



DEPARTMENT: WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

Strategic Environmental Assessment for Water Use in the Usutu-Mhlathuze WMA - Scoping Report.



Strategic Environmental Assessment

Author: Harrison Pienaar
Address: Private Bag X313
Pretoria, 0001
SOUTH AFRICA
Tel: (+27) 12 336-8238
Fax: (+27) 12 336-8947
Email: Harrisonp@dwaf.pwv.gov.za

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ABBREVIATIONS

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BID	Background Information Document
CMA	Catchment Management Agency
DFID	Department for International Development
DSS	Decision Support System
DWAF	Department of Water Affairs and Forestry
GIS	Geographic Information Systems
KNNCS	Kwazulu Natal Nature Conservation Services
SDI	Spatial Development Initiative
SEA	Strategic Environmental Assessment
WMA	Water Management Area

1. INTRODUCTION

1.1 AIMS AND OBJECTIVES OF THE SEA

There are two principal aims behind undertaking a strategic environmental assessment (SEA) for Water Use in the Usutu-Mhlathuze WMA. The first is, quite simply, **to achieve the goal and purpose of the SEA research programme**, as defined in the Logical Framework (Terms of reference). The second aim is **to assist the emerging Catchment Management Agency for the WMA in meeting some of its primary commitments**.

The **Goal** of the SEA research programme is to ensure that SEA Principles practice support the National Water Act.

The **purpose** of the SEA is to:

“Develop and test a replicable, participatory and affordable methodology and tools for incorporating strategic environmental assessments into decision-making regarding water use in Water Management Areas and Catchments.

The SEA's outputs to assist the CMA include:

- Developing a reliable database for strategic assessment.
- Identifying some of the key issues which need to be considered when formulating Catchment management plans and strategies.
- Creating a decision- support tool that can help to identify the strength and weaknesses of different water use options, in terms of their social, economic and environmental effects.
- Developing models for assessing hydro-economic, biophysical and social parameters.
- Enhancing the level of public participation about strategic water issues, particularly with regard to previously disadvantaged communities.

The SEA is being undertaken in close consultation with other directorates of DWAF and the Regional Office. Joint meetings, for the purpose of public participation, have been held with the Catchment Planning Team from Durban.

1.2 RELEVANT POLICIES, PLANS AND PROGRAMMES

One of the early tasks for the SEA Team and its consultants will be to review all relevant policies, plans and programmes (PPPs) generated by DWAF, other government departments at National and Provincial level, and by local government. It is important to clarify at the outset what is meant by relevant PPPs. **Policies** are statements prepared on behalf of government, or local authorities that define future actions and have the power of legislation behind them. Policies will usually be implemented within the framework of **Plans** (or Strategies) which identify the methods, physical extent, and resources

necessary to achieve the policy aims. **Programmes** set out the sequence of actions and time-scale for completing plans and strategies.

As a general principle, the SEA will need to consider:

- Those PPPs that relate directly to water use and water management.
- PPPs prepared for other infrastructure, land use and development activities that have the potential to have a significant impact on the water environment.

Relevant water based PPPs will include the National Water Resource Strategy, proposals for licensing, and water allocation, statements on the Reserve of major rivers, any policy statements, plans or proposals for water resource development prepared by Water Companies and Irrigation Boards. This is only an indicative list.

Relevant PPPs prepared for other purposes will include land use policies, plans and programmes for, inter alia, agricultural, forestry, industrial, power, mining and urban development. Some of these PPPs will be produced by the appropriate Government departments or Industrial Sectors. Others will be produced by the Town and Regional Planning Commission. The Department of Local Government and Housing, Municipal Authorities and the Department of Trade and Industry (Spatial Development Initiatives).

1.3 FORMAL APPROACH TO SEA

The SEA for the Usutu-Mhlathuze WMA will be conducted in accordance with the ***Guideline Principles for SEA in South Africa*** (DEAT/CSIR; 2000 - see Box 1). This basic methodology was developed in the Pilot Study for the Mhlathuze Catchment and is described in the ***Draft Guide for Water Use in Catchments*** (DWAf; August 2001). The essential tasks to be carried out in the SEA are reproduced below from the Draft Guide.

Box 1 Guideline Principles for SEA in South Africa

1. SEA is driven by the concept of sustainability.
2. SEA identifies the opportunities and constraints, which the environment places on the development of policies, plans and programs.
3. SEA sets the criteria for levels of environmental quality or limits of acceptable change.
4. SEA is a flexible process which is adaptable to the policy, planning and sectoral development cycle.
5. SEA is a strategic process, which begins with the conceptualisation of the policy, plan or programme.
6. SEA is part of a tiered approach to environmental assessment and management.

7. The scope of a SEA is defined within the wider context of environmental processes.
8. SEA is a participative process.
9. SEA is set within the context of alternative scenarios.
10. SEA is based on the principles of precaution and continuous improvement in achieving sustainability objectives.

Source: SEA Guidelines prepared for Department of Environmental Affairs and Tourism by CSIR, 2000.

Outline description of the SEA process

The essential steps in carrying out an SEA for water use in catchments are set out below and the linkages between them are shown in diagram 1. Although the SEA Process is shown as a sequential set of actions, many of the steps overlap and it will often be appropriate to repeat some earlier actions in the light of feedback and responses to consultation.

Task 1 A **Scoping Study** is required at the outset to determine the brief, terms of reference, physical extent, subject matter, resources, and time-scale of the SEA,

Task 2 **Stakeholders are identified**, contacted and fully engaged in the process. Typically 20-30 organisations will be involved including:

- other DWAF directorates,
- other government departments,
- industry, agriculture, forestry and tourism sectors,
- rural communities.

Task 3 **Participation** by local people or their representatives is planned and made as effective as possible,

Task 4 A **comprehensive data-base** is set up,

Task 5 **Fact-finding reconnaissance surveys** are undertaken,

Task 6 **Technical Studies** of social, economic hydrological and biophysical conditions within the catchment are commissioned,

Task 7 **Key Issues** are identified through a process of free thinking and debate and are analysed and integrated to create coherent statements,

Task 8 **Decision Support Mechanisms** are put in place

Task 9 **The SEA Findings** are presented to Stakeholders and Local People using interactive GIS maps, charts, calculations and text,

- Task 10** **Conclusions** are presented to decision-makers in a user-friendly form.
- Task 11** **A Monitoring and Evaluation Framework** is set up to assess how far the SEA findings are being applied in decision-making
- Task 12** **Maintenance and Updating** of the information contained in the SEA Databases is built into the work programmes of relevant organisations.

2. PRELIMINARY LIST OF KEY ISSUES

2.1 BIOPHYSICAL ASPECTS AND ISSUES

The biophysical picture is one of potential for abundance in the mining, tourism and forestry and agriculture sectors. Some areas have been critically degraded and other adverse environmental conditions such as acid rain and high levels of atmospheric pollution will require appropriate policy and management measures. While Mpumalanga and Maputo provinces fall into higher rainfall areas in the region, careful water management will be needed if agriculture, forestry and industry are to grow.

Environmental degradation presents serious threats to the tourist industry in both Mozambique and Swaziland. Skills shortages hamper development of industry especially in manufacturing and tourism. Management of water resources in the face of drought is essential if agricultural potential is to grow. Mining activities have to be carefully managed to preserve environmental balance. Marine balance has to be maintained along the Maputo coastline to ensure sustainable fishing activities and the tourist industry. Water resources could come under pressure with future development.

Main economic activities (mining, steel and chemical industries, coal-fired power stations, etc) within the Mpumalanga province have negative environmental impact (atmospheric and water pollution and soil degradation). Negative environmental impact of especially older coal mining (e.g. open-cast mining leading to environmental degradation, pollution of underground water reserves). New mines conform to latest international standards. Overall decrease in demand for agricultural labour due to increasing mechanisation in the commercial farming sector and long-lasting droughts. Uncertainty re: labour legislation has contributed. Water-resource stabilisation (building of dams) is being undertaken, but the overall water resource potential is becoming limited especially for a high-consumption sector such as agriculture.

Forestry and sugar-cane farming, which is a popular crop among small farmers, require substantial water allocations. This is of concern and improved water management is crucial. Medium term cropping options should be investigated. Acid rain resulting from airborne pollutants in the Highveld may have a disruptive effect on agriculture and especially forestry.

Biodiversity - The St. Lucia wetland is the most significant element and has been declared a World Heritage Site. The lakes of the region are fairly well conserved particularly through the St. Lucia – Kosi Bay coastal park. Forestry and groundwater use may need to be severely restricted (i.e. a moratorium placed on any further

expansion) in order to preserve water supplies to these lakes (notably Sibayi). The Makhatini Flats present a unique ecosystem, as does the basin of the Rio Maputo in Mozambique.

Alien invasive plants – The problem of Alien invasive plants in the forestry zone and in the Drakensberg escarpment areas should not be overlooked. Forest plantations also encroach on riparian zones and wetlands.

2.2 Economic aspects and issues

Richards Bay - This is the only significant economic growth point and is of importance to the Mhlathuze catchment, the WMA and the South African economy. The Richards Bay/Empangeni complex is seen as the economic hub of the WMA. Additional water will have to be supplied if projected growth materialises.

SDI - The Lebombo Spatial Development Initiative (SDI) has resulted in significant infrastructure investment, notably the extension of the N2 highway north. Tourism has been identified as one of the main economic opportunities for the region. However, opportunities for tourism to utilise the Pongolapoort Dam, should be further explored.

Conservation and tourism - Significant areas have been conserved – particularly with the addition of the St. Lucia World Heritage Site and the northern St. Lucia – Kosi Bay Coastal Park. Tourism offers significant opportunities for development – but this also places demands on the water resource with implications for other development.

2.3 SOCIAL ASPECTS AND ISSUES

Politics - The institution of new civil structures which result in a diminution of the powers of Traditional Leaders creates uncertainty and conflict. The addition of a new administrative boundary (the WMA) adds to this uncertainty in the eyes of local people and is not easily accepted.

Poverty and health - Much of the WMA shows extreme poverty. The terrain is rugged and inhospitable over vast areas. This is reflected in the social conditions of poverty, illiteracy, and health. Cholera and HIV are major health concerns. The rural population within the WMA might decrease steadily as a consequence of HIV/AIDS, with growth only in the major centres. The closure of mines both within the WMA and nationally, with consequent retrenchments, is increasing social pressures.

Poverty and pressure for development through irrigation - Most of the catchments comprising the WMA are poor and lack development. There appears to be available water in some areas (the Pongolapoort Dam and the fact that there is no significant dam on the Mfolozi River). This results in severe pressure to utilise or develop these resources. Finance, infrastructure and lack of access to markets are major hurdles.

Land ownership and water for equity - Approximately 50% of the WMA is communally owned. Opportunities and constraints for development need to be determined - to assess the level of any inequity which might have arisen in the way water has been shared out historically, and to provide pointers as to how best to go forward. The biggest area of privately owned land is that of the upper Mkuze catchment. This river is heavily utilised – to the detriment of Lake St. Lucia.

2.4 WATER RESOURCE ASPECTS AND ISSUES

Surface hydrology - The water resources of the WMA need to be quantified with greater accuracy, as the WMA comprises a number of independent secondary catchments (although there are some inter-basin transfers). The strategies for the management of the water resources for each of these are not necessarily inter-related.

Groundwater - The NE sandplain of the WMA is endoric. Extensive areas are dependent only on groundwater and have no other source of supply. This requires different approaches to hydrological modeling and evaluation of resources. Excessive utilisation of this groundwater (for more than the maintenance of sustainable livelihoods) could threaten the coastal lakes (e.g. Lake Sibayi).

Water Quality (i) Pollution from coal mines in the upper Mfolozi and Mkuze catchments. The downstream impact needs to be quantified and evaluated.

Water Quality (ii) Salinization of irrigated lands on the Makhatini Flats and what this means in terms of irrigation development success and potential. This is of particular importance in the light of plans announced by the MEC for Agriculture to grow cotton extensively in this area.

Water Quality (iii) Sedimentation -The Black and White Mfolozi Rivers experience high levels of sedimentation (sand). This raises the question of how much of the sedimentation is due to both land use practice and natural erosion.

Water for Eskom - Eskom subtracts significant volumes of water off the Upper Usutu, notably through transfers into the Vaal system from the Heyshope, Morgenstond and Jericho Dams. This will continue to be the case until the power stations concerned are either converted into dry-cooled stations (seen as too costly) or decommissioned through old age.

2.5 CRITICAL STRATEGIC ISSUES

A critical strategic issue is that of water allocation to industry at the possible expense of the use of the upper catchment (irrigation, forestry, subsistence farming). The value of the upper catchment needs to be looked at as well as its value against industrial wealth, ability to pay, and the national need for growth. Richards Bay is one of South Africa's most successful growth points. It is part of the country's national economic drivers. At the same time it does not offer enough employment opportunities, indeed we understand that the number of employment decreases as efficiencies increase. However, people are still attracted to Richards Bay in search for employment that are not existing. The importance of the hinterland in serving as a buffer for job seekers and industries needs to be looked at.

Environment - Annual flooding of the Makhatini Flats is required to maintain both the ecology and the prevailing social system. This utilises much of the available water from Pongolapoort. The prawn industry in Mozambique is significant to that country (value in jobs and income?) and greatly affected by flows from the Rio Maputo

International obligations - Swaziland and Mozambique are affected by South African decisions. There is no agreement yet with Mozambique. Supplies to Mozambique could perhaps be supplemented through the Rio Maputo (Usutu & Pongola) in compensation for water from the Nkomati. This rather increases the pressure on the WMA.

Mkuze and St. Lucia - The Mkuze River is over-utilised (especially by upstream sugar), which causes a threat to Lake St. Lucia (now a world heritage site). Prospects include construction of a dam to regulate flows (increasing low flow), or regulating or buying out sugar. Some water is now being brought from Pongolapoort dam.

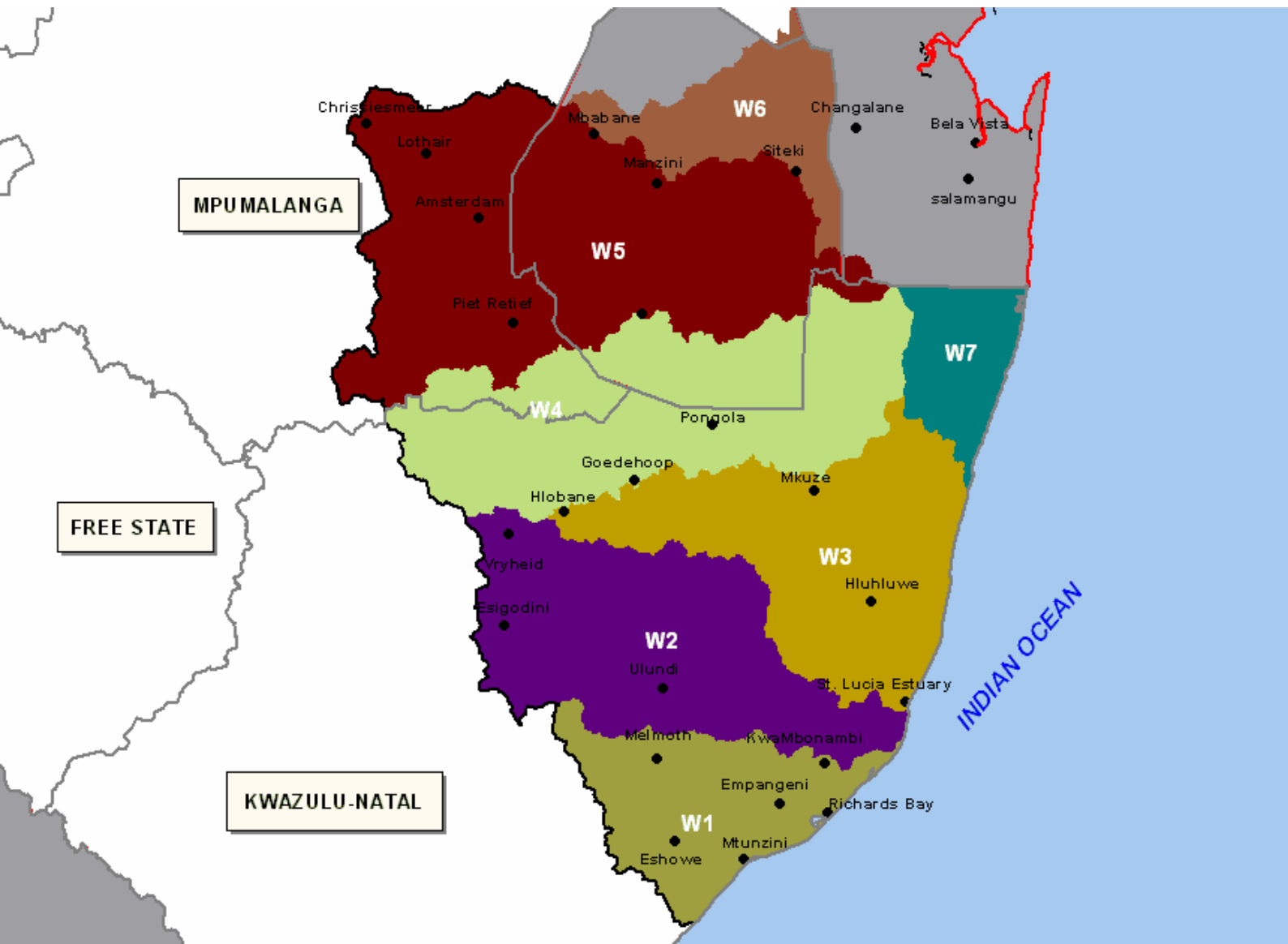
Water allocation, over-allocation and curtailments - The Mhlathuze catchment is the most stressed of all catchments in the WMA, and water resources have been over-allocated to users. The issue of inequity in water allocation has also been highlighted. This will test the implementation of the NWA with regards to compulsory licensing, curtailments, and possible re-allocation to other users. DFID are supporting DWAF in the piloting of compulsory licensing and the Mhlathuze catchment has been chosen as the first pilot.

Afforestation - There is pressure to increase afforestation in the Mhlathuze (already short of water), parts of the Zululand sandplain, the Upper Usutu (water required for international share), and the Upper Pongola. There have been strict curbs on further forestry development in all of these areas. Forestry Licence applications are stacked up for communal areas in the Sibayi catchment, and in the Bivane catchment. These need to be considered in the light of all costs and benefits and both areas offer land use scenarios suited to evaluation in this project. There may be significant opportunities for small-grower forestry in the Zululand coastal plain area south of St. Lucia. (KwaMonambi to the Thukela). This needs to be evaluated as one way of offering water for equity.

Sugar – Sugar-cane farming seems to be a major agricultural economic activity in several of the WMA's secondary catchments. Sugar is an important self-employer through small grower schemes. The industry cannot afford major expansion due to international trade protection policies, despite some internal tariff protection. Sugar is a major user of water and the benefits of these allocations will be under the spotlight.

Pongolapoort Dam - The existence of this dam creates a multiplicity of problems as DWAF is expected to deliver endless quantities of water. In practice the annual available yield from the dam is very limited. The dam has led to requests for irrigation releases from the SDI, and there is currently a scheme to grow cotton on the Makhatini Flats in a programme as yet unseen by the Department. Gauteng could potentially use water from the Pongolapoort Dam – but there is not much available water at the best of times. The issue that the sluice release gates are so placed in the wall that the dam cannot be lowered below 60% if ecological releases are to be made, which is critical to the yield of the dam.

FIGURE 1.1 MAP OF USUTU-MHLATHUZE WMA



3. DATA REQUIREMENTS

An extensive range of data is required for the SEA. Wherever practicable, this information will be drawn from published sources. However, there will be a need to generate new data where existing sources are lacking or inadequate. Quantitative information will be stored in databases in a format that is compatible with DWAF requirements, as stipulated by the Geomatics Directorate. The aim in collecting, storing and processing all data will be to render it suitable for integration through a Geographic Information System (GIS).

All consultants working on the SEA should maintain close contact with the GIS unit within the SEA Team and provide updates of their source material and files at not less than two-week intervals.

4. LIST OF KEY STAKEHOLDERS

5. APPROACH TO PUBLIC CONSULTATION AND PARTICIPATION

6. RANGE OF SUPPORTING STUDIES TO BE COMMISSIONED

The scoping exercise has indicated the need for a number of supporting studies, which are very much in line with those studies recommended as necessary by the SEA Guidelines for implementation in catchments.

One gap in the base information which is particular to this WMA (although we do also expect it to turn up elsewhere) is in the knowledge of the hydrology of several of the catchments making up the WMA. There is the need to apply a physically-based daily time step model to the land and water use data so that the impacts of land use changes can be adequately predicted, and scenarios for such changes can be modelled to support decision-makers.

The following studies have been commissioned:

1. A study of the hydrology of the WMA with a view to adding to the knowledge of river flow in certain catchments and providing a methodology for assessing land use change impacts.
2. A study of the macro-economics of the land and resource using sectors within the WMA.
3. A study of the economics of land and water users - with a particular focus on irrigated agriculture as the primary water consumer. This task will provide estimates of rands generated per m³ of water used, jobs provided by that same m³, along with other costs and benefits through linked activities.
4. A study of the biophysical potential of land within the WMA to support forestry and dryland cropping. Also of potentially irrigable land – whether within easy reach of water or not.
5. A study of the biodiversity value of the environment and the ecological cost of transforming this environment.
6. A study aimed at depicting the social situation within the WMA. This task includes much of the participation and consultation process - aimed at determining the situation and issues as perceived by stakeholders directly affected by decisions and planning within the WMA. Stakeholders will also be given the opportunity to input their own visions and plans for development. This study will unpack all information relating to, *inter alia*, population growth or decline, income, health infrastructure, poverty indices, and other data which suggests the development status, development opportunity and development need within the WMA..
7. A project aimed at the development of a decision support system which integrates all of the above information in ways which can be easily understood and assimilated by decision-makers.

The level of developmental research

Some of these studies or projects are developmental in the implementation of a SEA for Water at catchment or WMA level. These will not need to be repeated, or only in terms of data input and analysis when progressing to other WMAs. These studies

include much of the hydrological model development, the developmental additions to the biodiversity valuation process, the introduction of MCDA as a process in decision-making, and the development of the decision support system itself. The social assessment too has a strong research component in testing just how many participatory workshops are required and how these should be conducted.

No doubt we will always be seeking to improve on the SEA approach, the studies undertaken, and the data sets available. If this were not so we could anticipate significant reductions in the budget required for SEA implementation.

7. LINKS TO OTHER DWAF STUDY PROCESSES

The NWA places high demands on the Department as implementing agent to work holistically. It is clear that the SEA is a useful tool in supporting many essential DWAF activities and these have been identified both through previous work (the Mhlathuze study) and this scoping exercise. These activities, together with levels of SEA involvement where appropriate, include:

- (i) National Water Resources Strategy. SEA is seen in the NWRS as a tool in support of the implementation of the NWA.
- (ii) Catchment Management Strategies. The guidelines for the preparation of catchment management strategies (drawn up by Directorate Catchment Management) make SEA a **minimum requirement** in strategy development. The process of preparing Catchment Management Strategies has not commenced yet.
- (iii) Catchment and Basin Studies. It is recognised that these studies need to adopt a more holistic approach to the planning environment and that the SEA can inform this and help in shaping future technical studies. This has been tested for the Breede River Basin Study (managed by Directorate: Water Resources Planning). Most important has been the introduction of a "Strategic Planning Workshop" into the study, and plans to repeat this exercise on the commencement of succeeding studies of this nature.
- (iv) The setting up of Catchment Management Agencies and, more importantly, the need to provide emergent Agencies with the information on which to base decisions, are both areas for the SEA. In the setting up of CMAs the role of the SEA is in supporting Directorate: Catchment Management and the Regions in involving and informing stakeholders regarding water resource management issues through an intense public participation process.
- (v) Development of DWAF's departmental public participation guidelines. These have been informed by the SEA experience.
- (vi) The SEA team has been drawn into a number of interpretative, and ultimately policy support activities. These include the questions of Water Allocations and Compulsory Licensing (for CD: WU & C) and the need for interim Catchment Management Strategies to be put in place until such time as the statutory Catchment Strategies under (ii) above are put in place.
- (vii) Forestry and Water Use. SEA was first introduced into DWAF as a way of dealing with many of the defining considerations in the licensing of applications for new afforestation. This is now becoming a reality in the co-operative governance decision-making process of the provincial Licence Assessment Advisory Committees. One way of streamlining the forestry application and approval process is through the declaration of general authorisations in certain areas. These authorisations can be issued on the

- basis of water availability – but the implementation of SEA will lead to the resolution of many co-operative governance issues.
- (viii) SEA has been proposed as the way of approaching the issue of licensing wattle jungles as an SFRA. This process is being tackled in collaboration with Community Forestry. Ultimately this is also a co-operative governance issue.
- (ix) Water for Rural Development. The SEA has highlighted the issue of water for rural development and the inequities which persist. An SEA opportunities and constraints approach is seen as a way of informing DWAF of the level of opportunity for water use which might be taken up within the communal areas should the land holders choose to apply for water use licences. This in turn suggests the extent to which it may prove necessary to reserve resources for the previously disadvantaged.

8. STAFF RESOURCES

The SEA Team consists of the following staff members:

- Project Manager - Mike Warren
- Project Co-ordinator - Harrison Pienaar
- GIS Co-ordinator - Obed Baloyi
- Communications Co-ordinator - Pumeza Nodada
- SEA Advisor and facilitator - Dirk Versfeld
- SEA Technical Advisor - Peter Nelson (UK)
- Social Component Co-ordinator - Brian Mthembu
- Hydro-economic Co-ordinators - Stephen Mallory and Toriso Tlou
- Biophysical Co-ordinator - Stephen Horak

9. SEA TIME SCALE

The SEA for Water Use in the Usutu – Mhlathuze WMA started in October 2000 and it is envisaged that the study will be completed by March 2002.

10. SEA BUDGET

1	Funds Made Available to SEA Project from DFID	5 500 000.00
2	Less Total Expenditure to date (End May)	2 549 498.61
	Total Funds still available	2 950 501.39
	Less Expenditure expected to be spent (June 2001-March 2002):-	
3	Staff Cost	
	Book-keeping and administration	68 000.00
	Filing Clerk	24 000.00
	GIS Assistant	32 640.00
	Social Consultant	180 000.00
	Biophysical & SEA Consultant	240 000.00
	Tlou Consulting	221 000.00
	Technical Advisor	300 000.00
		1 065 640.00
	Individual Component Cost	
4	Social Component	
	Travelling Cost	35 088.00
	Social Research Study and Workshop Consultant	452 000.00
		487 088.00
5	Biophysical Component	
	Travelling Cost	32 000.00
	Mpumalanga Parks Board-Development of a Biobase	281 010.00
	Biobase Consultants	100 000.00
		413 010.00
6	Hydro-Economic Component	
	Hydro-Economics Study	812 812.00
	DSS Specifications	100 000.00
	DSS Coding	300 000.00
	Incorporation of MCDA into DSS	60 000.00
		1 272 812.00
7	Communications Component	
	Newsletter (1000 copies, 4-6 page A4)	7 000.00
	Brochure (1000 copies, A4 Back to back, full colour glossy)	5 000.00
	Posters (1000 A1 copies for a set of 6)	36 000.00
	Printing of Final Report (Usuthu-Mhlathuze)	10 000.00
	Newspaper Advertisements and Radio Announcements	
		58 000.00
8	Water for Rural Development	
	Workshops	50 000.00
		50 000.00
9	Administration Cost	
	Fly-by	30 000.00
	Break-away	9 226.32
	SEA Filing System Sundry Expenses	300.00

		39 526.32
	SHORT FALL/DEFICIT	(435 574.93)

Notes to Calculations:	
1 Funds Made Available to SEA Project from DFID	
Calculated on the basis that the pound is 11 for every one rand.	
2 Less Total Expenditure to date (End May)	
This figure does not include all invoices to date for Land Use Consultants cc. Also, certain items need to be verified and reconciled for VAT implications.	
3 Staff Cost	
<p>Administrative Assistant – Calculation until March 2002. GIS Assistant-Contracted for 8 months. Contract expired July 2001. Social Consultant-Contract ends December 2001-Calculation up until March 2002. Biophysical Consultant-Contracted to the end of March 2002.</p>	
4 Social Component	
Provision for travelling exclusive of VAT	
5 Biophysical Component	
Provision for travelling exclusive of VAT	
6 Hydro-Economic Component	
Hydro-Economics Study (WMAC)	
Original Budget	705 552.00
TPTC	32 160.00
Ground Water	50 100.00
Mozambique	25 000.00
	812 812.00
7 Communications Component	
Still awaiting an estimation for the cost to be incurred by providing for Newspaper advertisements and Radio announcements	