adjoining road system so as to form a strong north-south axis;
- create a series of mixed use nodes which integrate northern and southern areas spatially, economically and socially; and to
- provide opportunities for architecturally interesting developments which are people-friendly.

In addition a number of environmental principles were taken into consideration to formulate design guidelines related to landscaping and in particular the water course development. These principles that would be adhered to are the following:

- storm water attenuation should be achieved by a series of dams within the water course;
- siltation is to be alleviated through the use of silt traps, etc.;
- litter, which is a solid waste management function needs to be captured through traps for cleaning purposes;
- the ecological advantages of the area need to be reinforced by creating a more biodiverse environment;
- the aesthetic value of the area need to be enhanced through the use of high quality landscaping and particularly with the use of indigenous flora;
- a cleaning effect of the water could be established with the use of wetlands through which pollutants are removed from the water and water thereby purified;
- the recreational value of the area need to be considered particularly over the weekends with an emphasis on outdoor activities, educational activities and recreation, both passive and active over weekends; and
- from an aesthetic and security point of view, visibility of the open space is vital.

In order to sustain an environmentally sound water based development initiative it is further important to ensure that the water quality and quantity of the Florida Lake, Fleurhof dam and the upper catchment areas be of a very high standard. In order to maintain this long term objective the following activities will be initiated by the Council in the short term (Phase I):

- collection and synthesis of data, information and reports on the two water bodies and their catchment;
- limited survey of the dams to collect chemical and micro-biological water quality and sediment data to determine spatial differences. This will also be used for comparisons against existing water quality objectives. Analyses of the samples will be done at Cydna Laboratories.;
- limited survey of the catchment to identify the main sources of inflow into the two water bodies and the key features of the catchment which influence runoff water quality;
- survey of the wetlands upstream and downstream of the two water bodies to identify the key elements controlling the functioning of these wetlands;
- assess the current water bird population and suitability of the habitat with specific reference to the role of wetlands in attracting water birds;
- brief overview of the hydrological functioning of the catchment to determine mean runoffs and retention times on the two water bodies;
- design a baseline water quality monitoring programme to collect baseline data for one winter and summer season; and
- identification and prioritisation of feasible in-lake and catchment management strategies to address short, medium and long term objectives for the lakes.

At the end of Phase 1 the following objectives with regard to the water quality assessment of the Florida Lake, Fleurhof dam and its catchments would have been achieved:

- knowledge of the water quality problems associated with the water bodies;
- knowledge of the key driving forces that control the freshwater ecosystem;
- baseline monitoring plan in place to collect data over at least one season; and
- a prioritised list of in lake and catchment management strategies which can be implemented to address short, medium and long term management objectives.

The specific design guidelines for the future development of the study area are aimed at harmonising future development with the environment in which it will be set and to effect existing developments in a positive manner. These design guidelines are discussed in the following sections.

4.5.1 SITE DEVELOPMENT

Transport facilities and infrastructure are to be limited to the perimeter of the site as far as possible. Drainage of these surfaces are not to concentrate storm water into neighbouring properties but rather to feed some sort of irrigation system. Parking surfaces should have an engineered drainage system and no tarmac or large paved areas will be allowed. Landscaping will take in consideration all passive design principles related to the site itself as well as any neighbouring site.

4.5.2 BUILDINGS

More specific guidelines were set to minimise the visual impact of buildings in the UDP area. No building will be closer to any side boundary than the height of the facade facing such boundary and all natural building materials will be acceptable including clay bricks, off-shutter concrete and natural or tinted plaster (not painted). Paint will be limited on building elements such as doors, windows and structural elements. No I.B.R cladding will be allowed and roofs are to be pitched roofs with a minimum of 45 deg pitch with natural slate, thatch, tiles or shingles covering. Corrugated iron will only be allowed in barrel-vault form and either factory painted or corten steel. All colours to be natural, earthy hues. Building mass are to be limited by the application of the following formula:

- no roof, measured on plan, will exceed 100% of the largest elevation surface area of such building for 3-storey buildings , 150% for 2-storey and 200% for single storey.

4.5.3 LANDSCAPING GUIDELINES

The following landscaping guidelines were set:

- 15% of the site are to be landscaped with indigenous flora especially with development occurring along the water course;
- a recognised landscape architect must involved with the design proposals; and
- the developer to be kept responsible for the planting of indigenous trees along side walks.

4.6 CONCLUSION

This UDP is aimed at providing a guide for the future development of the Greater Florida Water based area. In this respect the local authority will not play the role of the developer, but that of facilitator. It is furthermore envisaged that a number of specific areas will be identified where the local authority can intervene and play an active role in facilitating development. These areas of development will be treated as individual projects or initiatives and each will be subject to separate processes.

The idea of the Greater Florida UDP is thus to create an integrated plan which incorporates the economic, environmental, land use and infrastructure components to reach an equitable balance in the development of the area. In addition the following critical development issues have been considered:

- the spatially distorted pattern of socio-economic development;
- the rapid rate of urbanisation and population growth and the associated demand for land for residential and economic development; and
- using the mining land as an opportunity for social and spatial integration.

The legislative requirements for an EIA has now been established and the study area has been described at the hand of the UDP process and outcome. Before establishing the site specific information and responsibilities it is necessary to establish the environmental information that would be needed to assess an EIA.

5 ENVIRONMENTAL INFORMATION CHECKLIST

As concluded at the end of chapter 2, the checklist is deemed to be the most appropriate method for an EIA in this study. The Department of Environmental Affairs (1992) provided a comprehensive checklist as part of its guideline document series. This Environmental Aspects Checklist is deemed to be adequate for the establishment of a base line for information requirements for this study.

This checklist identifies information requirements of environmental characteristics which may potentially be affected by development actions, or which could place significant constraints on a proposed development. It should be noted that the effect a development could have on an environmental attribute may be either positive or negative. The main environmental aspects are listed in figure 6 while a more comprehensive Environmental Aspects Checklist can be referred to in Annexure D.

Although it is stated that the checklist has endeavoured to include the major characteristics and linkages which should be considered by the environmental analyst or planner (Department of Environmental Affairs, 1992), it is not exhaustive and it cautions that the user should be aware that other characteristics, significant to a particular situation, may occur where assistance of experts may be required to assess certain potential impacts and to identify unlisted characteristics which may be affected in specific cases. The cumulative effects should also always be borne in mind.

The checklist also serves as a reminder to take all aspects into consideration for an

CHECKLIST FRAMEWORK

PHYSICAL CHARACTERISTICS OF THE SITE AND ITS SURROUNDINGS

- ☐ Land
- ☐ Freshwater systems
- ☐ Marine and estuarine systems
- ☐ Climate

ECOLOGICAL CHARACTERISTICS OF THE SITE AND ITS SURROUNDINGS

- ☐ Vegetation
- ☐ Animals
- ☐ Natural and semi-natural communities

CURRENT AND POTENTIAL LAND USE AND LANDSCAPE CHARACTER

- ☐ General considerations applicable to all development proposals
- ☐ Urban open space, protected and recreational areas
- ☐ Residential areas
- ☐ Commercial areas
- ☐ Industrial areas
- ☐ Agricultural and sylvicultutal areas

CULTURAL RESOURCES

- ☐ Sites and resources

SOCIO-ECONOMIC CHARACTERISTICS OF THE AFFECTED PUBLIC

- ☐ Demographic aspects
- ☐ Economic and employment status of the affected social groups
- ☐ Welfare profile
- ☐ Health profile
- ☐ Cultural profile

INFRASTRUCTURE SERVICES

- ☐ Energy supply
- ☐ Water
- ☐ Waste management
- ☐ Transport networks
- ☐ Education
- ☐ Housing
- ☐ Telecommunication
- ☐ Financial implications to region

SOCIAL AND COMMUNITY SERVICES AND FACILITIES

- ☐ Health service facilities
- ☐ Emergency services
- ☐ Recreational facilities

THE NATURE AND LEVEL OF PRESENT AND FUTURE ENVIRONMENTAL POLLUTION

- ☐ Air pollution
- ☐ Water pollution
- ☐ Noise, vibration and lighting
- ☐ Visual pollution (see also section on land use and landscape character)
- ☐ Solid of liquid waste and by-product disposal

RISK AND HAZARD

- ☐ Identification

HEALTH AND SAFETY

- ☐ Effects in the workplace
- ☐ Effects in the surrounding areas

CUMULATIVE AND SYNERGISTIC EFFECTS

ENHANCEMENT OF POSITIVE CHARACTERISTICS

Figure 6: EIA Checklist

assessment. As with the sample checklist included in Annexure D , the physical characteristics of the site and its surroundings are normally dealt with first. These include the topography, hydrology and climatic conditions of the site.

Secondly ecological characteristics of the vegetation and animals are taken into account with special reference to the ecological functioning of the natural and semi-natural communities.

After assessing the general considerations of current and potential land use and landscape character, more specific land use characteristics are dealt with. Cultural resources and socio-economic character of the affected public are dealt with before attention is shifted to the infrastructure services (energy, water, waste management and roads) that are normally provided at local council level. Regional financial implications for the supply of infrastructure are also considered with job creation opportunities and the possible demands on education and housing facilities.

The impact on social and community service facilities like health and emergency services are taken into account before the nature and level of present and future environmental pollution are evaluated. Risks and hazards are identified and the effects in the workplace and surrounding areas are noted.

Lastly the cumulative and synergetic effects are noted before possible enhancements of positive characteristics are evaluated.

CONCLUSION

The legislative requirements for an EIA has now been established and the study area has been described at the hand of the UDP process and outcome. With the general environmental Information that would be needed for an EIA established, it is now possible to establish the site specific information that would be required for the assessment of an EIA in the UDP area.

The specific responsibilities of local council will be established after the next section.

6 PROBLEM SPECIFIC EIA INFORMATION REQUIREMENTS

The following section identifies the relevant information needed for the equitable assessment of EIA's to be carried out in the execution of the Greater Florida Lake Urban Development Plan in general. Individual applications for rezoning or change of land use under current zoning will need to be evaluated against the general requirements as extracted from International Conventions and Agreements, Section 21 Activities and Protected Areas in terms of Act 73 of 89 and the Environmental Characteristics as set in the General Checklist in Annexure B .

6.1 INTERNATIONAL CONVENTIONS AND AGREEMENTS

Although all development activities are subject to the requirements set by International Conventions and Agreements, site specific spheres of influence can be extrapolated and applied on individual applications. The information that would be required for compliance assessment are set out in Table 3.

Table 3: Information needed for applicable International Conventions and Agreements

CONVENTION/AGREEMENT	DESCRIPTION	INFORMATION
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)	The conservation of animals that migrate across their borders. Palaeoarctic only.	Migratory bird distribution
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	The protection of endangered species prominent in international trade through appropriate trade control measures and monitoring the status of such species.	Specific business practices
Protocol for the Protection of the Ozone Layer (Montreal Protocol)	Ensuring measures to protect the ozone layer.	Industrial processes applied for
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	The broad aims of this convention are to stem the loss and to promote wise use of all wetlands.	Water fowl habitat distribution
Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposals (Basel Convention)	The reduction of the production of hazardous waste and the restriction of transboundary movement and disposal of such waste.	Industrial processes applied for
Convention on Biological Diversity (CBD)	To effect international co-operation in the conservation of biological diversity and to promote the sustainable use of living natural resources worldwide.	Species assessment
Framework Convention on Climate Change (FCCC)	The convention addresses the threat of global climate change by urging governments to reduce the sources of greenhouse gases.	Industrial processes applied for
Convention concerning the protection of the world cultural and natural heritage (World Heritage Convention)	The convention aims to promote co-operation among nations to protect natural and cultural heritage which is of such outstanding universal value that its conservation is of concern to all people.	Listed sites in application area & sphere of influence
World Conservation Union (IUCN: International Union for the Conservation of Nature and Natural Resources)	Conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.	Habitat protection measures
Convention on Prior Informed Consent (PIC)	Convention on Prior Informed Consent for certain hazardous chemicals and pesticides in international trade.	Type of Industrial processes applied for

6.2 SECTION 21 ACTIVITIES

For the purpose of this study all activities listed in terms of Section 21 of the Environment Conservation Act, No 73 of 1989 are deemed to be in force and as such will need an EIA to be performed. Although the activities as listed need to be declared in the application process for rezoning or change of land use, specific industrial process information would also be needed.

Table 4: Section 21 Activities

ACTIVITY	SPECIFIC INFORMATION
1 The construction or upgrading of:	
▫ facilities for commercial electricity generation and supply	
▫ nuclear reactors and installations for the production, enrichment, reprocessing and disposal of nuclear fuels and wastes	Industrial processes that will be used for industrial activity to be investigated
▫ transportation routes and structures, and manufacturing, storage, handling or processing facilities for any substance which is dangerous or hazardous and is controlled by national legislation	
▫ roads, railways, airfields and associated structures outside the borders of town planning schemes	
▫ cableways and associated structures	
▫ structures associated with communication networks, other than telecommunication lines and cables, as well as access roads leading to these structures	
▫ racing tracks for motor-powered vehicles and horse racing, excluding indoor tracks	
▫ canals and channels, including diversions of the normal flow of water in a river bed and water transfer schemes between water catchments and impoundment	1 in 50 year flood line
▫ dams, levees or weirs affecting the flow of a river	
▫ reservoirs for public water supply	
▫ schemes for the abstraction or utilisation of ground or surface water for bulk supply purposes	
▫ public and private resorts and associated infrastructure	
▫ sewage treatment plants and associated infrastructure	
▫ buildings and structures for industrial and military manufacturing and storage of explosives or ammunition or for testing or disposal of such explosives or ammunition	Mining operations

ACTIVITY	SPECIFIC INFORMATION
2. The change of land use from:	
□ residential use to industrial or commercial use	Rezoning Applications
□ light industrial use to heavy industrial use	
□ agricultural or undetermined use to any other land use	
☒ use for grazing to any other form of agricultural use	
□ use for nature conservation or zoned open space to any other land use	
3. The concentration of livestock in a confined structure for the purpose of mass commercial production.	
4. The intensive husbandry of, or importation of, any plant or animal that has been declared a weed or an invasive alien species.	
5. The release of any organism outside its natural area of distribution that is to be used for biological pest control.	Florida lake
6. The genetic modification of any organism with the purpose of fundamentally changing the inherent characteristics of that organism.	
7. The reclamation of land below the high-water mark of the sea and in inland water including wetlands.	
8. The disposal of waste in terms of section 20 of the Environment Conservation Act, 1989.	
9. Scheduled processes listed in the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965).	Re-assess Mining operations

6.3 PROTECTION AREAS

Although formally declared protection areas falls under the administration of the Department of Environmental Affairs and Tourism Private Conservancies, Biosphere Reserves and Natural Heritage Sites does not have any legal status and needs to be administered by private owners and neighbours. (Department of Environmental Affairs and Tourism, 1998, p.36)

Table 5: Protected Areas

AREA	INFORMATION
Protected Natural Environment	Extent To be identified
Special Nature Reserves	
Limited Development Areas	
Biosphere Reserves	
Private Conservancies	
Natural Heritage Sites	

6.4 ENVIRONMENTAL CHARACTERISTICS

The following extract from the general Checklist in Annexure A can be taken as the baseline information requirements for all development proposals.

Table 6: Environmental Characteristics

CHARACTERISTIC	INFORMATION
PHYSICAL CHARACTERISTICS OF THE SITE AND ITS SURROUNDINGS	
□ Land	Updated Status Quo data
□ Freshwater systems	
▣ Climate	
ECOLOGICAL CHARACTERISTICS OF THE SITE AND ITS SURROUNDINGS	
□ Vegetation	Update Status Quo data
□ Animals	
□ Natural and semi-natural communities	
CURRENT AND POTENTIAL LAND USE AND LANDSCAPE CHARACTER	
▣ General considerations applicable to all development proposals	Update Status Quo data and assess in terms of UDP
□ Urban open space, protected and recreational areas	
▣ Residential areas	
□ Commercial areas	
□ Industrial areas	
▣ Agricultural and sylvicultutal areas	
CULTURAL RESOURCES	
□ Sites and resources	To be identified
SOCIO-ECONOMIC CHARACTERISTICS OF THE AFFECTED PUBLIC	
□ Demographic aspects	Update Status Quo data and obtain reliable census data
□ Economic and employment status of the affected social groups	
□ Welfare profile	
□ Health profile	
□ Cultural profile	
INFRASTRUCTURE SERVICES	
□ Energy supply	Update Status Quo and Development Impact data
□ Water	
□ Waste management	
□ Transport networks	
□ Education	Assess
□ Housing	
□ Telecommunication	
□ Financial implications to region	
SOCIAL AND COMMUNITY SERVICES AND FACILITIES	
□ Health service facilities	Update Status Quo data
□ Emergency services	
□ Recreational facilities	

CHARACTERISTIC	INFORMATION
THE NATURE AND LEVEL OF PRESENT AND FUTURE ENVIRONMENTAL POLLUTION	
□ Air pollution	Bylaws
⊡ Water pollution	
□ Noise, vibration and lighting	
⊡ Visual pollution (see also section on land use and landscape character)	
□ Solid of liquid waste and by-product disposal	Assess
RISK AND HAZARD	
⊡ Identification	Assess
HEALTH AND SAFETY	
□ Effects in the workplace	Assess
□ Effects in the surrounding areas	
CUMULATIVE AND SYNERGISTIC EFFECTS	
⊡ Identification	Assess
ENHANCEMENT OF POSITIVE CHARACTERISTICS	
□ Identification	Assess
OTHER	
□ Identification	Assess

6.5 CONCLUSION

The foregoing sections identified the general information that would be required for the equitable evaluation of EIA submissions for the study area. Further specific sets of required information can be set for each of the development precincts of the Urban Development Plan. The more detailed requirements are deemed to be outside the scope of this study as it would only be a Shortlist of the general requirements set in the foregoing section.

As shown in previous sections, a great amount of data from varied information sources needs to be taken into account for the equitable evaluation of proposals. This varied information needs to be identified, collected, captured, organised, maintained and made available by specific "specialists" with expertise in the day to day needs of a local council.

It is therefore expedient to identify specific "specialist" groupings from within a local council to do the integrated management and administration of specific information groupings. In the following section specific responsible departments or authorities will be identified for the different information groups.

7 INFORMATION RESPONSIBILITIES

In the previous sections all the relevant environmental information that would be required by local government has been identified. For the purpose of this study, information responsibilities are seen to include the acquisition, capturing, verification and maintenance of the required data. Specific departments responsible for relevant information will be identified in this section.

Data or information can be acquired from outside consultants or specialists or generated in-house either by the day to day business processes or by translation of existing data. Before any acquired data can be used it must be verified, either by cross checking the data itself or by verifying the accompanied meta data. Whenever an organisation or department has added "value" to this data for example by updating or refinement, a complete record of the method and process must be kept available for cross checking and reference by down line users.

Although a great volume of data is generated by local government departments in their normal day to day business of providing services and infrastructure, a potentially valuable contribution is made by outside specialists. The data from specialists are normally motivational or background data provided for a varied range of applications like:

- township applications;
- re-zonings;
- business licences; and
- special consent applications.

Different departments with specific expertise comment on relevant aspects of these applications. The Technical Services Department would for instance comment on the need and cost of upgrading infrastructure for a proposed new township, while the Building Control Department would only comment in terms of the National Building Regulations. Thus information is only generated by the comment of the Technical Services department while Building Control's comment can be seen as Statutory control.

It must however be noted that the EIA Process is inherently multi-diciplinary and that responsibilities will overlap between departments. These overlaps need to be identified and well defined spheres of responsibilities need to be established for information maintenance.

The department that uses the relevant data on a day to day basis must take ownership and responsibility for the information that it generates. When looking at the relevant responsible departments as set out in Annexure E, it is possible to establish "lead" departments which can take responsibility for related information as illustrated in figure 7. This allocation has taken into consideration both the core function of the department and the in house experts and professionals normally employed by the specific department.

As the Council is currently (1999) in a re-structuring process only one possible division of responsibilities are set out in Annexure E, with the majority of responsibilities allocated with the following functional departments:

BC Building Control.
LED Local Economic Development.
EM Environmental Management.
TS Technical Services.
GIS Geographic Information Systems.

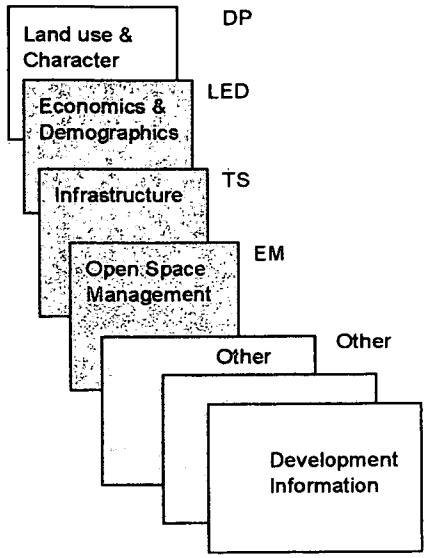

Figure 7: Allocation of Departments

The Building Control Department's main task is the regulation of building activities in terms of the National Building Regulations and the application of relevant Town Planning Scheme Clauses. Local Economic Development strives to facilitate and encourage all prospective economic commitments to the area by developers, while Environmental Management deal mainly with the impact of past, current and future development in the area. The application of health regulations and the provision of elementary health services are handled by the Environmental Health Department. Technical Services are responsible for the planning, provision and maintenance of infrastructure like roads, sewer, water and electricity. While the GIS 'department' is responsible for the capturing of all data, all relevant departments are to be responsible for the verification of data captured.

The main responsibility for construction activities in terms of Section 21 of the Environment Conservation Act and infrastructure services can be dealt with by the Technical Services Department. The change of land use and the maintenance of information on current and future characteristics of development sites, with cognisance of the landscape character and cultural resources, can be allocated to The Development Planning Department. While the Environmental Health Department can take responsibility for the "output" control of developments, the Environmental Management Departments can be responsible for the identification and management of information on open spaces and protected areas.

As the core function of the Building Control Department is only one of control, it is possible to define it as a user of information only. The other department mentioned in Annexure E, Emergency Services can also be seen only as a user of the information, with the only possible exception that of reporting on traffic incidence or major environmental accidents such as fires and hazardous spills. The Local Economic Development department is best aligned to maintain the information on possible economic and employment opportunities that would result from proposed development.

The study has now identified all relevant information needs and the relevant departments responsible for the maintenance thereof, the following section will offer a short summary and recommendations for further action and study.

8 FINAL CONCLUSIONS AND RECOMMENDATIONS

Although the legal requirements for EIA's is well established at National Level, the responsibilities at Local Government level is unclear. The future designation of Local authorities as competent authorities in terms of Section 22(1) of the Environment Conservation Act No 73 of 1998 implies that the evaluation of EIA's would rest at local level.

As indicated from the Californian precedent discussed in section one, each environmental impact assessment creates new data sources that are widely used by authorities and other interested parties. This study then aimed to identify the information requirements and responsibilities of the Western Metropolitan Local Council to enable the equitable evaluation of EIA's as part of their development impact assessment process for proposed development, with special reference to the Greater Florida Lake Development Area.

Whilst the legislative requirements, process and the required report contents of the EIA process is well established, the choice of the method to be used is left to the applicant. The legislative requirements for local councils implies a delegated responsibility that needs to be taken up where and when the necessary skills and expertise have been obtained.

8.1 LEGISLATIVE REQUIREMENTS

The legislative requirements can be seen to filter down through the different tiers of government, for example all development is subject to the requirements set by International Conventions and Agreements while only some developments will be affected by National Legislation as summarised in table 3.

The same "delegation" of compliance exists between Provincial and Local Government. Some International conventions and agreements like the Law of the Sea Convention has got minimal influence over inland Provinces and by implication on Local Government in these provinces as well. Only the Conventions and Agreements with direct compliance implications were thus of interest for this study as discussed in section 3. The delegation also implies that no Local Bylaws may contravene Provincial and National legislation.

Although it is recommended that the Environmental Management Department be responsible for the application of International Agreements and Conventions at Local Council level, it is still possible to do a more detailed allocation of responsibilities for specific laws, conventions, regulations and by-laws.

The legislative requirements can be combined with the base environmental information to comply with the generic information requirements for an EIA.

8.2 ENVIRONMENTAL INFORMATION CHECKLIST

Although the checklist system is deemed to be the most relevant method for this study as it provides for:

- the use of available data;
- ease of transfer of data from and to other methods like overlay maps; and
- ease of transfer from manual methods to computer systems.

Any other method may be used provided that all aspects are taken into consideration.

The general information that would be required for the equitable evaluation of EIA submissions for the study area can be refined for each of the development precincts of the Urban Development Plan.

The more detailed information requirements for each precinct were deemed to be outside the scope of this study as it would only be a Shortlist of the general requirements as set in this study. Future information needs will also be dependant on the information that is currently available.

8.3 EIA INFORMATION AVAILABLE

A preliminary investigation of the available information on the WMLC's GIS System indicated that the data sets is still immature as only elementary cadastral boundaries has been captured and is in the process of being verified. The following also came to light:

- infrastructure data, roads, stormwater, sewer, etc. is not available in electronic format and is in the process of being captured;
- no verified environmental characteristic data are available that can be used for site specific analysis;
- data available for the study area has not been verified and no meta data sets are available to establish the origin and accuracy of the available data.

It must be noted that the demographic data used for the status quo investigation carried out for the Florida Lake project, originated from a survey that was done in 1989 and as such does not form a good basis for further studies as rightfully noted by Van der Merwe (1998, p.5).

8.4 EIA INFORMATION RESPONSIBILITIES

It is necessary that the department that use specific information for it's day to day business should be responsible for that information. The responsibility must include the acquisition, capturing, verification and maintenance of the required data.

As the Council is currently (1999) in a re-structuring process only one possible division of responsibilities are set out in Annexure E, with the majority of responsibilities allocated with the following functional departments:

LED	Local Economic Development.	EM	Environmental Management.
TS	Technical Services.	GIS	Geographic Information Systems.

8.5 THE GREATER FLORIDA LAKE URBAN DEVELOPMENT PLAN AS AN EXAMPLE

This UDP aimed at providing a guide for the future development of the Greater Florida Water based area. In this respect the local authority will not play the role of the developer, but that of facilitator. It is furthermore envisaged that a number of specific areas will be identified where the local authority can intervene and play an active role in facilitating development. These areas of development will be treated as individual projects or initiatives and each be subject to separate processes.

The idea of the Greater Florida UDP is thus to create an integrated plan which incorporates the economic, environmental, land use and infrastructure components to reach an equitable balance in the development of the area. In addition the following critical development issues have been addressed:

- the spatially distorted pattern of socio-economic development;
- the rapid rate of urbanisation and population growth and the associated demand for land for residential and economic development; and
- using the mining land as an opportunity for social and spatial integration.

Without losing the perspective that environmental parameters are part of the evaluation of any proposals, it is clear from the study that the responsibility for information needed for specific components can be allocated according to the proposals as set out in this study, for example:

- the Local Economic Development department will provide and maintain the relevant economic information;
- the infrastructure information will have to be provided by the Technical Services Department;
- the land use information will have to be provided by the Development Planning Department; and
- the information for the application of environmental legislation will have be provided by the Environmental Management Department.

Although it must be borne in mind that the greater Florida Lake Urban Development Plan has got a long history of change and adoption, one can not use the existing environmental information for proposal evaluation, as it is out dated and non-verifyable.

8.6 RECOMMENDATIONS

Although the investigation of the planning, financing, staffing and implementation of a Metro wide Land Use Planning and Information System falls outside the scope of this study, the following must however be taken into account in the process of establishing an information base for EIA Information integration:

- "A GIS project may be effective and important; however, it will never be recognised if you do not keep your co-workers, supervisors, and decision makers interested in and supportive of your product "(Materassi, 1999). A few strategies that have helped Grand Terrace, California to successfully implement their GIS based land use information system include:
  - involving all departments;

- documenting accomplishments;
- consolidating GIS with other funded programs; and
- getting the word out.

- A stricter data verification and meta data maintenance regime needs to be implemented to prevent the system being corrupted by non-sense data sets;
- The relevant departments need to institute a training programme to address the high level of computer illiteracy;
- Information that has had value added, e.g. street names added, must be made available to all; and
- the Local or Metro Council must be able to register as a Competent Authority for the assessment of EIA Studies to enable them to establish credibility as a source of information for such studies.

8.7 CONCLUSION

This study can be seen to be successful in establishing the information requirements and responsibilities at local government level to enable equitable evaluation of EIA's as part of their development impact assessment process for proposed development.

However only a general allocation of information responsibilities was possible for the study area as verified information is not readily available from inside the WMLC. Whenever more specific proposals are received, a complete system of information allocation, verification and management would need to be implemented.

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10 ANNEXURES

10.1 ANNEXURE A- INTERNATIONAL CONVENTIONS AND AGREEMENTS ON ENVIRONMENTAL ISSUES

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10.3 ANNEXURE C- ZONING AND REQUIREMENTS

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ANNEXURE A- INTERNATIONAL CONVENTIONS AND AGREEMENTS ON ENVIRONMENTAL ISSUES

(INFORMATION AS AT 1 SEPTEMBER 1997)

CONVENTION/AGREEMENT		DESCRIPTION	PRESENT STATUS	ROLE OF PROVINCES
1.	Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (Responsible departmental official: Mr J J Lombard Telephone (012) 310-3578)	The convention was a response to the need for nations to co-operate in the conservation of animals that migrate across their borders. These include terrestrial mammals, reptiles, marine species and birds. Special attention is paid to endangered species. South Africa is a major partner in this convention as it is the terminus for many of the migratory species, both to the Palaeoarctic (birds) and the Antarctic species (whales and birds).	South Africa acceded to the convention in December 1991. COP5, which was held from 10 to 16 April 1997 in Geneva, Switzerland, elected South Africa the alternate member of the Standing Committee for the Africa region.	DEAT co-ordinates implementation. Provincial governments are responsible for active in situ protection of the relevant species.
2.	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Responsible departmental official: Dr P Botha Telephone (012) 310-3575)	The main objectives of this convention are the protection of endangered species prominent in international trade through appropriate trade control measures and monitoring the status of such species. This convention has a high profile in South Africa as well as internationally. At the last three biannual conferences of the parties to CITES, the trade in elephant and rhino products was a major issue on the agenda.	South Africa participated in the 1973 Washington Conference during which the convention was drafted, and ratified the convention in 1975. COP10 was held in Harare, Zimbabwe in June 1997.	DEAT is responsible for deter mining national policy and co-ordination of implementation. Issuing of permits is a provincial function. Customs and Excise and the Directorates of Plant and Quality Control and of Veterinary Services of the Department of Agriculture have certain control responsibilities.
3.	Antarctic Treaty (Responsible departmental official: Mr D J van Schalkwyk Telephone (012) 310-3560)	The main purpose of the Antarctic Treaty is to regulate relations among countries in Antarctica. Included in the provisions of the Treaty are that Antarctica shall be used for peaceful purposes only, to promote international co-operation, for the exchange of information and the freedom of scientific investigation. South Africa, through its membership to the Treaty, which included the ratification of the Conventions for the Conservation of Antarctic Marine Living Resources, the Conservation of Antarctic Seals, the Agreed Measures for the Conservation of Antarctic Fauna and Flora and the Protocol on Environmental Protection to the Antarctic Treaty, remains party to any decision-making with regard to Antarctica and the sub-Antarctic. The Antarctic Treaties Act, 1996 (Act 60 of 1996) came into effect on 1 February 1997 and provides South Africa with a legal instrument to enforce the provisions of the Antarctic Treaty and its various conventions.	South Africa, one of the original signatories to the Antarctic Treaty, signed the Treaty on 21 June 1961.	DEAT has a Directorate: Antarctica and Islands which manages the South African National Antarctic Programme (SANAP).

CONVENTION/AGREEMENT		DESCRIPTION	PRESENT STATUS	ROLE OF PROVINCES
4.	Protocol for the Protection of the Ozone Layer (Montreal Protocol) (Responsible departmental official: Mr M R Steyn Telephone (012) 312-0215)	The protocol is aimed at ensuring measures to protect the ozone layer. South Africa also ratified the subsequent London Amendments to the protocol designed to restrict the use of chlorofluoro-carbons (CFCs) and halons. Even though the Copenhagen Amendments to the Protocol have not yet been ratified, South Africa has acted in full compliance with these amendments and is in the process of ratifying them.	Agreed upon September 1987. South Africa became a signatory in January 1990.	DEAT responsible for implementation of protocol.
5.	Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) (Responsible departmental official: Mr G I Cowan Telephone (012) 310-3701)	The broad aims of this convention are to stem the loss and to promote wise use of all wetlands. The convention addresses one of the most important issues in South Africa, namely the conservation of the country's water supplies, for both the use of the natural and the human environments. South Africa has designated 15 sites to the List of Wetlands of International Importance. A number of others is under consideration. A Wetland Conservation Bill has been proposed that will help South Africa to meet the aims of the convention.	South Africa ratified the convention in March 1975. COP7 will be held in 1999 in Costa Rica.	DEAT is responsible at national level for policy development and co-ordination of implementation. Management of listed wetlands is undertaken by the responsible authorities, which mainly are provincial governments and the National Parks Board.
6.	Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposals (Basel Convention) (Responsible departmental official: Mr W E Scott Telephone (012) 310-3654)	The main objectives of the convention are the reduction of the production of hazardous waste and the restriction of transboundary movement and disposal of such waste. It also aims to ensure that any transboundary movement and disposal of hazardous waste takes place in an environmentally sound and responsible way. Locally, draft regulations were published in an effort to control the movement of such waste.	South Africa ratified the convention in May 1994. COP4 will be held from 6 to 10 October 1997 in Kuala Lumpur, Malaysia.	DEAT is competent national authority which co-ordinates. Provinces must ensure that receivers comply with conditions of convention.
7.	Convention on Biological Diversity (CBD) (Responsible departmental official: Dr G T Willemse Telephone (012) 310-3836)	The aim of the CBD is to effect international co-operation in the conservation of biological diversity and to promote the sustainable use of living natural resources worldwide. It also aims to bring about the sharing of the benefits arising from the utilisation of natural resources.	Convention was signed by South Africa in June 1993 and ratified on 2 November 1995. COP4 will be held during the first half of 1998.	DEAT is responsible for policy development and co-ordination of implementation. Several central government departments, the provincial governments and statutory institutions such as the National Parks Board and the National Botanical Institute are involved in implementation.

CONVENTION/AGREEMENT		DESCRIPTION	PRESENT STATUS	ROLE OF PROVINCES
8.	International Whaling Commission (IWC) (Responsible departmental official: Mr G de Villiers Telephone (021) 402-3019)	As a founder member of the IWC, South Africa has a proud record regarding conservation and research aimed at providing a scientific basis for whale management. Today South African scientists are recognised experts in the field. Recently, the South African representative to the International Whaling Commission was elected as vice-chairman of the organisation, but could not take up this position because of subsequent ill health and early retirement.	South Africa was one of 15 nations to sign the convention in December 1946. Annual meeting to take place during October 1997 in Monaco.	DEAT (Sea Fisheries) directly responsible for attending to IWC matters in close consultation with Department of Foreign Affairs and NGO interest groups.
9.	Framework Convention on Climate Change (FCCC) (Responsible departmental official: Mrs Y Scorgie Telephone (012) 309-3026)	The United Nations Framework Convention on Climate Change was signed by 154 governments in Rio de Janeiro during the United Nations Conference on Environment and Development (UNCED) in June 1992. The convention addresses the threat of global climate change by urging governments to reduce the sources of greenhouse gases. The ultimate objective of the convention is to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system of the world.	COP3 will take place in December 1997 in Kyoto, Japan. South Africa ratified on 29 August 1997.	DEAT responsible for policy development and administration of convention. Provinces to negotiate with all sectors of society (e.g.. business and local communities) to propagate compliance measures to reduce greenhouse gas emissions.
10.	Convention concerning the protection of the world cultural and natural heritage (World Heritage Convention) (Responsible departmental official: Ms I Coetzee Telephone (021) 402-3022)	The convention aims to promote co-operation among nations to protect natural and cultural heritage which is of such outstanding universal value that its conservation is of concern to all people. The convention was adopted by UNESCO in 1972. At present 144 countries are Parties to it.	South Africa ratified the convention on 10 July 1997.	DEAT responsible for co-ordination of implementation and determining overall policy. Provinces responsible for implementation.
11.	Convention on Desertification (Responsible departmental official: Ms W A Lutsch Telephone (012) 310-3694)	Convention to combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa.	Adopted June 1994. South Africa signed January 1995. COP1 to be held in Rome Italy from 29-9-1997 to 10-10-1997. South Africa ratified on 29 August 1997.	DEAT responsible for co-ordination of implementation and determining overall policy. Provinces to implement.
12.	Law of the Sea Convention (Responsible departmental official: Mr G de Villiers Telephone (021) 402-3911)	Comprehensive codification of the law of the sea.	Adopted December 1982 and entered into force in 1994. Ratification currently under consideration.	DEAT responsible for implementation along with Department of Transport, Cape Nature Conservation, Sea Fisheries, Natal Parks Board and National Parks Board.

CONVENTION/AGREEMENT		DESCRIPTION	PRESENT STATUS	ROLE OF PROVINCES
13.	Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) (Responsible departmental official: Mr G de Villiers Telephone (021) 402-3019)	Agreement to manage and regulate exploitation of Antarctic marine living resources. A South African scientist is currently chairman of the Scientific Committee. DEAT contributes to the Ecosystem Monitoring Programme.	Established September 1980 and entered into force in 1982. Forthcoming annual meeting taking place in November 1997 in Hobart, Australia. Technical working group meetings held in USA in July 1997.	DEAT (Sea Fisheries) responsible.
14.	Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 and its protocol of 1996 (London Guidelines) (Responsible departmental official: Dr L Jackson Telephone (021) 402-3344)	Effective control of all sources of marine pollution obliging parties to take practical steps to prevent pollution of the sea by dumping. The convention provides a regulatory framework for the prevention and control of dumping of waste into the sea, where dumping is defined as - any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures ·any deliberate disposal at sea of vessels, aircraft, platforms or other man-made structures.	South Africa was s signatory to the 1972 Convention, but only ratified it in September 1978. The convention is brought into force locally in terms of the Dumping at Sea Control Act, 1980 (Act 73 of 1980) which came into force on 23 April 1982. South Africa was also a signatory to the 1996 Protocol which will eventually replace the current convention. The protocol was opened for ratification in April 1997 and DEAT is in the process of getting Parliamentary approval for ratification. The following two meetings of the Contracting Parties have taken place or are to take place during 1997: ·Scientific Group meeting: 12 to 16 May 1997 ·Consultative meeting: 27 to 31 October 1997 DEAT will be hosting, jointly with IMO, the 1998 Scientific Group meeting, which will be held in Cape Town in April 1998.	DEAT responsible for legislation. Sea Fisheries responsible for issuing permits to dump at sea and general administration. The provinces do not have any role in the implementation of the convention.

CONVENTION/AGREEMENT		DESCRIPTION	PRESENT STATUS	ROLE OF PROVINCES
15.	World Conservation Union (IUCN: International Union for the Conservation of Nature and Natural Resources) (Responsible departmental official: Mr J J Lombard Telephone (012) 310-3578) (The IUCN is an international non governmental organisation. It is not a body governing the implementation of an international agreement.)	Founded in 1948. The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organisations in a unique world partnership. It is one of very few international organisations that both governments and non-governmental bodies can join. It has as mission to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. Its objectives are - ·To ensure the conservation of nature, and especially of biological diversity, as an essential foundation for the future ·To ensure that where the earth's natural resources are used this is done in a wise, equitable and sustainable way ·To guide the development of human communities towards ways of life that are both of good quality and in enduring harmony with other components of the biosphere.	South Africa obtained membership in 1973 and is represented by DEAT. Next World Conservation Congress will take place in 1999/2000. IUCN/ROSA Tri-Annual Regional Meeting will take place towards the end of 1998. Approval has been given for the establishment of an IUCN Country Office in South Africa.	Individual provinces have the choice to become members in the category of government agencies. At present only four of the provinces hold IUCN membership.
16.	Convention on Prior Informed Consent (PIC) (Responsible departmental official: Mr W E Scott Tel: (012) 310-3654)	Convention on Prior Informed Consent for certain hazardous chemicals and pesticides in international trade.	Currently being negotiated by Intergovernmental Negotiating Committee (INC). Two meetings held in 1996. One scheduled for 1997 in The Netherlands. Convention scheduled for completion before the end of 1997.	DEAT is responsible. Role of provinces unknown at this stage.

CONVENTION/AGREEMENT		DESCRIPTION	PRESENT STATUS	ROLE OF PROVINCES
17.	Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (Responsible departmental official: Dr A Badenhorst Tel: (021) 402-3105)	The main objectives of the agreement are to ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks, to improve co-operation between states to that end and to ensure more effective enforcement by flag states, port states and coastal states of conservation and management measures adopted for such stocks, particularly on the high seas.	The agreement was adopted on 4 August 1995 by the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks. It has not yet been signed by South Africa, the rationale being that the South African Fisheries Policy should be completed and implemented first. The finalisation of the policy is imminent (mid-1997).	DEAT is the competent national authority.
18.	International Commission for the Conservation of Atlantic Tunas (ICCAT) (Responsible departmental official: Dr J A van Zyl Tel: (021) 402-3020)	The main objective of the commission is the responsibility for the international management of tuna species in the Atlantic Ocean, including the southern albacore (longfin tuna, *Thinnus alalunga*), upon which the South African tuna fishery depends. The commission addresses international co-operation in maintaining the tuna populations at levels which will permit the maximum sustainable catch for food and other purposes and the conservation of the resources of tuna and tuna-like fishes of the Atlantic Ocean.	South Africa acceded to the convention in October 1967 and ratified it in 1970.	DEAT is the competent national authority responsible for attending to ICCAT recommendations in close co-operation with the Department of Foreign Affairs.
19.	South East Atlantic Fisheries Regional Organisation (SEAFRO) (Responsible departmental official: Dr M Mayekiso Tel: (021) 402-3018)	The intention is to create a regional fisheries organisation to internationally manage the use of fish resources outside the EEZs of countries in the region, that are not being addressed by any other fisheries organisations (e g ICCAT).	Negotiations between coastal countries of the region (Angola, Namibia, South Africa, United Kingdom) have started and a draft convention is being compiled.	DEAT responsible for initial negotiations and ultimately, along with the Department of Foreign Affairs, for ratification. Implementation will also be a function of DEAT.
20.	Wetlands International (Responsible departmental official: Mr G I Cowan Tel: (012) 310-3701)	Wetlands International is a non-profit organisation governed by a global Board comprised of member country delegates, wetland specialists and representatives of international organisations. It was established in 1995 by the integration of the International Waterfowl and Wetlands Research Bureau (IWRB), the Asian Wetland Bureau (AWB) and Wetlands for the Americas (WA)	Mr G I Cowan and Dr R M Randall are the two national delegates. Mr Cowan has been elected to the Regional Council Africa and Middle East. The Annual meeting takes place in March.	DEAT is responsible.

ANNEXURE B- URBAN DEVELOPMENT PLAN GOALS AND OBJECTIVES

GOAL	OBJECTIVES
***Goal 1*: Optimising the opportunities presented by the existing open spaces and natural areas, specifically for active and passive recreation, entertainment and other leisure purposes, in order to utilise the open space element to integrate the study area.**	To establish a physical north-south open space linkage or a green belt between Ontdekkers Road in the north and Meadowlands in the south, along the existing water course between the two water features, Florida Lake and Fleurhof Dam. To enhance, rehabilitate and expand the potential of Florida Lake and its immediate surrounds, to allow a diversity of passive and active recreation, entertainment and other leisure activities and facilities. To investigate, in liaison with the relevant mining house, the potential for the rehabilitation and development of Fleurhof Dam, its associated vlei and its immediate surrounds, to allow a diversity of passive and active recreation, entertainment and other leisure facilities. To upgrade and develop the existing bird sanctuary to allow passive recreational use of the area. To market and promote the use of the open space and natural features of the area for a diversity of cultural and other events, such as the Eisteddfod.
***Goal 2*: Promoting a healthy and safe natural environment, that ensures an area that is of high quality for living and working for all the residents of and visitors to the area.**	To plan for the conservation of all natural areas and ecosystems in their natural state, to ensure their long term Sustainability. To promote the integration of the natural environment with the built environment, to ensure the linking and continuity of natural ecosystems and to also ensure the access of natural areas to as many people as possible. To monitor and control the location and development of all types of land uses and activities in the environment, to ensure the appropriate siting of activities in relation to the sensitivity of the natural ecosystem. To limit and restrict the development and establishment of activities and land uses that are potentially harmful to or will impact on the natural environment. To control and monitor all forms of pollution generation, either into the air, water or on land, to ensure a healthy and safe natural environment. To actively promote and implement measures that will enhance and upgrade the natural environment, such as tree planting, clean up campaigns, control on the nature and appearance of building structures, etc.
***Goal 3*: Broaden the economic base of the Greater Florida Lake Water based Development Area**	To identify and promote growth and development opportunities of the economic sectors with comparative advantages within the area To promote the establishment of small, micro and medium enterprises (SMMEs) to provide employment and capacity building opportunities and to generate income. To provide mechanisms and development incentives to attract industries to the area. To develop an aggressive investment (marketing) strategy to promote the locational advantages of the Greater Florida Lake Water based Development area.

GOAL	OBJECTIVES
***Goal 4*: Improving accessibility**	To create an effective north-south transportation link. To link the area to the national road network (N1/N17/Main Reef Road). To improve land accessibility from the local road network. To improve and promote parking facilities
Goal 5: Improving and promoting public transport	To improve the railway network in the vicinity of the study area including the upgrading of the existing stations To improve or provide appropriate taxi rank facilities
***Goal 6*: Creating a strong identity and character within the urban environment.**	To protect and promote the cultural and historic elements To improve and maintain a high level of security through the area To ensure the provision and maintenance of social amenities at appropriate locations and in an appropriate form. To protect and enhance those elements that contribute to the strong identity and character of the area.
***Goal 7*: Appropriately integrating vacant land into the urban system**	To identify and categorise develop able and non-develop able vacant land To promote efficient development through: o supporting a mix of land uses o supporting intense development o establishing a land release programme o co-ordinating land release with provision of infrastructure To specify land uses to ensure: o an appropriate land use mix o appropriate use on non-developable vacant land To ensure appropriate management and use of currently vacant land until it is released for development.
***Goal 8*: Providing appropriate infrastructure to support urban environment**	To ensure the sufficient and timeous provision of infrastructure
***Goal 9*: Ensuring the financial feasibility of development occurring in the area.**	

ANNEXURE C - ZONING AND REQUIREMENTS

ZONING	DEVELOPMENT CONTROLS	POLICY AREA & ADDITIONAL REQUIREMENTS
NON SPECIFIC AREAS		The status quo within these areas should be maintained and any application for a change in land use will be considered on merit or in terms of existing Council policies not reflected in this UDP, e.g.. the Ontdekkers Road Policy.
TECHNIKON SOUTH AFRICA PRECINCT		The aim of development in this precinct is to create an area of educational significance with a focus on the existing and future activities of Technikon South Africa (TSA). Uses would not only include TSA uses but also any use that would complement the primarily educational character of this precinct.
Institutional	**Height**: 3 storeys with additional storeys with the consent of the Council **Coverage**: 40%, but where parking is provided under the building = 50% **FAR**: 1,5 **Parking**: To the satisfaction of the Council **Building lines**: 5m along all street frontages SDP Approval	o Urban design and landscaping requirements to be met. o Where applicable, land donated in exchange for water course development undertaken by developer. Policy Area C. The strip of properties along the northern side of Honeyball Road needs to be considered for alternative uses such as book shops, computer shops and offices which would be compatible with and will enhance the educational uses to the north thereof. Ideally block development with limited access where at least 3 of the existing properties is consolidated should also be promoted in this Policy Area in order to reduce the number of access points along Honeyball Road.
Business	Standard conditions of the TPS.	o Business uses including retail to be considered. o Design and landscaping requirements to be met.
Residential	Standard conditions of the TPS.	Policy Area A Residential area to remain and applications for home offices to be considered on merit. An increase in residential density also to be considered favourably. All uses will be subject to the normal conditions of the Town Planning Scheme (TPS) and existing Council policies.
Special	Standard conditions of the TPS.	Policy Area B Special zoning to allow for a wide variety of uses including residential, guest houses, crèches, book shops, restaurants and related uses which are compatible with and which will enhance the educational and residential character of the surrounding area. All uses will be subject to the normal conditions of the TPS and existing Council policies. Attention needs to be given to certain road closures and limited access along both Golf Club Terrace and Christiaan de Wet Road. Such road closures and limited access would be aimed at reducing the through-traffic within this Policy Area.
Public Open Space	Standard conditions of the TPS and recreational uses to be accommodated where applicable.	Landscaping and water course development requirements to be met.
LEN RUTTER PARK PRECINCT		The aim of development in this precinct is to retain a central area of high quality public open space and recreational facilities surrounded by low intensity, high quality urban development. Through this it is intended to create a safe and secure green space and urban area.

ZONING	DEVELOPMENT CONTROLS	POLICY AREA & ADDITIONAL REQUIREMENTS
Business	**Height**: 2 storeys **Coverage**: 30% **FAR**: 0,5 **Parking**: APS SDP Approval	o Urban design and landscaping requirements to be met. o Where applicable, land donated in exchange for watercourse development undertaken by developer. Policy Area D. The development of this area is purely intended for an office park environment, including medical suites. No retail uses to be considered in this Policy Area. Furthermore limited access should be provided to this specific Policy Area, ideally one through a maximum of 1 entrance point and 1 exit point. This area should only be divided into a maximum of 2 individual properties.
Residential	**Density**: 20 units/ha **Height**: 2 storeys SDP Approval In Policy Area E the standard conditions of the TPS will apply	o Design and landscaping requirements to be met. o Where applicable, land donated in exchange for development of proposed street by developer. Policy Area E. This area to remain residential, but business development and higher density residential development to be considered on merit and only where such development take place on a block basis where a block is considered to be a consolidation of at least 4 of the existing erven. Incentives to encourage such block development should be considered.
Public Open Space	Standard conditions of the TPS.	o Landscaping and water course development requirements to be met o recreational uses to be accommodated where applicable.
Business	Standard conditions of the TPS.	o Urban design and landscaping requirements to be met. Policy Area F. To create an urban landmark a height of 6 storeys to be considered for development on these corner stands. The northward extension of this Policy Area to incorporated the 2 erven directly to the north of the existing Policy Area should be considered on merit where such an extension would allow for a more viable development.
FLORIDA CBD PRECINCT		It is intended to promote business and mixed use development in the area along Goldman Street and to the south thereof towards the railway line. The residential area to the north of Goldman Street needs to be retained as far as possible and applications for a change in land use to be considered on merit and subject to existing Council policies. Where possible the upgrading of existing, but older developments should be encouraged.
Residential	Standard conditions of the TPS.	Policy Area G. This area constitutes an area of mixed uses which is subject to the section of the Florida Development Plan setting out the development guideline for the development of this specific Policy Area. These guidelines will apply to this Policy Area in terms of the Greater Florida UDP.
Business	Standard conditions of the TPS.	o Upgrading where possible. Policy Area G. This area constitutes an area of mixed uses which is subject to the section of the Florida Development Plan setting out the development guideline for the development of this specific Policy Area. These guidelines will apply to this Policy Area in terms of the Greater Florida UDP.

ZONING	DEVELOPMENT CONTROLS	POLICY AREA & ADDITIONAL REQUIREMENTS
BIRD SANCTUARY PRECINCT		The bird sanctuary is to be retained and made more accessible to the general public. Complementary uses such as environmental education facilities or a museum can be accommodated within this area. Additional uses such as low key, environmentally compatibly restaurants should purely be considered on merit and subject to the conditions of the TPS or applicable and approved Council policies.
Public Open Space	Standard conditions of the TPS.	o Landscaping and water course development requirements to be met. o Other uses to be incorporated should be located in areas highlighted in Map -.
FLORIDA LAKE PRECINCT		This precinct is to be developed as the hub of activity whilst maintaining the softer, greener environment currently present. Uses which are currently in operation around the Lake will remain and be incorporated into the general design and landscaping. Some land, however are to be utilised for economic development and such land are indicated on Map -.
Residential	Standard conditions of the TPS.	o Street closures to consider access of residents.
Public Open Space	Standard conditions of the TPS and recreational uses to be accommodated where applicable.	o Landscaping and water course development requirements to be met.
Business	**Height**: 3 storeys **Coverage**: 70%, but where parking is provided under the building = 80% **FAR**: 1,5 **Parking**: To be provided to the satisfaction of the Council. SDP Approval <u>In Policy Area F</u>: Standard conditions of the TPS. <u>In Policy Area G</u>: **Height**: 3 storeys **Coverage**: 40%, but where parking is provided under the building = 45% **FAR**: 1,2 **Parking**: APS SDP Approval	o Urban design and landscaping requirements to be met. o Where applicable, land donated in exchange for water course development undertaken by developer. Policy Area H. This is currently an area of mixed uses and it is envisaged that this mixed use character will remain. Specific uses to be considered and promoted are that of hotels and conference facilities. Attention however needs to be given to the design and quality of future development and the upgrading of the area in general. o Urban design and landscaping requirements to be met. Policy Area I. The existing facilities need to be relocated and business development in the form of retail, home industries, mini factories, SMME incubator uses, markets and the like encouraged. The use of the existing structures on the site and the conversion thereof to accommodate such business uses need to be promoted. Ideally the creation of an urban area similar to Granville Island, Vancouver, Canada should be a guiding example in this specific Policy Area. o Urban design and landscaping requirements to be met. o Existing structures to be retained as far as possible.
FLEURHOF SOUTH PRECINCT		The notation given to this specific area only indicates a residential zoning, but this does not exclude uses such as schools, parks and other community related uses which serve the residential area. Where applicable, consideration also needs to be given to uses such as public garage and limited retail facilities such as local neighbourhood centres.
Public Open Space	Standard conditions of the TPS and recreational uses to be accommodated where applicable.	o Landscaping and water course development requirements to be met.

ZONING	DEVELOPMENT CONTROLS	POLICY AREA & ADDITIONAL REQUIREMENTS
Residential	Standard conditions of the TPS.	○ Design requirements to be met. Policy Area J. The zoning of this area is indicated as "Residential", but related uses such as schools, churches, park area and business uses are to be introduced and considered on merit. The proposed residential area need to cater for a variety of residential densities and designs. Densities should be aimed at approximately 10 units/ha along the existing Fleurhof residential area boundary in the north with an increase in densities to approximately 40 units/ha in the south along the water course. In specific areas towards the southern edge of this proposed residential area, much higher densities e.g. 100 units/ha should be considered on merit. With these higher densities a lower coverage should be allowed with a higher percentage of the area being utilised for landscaping purposes. The design and landscaping guidelines would apply in this respect. In this particular instance it is also not the intention to create single residential erven but to provide for alternative housing options such as town houses or cluster house development.
MINING BELT PRECINCT		The aim of development in this precinct would be to extend the existing industrial development occurring along Main Reef Road in an westerly direction and incorporating the Water based spine running through the entire study area into such future development. No noxious industries would however be allowed. Complementary uses such as training facilities, take away and retail related to the industrial uses should be considered favourably. The mining related activities within this area are considered to be retained for the foreseeable future and therefore only addressed in terms of landscaping. Along the water course recreational uses need to be incorporated. Such uses would include theme parks and sports fields.
Public Open Space	Standard conditions of the TPS and recreational uses to be accommodated where applicable, in particular regional recreation facilities.	○ Landscaping and water course development requirements to be met. Policy Area K. There should be a specific focus on the establishment of training facilities in this Policy Area. Furthermore, attention needs to be given to the integration of the industrial and training uses with the area surrounding the river course. Sensitive landscaping and design need to be applied to create an area of industrial and training uses set in a more park like atmosphere which includes recreational facilities.
Industrial	Standard conditions of the TPS, excluding noxious industries.	○ Training facilities to be the focus in Policy Area L. This area in particular is to be used for the development of regional recreational facilities. This area is in close proximity to the large population concentration in Meadowlands where a under supply of recreational facilities has been identified. The facilities to be established within this Policy Area need to address that need. ○ Design and landscaping requirements to be met.
Mining		○ Landscaping requirements to be met.

ZONING	DEVELOPMENT CONTROLS	POLICY AREA & ADDITIONAL REQUIREMENTS
MEADOWLANDS PRECINCT		The proposed northward link road of Westlake Extension will provide an opportunity for some economic development along the road into Heckroodt Circle through greater accessibility and visibility. This would in all likelihood become a mixed use area with a focus on informal trade and related uses. The remainder of this precinct need to be considered in terms of the development proposals of the Dobsonville/Meadowlands UDP and Upgrading Initiative.
Public Open Space	Standard conditions of the TPS and recreational uses to be accommodated where applicable.	o Landscaping and water course development requirements to be met.
Residential	Standard conditions of the TPS.	Policy Area M. In this Policy Area a mixed land use pattern is the main focus where residential uses and areas of employment are integrated. The height should not exceed 3 storeys and landscaping and urban design requirements need to be met. Policy Area N. This area is located directly adjacent to the proposed N17 motorway. Residential densities in this area should be high at a maximum of 150 units/ha with a maximum height of 3 storeys. Attention needs to be given to design alternatives and landscaping. o Urban design and landscaping requirements to be met.
Business	Standard conditions of the TPS.	Policy Area M. In this Policy Area a mixed land use pattern is the main focus where residential uses and areas of employment are integrated. The height should not exceed 3 storeys and landscaping and urban design requirements need to be met. o Urban design and landscaping requirements to be met
STATION PRECINCTS		The two stations within the study area need to be considered as areas of upgrade and the incorporation of intermodal facilities, particularly taxi facilities as well as areas for informal trade.
Public Open Space	Standard conditions of the TPS and recreational uses to be accommodated where applicable.	o Landscaping and water course development requirements to be met.
Residential	Standard conditions of the TPS.	o Urban design and landscaping requirements to be met
Business 1	Standard conditions of the TPS.	o Upgrading where possible. o Urban design and landscaping requirements to be met
		o indicates additional requirements

ANNEXURE D- ENVIRONMENTAL ASPECTS CHECKLIST

1. PHYSICAL CHARACTERISTICS OF THE SITE AND ITS SURROUNDINGS

Land

- the nature of surface (e.g. old weathered surfaces)
- the nature of substrata (e.g. rock, soil deposit)
- unstable bedrock or fault lines
- seismic activity
- slope of the land
- waterlogging of depressions
- the binding or bonding of soils
- stability of site
- surface subsidence
- compressive strength of soils
- rates of erosion or siltation by wind or water
- the potential of soils to be used for formal/informal agricultural purposes
- the potential of soils to be used for commercial purposes
- access to mineral deposits
- the availability of or access to construction materials such as rock and gravel
- the availability of topsoil or fill material
- the management of excess soil or spoil material
- unique geological or physical features
- mobile sand dunes
- prominent landscape features
- existing physical degradation of the local environment

Freshwater systems

- streams or river channels
- river flow
- natural drainage patterns
- engineered drainage patterns
- drainage limitations
- the water-table
- run-off as a result of the hardening of surfaces, or loss of the sponge effect of vegetation
- changes to floodplains
- the quality or quantity of surface water groundwater or public water supplies
- conservation or recreational value of rivers, streams, lakes, wetlands, dams or islands
- ability to absorb run-off
- threats to hydrological functioning through existing or altered:
  - pollution
  - turbidity
  - salinity
  - chemical processes or nutrient balances
  - changes in sediment flows and siltation rates
  - canalisation
  - impoundment construction
  - water extraction

Marine and estuarine systems

- prominent coastal features such as coastal cliffs
- existing or altered processes such as:
  - wave and tidal action
  - deposition/removal of sand
  - sedimentation rates and patterns turbidity
  - salinity
  - chemical processes or nutrient balances
- inherently unstable ecosystems such as:
  - mobile sand dunes
  - sand sources such as mobile sand dunes
  - rocky and sandy shorelines
  - the seabed and sub-tidal areas
  - coastal islands
  - functioning of estuary systems
  - river mouths

Climate

- wind strength, direction and frequency
- frequency of flash-floods
- rainfall patterns
- fluctuations in temperature or humidity
- intensity of inversions
- dispersal or influx of pollutants
- global warming and sea-level rise

2. ECOLOGICAL CHARACTERISTICS OF THE SITE AND ITS SURROUNDINGS

Vegetation

- survival of rare or endangered plant species
- diversity of plant communities
- sand-trapping vegetation such as that found on foredunes
- vegetation communities of conservation or scientific importance
- conservation of vegetation communities of particular recreational value
- the introduction or spread of invasive alien seeds and plants
- natural replenishment of existing species
- frequency of veldt fires
- frequency of use of off-road vehicles
- amount of trampling of special areas of vegetation
- firewood collection
- overgrazing
- over-exploitation
- genetically engineered organisms

Animals

- survival of rare or endangered animals
- diversity of animal communities
- animal communities of particular scientific, conservational or educational value
- natural migration of species
- survival of animal communities of particular recreational value
- non-resident or migrant species
- alien species (including invasive and domestic species)
- survival of animal communities due to:
  - frequency of veldt fires
  - threat from poaching
  - frequency of use of off-road vehicles
  - intrusion of roads and fencing
  - over-exploitation
  - genetically engineered organisms

Natural and semi-natural communities

- local, regional or national importance of the natural communities (e g economic, scientific, conservational, educational)
- compatibility of the development and the natural communities
- appropriateness of conservation methods to be employed
- ecological functioning of natural communities due to:
  - physical destruction of the habitat
  - reduction in the effective size of the community
  - quality and flow of groundwater
  - quality of standing or flowing water
  - oxygen content of the water
  - salinity
  - turbidity
  - flow rate
  - temperature level of chemical and other forms of pollution
  - eutrophication toxins such as effluents or poisons
  - siltation patterns
  - air quality
  - levels of dust pollution and deposition
  - availability of food
  - the construction of access routes, roads and pathways
  - recreational pressure
  - secondary or cumulative impacts affecting other natural communities
  - presence or introduction of invasive alien species
  - rehabilitation potential
  - predator-prey relationships
  - barriers to animal movement or migration
  - altered fire regime

3. CURRENT AND POTENTIAL LAND USE AND LANDSCAPE CHARACTER

General considerations applicable to all development proposals

- compatibility of land uses within the area
- aesthetic quality of the landscape
- sense of place within the area
- character of the area
- compatibility with the scale of developments in the area
- compatibility with building materials used in the area
- preservation of scenic views and valued features
- revitalisation of run-down areas
- landscaping plans and/or site restoration proposals
- need for buffer zones to allow for natural processes such as coastal erosion, windblown sand and changes in river channels
- political considerations such as land claims and historical rights
- legal considerations such as servitudes and rights of way

Urban open space, protected and recreational areas

- urban open space systems or recreational areas
- natural features such as streams and ridges
- natural heritage sites
- change in use or intensity of use
- pressures on recreational facilities and open space systems
- improved public amenity
- enhancement or linkage of facilities and open space systems
- rehabilitation of disturbed or degraded sites
- potential for harbouring vagrants and criminals

Residential areas

- need to displace people or affect existing housing
- lifestyle, neighbourhood character or stability
- quality of life within the residential area
- effect on views, overlooking and privacy
- effect of overshadowing causing loss of sunlight hours
- compatibility with the surrounding residential developments
- community cohesion
- the needs of the elderly, handicapped or other special interest groups
- community safety aspects such as lighting, open areas and policing
- adequacy of infrastructure to service the area (see also section 7)
- access and movement patterns
- change in the volume of through traffic
- property values and local tax base

Commercial areas

- character of urban centre
- volume of traffic and adequacy of vehicular access
- inappropriate siting
- provision of parking
- adequacy of pedestrian walkways
- conflicts between vehicular and pedestrian traffic
- safety of the area and surveillance
- the rate of decay or change in character of the area

Industrial areas

- volume of traffic and adequacy of vehicular access
- levels of pollution - gas emissions, effluent or solid waste
- polluted street run-off
- aesthetic quality of the area
- provision of parking

Agricultural and sylvicultutal areas

- use of high-potential farmland
- use of areas available for commercial forests
- a need for buffer zones or greenbelts to contain urban sprawl
- availability of water
- pollution levels of air and local water supplies by fertilisers, pesticides or feedlots
- disease control activities such as crop spraying
- rate of soil erosion and sedimentation
- levels of toxins, dust and bad smells in the air
- bush encroachment
- damaged land due to overgrazing or bad farming methods
- spread of invasive alien plants
- provision of housing and educational facilities

4. CULTURAL RESOURCES

Sites and resources

- structures and sites of architectural, cultural or historic heritage
- sites of archaeological or palaeontological importance
- special attraction of local sites, traditions or events
- sites or areas of religious or spiritual significance
- sites or areas of special social or cultural interest
- the integrity of cultural resources

5. SOCIO-ECONOMIC CHARACTERISTICS OF THE AFFECTED PUBLIC

Demographic aspects

- growth rate of the local population
- location, distribution or density of the population
- existing age or gender composition of the population
- existing migration movements
- existing biographical composition of the population
- inflow of tourists

Economic and employment status of the affected social groups

- economic base of the area
- distribution of income
- local industry
- rate and scale of employment growth
- labour needs and the spare labour capacity of the area
- movement of labour away from existing employment in the area
- job opportunities for school-leavers
- competition through non-local labour moving into the area
- non-local labour remaining in the area after completion of the development
- pressure placed on particular skills, age range or gender needs
- short- and long-term unemployment trends

Welfare profile

- incidence of crime, drug abuse, or violence
- extent of homelessness and overcrowding
- adequacy of support systems such as crèches and shelters for destitute children
- quality of life (see also section 7 on infrastructure and section 8 on community services and facilities)
- adequacy of services

Health profile

- availability of clinics/health services
- incidence of disease
- incidence of mental illness
- threats to health from pollution (see also section 9 on pollution)

Cultural profile

- existing lifestyles, household composition and family network
- cultural or lifestyle diversity
- cultural or lifestyle stability
- religious and cultural attitudes, outlooks and expectations of the local population

6. INFRASTRUCTURE SERVICES

Energy supply

- the demand for power and its effect on peak and base loads
- power generation and associated infrastructure
- the need for new transmission lines
- the adequacy of emergency power facilities
- the danger to the local community and the environment or processing units in the case of a major power failure
- availability of alternative fuel source
- planned provision of power for the area

Water

- water rights
- wasteful or excessive water requirements
- planned provision for water supply to the area
- adequacy and reliability of water supply
- adequacy of groundwater reserves
- need for additional abstraction schemes or construction of new supply reservoirs
- adequacy of emergency supply system
- need for additional purification systems
- need for inappropriately sized or located impoundment
- need for new pipelines
- danger to local people and industry in the event of a major water supply failure

Waste management

- efficiency and capacity of existing waste management facilities
- extent of contribution to centralised waste-processing facilities
- ability to provide necessary facilities need for new pipelines
- risk associated with waste transport
- adequacy of emergency waste disposal facilities
- risk to the community and the local environment should the facility break down
- hazard of groundwater pollution
- danger of rodents and scavengers at waste sites
- potential for windblown or waterborne refuse pollution
- visual and smell effects of waste sites and treatment works
- hazard of birds to air traffic near sewage ponds and landfill sites
- utilisation of treated waste water and recycled materials
- on-site waste management potential

Transport networks

- existing transport systems
- present patterns of circulation or movement of people and/or goods
- generation of more private and public traffic
- adequacy of existing road network
- adequacy of existing parking facilities
- adequacy of existing traffic management schemes
- need for and desirability of additional road schemes over and above those which have been planned
- temporary access roads used for the development
- a viability of the rail service
- rail capacity
- need for additional rail links
- adequacy of harbour facilities
- need for expanded harbour and related facilities
- adequacy of air transport facilities
- ability of commerce and social facilities to locate along route

Education

- demand for specific types of technical skills training
- demand for specific types of industrial training
- adequacy of existing technical institutions
- adequacy of nursery, junior and secondary education facilities
- need for additional education facilities
- demand which exceeds the planned provision of educational facilities
- pre-school facilities

Housing ○ property values and levels of rates ○ potential conflict over land use ○ availability of housing stock ○ need to release additional land for housing developments ○ acceptability of such land release ○ adequacy of infrastructure for further housing developments ○ ability of private or local authority to provide housing ○ location for suitable housing sites	○ compatibility of planned development with existing housing ○ sites suitable for construction camps ○ standard of provision of facilities required by authority ○ design and layout of site facilities ○ use to which construction camp may be put alter termination of the construction period
Telecommunication ○ installation of additional telecommunication transmission lines or facilities	○ existing telecommunication network
Financial implications to region ○ job creation and economic opportunity ○ enhancement of regional sell-sufficiency ○ financial programmes of responsible authority ○ comparative wage rates between those of existing employment in the local area and those offered by the new development ○ insurance rates	○ movement away from existing employment due to higher wage rates offered in the new development ○ cost implications of the supply of energy, water waste management, transportation, education, housing and telecommunication
7. SOCIAL AND COMMUNITY SERVICES AND FACILITIES	
Health service facilities ○ adequacy of temporary facilities during construction phase of developments ○ adequacy of on-site health facilities ○ adequacy of facilities for primary health care (e g screening facilities for tuberculosis or AIDS, family planning advice)	○ adequacy of the existing health services to cope with increased population ○ projected provision of health service facilities ○ need for additional facilities
Emergency services ○ adequacy of existing emergency services (e.g. fire and ambulance services) ○ projected provision of services to meet increased demand ○ need for additional emergency services	○ adequacy of the emergency and safety services provided by the developer ○ ability of the local resources to deal with emergencies
Recreational facilities ○ adequacy of existing facilities ○ projected provision of facilities to meet increased demand	○ need for additional facilities ○ recreational and service facilities in the workplace

8. THE NATURE AND LEVEL OF PRESENT AND FUTURE ENVIRONMENTAL POLLUTION

Air pollution

- existing levels of atmospheric pollution
- the nature of air pollution, such as ozone-depleting gases, acidic compounds and toxic substances
- extent of the local build-up of pollutants due to inversions
- compounding of effects with existing pollutants or other chemicals in the atmosphere (e.g. photochemical smog production)
- smog formation and reduction in visibility
- production of offensive odours
- quantity and type of particulate matter produced with reference to size, composition and chemical stability
- pollution of adjacent sensitive areas
- effects on human health, crops, wildlife, livestock and other potentially affected organisms
- effects on stonework, buildings or works of art

Water pollution

- level of water pollution
- high localised levels of pollution
- pollution of surface waters from polluted underground waters
- the concentration of pollutants due to variations of water flow
- localised pollution build-up through changes in salinity gradients and/or current movements
- effective dispersal mechanisms
- salinization of fresh waters
- synergistic or compounding effects with existing pollutants
- production of offensive odours
- effect of treated or untreated effluent on the flora and fauna of river lake, canal, estuary or coastal waters
- effects on dependent natural communities through changes in aquatic fauna and flora
- effect on irrigation schemes
- effect on recreational activities

Noise, vibration and lighting

- increase in ambient noise, vibration or illumination levels
- length of time that there will be noise, vibration or lighting impacts
- peace and quiet of residential areas either during day- or night-time
- change in the quality of life due to artificial lighting
- functioning of schools, hospitals and old people's homes or informal recreation areas
- exacerbation of "creeping" ambient noise levels
- the need for individual protection against noise
- levels of annoyance and discomfort due to vibration caused by such activities as blasting and pile-driving
- structural damage caused to buildings by vibration
- effects on wildlife of nature reserves, sites of special scientific interest, or high-quality habitat of local significance
- reduction of wilderness quality in declared wilderness areas

Visual pollution (see also section on land use and landscape character)

- existing level of visual pollution
- reduction in aesthetic quality of the environment through:
  - sign-boards and advertising
  - overhead transmission cables and telephone wires .
  - unsightly or inappropriate walls, buildings, roads or other installations

Solid of liquid waste and by-product disposal

- existing or proposed water disposal plans
- choice of alternative means of disposal
- alternative treatment technologies
- choice of disposal sites
- biological and chemical characteristics of the leachates generated within the disposal site
- the quantity of leachates produced
- measures to reduce or treat leachates
- potential pollution of nearby surface waters
- potential groundwater pollution
- waste minimisation potential of process
- containment and treatment of wastes at site of generation
- final disposal option
- gas emissions from landfill
- allowance for physical and chemical variation in waste generated
- visual intrusion caused by waste disposal site or disposal plant
- potential health hazard to nearby residents
- suitability of traffic to transport the waste materials
- volume of traffic to transport the waste materials
- proposed alter-use of the site and its management

9. RISK AND HAZARD

Identification of:

- standards required for process equipment in chemical and processing industries:
  - safety and design reviews
  - safety audits
  - hazard and operability reviews
  - failure mode and effect analysis
- the level and identity of hazard to the public
- probability of occurrence
- extent of effect - local, regional or panoramic
- workers' safety/degree of risk
- the level of risk and hazard for other living organisms

10. HEALTH AND SAFETY

Effects in the workplace through:

- dust, fume and particulate matter
- noise
- odours
- gases
- vapours
- use of dangerous chemicals
- lighting
- heat
- cold
- noise
- vibration
- radiation
- protective clothing and equipment
- access to recreational facilities
- risk of workplace accidents
- risk of major disasters involving multiple loss of life or injury
- availability of services such as crèches, factory-based health services, canteens, change-rooms, toilets

Effects in the surrounding areas through:

- o dust
- o fumes
- o particulate matter
- o noise
- o vibration
- o radiation
- o odours
- o gaseous emissions
- o vapours
- o use of dangerous chemicals
- o lighting
- o risk of major disasters involving explosions or major leaks of toxic liquids or gases
- o solid waste disposal techniques
- o liquid waste effluent and disposal

11. CUMULATIVE AND SYNERGISTIC EFFECTS

- o the ability of the natural and social environments to assimilate cumulative stresses placed on them
- o the likelihood of negative synergistic effects
- o existing or future development rights because of a precedent being set

12. ENHANCEMENT OF POSITIVE CHARACTERISTICS

- o any of the characteristics listed in points 2 to 11 above

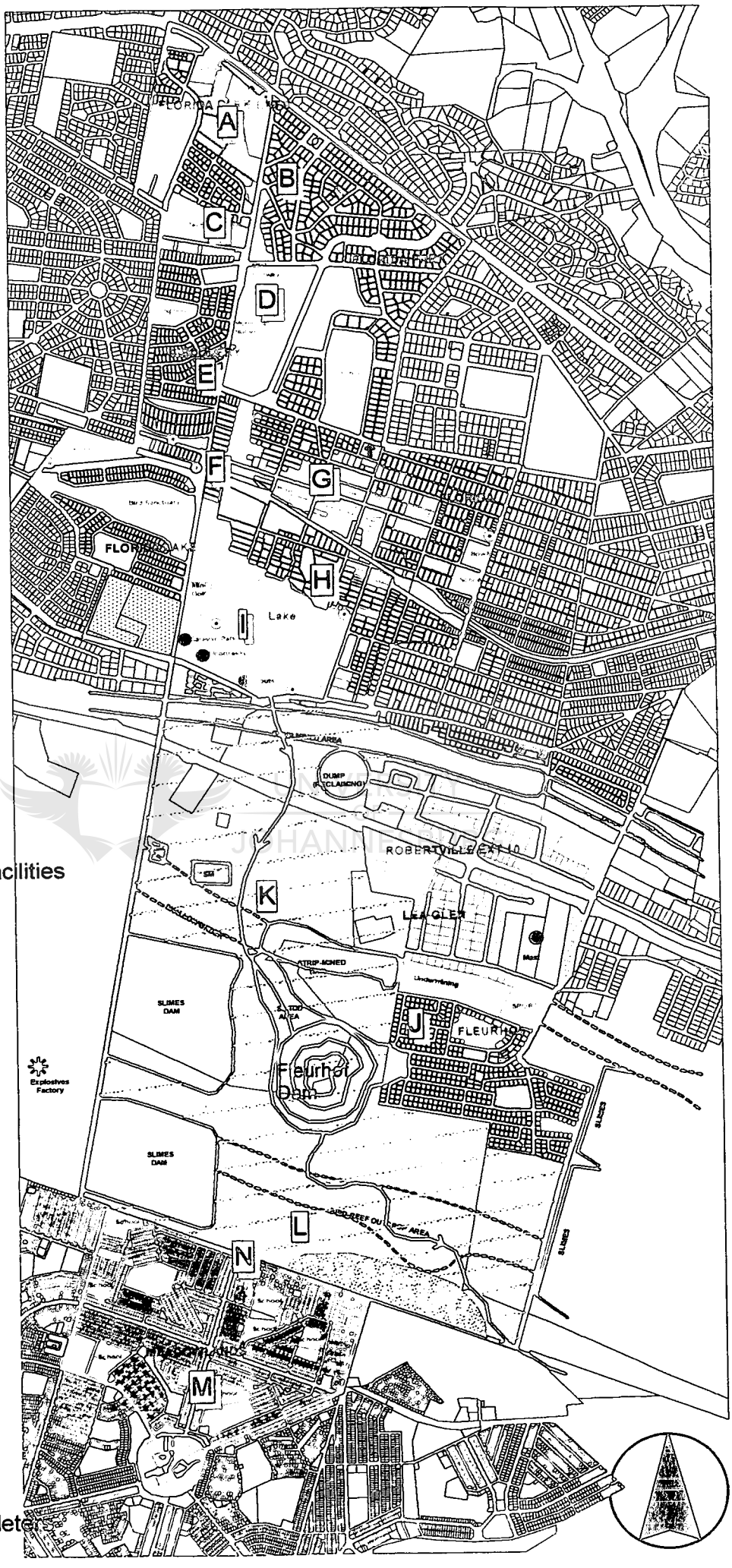
ANNEXURE E- ALLOCATION OF INFORMATION RESPONSIBILITIES TO DEPARTMENTS AND AUTHORITIES

INFORMATION	RESPONSIBLE DEPARTMENT
International Conventions and Agreements	National & Provincial Government, **EM**
SECTION 21 ACTIVITIES	
1 The construction or upgrading of:	
○ facilities for commercial electricity generation and supply	BC, **TS**
○ nuclear reactors and installations for the production, enrichment, reprocessing and disposal of nuclear fuels and wastes	Prov Gov., BC, EH, EM & **TS**
○ transportation routes and structures, and manufacturing, storage, handling or processing facilities for any substance which is dangerous or hazardous and is controlled by national legislation	Prov Gov., BC, EH, EM & **TS**
○ roads, railways, airfields and associated structures outside the borders of town planning schemes	Prov Gov. & **TS**
○ cableways and associated structures	Prov Gov., BC, EM & **TS**
○ structures associated with communication networks, other than telecommunication lines and cables, as well as access roads leading to these structures	GIS from Telecom service providers
○ racing tracks for motor-powered vehicles and horse racing, excluding indoor tracks	BC, EH, EM & **TS**
○ canals and channels, including diversions of the normal flow of water in a river bed and water transfer schemes between water catchments and impoundment	Prov Gov. & **TS**
○ dams, levees or weirs affecting the flow of a river	Prov Gov. & **TS**
○ reservoirs for public water supply	Prov Gov. & **TS**
○ schemes for the abstraction or utilisation of ground or surface water for bulk supply purposes	Prov Gov. & **TS**
○ public and private resorts and associated infrastructure	BC, EH, EM & **TS**
○ sewage treatment plants and associated infrastructure	EH, **TS**
○ buildings and structures for industrial and military manufacturing and storage of explosives or ammunition or for testing or disposal of such explosives or ammunition	Prov Gov., BC, EH, EM & **TS**
2. The change of land use from:	
○ residential use to industrial or commercial use	BC & **DP**
○ light industrial use to heavy industrial use	BC & **DP**
○ agricultural or undetermined use to any other land use	BC & **DP**
○ use for grazing to any other form of agricultural use	**DP**
○ use for nature conservation or zoned open space to any other land use	BC, **EM** & TS

INFORMATION	RESPONSIBLE DEPARTMENT
3. The concentration of livestock in a confined structure for the purpose of mass commercial production.	BC, **EH** & TS
4. The intensive husbandry of, or importation of, any plant or animal that has been declared a weed or an invasive alien species.	BC, **EH** & TS
5. The release of any organism outside its natural area of distribution that is to be used for biological pest control.	EH, **EM** & TS
6. The genetic modification of any organism with the purpose of fundamentally changing the inherent characteristics of that organism.	EH & **EM**
7. The reclamation of land below the high-water mark of the sea and in inland water including wetlands.	EM & **TS**
8. The disposal of waste in terms of section 20 of the Environment Conservation Act, 1989.	**EH**, EM & TS
9. Scheduled processes listed in the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965).	**EH**, EM & TS
PROTECTED AREAS	
Protected Natural Environment	**EM**
Special Nature Reserves	
Limited Development Areas	
Biosphere Reserves	
Private Conservancies	
Natural Heritage Sites	**EM** & BC
ENVIRONMENTAL CHARACTERISTIC	
PHYSICAL CHARACTERISTICS OF THE SITE AND ITS SURROUNDINGS	
Land	**GIS**
Freshwater systems	**GIS**, EM
Climate	**GIS**
ECOLOGICAL CHARACTERISTICS OF THE SITE AND ITS SURROUNDINGS	
Vegetation, Animals, Natural and semi-natural communities	**EM**
CURRENT AND POTENTIAL LAND USE AND LANDSCAPE CHARACTER	
General considerations applicable to all development proposals	BC, EM, **DP**, TS
Urban open space, protected and recreational areas	EM, **DP**
Residential areas	**DP**, BC
Commercial areas	**DP**, EM, BC
Industrial areas	**DP**, EM, BC
Agricultural and sylvicultutal areas	**DP**, EM, BC, TS

INFORMATION	RESPONSIBLE DEPARTMENT
CULTURAL RESOURCES	
Sites and resources	**DP**, EM, BC
SOCIO-ECONOMIC CHARACTERISTICS OF THE AFFECTED PUBLIC	
Demographic aspects	No specific department responsible, National Government **census data** to be obtained.
Economic and employment status of the affected social groups	**LED**
Welfare profile	**EH**
Health profile	**EH**
Cultural profile	Nat Gov. **census data**
INFRASTRUCTURE SERVICES	
Energy supply	**TS**
Water	EH, **TS**
Waste management	EH, **TS**
Transport networks	Prov Gov. & **TS**
Education	**Prov Gov**.
Housing	**Prov Gov**. & HA
Telecommunication	**GIS** from Telecom service providers
Financial implications to region	DP & **LED**
SOCIAL AND COMMUNITY SERVICES AND FACILITIES	
Health service facilities	**EH**
Emergency services	**ES**
Recreational facilities	**DP**, LED
THE NATURE AND LEVEL OF PRESENT AND FUTURE ENVIRONMENTAL POLLUTION	
Air and Water pollution	**EH**, EM
Noise, vibration and lighting	**EH**, EM
Visual pollution (see also section on land use and landscape character)	BC, **DP**
Solid or liquid waste and by-product disposal	EH, EM, **TS**
RISK AND HAZARD	

INFORMATION	RESPONSIBLE DEPARTMENT
Identification	**All**
HEALTH AND SAFETY	
Effects in the workplace	BC, **EH**
Effects in the surrounding areas	BC, **EH**, TS
CUMULATIVE AND SYNERGISTIC EFFECTS	
Identification	All
ENHANCEMENT OF POSITIVE CHARACTERISTICS	
Identification	All
OTHER	
Identification	All
Note: Possible "lead" Department indicated by bold and underline	



POLICY AREA
PRECINCTS

TECHNICON SOUTH AFRICA
A, B & C
LEN RUTTER PARK
D, E & F
FLORIDA CBD
G
FLORIDA LAKE
H & I
FLEURHOF SOUTH
J
MINING BELT
K & L
MEADOWLANDS
M & N

⊙ Monum.shp

Landuse

- Business (Retail/Offices)
- Community & Education Facilities
- Industrial
- Municipal
- Public Open Space
- Residential
- Vacant
- Agricultural
- Mining
- Properties
- Florida Lake Study Area

0 500 1000 1500 Meters

LANDUSE