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ENVIRONMENTAL MANAGEMENT FRAMEWORK FOR THE DRAKENSTEIN MUNICIPAL AREA

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Morris Environmental & Groundwater Alliances (MEGA)

DeVilliers Brownlie Associates

Chand Environmental

Elzette Henshilwood – Planning and GIS

Lize Malan – Planning and Heritage Consultant

EnAct International

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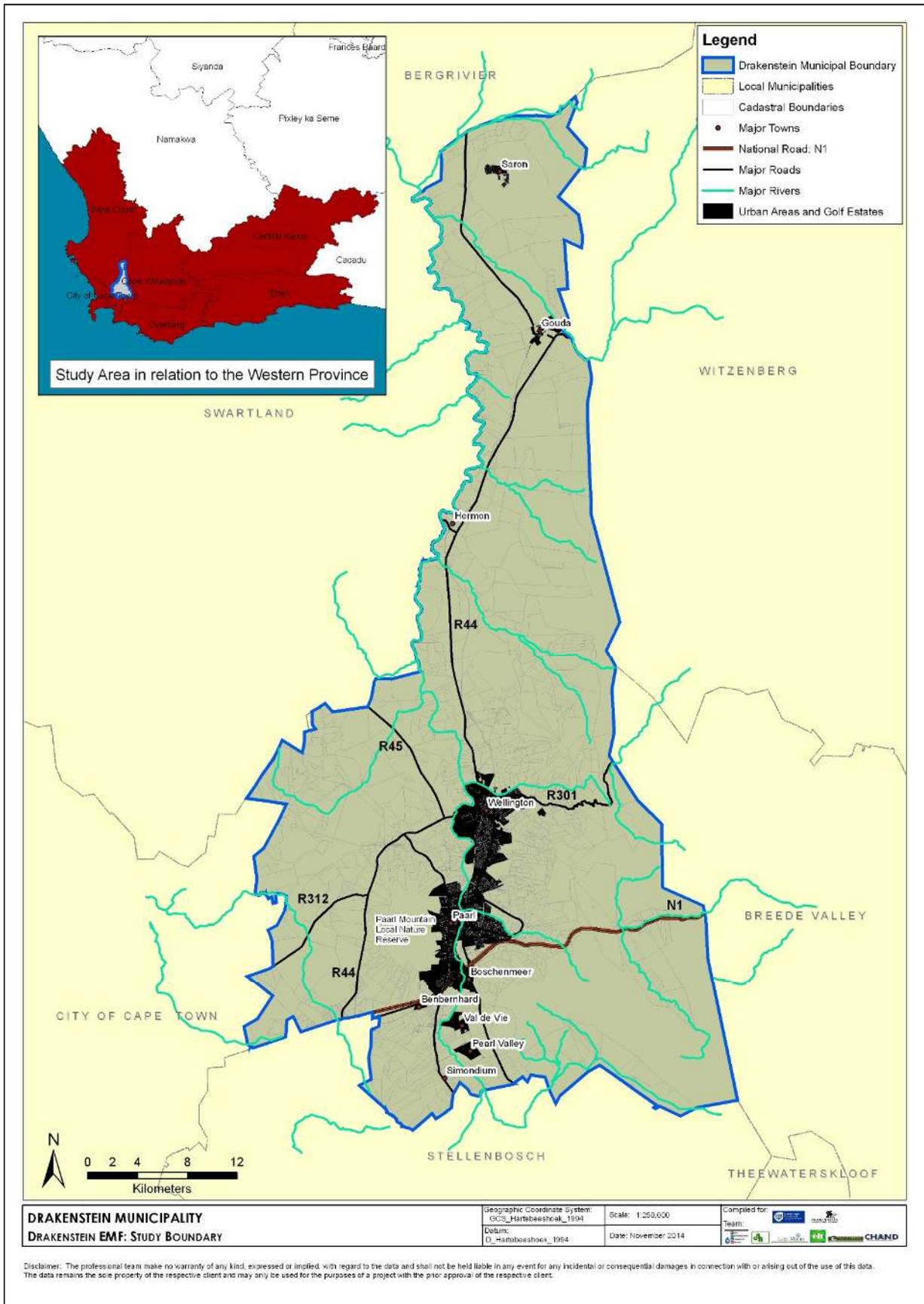
ENVIRONMENTAL MANAGEMENT FRAMEWORK (EMF) FOR THE DRAKENSTEIN MUNICIPAL AREA

Final Draft

1 *Background and Introduction*

The Drakenstein Municipality is one of five municipal areas within the Cape Winelands District Municipality (CWDM). It is located in the heart of the Boland, and includes the towns of Paarl, Wellington, Hermon, Gouda and Saron (Refer to Map 1). The municipal area, of approximately 1 541km², stretches from Simondium in the south, with the Groot Drakenstein Prison marking the boundary, to Saron in the north. The eastern boundary is defined by the Klein Drakenstein, Limiet and Saron Mountains. On the western side of the municipality, the boundary runs through agricultural areas, with the municipalities of Stellenbosch and Cape Town in the south west and Swartland to the north west. Neighbouring municipalities to the east are Witzenberg and Breede Valley Municipality, both of which also fall within the CWDM.

Drakenstein is the second largest municipality in the Western Cape (with the Cape Town Municipality being the largest) in terms of population. Paarl and Wellington are the main urban centres within the municipality, where most of the economic activity takes place and the majority of the population resides. Agriculture forms the backbone of the CWDM economy, and the Drakenstein Municipality is regarded as the agricultural centre within the wine and fruit belt.



MAP 1: EMF Study Area

The southern part of the municipality is characterized by vineyards irrigated from the Berg River. Although viticulture is no longer as dominant as it used to be, with other crops such as olives being introduced and other sectors such as manufacturing growing rapidly, the wine and table grape industry is still a major source of income and employment in the area. Agriculture as a sector remains dominant in Drakenstein both in terms of contribution to the local economy and employment. There are many backward and forward linkages within the local economy that are related to viticulture, particularly in the manufacturing sector such as agro-processing, packaging, fertilisers and machinery (Boulle and Newton, 2006). Paarl and Wellington are important service centres in the Cape Winelands.

In the northern part of the municipality, the economy is dependent on dry land crops such as wheat and canola. Hermon and Gouda in particular are service centres for agriculture, whilst Saron, founded as a Moravian Mission Station, is less important in this capacity.

1.1 Environmental Management Frameworks – An Overview

The Department of Environmental Affairs & Development Planning (DEA&DP) initiated the compilation of an Environmental Management Framework (EMF) for the Drakenstein Municipality. A primary objective of an EMF is to support environmental decision-making, not only for environmental authorities such as the DEA&DP, but also for other authorities whose decisions could have environmental implications. It is particularly important to have close liaison with the municipality during the development of the EMF.

The National Environmental Management Act (Act 107 of 1998, as amended) commonly referred to as NEMA is a framework law that gives effect to the environmental right in the Constitution¹. Chapter 5 of NEMA sets out the objectives of integrated environmental management and provides, among other things, for the listing of activities that may not commence without an environmental authorisation. Section 24 (which forms part of Chapter 5) of NEMA states that in order to give effect to the objectives of integrated environmental management, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported on to the competent authority charged with granting environmental authorisations². The process of doing so is commonly referred to as environmental impact assessment (EIA). Section 24 also allows the Minister of Environmental Affairs and every MEC, to compile “information and maps that specify the attributes of the environment in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes...³.”

The EIA Regulations to give further effect to section 24 came into effect on 3 July 2006 (GN 385, 386 and 387 of 21 April 2006). These Regulations replaced those promulgated in 1997 under the Environment Conservation Act (Act 73 of 1989). The “information and maps” referred to in section 24(3) of the Act were defined in

¹ See section 24 of the Constitution of the Republic of South Africa, 1996.

² Section 24(1) – This is typically the environmental authority (provincial or national) or any other Minister as specified in the EIA Regulations published in terms of section 24 of NEMA.

³ Section 24(3) of NEMA.

the 2006 NEMA EIA Regulations as an Environmental Management Framework (EMF). Chapter 8 in the 2006 NEMA EIA Regulations dealt with EMFs. The NEMA 2006 EIA Regulations were repealed and replaced with the 2010 NEMA EIA Regulations, which came into effect on 3 July 2010 (GN 543, 544, 545 and 546 of 18 June 2010). These Regulations included, for the first time, a Listing Notice 3 which included various activities in sensitive locations as specified by the respective provinces. In addition to Regulations relating to EIAs, EMF Regulations were also promulgated (GN 547 of 18 June 2010).

The 2010 NEMA EIA Regulations have been repealed and replaced with the 2014 NEMA EIA Regulations (GNR 982, 983, 984 and 985 of 4 December 2014). These new regulations came into effect on 8 December 2014. In addition, Exemption Regulations (GNR 994 of 8 December 2014) and Appeal Regulations (GNR 993 of 8 December 2014) were also published. The EMF Regulations as published in 2010 remain in place.

1.1.1 What is the legal standing of an EMF?

This section deals with the question of whether there is a legal obligation to implement and adhere to an EMF. The legislation states the following:

1. *Section 24(3) of NEMA*: “The Minister, or an MEC with the concurrence of the Minister, may compile information and maps that specify the attributes of the environment in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes which must be taken into account by every competent authority⁴.
2. *Section 24(4)(b)(vi) of NEMA*: Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must include, with respect to every application for an environmental authorization and where applicable “consideration of environmental attributes identified in the compilation of information and maps contemplated in subsection (3). This creates an obligation for an applicant to take into account any applicable EMF when investigating, assessing and communicating to the competent authority the potential impacts of activities on the environment. The draft guideline on Environmental Management Frameworks prepared by DEA (formerly DEAT) in 2005⁵ states that “EMFs provide applicants with an early indication of the areas in which it would be potentially appropriate to undertake an activity”.
3. *Section 24O(b)(v) of NEMA*: In terms of this section the competent authority must take into account all relevant factors, which may include “any information and maps compiled in terms of section 24(3), including any prescribed environmental management frame-works, to the extent that such information,

⁴ “competent authority”, in respect of a listed activity or specified activity, means the organ of state charged by this Act with evaluating the environmental impact of that activity and, where appropriate, with granting or refusing an environmental authorisation in respect of that activity;

⁵ DEA (2010): *Environmental Management Frameworks in terms of the EMF Regulations 2010*, Integrated Environmental Management Guideline Series 6, Department of Environmental Affairs (DEA), Pretoria.

maps and frame-works are relevant to the application”. Arguably, where an EMF has been drafted, this should be considered to be a “relevant factor” and must accordingly be considered.

4. *Regulation 2(1)(c) of the 2010 EMF Regulations:* When considering an application for an environmental authorisation the environmental authority is required to (i.e. must) take an EMF into consideration unless it is irrelevant to the decision being made.
5. *Regulation 5 of the 2010 EMF Regulations:* An EMF may be adopted by the MEC in concurrence with the Minister⁶ (regulation. Where an EMF has been adopted it must be taken into account in the consideration of applications for environmental authorisation in or affecting the geographical area to which the framework applies.⁷ The Regulations also allow for EMFs to be taken into account even if not adopted by the MEC in concurrence with the Minister⁸ but the terminology used in this case is less definitive, as follows: “may be taken into account in the consideration of environmental applications”.

In summary, in the case of the environmental (competent) authority responsible for environmental obligations, the EMF must be considered provided that it is an adopted EMF in terms of regulation 5(1) of the 2010 EMF Regulations. Although there is no specific obligation placed on other organs of state to apply or use EMFs in their planning and decision-making processes, section 2(1) of NEMA does state that: “the principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment.” In instances where an EMF is in place, this should assist an organ of state in taking account of the NEMA principles in relation to actions that could have a significant environmental impact.

1.1.2 What is the purpose of an EMF?

Given the relatively broad definition of “environment” in NEMA as well as the growing recognition that the development path of the country needs to be shifted onto a more sustainable footing, it is clear that EMFs should be used to support the goal of sustainability. This is acknowledged in the EMF Regulations as follows (Regulation 2(3) where it is stated that EMFs are aimed at (a) promoting sustainability; (b) securing environmental protection; and (c) promoting cooperative environmental governance.

Furthermore, in terms of section 24(2)(b) and (c) EMFs are also intended to assist the environmental authorities in determining the following:

- ◆ Whether there are any activities within the geographical area and based on the environmental attributes that may not commence without environmental authorisation (section 24(2)(b)). These are referred to as specified activities.

⁶ Regulation 5(1) of the 2010 EMF Regulations

⁷ Regulation 5(2) of the 2010 EMF Regulations

⁸ Regulation 5(3) of the 2010 EMF Regulations

- ◆ Whether there are any activities within the geographical area and based on the environmental attributes that may be excluded from having to obtain environmental authorisation (section 24(2)(c), in which case such activities must meet required norms and standards (section 24(2)(d).

In summary, therefore, the objectives of the EMF are to provide:

1. A framework to facilitate the pursuit of a sustainable development path in the geographical area with which it is concerned, specifically in relation to land use and development.
2. A comprehensive and integrated information base on the environmental attributes of an area and their sensitivity, together with management information in respect of these attributes (e.g. limits of acceptable change, thresholds, management objectives).
3. A tool to support the identification of issues that require consideration / investigation in an Environmental Impact Assessment process through referring to the information base of environmental attributes.
4. A decision-support tool for environmental authorities when considering environmental applications in terms of section 24 of NEMA and the associated EIA Regulations.
5. Guidance to applicants with respect to the appropriateness of development or land use proposals and to any professionals that are assisting in the application process, particularly in the environmental and planning fields.
6. Assistance and support to other authorities in the consideration of environmental factors in their decision-making processes, especially where these are concerned with the use of land and resources.
7. Support for cooperative governance, particularly as regards land and resource use planning and development..

An EMF comprises a set or compilation of information maps showing the environmental attributes or characteristics of an area. These maps must show information that is important for planning of development and for decision-making purposes about land use and development. The main purpose of an EMF is to support the competent environmental authority, which in the Western Cape is the DEA&DP, in making their decisions in terms of the EIA Regulations. It must also be considered by the DEA or any other authority that may be designated as the competent authority for certain Listed Activities and where the application falls within an area for which an EMF has been prepared.

Ideally, the EMF should also be used by other authorities, especially those that are involved in decisions about the use of land (e.g. municipal rezoning decisions, issuing of “plough permits” by the Department of Agriculture). Thus the authorities would then be using a common information base and goals, which in turn would support the obligation placed on them to give effect to co-operative governance principles.

It must be borne in mind that the EMF is a strategic-level document and thus it does not replace the need for EIAs to be undertaken for particular projects. The EMF is also not a land use plan in the traditional sense meaning it does not fulfill the role of the Spatial Development Framework (SDF) or the former Structure Plans. Rather, the EMF is concerned with the environmental attributes of an area and the sensitivity of those attributes, with a view to promoting development that is responsive to the prevailing environmental conditions. It is in this sense that the EMF can contribute to the objectives of sustainable development.

From the perspective of projects that are subject to the EIA Regulations, the EMF can assist in:

- ◆ Assessing a project in the context of the area / region / landscape within which it is located.
- ◆ Screening a project proposal in terms of the environmental attributes applicable to its location to determine:
 - the likely environmental issues and thus specialist inputs required;
 - the appropriateness of the proposed project given the attributes of the site and its surroundings;
 - the alignment of the project with environmental management and sustainability objectives;
 - alternatives for assessment.
- ◆ Identifying the factors that need to be considered in formulating a development proposal that is responsive to environmental conditions – proactive planning rather than reactive planning.
- ◆ Identifying sensitive areas or characteristics that need to be taken into account and to which the development proposal should respond in a manner that avoids or at least minimizes negative impacts in this regard.
- ◆ Establishing the need for environmental authorisation in respect of Listed Activities that are based on their location / position in the landscape. For example, many of the activities in Listing Notice 3 of the NEMA 2010 EIA Regulations fall into this category and the spatial information on environmental attributes in the EMF provides a reference point for determining whether an environmental application needs to be made or not.

In summary, the EMF is aimed at providing information that can be used by the authorities to support decision-making that will take development in the “right direction.” Similarly, applicants can use the EMF to inform their development proposals. The idea is to find the best possible match between protecting resources (i.e. preventing their loss or degradation) on which humankind depends, whilst taking account of the need for development to address pressing social needs such as poverty and unemployment.

1.1.3 What must the EMF contain?

At the time that the EMF for the greater Saldanha area was initiated, it was envisaged that it would comprise three parts:

- ◆ Environmental Status Quo.
- ◆ Strategic Assessment.
- ◆ Strategic Environmental Management Plan (SEMP).

This structure readily addresses the requirements of the 2010 EMF Regulations. In accordance with Regulation 3(3), the following needs to be considered in the development of an EMF:

1. The status quo of the environment;
2. The desired state of the environment; and
3. The actions necessary to achieve the desired state.

Regulation 4 sets out detailed requirements in respect of the content of an EMF. The links between the elements that make up this EMF and the content requirements of the EMF Regulations are shown in Table 1 below.

TABLE 1: Relationship between EMF Regulations and EMF content

EMF PART	CONTENT REQUIRED AS PER REGULATION 4	CORRESPONDING ELEMENTS IN THIS EMF
ENVIRONMENTAL STATUS QUO	<ul style="list-style-type: none"> • Identify by way of a map or otherwise the geographical area to which it applies. 	<ul style="list-style-type: none"> • Provision of map and explanation of the boundaries of the study area.
	<ul style="list-style-type: none"> • Specify the attributes⁹ of the environment in the area, including the sensitivity, extent, interrelationship and significance of those attributes. 	<ul style="list-style-type: none"> • Synthesis of existing information on environmental and heritage resources as well as socio-economic characteristics of the study area.
ENVIRONMENTAL STATUS QUO (Cont.)	<ul style="list-style-type: none"> • Identify any parts in the area to which those attributes relate. 	<ul style="list-style-type: none"> • Development of a spatial database (GIS) for environmental and socio-cultural attributes where spatial data are available (where they occur, how extensive they are). • Explanation of the sensitivities/vulnerabilities of the attributes. • Description of concerns, pressures and trends in respect of the attributes. • Determine whether there are any areas where thresholds indicating limits of acceptable environmental change may have been exceeded, or are at risk of being exceeded.
	<ul style="list-style-type: none"> • State the conservation status of the area and in those parts. 	<ul style="list-style-type: none"> • Identification and mapping of public and private protected areas for conservation (terrestrial and marine) and priority areas for biodiversity conservation in terrestrial, marine and freshwater systems.
	<ul style="list-style-type: none"> • Indicate the parts of the area with specific socio-cultural values and the nature of those values. 	<ul style="list-style-type: none"> • Review of socio-economic characteristics and of heritage resources. • Assessment of sensitivities/vulnerabilities, of heritage resources. • Description of development needs: priorities, pressures and trends.
	<ul style="list-style-type: none"> • Identify information gaps. 	<ul style="list-style-type: none"> • Description of information gaps.

⁹ The definition of environmental attribute in the EMF Regulations is that an "attribute" means the quality ascribed to an element in the environment that distinguishes it in character, form or nature from other elements in the environment.

EMF PART	CONTENT REQUIRED AS PER REGULATION 4	CORRESPONDING ELEMENTS IN THIS EMF
STRATEGIC ANALYSIS	<ul style="list-style-type: none"> State the environmental management priorities of the area. Specify the attributes of the environment in the area, including the sensitivity, extent, interrelationship and significance of those attributes. 	<ul style="list-style-type: none"> Formulation of a vision and objectives based on the Environmental Right in the Constitution, sustainability policy and the NEMA principles. Establishment of desired outcomes in respect of the attributes based on sensitivities and dependencies. Establishment of Limits of Acceptable Change based on the current situation and the desired outcomes. Determination of whether any thresholds of acceptable environmental change applicable to attributes have been exceeded or are at risk of being exceeded.
STRATEGIC ENVIRONMENTAL MANAGEMENT PLAN (SEMP)	<ul style="list-style-type: none"> Specify the attributes of the environment in the area, including the sensitivity, extent, interrelationship and significance of those attributes. State the environmental management priorities of the area. Indicate the kind of developments or land uses that would have a significant impact on those attributes and those that would not. Indicate the kind of developments or land uses that would be undesirable in the area or in specific parts of the area. Indicate a revision schedule for the environmental management framework. 	<ul style="list-style-type: none"> Determination of Environmental Management Zones (EMZs) based on environmental and socio-cultural attributes and their sensitivities and vulnerabilities. Provision of management guidelines for the EMZs. Identification of appropriate and inappropriate developments or land uses per EMZ, taking into account the principal impacts associated with these developments or land uses and the environmental attributes that would thus be impacted. Formulation of decision-making criteria for the review of environmental applications. Provision of a monitoring and evaluation framework. Provision of guidelines for the review and updating of the EMF.

1.1.4 What is the relationship between the EMF, IDP and SDF?

An IDP “must reflect a spatial development framework which must include the provision of basic guidelines for a land use management system for the municipality.”¹⁰ Regulations made under the MSA¹¹ set out the requirements for an SDF, including that it “must provide a visual representation of the desired spatial form of the municipality...which representation must indicate desired or undesired utilisation of space in a particular area”¹² and “must contain a strategic assessment of the environmental impact of the spatial development framework”¹³. An EMF could, therefore, be used to inform the Strategic Environmental Assessment or to “determine the desired or undesired utilisation of space in a particular area.”

The provisions of the MSA (Municipal Systems Act) require that the compilers of IDPs and SDFs take into account any information contained in a relevant EMF. This conclusion is based on the general obligations of municipalities, as set out in this Act. Sections 23 and 24 respectively require that a municipality must undertake planning that gives effect to its development duties as set out in the Constitution and to its duties in terms of co-operative government. As far as cooperative governance is concerned, the MSA provides that planning undertaken by a

¹⁰ Section 26(1)(e) of the Municipal Systems Act 32 of 2000.

¹¹ Municipal Systems Regulations (GNR 459 of 25 May 2001).

¹² Regulation 4(i)(ii) of the EMF Regulations.

¹³ Regulation 4(f) of the EMF Regulations.

municipality must be aligned with and complement the development plans and strategies of other affected municipalities and other organs of state, which would include EMFs developed by an MEC or the Minister.¹⁴ The constitutional duties of municipalities include:

- ◆ that development planning gives progressive effect to the environmental right in section 24 of the Constitution;¹⁵
- ◆ that a clean and healthy environment is promoted;¹⁶ and
- ◆ that municipalities participate in national and provincial development programmes.¹⁷

The difference between an EMF and a SDF is that the EMF focuses on environmental attributes whereas the SDF reflects proposals or intentions in relation to land use and development. The EMF serves primarily as an environmental decision-making tool for provincial authority (Department of Environmental Affairs and Development Planning - DEA&DP) but can be used by other decision-makers as well. In the light of the general obligations to harmonise planning instruments and to take into account environmental considerations referred to above, a municipality that failed to consider an applicable EMF when compiling or reviewing an IDP or SDF would have failed to take into account a relevant consideration. Under these circumstances, the adoption of the SDF or IDP may well be reviewable in terms of the principles of administrative justice.

Thus the EMF should be used to inform the SDF since environmental resources are fundamental to development planning or determining how land should be used. Accordingly, the EMF could be incorporated into the SDF as an environmental “layer” or series of “layers” thereby informing the identification of areas suitable / unsuitable for particular land uses. The Environmental Management Zones (EMZs) determined in the EMF should thus directly inform the spatial planning categories in the SDF. The relationship between the IDP, SDF and EMF is discussed in more detail in Part 3 – the SEMP (Strategic Environmental Management Plan).

It is not the role of the EMF to define the urban edge. The urban edge is a spatial planning tool and is defined or adopted by the competent authority¹⁸ as part of the SDF approval process and the formulation of the SDF is the responsibility of local authorities. Where the NEMA EIA regulations refer to ‘urban areas’ this does not mean that the environmental authority has jurisdiction over the definition of urban edges; in this context, ‘urban areas’ means areas situated within the defined urban edge or within built up areas where an urban edge has not been defined. (NEMA specifically defines the competent authority as being that authority responsible for issuing environmental authorizations in respect of listed activities. Determination of the urban edge is not a listed activity. Thus to determine an urban edge via the EMF would be impinging on the function of the municipality, namely that of municipal planning. In the Constitution, “municipal planning” is the sole competence of the municipal sphere of government.

¹⁴ Section 24(1) of the MSA (Municipal Systems Act).

¹⁵ Section 23(1)(c) of the LG: MSA.

¹⁶ Section 152(1)(d) of the Constitution.

¹⁷ Section 153(b) of the Constitution.

¹⁸ Definitions in GNR 983, 984, 985 of NEMA 2014 EIA Regulations.

Another consideration is the National Environmental Management Act (NEMA). This Act sets out principles that apply to the actions of all organs of state that may significantly affect the environment.¹⁹ The principles include that “there must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.” Since the adoption of a development plan is an “action that may significantly affect the environment” the NEMA principles apply to the adoption of plans by organs of state. Thus, development plans such as the SDF should take into account any EMF in respect of the area concerned.

Whereas a SDF is concerned with spatial planning, the EMF is focused on the environmental attributes of an area. The EMF therefore:

- ◆ Recognises that there are important natural resources that need to be retained in order to provide for the needs and ensure the health and well-being of citizens in the municipality in the long-term. These natural resources are important because it is due to their existence that the citizens of Drakenstein can have clean air, clean / drinkable water, soil in which to grow crops and the pollinators that are needed to produce food. Completely undisturbed natural areas such as wilderness areas and conservation areas are also important not only because of the role they play in keeping resources such as water clean, but also because of their role in human well-being (e.g. spiritual or cultural significance). The benefits that are provided to humankind by nature are often referred to as “ecosystem services.”
- ◆ Recognises that there are important cultural and social resources that make an area what it is that are valued by citizens. These contribute to the “sense of place” and “sense of community.” They may also play an important role in the local economy (e.g. tourist attractions).

1.2 Structure of the EMF

This EMF has been structured into three sections or parts:

1. **PART 1: A situation analysis** (or ‘environmental status quo report’): This comprises a synthesis of the existing information, taking account of environmental and land use issues, as well as any important trends. The focus of this section is the provision of a series of maps showing important natural and cultural / social resources and characteristics or attributes – where these resources occur and how sensitive or important they are.
2. **PART 2: A strategy** (incorporating a Strategic Environmental Assessment²⁰) in which priorities are identified and opportunities and constraints explained.

¹⁹ Section 2 of NEMA.

²⁰ ‘Strategic Environmental Assessment’ or ‘SEA’ refers to a process that integrates sustainability considerations into the formulation, assessment and implementation of policies, plans and programmes. SEA is ‘sustainability-led’. It focuses on the opportunities and constraints that the environment provides for future development, asking the question “what development can our environment sustain?” In the EMF context, the SEA relates to the specific geographical area covered by the EMF, although it must also take into account the relationship of that area to adjoining municipal areas. The purpose of the SEA is to formulate a framework for sustainable management and decision-making; the so-called Sustainability Framework Model (DEAT (2007): Integrated Environmental Assessment Guideline Series 4: Strategic Environmental Assessment, DEAT, Pretoria.).

This will also set out a vision, goals or sustainability objectives, as well as criteria and indicators for the future. This section also includes the analysis of the Environmental Management Zones, based on the situation analysis and taking account of the strategy, particularly the objectives which reflect the “desired future” for the area.

3. **PART 3: A Strategic Environmental Management Plan** which will provide an action plan to achieve the strategy based within the context of the environmental attributes. This plan will cover:
 - Recommendations for the EMZs.
 - Recommendations relating to the integration of the EMF with land use and planning instruments (SDF/IDP, zoning schemes) and other environmental initiatives (SOER, EMS).
 - Recommendations in respect of a monitoring, evaluation and reporting framework.
 - Provision of a decision-making framework.
 - Recommendations regarding ongoing data gathering requirements.

1.3 Comments on information sources and gaps

The collection and collation of baseline information has focused on spatial information that is available in GIS format and existing reports and studies. Both documents that are concerned with policy, as well those that contain scientific data, statistics and research information have been sourced for the purposes of the EMF. Some primary research was also undertaken, namely, that of identifying and mapping wetlands. This information is critical to the EMF, since wetlands are unique habitats and play an important role in maintaining water resources (Refer to Section 4.1). In addition, data on heritage resources, also an important feature in the Drakenstein, which was available in hard copy, was digitised for inclusion in the GIS database that has been established as part of this EMF.

1.3.1 Documents and reports

Various documents and reports have been reviewed such as the IDP, State of Environment Reports, studies undertaken on the Berg River, as well as the SDF (Spatial Development Framework) and IDP (Integrated Development Plan) for the municipal area. In addition to documents and reports, reference was also made to relevant legislation. Documentation that was used in the preparation of the EMF is provided in the reference list.

1.3.2 Specialist research

Whilst the EMF is based primarily on the best available existing information, some additional specialist investigations were undertaken to address material information gaps. Heritage data and comprehensive and reliable wetlands information were lacking. Both of these are critical from an environmental attribute point of view in the context of the Drakenstein Municipality.

The municipality had commissioned a heritage survey which was completed early in 2009. Spatial information was available in hard copy format and was incorporated into the EMF GIS database. It was shown in the Berg River Study undertaken by Ninham Shand that wetlands are a critical component of the hydrological system in the Drakenstein. Available information on the location and ecological status of wetlands was generally lacking, however, with spatial data comprising both natural wetlands, farm dams and other man-made structures. Accordingly a specialist wetland study was commissioned which was undertaken by the Freshwater Consulting Group.

1.3.3 Spatial (GIS) information

A range of spatial data sources were obtained and these have been used to develop maps showing environmental attributes and to formulate the EMZs. Details of spatial information used can be found in Appendix A. GIS information has been obtained from the following sources:

- ◆ DEA&DP
- ◆ Drakenstein Municipality
- ◆ SANBI / CapeNature
- ◆ Cape Winelands District Municipality
- ◆ Department of Agriculture
- ◆ Department of Water Affairs

Full details of GIS information used and its source are given in Appendix A. In addition to the above the following was undertaken as part of the EMF project:

- ◆ Heritage information that had been mapped for the purposes of the heritage study undertaken by the municipality was digitised and added to the GIS database.
- ◆ A wetlands GIS layer was established on the basis of the specialist wetlands study.

All of the layers or maps resulting from the GIS information were discussed with the relevant authorities to ensure that the best available and most current information had been used. From a biodiversity information perspective, the starting point was to use the information base that had been compiled for the purposes of the SDF, as no fine-scale plan has been developed for the Drakenstein. These data together with that from the wetlands study have been used to identify ecological corridors. The corridors have also been considered in the context of linkages to neighbouring municipalities and have been reviewed with CapeNature.

1.3.4 Public participation

Another source of information was that of the Public Participation Process. The following activities were undertaken:

- ◆ The EMF project was advertised in March 2008.
- ◆ Notification of the project was placed with the rates bill of residents (August 2008).
- ◆ Two public workshops were held, one in Paarl (5 November 2008) and one in Saron (28 November 2008).
- ◆ A questionnaire was circulated to all I&APs in November 2008.
- ◆ Progress newsletters have been provided to registered Interested and Affected Parties (I&APs).

The record of the public participation activities is given in Appendix B.

1.3.5 Information gaps and shortcomings

The following information gaps were found:

- ◆ There is a paucity of information on water quality in the Drakenstein, and no receiving water standards have been set.
- ◆ Although the ecological reserve has been determined for some subcatchments, no reserve determination has been undertaken for the Berg River catchment as a whole²¹.
- ◆ The Cape Winelands District Disaster Management Plan²² provides some spatial data on risks. Criteria for defining these and the relative significance thereof (e.g. fire risks) were not available for all risks. Accordingly, where the criteria used to determine the significance of risks were not available, these data were not drawn into the EMF database.

In considering the environmental attributes of the study area, the emphasis has been on synthesising information relating that is central to development planning. This means that the focus has been on environmental attributes that constitute resources critical to maintaining economic activity and human health and wellbeing, as well as those issues that may present risks to development (e.g. erosion potential, flood risk). Accordingly, factors such as climate and geology have not been mapped as individual attributes. Rather, cognisance has been taken of how these elements express themselves in the landscape. The landscape (or environment) is shaped by various factors and the interaction between them. For example, the influence of geology can be seen in topography, groundwater systems and the occurrence of mineral resources. In turn, topography is also influenced by rivers and streams, which in turn are affected by climatic conditions. As a result of this approach, detailed descriptions of rock types, vegetation types and the like are not included in the EMF. Rather the focus is on the critical indicators and the interaction between them.

²¹ DWAF (Bertrand van Zyl) pers comm. January 2009.

²² Africon (2005): Cape Winelands District Municipality – Disaster Management Plan.

PART ONE – Current Situation

2 Environmental attributes

Since the EMF is concerned with the environmental attributes of a particular area, this section is focused on information maps as provided for in section 24(3) of NEMA and Regulation 4 of the 2010 EMF Regulations. Brief descriptive information is given insofar as this is relevant to the reading and interpretation of the maps.

Having researched the various information sources available and taking account of the environmental attributes that are central to development planning, the following environmental attributes are addressed:

1. Biodiversity resources
2. Water resources
3. Agricultural resources
4. Heritage and cultural resources.

The maps in this section are based on information that is available in the Drakenstein EMF GIS database. More detailed and larger scale views of the data are thus available. The GIS database is housed by both the DEA&DP and the Drakenstein Municipality.

2.1 Biodiversity resources

The Drakenstein Municipality is located within the Cape Floral Region, which is one of the six plant kingdoms in the world. Thus, the Drakenstein Municipality incorporates a number of areas that are recognized as being ecologically significant locally, provincially and nationally. Briefly, these areas can be grouped as: threatened ecosystems, special habitats, protected areas, important areas for the delivery of ecosystem services²³, and ecological corridors. Vegetation information is commonly used as the key informant in determining the biodiversity significance. In the case of compiling existing data on the biodiversity attributes for the Drakenstein municipal area, a high-level of correlation between significant vegetation types and other species has been found. Whilst water resources are discussed in a separate sub-section, rivers and wetlands are a critical element of the biodiversity resource base in the Drakenstein (see Section 2.2).

2.1.1 Threatened ecosystems

Much of the original natural habitat in the Drakenstein Municipality has been converted for agricultural, residential or urban use. In addition, invasion by alien plants has led (and is continuing to lead) to significant loss of biodiversity and transformation of ecosystems. Poor fire management of the fire-dependent vegetation types has also led to loss of biodiversity.

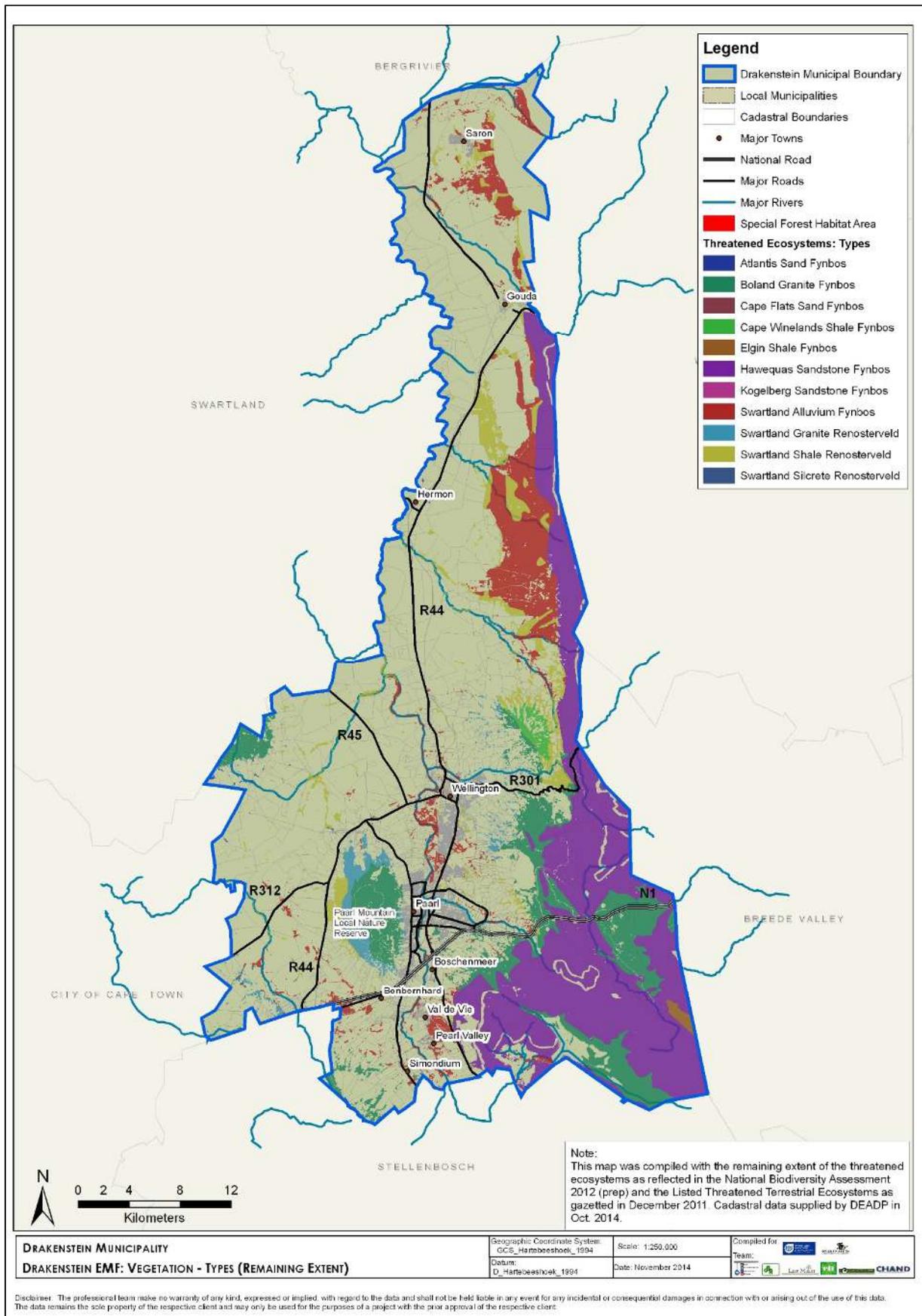
²³ The Millennium Ecosystem Assessment (MEA) report 2005 defines Ecosystem services as benefits people obtain from ecosystems

Nineteen terrestrial vegetation types (Refer to Map 2 and Table 3) are found in the Drakenstein: The status of these vegetation types/ ecosystems is as given in the Listed Threatened Terrestrial Ecosystems published in 2011 (GNR 1002 of 9 December 2011).

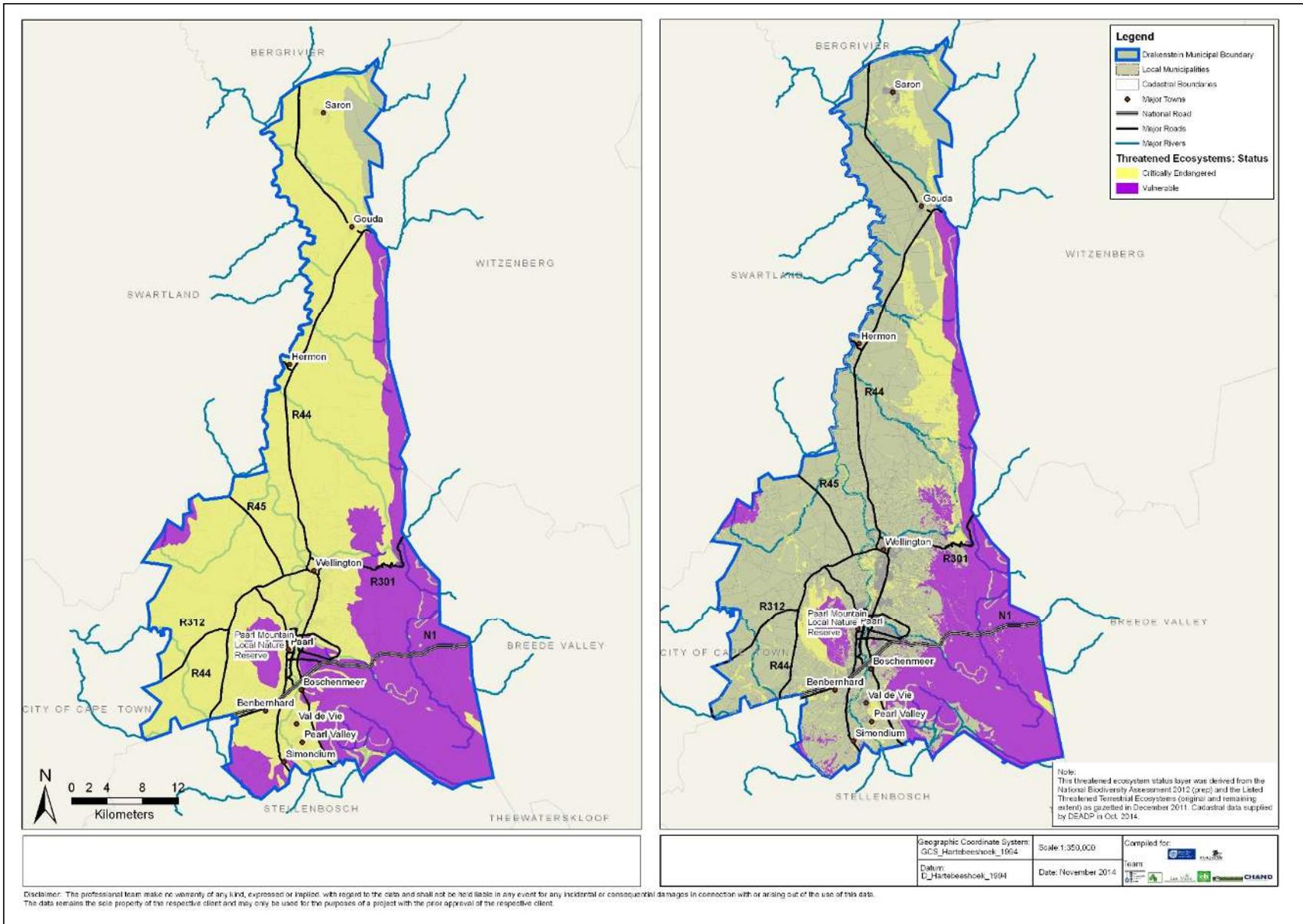
TABLE 3: Terrestrial vegetation types

VEGETATION TYPE	CONSERVATION STATUS	RATIONALE
Cape Flats Sand Fynbos	Critically Endangered	High threatened / Red Data plant species associations
Elgin Shale Fynbos	Critically Endangered	Remaining natural habitat ≤ conservation target
Swartland Alluvium Fynbos	Critically Endangered	Remaining natural habitat ≤ conservation target
Swartland Granite Renosterveld	Critically Endangered	Remaining natural habitat ≤ conservation target, plus high threatened / Red Data plant species associations
Swartland Shale Renosterveld	Critically Endangered	Remaining natural habitat ≤ conservation target, plus high threatened / Red Data plant species associations
Kogelberg Sandstone Fynbos	Critically Endangered	High threatened / Red Data plant species associations
Swartland Silcrete Renosterveld	Critically Endangered	Remaining natural habitat ≤ conservation target
Atlantis Sand Fynbos	Critically Endangered	High threatened / Red Data plant species associations
Boland Granite Fynbos	Vulnerable	High threatened / Red Data plant species associations
Cape Winelands Shale Fynbos	Vulnerable	Remaining natural habitat ≤ conservation target
Hawequas Sandstone Fynbos	Vulnerable	High threatened / Red Data plant species associations
Breede Shale Fynbos	Least threatened	
Breede Shale Renosterveld	Least threatened	
Northern Shale Band Vegetation	Least threatened	
Olifants Sandstone Fynbos	Least threatened	
Southern Afrotemperate Forest	Least threatened	
Western Altimontane Sandstone Fynbos	Least threatened	
Western Coastal Shale Band Vegetation	Least threatened	
Winterhoek Sandstone Fynbos	Least threatened	

There are eleven Threatened Ecosystems in the Drakenstein Municipal Area: eight Critically Endangered and three Vulnerable vegetation types (Refer to Map 3). The little natural habitat that remains in the lower lying areas of the Municipality is highly fragmented outside of protected areas, and classified as either *Critically Endangered* or *Vulnerable*. This means that every remaining patch (or most) of the remaining vegetation in these categories must be conserved if national conservation targets for the affected vegetation types are to be met. Relatively less threatened vegetation is found in the eastern mountainous parts of the Municipality, much of which is protected in provincial nature reserves or mountain catchment areas.



MAP 2: Vegetation Types – Remaining Extent



MAP 3: Threatened Ecosystems – Original and Remaining Extent

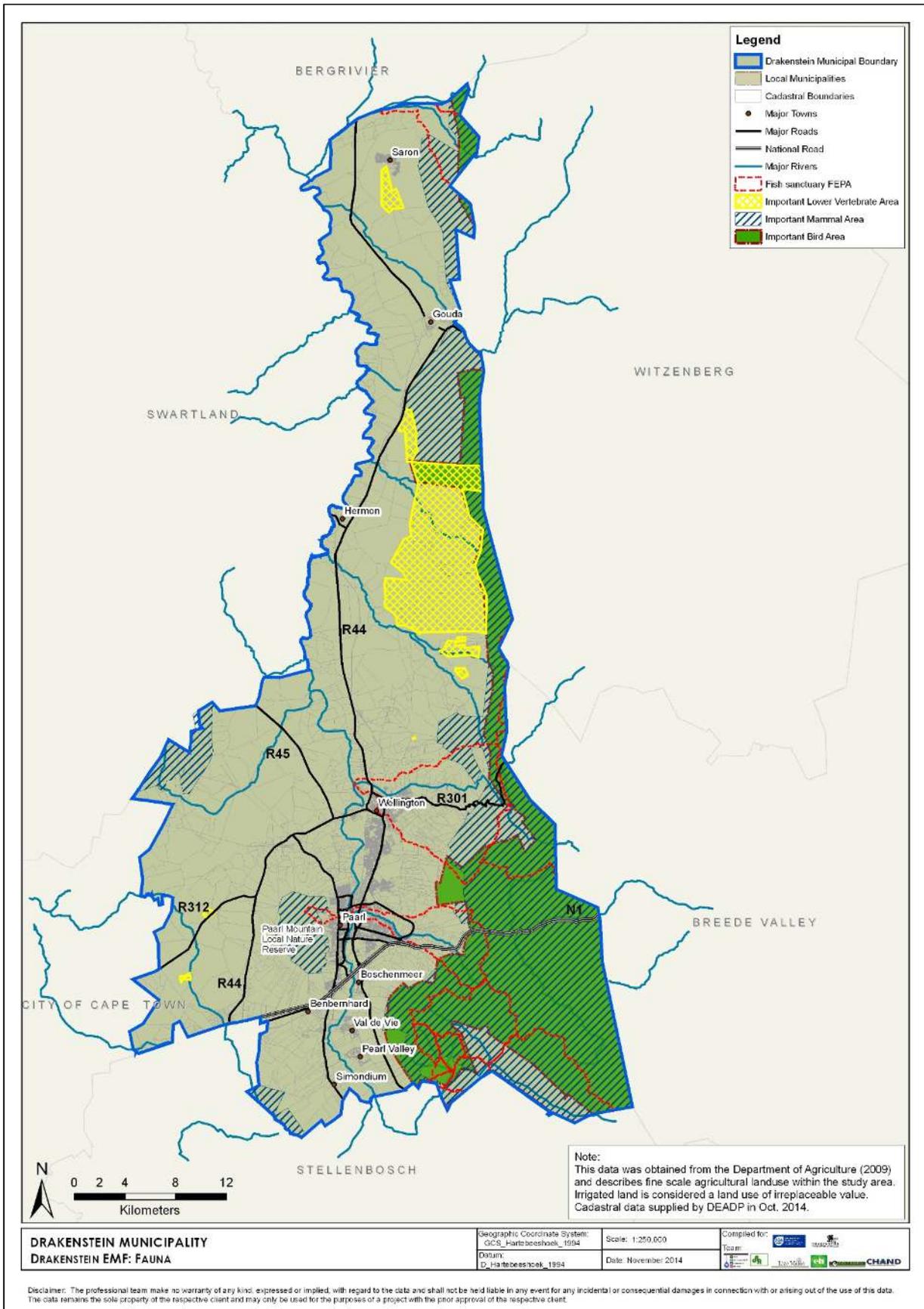
2.1.2 Fauna

Important faunal areas in the study area are shown on Map 4. Much of the indigenous habitat of the Drakenstein, with the exception of mountainous areas, has been converted for agriculture and other uses. The remaining natural areas provide habitat for mammals such as Leopard (*Panthera pardus*), Caracal (*Felis caracal*), Grey Rhebok (*Pelea capreolus*), Cape Grysbok (*Raphicerus melanotis*), Klipspringer (*Oreotragus oreotragus*), Baboon (*Papio ursinus*), Badger (*Mellivora capensis*), Dassie (*Procapia capensis*), Grey Mongoose (*Galerella pulverulenta*), Striped Polecat (*Ictonyx straitus*), Porcupine (*Hystrix africaeaustralis*), and Water Mongoose (*Atilax paludinosus*). Small mammal species include the striped fieldmouse (*Rhabdomys pumilio*), Namaqua Rock Mouse (*Aethomys namaquensis*), spiny mouse (*Acomys subspinosus*), vlei rat (*Otomys irroratus*) and the elephant shrew (*Elephantulus rupestris*). Riparian vegetation and river corridors, as well as agricultural lands and remnant patches of indigenous vegetation, permit movement of these animals across the landscape.

According to the State of Biodiversity for the Western Cape there are numerous bird species typical of the Cape mountains, as well as reptiles (including threatened tortoise species) and amphibians. The Drakenstein Municipality lies in a region of particularly high frog endemism and moderately high reptile endemism (including species such as the Hawequa Flat-tailed Gecko *Afroedura havequensis* and Oelofsen's girdled lizard *Cordylus oelofseni*).

Various indigenous and endemic freshwater fish species occur in the rivers; the area is important to indigenous fish conservation. Indigenous fish recorded from the Berg River include the *Witvis* (*Barbus andrewi*) (endangered) and the Berg River Redfin (*Pseudobarbus burgi*) (endangered). A number of invertebrates are found in the Drakenstein; they include butterfly species, some of which are threatened and/ or local endemics found in the mountainous areas.²⁴

²⁴ Turner, A. A. (ed.) 2012. Western Cape Province State of Biodiversity 2012. CapeNature Scientific Services, Stellenbosch

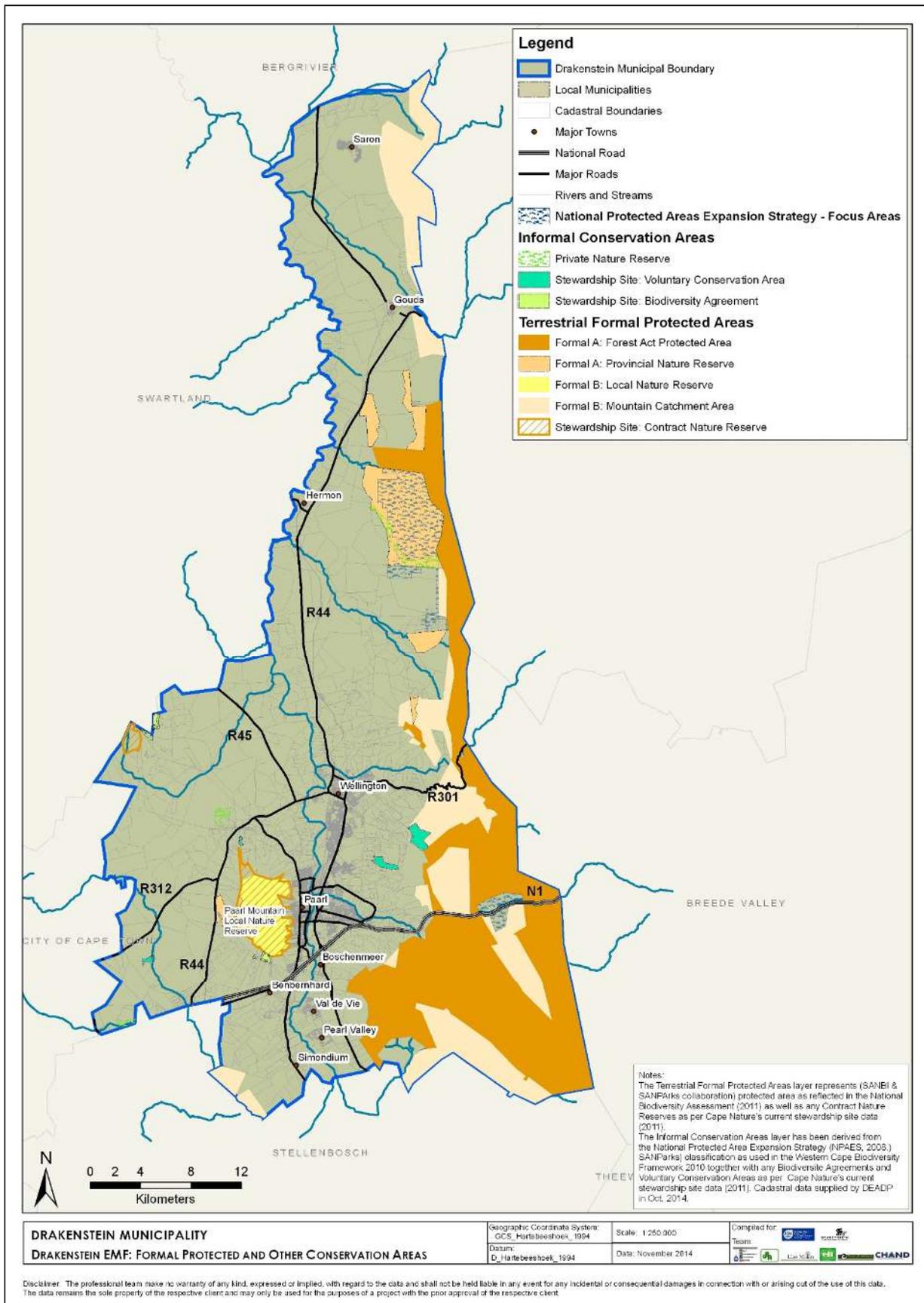


MAP 4: Fauna

2.1.3 Protected areas

Protected areas and areas managed for conservation in the Drakenstein Municipality comprise (Refer Map 5):

- ◆ Six provincial nature reserves lying within, or partially within, the Municipal area: the Limietberg, Groenberg, Groot Winterhoek, Simonsberg, Jan Briers Louw and Waterval Nature Reserves. The Limietberg and Groot Winterhoek Nature Reserves form part of the Cape Floristic Region World Heritage Site.
- ◆ One local authority nature reserve: Paarl Mountain Nature Reserve, which has heritage value.
- ◆ At least four Contract Nature Reserves established through the stewardship program, including the Elandsberg Contract Nature Reserve; the largest remaining fragment of renosterveld in a nature reserve globally. Others are the Foxenburg, Renosterveld and Bontebok Ridge Contract Nature Reserves.
- ◆ The Cape Winelands UNESCO Biosphere Reserve, listed in 2007, incorporates this Municipality.
- ◆ A number of conservancies, which are voluntary conservation areas.
- ◆ The Hawequas, Hottentots-Holland and Winterhoek Mountain Catchment Areas.
- ◆ A public bird sanctuary, Kluitjieskraal, which is defined as a state forestry area
- ◆ The Paarl Arboretum on the banks of the Berg River.



MAP 5: Protected Areas

2.1.4 Known and Likely Critical Biodiversity Areas

Information on the conservation status of ecosystems in the Drakenstein, together with an analysis of the size and concentration of, and connections between remaining patches of indigenous vegetation (to gauge their viability in the long term) by CapeNature, was used to derive an Integrated Biodiversity Layer, in order to determine Known or Likely Critical Biodiversity Areas (CBAs)²⁵.

The Known CBAs comprise areas of Critically Endangered habitat, in addition to Endangered and some Vulnerable habitat having the best patch size, density and connectivity. The Likely CBAs²⁶ comprise both Endangered and Vulnerable habitat of sufficient size, density and connectivity to be viable in the long term.

There is information on Red Data species available from SANBI. Due to the sensitive nature of these data, it is not possible to show it spatially. Whilst it can be expected that the location of many Red Data species is likely to fall within the known and likely CBAs, it is probable that there are species outside of these areas. Accordingly, SANBI must be consulted in the course of undertaking a baseline study on biodiversity for any vacant / undeveloped / vacant land, whether this land falls within a sensitive biodiversity area or not.

2.1.5 Special habitats

Special habitats refer to areas that are unique or that have particular characteristics or features. Four types of ‘special habitats’ are found at a smaller scale than broad vegetation types or ecosystems, namely:

- ◆ Wetlands which are important for regulating water quality and flow (please refer to Section 2.3.4 for details) and providing particular wildlife habitat;
- ◆ Silcrete patches which provide unique habitat for distinct and often endemic biodiversity;
- ◆ Indigenous forest patches; and
- ◆ Locations that are known to provide habitat for a number of recorded Red Data Book plant species.

2.2 Important areas for the delivery of ecosystem services

Humankind benefits from a multitude of resources and processes that are provided by ecosystems. Collectively, these benefits are known as ‘ecosystem services.’ Ecosystem services can be divided into: *provisioning* such as the production of food and water; *regulating*, such as the control of climate and disease; *supporting*, such as

²⁵ These Known and Likely CBAs have **not** been determined through a Systematic or Fine-Scale Biodiversity Planning exercise. However, their classification is the ‘best available’ until such planning is carried out in the Drakenstein.

²⁶ Highly likely to be selected as CBAs in any Systematic Conservation Planning exercise, although not all of these would necessarily be selected.

nutrient cycles and crop pollination; *cultural*, such as spiritual and recreational benefits; and *preserving*, such as guarding against uncertainty through the maintenance of diversity (http://en.wikipedia.org/wiki/Ecosystem_services).

The areas that are considered most important in terms of ecosystem services within the Drakenstein Municipality are as follows:

1. *Rivers*: The most significant role of rivers is that of water supply. Most of the rivers in the Drakenstein Municipality are degraded due to the impacts of invasive alien fish species, modification of the river banks, clearing of riparian vegetation, invasion of riparian areas with alien plants, development within the floodplain, conversion of valley bottom wetlands, reduction or removal of buffer areas between wetlands or rivers and adjacent land uses, and the cumulative negative effects of chemicals, nutrients and other pollutants in runoff from agricultural lands or settlements and/or releases from intensive aquaculture (especially trout farms).
2. *Wetlands* are considered to be the most productive and biologically diverse ecosystems in southern Africa. They are also one of the most threatened and neglected habitats. There are numerous so-called 'valley bottom' wetlands in the Drakenstein that play a critical role in trapping sediment, preventing erosion, and helping to maintain water quality in rivers; many – if not most – of these wetlands are vulnerable to conversion (or have already been converted) for agricultural production. Most valley bottom wetlands in the Drakenstein area are naturally unchannelled valley bottoms. 'Seepage' wetlands are also common landform features in the Drakenstein area. These are located on relatively steep slopes and are characterised by diffuse, shallow subsurface flow which gives them a high potential for nitrogen and especially nitrate removal. Seepage wetlands also contribute to extending the period of flow in downstream systems, by slowing down the rate of surface and subsurface water movement down the slope.
3. *Mountain catchments*: The Hawequas, Hottentots-Holland and Winterhoek Mountain Catchment Areas were proclaimed to protect habitat critical to a reliable supply of clean water.
4. *Productive soils*. The soils of the Drakenstein underpin agricultural production (refer to 4.4) and contribute to food security, not only in the Drakenstein Municipal Area, but further afield. That is, their value extends beyond the municipal boundary.
5. *Remaining areas of priority biodiversity*. Areas containing indigenous vegetation provide habitat for pollinators on which agricultural production depends, and help to conserve a wide range of living material. The latter effectively safeguards options for our future adaptation and wellbeing.

2.2.1 Ecological corridors

Ecological corridors (Map 6) strive to ensure that key ecological and evolutionary processes at different scales will continue in perpetuity. They create linkages between different ecosystems on land, focusing on attributes that are significant for biodiversity conservation, and between terrestrial and freshwater ecosystems. Streams and rivers with their associated floodplains, wetlands and riparian habitats, as well as mountain chains, effectively provide natural corridors across landscapes. Ecological corridors extend within and beyond the boundaries of the Drakenstein municipal area. These corridors safeguard 'green' links, and particularly in urban areas may constitute valued open space for recreation and relaxation.

The Berg River provides an important link between the mountains and the sea. Although the Berg River catchment has been extensively developed, and the riparian corridor is in a poor condition, the river nevertheless constitutes a substantial vegetated area through an otherwise largely ecologically sterile, cultivated catchment. In places, therefore, it is probably the only refuge for both remnant riverine and terrestrial fauna. This corridor also provides links between the lowlands and the upper reaches of its tributaries.

The mountain catchment areas and nature reserves (Limietberg, Groot Winterhoek) in the eastern part of the Drakenstein provide a valuable north-south ecological corridor. In addition to river and mountain corridors, it is important to set aside linkages between ecosystems that are a priority for biodiversity conservation, where relevant, and to try to safeguard areas particularly important from an ecological and/or evolutionary perspective. These areas include interfaces between different soil types, transition areas and gradients between upland and lowland areas, as well as macro-climatic gradients.

Ecological corridors within the boundaries of the Drakenstein, and linking with important areas for biodiversity conservation beyond the Drakenstein, were identified by taking into account and trying to incorporate and link the various environmental attributes listed below, based on a range of information from the SANBI and CapeNature (integrated biodiversity layer), the Berg River Study (Ninham Shand & Freshwater Consulting Group) and a survey of wetlands in the Drakenstein undertaken by the Freshwater Consulting Group for this EMF:

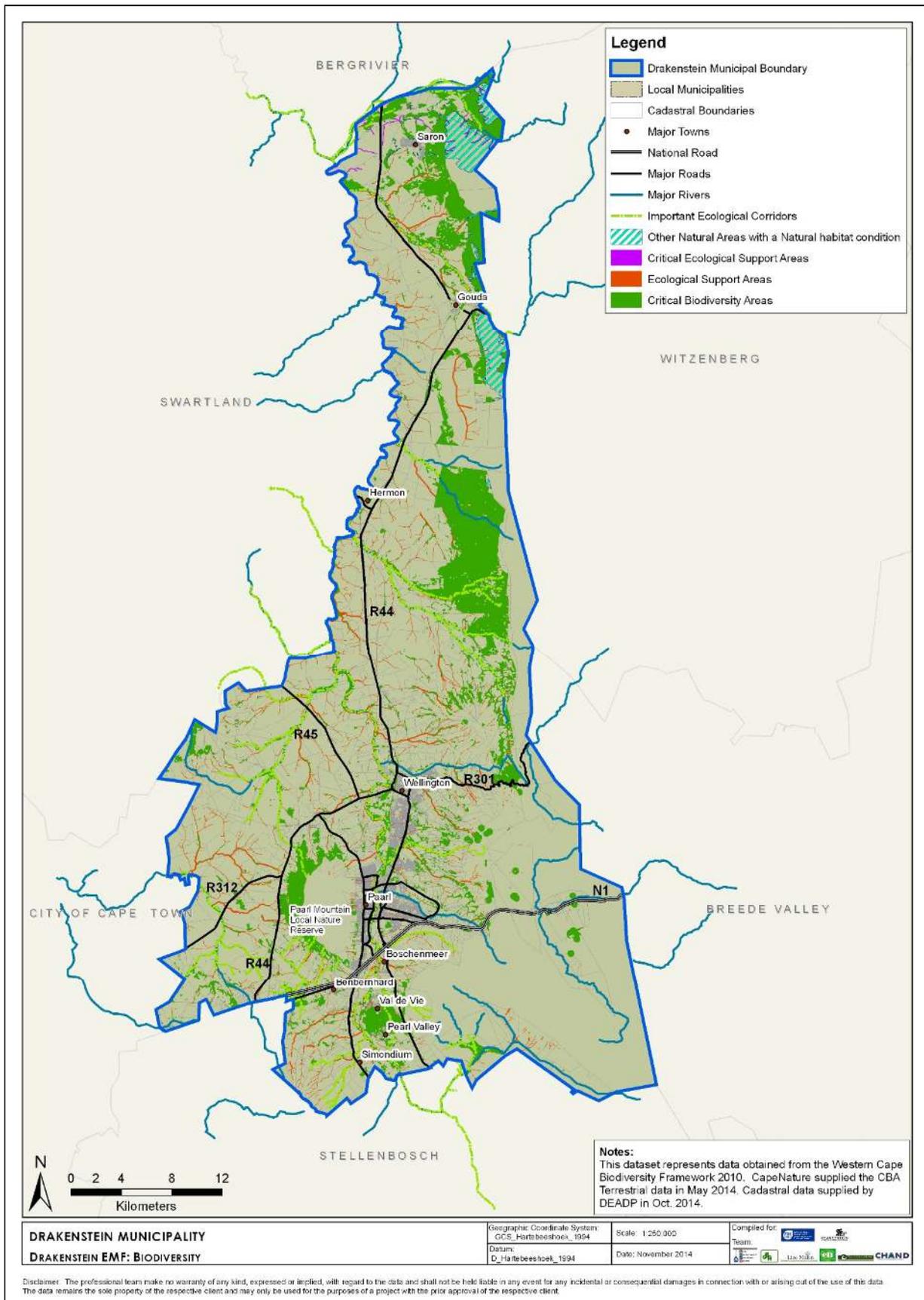
- ◆ Priority streams and rivers in and beyond the Drakenstein in terms of their role as ecological corridors, either supporting or linking different freshwater systems of significance, providing longitudinal and lateral corridors for semi-aquatic fauna, and/or providing links with terrestrial areas;
- ◆ Protected areas both within and beyond Drakenstein;
- ◆ Areas known or likely to constitute Critical Biodiversity Areas within the Drakenstein and in municipalities beyond the Drakenstein;

- ◆ Ecosystem remnants having a high connectivity and density within the Drakenstein and in municipalities beyond the Drakenstein, including Renosterveld priority clusters;
- ◆ Special habitats within the Drakenstein, including priority wetlands either associated with, or distinct from, streams and rivers.

The width of corridors draws on recommendations of a number of studies²⁷. The width of river corridors ranges from 30-50m on either side of the river bank depending on its size; and 115m from the centre of the Berg River, wetlands have a setback line (buffer) of 30m from the edge of the wetland.

Please note: The identification of ecological corridors was not based on a systematic conservation planning exercise. No such systematic conservation planning exercise has been undertaken for the Drakenstein municipal area. The demarcation of corridors is based on professional judgement of the project team working with ecological specialists, and comment from CapeNature. The corridors are depicted as links between significant ecological attributes; in effect, the boundary of these corridors must be taken to be the boundary of these significant ecological attributes (e.g.. when running through a known CBA, the edge of the CBA would be taken as the boundary of the corridor; when passing through a wetland area, the setback line from that wetland would demarcate the edge of the corridor, etc.).

²⁷ Biodiversity priorities in the Drakenstein (CAPE, CEPF, CapeNature and the Botanical Society of South Africa);Berg River Catchment Study (in preparation, Ninham Shand and the Fresh Water Consulting Group 2008?)



MAP 6: Important biodiversity and ecological corridors

2.3 Water Resources and River Systems

Surface water is the main source of water in the Drakenstein Municipality, with groundwater playing an insignificant role in this regard. A number of rivers traverse the area, the largest of these being the Berg River with the Palmiet, Sand, Dal, Klein Berg, Bot, Twenty Four, Krom, Kompanjies, Voelvllei and Klapmuts as tributaries. The Berg River rises in the Franschoek and Drakenstein mountains. Initially it flows northwards through Paarl, Wellington, Hermon and Gouda, where it is joined by the Klein Berg and Vier-en-Twintig rivers. It then flows westwards and its mouth is at St. Helena Bay on the west coast.

Rivers in the Western Cape are among the most severely threatened in South Africa, with 95 % of them assessed as critically endangered meaning that less than 10% of their length is intact (SANBI 2004). With increasing levels of human activity with its associated impacts, rivers become less and less resilient. Wetlands would be similarly affected. As a result the ability of rivers and wetlands to provide resources and services (i.e. ecosystem services) to human users reduces. Rivers and wetlands are of critical importance, both for humankind and for the economy. Among others is the provision of water necessary for agricultural, domestic and industrial use as well as natural resources such as fish and plant species for human consumption. These systems are also valuable tourism, recreational and cultural resources.

2.3.1 Availability of water resources

The Berg River is one of four Water Management Areas in the Western Cape. It provides an important source of water for the City of Cape Town, Winelands and the West Coast. In terms of future water supply planning, the Drakenstein falls within the ambit of the Department of Water Affairs Western Cape Water Supply System. This planning process considers water supply requirements over a 30-year timeframe. An holistic approach is taken, which means that each supply source is seen as contributing to the system as a whole.

Water is allocated on the basis of what is available in the system, with towns being given priority over agriculture. Irrigation water for agricultural purposes is obtained from surface water resources (rivers / dams), with the Berg River being an important source. In addition, the municipality is facing increased demand for water due to urbanisation, economic development, intensification of land use practices and the provision of water to meet the basic needs of a growing population. Currently, most of the water in the Drakenstein Municipality is supplied locally from the Wemmershoek Dam, which is located within the municipal area. This water is purchased from the City of Cape Town. This supply is augmented by dams on Paarl Mountain. Gouda's water is supplied by the West Coast District Council from the Voelvllei Dam. Water supply in Saron is under pressure as a result of the high demand for irrigation water in the settlement. Groundwater is not a significant resource within Drakenstein, with only a few private boreholes being present in the area. The Department of Water Affairs has not designated any significant or strategic aquifers in the Drakenstein Municipality. A major study is underway in relation to the exploitation of the Table Mountain Group (TMG) aquifer. The study area for this investigation extends into the Drakenstein.

According to the State of Environment Report (EEU, 2005), the municipality intends to reduce its dependence on external water sources, namely the purchase from the City of Cape Town and the West Coast District Municipality. This is to be achieved through greater use of the mountain water, supplemented by Berg River Water as well as the expansion of the Antoniesvlei scheme at Wellington.

The water use situation from the Berg River (per sector) is shown in the pie chart below, based on information published by the DWA. The most recent addition to the Western Cape Supply System is the Berg River Dam near Franschoek. According to the Department of Water Affairs (DWA)²⁸, there was no spare capacity in the Western Cape Water Supply System prior to the new Berg River Dam coming on stream. Consumptive use amounted to 745 million cubic metres and the shortfall was 36 million cubic metres, according to the 2005 data. It can be seen that urban use (54%) followed by agriculture (42%) consume 96% of the water. The preliminary ecological reserve provision is 3% with the remaining water being utilised by invasive alien vegetation and afforestation.

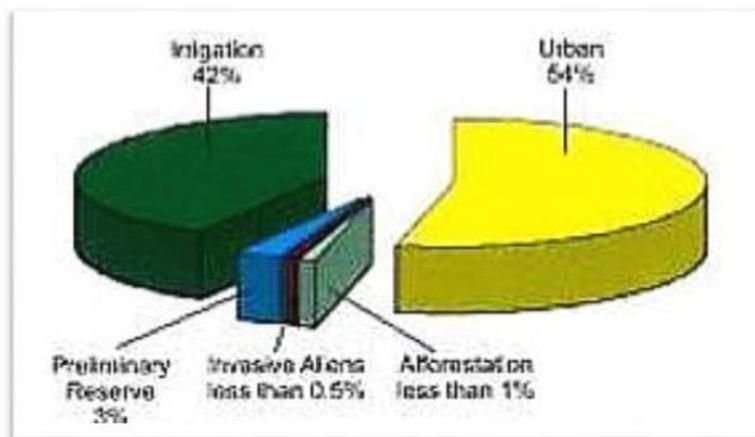


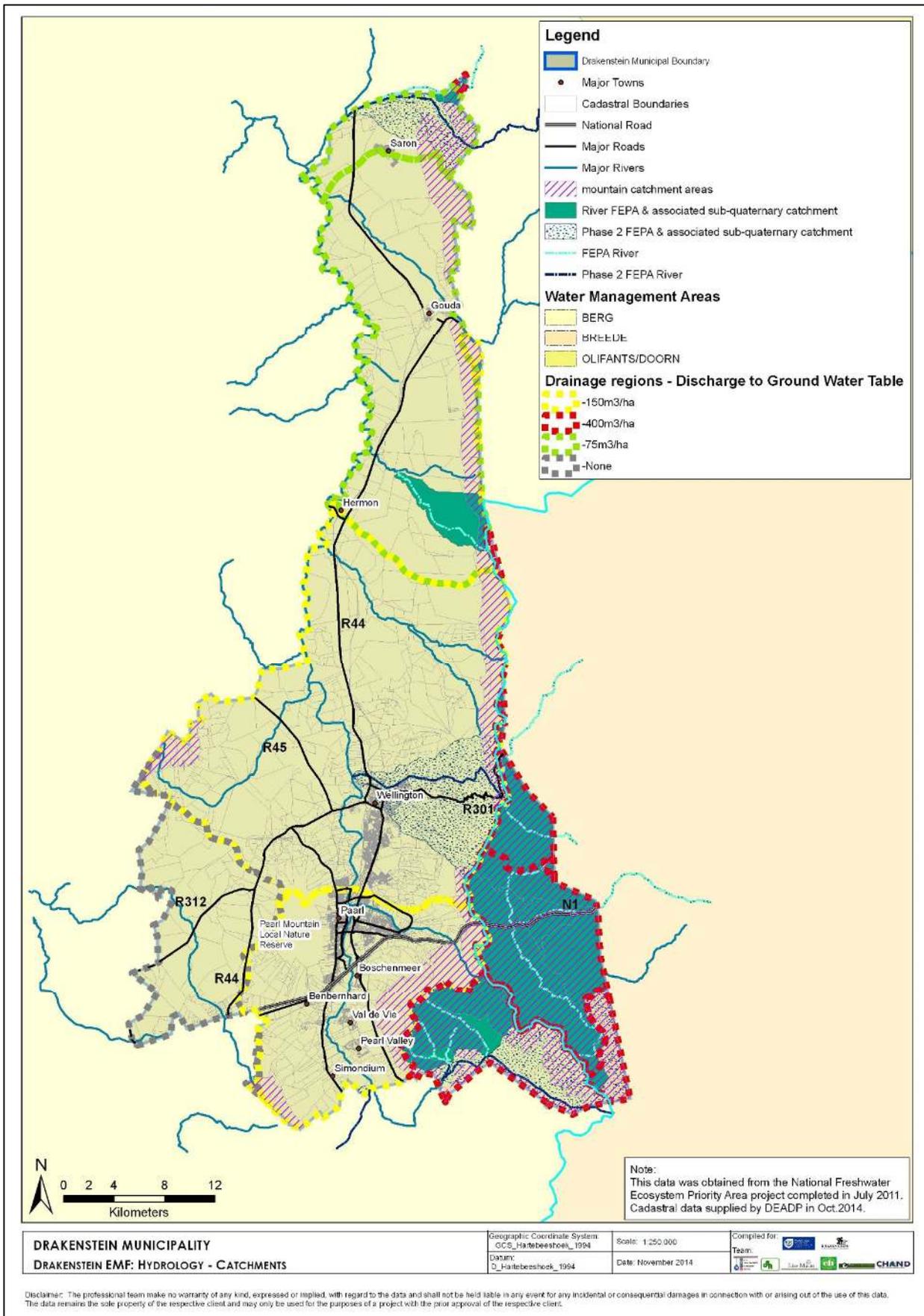
FIGURE 1: Water use per sector (DWA 2005)

More recent water resources planning for the Western Cape has been undertaken through a joint initiative between the Department of Water Affairs and the DEA&DP. An Integrated Water Resources Management Action Plan has been developed that identifies short (1-5 years), medium (6-15 years) and long term (15 years and beyond) actions to guide implementation of projects / activities and future development priorities for achieving appropriate water resource management. According to the Western Cape IWRM Action Plan: Status Quo Report²⁹ sufficient water is available in the Water Management Area to meet demand until about 2018/19.

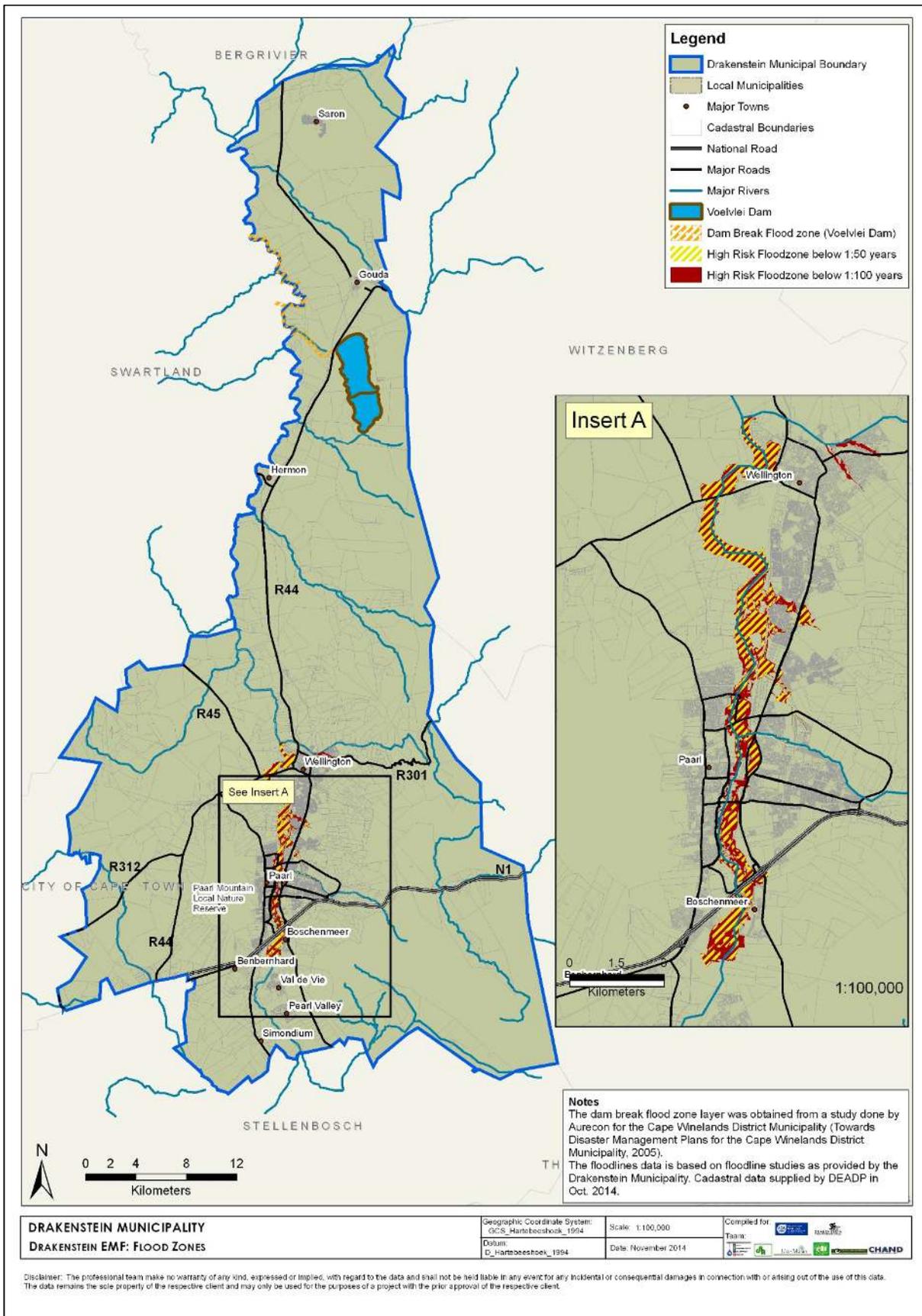
Map 7 shows hydrological information such as catchments, water management areas and drainage regions. The GIS data have been derived from the Freshwater Ecosystem Priority Areas (FEPAs) study undertaken by SANBI. Floodlines have been determined for a portion of the Berg River. This is important information for development planning. The floodline information is shown in Map 8.

²⁸ Formerly the Department of Water Affairs and Forestry (DWA)

²⁹ Western Cape Integrated Water Resources Management Action Plan (2011): Chapter 8 – The Berg River WMA.



MAP 7: Catchments and Water Management Areas



MAP 8: Flood zones

2.3.2 Water quality in river systems

The only part of the Berg River system that is in a near-pristine state is the upper catchment of the Vier-en Twintig River. Tributaries of the Berg River in the southern portion of the Drakenstein municipal area are ecologically degraded as a result of alien vegetation infestation and agricultural activities (associated with river modification, water abstraction and runoff of pollutants). Where the Berg River and the lower reaches of its tributaries pass through urban areas, water quality and habitat integrity are reduced mainly as a result of urban development. In the northern part of the municipal area north of Hermon) flow patterns in the Klein Berg and Vier-en Twintig Rivers have been altered by diversion weirs. Throughout this area alien fish (e.g. bass) are widespread and have led to the disappearance of indigenous fish (e.g. Berg River Redfin)³⁰

Water quality in Drakenstein is characterized as follows:

- ◆ A substantial increase in phosphorus and nitrogen nutrients in the Berg River between Franschoek and Paarl, reflecting inputs from the Franschoek WWTW (outside of the Drakenstein study area), as well as runoff from agricultural areas and golf estates. A significant decrease in water quality occurs between Paarl and Hermon due to a substantial increase in nutrients and contamination from runoff from poorly serviced urban areas in Paarl and Wellington.
- ◆ Levels of some indicator bacteria strains (e.g. *Escherichia coli*) in the Berg River that may pose a risk to human health for direct-contact (e.g. swimming) and possibly intermediate-contact (e.g. canoeing) use (State of the Environment Report, EEU, 2005). The bacterial counts downstream of Mbekweni generally exceed the guideline values for most uses.
- ◆ An increase in levels of salts in the river over the past 50 years, suggesting the influence of increases in saline return flows from irrigation along the Berg River, coupled with abstraction of water from the main channel and its less saline tributaries.
- ◆ The contribution of toxic pollutants from sources such as crop sprays, cattle dips and industrial effluent is currently unknown.
- ◆ Lack of services has been found to be a significant contributor to pollution of the Berg River. An investigation on services and housing by Lyners Consulting Engineers & Project Managers in 2005 undertaken for the municipality has shown that there are a number of areas in Paarl that are over populated and under serviced. Very few people in these areas have access to basic water and sanitation facilities. This is aggravated further by the lack of proper refuse removal services and proper housing facilities. These areas include:
 - Mbekweni,
 - Oliver Tambo and Newton,
 - Fairyland,

³⁰ Ninham Shand and the Fresh Water Consulting Group (2009): Drakenstein River Environmental Management Plan

- New Orleans,
- Klein Nederburg,
- Klein Drakenstein and
- Zakwaziwana.

Water quality in the Berg River is a significant concern, to the extent that it has impacted on the export market for agricultural goods, as it is an important source of irrigation water. Crops that are irrigated with water that is of poor quality cannot be imported into the European Union (Europegap standards). The Department of Water Affairs has formulated an action plan together with industry and the municipality to address this issue. DWA undertake regular water quality monitoring but these data have not been systematically analysed or assessed to determine trends, as yet. This monitoring does not include constituents such as those that would originate from the use of agri-chemicals (e.g. fertilisers, pesticides) or industrial effluent. The focus is on physical properties and bacteriological constituents.

According to the Strategic Environmental Assessment (SEA) undertaken in 2006, the organic loading in the Berg River is high in the Paarl-Wellington areas where the storm water runoff originates from agricultural, urban and industrial activities including wine and spirit production, food canning and processing, wool washing, textile milling, tanneries and cigarette and tobacco manufacturing. Treated sewage effluent is also discharged into the Berg River from Paarl and Wellington as well as from some individual treatment plants such as the Correctional Services centres.

2.3.3 Freshwater Ecosystem Priority Areas

Aquatic ecosystem information is available from the National Freshwater Ecosystem Priority Area project. An atlas showing FEPAs (Freshwater Ecosystem Priority Areas) has recently been published. The FEPA maps are supported by a Technical Report.³¹ The FEPA information has been incorporated into the EMF GIS database (see Maps 7 and 9). Different categories are shown on the FEPA maps, each with differing management implications:

- ◆ *River FEPA and associated sub-quaternary catchment:* River FEPAs achieve biodiversity targets for river ecosystems and threatened/near-threatened fish species, and were identified in rivers that are currently in a good condition (A or B ecological category). Their FEPA status indicates that they should be retained in a good condition in order to contribute to the biodiversity goals of the country. For river FEPAs the whole sub-quaternary catchment is shown as a FEPA, although FEPA status applies to the actual river reach shown on the map within such a sub-quaternary catchment.
- ◆ *Wetland or estuary FEPA:* For wetlands, only the actual mapped wetland is shown on the map as a FEPA.

³¹ Nel, J.L. et. al (2011): Technical Report for the National Freshwater Ecosystems Priority Project, Water Research Commission, WRC Report No. K5/1801

- ◆ *Wetland cluster:* Wetland clusters are groups of wetlands embedded in a relatively natural landscape. This allows for important ecological processes such as migration of frogs and insects between wetlands.
- ◆ *Phase 2 FEPA and associated sub-quaternary catchment:* Phase 2 FEPAs were identified in moderately modified (C) rivers. The condition of these Phase 2 FEPAs should not be degraded further, as they may in future be considered for rehabilitation once good condition FEPAs (in an A or B ecological category) are considered fully rehabilitated.

The eastern parts of the Drakenstein Municipal Area are dominated by river FEPAs (Berg River and tributaries) where wetland clusters are also located). There are a number of demarcated Phase 2 FEPAs in the vicinity of Saron and Wellington. Important river catchments are shown in Map 7 and the FEPA wetlands and rivers are shown in Map 8 along with other relevant hydrological information.

2.3.3.1 River systems

The Berg River is critically important as a water supply to its mouth; considered the second most important estuary in the country. As one of only a few large rivers in the Western Cape, the Berg is important in its own right. The Drakenstein Municipality has recently commissioned a study to develop an Environmental Management Plan for the Berg River. This study is focused on ecological issues and has considered the entire municipality at a sub-catchment level.³²

The river form has changed considerably over the last 70 years, from a wide and foothill area with numerous interconnecting channels, wetlands and stands of palmiet reeds (*Prionium serratum*), and islands, sand-bars and pools in what is now the Paarl urban area, to a single meandering channel. Split channels are now limited to the reaches immediately downstream of the Wemmershoek tributary, as well as immediately downstream of Hermon. While channelisation is extensive downstream of Wellington, a few portions of the river in the Hermon area still have secondary flood channels, which contribute to hydraulic diversity.

It is noted in the Environmental Management Plan for the Berg River that the key characteristics of the freshwater ecosystems in Drakenstein are as follows:

- ◆ Poor water quality, in particular, nutrient enrichment and bacterial contamination in urban areas as well as increasing salinity.
- ◆ Sedimentation from erosion in the catchment, and of valley bottom wetlands leading into the Berg River
- ◆ Increased electrical conductivity suggesting an increase in saline return flows from irrigation and abstraction from less saline tributaries.

³² Ninham Shand & Freshwater Consulting Group, 2008

- ◆ Erosion of river beds and banks from channelisation.
- ◆ Loss of stream flow as a result of alien vegetation, in particular, eucalypts *Eucalyptus* spp. lining the river upstream of Paarl and downstream of Wellington.
- ◆ Loss of endemic and threatened fish species (there are four endemic fish species in the Berg River catchment; these fish – with the possible exception of the Berg-Breed witvis that is considered extinct in the Berg River – have been largely eradicated in the mainstem of the river).

Riparian vegetation along the Berg River, of importance in safeguarding the river health, has been assessed as “Poor” throughout all the reaches of the Berg River in the Drakenstein area, with the exception of the reaches between the Krom River and the Klein Berg, where remnant indigenous vegetation contributes to a marginally improved score of “Fair”. Riparian vegetation is dominated by large stands of eucalypts along most of the reaches of the Berg River in the Drakenstein area.

Habitat Integrity in the main stem of the Berg River in the Drakenstein area was assessed by RHP (2004)³³ as “Fair” in the reaches upstream of Paarl, “Poor” in the reaches within the Paarl/Wellington area and downstream as far as Zonquasdrift and “Fair” to “Poor” to the downstream boundary of the Drakenstein area and beyond. The classification of the sub-catchments in respect of specific ecological criteria has been mapped: buffers along rivers and wetlands, erosion and alien vegetation.

The aforementioned Ninham Shand / Freshwater Consulting Group study on the Berg River identified ‘red flags’, namely issues that require attention (Table 4).

TABLE 4: Red Flags relating to the rivers in the Drakenstein

SUB-CATCHMENT CODE	CATCHMENT	MAIN RIVER	RATIONALE
Die01	Diep	Klapmuts	Severe erosion needs to be addressed
Ber08	Berg	Krom	Area potentially includes some urban wetland remnants
Ber08	Berg	Krom	Important remnant habitat for indigenous fish
Ber08	Berg	Krom	Area contains remnant floodplain habitat
Ber08	Berg	Krom	Erosion needs addressing
Ber15	Berg	Berg	Erosion nick point present
Ber25	Berg	Twenty Four Rivers	Extensive area of wetlands, albeit degraded
Bre01	Breede	Molenaars	Encroachment of resort dwellings onto river edge and input of trout farm effluent
Bre02	Breede	Krom/Smallblaar	Trout farm effluent into near-pristine system
Bre02	Breede	Krom/Smallblaar	Trout farm effluent into near-pristine system
Bre03	Breede	Elands	Trout farm effluent into near-pristine system

‘Exceptions have also been identified – this refers to characteristics that warrant a particular part of a river or catchment as being of maintained as is, because it is currently in a relatively good ecological state (Table 5).

³³ River Health Programme

TABLE 5: Exceptions – areas that need to be maintained due to ecological importance and condition

SUB-CATCHMENT CODE	MAIN RIVER	RATIONALE
Ber06	Palmiet	Remnant floodplain habitat on lower reaches of Palmiet River, on urban fringe
Ber07	Dal	Remnant valley bottom wetlands in open space
Ber07	Dal	Remnant valley bottom wetlands in open space
Ber07	Dal	Remnant valley bottom wetlands in urban area – being developed at time of report compilation
Ber09	Bot/Sand	Examples of remnant valley bottom wetlands in least impacted condition
Ber09	Bot/Sand	
Ber09	Bot/Sand	
Ber09	Bot/Sand	Remnant floodplain habitat on lower Sand River
Ber11	Berg	Examples of remnant valley bottom wetlands in least impacted condition
Ber11	Berg	
Ber13	Kompanjies	Remnant valley bottom and floodplain wetlands in otherwise highly impacted sub-catchments
Ber13	Kompanjies	
Ber13	Kompanjies	
Ber15	Berg	Remnant valley bottom and floodplain wetlands in otherwise highly impacted sub-catchments
Ber15	Berg	
Ber15	Berg	
Ber20	Vöelvei	Good examples of relatively unimpacted unchannelled valley bottom wetlands
Ber20	Vöelvei	
Ber20	Vöelvei	
Ber21	Berg	Good examples of relatively unimpacted unchannelled valley bottom wetlands
Ber21	Berg	
Ber21	Berg	
Ber22	Klein Berg	Highly impacted urban area of Saron, where water quality and other impacts rated as more impacted than generic assessment
Ber25	Twenty Four Rivers	Highly impacted urban area of Saron, where water quality and other impacts rated as more impacted than generic assessment
Die01	Klapmuts	Examples of remnant valley bottom wetlands in least impacted condition
Die01	Klapmuts	
Die03	Klapmuts	Extensive <i>Pennisetum macrourum</i> wetland

2.3.3.2 Wetlands

A specialist wetlands study was undertaken for the EMF by the Freshwater Consulting Group (Refer to Appendix C). All identifiable wetlands of three catchments included in the Drakenstein Municipal Area, namely those of the Berg, Breede and Diep Rivers, were mapped (see Map 9), drawing on available data, orthophotos, aerial photography and satellite imagery (Freshwater Consulting Group

and MGIS, 2009)³⁴ using the revised National Wetland Classification System (NWCS) (SANBI 2009). Through limited groundtruthing, it was clear that mapping was generally reliable, except where there were dense stands of alien invasive vegetation. Artificial wetlands (e.g. dams) were differentiated from natural wetlands.

Of the 4238 wetland polygons mapped, 1463 were classified as artificial systems; most of them comprised dams. The greatest density of dams (both in- and off-channel) occurs in the wetter southern portion of the study area, particularly south of Paarl. No dams were noted in the Berg River subcatchments.

Most of the natural wetlands are 'hill slope' or 'valley bottom/ floor' wetlands, with some being described as 'plain' wetlands on flat land close to the Berg River. Some of the least impacted examples of hill slope seeps, channelled and unchannelled valley bottom wetlands occur in the Diep River subcatchments.

- ◆ **Hill slope wetlands** are by far the most common. Most occur as seeps on relatively steep slopes. The largest area of these seeps is located in mountains of the Klein Drakenstein, the Limietberg, the Havequas and the Groot Winterhoekberg.

These wetlands provide an important ecosystem service:

the diffuse subsurface flow through these wetlands gives them a high potential for nitrogen and especially nitrate removal. They also contribute to extending the period of flow in downstream systems, by slowing down the rate of surface and subsurface water movement down the slope.



- ◆ **Valley bottom wetlands** also occur, with the majority being naturally unchannelled valley features, although some have been artificially channelled. ***These wetlands provide an important ecosystem service:*** Shallow, diffuse flow through these wetlands means that they can be effective in terms of buffering floods, trapping sediment (low flow periods only) and removing phosphorus³⁵. Subsurface seepage of water from the surrounding catchment into the valley bottom promotes removal of nitrates and other toxicants, which is further improved by close contact of water to wetland vegetation and soils.

Both the unchannelled valley bottom wetlands and hillslope seeps are highly vulnerable to headwall erosion, which results in the creation of channelled systems, and the loss of many of their beneficial wetland functions. The valley bottom wetlands are particularly sensitive to bank and bed erosion, resulting from concentration of flows; livestock trampling; burning, increased surface runoff, alien

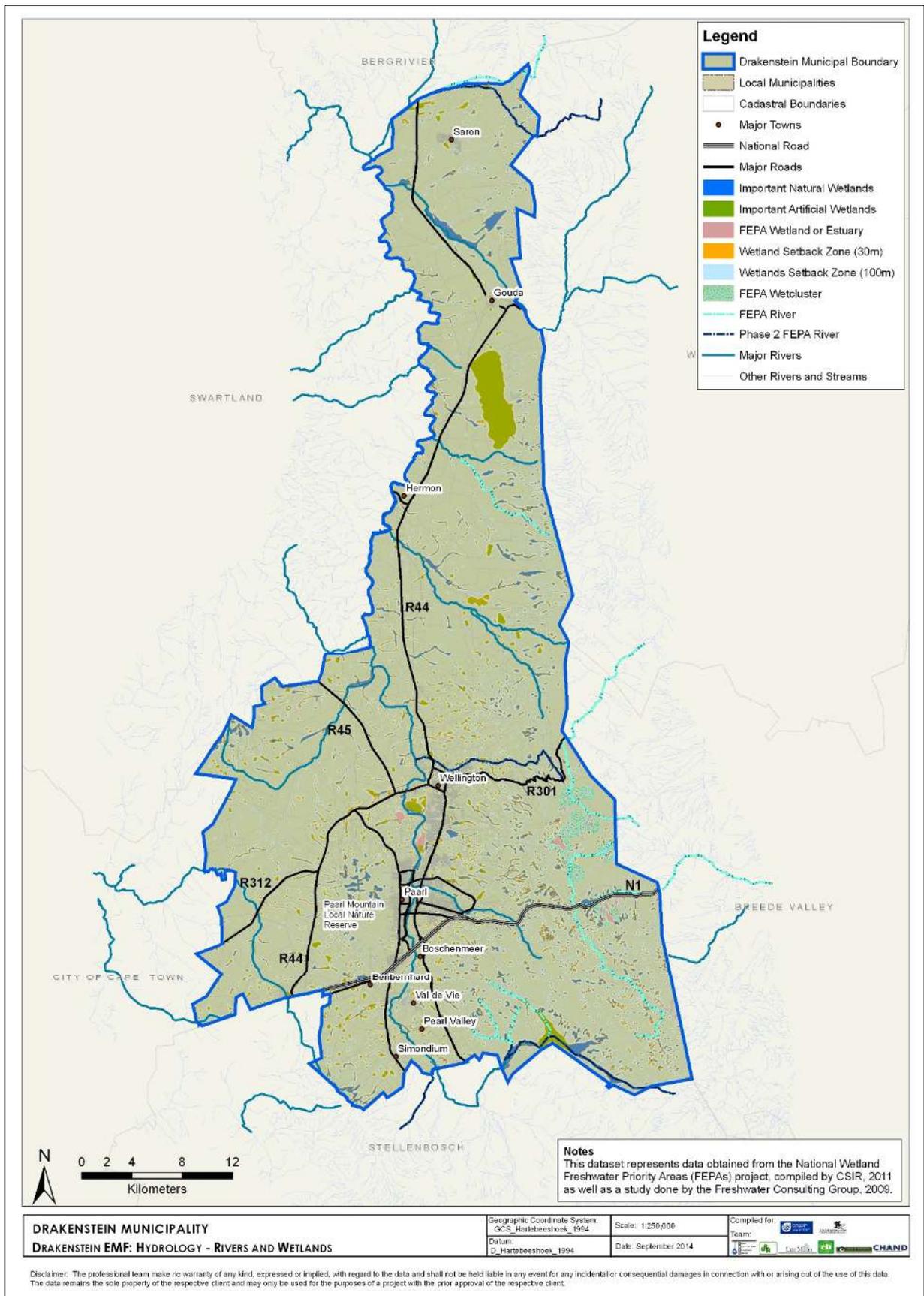
³⁴ Report prepared for DEA&DP by E. (Liz) Day, K. Snaddon, S.G. Ractliffe and D.J. Ollis of the Freshwater Consulting Group, and Iselle Murray of MGIS (Appendix C).

³⁵ Phosphorus is sometimes re-mobilised under prolonged anaerobic conditions

vegetation and inadequate attention to the design and placement of infrastructure such as road culverts.

Sixty percent of the area covered by natural wetlands occurs within protected areas – largely in the mountain ranges along the east of the study area. This indicates relatively high levels of protection of some of the remnant wetlands, but it also **highlights the likely extent of loss of wetlands from developed areas**; this aspect is a concern, given the fact that the large rivers in the study area, and the Berg River in particular, would under natural circumstance have been associated with extensive areas of floodplain wetlands and wetland flats (e.g. Aurecon 2009). The elimination of low-lying wetlands presents difficulty in finding extant corridors of continuous wetland in good condition that link the mountains and the main Berg River. A total of 3654 (2775 ha) of natural wetlands occur in Critical Biodiversity Areas – highlighting the likely importance of conservation of such wetlands within a structured biodiversity conservation plan for the area.





MAP 9: Rivers and wetlands

2.4 Agricultural Resources

The Drakenstein area has a well-established agricultural sector. A recent study by the Department of Agriculture (Western Cape) shows that a variety of fruit crops are grown in the area. Viticulture is a key sector within Drakenstein's agricultural sector, with 18 percent of all South Africa's wine grape cultivation occurring in Paarl. Another key product is olives, with 90 percent of all South Africa's olives produced in the Western Cape. Although no specific figures are available for Drakenstein, it is widely acknowledged that a significant number of olives farms occur in the greater Paarl area³⁶. Map 10 shows the spatial extent of cultivation and range of crops grown.

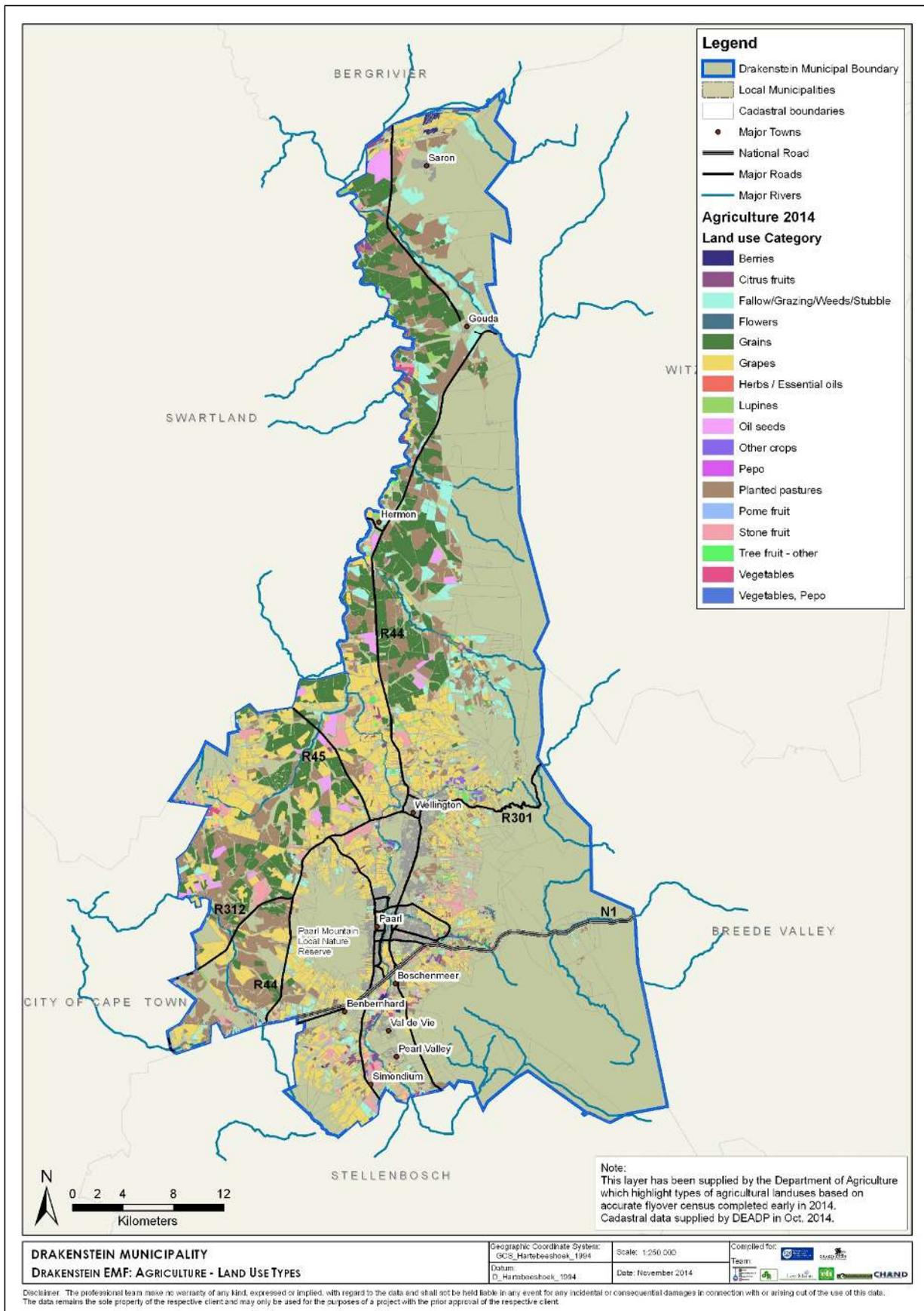
Agriculture is characterised by the following in Drakenstein:

- ◆ There is a trend towards mixed crop farming and intensive animal farming, with many wine farmers introducing other crops such as olives and/or intensive feedlots (Refer to Map 9).
- ◆ Most feedlot composting operations are located in the western part of the municipality in the area abutting the City of Cape Town.
- ◆ Irrigated lands occur mainly in the southern part of the municipality, with the Berg River as the main water source. South of Paarl agriculture consists mainly of vineyards and fruit orchards.
- ◆ From Wellington, northwards there is a progressive shift towards dryland grain farming and stock farming.

Agriculture is a significant contributor to the economy of Drakenstein, as well as the district and provincial economies. It is also important to the national economy, particularly through its export revenue. This is one of the reasons why the water quality of the Berg River needs to be maintained in an acceptable condition. According to the Drakenstein LED Strategy some 14% of the national GDP is contributed by the Western Cape, and the contribution of the agriculture sector is higher than the national average. The Cape Winelands District Municipality has the second largest economy in the Western Cape after the City of Cape Town. Agriculture forms the backbone of the district economy and contributes about 14% towards the district GGP and represents about 38% of the labour force.

According to the LED Strategy, data from 2005 indicates that agriculture is the fourth most important sector in the Drakenstein local economy, contributing 10.23 percent of GDP. The agricultural sector is the largest employer in the region. Much of the manufacturing activity in the area is linked to agriculture, such as agro-processing, packaging, fertiliser and machinery (manufacture, maintenance). Data from 2003 showed that the most important exports from Drakenstein, in terms of their contribution to the total value of exports from the municipality, consisted of fruit and nuts (41 %), wine, beer and spirits (37 %), processed fruit, vegetables and nuts (9 %), tobacco (5 %), machinery (2 %) and other (6 %).

³⁶ Drakenstein LED Strategy, Boulle and Newton, 2006.



MAP 10: Agricultural land use and crops

Besides the economic aspects of agriculture, the rural and farming landscapes are an important element of the cultural history of Drakenstein as well as being a key contributor to its scenic beauty (refer to section 2.5). Thus, whilst farming is a significant economic activity, it is valuable for other reasons as well including its contribution to the growing tourism sector.

From the above commentary, it is clear that the maintenance of agricultural resources in the Drakenstein area is of priority. Discussion with the Department of Agriculture indicates that loss of agricultural land to other uses is undesirable from both an economic and local food security perspective. Agricultural land that has associated water rights is regarded as being of particular value by the Department. Accordingly, agricultural land in the study area have been analysed in terms of irrigated lands and dry-land farming (Map 11).

Water is a limited resource and thus agricultural land with associated water rights is a valuable asset. Whilst agricultural potential is often used as a measure of the value or suitability of land for this purpose, in the case of Drakenstein this is not a particularly useful measure. The maintenance of current agricultural production is seen as a priority for food security, land reform and the local economy.

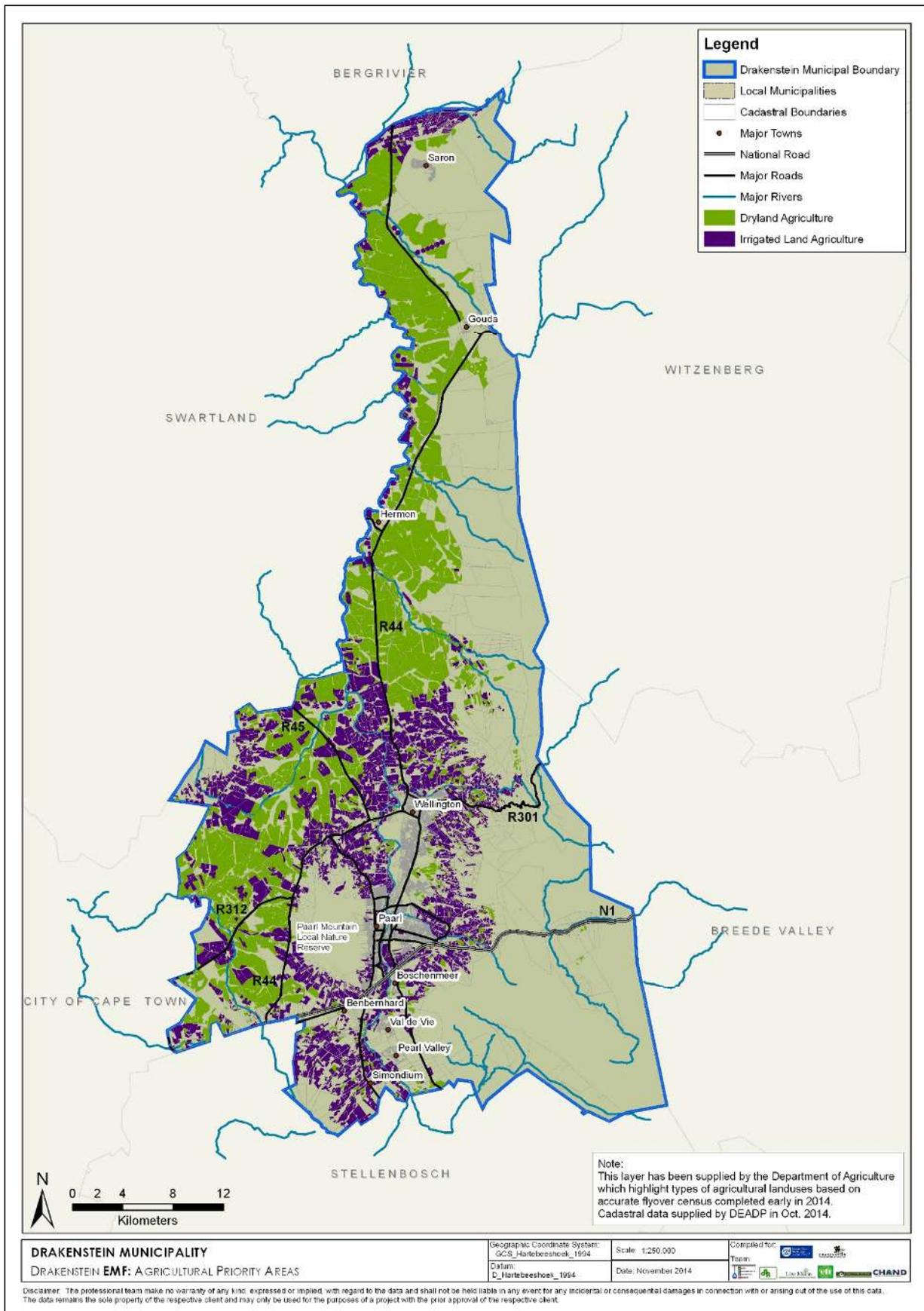
It is evident that almost all of the productive land that is available for agriculture is already being farmed. Thus the protection of agriculturally productive land is seen as of priority. Once land that is used for food production and other crops (e.g. wine grapes), which are important to the economy, food security and 'sense of place' in Drakenstein, has been lost to non-agricultural uses this cannot be readily reversed. A further concern in this regard is the associated change in water use away from agriculture, where irrigated lands are involved (i.e. water rights for agricultural purposes may be permanently lost to other less essential uses).

2.4.1 Irrigated Lands

Irrigated lands are considered to be of particular significance by the Department of Agriculture. The fact that this land has water use rights is of value, since this provides a level of security regarding water availability. This is particularly relevant due to the fact that water is considered to be a potentially limiting factor and thus loss of irrigated lands is highly undesirable.

2.4.2 Dry-land farming

Dryland farming is also important, but the loss thereof is less significant than that of irrigated lands.



MAP 11: Agricultural Land – Irrigated and Dryland

2.5 Cultural and scenic resources

The Drakenstein region has a long history of settlement, with the result that the municipal area is characterised by a rich cultural heritage. This is acknowledged by the fact that the Cape Winelands Area, which includes the southern part of the Drakenstein Municipality is designated as a World Heritage Site, based on its cultural history and landscape. Natural features such as mountains, valleys, river corridors, wetlands, areas of indigenous vegetation and the presence of cultivated lands, wine farms and historical features combine to make the area one of scenic beauty.

According to the SOER, the cultural heritage represents an important part of the social capital of the area, which can effectively be utilized to build community identity and pride. In addition, these cultural resources provide a potential tourism asset. The scenic beauty of this municipal area also contributes to its tourism potential: some of the best scenic routes and mountain passes in the Boland provide tourism links to Ceres, Tulbagh and Wolseley (e.g. Bainskloof and Nuwekloof passes), Stellenbosch (Helshoogte) and Worcester and beyond (Du Toitskloof Pass). Scenic routes have been identified by the Drakenstein Municipality. Cultural and aesthetic resources are shown on Map 12.

A survey of Grade 3 heritage resources, i.e. heritage resources of local significance, within the municipal area in terms of the National Heritage Resources Act, Act 25 of 1999, was commissioned by the Drakenstein Municipality, which was undertaken by the Heritage Survey Group. The survey is largely complete, but has not been advertised for public comment yet, thus the information presented here should be treated as preliminary. Initial findings indicate that there are a number of resources that should be classed as Grade 1 or 2, as they are of national or provincial significance and should thus receive a high level of protection.

The following themes were established by the consultants that undertook the heritage study for the municipality as adding to the character of Drakenstein:

- ◆ Archaeology and pre-colonial history,
- ◆ Zone of contact,
- ◆ Slavery,
- ◆ Cultivation and production,
- ◆ Food processing,
- ◆ Access to water,
- ◆ Language,
- ◆ Education,
- ◆ Religion,
- ◆ Ritual and tradition,
- ◆ Social identity,
- ◆ Recreation,
- ◆ Scenic beauty,
- ◆ Routes and transport,
- ◆ Displacement,

- ◆ Struggle and contestation,
- ◆ Regional landscape pattern,
- ◆ Regional architecture,
- ◆ Development of manufacturing and trade, and
- ◆ Civil and administration.

Five broad historical periods that informed the evolution of the cultural landscape of the Drakenstein Municipality have been identified:

- ◆ The Pre-colonial period
- ◆ The 17th Century
- ◆ The 18th Century
- ◆ The 19th Century, and
- ◆ The 20th Century.

Based on an assessment of these five phases in the evolution of the cultural landscape, a number of historically significant precincts were identified, in addition to the register of heritage resources. These precincts provided preliminary informants to the Drakenstein Spatial Development Framework. They have since been updated and mapped in detail and the results of this exercise is summarised below. The Drakenstein Heritage Resources Survey was formally adopted by the Council in January 2011 (Council Meeting Minutes of 18 January 2011).

1. *Agter Paarl Slopes and Paarl Mountain (HA 01 and HA 05)*: This area is a cultural landscape of local significance in terms of the following:
 - Conservation-worthy farmsteads including Zandwijk, Diamant, Den Leeuwenjacht, Fairview, Schoongezicht and Rheeboekskloof, which are framed by the visual prominence of the mountain backdrops.
 - High scenic value in terms of upward views towards the Paarl Mountain.
 - Gateway significance at Windmeul, further enhanced by the strong presence of the Dutch Reformed Church.
 - Agricultural landscape with tourism presence in places.
 - Expansive cultural landscape.
 - Remnants of quarrying and related activities
 - Memorial to the Afrikaans language
 - Dominant landmark of Paarl Mountain.

The suggested grading for this area is 3b (of local importance) and 1/2 for Paarl Mountain (of national/provincial significance). Note that Paarl Mountain was declared a national monument in 1963 in terms of the Historical Monuments, Relics and Antiquities Act (Act 4 of 1934) – thus it is now a provincial heritage resource.

2. *Paarl Historical Core (including its agricultural and riverine setting) (HA 2)*: A historical urban landscape of high heritage significance (potentially Grade1). It has highest scenic historical value in the Western Cape and the country, particularly with regard to views along the historical Paarl Main Road streetscape axis; upwards (westward) views towards Paarl Mountain, downward (eastward) views into the

Berg River Valley and variety of views of agricultural land within an urban setting. The Paarl Historical Core contains one of the highest concentrations of formally recognized heritage sites in the country. Important features include:

- The juxtaposition of historical farmsteads and urban development located within a dramatic mountain valley setting.
- The intact and enduring historical pattern of settlement in terms of its built form, planting, access and subdivision.
- Strong historical layering evident in its early structures and patterns of land use ranging from farmland to urban industrial and commercial precincts.
- The concentration of buildings of architectural significance displaying examples of highest quality early craftsmanship.
- It has strong historical associations as an agricultural and industrial centre in relation to the growth of the wine industry, olive industry and early general industrial expansion in the Western Cape.
- It has strong historical associations with the early movement to have Afrikaans formally accepted as a national language.

The suggested grading of this area is a Grade 2 cultural landscape, although Grade 1 grading status may also be appropriate.

3. *Historical Berg River Corridor (HA 3)*: A historical rural landscape of high heritage significance in terms of the following:

- Its role as a productive agricultural landscape located outside the metropolitan area spanning more than 300 years. It is one of the last remaining agricultural valley contexts in the region.
- Its role in the history of the wine industry spanning more than 300 years and in the fruit industry spanning more than 150 years. The Drakenstein was the centre of the consolidation of 29 farms under Rhodes Fruit Farms in 1902, which stayed in the ownership of a subsidiary of a major economic institution for more than a century i.e. De Beers/Anglo-American. The linkages with Rhodes who is a key figure in South African history is also of importance.
- The concentration of conservation-worthy historical farmsteads and associated rural settings dating from the 18th century onwards, including Boschendal, Le Rhone, Lekkerwijn, Delta, Weltevreden, Meerrust, Bien Donne, Watergat, Watervliet and Riverside.
- It has a legible, intact and enduring historical pattern of settlement due to the placement of historical farmsteads along the banks of the Berg River and the patterns of cultivation and planting.
- A dramatic valley setting and sense of containment created by sheer mountain faces, Fynbos covered foot slopes and a flat alluvial valley floor occupied by intensive agriculture and limited built form.
- Relationship with a major scenic route network and the variation and complexity of views, ranging from dramatic distant mountain views, focused views towards landmark buildings, e.g. Boschendal, and townscape views of villages such as Lanquedoc and Pniel.

- There is a strong historical layering of its historical structures and patterns of land use including farm complexes, agro industrial sites, (e.g. Groot Drakenstein Prison and Infruitex Research Station) and recreational sites (e.g. Dwars and Berg Rivers).
- Its role in the history of farm labour, i.e. wage labour, indentured labour, slavery, permanent versus seasonal/migrant labour and the related shifts from a feudal to a corporate to a democratic order.
- Its role in the history of forced removals, e.g. at Simondium and also as a landscape of missionary settlement/religion after emancipation, e.g. at Pniel and Simondium. Also in terms of its role

The suggested grading of this cultural landscape is Grade 1 or 2.

4. *Wemmershoek Slopes (HA 6)*: A cultural landscape of considerable heritage significance in terms of the following:

- It possesses a number of historical homesteads located within a distinctive and dramatic setting on the slopes between the Berg River and the Klein Drakensteinberge. De Hoop, first granted in 1692, is a landmark example of an early nineteenth century homestead in a vineyard setting. The homestead dates from 1840 and is representative of opstalle built at the foot of mountain slopes.
- Its high scenic value with views toward the Klein Drakenstein slopes from the R303. The relationship between the vineyard setting in the foreground and the mountain backdrop and the relatively intact, undisturbed nature of this landscape, is scenically important.
- The highly distinctive and intact pattern of historical farm werfs in vineyard settings located between a river course and mountains.
- It has strong associational value due to its relationship with prominent Huguenot families such as the Roux family from Nantes.

The suggested grading of this cultural landscape is Grade 3.

5. *Klein Drakenstein (HA 7)*: A cultural landscape of significance heritage value in terms of the following:

- The high concentration of historical farmsteads located in a broad valley with dramatic mountain ranges to the north and south. Homesteads and farm werfs of high heritage significance are located on the lower mountain slopes include Nederburg, Languedoc, Amstelhof, Wildepaardejagt, Salem, Lustigaan, Ronwe and Dekkersvlei.
- It has high scenic value in terms of dramatic upwards views towards the Klein Drakensteinberge from the raised bridge of the N1 towards the Du Toitskloof tunnel.
- The combination of a range of elements representative of the Cape Winelands Landscape, including farm werfs, vineyards, and orchards with tree-lined windbreaks, and dramatic mountain settings at a major threshold or point of entry between the Cape Boland area and the flat Klein Karoo landscape to the east.

- It represents a highly distinctive, legible, intact enduring pattern of historical farm werfs set in vineyard settings with a dramatic mountain backdrop.
- It has strong associational value in terms of relationship with early Huguenot settlers in the valley.

The suggested grading of this area is Grade 3.

6. *Daljosafat (HLA 8)*: A historical rural landscape of high heritage significance in terms of the following:

- The high concentration of conservation worthy farmsteads including inter alia, Non Pareil (granted 1694), Roggeland (granted 1691, the original Dal Josofat), Schoongezicht (granted 1694), Kleinbosch (granted 1692) and Valencia (1818), all Provincial Heritage Sites.
- The strong association of the area, in particular Kleinbosch, with the origins of the Afrikaans Language Movement, the “Genootskap van Regte Afrikaners” and the editorship of the journal “Die Afrikaanse Patriot, (1876). The Huguenot Memorial School (1893), and an associated graveyard, is located on the farm.
- The role of the Berg River as the eastern frontier of the Colony until 1690 when the early Huguenots were granted land on the east bank. The strong visual spatial quality of the area, with the vivid mountain backdrop to the east and the views towards Cape Town to the west.

The suggested grading of this area is Grade 1 or 2.

7. *Bloulei (HLA 9)*: A Cultural landscape of potential Grade 2 heritage status, with its significance related primarily to its aesthetic (scenic), historical and architectural qualities, including the following:

- The high concentration of conservation worthy farmsteads including inter alia, Nartia, Welgegund, Welbedacht, De Fortuin
- The historic significance of the area as an area of the early settlement (17th and 18th centuries) in the Drakenstein Valley
- Significant surviving remnant cadastral pattern of early rural settlement.
- The strong visual quality of the area, with the vivid mountain backdrop to the Limietberg and of the Bloulei Valley.
- Strong gateway conditions at the entrance to the unique extended horseshoe shaped road linking farms in the Valley.

The suggested grading of this area is Grade 2.

8. *Bovlei (HLA 10)*: A historical rural landscape of heritage significance primarily in terms of its scenic, historical and architectural qualities:

- The high concentration of conservation worthy farmsteads in scenic settings including Groenvlei, Groenberg Groenfontein, Onverwacht, De Twyfeling & Welvanpas.
- The buildings of outstanding architectural and historical significance located in spectacular scenic settings;

- The presence of authentic and layered building fabric of historical and architectural value.
- High concentration of intact historical werfs,
- Unique historical scenic road linking farms.
- The visual quality created by the mountain backdrop and broad valley views narrowing into tight valleys with, steep defining edges;
- Historical associations with the development of the fruit industry in the Western Cape; and
- Historical associations with slave builders.

The suggested grading of this area is Grade 1 or 2.

9. *Voor Groenberg (HA 10A)*: A historical rural landscape of heritage significance primarily in terms of its aesthetic (scenic), historical and architectural qualities:
- Concentration of conservation worthy farmsteads.
 - Substantially intact rural /agricultural landscape
 - Visual spatial quality of the area, with the dominant Groenberg Mountain forming the backdrop and providing a sense of place

The suggested grading of this area is Grade 3A.

10. *Wellington town (HA 11)*: A historical urban landscape of heritage significance in terms of the following:
- Considerable architectural significance due to concentration of mid to late 19th century dwellings, particularly along Bain Street and 18th century farmsteads within the town limits and adjacent to riverine corridor (Versailles, Olyvenhout, Onverwacht)
 - Considerable historical significance due to origins of town as kerkdorp from 1838 located on an old wagon route, now Main Street, and the dominance of the church as a landmark at the head of Church Street
 - Visual, spatial and environmental significance in terms of the irregular grid set up by the T-junction at the intersection of Main and Church Streets and bounded by the Krom River to the north. The Spruit River, fed by the Bloulei, marked the eastern boundary of the initial grid. Victoria Park, to the south of Church Street and the Municipal buildings to the north create a strong civic/religious node at the Main and Church Street intersection.
 - The green edge provided by the Krom River to the north and the intensive viticulture located in the riverine corridor and the siting of the landmark historical buildings on the elevated terraces such the 18th century homesteads (Versailles and Onverwacht) and the early 20th century educational facilities provide a strong sense of place.
 - The encircling mountains and agricultural landscapes, particularly the the Bovlei, Bloulei and Groenberg characterised by vineyards, farmsteads, avenues of trees and hedgegrows, all of which contribute substantially to scenic and aesthetic context of the town.
 - The social significance related to the role of religion in the foundation of the town in 1838, the landmark nature of the church and the role of

education related to the Hugenot College for the training of female missionaries and related teacher training facilities from the early decades of the twentieth century. Considerable linguistic cultural significance related to the association of Wellington, together with Daljosafat with the emergence of the Afrikaans language.

- Its surviving historical settlement pattern in terms of its grid-layout, building form, landmark structures and social institutions.
- Its association with early agricultural activities and education.

The suggested grading of this area is Grade 3B.

11. *Perdeberg slopes (HA 12)*: A cultural landscape of considerable heritage significance in terms of the following:

- High scenic qualities due to the open, gentle, undulating plain, flanked by Paarl Mountain to the east and the Perdeberg to the west.
- Dispersed rural settlement occurs on the undulating plains and is flanked by a more intensive pattern of settlement on the Perdeberg mountain slopes.
- The pattern of cultivation consisting of wheat fields and vineyards, a landscape that reflects a pattern of overlap of the Boland and Swartland cultural landscapes.
- The natural landmark qualities of the Perdeberg.
- The high concentration of historical homesteads on the mountain slopes such as Staart van Paardeberg, Schoone Oord and Vondeling
- The relatively intact and historical pattern of settlement in terms of the siting of homesteads, access alignments and planting patterns.

The suggested grading of this area is Grade 3.

12. *Hermon (and its agricultural setting) (HA 13)*: Cultural landscape of local significance defined by the twin historical settlements and their agricultural settings:

- Rondeheuvel Village is of considerable local historical and social significance as a substantially intact, surviving former mission outstation of the Wellington Dutch Reformed Mission Church;
- The village retains a historical pattern in its layout, built form, planting and subdivision despite the physical separation created by the R46. Strong historical layering evident in its early structures and patterns of land use which ranges from farmland to rural mission and railway settlement;
- It contains groups of buildings of great social and historical significance (Rondeheuvel Village) as well as idiosyncratic buildings of architectural significance (including the 'riet' barn in Station Road).
- It has strong historical spiritual links with the Dutch Reformed Mission Church in Wellington (Rondeheuvel Village).
- Constitutes an interesting example of a Mission Village settlement pattern which never reached maturity, its development having been arrested in the early 20th century.

The suggested grading of this area is Grade 3B.

13. *Saron historical core (and agricultural setting) (HA 14)*: A historical urban landscape of heritage significance in terms of the following:

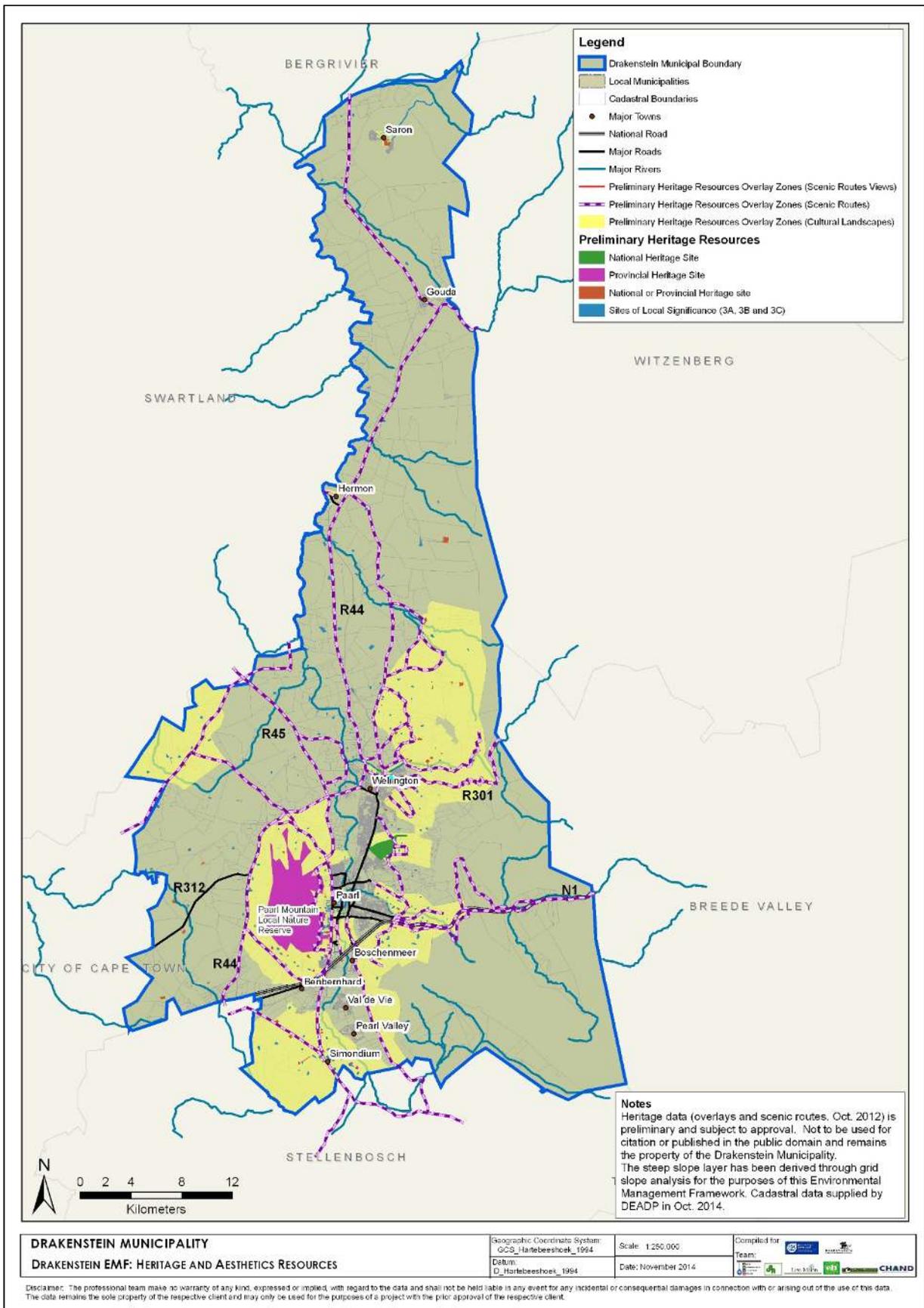
- Considerable social, historical significance is attached to the establishment of the Rhenish Missionary settlement in 1846 for freed slaves and indigenous inhabitants, many of whom had been displaced by colonial settlement of pastoral land. The mission centre is the focal point in Saron.
- Aesthetic/environmental significance due to the open, public nature of the area, particularly around the church. Also of importance are the smaller, defined and more intimate spaces, namely the cemetery, Mill Square, the walled areas in front of the pastorie and the tree-line avenues.
- There are buildings of architectural significance comprising the religious/civic node at the head of the Church Street. They also form a coherent group together with the cemetery and tree-lined avenue.
- The mill represents a significant aspect of Saron's agricultural and industrial history. While no longer in use, many of the mill parts remain and it could thus be restored. The leiwater system which played a fundamental role in fruit and vegetable gardening since the inception of the settlement has considerable technological and social significance
- The significance of the settlement structure, which shows a distinct geometric order in the form a grid pattern with Church Street as the main axis and the mission centre at the focal point. The streets and furrows are laid out with houses facing directly onto the streets with garden allotments located behind the buildings. This results in a semi-rural character, largely due to the continuous nature of the garden allotments in the middle of street blocks. While much of the residential fabric is no longer in its original form, largely due to the 1969 earthquake and inappropriate alterations and additions, the underlying structure, form and morphology of the historical settlement remains and has heritage significance.

The suggested grading of this area is Grade 3B.

14. *Agter Groenberg Farms (HA15)*: This area is of heritage significance primarily in terms of its aesthetic (scenic), historical and architectural qualities:

- Conservation worthy farmsteads including Rooshoek, Kruishof, Standvastigheid, & Tweefontein;
- Expansive, isolated and largely unaltered historical cultivated rural landscapes barely 20km from an urban area;
- Unique substantially intact farm werfs;
- Highly scenic expansive views from elevated farmsteads;
- Substantially intact rural /agricultural landscape; and
- The strong visual spatial quality of the area, with the dominant Groenberg and Limietberg Mountains forming the backdrop and providing a sense of place.

The suggested grading of this area is Grade 2.



MAP 12: Heritage and Aesthetic resources

3 Socio-economic conditions

3.1 Introduction

Drakenstein has a population of just over 200 000 people (Census 2001 figures cited in the draft LED Strategy, 2006), of which 126 000 live in the urban centre of Paarl, 34 000 in Wellington, 7 400 in Gouda and 5 134 in Saron (Macroplan, 2005). Thus, more than 80% of the population lives in urban areas. The population can be described as youthful with 55,5% under the age of 30%. The dependency ratio of 46,4% compares well to that of Western Cape at 49% (www.wesgro.org.za). However the human development index for the Drakenstein at 0.70 compared to the 0.72 for the Western Cape, provides an indication of the developmental challenges faced in the Drakenstein (Drakenstein IDP 2007-2012).

The 2009 PSDF (Provincial Spatial Development Framework) included an investigation into the growth potential of towns in the Western Cape. Paarl and Wellington on the N1 and rail corridor respectively is regarded as important and these towns have been identified as leader towns with significant growth potential in the PSDF. An updated growth potential study has been conducted for the purposes of the PSDF revision process, which was completed in August 2013. This study confirmed that Paarl has a high growth potential.

3.2 Poverty and employment levels

Drakenstein is the second largest economic centre in the Western Cape after Cape Town, and has one of the highest average incomes in the country (Boulle and Newton, 2006). Socio-economic statistics also reveal extreme poverty, which is largely concentrated in the rural areas and historically non-white urban neighbourhoods, black townships and informal settlement areas (Macroplan, 2005). The level of inequality is extremely high, with nearly a quarter of households earning less than R800 a month and 42% earning less than the household subsistence level of R1600 per month (Drakenstein IDP 2007-2011, Boulle and Newtown, 2006). Socio-economic indicators show that some 52% of households have no income. The total number of indigent households has decreased from 23% in 2009/2010 to 15% in 2011/2012 financial year (IDP 2013-2018).

Unemployment is measured at 23%, compared to 18,4% for the Cape Winelands District Municipality (Drakenstein IDP, 2007-2011) and 17,2% for the Western Cape in 2007 (www.sairr.org.za). The IDP states that 44% of the population is employed in low skilled occupations, with 39% in skilled occupations, and 19% in highly skilled occupations. Unemployment has increased by about 7% to 23 % since 1996. There appears to be a correlation between the rise in unemployment and the decrease in activity of several labour intensive industry sectors.

Agriculture is the biggest employer in the Drakenstein. Over two thirds of the manufacturing sector can be linked directly to agriculture. The manufacturing sector used to be the second largest employer, but has shed jobs, due to the closure of

operations particularly in the textile sector. According to analyses undertaken for the purposes of the LED strategy, jobs increased from 65 202 in 1996 to 65 321 in 2001. This is 0,04 % per annum whereas the population is estimated to have increased by an estimated 1,2% per annum, with in-migration from the rural poor being the main source of population growth. Seasonal farm labour and factory work are significant sources of employment for unskilled labour (SOER, 2005). The tourism sector, a potential source of employment, is considered to be ‘under developed’, given its prominence in the wider Cape Winelands District Municipality. A study on poverty, known as the Bayette study is cited in the SOER. The report concludes that for the municipality to achieve moderate success in its poverty reduction efforts, attention would have to be focused on the promotion of economic growth and the better distribution of the benefits of growth in the local economy. Improved access to health and education, as well as basic services (e.g water, sanitation, electricity) are also pivotal in helping to overcome poverty.

3.3 Local economic development programmes/projects

The Drakenstein Local Economic Development (LED)³⁷ Strategy is based on the need to grow the economy and the need to reduce poverty: “this dual economic development mandate rests on recognising the local character of economic need and of potential areas of growth.” The approach is illustrated by the diagram below.

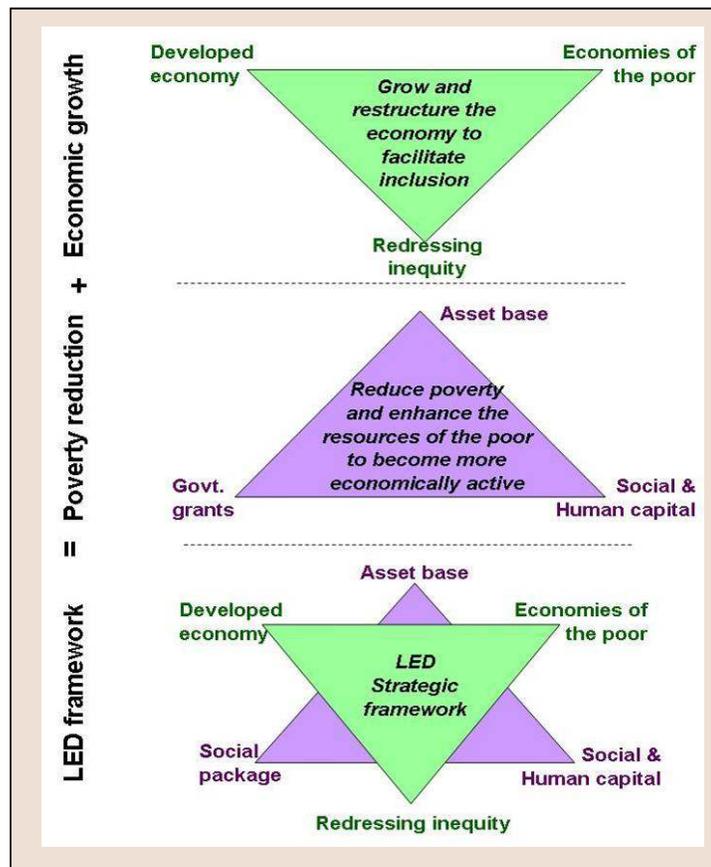


FIGURE 2: LED approach

³⁷ Boule and Newton (2005): Drakenstein Local Economic Development Strategy.

Strategies that are put forward by the LED are organised into various categories as shown in the Table overleaf.

TABLE 6: LED strategies

DEVELOPED ECONOMY		TARGET
<i>Objective</i>	To increase the number of economic opportunities and breadth of participation by growing the formal economy by 6% by 2014	
<i>Interventions</i>	Sector support	Major economic sectors
	Development of the urban landscape	Paarl and Wellington
	Marketing strategy	Businesses and tourists
	Sustain the educational quality	Schools and school goers
ECONOMIES OF THE POOR		TARGET
<i>Objective</i>	To increase and broaden participation of the poor in the economy by creating an additional 12 500 jobs by 2014	
<i>Intervention</i>	Maximise the creation of low skilled jobs via EPWP	Unemployed
	Cooperative support programme	Unemployed, informal traders and subsistence farmers
	Small farmer support programme	New emerging farmers
	Food gardens	Urban poor with no income living in the towns
	SMME support (see developed economy)	
ECONOMIC BRIDGES		TARGET
<i>Objective</i>	To broaden economic participation through the transfer of land and support for BBEEE	
<i>Intervention</i>	Preferential procurement policy	SMMEs and HDI firms
	Land policy	Landless
	Rural transport	Those located far from the economic centres
	Economic information	All economic actors
GOVERNMENT GRANTS		TARGET
<i>Objective</i>	To facilitate universal access to basic needs and social services	
<i>Intervention</i>	Welfare grants	Indigent, disabled and aged
	Indigent grant	Indigent
	Social and community services	Poorer communities
SOCIAL AND HUMAN CAPITAL		TARGET
<i>Objective</i>	To build the social and human capital of the poor	
<i>Intervention</i>	Sector based skills development and training	Unemployed and those employed in sectors in decline
	Skills strategy	Providers
	Continuous education	Children in low-income communities and the illiterate
	Social capital	Low-income communities
BUILDING THE ASSET BASE OF THE POOR		TARGET
<i>Objective</i>	To build the asset base of the poor	
<i>Intervention</i>	Land redistribution	Landless, homeless and emergent farmers
	Housing	Residents without adequate shelter

The reliance of the local economy on exports, specifically agricultural and agri-processed products is note in the 2013-2018 IDP. In this regard, the European Union has traditionally been the premier export market for the region. Economic growth has, however, been sluggish over the past several years. This is attributed to

the global economic crisis as well as the ‘demise of the clothing sector in Drakenstein.’

3.4 Urbanisation, housing and infrastructure

Urbanization has led to the rapid development of informal settlements and has also resulted in pressure on infrastructure and basic services. In 2005, the following was estimated for the Drakenstein Municipality:

- ◆ Informal settlements (basic services required): 5564 households
- ◆ Formal housing: 22362 applications on waiting list.

The number of households in the Drakenstein Municipal Area increased from 46,263 (2001) to 59,773 (2011). Thus between 2001 and 2011, an additional 13,510 households established themselves within the municipal area (IDP 2013-2018). The 2011 Census indicates that 50,876 households reside in formal dwellings. A substantial number of people that live in Mbekweni, a township situated to the north of Paarl live in shack dwellings.

There is a generally well-developed infrastructure network in Drakenstein. Key infrastructure is shown on Map 13. The IDP expresses concern about the maintenance of these systems, especially as such requirements compete with the need to extend services to new development and social housing projects. Due to the lack of services, people relieve themselves on riverbanks, stormwater channels, open spaces, railway lines etc. The services currently available to these households is inadequate and in most cases dilapidated and damaged. This creates even more pollution as sewage, water and grey water is allowed to run freely from these facilities into the existing stormwater system. Projects that were underway to provide basic services to informal settlements amounted to 2 062, meaning that there were 3 502 households that still required basic services (Lyners Consulting Engineers & Project Managers, 2005).

Almost all formal households have waterborne sewerage, with the exception of certain areas in Paarl and Wellington, as well as rural areas. The sewerage treatment works at Paarl and Wellington are under pressure to accommodate increased demand. Upgrades and capacity increases are underway. The rate of the developments in terms of provision of basic services and formal housing will be limited by the rate in which the bulk infrastructure can be upgraded. The progress in upgrading the bulk services is mostly restricted by the financial ability of municipality and the availability of other sources of funding. Notwithstanding, the proportion of households with access to services such as piped water and waterborne sewage and electricity has increased between 2001 and 2011 (IDP 2013-2018).

The SDF notes that the municipality has a well-developed road network:

- ◆ The N1 National Road cuts across the municipality from east to west in its southern regions providing easy access to the Cape Metropolitan area to the west and Worcester and the northern provinces to the east.

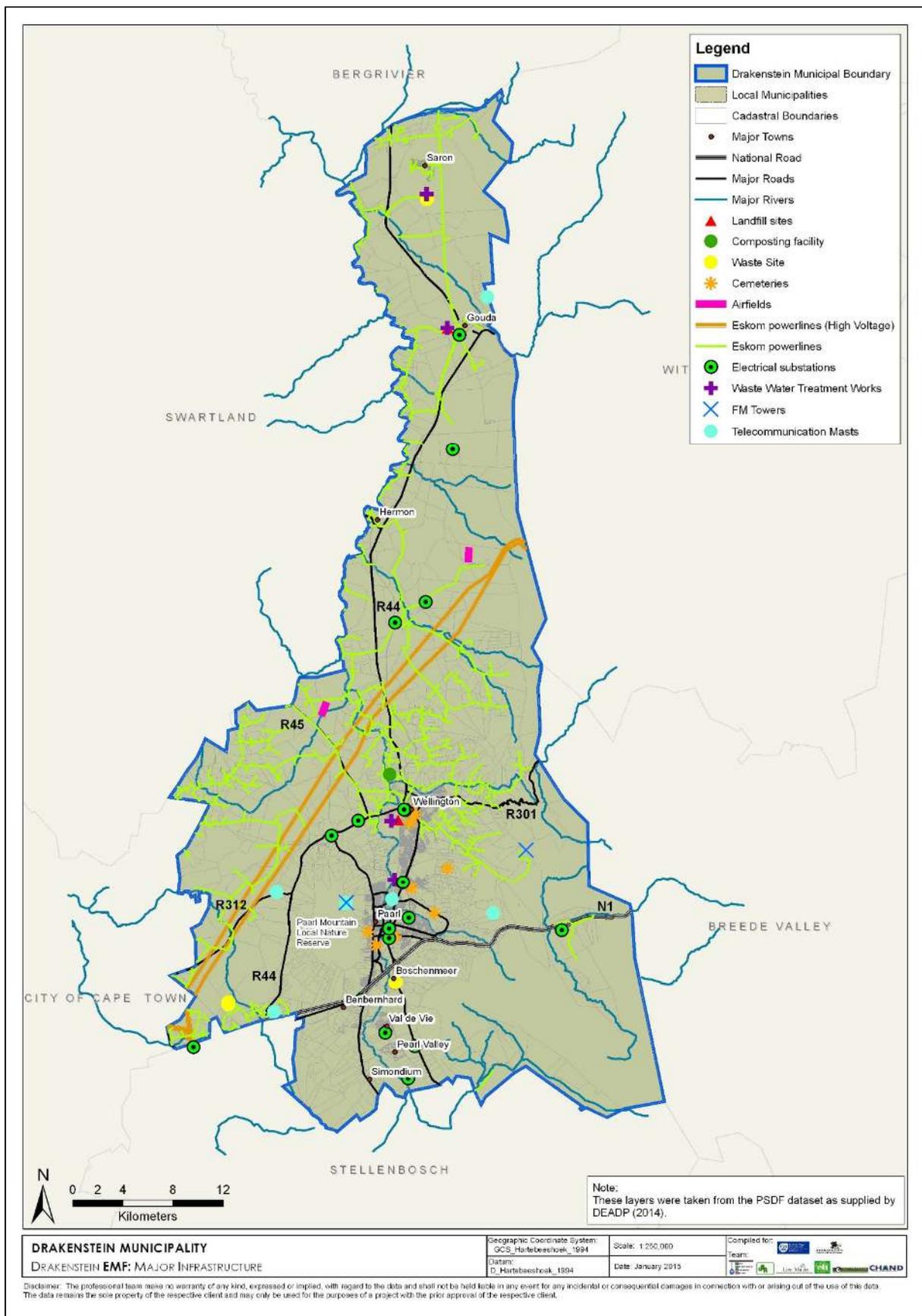
- ◆ Paarl Main Road runs north-south through the centre of the most urbanized area in the municipality (Paarl) and becomes the R45 connecting the town to Malmesbury in the north-west and Franschhoek and Stellenbosch in the south.
- ◆ The R310, Jan van Riebeeck Drive connects the urban areas of Wellington, Mbekweni and Paarl and provides an additional road link to Franschhoek.
- ◆ The R44 runs north-south along the length of the municipality on its western side connecting the all the major urban areas (Saron, Gouda and Hermon to the north and Wellington, Mbekweni and Paarl in the central and southern areas). This road also connects the municipality with its neighbours: the municipalities of Bergrivier to the north, Witzenberg to the north-east and Stellenbosch to the south.

In addition, the municipality is the gateway to some of the best scenic routes/mountain passes in the Boland providing tourist links to Ceres, Tulbagh and Wolseley (Bainskloof Pass and Nuwekloof Pass), Stellenbosch (Helshoogte) and Worcester and beyond (Du Toitskloof Pass). The system of roads therefore provides good connectivity between the municipality, its main urban area of Paarl-Wellington-Mbekweni) and the towns of:

- ◆ Ceres, Tulbagh and Wolseley in the Witzenberg Municipality;
- ◆ Porterville and Piketberg in the Bergrivier Municipality;
- ◆ Stellenbosch and Franschhoek in the Stellenbosch Municipality;
- ◆ Malmesbury;
- ◆ Durbanville and the City of Cape Town; and
- ◆ Worcester.

Public transport mostly takes the form of minibus taxis serving towns internally, as well as connecting the major centres. The area is also served by a north–south rail connection to Cape Town with stations at:

- ◆ Paarl;
- ◆ Huguenot;
- ◆ Mbekweni;
- ◆ Dal Josafat;
- ◆ Wellington;
- ◆ Malan;
- ◆ Soetendal;
- ◆ Hermon; and
- ◆ Gouda.



MAP 13: Infrastructure

3.5 Community facilities

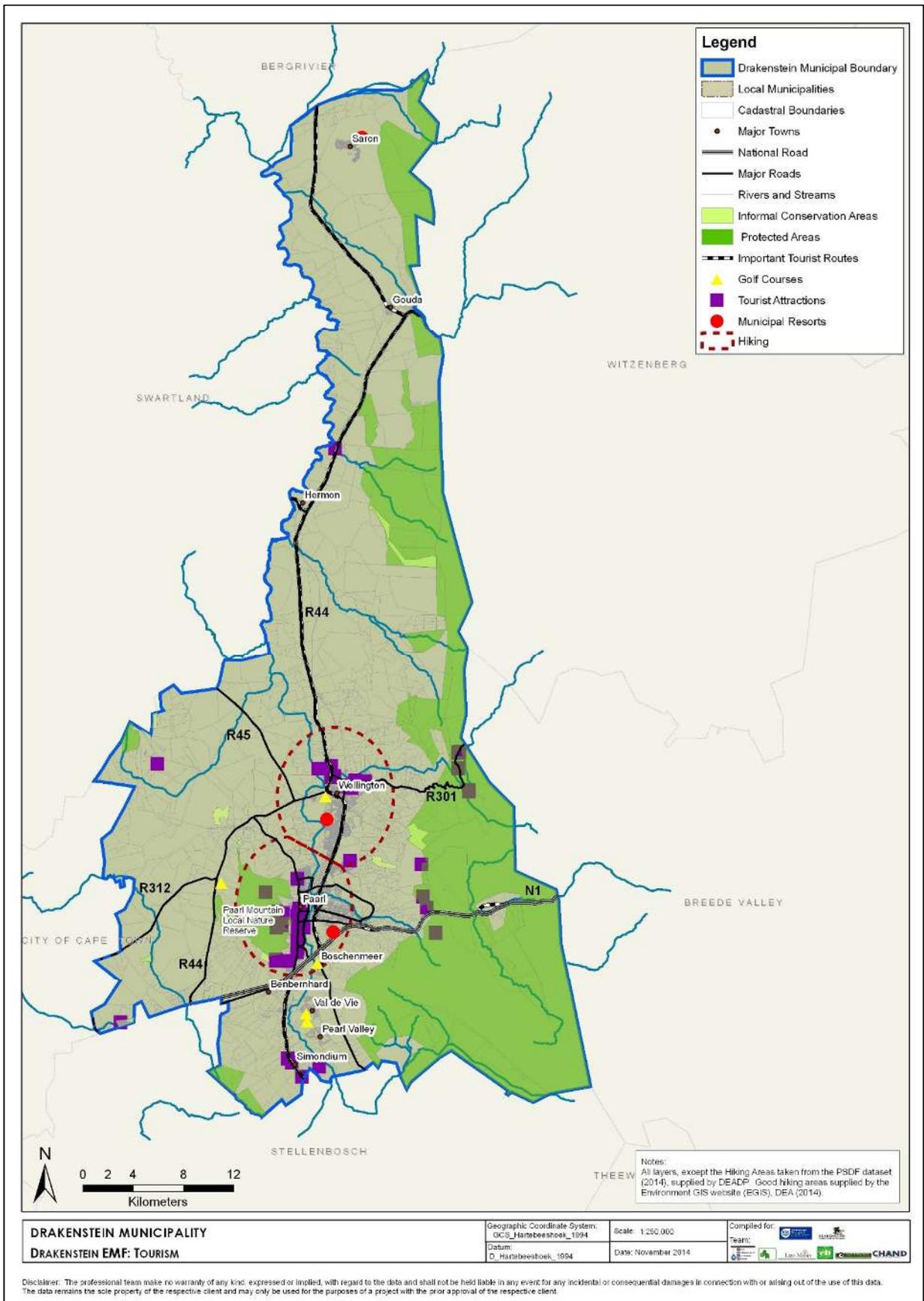
- ◆ *Health care:* The Drakenstein IDP states that there are 23 medical facilities in the municipal area. This includes a large provincial (recently expanded and upgraded) and private hospital in Paarl. The smaller centres are served by private medical practitioners and provincial clinics.
- ◆ *Education:* According to the IDP (2007-2011) there are 67 Primary and Secondary Schools in the Drakenstein. The Cape Peninsula University of Technology has a campus in Wellington (formerly the Teacher's Training College) and Boland College has a campus in Paarl offering tertiary education courses.
- ◆ *Cemeteries:* A cemetery study was commissioned by the Drakenstein Municipality in 2006. The study promoted the notion of sub-regional cemeteries as opposed to smaller local cemeteries. In order to satisfy the projected demand a number of sites were identified and assessed in terms of factors such as location and potential for groundwater pollution. Sites that have been identified for the establishment of new cemeteries or the extension of existing ones are:
 - Erven 8384-8388 and 8395-8397 (Vlakkeland): in Mbekweni to serve the Paarl Wellington community with a capacity for 80 000 graves.
 - A portion of erf 16755, in Dal Josafat, to extend the existing cemetery.
 - Erf 34, Wellington to allow for an extension of the Champagne Cemetery.
 - Southern portion of Erf 34 in Wellington Industria.
 - Erf 603, Gouda, extension of current cemetery
 - Erf 0 South Farms: Extension of the Simondium Cemetery.

3.6 Public tourism and recreational opportunities /facilities

The natural environment of the Drakenstein Municipality offers a number of tourism and recreational opportunities (Map 14), such as resorts along the Berg River, hiking and picnic facilities on Paarl Mountain and in the Limietberg Reserve (Bainskloof). Formal and informal conservation areas allow for nature-based outdoor activities such as hiking, bird watching, cycling and walking. Both Paarl and Wellington are recognised as towns that are located in areas that offer good hiking opportunities. The municipality owns amenities such as public swimming pools in certain areas, sportsfields and related infrastructure used by sports clubs, and a day resort at Saron.

Other amenities include numerous wine farms, a lion sanctuary, a snake park, and a bird watching area at the sewage treatment works. The IDP notes that there is an unequal and unsustainable provision of sport and recreation amenities and parks, in the municipal area, with a need to provide more in poorer areas.

The Berg River Canoe Marathon, one of three world-class canoe marathons in South Africa, passes through the Drakenstein Municipality. This Marathon has been contested since 1961. It takes place over four days over a distance of 228 kilometres, making it the longest canoe race in South Africa.



MAP 14: Tourism and recreational resources

PART TWO – Strategic Analysis

4 Strategy informants

The second element of the EMF is the Strategic Analysis. This can be seen as the “forward looking” part of the EMF. Whilst the situation analysis provides insight into where the study area stands in terms of its environmental attributes, strategy looks to the desired situation for the future. In developing the strategy element of the EMF, a key consideration is that of the existing policy environment, particularly that which is relevant to land use, environment and sustainable development. The EMF needs to be placed within and aligned to relevant national, provincial and local policy.

Those policies which are of particular relevance to the use of land form the focus of this section. This is due to the fact that this is the most pertinent aspect to the EMF if it is to serve as a tool to guide development through ‘encouraging appropriate development in appropriate locations.’ This is how the EMF can play a role in moving towards a path of sustainable development.

4.1 National Policy

National policy is important in providing contextual information for the EMF, particularly in terms of Government’s vision from a sustainable development perspective. The National Planning Commission released the National Development Plan: Vision for 2030 (NDP) in November 2011. Twelve priority areas are identified in this Plan:

1. An economy that will create more jobs
2. Improving infrastructure
3. Transition to a low carbon economy
4. An inclusive and integrated rural economy
5. Reversing the spatial effects of apartheid
6. Improving the quality of education, training and innovation
7. Quality health care for all
8. Social protection
9. Building safer communities
10. Reforming the public service
11. Fighting corruption
12. Transforming society and uniting the economy

The National Framework for Sustainable Development (DEAT 2008) recognises the inter-connection between ecosystems, natural resources and sustainable development and that South Africa’s natural systems and biodiversity provide a basis for economic growth and development. Five strategic priority areas for action and intervention are identified:

- ◆ Enhancing systems for integrated planning and implementation;
- ◆ Sustaining ecosystems and using natural resources efficiently;
- ◆ Economic development via investing in sustainable infrastructure;

- ◆ Creating sustainable human settlements; and
- ◆ Responding appropriately to emerging human development, economic and environmental challenges

In the context of development priorities, the NFSD highlights the following:

- ◆ The value of ecosystems recognising that ecosystem functioning is critical to achieve sustainable development
- ◆ Improving aquatic ecosystems, specifically water availability and water quality.
- ◆ Investing in protecting and enhancing ecosystem services.
- ◆ Dematerialising the economy and improving the efficiency of production and consumption systems.
- ◆ Air quality enhancement and monitoring through investment in clean technologies.
- ◆ Energy efficiency.
- ◆ Food security and natural-resource based livelihoods.
- ◆ Economic and fiscal instruments as incentives for environmental reform in support of sustainable development.
- ◆ Implementation of international agreements.

A process to develop the sustainability strategy has been underway since 2008 and has culminated in the National Framework for Sustainable Development (NFSD) and the National Strategy for Sustainable Development (NSSD). In the context of South Africa’s strategy, sustainable development implies the selection and implementation of a development path which allows for the achievement of appropriate and justifiable social and economic goals (based on meeting basic needs and equity) without compromising the natural system on which human wellbeing and a healthy economy is based.³⁸

TABLE 9: NSSD sustainability priorities and strategic goals

PRIORITY	STRATEGIC GOALS
Responding effectively to climate change	<ul style="list-style-type: none"> • Decrease greenhouse gas (GHG) emissions to levels required by science • Reduce dependency on fossil fuels and enhance security of energy supply • Improve climate resilience in communities.
Greening the economy	<ul style="list-style-type: none"> • Increasing the contribution of the Environmental Goods and Services Sector to employment and the GDP • Reducing the resource intensity of the economy (including energy and carbon) • Promoting cleaner technologies and investing in sustainable infrastructure • Promoting sustainable livelihoods and building local economies.
Building sustainable communities	<ul style="list-style-type: none"> • Enhancing spatial planning to promote social cohesion and integration between communities as well as between communities and the natural environment • Ensuring universal access to basic and community services • Improving the standard / quality of housing and other structures to optimise resource (energy, water, building materials etc.) efficiency • Promoting self-sufficiency, food security and equitable access to natural resources that support livelihoods • Improving equity, security and social cohesion
PRIORITY	STRATEGIC GOALS

³⁸ Page 34 of the NFSD

Sustaining ecosystems and using natural resources efficiently	<ul style="list-style-type: none"> • Managing the use of all natural resources to ensure their sustainability • Protecting and restoring scarce and degraded natural resources • Preventing the pollution of air, water and land resources so that community and ecosystem health is not adversely affected • Avoiding the irreversible loss and degradation of biodiversity (marine, terrestrial, aquatic ecosystems)
Enhancing governance systems and capacity	<ul style="list-style-type: none"> • To ensure effective integration and collaboration across all functions and sectors within government • To demonstrate commitment in changing the development focus to one based on sustainable programmes • To adopt a long-term view to development planning and implementation that takes cognisance of intergenerational equity • To adhere to and exercise principles of good and ethical governance • To monitor, evaluate and report performance and progress in respect of sustainability goals.

4.2 Outcome 10 – Programme of Action

Government has agreed on 12 outcomes as the focus of its work between 2009 and 2014. There are measurable outputs with targets associated with each outcome and each output is linked to a set of activities aimed at achieving the targets. Each of the 12 outcomes has a delivery agreement which in most cases involves all spheres of government and a range of partners outside government.

Outcome 10 is related to the environment. The outcome is stated as being: “Environmental assets and natural resources that are well protected and continually enhanced.” Outcome 10 makes specific reference to the obligation placed on government in respect of realising the environmental right in the Constitution. Four outputs (each of which has sub-outputs) have been identified in Outcome 10:

- ◆ **Output 1:** Enhanced quality and quantity of water resources.
- ◆ **Output 2:** Reduced greenhouse gas emissions, climate change impacts and improved air/atmospheric quality.
- ◆ **Output 3:** Sustainable environmental management.
- ◆ **Output 4:** Protected biodiversity.

4.3 Sector-specific policies and strategies

Sector-specific strategies have been developed which cover various aspects of sustainability.

4.3.1 Climate change

National government’s policy position³⁹ on climate change response is built on six pillars. These are:

- ◆ Greenhouse gas emission reductions and limits;
- ◆ Build on, strengthen and/or scale up current initiatives;
- ◆ Implementing the “Business Unusual” call for action;
- ◆ Preparing for the future;

³⁹ Media statement by the Minister Environmental Affairs and Tourism, 28 July 2008

- ◆ Vulnerability and Adaptation; and
- ◆ Alignment, Coordination and Cooperation.

The above priorities are reflected in the NSSD and National Climate Change Response Strategy where the key focus falls on reducing greenhouse gas emissions and dependency on fossil fuels; enhancing energy supply security; improving communities' resilience to climate change; and ensuring ecosystem resilience is not disrupted.

4.3.2 Greening the economy

National government recognises the importance of promoting a “green economy”. The Minister of Finance has acknowledged that the “cost of inaction towards sustainability will far exceed the cost of moving towards a low carbon economy” and has emphasised that the nation should be prepared to do extraordinary things to deliver the jobs and provide skills training and new businesses opportunities in “an environmentally responsible development path.”⁴⁰

- ◆ Increasing the contribution of the Environmental Goods and Services Sector to employment and the GDP;
- ◆ Reducing the resource intensity of the economy (including energy and carbon);
- ◆ Promoting cleaner technologies and investing in sustainable infrastructure; and
- ◆ Promoting sustainable livelihoods and building local economies.

4.3.3 Natural resources

In the NSSD natural resources (e.g. water, soil, biodiversity) are recognised as being the basis of life, economic activity and human wellbeing. Functioning ecosystems generate goods (natural products e.g. water, timber, flowers, food and medicines) and services (e.g. recycling of wastes, purification of water and air, flood attenuation, recreational opportunities and carbon sequestration). It is recognised that the depletion or wasteful use of natural resources, and/or degradation of ecosystems, therefore pose a threat to the attainment of socio-economic objectives.

The Western Cape can be considered a globally significant biodiversity “hot spot” due to the presence of the Cape Floral Kingdom, one of only six plant kingdoms in the world. Continued degradation of ecosystems and ecosystem services in the Province is recognised as having the potential for severe effects on the provincial economy. The DEA&DP is the custodian Department in respect of biodiversity, although most of the on-the-ground management is undertaken by CapeNature. In respect of biodiversity, the DEA&DP's stated objective is to “promote equitable and sustainable use of natural resources to contribute to economic development, by managing biodiversity, and its components, processes, habitats, ecosystems and functions and to effectively mitigate threats to sustainable management of biodiversity and natural resources.”⁴¹ Currently water resources in the Province are over-allocated. Accordingly the PGWC considers it necessary to focus on the

⁴⁰ Minister of Finance, speaking at the United Nations Environment Programme Finance Initiative (UNEP FI) Global Roundtable, 22 October 2009

⁴¹ Page 42 of DEA&DP Strategic Plan 2010-2015

sustainable management of water resources due to the implications of climate change. Drier conditions are predicted particularly in the western parts of the Province.

The DEA&DP also have a role to play in respect of pollution and waste management. Various problems have been identified by the Department with regard to pollution and waste⁴² which are amongst others, limited waste minimisation at source; poor effluent quality from industry and wastewater treatment works, and pollution of water resources which has water availability and health implications.

4.4 Provincial policy

The provincial government identified a number of strategic objectives (Provincial Strategic Objectives – PSOs) which cover institutional, governance, economic, environmental and social issues. Strategic Objective 7 is concerned with mainstreaming sustainability into the activities of the provincial government. One mechanism for achieving this is through ensuring that sustainability principles such as those in NEMA section 2 are taken into account in environmental decision making. The Provincial Government has also initiated OneCape 2040, a plan which complements the NDP and which also builds on the PSOs. The vision for the Province as expressed in OneCape 2040 is for the Western Cape to be “a highly-skilled, innovation driven, resource efficient, connected, high opportunity and collaborative society”. Various transitions or changes are identified in OneCape 2040, including the need to change from unsustainable, carbon intensive resource use to sustainable, low carbon resource use.

Another important provincial plan is the Provincial Spatial Development Framework (PSDF). The first PSDF was produced in 2009. As with other spatial plans, it is subject to regular review, with the result that a revised and updated PSDF was published in March 2014. The 2014 PSDF has the following goals:

- ◆ more inclusivity, productivity, competitiveness and opportunities in urban and rural space-economies;
- ◆ better protection of spatial assets (e.g. cultural and scenic landscapes) and strengthened resilience of natural and built environments; and
- ◆ improved effectiveness in the governance of urban and rural areas.

Accordingly, the focus in the PSDF is on:

- ◆ Sustainable use of provincial assets, such as water, biodiversity and ecosystem services, soils, minerals and scenic landscapes.
- ◆ Promoting opportunities in the space economy in both urban and rural areas.
- ◆ Developing integrated and sustainable settlements.

⁴² Page 10 of Strategic Directive 7

In terms of resource management, the 2009 PSDF committed the Province to safeguarding these assets. The following objectives were set and these have been confirmed in the 2014 PSDF⁴³:

- ◆ Protect biodiversity and agricultural resources.
- ◆ Minimise the consumption of scarce environmental resources, particularly water, fuel, and land – in the latter case especially pristine and other rural land, regarded as the province’s ‘goldmine-above-the-ground’ and is a non-renewable resource.
- ◆ Conserve and strengthen the sense of place of important natural, cultural and productive landscapes, artefacts and buildings.

In addition to the general objectives and policies set out in the PSDF, there is specific guidance with regard to investment, policy and location for the Drakenstein area. Paarl is identified as a town with development potential related to agricultural industry in the 2009 PSDF states that “all land put under the plough including for orchards, vineyards, forestry plantations, annual crops, pastures, and including irrigation lands shall be reserved for Intensive Agriculture and should not be converted to other purposes.” (RC4).

Besides the PSDF, there are a number of other specific policies that are aimed at giving effect to the OneCape 2040 vision. These cover infrastructure, land transport and the green economy:

1. The Western Cape Infrastructure Framework (WCIF) quantifies the scale and nature of the infrastructure requirements and how and where infrastructure needs to be provided.
2. The Western Cape Provincial Land and Transport Framework (PLTF) which sets out the requirements for effective and safe public transport systems. It also deals with links to other provinces, as well as addressing issues relating to dependence on fossil fuels within the transport sector.
3. The Western Cape Green Economy Strategic Framework aims at positioning the Western Cape as the leading green economic hub in Africa. This framework is centred around six strategic objectives:
 - To become the lowest carbon Province.
 - To increase usage of low-carbon mobility.
 - To ensure a diversified, climate-resilient agricultural sector and expanded value chain.
 - To become the emerging market leader in resilient, liveable and smart built environment.
 - To ensure high growth of green industries and services.
 - To secure ecosystem infrastructure.

⁴³ Page 39 of the 2014 PSDF.

4.5 Municipal policies and plans – IDP and SDF

A number of broad overarching policies in the Drakenstein IDP seek to establish an overall conservation approach for the Municipality:

- ◆ Minimal intervention in areas of natural, historic and cultural significance;
- ◆ Concern for the visual quality of the landscape and the impact of inappropriate development and development parameters thereon;
- ◆ Recognition for the important role of agriculture in the social and economic development of the community and the protection of agriculture related resources;
- ◆ Recognition of the impact of agricultural activities on the natural environment and the containment thereof;
- ◆ Protection of valuable agricultural and natural areas from urban sprawl;
- ◆ Protection of the quality and ambience of towns through appropriate development strategies; and
- ◆ Protection of the right of individuals to access nature areas, whilst at the same time limiting the negative impact thereof.

The Drakenstein Municipality IDP has identified key priority areas for intervention. These are:

1. The provision of housing, social infrastructure and basic services;
2. Local economic development and job creation;
3. Urban development should be contained within the existing boundaries of the major towns and development policy should be geared towards compaction rather than indiscriminate sprawl.

The aim of the **Drakenstein Municipality SDF** is to provide a vision for sustainable development and a framework for land use management in the Drakenstein Municipality from an environmental perspective. In order to achieve this, it is essential to ensure the following:

- ◆ That *core areas of high biodiversity value* be protected from all forms of modification and development, through the establishment of conservation policies and biodiversity management plans. In addition, *biodiversity networks* and corridors are established, delineated and mapped and that management plans are prepared for these corridors ;

- ◆ That *nature conservation and recreation* opportunities be established in a complementary manner, allowing for the maximum access to conservation areas;
- ◆ That natural features and the attraction of the area, with special reference to the *aesthetics* thereof, be protected
- ◆ That the *heritage resources* of the Drakenstein Municipality be protected, and that the heritage resources also include the natural heritage, not only the built environment, as the context within which the built environment was established is as important as the buildings ;
- ◆ That the *soil and the agricultural potential* of the area be protected; and
- ◆ That the *water resources* and wetlands of the municipality be given maximum protection in order to ensure the system as a potable resource, for irrigation and for recreation purposes. *River corridors* be defined as all land within the 1 100 year flood line of the stream or river and where the 1: 100 year flood line occurs on or in close proximity of the riparian area (on the river banks), a distance of not less than 50 m from the edge of the water in the stream or river (i.e. from the edge of the marginal habitat);
- ◆ Priority be given to the development of under-utilised land and vacant areas in the urban areas, rather than development beyond the urban edges.
- ◆ New high density and high intensity mixed use settlements be established in areas of low environmental significance rather than permitting expansion into areas of transition around the core areas of conservation, biodiversity corridors or in areas of high intensity agriculture and relatively high agricultural potential.
- ◆ New servicing systems, e.g. water saving toilets, composting toilets and urine separating toilets, be used in all new settlements and in redevelopment areas in existing nodes, in order to reduce the average water consumption of users and to limit wastewater flows.

4.5.1 Other municipal policies and studies

Paarl Farms Study

The Paarl Farms Land Use Management Policy, prepared by the Drakenstein Municipality, deals with the future use of the Paarl “town farms” to the west of the Berg River. These farms are under severe pressure for residential development and although the issue of the future use of these farms has been debated since the 1950s no final resolution of the matter has been achieved. In developing the policy an analysis of the agricultural potential of the land, and the heritage and landscape value of the properties was investigated.

The policy places a high premium on the heritage and landscape value of the remaining farms, as well as the conservation of the high potential agricultural land. As part of the formulation process, a number of development scenarios were considered, including low-density gentleman's estate type development, and limited residential development adjoining existing residential areas. Concerns about sprawl, visual impact and the setting of a precedent for further development, have ruled out these forms of development as inappropriate.

Urban edge study

The Urban Edge Study was initiated by the Drakenstein Municipality in 2005, and undertaken by MCA. This study, in addition to an Urbanisation and Densification Study, an Open Space Policy study and a Cemetery Study was intended to complement and provide detail to the SDF, so that all these studies in combination provide a clear indication of Council policy with regard to urban development within the municipal area. A number of urban edges have been proposed for the settlements in the Drakenstein. This issue will be resolved through the SDF review process that has been established by the Province.

Densification study

The Densification and Urbanisation and Open Space Strategy was commissioned to provide input to the Drakenstein SDF. It provides detailed analysis of land suitable for infill residential development, land that should be retained for use as open spaces and policies and strategies for further residential densification in existing developed areas, suitable for such development. The strategy proposes integration of urban activities, socioeconomic integration and a pattern of densification that promotes a minimum gross density of 25 dwelling units per hectare.

5 Priorities, pressures, trends, opportunities and constraints

The information provided in this section has been derived from existing studies, interviews with CapeNature, the Department of Agriculture, the Drakenstein Municipality and DEA&DP, and also from the public engagement process.

5.1 What are the key issues and trends regarding environment and development?

5.1.1 Issues and trends related to the economy

- ◆ There is pressure to develop on agricultural land. This is a major issue from a loss of agriculturally productive land perspective. It is also a concern in that it leads to a change in the character of the area. The rural and cultural landscapes that characterise the Drakenstein are seen as a significant asset by residents and for the tourism industry.
- ◆ Restricting development on the Paarl “town” farms may result in inappropriate pressure for development elsewhere in the area. The Paarl Farms study noted the pressure for middle to high end development, although no empirical research in this regard has been undertaken to date.
- ◆ Local business opportunities, especially in relation to tourism have increased. This trend is positive, since tourism in the Drakenstein is seen to be ‘underdeveloped’ (Boulle and Newton 2006).
- ◆ The development of mining resources (mainly quarries) is a problem, in terms of degradation of ‘sense of place’, loss of agricultural land and of biodiversity. Rehabilitation of old quarries is seldom satisfactory.
- ◆ Manufacturing is not as significant an economic activity as it used to be, particularly with the closure of major textile production facilities such as Berg River Textiles. There has been an increase in the transport industry sector and the printing industry in Paarl. Agri-industries are still an important component of the local economy.

5.1.2 Issues and trends related to social infrastructure and development

- ◆ The capacity of the bulk services infrastructure, i.e. major roads, potable water supply dams and reservoirs, solid waste disposal sites and wastewater treatment works is at the limits of its ability to function efficiently. Annual water restrictions contaminated effluent run-off into the river systems and waste disposal in un-permitted sites are the most obvious symptoms for the inability of the system to cope with the development pressure.
- ◆ An increasing demand for houses coincides with an increase in demand for developable land, most of which is sought along the urban edge, where typically

low income areas were established in terms of the segregated development policies of the past, with little or no regard for the conservation of the natural environment. This method of housing delivery continues, as it presents the most affordable option for large housing schemes as contractor supplied products.

- ◆ The influx of farm workers into the Drakenstein area creates a need for the establishment of more housing units, which in turn requires more land. Labourer's cottages are being converted into guest accommodation, which could be further exacerbating this problem.
- ◆ Infrastructure is at the limit of its capacity. Taking services to the other side of the N1 is a problem from pressure point of view.
- ◆ Development pressure is primarily in the Paarl area – also towards Wellington and towards Franschoek. There is rapid urban expansion with Paarl being considered is part of greater Cape Town functional region manifested as sprawl.
- ◆ Development pressure to the south of the N1 is for low density estate-style development – this is remote from work opportunities.
- ◆ Waste management is a concern – the Wellington landfill is used by the entire municipal area. According to the Integrated Waste Management Plan, the lifespan of the landfill was anticipated to run out in 2012.
- ◆ There is a need to provide additional sport and recreation amenities and parks in the municipal area, particularly in poorer areas.
- ◆ There is a need for spatial restructuring of the Wellington-Paarl corridor. This has not been considered at in SDF – the principles have been provided, but no strategy or implementation approach has been developed.

5.1.3 Issues and trends related to the natural environment

- ◆ It is generally accepted that water resources in the Drakenstein Municipality, particularly the Berg River, are stressed, and that more efficient use of available water is crucial to sustainability. The biggest challenge is seen to be balancing scarce water supply with rising demand in a way that is equitable and efficiently divided between sustaining the ecological needs of the rivers on the one hand, and domestic, agricultural and industrial use from rivers and dams.
- ◆ Water quality in the Berg River is also a significant issue. A key issue is that of pollution arising from unserviced informal areas. Discharge of off-spec effluent from Waste Water Treatment Works (WWTW) is also an issue. Bacteriological pollution poses a threat to the agricultural sector, particularly in respect of the export market to Europe due to the need to meet the Europgap standards. The impact of the use of pesticides and fertilizers on water quality is not well understood. Water quality monitoring does not address the constituents or pollutants that originate from agri-chemicals.

- ◆ Habitat integrity and water quality in the upper reaches of the Berg River deteriorates downstream as a result of alien vegetation encroachment (*Acacia* sp.), the interbasin transfer of water, loss of riparian areas and wetland (particularly valley bottom wetland) and river modification. Urban and agricultural development reduces the water quality at Franschhoek and Paarl/Wellington, which mainly arises from domestic and wine farm effluent or stormwater runoff. The lack of environmental flow releases from Wemmershoek Dam results in a severely altered flow regime and habitat downstream, which reduces the delivery of goods and services provided by the river (RHP, 2004).
- ◆ There is no natural buffer along the Berg River and many of the smaller rivers as well. In the case of the Berg River, 'hard' development extends right up to the river bank along most of its length – this poses a risk to these developments due to flooding, which is likely to increase with global warming. Encroachment of development into wetland and riverine areas is therefore of key concern.
- ◆ Invasive alien plants and invasive alien fish in rivers are both problematic. Currently no integrated or coordinated alien removal programme within the municipality.
- ◆ Although some ecological reserve determinations have been carried out for particular subcatchments, the ecological reserve has not been determined for rivers as a whole in the Drakenstein Municipality. This fact points to the need for a risk-averse and cautious approach to increasing the extraction of water from these river systems until such time as reserves have been determined.
- ◆ The two key pressures that contribute to loss of biodiversity are low density, up-market developments, and agricultural development on areas of conservation value.
- ◆ Some of the areas with high biodiversity have a high agricultural value (e.g. areas surrounding Paarl Mountain). These areas usually have high land prices due to this high agricultural potential. Land clearing for either agriculture or development is a constraint to biodiversity of an area.
- ◆ There is a risk of urban sprawl and loss of valuable agricultural land due to development being located outside of and at a distance from existing towns. There is a need to manage a way of developing rural agricultural areas, so that no other development on high yielding agricultural land occurs.
- ◆ According to the SEA (Strategic Environmental Assessment) for the Cape Winelands⁴⁴ the overall trend in the health of ecosystem services is one of general deterioration. Interventions are required to prevent a situation where natural systems are no longer able to adequately support economic activity and human health and wellbeing.

⁴⁴ CSIR (2007): Strategic Environmental Assessment for the Management of Ecosystem Services in the Cape Winelands District Municipality.

5.2 What key values and concerns were expressed by stakeholders?

At the workshops, participants addressed the following questions:

1. What do you love about Drakenstein?
2. What don't you like about Drakenstein?
3. Which natural and cultural resources do you think are the most important for Drakenstein's economy? Why?

TABLE 7: Stakeholder views on value of environmental attributes

ENVIRONMENTAL ATTRIBUTE	VALUED BY STAKEHOLDERS FOR, OR BECAUSE IT UNDERPINS	CONCERNS, THREATS TO THESE VALUES
Mountains, natural landscapes, scenery	<ul style="list-style-type: none"> • Landscape character, scenic beauty • Tourism, job creation • Quality of life • Natural heritage • Sense of place (especially Paarl Mountain) 	<ul style="list-style-type: none"> • Mining • Alien vegetation • Uncontrolled development • Informal settlement • Uncontrolled fires
Fynbos, biodiversity, nature reserves	<ul style="list-style-type: none"> • Herbal plants • Medicinal plants • Tourism • Recreational activities (e.g. walking) 	
Productive agricultural soils	<ul style="list-style-type: none"> • Long term food security within and beyond Drakenstein • Source of labour-intensive employment • Supports most businesses in Drakenstein 	<ul style="list-style-type: none"> • Mining • Loss through development • Informal settlement
Rural landscape, winelands, orchards, grain	<ul style="list-style-type: none"> • Landscape character/ atmosphere/ sense of place • Heritage • Quality of life • Tourism • Job creation in tourism sector 	<ul style="list-style-type: none"> • Mining • Urban sprawl • Informal settlement
Vineyards inside the town	<ul style="list-style-type: none"> • Landscape character • Heritage 	<ul style="list-style-type: none"> • Insensitive developments
Clean air	<ul style="list-style-type: none"> • Healthy lifestyle 	<ul style="list-style-type: none"> • Polluting industries
Small towns	<ul style="list-style-type: none"> • Healthy, friendly lifestyle • Can walk to work 	<ul style="list-style-type: none"> • Urban sprawl • Informal settlement
Historic buildings, unique heritage	<ul style="list-style-type: none"> • Heritage • Sense of place • Tourism opportunities (business) • Job creation in tourism sector 	<ul style="list-style-type: none"> • Insensitive developments
Water	<ul style="list-style-type: none"> • Clean water for consumption • Water for agriculture 	<ul style="list-style-type: none"> • Scarcity • Pollution of water sources/ivers
Berg River, smaller rivers, river corridors	<ul style="list-style-type: none"> • Water supply • Recreation and tourism • Landscape character 	<ul style="list-style-type: none"> • Deterioration in water quality of Berg River (could place exports at risk) • Inadequate services infrastructure • Alien plants • Loss through development
Wetlands	<ul style="list-style-type: none"> • Water quality and quantity • Flood regulation and erosion control 	<ul style="list-style-type: none"> • Loss through development
Public open space, green belts	<ul style="list-style-type: none"> • Recreation • Quality of life • Green spaces 	<ul style="list-style-type: none"> • Insensitive developments

5.3 What resources were seen as being important by stakeholders?

Information shown in the table overleaf is from inputs obtained at the two stakeholder workshops and the questionnaire (Appendix B).

1. Which natural and cultural resources do you think are the most important for Drakenstein's economy? Why?
2. Which natural and cultural resources do you believe are the most important for people's health and wellbeing? Why?

The resources identified as being important for the local economy and for people's health and wellbeing that are directly dependent on nature / natural resources have been highlighted in grey in the table.

TABLE 8: Important resources

RESOURCES IMPORTANT FOR THE LOCAL ECONOMY	RESOURCES IMPORTANT FOR PEOPLE'S HEALTH AND WELLBEING
Agriculture (e.g. grain, fruit) – most businesses are linked	Clean air
Water resources - irrigation	Water
Water works infrastructure	Sanitation / sewage treatment
Available workforce - Many skilled people in Drakenstein	Health facilities
Inhabitants	Waste recycling and refuse removal
Location - Drakenstein is Central and close enough to Cape Town, Harbour and the Airport.	Natural environment / good management of sensitive areas
Cultural assets – History, language, architecture, African languages	Open space / recreational areas and facilities / green belt
Natural environment - Tourism / Tourists - Rivers - Mountains - Reserves - Wine tasting	

5.3.1 Concerns raised by stakeholders

The workshop discussion also dealt with concerns using the following questions:

1. What type of development do you think should not be considered for Drakenstein under any circumstances?
2. If you could wave a magic wand, what would you change about Drakenstein? What wouldn't you change?
3. What are your biggest fears for the future of Drakenstein?

Concerns that were raised by stakeholders are as follows:

- ◆ Decision making is driven by narrow political interest
- ◆ The quality of the Berg River.
- ◆ Landfill sites being filled at high rate.
- ◆ Uncertainty about land reform processes and implications for land management

- ◆ Development happening on high yielding agricultural land.
- ◆ Uncontrolled development.
- ◆ Foreign ownership of properties and effect on land values.
- ◆ Change of informal housing to formal housing.
- ◆ Water quality problems a result of informal settlements.
- ◆ Lack of infrastructure for informal settlements.

5.4 What are the key opportunities and constraints?

Constraints: These can be grouped as follows:

1. Limiting factors to the development of physical structures or infrastructure, or the transformation of natural areas, and
2. Factors that are unlikely to contribute to, and may detract from, sustainability.

It is important to note that the ‘constraints’ in respect of certain types of development may present opportunities for other activities that do not rely on significant structures or infrastructure, such as tourism and recreation (e.g. passive recreation opportunities require minimal infrastructure and thus may not result in significant environmental impacts provided correctly managed).

Factors that require consideration in respect of infrastructural or physical development;

- ◆ River conservation status, water quality issues
- ◆ 1:100 year floodlines
- ◆ Heritage areas and objects
- ◆ Critical Biodiversity Areas, special habitats, threatened ecosystem status, ecological corridors, etc
- ◆ Protected areas (nature reserves - provincial, local, national heritage sites, mountain catchments, conservancies, etc)
- ◆ Catchments, wetlands
- ◆ Steep slopes >1:4
- ◆ Valued landscapes / landscape features
- ◆ Important areas for threatened species (bird, mammal, lower vertebrate areas)
- ◆ Erosion.

Opportunities - A combination of favourable circumstances or situations to support further development in a sustainable way:

1. Agricultural soils of high productive potential (SDF 2006) opportunities still exist for beneficiation of, and/ or investment in:
 - wine farms/wineries;
 - cultivation of table and oil olives;
 - fruit farming and processing;
 - expanding dairy production;
 - extracting oils from herbs and grapeseed;

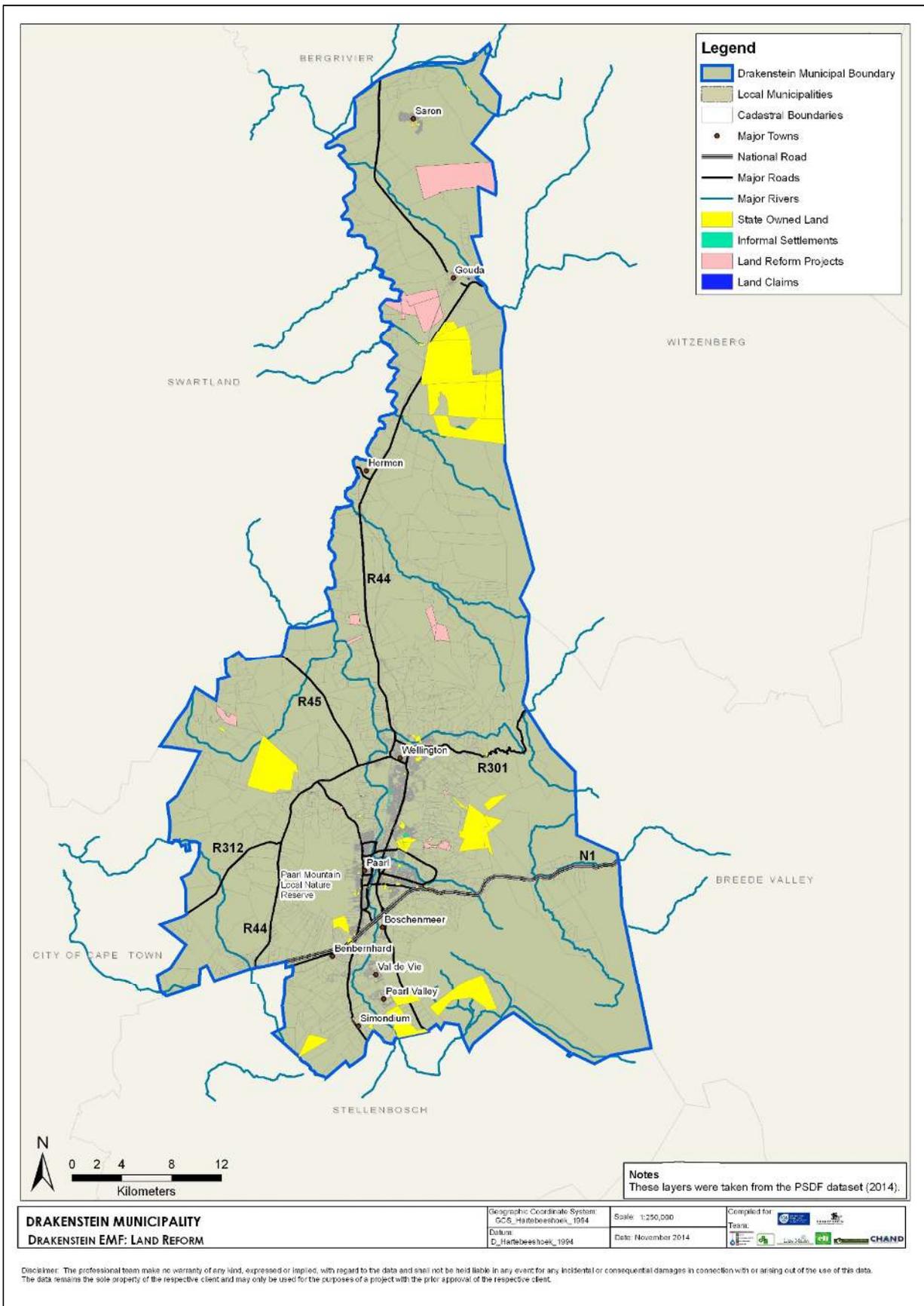
- production of organic fertilizers;
 - bulbs, flowers, seeds and hydroponics;
 - storage, cooling, drying and packing facilities;
 - processing of high value niche products
2. Another opportunity within the agricultural sector is that of responsible farming through participation in programmes such as the Biodiversity and Wine Initiative and Fair Trade. The Western Cape Government’s green economy framework identifies this as an opportunity. With the strength of the agricultural sector in Drakenstein there are growth opportunities that marry ecological and agricultural needs. This also applies to agri-industries and agri-tourism.
 3. Industry – the SDF 2006 mentions production of road haulage equipment.
 4. Recreation and tourism: the Drakenstein has landscape character of heritage/cultural value, unique natural/landscape assets/features, World Heritage Site (natural), World Heritage Site nomination (Cape Winelands, cultural), the UNESCO Winelands Biosphere Reserve and events such as the Berg River Canoe Marathon, etc. According to the SDF, further investment opportunities within the tourism industry in the Drakenstein Municipality include:
 - development of theme resorts;
 - craft products and retail facilities for tourist travelers;
 - recreation, “activity” and sports-related facilities;
 - specialized farm and township tours;
 - health tourism facilities;
 - heritage tourism facilities;
 - retirement/tourism residential developments;
 - upgrade of tourism infrastructure;
 - further accommodation facilities – hotels, guesthouses, backpackers, homestays, farm-based; and
 - convention and exhibition facilities
 5. Opportunities to improve delivery of ecosystem services and increase labour-intensive employment by, amongst others, clearing of alien vegetation in particular from catchments and riparian zones, restoring degraded areas and river corridors, improving management of soils, water and indigenous habitats and acting as stewards for natural resources. There is potential to explore schemes in the Drakenstein area to boost a ‘green economy’.
 6. Land reform and rural development are important priorities in the National Development Plan. Provincial and local government have a supportive role to play in terms of land reform, as the constitutional mandate in this regard is vested in national government. The PSDF provides a spatial framework that is aimed at supporting national programmes related to land reform and rural development. In addition, the PSDF notes the need to channel public investment into rural development initiatives (i.e. land reform, agrarian transformation, environmental rehabilitation, enterprise development, etc) to

areas where it can offer real and sustained improvements to beneficiaries and the rural community.⁴⁵ Potential to realise such opportunities (land reform, rural enterprise development and environmental rehabilitation) exist in Drakenstein due to factors such as its agricultural potential and the fact that there is state-owned land (Map 15). Established land reform projects within Drakenstein are also shown.

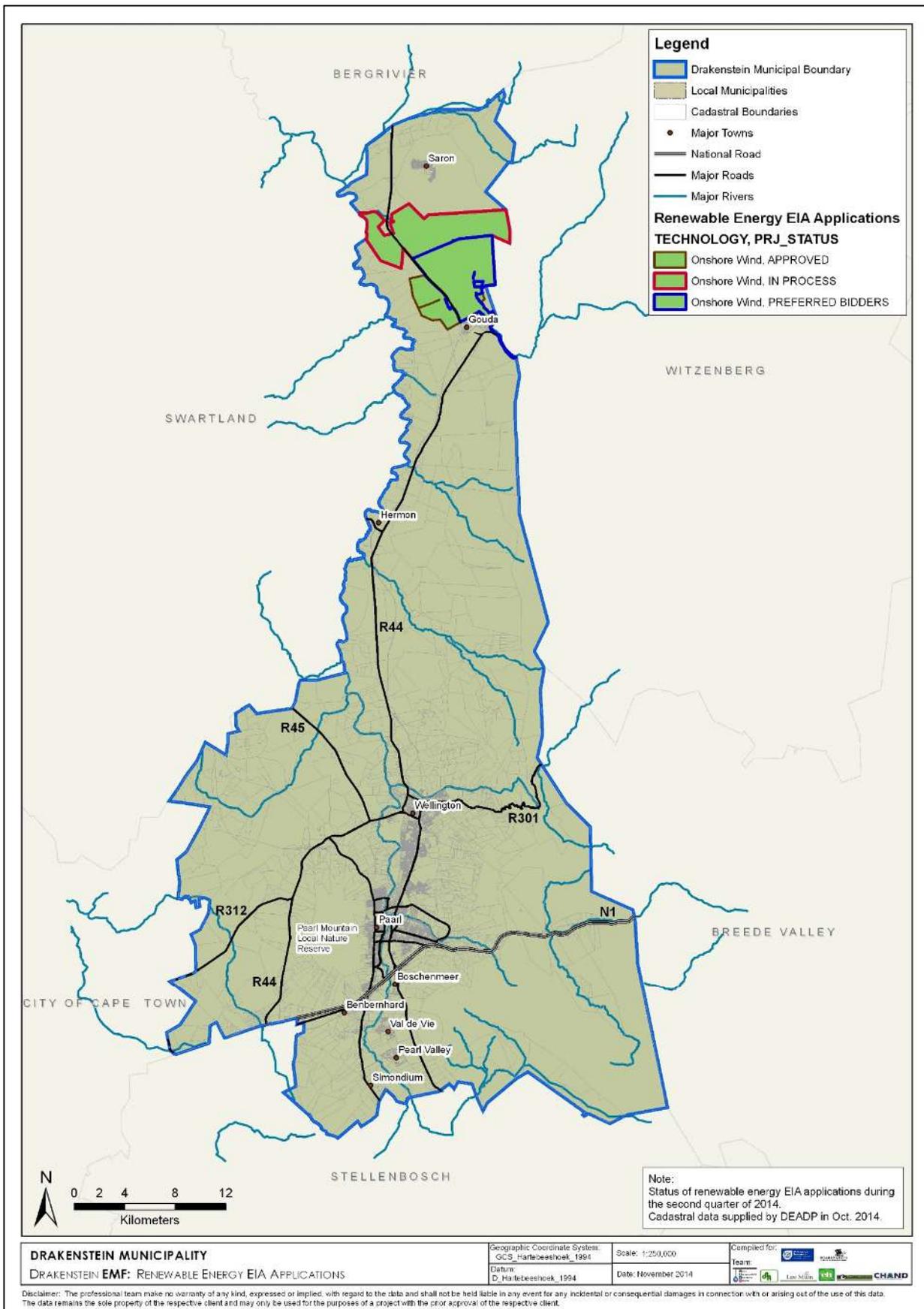
4. Development of the green economy is a focus of the Western Cape Government and a strategy framework has been developed. According to the Western Cape Government's green economy framework the province is well placed to be the most important research and servicing hub for renewable energy in South Africa and even Africa. Alternative energy projects are underway in Drakenstein as is shown on Map 16. According to the IDP energy efficiency is one of the Key Focus Areas of the municipality. The municipality has adopted a Green Building Manual has been adopted and published. The development of an Energy master Plan is underway. In 2010/2011 an agreement was signed with Eskom relating to the installation of a Demand Side Management System.⁴⁶

⁴⁵ Page 65 - 2014 PSDF

⁴⁶ Pages 50 and 51 of the 2013-2018 Drakenstein IDP.



MAP 15: Presence of state owned land and land reform projects



MAP 16: Renewable energy projects

6 EMF Vision and strategic objectives

The vision and strategic objectives that have been developed for the purposes of the EMF has taken account of the policy context, stakeholder inputs, the situation analysis and the analysis of opportunities, pressures and trends. Objectives relating to sustainable development as put forward by national, provincial and local government provide the context for the EMF's vision and objectives. The Drakenstein Municipality has provided for an environmental sector plan in its 2013-2018 IDP. The municipality has developed an Environmental Management System which is aimed at protecting the integrity of the environment and ensuring sustainability of the municipal area. It is also intended to promote "participative Greener Governance."⁴⁷ The EMF is seen as part of this system.

6.1 Stakeholder values

In respect of the vision for the future of Drakenstein, stakeholders stated that it would be an area where:

- ◆ Pollution of resources is minimal (rivers and air quality) / there is no smog.
- ◆ There is good water quality / adequate clean water available.
- ◆ The area is free of alien vegetation.
- ◆ Waste is minimal and sustainable waste management is in place - Grey water, Solid waste, Recycling, Low carbon foot print.
- ◆ Densification of urban areas occurs on land with low agricultural or non-agricultural land.
- ◆ Urban sprawl is controlled.
- ◆ No informal settlements.
- ◆ Development shows an agricultural bias.
- ◆ Rural sense of place and heritage is retained.
- ◆ Capital has been freed up to help the other neighbouring towns, e.g. Saron.
- ◆ Strong development guidelines are in place which are properly applied
- ◆ There is good infrastructure – Power, Water, Sewage, Telecommunications.
- ◆ Alternative energy – wind
- ◆ There is no crime.
- ◆ Retain and protect biodiversity (recreational purposes)
- ◆ Urban renewal has occurred with pedestrian walkways and cycling paths.
- ◆ Good public transport is in place.
- ◆ The aesthetic appeal of the area is intact: biodiversity and heritage is preserved.
- ◆ All who live in Drakenstein are able to participate in its economy.
- ◆ There are good education, training and medical facilities.
- ◆ Berg River Valley is a clean / green area.
- ◆ Labour intensive industries have been established.

⁴⁷ Page 177 of the Drakenstein Municipality 2013-2018 IDP.

The types of development that stakeholders saw as being **undesirable** are:

- ◆ High density housing.
- ◆ Nuclear power stations.
- ◆ River front developments.
- ◆ Informal settlements (rather subsidised housing).
- ◆ Mining (must be better regulated).
- ◆ Smoke stack industries.

6.2 EMF vision and strategic objectives

Vision

An environment to sustain livelihoods, and the health and wellbeing of people:

Strategic objectives:

- ◆ To communicate clearly the limits of acceptable change relating to the natural and cultural environment for consideration in decision-making by all authorities. The proponent / applicant is responsible for demonstrating that proposed development would not infringe on or cross those limits of acceptable change.
- ◆ To create a predictable development environment, providing an early warning system for developers of the levels of likely risk in submitting development proposals in different areas and the associated need to consider alternatives to minimize unacceptable impacts on the environment.
- ◆ To apply the mitigation hierarchy, namely first striving to avoid and then minimize and remedy negative impacts, as a requirement of the national environmental management principles (Section 2 of NEMA).
- ◆ To guide the location of development in the Drakenstein Municipality in such a way that it:
 - conserves high productivity agricultural soils;
 - conserves important biodiversity;
 - conserves systems that regulate and provide reliable supply of clean water;
 - avoids, and where not possible fully to avoid, minimises pollution of land, air, surface water and groundwater;
 - conserves land cover to prevent erosion;
 - conserves heritage and cultural resources;
 - conserves landscape character and aesthetic qualities;
 - avoids exposure to natural hazards; and
 - provides a healthy living environment.
- ◆ To guide environmental decision making regarding development so that it:
 - Promotes good stewardship of land;
 - Promotes greater efficiency of energy, land and water use;
 - Promotes rehabilitation/ restoration of degraded natural areas to improve ecosystem services.

PART THREE – Strategic Environmental Management Plan

7 Overview of SEMP

The Strategic Environmental Management Plan (SEMP) forms the heart of the EMF; it provides guidance to support environmental decision making that will benefit the management of important resources in the Drakenstein area. It is not the purpose of the EMF to serve as a resource management plan – its purpose is to facilitate the incorporation of sustainability issues into spatial development and land use planning, primarily through the environmental application and authorisation processes provided for in section 24 of NEMA. The management of air quality, waste and water resources at municipal level would be the focus of Air Quality Management Plans (AQMPs), Integrated Waste Management Plans (IWMPs) and Infrastructure / Services Plans (e.g. water supply, sewage). The management of agricultural land is the responsibility of the Department of Agriculture and water resources are the responsibility of the Department of Water Affairs or a Catchment Management Agency, if in place. For this reason, **these municipal-wide issues – nested within provincial and national scales - are only addressed in the EMF insofar as they are relevant to the NEMA EIA Regulations.**

7.1 Purpose of the SEMP

The purpose of the SEMP is as follows:

- ◆ to identify Environmental Management Zones (EMZs) based on the environmental attributes of the area;
- ◆ to provide management guidance for the EMZs in respect of the environmental attributes that fall within that EMZ;
- ◆ to establish a framework to check the ‘on the ground’ effectiveness of the EMF; and
- ◆ to set out a mechanism to facilitate updating of the EMF and its linkages to the municipal IDP / SDF review process and to other relevant tools such as the AQMP, IWMP, catchment management and agricultural resources plans/strategies.

The SEMP therefore comprises the following:

- ◆ Environmental management zones with management recommendations.
- ◆ Listing and delisting of activities.
- ◆ Roles and responsibilities in respect of the EMF.
- ◆ Decision-making framework.
- ◆ Monitoring and evaluation framework.
- ◆ Revision / updating of the EMF.
- ◆ Integration with SDF/IDP/SoER/EMS etc.

8 Environmental Management Zones

The Environmental Management Zones (EMZs) are identified and described in this section. There are 3 EMZs, which have been identified based on a combination of the environmental attributes and the potential for significant impacts in relation to the activities listed in the 2014 NEMA EIA Regulations, namely Listing Notices 1, 2 and 3 (GNR 983, 984 and 985 of 4 December 2014).

In determining the EMZs, the key driver must be the objectives of an EMF. Regulation 2(3) of the 2010 EMF Regulations state that EMFs must be aimed at “promoting sustainability” and “securing environmental protection.” As has been noted elsewhere in this document South Africa’s National Framework for Sustainable Development recognises that South Africa’s natural systems and biodiversity provide a basis for economic growth and development. This reality is recognized on an international and national level and has been highlighted through initiatives such as the Millenium Ecosystem Assessment. This study drew the following key conclusions⁴⁸:

1. Human activity has and continues to lead to fundamental and widespread environmental change, leading to extinction on a massive scale. “The extent of this loss should not be underestimated (Paragraph 11).”
2. The ways in which humans have altered the natural environment have led to significant benefits to society, but these benefits have been accompanied by rapidly increasing costs due to ecosystem degradation. Human activity is creating a world for future generations that is likely to be substantially degraded (Paragraph 20).
3. “It has been established conclusively that efforts to eradicate poverty will not succeed where environmental degradation is allowed to continue. This is of particular concern as environmental degradation is set to significantly worsen over the next 50 years. It therefore seems unlikely that the international community will meet its Millennium Development Goal commitments to reduce poverty and increase development, at least in the long-term. These changes may also undermine the current progress that is being made, leading to a worsening of poverty (Paragraph 25).”
4. “If the devastating impact of continued ecosystem degradation on development and the economy is to be avoided, it is clear that substantial changes will have to be made to the way in which the natural environment is valued. The case for concerted and decisive action has now been made (Paragraph 30).”

⁴⁸ These paragraphs have been cited or paraphrased from the House of Commons Environmental Audit Committee Report on the UN Millenium Ecosystem Assessment, First report of Session 2006-07 (<http://www.publications.parliament.uk/pa/cm200607/cmselect/cmenvaud/77/77.pdf>)

Similarly, the Southern African Millennium Ecosystem Assessment⁴⁹ notes that: “All people, everywhere, are absolutely dependent on ecosystem services, although well-being is also affected by many other factors.” “Low levels of well-being can make it difficult to focus resources on protecting ecosystem services. This can lead to a downward spiral of ecosystem degradation and declining well-being through the creation of a ‘poverty trap’. On the other hand, if appropriate interventions are made, it can drive an upward spiral of healthy ecosystems and rising well-being.” “At least four of the eight Millennium Development Goals (reducing hunger and child mortality, combating diseases and ensuring environmental sustainability) will not be met in the southern African region unless decisive action is taken to stabilise ecosystem services.”

This same message has been acknowledged by Ms Buyelwa Patience Sonjica, formerly South Africa’s Minister of Water and Environmental Affairs, in the Foreword of a publication relating to biodiversity and development:⁵⁰ *“Our experience in South Africa has shown us that we must look after our natural capital if we are to meet our country’s pressing socio-economic challenges in the face of climate change. Biodiversity and healthy ecosystems provide us with essential services – pollination of crops, a regular supply of clean water, and prevention of flooding and soil erosion. Many of the benefits derived from biodiversity and ecosystems are public goods that appear to be free, and their values are not captured in markets and prices or taken into account in decision-making, leading to loss of biodiversity, degradation of ecosystems and worsening greenhouse gas emissions. We can turn this situation around, however, by investing in maintaining and restoring our ecological infrastructure to promote development and help us adapt to climate change. This kind of investment can promote food security, ensure a sustained water supply, reduce damage from natural disasters and create work opportunities for the unemployed.”*

The reason for providing the above context to the EMZs is that the EMF does provide a tool to support the change that is being sought in the way the natural environment is valued. Transformation of land on which natural systems exist is one of the main causes of environmental change and the EMF is concerned with issues related to land use and development. In particular, the fact that it is a spatial tool that is concerned with environmental attributes, means that it has a potentially significant role to play in avoiding or at least reducing the transformation of natural areas that are important assets for long-term health and wellbeing.

8.1 Identification of the EMZs

The point of departure that has been applied in determining the Environmental Management Zones (EMZs) is that natural resources and human endeavours are not separate from each other. Natural attributes and human activities need to be seen in the context of the landscape in which they are located. Thus human activities and natural attributes need to be viewed holistically – as different aspects of one system or landscape. Human health and wellbeing is related to various benefits that nature

⁴⁹ Biggs, R., Bohensky, E., et al 2004. Nature supporting people: the Southern African Millennium Ecosystem Assessment. CSIR, Pretoria

⁵⁰ Cadman, M., Petersen, C., Driver, et al. 2010. Biodiversity for Development: South Africa’s landscape approach to conserving biodiversity and promoting ecosystem resilience. South African National Biodiversity Institute, Pretoria.

provides to humankind (referred to as ecosystem services) such as soil for growing of food crops; clean water for drinking; pollination of food crops and features that fulfil recreational, cultural or spiritual needs, to name a few. Maintaining the natural resource base is central to ensuring the health and wellbeing of humans and meeting their developmental needs.

The concept of “significant impact” has been applied in determining the EMZs. A significant impact is any impact that would threaten the health of either the environment and / or people in the area covered by the EMF. That is, it is an impact that would:

- ◆ Threaten the integrity and resilience of ecosystems which sustain development, human wellbeing and livelihoods, by degrading or causing deterioration or loss of:
 - important biodiversity;
 - ecosystems that regulate and provide reliable supply of clean water (i.e. that meets relevant water quality standards), either groundwater and/or surface water;
 - air quality (i.e. air that meets relevant air quality standards);
 - soils having high agricultural productivity that contribute to food security in the long term; and
 - natural areas known to support livelihoods of vulnerable communities.

- ◆ Threaten the physical health or increase the vulnerability of people to:
 - natural hazards and/or unstable areas;
 - the spread of disease; and
 - pollution with known adverse health effects.

- ◆ Threaten healthy societies by causing loss of:
 - important heritage;
 - valued public open space; and
 - natural areas or landscapes valued for their sense of place or that are of cultural importance.

Any activity that would be likely to cause one or more significant impacts, as defined above would be considered to be ‘undesirable’. Those impacts that are significant and also irreversible, or could result in irreplaceable loss of unique resources, should be considered as a “fatal flaw” or a “show stopper”. Developments involving transformation of land, particularly on an extensive scale would typically be of particular concern in this regard.

The approach described above is in line with the principles and goals of the PSDF and other strategic frameworks / policies developed for the Western Cape (Refer to Section 5.4). It also reflects municipal priorities and those of stakeholders. In all of these instances, protection of agricultural, biodiversity and cultural assets or resources is regarded as an imperative.

8.1.1 Description of EMZs

Spatial data have been mapped for each of the attributes in the study area. These attributes cover resources and restrictions (constraints) or risks. The value, irreplaceability and vulnerabilities associated with the attributes have been central to determining the EMZs. Three EMZs have been determined:

- ◆ *EMZ 1 – Keep assets intact:* This EMZ is based on resources that are considered critical in maintaining the quality of life of people living in the study area and the economic activity of the area, as well as protecting assets that represent either natural or cultural heritage for current and future generations. This is in accordance with the environmental right in the Constitution and the NEMA principles. A healthy natural resource base is also fundamental to the realisation of socio-economic rights.
- ◆ *EMZ Zone 2 – Develop with care: valued resources:* This EMZ is based on resources that fulfil an important supportive role in maintaining critical natural resources identified in Zone 1 as well as resources that may be regarded as particularly sensitive to certain types of disturbance (i.e. impacts of development on these areas may be significant).
- ◆ *EMZ 3 – Develop with care zone: restrictive conditions or risks.* This EMZ identifies areas where environmental quality is approaching limits of acceptable change (e.g. polluted) or where natural hazards pose a risk (e.g. flooding) are also included in this zone (i.e. impacts of these areas on proposed development may be significant).

It must be noted that no one attribute within an EMZ is regarded as being more or less sensitive than any other attribute. Each is of equal status. Thus if more than one attribute is present at a particular location, the implication is that a wider range of issues will require investigation (e.g. through specialist studies). The fact that more than one attribute within an EMZ occurs on a site does not make this location more sensitive than if only a single attribute were to be present. Environmental sensitivity is not based on the number of attributes at a particular location – rather it is driven by the type of attribute, with those in the Keep Assets Intact Zone being the most sensitive due to their value to and their irreplaceability.

The EMZs provide a means for achieving the following requirements as set out in the 2010 EMF Regulations, in that they serve to:

- ◆ Specify the attributes of the environment in the area, including the sensitivity, extent, interrelationship and significance of those attributes.
- ◆ Identify any parts in the area to which those attributes relate.
- ◆ Show the environmental management priorities of the area.
- ◆ Indicate those areas with specific environmental and socio-cultural values and the nature of those values.

This has been achieved by considering the environmental attributes in an integrated and holistic way. Stated differently, the attributes have been looked at in combination rather than solely as individual entities. Thus it enables the identification of areas that are most or least sensitive to development. This provides an integrated rather than a fragmented perspective, which could arise if an attribute-by-attribute approach is adopted.

These EMZs could be regarded as a tool to assist Applicants or Developers in identifying appropriate locations for development proposals and for providing a “first scan” of the issues that may need to be addressed in the application process (e.g. through specialist studies). Clearly, the more responsive the application is to the EMZ information the lower the risk of conflict with stakeholders / Interested and Affected Parties (I&APs) and of authorisation being refused. The converse also applies. The EMF is not concerned with providing detailed guidance on the conducting of the EIA process. Guidelines in this regard are available as noted in Section 11.1.

It must be noted that the activities described in the EMZ in this section are not *verbatim* the Listed Activities in the NEMA 2014 EIA Regulations, namely Listing Notice 1 (GNR 983 of 4 December 2014), Listing Notice 2 (GNR 984 of 4 December 2014), Listing Notice 3 (GNR 985 of 4 December 2014) and those waste management activities listed under the National Environmental Management Waste Act (GNR 718 of 3 July 2009, as amended). Activities listed under this Act require a waste management licence. The procedure for obtaining a waste management licence requires the undertaking of either a Basic Assessment or Scoping and EIA, depending on the category within which the activity falls.

For the purposes of the EMF, activities are described using general terms, but are sufficiently detailed so as to make it evident which Listed Activities are relevant. The reason for taking this approach is to ensure that the EMF does not become out-of-date due to amendments to the Listed Activities. In order to determine which activities will trigger the requirements for a Basic Assessment or Scoping and EIA process reference must be made to the NEMA 2014 EIA Regulations and associated Listing Notices.

8.2 Management guidelines for the EMZs

Since the purpose of the EMF is to consider the environmental attributes of an area and to use this information to provide guidance with respect to appropriate / inappropriate development, the following has been developed for each EMZ:

1. A management framework which can be used as a basis for testing development proposals or for developing objectives/goals for a development proposal (i.e. objectives-led planning and design of a development proposal. The management framework comprises the following:
 - *Management objectives*: these are the objectives that should be borne in mind in the planning of land use and development and in related decision-making processes.

- *Desired outcomes*: These are the effects that one would want to see “on the ground”, namely the results of giving effect to the objectives.
 - *Limits of Acceptable Change (LoAC)*: these are thresholds that need to be considered in the planning of land use and development and in related decision-making processes. They represent a limit beyond which change in the current status of that particular attribute would be regarded as undesirable because of the potential for loss or degradation of an irreplaceable resource. These limits are based on the best available scientific information.
 - *Opportunities for benefit*: these represent areas where social and / or economic and / or environmental benefits could be realised.
 - *Mitigation options*: these show the level of mitigation in the mitigation hierarchy that could be used to address impacts on particular attributes. Where the attribute/ resource are irreplaceable, avoidance (rather than minimizing, rehabilitating or offsetting) is likely to be the sole option.
2. A matrix linking attributes and activities / types of development that may be considered inappropriate or appropriate. The activities in this matrix are based on the Listed Activities in the NEMA 2010 EIA Regulations. This matrix should only be used as being indicative of developments that may or may not be appropriate – it is not to be taken as being definitive, as each application must be evaluated on its own merits. The matrix comprises the following:
- Firstly, the types of development or activities that should be **avoided** (or are likely to be considered undesirable) in relation to the attribute, given its irreplaceability and/or vulnerability and societal value.
 - Secondly, the types of development that are **likely to have significant negative impacts** but that could be considered in exceptional circumstances (e.g. critical for social infrastructure delivery). This is based on the context provided by the Environmental Right in the Constitution which calls for ecologically sustainable development whilst ensuring justifiable socio-economic development. The EMF recognizes that there may be exceptional circumstances where development may need to be considered. This applies to crucial public / social infrastructure or facilities to meet basic needs where there are no alternative locations available. Exceptions to this ‘avoid’ rule would need to be clearly demonstrated and the basis for stating that no alternatives are available would have to be based on rigorous scientific analysis. Where residual negative impacts of a proposed activity would be significant **despite proposed mitigation**, the project would be contrary to sustainable development objectives and trade-off rules. Only in cases where there are no feasible alternatives, where the activities would deliver substantial societal benefits and would be undertaken in the overriding public interest, could the proposed project be considered.
 - Thirdly, the types of development / activities **that could readily be considered** as they are unlikely to have a significant environmental impact.

All proposed developments in each EMZ should be evaluated to ensure that:

- ◆ It would meet the management objectives for this zone and preferably result in net benefit both for the natural and social environment, and
- ◆ Changes to the environment as a consequence of the development would not result in the limits of acceptable change being exceeded.

The management objectives, desired outcomes and limits of acceptable change that have been provided for each attribute within each EMZ have been formulated on the basis of sustainability principles. It is necessary for the EMF to be framed within these principles in order for it to guide the formulation of appropriate development proposals and environmental decision-making effectively, within its “scope of influence.” This means that it must be borne in mind that the EMF is a tool that is aimed at supporting the implementation of the NEMA EIA Regulations. Thus, it cannot be seen as the sole mechanism whereby sustainability objectives would be achieved.

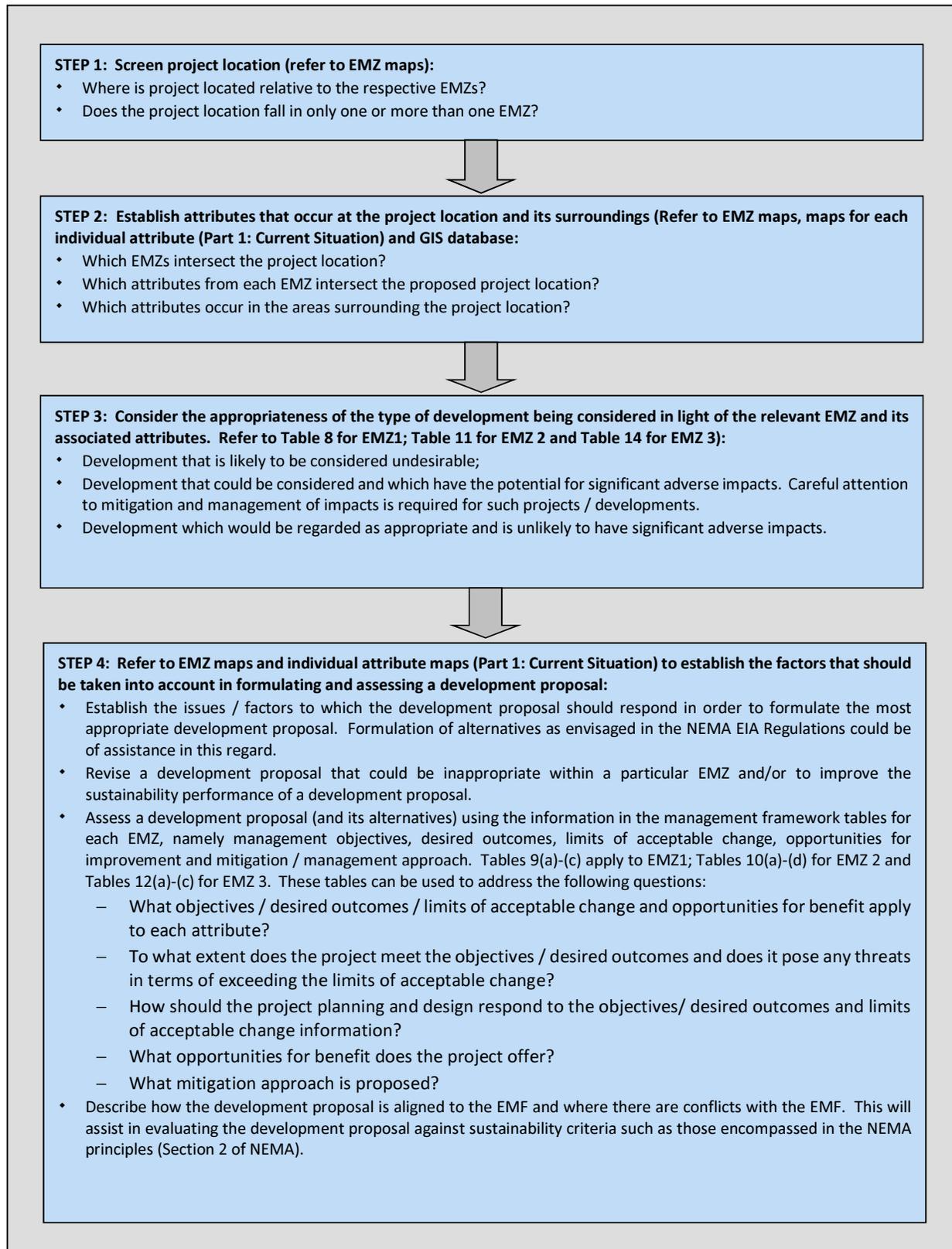
From the perspective of development proponents, the information in respect of each EMZ can be used to guide the formulation of the development / project proposal. The objective is to achieve development proposals that are aligned with, and hence do not undermine, sustainability objectives. Similarly, the management objectives, desired outcomes and limits of acceptable change ought to be considered in decision-making. This issue is covered in more detail in Section 12 of the SEMP.

The information on environmental attributes that has been used in the EMF is the most recent available from the various organisations or institutions that house these data. Applicants and their consultants must ensure that the latest GIS database is consulted and not rely solely on the maps published (i.e. hard copy) in the EMF. The GIS information is available from the DEA&DP as well as the Drakenstein municipality.

Where an attribute intersects a particular location or property, this points to the need to investigate this issue as part of the EIA process. This would normally involve consulting a relevant specialist to assist in undertaking a more detailed investigation of the issue. Typically, this would involve ‘groundtruthing’ to verify the presence of the attribute at the specific location as well as its surroundings, since environmental impacts may extend beyond the boundaries of a site. In cases where scientific (specialist) studies are at variance with the EMF (e.g. area identified as being sensitive in the EMF is not found to be sensitive in a specialist study), the onus is on the Applicant and the Environmental Assessment Practitioner (EAP) to ensure that the scientific analysis is rigorous, that findings have been discussed with relevant authorities and, preferably, that the study concerned has been subject to peer review, if required by the competent authority. ***The burden of proof to demonstrate that a development proposal is aligned to the EMF lies with the project proponent / applicant.***

8.2.1 Road map for using the EMZ information

A summary for the application of the EMZ information is provided in the flow diagram below.



8.3 EMZ 1 – Keep Assets intact Zone

This zone is based on the following attributes (Refer Table 10):

1. Resources that are critical to sustaining ecological integrity, which in turn is essential for human health and wellbeing, and maintaining economic activity. These comprise biodiversity resources. Biodiversity resources support people and the economy through providing ecosystem services. They also serve as an economic asset (e.g. tourism).
2. Resources that are important for food security, economic activity and job creation. These relate to irrigated agricultural land – the key agricultural asset. Agriculture is important to the local economy and job creation.
3. Resources that are important to communities, for society and for sense of place. These comprise heritage and scenic resources.

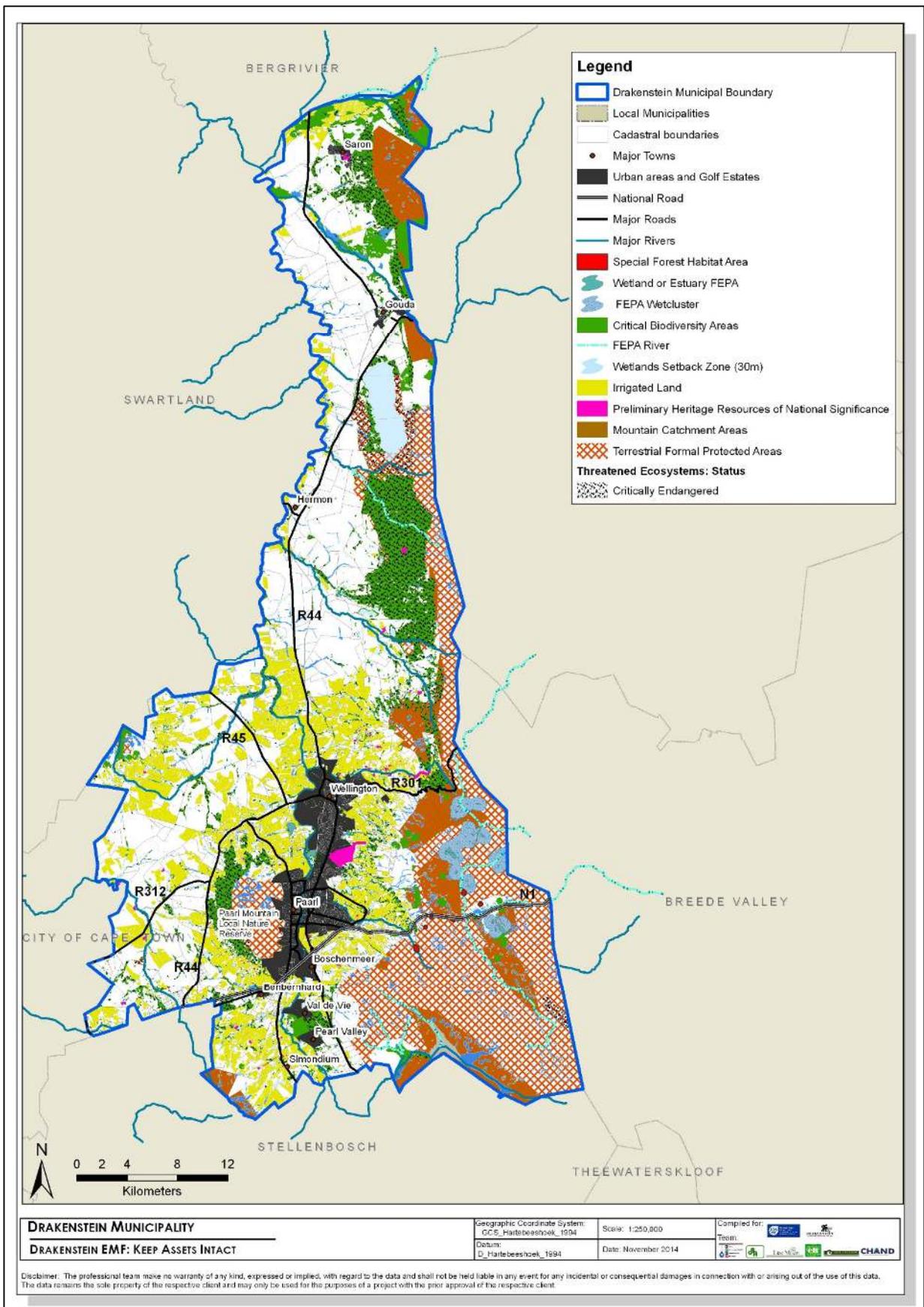
TABLE 10: Attributes that inform EMZ 1 – Keep Assets Intact

EMZ 1 – KEEP ASSETS INTACT				
ATTRIBUTE		RATIONALE		COMMENTS / NOTES
RESOURCE CRITERIA				
BIODIVERSITY RESOURCES	Critical Biodiversity Areas (CBAs)	<ul style="list-style-type: none"> • Maintain healthy ecosystems for the long-term, which in turn are needed to support human health and wellbeing and a strong economy. • Meet conservation targets required in terms of international commitments. 	CBAs comprise the most efficient configuration of areas in the landscape needed to meet targets for biodiversity conservation.	
	Listed Critically Endangered ecosystems	<ul style="list-style-type: none"> • Ecosystems that contain important biodiversity that is considered to be at imminent risk of extinction. 	Listed in terms of NEMBA as Threatened Terrestrial Ecosystems. (Most of these ecosystems would be incorporated within CBAs.)	
	Protected Areas	<ul style="list-style-type: none"> • Maintain pristine ecosystems and ecosystems that are crucial for human wellbeing, and prevent disturbance by human activities in the long term. • Meet international targets in respect of formal conservation areas. • Support the ecotourism sector. • Provide a wilderness experience for people. 	Private and Public Nature Reserves declared in terms of NEMPAA have been included, as well as Mountain Catchment Areas	
	Freshwater ecosystem priority areas (FEPAs)	<ul style="list-style-type: none"> • Maintain the biodiversity of freshwater ecosystems. • Maintain the functioning of priority aquatic ecosystems as these are critical in maintaining water resource quantity and quality. • River FEPAs achieve biodiversity targets for river ecosystems and threatened/near-threatened fish species, and were identified in rivers that are currently in a good condition (A or B ecological category). 	FEPAs have been determined on the basis of conservation targets for freshwater ecosystems at national level.	

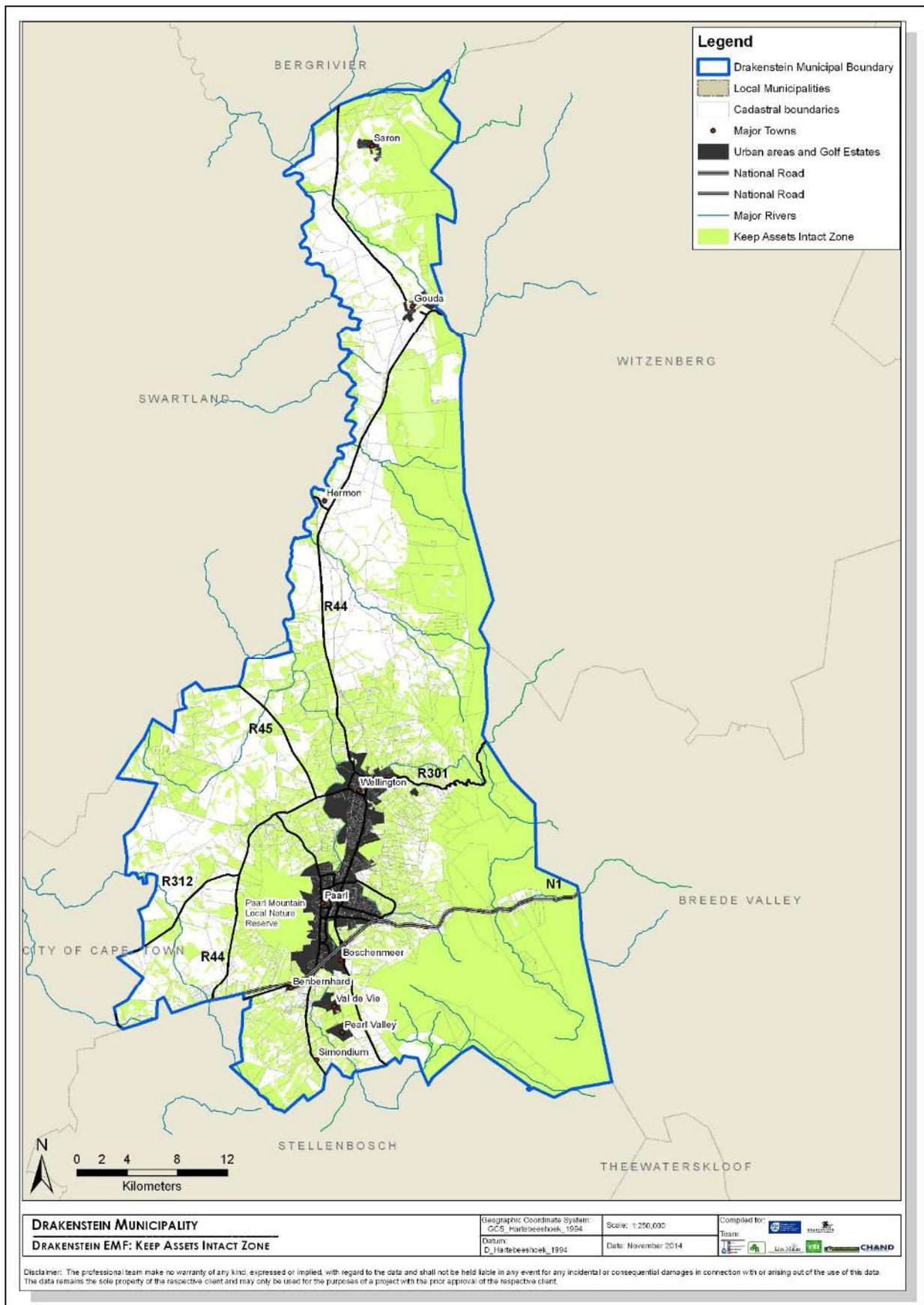
EMZ 1 – KEEP ASSETS INTACT			
ATTRIBUTE		RATIONALE	COMMENTS / NOTES
RESOURCE CRITERIA			
AGRICULTURAL RESOURCES	Irrigated agricultural land	<ul style="list-style-type: none"> Agricultural land that has water rights attached to it is regarded as the most valuable by the Department of Agriculture. Once such land has been transformed, the Water Rights are lost to agricultural production. 	Irrigated land (agricultural land with associated water rights) is regarded as a priority asset by the Department of Agriculture
HERITAGE RESOURCES	National (Grade 1) heritage sites	<ul style="list-style-type: none"> These resources are of national significance. 	Heritage resources have been graded according to their relative importance at national, provincial or local levels

The attributes set out in Table 10 are shown spatially on Map 17. This map therefore shows the combination of attributes considered to be the most environmentally sensitive. The full spatial extent of EMZ 1 is shown in Map 18. Maps showing the individual attributes are provided in Part 1: Current Situation of this EMF and are available as individual layers in the GIS database.

As the EMZ 1 combines the environmental attributes of most or highest sensitivity, it contains a number of layers and is therefore busy in appearance. The maps that appear in this EMF should therefore only be used for basic information purposes (e.g. the site falls within EMZ 1 or not). Applicants and EAPs are advised to consult the GIS database that forms part of this EMF to ensure that all of the relevant environmental attributes are identified for the project location and that the most accurate and up-to-date information is being consulted. The GIS database has a query tool to assist this process. Specialist studies would always be required for “groundtruthing” purposes in respect of each EMZ 1 attribute that is indicated as being present on the site. Such groundtruthing would also be valuable in determining the extent of the impact assessment required.



Map 17: EMZ 1 – Keep Assets Intact (Attributes)



MAP 18: EMZ 1 – Keep Assets Intact (Total Spatial Extent)

8.3.1 Development and EMZ 1 – Keep Assets Intact

The matrix (Table 11) showing the relationship between EMZ 1 – Keep Assets Intact and development comprises the following:

- ◆ *Activities that would generally be deemed to be unacceptable or undesirable:* These activities would typically be incompatible with the receiving environment and would thus be contrary to sustainability principles (i.e. activities that should preferably be avoided). The reason that such activities are likely to be considered unacceptable or undesirable is related to the irreplaceability and/or vulnerability of resources and their societal value (e.g. ecosystem services / benefits to humankind).
- ◆ *Activities that could be considered for public interest reasons but are likely to have significant negative impacts:* These activities would have significant negative impacts by virtue of the sensitivity and value of the receiving environment. It is recognised that there may be exceptional circumstances where no location alternatives are feasible for the development to meet crucial public needs (e.g. infrastructure to address basic needs). Exceptions would need to be demonstrated beyond reasonable doubt, and would only be considered for projects of overriding public importance. Proposed projects involving these activities would need a rigorous EIA process with specialist studies in all fields of likely impact. Where residual negative impacts of a proposed activity would be significant **despite proposed mitigation**, the project would be contrary to sustainable development objectives and trade-off rules. Only in cases where there are no feasible alternatives, where the activities would deliver substantial societal benefits and would be undertaken in the overriding public interest, could the proposed project be considered. Exceptions to the ‘avoid rule’ would need to be clearly demonstrated as would the basis for stating that no alternatives are available, and would need to be supported by rigorous scientific analysis. Through applying this approach, the EMF distinguishes between proposed development principally for private benefit where there is a risk of significant negative and/ or irreversible impacts and loss of irreplaceable natural resources (i.e. assets held in the public trust), and proposed development of crucial public infrastructure where no other alternatives exist. This is in line with the Environmental Right in the Constitution which calls for ecologically sustainable development whilst ensuring justifiable socio-economic development.
- ◆ *Activities that are considered unlikely to have a significant negative impact:* These activities would typically be compatible with the objectives of the EMZ and would not pose a risk of exceeding the LoAC (Limits of Acceptable Change). These types of development / activities **that could readily be considered** as they are unlikely to have a significant negative environmental impacts.

Guidance in respect of environmental applications and waste licence applications:

Environmental attributes that make up EMZ 1 – Keep Assets Intact are those that are regarded as being environmentally sensitive and of high value in supporting social and economic systems, as has been noted elsewhere in this EMF. The loss or degradation of these resources ought to be avoided. Effectively this means that most

development types involving a material or substantial transformation of land are likely to be undesirable. All attributes and areas in EMZ 1 are identified as ‘sensitive’ and are regarded as the most sensitive in the geographical area with which the EMF is concerned. This has relevance to Listing Notices or Listed Activities where reference is made to environmentally sensitive areas, zones, features or attributes (e.g. Listing Notice 3 of the 2014 NEMA EIA Regulations, GNR 985 of 4 December 2014). EMZ 1 offers opportunities for activities that “tread lightly” in terms of resource consumption and development footprint or that involve environmental restoration / rehabilitation.

The matrix provided in Table 11 ought to be applied as a **screening mechanism** and should not be interpreted as being definitive. It provides an indication of the types of development / activities within EMZ 1 which are considered appropriate / inappropriate. The risk of not obtaining environmental authorisation (i.e. authorisation is refused) would be highest for those development types regarded as being inappropriate. Clearly, each project must be evaluated on its merits and on the extent to which it is responsive to environmental factors.

One of the objectives of the EMF is to provide guidance for the NEMA EIA Regulations. The 2014 NEMA EIA Regulations (GNR 982 of 4 December 2014) allow for the competent authority to provide advice or instruction on the “nature and extent of any of the processes that may or must be followed or decision support tools that must be used in order to comply with the Act and these Regulations.”⁵¹ In terms of NEMA section 24O(b)(v) and Regulation 5(2) of the EMF Regulations (GNR 547 of 18 June 2010) the competent authority must take an EMF that has been adopted⁵² into account in the consideration of environmental applications. It therefore follows that in providing advice or instruction to an applicant / proponent in the context of regulation 8 of the 2014 NEMA EIA Regulations, it would be advisable for the competent authority to take guidance from the EMF. The following guidance is applicable to EMZ 1:

1. *Regulation 8(a)*: With regard to regulation 8(a) applicants / proponents ought to be advised or instructed to fulfil at least the following:
 - Cognisance must be taken of the EMF in any environmental application within the Drakenstein Municipal area (Refer to Map 1 for EMF boundary). This includes spatial information on environmental attributes as well as management objectives, desired outcomes and limits of acceptable change applicable to each attribute. Applicants/proponents should demonstrate the extent to which the proposed activity meets the applicable management objectives and desired outcomes. Guidance on mitigation measures and opportunities for benefit should also be considered (refer to Section 8.3.2).
 - Each environmental attribute that is present on the project site must be subject to a specialist study. In addition, consideration must be given to

⁵¹ Regulation 8(a).

⁵² An EMF may be adopted by the MEC in concurrence with the Minister. Where an EMF has been adopted it must be considered. The Regulations also allow for EMFs to be taken into account even if not adopted by the MEC in concurrence with the Minister (Regulation 5(3)). The terminology used in regulation 5(3) is “may be taken into account in the consideration of environmental applications” whereas that used in regulation 5(2), which deals with adoption of EMFs is “must be taken into account in the consideration of environmental applications” (emphasis added).

inter-relationships between attributes, especially where an impact on one attribute could have 'knock-on' effects on other attributes. Specialists therefore need to work in consultation with one another.

- Authorities and/or agencies with responsibility with respect to issues / concerns relevant to the application must be consulted – and not just those authorities that have jurisdiction (i.e. decision-making power) in respect of any aspect of the application.
 - Where specialist input indicates that an attribute shown in the EMF is actually not present on the site or its immediate surroundings, verification of this information must be provided. This must include consultation with the relevant authority or agency. An independent peer review could also be requested. Where there is any uncertainty about the matter, such as conflicting information, an independent review should always be required.
 - Applications for exemption under the Exemption Regulations (GNR 994 of 8 December 2014) should be strongly discouraged.
2. *Regulation 8(b)*: With respect to EMZ 1, the EMF provides guidance on activities that would be regarded as appropriate / inappropriate where highly sensitive and valuable environmental attributes occur. This information would be an important consideration in determining the likely success of an application and should be used by the competent authority in the context of regulation 8(b).

Regulation 15 specifies that the EAP must identify if an application is subject to a Basic Assessment (BA) or Scoping and Environmental Impact Report (S&EIR). The EAP must make this identification by referring to the Listing Notices. When determining the requirements for the BA or S&EIR process, the EAP must have regard to any applicable guidelines and any advice given by the competent authority in terms of regulation 8. Moreover, to meet the requirements of the 2014 NEMA EIA Regulations, whether BA or S&EIR, the EAP must take account of the EMF:

1. *Basic Assessment*: According to regulation 19, a BA must contain the information listed in Appendix 1. The applicable legal and policy context, guidelines, spatial tools, municipal planning frameworks and instruments must be described (Appendix 1 – 3(1)(e)(i)). An explanation as to how the application complies with and responds to the EMF must be given (Appendix 1 – 3(1)(e)(ii)).
2. *Scoping & EIR*: The policy and legal context, guidelines, spatial tools, municipal planning frameworks and instruments to be considered in the assessment must be described (Appendix 2(e)) in the Scoping Report. Although the EIR content only makes reference to the inclusion of the legal and policy context (Appendix 3 – 3(e)), it would be necessary to address any guidelines, spatial tools, municipal planning frameworks and instruments identified in the Scoping Report and/or Plan of Study. Any deviation from the Scoping Report, including the Plan of Study, must be indicated and motivated (Appendix 3 – 3(u)). It is improbable that a deviation involving the absence of consideration of the EMF would be accepted by the competent authority.

TABLE 11: Development / activities matrix for Zone 1 – Keep Assets Intact

Activities that should be avoided (i.e. that should typically not be considered) in this zone	Activities that could only be considered due to overriding public interest but which are nonetheless likely to have a significant negative impact in this zone	Activities that are unlikely to have a significant negative impacts in, and could be considered for, this zone
<ul style="list-style-type: none"> • Mining projects – including prospecting / exploration • Industrial / manufacturing projects • Exploration, extraction or processing of oil or gas • Bulk storage / stockpiling of minerals, ore or coal • Storage / handling facilities for dangerous goods / substances • Facilities / infrastructure for bulk transport of dangerous goods • Intensive agriculture • Facilities for the concentration of livestock or for intensive / commercial livestock production • Aquaculture / mariculture facilities • Forestry / afforestation • Agri-industrial facilities. • Dams (instream & offstream) and water transfer schemes • Solid waste disposal sites • Recycling facilities • Waste transfer stations / waste storage and handling facilities • Liquid waste storage facilities / waste lagoons • Waste treatment facilities • Sewage, wastewater or effluent treatment works • Power generation (fossil fuels or nuclear) • Power generation projects (renewable) • Electricity distribution infrastructure • Bulk water, sewage or stormwater infrastructure • Cemeteries • Abattoirs • Extensive or large-scale recreational and tourism facilities • Residential projects • Commercial or retail facilities • Airports and/or landing strips • Linear infrastructure, including roads and railways. • Bulk water supply infrastructure. • Bulk stormwater outlets, canals or channels. • Outdoor advertising (billboards) • Infilling, excavation or deposition of material. • Jetties, slipways, marinas (on inland waters) 	<ul style="list-style-type: none"> • Generation of renewable energy for public supply purposes, but only if no other option is available based on scientific reasons, not economic reasons. • Linear public infrastructure but only to be considered where essential for meeting basic needs, where no other option exists. This includes bulk public water supply infrastructure, sewage infrastructure and Stormwater infrastructure where flood risks are present. • Bulk stormwater outlets, canals or channels required to manage flood risk in low cost and informal settlements. <p>The above activities are only permissible in exceptional cases involving the development of crucial public infrastructure where the need for the project and absence of feasible spatial alternatives could be demonstrated beyond reasonable doubt.</p>	<ul style="list-style-type: none"> • Non-consumptive nature and/or heritage tourism or recreational facilities, and associated infrastructure • Extensive game farming (provided that the carrying capacity of the affected habitat is not exceeded) • Sustainable harvesting of natural products • Management (e.g. controlled burns, alien organism removal) for conservation purposes • Education • Research • Linear public infrastructure where suspended above ground (i.e. development footprint is extremely limited). • Linear infrastructure that would be located underground (by virtue of the fact that the disturbance would be short-term and the disturbance footprint would be limited) may be considered, where there is certainty (based on scientific research) that search and rescue of important species, and restoration of the disturbed area, would be successful. • Extraction of groundwater but only to be considered if outside of buffer areas for rivers and wetlands.

8.3.2 Management Framework for EMZ 1 – Keep Assets Intact

Given the resources that are incorporated into this EMZ, the following Strategic or management objective has been determined:

Strategic (management) objective applicable to Zone 1 – Keep Assets Intact
No negative change to irreplaceable resources – positive change such as restoration encouraged

EMZ 1 contains the following attributes:

- ◆ Irreplaceable biodiversity resources (Table 12(a));
- ◆ Irreplaceable agricultural resources (Table 12(b)); and
- ◆ Irreplaceable heritage resources (Tables 12(c)).

The management framework comprises the following for each attribute:

- ◆ The management objective.
- ◆ Desired outcome (basis against which objective can be measured to establish progress, even success, in respect of the objective).
- ◆ Limit of Acceptable Change (limit beyond which irreversible change to an attribute is likely to occur and thus compromise the functioning of this attribute and thus the ability to sustain the services / benefits that are important to human wellbeing).
- ◆ Opportunity for benefit (factors for consideration that could result in benefits to society and to the environment; includes opportunities that could contribute to social priorities such as poverty alleviation and job creation).
- ◆ Mitigation / management approach.

TABLE 12(a): Management Framework for EMZ 1 – Keep Assets Intact (Natural Resources)

<i>Irreplaceable biodiversity resources (terrestrial and aquatic)</i>						
ATTRIBUTE	MANAGEMENT OBJECTIVES	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	MITIGATION / MANAGEMENT APPROACH	
Critical Biodiversity Areas (CBAs) ⁵³ – known or likely	<ul style="list-style-type: none"> To keep CBAs intact. 	<ul style="list-style-type: none"> The current extent of the CBAs is maintained, meaning that there has been no reduction in the area designated as CBA. There is no degradation in the quality of CBAs. CBAs that are being restored where necessary. 	Current coverage (ha) of the landscape that is designated as CBA.	<p><i>Restoration of degraded habitat will improve the conservation estate and ecosystem service.</i></p> <p><i>Promotion of community based natural resource projects</i></p>	<p><i>Avoid. If unavoidable because of overriding reasons of public interest and the lack of alternative locations/ sites, then find alternative substitute areas as offsets to ensure conservation targets will still be met.</i></p> <p><i>A biodiversity offset would be considered in exceptional circumstances (overriding public importance and no feasible alternatives) <u>only</u> where there are other options in the landscape to meet targets.</i></p>	
Listed Endangered ecosystems ⁵⁴	Critically (CR) ecosystems	<ul style="list-style-type: none"> To keep CR ecosystems intact. 	<ul style="list-style-type: none"> The localities and extent of Critically Endangered (CR) ecosystems is maintained. The conservation status of CR ecosystems is maintained or improved. 	<p>Current coverage (ha) of the landscape that is designated as Critically Endangered ecosystems.</p> <p>Existing conservation status of Critically Endangered ecosystems</p>	<p><i>Restoration of degraded habitat will improve the conservation estate and ecosystem service.</i></p> <p><i>Promotion of community based natural resource projects</i></p>	<p><i>Avoid. If unavoidable because of overriding reasons of public interest and the lack of alternative locations/ sites, then find alternative substitute areas as offsets to ensure conservation targets will still be met.</i></p> <p><i>A biodiversity offset would be considered in exceptional circumstances (overriding public importance and no feasible alternatives) <u>only</u> where there are other options in the landscape to meet targets.</i></p>

⁵³ The CBAs have been determined from biodiversity information combined with data from the specialist wetland study (Refer to Section 2.1.4). These are known or likely CBAs as a systematic conservation / biodiversity plan has not been prepared for Drakenstein as yet.

⁵⁴ Listed in terms of the National Environmental Management Biodiversity Act (GNR 1002 of 9 December 2011).

TABLE 12(a): Management Framework for EMZ 1 – Keep Assets Intact (Natural Resources) - continued

ATTRIBUTE	MANAGEMENT OBJECTIVES	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	MITIGATION / MANAGEMENT APPROACH
Special habitats (quartz patches, special forest habitat)	<ul style="list-style-type: none"> To ensure that no fragmentation or loss of these habitats occurs. 	The localities and extent of special habitats are intact	Current extent of these special habitats,.	<i>Restoration of degraded habitats thereby improving the conservation status of threatened species.</i>	<p><i>Avoid and strive to restore degraded systems. If unavoidable because of overriding reasons of public interest and the lack of alternative locations/ sites, then find alternative substitute areas as offsets to ensure conservation targets will still be met.</i></p> <p><i>These areas constitute potential 'offset receiving areas'</i></p>
Known localities of Red List / Red Data Book ⁵⁵ , Critically Endangered (CR), Endangered (E) or local endemic plant species	<ul style="list-style-type: none"> To ensure the conservation status of species does not change to a more threatened category than the current designation 	<ul style="list-style-type: none"> The conservation status of CR and E species is at least the same but preferably improved. The localities and extent of CR, E and endemic plant or animal species are intact 	Existing conservation status of CR and E species	<i>Restoration of degraded habitats thereby improving the conservation status of threatened species</i>	<p><i>Avoid and strive to restore degraded systems. If unavoidable because of overriding reasons of public interest and the lack of alternative locations/ sites, then find alternative substitute areas as offsets to ensure conservation targets will still be met.</i></p> <p><i>These areas constitute potential 'offset receiving areas'</i></p>
Protected areas (public and private)	<ul style="list-style-type: none"> To ensure protected natural areas are safeguarded in perpetuity. To make sure that activities on adjacent properties do not pose any threat of degradation. To maintain the scenic value associated with protected areas. To prevent loss or degradation of areas that provide a wilderness experience. 	<ul style="list-style-type: none"> Protected natural areas are safeguarded in perpetuity and there is no threat of de-proclamation. There is no evidence of biodiversity degradation due to adjacent activities. The quality of areas that offer a wilderness experience within protected areas is retained. 	Existing mapped extent of Protected Areas (PAs), PA expansion areas.	<p><i>Promotion of community-based projects to manage natural resource.</i></p> <p><i>Promotion of community-based nature/conservation orientated tourism projects and nature based tourism which has associated opportunities for small business development</i></p>	<p><i>Avoid transforming these areas and / or restrict any development to already transformed or irreparably degraded sites.</i></p>

⁵⁵ Note that SANBI must be consulted to obtain information on Red Data species. This applies to any project site on vacant / undisturbed / undeveloped land that falls outside of areas identified as being sensitive from a biodiversity perspective. The reason is that such species are not necessarily confined to areas that have been identified as being of biodiversity significance.

TABLE 12(a): Management Framework for EMZ 1 – Keep Assets Intact (Natural Resources) - continued

ATTRIBUTE	MANAGEMENT OBJECTIVES	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	MITIGATION / MANAGEMENT APPROACH
Freshwater ecosystem priority areas (FEPAs) – rivers, wetland clusters and wetlands	<ul style="list-style-type: none"> • To avoid the loss or degradation of FEPAs. • To maintain resilience in wetland and riverine ecosystems. • To ensure the resilience of river and wetland ecosystems is maintained so as to sustain delivery of ecosystem services. 	<ul style="list-style-type: none"> • FEPAs are intact. • Buffer zones around FEPAs are maintained. • Flow regimes in rivers make provision for ecological requirements in terms of volume and flooding patterns. 	<p>Existing FEPAs.</p> <p>Proposed buffer zones for different FEPAs.</p> <p>Published / available ecological reserve for rivers</p>	<p><i>Restoration of degraded habitat will improve its condition, increase associated biodiversity and ecosystem services. Improve habitat protection and ongoing management.</i></p> <p><i>Promotion of community based natural resource and conservation economy projects that give effect to green economy goals, as well as supporting self-sufficiency and sustainable livelihoods,</i></p>	<p><i>Avoid development in these areas and strive to reinstate/ restore natural systems. If development is unavoidable because of overriding reasons of public interest and the lack of alternative locations / sites, then stringent conditions should be required to avoid ecological degradation. Where unavoidable, find substitute areas as offsets to ensure meeting of conservation targets.</i></p> <p><i>These areas constitute potential 'offset receiving areas'</i></p>
Important wetlands and wetland buffers – 30m setback from edge of all wetlands ⁵⁶	<ul style="list-style-type: none"> • To protect and build resilience in wetland ecosystems in order to sustain delivery of ecosystem services 	<ul style="list-style-type: none"> • No loss, transformation, reclamation or degradation of wetlands and associated buffer. • Wetland restoration is being undertaken. 	Existing mapped natural wetlands	<p><i>Improvement of ecosystem services possible through restoring degraded or reclaimed wetlands and removing alien invasive organisms.</i></p> <p><i>Promotion of community based natural resource and conservation economy projects that give effect to green economy goals, as well as supporting self-sufficiency and sustainable livelihoods,</i></p>	<p><i>Avoid transforming these areas and / or restrict any development to areas outside of the proposed buffer zone. Strive to reinstate/ restore natural systems.</i></p> <p><i>Avoid discharge of effluent, wastewater or stormwater from developed areas into these systems. Discharge could be considered provided that water quality and volume acceptable for ecological, or human use purposes will not be compromised.</i></p> <p><i>Avoid abstraction from these systems.</i></p>

⁵⁶ This information was derived from the specialist wetland study undertaken as part of the EMF.

TABLE 12(a): Management Framework for EMZ 1 – Keep Assets Intact (Natural Resources) - continued

ATTRIBUTE	MANAGEMENT OBJECTIVES	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	MITIGATION / MANAGEMENT APPROACH
<p>River corridors and associated riparian vegetation, riparian buffers and associated supporting wetlands (setback line from river bank or centre of river channel, minimum 30m, maximum 115m, depending on particular system) or as determined by a setback line</p>	<ul style="list-style-type: none"> To conserve and restore river corridors and supporting riparian and wetland areas, to build resilience of these systems and sustain delivery of ecosystem services 	<ul style="list-style-type: none"> No loss or degradation of riparian areas, river banks or supporting wetlands. Restoration of riverine areas is being undertaken on a systematic basis. 	<p>Mapped river corridors and buffer zones</p> <p>Published ecological reserve for rivers</p>	<p><i>Improvement of ecosystem services possible through restoring riparian areas and river corridors, removing alien invasive organisms.</i></p> <p><i>Promotion of community based natural resource and conservation economy projects that give effect to green economy goals, as well as supporting self-sufficiency and sustainable livelihoods,</i></p>	<p><i>Avoid transforming these areas and / or restrict any development to areas outside of the proposed buffer zone. Strive to reinstate/ restore natural systems.</i></p> <p><i>Avoid discharge of effluent, wastewater into these systems. Discharge could be considered provided that water quality and volume acceptable for ecological, or human use purposes will not be compromised.</i></p> <p><i>Ensure that any abstraction of water is such that the ecological reserve is not compromised.</i></p>
<p>Mountain catchment areas</p>	<ul style="list-style-type: none"> To protect and restore areas that are known to be critical for reliable delivery of freshwater 	<ul style="list-style-type: none"> No loss or degradation of indigenous vegetation cover and/ or loss or deterioration of riparian areas, watercourses or wetlands. 	<p>Existing extent of mountain catchment areas.</p>	<p><i>Improve ecosystem services possible through restoring degraded terrestrial or freshwater habitats, removing alien invasive organisms;</i></p> <p><i>Promotion of community based natural resource and conservation economy projects that give effect to green economy goals, as well as supporting self-sufficiency and sustainable livelihoods.</i></p>	<p><i>Avoid transforming these areas and / or restrict any development to already transformed or irreparably degraded sites. Strive to reinstate/ restore natural systems. If development is unavoidable because of overriding reasons of public interest and the lack of alternative locations / sites, then find substitute areas as offsets to ensure no net loss of ecosystem services (particularly water yield).</i></p>

TABLE 12(b): Management Framework for EMZ 1 – Keep Assets intact (Agricultural Resources)

<i>Irreplaceable productive agricultural land</i>					
ATTRIBUTE	MANAGEMENT OBJECTIVES	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	MITIGATION / MANAGEMENT APPROACH
Irrigated agricultural areas	<ul style="list-style-type: none"> To retain land with productive soils and water rights for agricultural purposes. 	<ul style="list-style-type: none"> No transformation of existing irrigated lands. 	Existing extent of irrigated agricultural land	<i>Improve ecosystem services through best practice management following guidelines for environmentally friendly production (e.g. LandCare or BBI)</i>	<i>Avoid transforming these areas. Prevent loss of water rights associated with irrigated agricultural land.</i>

TABLE 12(c): Management Framework for EMZ 1 – Keep Assets intact (Heritage Resources)

<i>Irreplaceable heritage⁵⁷ resources</i>					
ATTRIBUTE	MANAGEMENT OBJECTIVES	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	MITIGATION / MANAGEMENT APPROACH
Grade 1 heritage sites / resources	<ul style="list-style-type: none"> Grade 1 heritage assets are protected in perpetuity 	<ul style="list-style-type: none"> No loss or degradation of Grade 1 heritage sites / resources caused by inappropriate development or land use. Public / visitor access to Grade 1 heritage sites / resources is not compromised. 	Existing Grade 1 heritage sites / resources – number and condition of these sites.	<i>Restore sites and landscapes</i>	<i>Avoid development that negatively affects these sites or that could change their character, sense of place or sense of history.</i>

⁵⁷ Comprising cultural, archaeological or palaeontological resources

8.4 EMZ 2 – Develop with Care: Valued Resources

This zone is made up of attributes that encompass important resources but which are not as significant and/or as threatened, vulnerable or at risk as those in EMZ 1 – Keep Assets Intact.

TABLE 13: Attributes that inform EMZ 2 – Develop with Care: Valued Resources

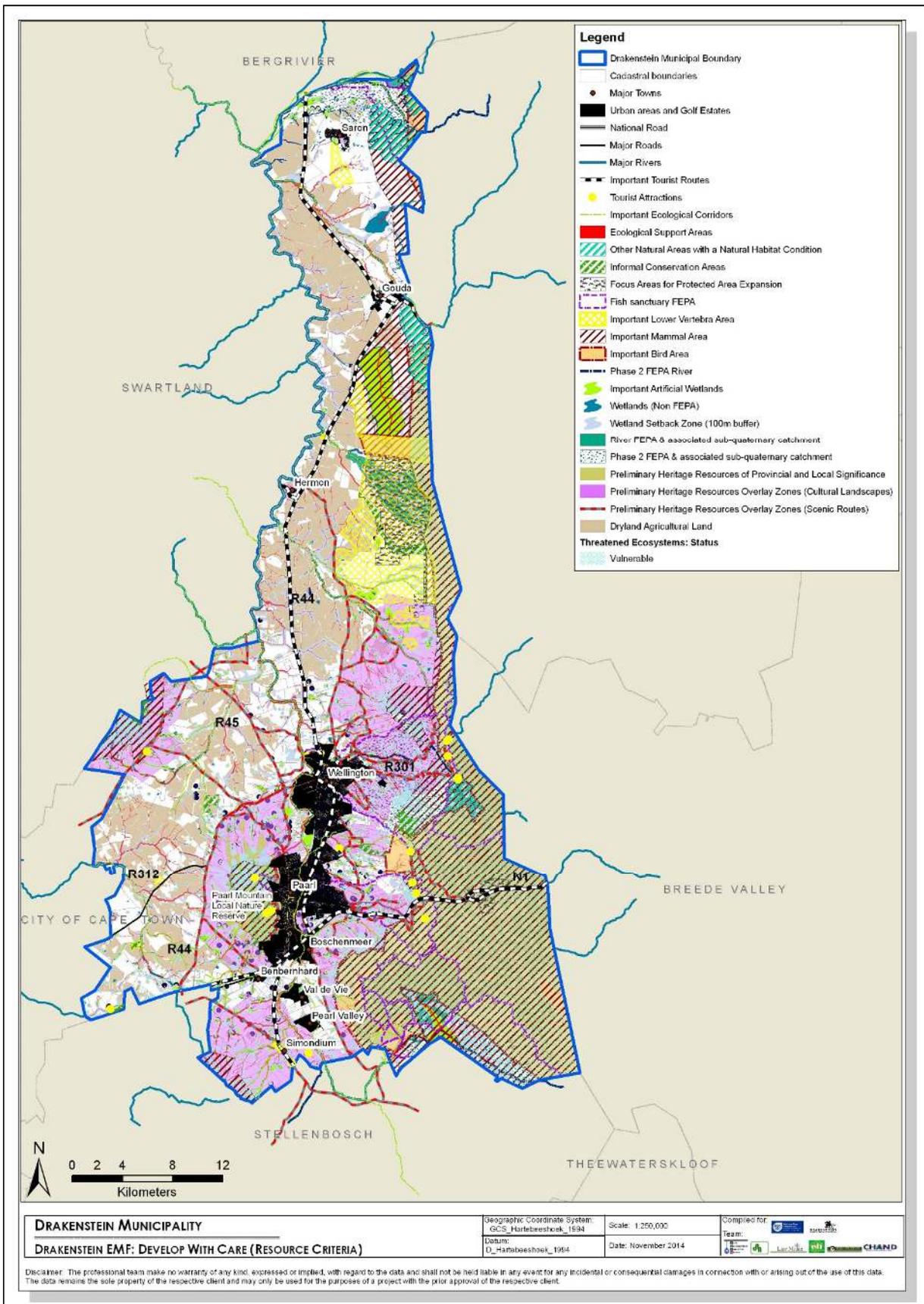
EMZ 2 – DEVELOP WITH CARE: VALUED RESOURCES			
ATTRIBUTE	PURPOSE	COMMENTS / NOTES	
RESOURCE CRITERIA			
BIODIVERSITY RESOURCES	FEPA sub-quaternary catchment and FEPA fish sanctuary	<ul style="list-style-type: none"> Important areas for maintaining runoff and discharge into rivers. Fish sanctuaries are sub-quaternary catchments that are essential for protecting indigenous threatened and near-threatened freshwater fish populations 	These are the sub-catchments associated with FEPA Rivers.
	Phase 2 FEPA Rivers	<ul style="list-style-type: none"> These are moderately modified (C) rivers and thus should not be degraded further. 	These rivers are likely to be the focus of future conservation action.
	Non-FEPA wetlands	<ul style="list-style-type: none"> Wetlands are important ecosystems for regulating water flow and quality. 	These wetlands are not of the same priority as FEPAs.
	Other ecological support areas	<ul style="list-style-type: none"> Areas that are important (but not critical) for maintaining ecological processes within CBAs. 	
	Listed Vulnerable ecosystems	<ul style="list-style-type: none"> Ecosystems that contain important biodiversity that is considered to be threatened, although not at imminent risk of extinction. 	Listed in terms of NEMBA as Threatened Terrestrial Ecosystems
	Threatened plant and animal species / of conservation concern ⁵⁸	<ul style="list-style-type: none"> Known sites / habitats of threatened or conservation-worthy species, the loss of which may be irreplaceable. 	
	Habitat for important mammals, lower vertebrates, birds and fish species	<ul style="list-style-type: none"> Sites of threatened or conservation-worthy species, the loss of which may be irreplaceable 	
	Ecological corridors	<ul style="list-style-type: none"> Important for enabling landscape links and persistence of biodiversity 	
	Informal conservation areas	<ul style="list-style-type: none"> Areas currently being managed for biodiversity conservation but with no secure long-term conservation status 	
	Focus areas for protected area expansion	<ul style="list-style-type: none"> Priority areas for achieving national targets for biodiversity conservation and for securing within the country's protected area network 	Identified in the National Protected Area Expansion Strategy
Land within 100m of wetlands (wetland buffer)	<ul style="list-style-type: none"> Important to buffer wetland habitat and support their hydrological function 		
AGRICULTURAL RESOURCES	Dryland agriculture	<ul style="list-style-type: none"> These areas are important for crop growing and food security 	

⁵⁸ Threatened species locations would generally be incorporated into CBAs. There may, however, be locations that fall outside of a CBA. Point data in this regard is not readily available. Should such species be found on a site, additional detail can be obtained from redlist.sanbi.org.

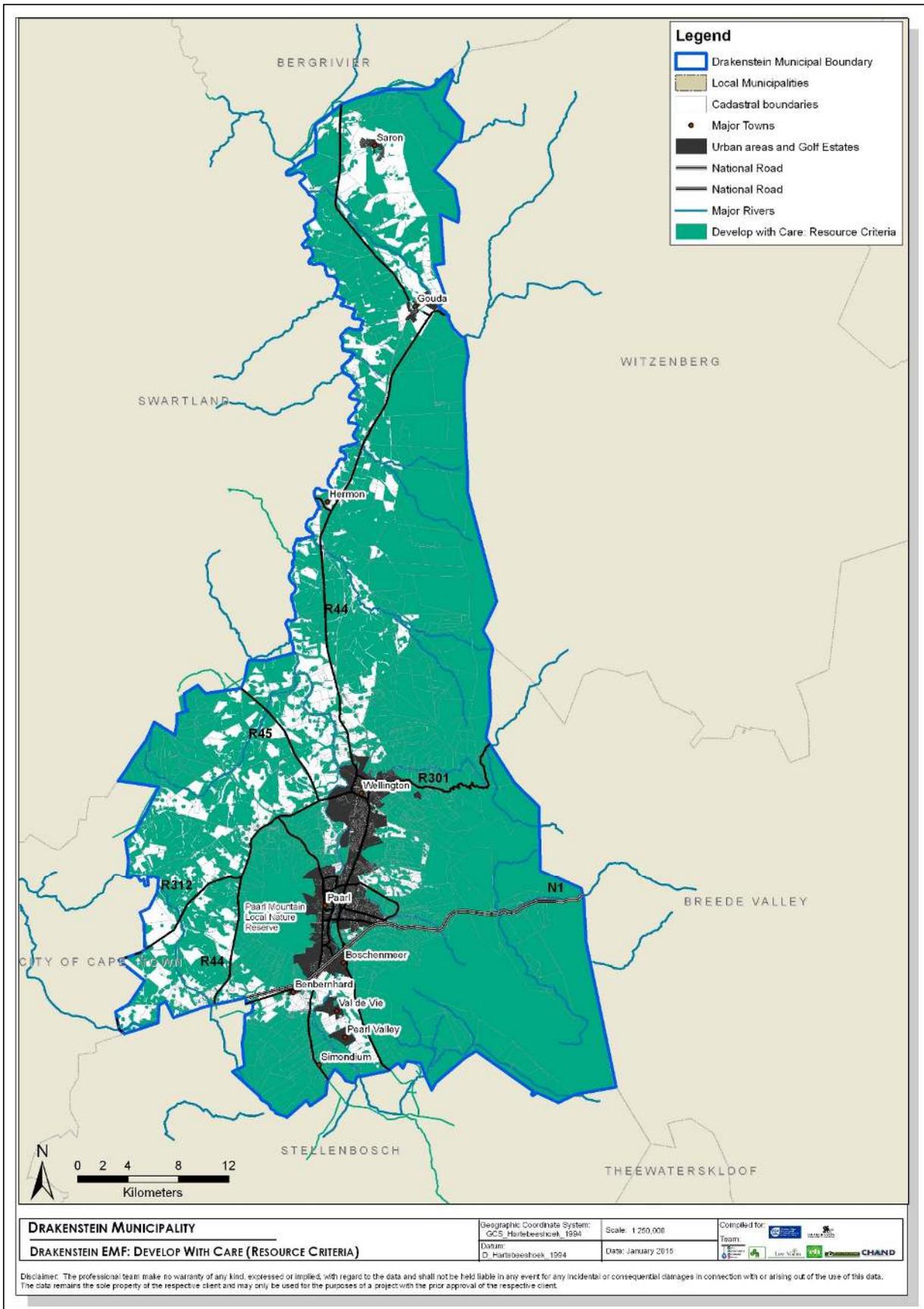
EMZ 2 – DEVELOP WITH CARE: VALUED RESOURCES		
ATTRIBUTE	PURPOSE	COMMENTS / NOTES
RESOURCE CRITERIA		
HERITAGE RESOURCES	Known landscapes (including identified Grade I cultural landscapes), Grade II buildings and sites, and known scenic routes	<ul style="list-style-type: none"> • Areas where there are known cultural landscapes of value. • Heritage sites or artefacts not of national importance.
PUBLIC / TOURISM RESOURCES	Public Open Space	<ul style="list-style-type: none"> • These are important resources for communities for recreational and sporting activities. They also provide green spaces in urban areas.
	Tourist attractions	<ul style="list-style-type: none"> • Tourism is an important economic activity. Ensuring the quality of tourist attractions is therefore important.
	Scenic routes	<ul style="list-style-type: none"> • Scenic routes form part of the tourist / visitor experience. They are also important for the 'sense of place' for local residents / communities.

Map 19 shows the attributes that make up EMZ 2 and Map 20 reflects its total spatial extent. Maps showing the individual attributes are provided in Part 1: Current Situation of this EMF and are available as individual layers in the GIS database.

As the EMZ 2 combines the environmental attributes of most or highest sensitivity, it contains a number of layers and is therefore busy in appearance. The maps that appear in this EMF should therefore only be used for basic information purposes (e.g. the site falls within EMZ 2 or not). Applicants and EAPs are advised to consult the GIS database that forms part of this EMF to ensure that all of the relevant environmental attributes are identified for the project location and that the most accurate and up-to-date information is being consulted. The GIS database has a query tool to assist this process. Specialist studies would always be required for “groundtruthing” purposes in respect of each EMZ 2 attribute that is indicated as being present on the site. Such groundtruthing would also be valuable in determining the extent of the impact assessment required.



MAP 19: EMZ Zone 2 – Develop with Care: Valued Resources (Attributes)



MAP 20: Zone 2 – Develop with Care: Valued Resources (Total Spatial Extent)

8.4.1 Development and EMZ 2 – Develop with Care: Valued Resources

A matrix describing the development types that would be considered appropriate or inappropriate in Zone 2 – Be Careful (Resources) is provided in Table 14:

- ◆ *Activities that would generally be deemed to be unacceptable in that zone:* These activities would typically be incompatible with the receiving environment and would be contrary to sustainable development and the management objectives.
- ◆ *Activities that could be considered for public interest reasons but are likely to have significant negative impacts* by virtue of the sensitivity and value of the receiving environment. Where residual negative impacts of a proposed activity would be significant **despite proposed mitigation**, the project would be contrary to sustainable development objectives and trade-off rules. This implies that a more suitable location should be sought or that the project should be subject to substantial planning and design revision to better respond to the environment in which it is to be situated.
- ◆ *Activities that are considered unlikely to have a significant negative impact:* These activities would typically be compatible with the objectives of the EMZ and would not pose a risk of exceeding the LoAC.

Guidance in respect of environmental applications and waste licence applications:

Environmental attributes that make up EMZ 2 – Develop with Care: Valued Resources are important in supporting social and economic systems, as is the case with those attributes that make up EMZ 1. In the case of EMZ 2, however, these resources are not as sensitive as is the case with EMZ 1. This means that changes or impacts resulting from development need to be mitigated to the extent that these resources can be maintained at least in their current condition (as a minimum) in the long-term.

All attributes and areas in EMZ 2 are regarded as valued resources and as such are defined as ‘sensitive’ in this EMF. This has relevance to Listing Notices or Listed Activities where reference is made to environmentally sensitive areas, zones, features or attributes (e.g. Listing Notice 3 of the 2014 NEMA EIA Regulations, GNR 985 of 4 December 2014). Whilst these attributes are not regarded as having the same level of sensitivity as EMZ 1, development needs to be undertaken with due care towards these resources.

The matrix provided in Table 14 ought to be applied as a **screening mechanism** and should not be interpreted as being definitive. It provides an indication of the types of development / activities within EMZ 2 – Develop with Care: Valued Resources where there is potential for significant adverse environmental impacts. An Where a significance rating system is used, such impacts would typically be rated as “high negative or very high negative”. In these circumstances, mitigation measures to reduce the impact from significant to acceptable would be necessary. Whereas for EMZ 1, negative impacts should be avoided, in the case of EMZ 2, where negative impacts cannot be avoided, measures to minimise adverse impacts,

including compensating or offsetting residual negative impacts, would be acceptable. This is in accordance with the mitigation hierarchy.

If significant impacts cannot be adequately mitigated, this points to a potential ‘show stopper’ and a high likelihood of environmental authorisation being refused. Accordingly, emphasis needs to be placed on thorough investigation of mitigation measures in the impact assessment process and in specialist studies. Mitigation measures must be fully described and their likely effectiveness / success explained. Furthermore, information on the provisions for implementation of mitigation measures (e.g. financial, technical) must also be provided so that the level of certainty / assurance that these measures will be implemented is clear.

Clearly, each project must be evaluated on its merits and on the extent to which it is responsive to environmental factors. Specialist studies would always be required for “groundtruthing” purposes in respect of each EMZ 2 attribute that is indicated as being present on the site. Such groundtruthing would also be valuable in determining the extent of the impact assessment required.

One of the objectives of the EMF is to provide guidance for the NEMA EIA Regulations. The 2014 NEMA EIA Regulations (GNR 982 of 4 December 2014) allow for the competent authority to provide advice or instruction on the “nature and extent of any of the processes that may or must be followed or decision support tools that must be used in order to comply with the Act and these Regulations.”⁵⁹ In terms of NEMA section 24O(b)(v) and Regulation 5(2) of the EMF Regulations (GNR 547 of 18 June 2010) the competent authority must take an EMF that has been adopted⁶⁰ into account in the consideration of environmental applications. It therefore follows that in providing advice or instruction to an applicant / proponent in the context of regulation 8 of the 2014 NEMA EIA Regulations, it would be advisable for the competent authority to take guidance from the EMF. The following guidance is applicable to EMZ 2:

1. *Regulation 8(a)*: With regard to regulation 8(a) applicants / proponents ought to be advised or instructed to fulfil at least the following:
 - Cognisance must be taken of the EMF in any environmental application within the Drakenstein Municipal area (Refer to Map 1 for EMF boundary). This includes spatial information on environmental attributes as well as management objectives, desired outcomes and limits of acceptable change applicable to each attribute. Applicants/proponents should demonstrate the extent to which the proposed activity meets the applicable management objectives and desired outcomes. Guidance on mitigation measures and opportunities for benefit should also be considered (refer to Section 8.4.2).
 - Each environmental attribute that is present on the project site must be subject to a specialist study. In addition, consideration must be given to

⁵⁹ Regulation 8(a).

⁶⁰ An EMF may be adopted by the MEC in concurrence with the Minister. Where an EMF has been adopted it must be considered. The Regulations also allow for EMFs to be taken into account even if not adopted by the MEC in concurrence with the Minister (Regulation 5(3)). The terminology used in regulation 5(3) is “may be taken into account in the consideration of environmental applications” whereas that used in regulation 5(2), which deals with adoption of EMFs is “must be taken into account in the consideration of environmental applications” (emphasis added).

inter-relationships between attributes, especially where an impact on one attribute could have 'knock-on' effects on other attributes. Specialists therefore need to work in consultation with one another.

- Authorities and/or agencies with responsibility with respect to issues / concerns relevant to the application must be consulted – and not just those authorities that have jurisdiction (i.e. decision-making power) in respect of any aspect of the application.
- Where specialist input indicates that an attribute shown in the EMF is actually not present on the site or its immediate surroundings, verification of this information must be provided. This must include consultation with the relevant authority or agency. An independent peer review could also be requested. Where there is any uncertainty about the matter, such as conflicting information, an independent review should always be required.
- Applications for exemption under the Exemption Regulations (GNR of 8 December 2014) should be strongly discouraged.

2. *Regulation 8(b)*: With respect to EMZ 2, the EMF provides guidance on activities that would be regarded as appropriate / inappropriate where highly sensitive and valuable environmental attributes occur. This information would be an important consideration in determining the likely success of an application and should be used by the competent authority in the context of regulation 8(b).

Regulation 15 specifies that the EAP must identify if an application is subject to a Basic Assessment (BA) or Scoping and Environmental Impact Report (S&EIR). The EAP must make this identification by referring to the Listing Notices. When determining the requirements for the BA or S&EIR process, the EAP must have regard to any applicable guidelines and any advice given by the competent authority in terms of regulation 8. Moreover, to meet the requirements of the 2014 NEMA EIA Regulations, whether BA or S&EIR, the EAP must take account of the EMF:

1. *Basic Assessment*: According to regulation 19, a BA must contain the information listed in Appendix 1. The applicable legal and policy context, guidelines, spatial tools, municipal planning frameworks and instruments must be described (Appendix 1 – 3(1)(e)(i)). In addition, the EAP must explain how the application complies with and responds to the EMF (Appendix 1 – 3(1)(e)(ii)).
2. *Scoping & EIR*: The policy and legal context, guidelines, spatial tools, municipal planning frameworks and instruments to be considered in the assessment must be described (Appendix 2(e)) in the Scoping Report. Although the EIR content only makes reference to the need to include the legal and policy context (Appendix 3 – 3(e)), it would be necessary to address any guidelines, spatial tools, municipal planning frameworks and instruments identified in the Scoping Report and/or Plan of Study. Any deviation from the Scoping Report, including the Plan of Study, must be indicated and motivated (Appendix 3 – 3(u)). It is improbable that a deviation involving the absence of consideration of the EMF would be accepted by the competent authority.

TABLE 14: Development / activities matrix for EMZ 2 – Develop with Care: Valued Resources

Activities that should be avoided (i.e. that should not be considered) in this zone	Activities that are likely to have significant negative impact in this zone- (scale dependent)	Activities that could be considered for this zone
<ul style="list-style-type: none"> • Extraction or processing of oil or gas • Power generation projects (fossil fuels or nuclear) • Mining projects 	<ul style="list-style-type: none"> • Industrial / manufacturing projects • Bulk storage / stockpiling of minerals, ore or coal • Storage / handling facilities for dangerous goods / substances • Facilities / infrastructure for bulk transport of dangerous goods • Intensive agriculture • Facilities for the concentration of livestock or for intensive / commercial livestock production • Aquaculture / mariculture facilities • Forestry / afforestation • Agri-industrial facilities. • Dams (instream & offstream) and water transfer schemes • Solid waste disposal sites • Recycling facilities • Waste transfer stations / waste storage and handling facilities • Liquid waste storage facilities / waste lagoons • Waste treatment facilities • Sewage, wastewater or effluent treatment works • Power generation (fossil fuels or nuclear) • Power generation projects (renewable) • Electricity distribution infrastructure • Bulk water, sewage or stormwater infrastructure • Cemeteries • Abattoirs • Extensive or large-scale recreational and tourism facilities • Residential projects • Commercial or retail facilities • Airports and/or landing strips • Linear infrastructure, including roads and railways. • Bulk water supply infrastructure. • Bulk stormwater outlets, canals or channels. • Outdoor advertising (billboards) • Infilling, excavation or deposition of material. • Jetties, slipways, marinas (on inland waters) 	<ul style="list-style-type: none"> • Non-consumptive nature and/or heritage tourism or recreational facilities • Extensive game farming (provided that the carrying capacity of the affected habitat is not exceeded) • Sustainable harvesting of natural products • Management (e.g. controlled burns, alien organism removal) for conservation purposes • Education • Research • Linear public infrastructure where suspended above ground, except for power lines located in bird flight paths or important bird areas. • Linear infrastructure that would be located underground (by virtue of the fact that the disturbance would be short-term and the disturbance footprint would be limited) may be considered, where there is certainty that search and rescue and rehabilitation the disturbed area would be successful. • Groundwater abstraction provided outside of buffer zones of FEPA Phase 2 rivers and non-FEPA wetlands. • Outdoor advertising provided not located where it would disrupt sense of place. • Small scale agri-tourism, agri-commercial or non-polluting agri-industrial facilities on existing transformed land. • Facilities for the concentration of livestock or for intensive / commercial livestock production, if based on organic farming principles and located where agriculture or agri-industry is already in place. • Aquaculture facilities within existing off-stream dams.

8.4.2 Management framework for EMZ 2 – Develop with Care: Valued Resources

Given the important resources that are present in EMZ 2, the following strategic objective has been formulated:

**Strategic (management) objective applicable to Environmental Management Zone 2 –
Develop with Care: Valued Resources**

Avoid change to valued resources that would jeopardise their long-term value and ability to sustain social and economic systems.

This EMZ contains the following attributes:

- ◆ Important biodiversity areas (Table 15(a)).
- ◆ Important productive agricultural land (Table 15(b)).
- ◆ Important heritage resources (Table 15(c)).
- ◆ Important public assets (Table 15(d)).

The management framework comprises the following for each attribute:

- ◆ The management objective.
- ◆ Desired outcome (basis against which objective can be measured to establish progress, even success, in respect of the objective).
- ◆ Limit of Acceptable Change (limit beyond which irreversible change to an attribute is likely to occur and thus compromise the functioning of this attribute and thus the ability to sustain the services / benefits that are important to human wellbeing).
- ◆ Opportunity for benefit (factors for consideration that could result in benefits to society and to the environment; includes opportunities that could contribute to social priorities such as poverty alleviation and job creation).
- ◆ Mitigation / management approach.

TABLE 15(a): Management Framework for EMZ 2 – Develop with Care: Valued Resources (Natural Resources)

<i>Important biodiversity</i>					
ATTRIBUTE	MANAGEMENT OBJECTIVE	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	POTENTIAL MITIGATION
FEPA sub-quaternary catchments and FEPA fish sanctuary	<ul style="list-style-type: none"> To maintain natural flow and run-off patterns To prevent additional freshwater species from becoming threatened and to prevent those fish species that are already threatened from becoming extinct. 	<ul style="list-style-type: none"> Changes in flow patterns and runoff are solely the result of natural factors. Conservation status of freshwater fish species is at least maintained, preferably improved 	<p>Accepted / documented ecological reserve.</p> <p>Current status of freshwater species – non-threatened species remain so and threatened species do not become more threatened or extinct.</p>	<p><i>Restoration, protection and proper ongoing management of degraded habitat could improve the ecological condition of the river, increase biodiversity and improve ecosystem services, and minimize fire hazard.</i></p> <p><i>Promotion of community-based projects to manage natural resources and support the green economy</i></p>	<p><i>Avoid development in these areas through appropriate design and layout. Maintain buffer areas and linkages, and strive to reinstate/ restore natural systems. If unavoidable because of overriding reasons of public interest and the lack of alternative locations / sites, then find substitute areas as offsets to ensure conservation targets will still be met.</i></p> <p><i>Potential ‘offset receiving areas’</i></p> <p><i>Avoid discharge of effluent, wastewater into these systems. If discharge is unavoidable, ensure it is treated to a standard acceptable for the maintenance of ecological functioning / processes.</i></p> <p><i>Ensure that any abstraction of water is such that the ecological reserve is not compromised</i></p>
Phase 2 FEPA Rivers	<ul style="list-style-type: none"> To prevent further degradation of river system 	<ul style="list-style-type: none"> The ecological status of the river is unchanged or improved. Buffer zone is kept intact. 	<p>Existing ecological status of the rivers – FEPA Category C – moderately modified.</p> <p>Buffer zone of recommended width.</p>	<p><i>Restoration, protection and proper ongoing management of degraded habitat could improve the ecological condition of the river, increase biodiversity and improve ecosystem services, and minimize fire hazard.</i></p> <p><i>Promotion of community-based projects to manage natural resources and support the green economy</i></p>	<p><i>Avoid discharge of effluent, wastewater into these systems. If discharge is unavoidable, ensure it is treated to a standard acceptable for the maintenance of ecological functioning / processes.</i></p> <p><i>Ensure that any abstraction of water is such that the ecological reserve is not compromised and that availability to essential uses such as basic needs and agriculture is not compromised.</i></p>

TABLE 15(a): Management Framework for EMZ 2 – Develop with Care: Valued Resources (Natural Resources) – continued

<i>Important biodiversity</i>					
ATTRIBUTE	MANAGEMENT OBJECTIVE	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	POTENTIAL MITIGATION
Non-FEPA wetlands and artificial wetlands known to be important for biodiversity	<ul style="list-style-type: none"> To avoid, or minimize and offset, loss of wetlands 	<ul style="list-style-type: none"> No net loss of wetland habitat in the landscape 	Current overall area of wetlands in landscape	<p><i>Restoration, protection and ongoing management of degraded habitat to improve the ecological condition of wetlands, increase biodiversity and improve ecosystem services, and minimize fire hazard.</i></p> <p><i>Promotion of community-based projects to manage natural resources and support the green economy</i></p>	<i>Avoid development in these areas; if unavoidable, provide offsets to compensate for loss of habitat and function</i>
Vulnerable ecosystems ⁶¹	<ul style="list-style-type: none"> To avoid, or minimize, loss of Vulnerable ecosystems. 	<ul style="list-style-type: none"> There is no net loss of Vulnerable ecosystems. 	Maintain conservation status of Vulnerable ecosystems.	<p><i>Restoration, protection and ongoing management of degraded habitat to improve the ecological condition of wetlands, increase biodiversity and improve ecosystem services, and minimize fire hazard.</i></p> <p><i>Promotion of community-based projects to manage natural resources and support the green economy</i></p>	<i>A biodiversity offset would be required for any impacts on Vulnerable ecosystems</i>
Threatened plant and animal species ⁶²	<ul style="list-style-type: none"> To ensure that the conservation status of rare plants and local endemics is at least maintained (i.e. does not change to a more threatened category), but preferably improved 	<ul style="list-style-type: none"> Conservation status of threatened plants is maintained or improved. No reduction in local populations of threatened species and/ or local endemics 	<p>Existing conservation status of rare plants and local endemics.</p> <p>Existing number of rare plant populations.</p>	<p><i>Improve habitats for threatened or local endemic species through restoring degraded habitats, removing alien invasive organisms, improving habitat protection and minimizing fire hazard.</i></p> <p><i>Promotion of community-based projects to manage natural resources and support the green economy</i></p>	<p><i>Avoid negative impacts through design and layout, especially if critically endangered.</i></p> <p><i>Where avoidance is not feasible, minimization, restoration of disturbed areas, and offsets to protect / increase and manage like habitat for threatened species. Relocation of such species should not be applied as the preferred mitigation measure and is only acceptable if scientifically proven that it will be successful.</i></p>

⁶¹ Listed in terms of the National Environmental Management Biodiversity Act (GNR 1002 of 9 December 2011)

⁶² Listed in terms of the National Environmental Management Biodiversity Act (GNR 1187 of 14 December 2007)

TABLE 15(a): Management Framework for EMZ 2 – Develop with Care: Valued Resources (Natural Resources) – continued

Important biodiversity					
ATTRIBUTE	MANAGEMENT OBJECTIVE	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	POTENTIAL MITIGATION
Ecological corridors	<ul style="list-style-type: none"> To protect corridors in the landscape linking priority freshwater and terrestrial areas within and beyond the Drakenstein municipality To restore degraded areas within ecological corridors 	<ul style="list-style-type: none"> Corridors are intact as is connectivity and functionality of these landscape 	Existing corridors / connectivity at current level of functioning (pattern and process).	<p><i>Improve habitat for biodiversity and ecosystem services through restoring degraded or transformed areas, removing alien invasive organisms, improving habitat protection and ongoing management, and minimizing fire hazard.</i></p> <p><i>Promotion of community-based projects to manage natural resources and support the green economy.</i></p>	<p><i>Avoid development in these areas and strive to reinstate/ restore natural systems. If unavoidable because of overriding reasons of public interest and the lack of alternative locations/ sites, then find alternative substitute areas as offsets to ensure connectivity at landscape scale.</i></p>
Land within 100m of wetlands / wetland buffer	<ul style="list-style-type: none"> To ensure that land use in a buffer zone around wetlands does not threaten the functioning of these systems. 	<ul style="list-style-type: none"> Wetlands are in a healthy condition from an ecological structure, composition and function perspective 	Existing area and condition of buffer zones around wetlands	<p><i>Restore degraded or transformed areas and remove alien invasive organisms. Implement ongoing management.</i></p> <p><i>Promotion of community-based projects to manage natural resources and support the green economy.</i></p>	<p><i>Avoid development in these areas and strive to reinstate/ restore natural systems.</i></p>
Natural areas known to provide important habitat for particular faunal species: birds, mammals, lower vertebrates and/or fish	<ul style="list-style-type: none"> To ensure that the conservation status of threatened species is maintained (i.e. does not change to a more threatened category) or improved. 	<ul style="list-style-type: none"> Conservation status of threatened species is maintained or improved. Local populations of threatened species and local endemics maintained or increased. 	Existing extent and condition of important faunal habitat	<p><i>Remove alien invasive organisms. Implement ongoing management.</i></p> <p><i>Promotion of community-based projects to manage natural resources and support the green economy.</i></p>	<p><i>Where habitat of Endangered species is involved, avoid negative impacts through design and layout. For relatively less threatened species, where avoidance is not feasible, minimization, restoration of disturbed areas, and offsets to protect / increase and manage like habitat for threatened species, preferably located within earmarked ecological corridors and Critical Biodiversity Areas</i></p>
Informal conservation areas	<ul style="list-style-type: none"> To ensure that habitats that contribute to biodiversity conservation and/ or provide valued goods or ecosystem services remain under conservation management 	<ul style="list-style-type: none"> Important habitats for conservation of species or vegetation types are maintained. Delivery of valued ecosystem services is sustained. 	Existing conservation role and function.	<p><i>Restoration of degraded areas to improve value of area for conservation where important or threatened biodiversity occurs, and/ or to increase delivery of valued ecosystem goods and services</i></p>	<p><i>Specialist studies needed to determine conservation status of ecosystems and species. Apply mitigation hierarchy accordingly.</i></p>

TABLE 15(a): Management Framework for EMZ 2 – Develop with Care: Valued Resources (Natural Resources) – continued

<i>Important biodiversity</i>					
ATTRIBUTE	MANAGEMENT OBJECTIVE	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	POTENTIAL MITIGATION
Focal areas for protected area expansion	<ul style="list-style-type: none"> To maintain options for conservation targets to be met through future inclusion of focal areas in the conservation estate. 	<ul style="list-style-type: none"> Areas to be maintained for conservation use. 	Existing area and condition of focal areas.	Restoration of degraded or disturbed areas.	<i>Avoid development in these areas unless there are overriding reasons of public interest and the lack of alternative locations/ sites. Apply strict mitigation hierarchy.</i>

TABLE 15(b): Management Framework for EMZ 2 – Develop with Care: Valued Resources (Agricultural Land)

<i>Productive agricultural land</i>					
ATTRIBUTE	MANAGEMENT OBJECTIVE	DESIRED OUTCOME	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	POTENTIAL MITIGATION
Dryland agricultural areas	<ul style="list-style-type: none"> To retain productive agricultural land that is important for food security. 	<ul style="list-style-type: none"> No transformation of productive agricultural land that is of priority for food security. 	Existing extent of productive dryland agricultural land that is considered of priority by Department of Agriculture	<i>Positive contribution to improve ecosystem services through best practice management following guidelines for environmentally friendly production(e.g. LandCare or BBI)</i>	

TABLE 15(c): Management Framework for EMZ 2 – Develop with Care: Valued Resources (Heritage Resources)

<i>Important heritage resources</i>					
ATTRIBUTE	MANAGEMENT OBJECTIVE	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	POTENTIAL MITIGATION
Grade II and III heritage resources Grade I cultural landscapes (identified as overlay zones in the draft Drakenstein Heritage Survey), and known scenic routes	<ul style="list-style-type: none"> Protect and restore sites, landscapes and other heritage assets Protect the aesthetic value of specific scenic routes 	<ul style="list-style-type: none"> No loss of or damage to heritage sites or landscapes No visual intrusion by structures or land conversion that is incompatible with scenic values. 	Existing Grade II and III heritage resources, Grade I cultural landscapes Quality of scenic views acceptable to heritage authority and local heritage / historical / urban conservation committees.	<i>Positive contribution to restore and maintain heritage resources in the long-term</i>	<i>Assess potential impacts and determine appropriate mitigation. Ensure visual impact assessment where scenic routes and vistas would be negatively affected. Address in Construction Environmental Management Plan to include monitoring presence over the period during which excavations are made. If historical remains are found the relevant heritage authority must be advised and an appropriate expert appointed to determine mitigation measures</i>

TABLE 15(d): Management Framework for EMZ 2 – Develop with Care: Valued Resources (Public and Tourism Resources)

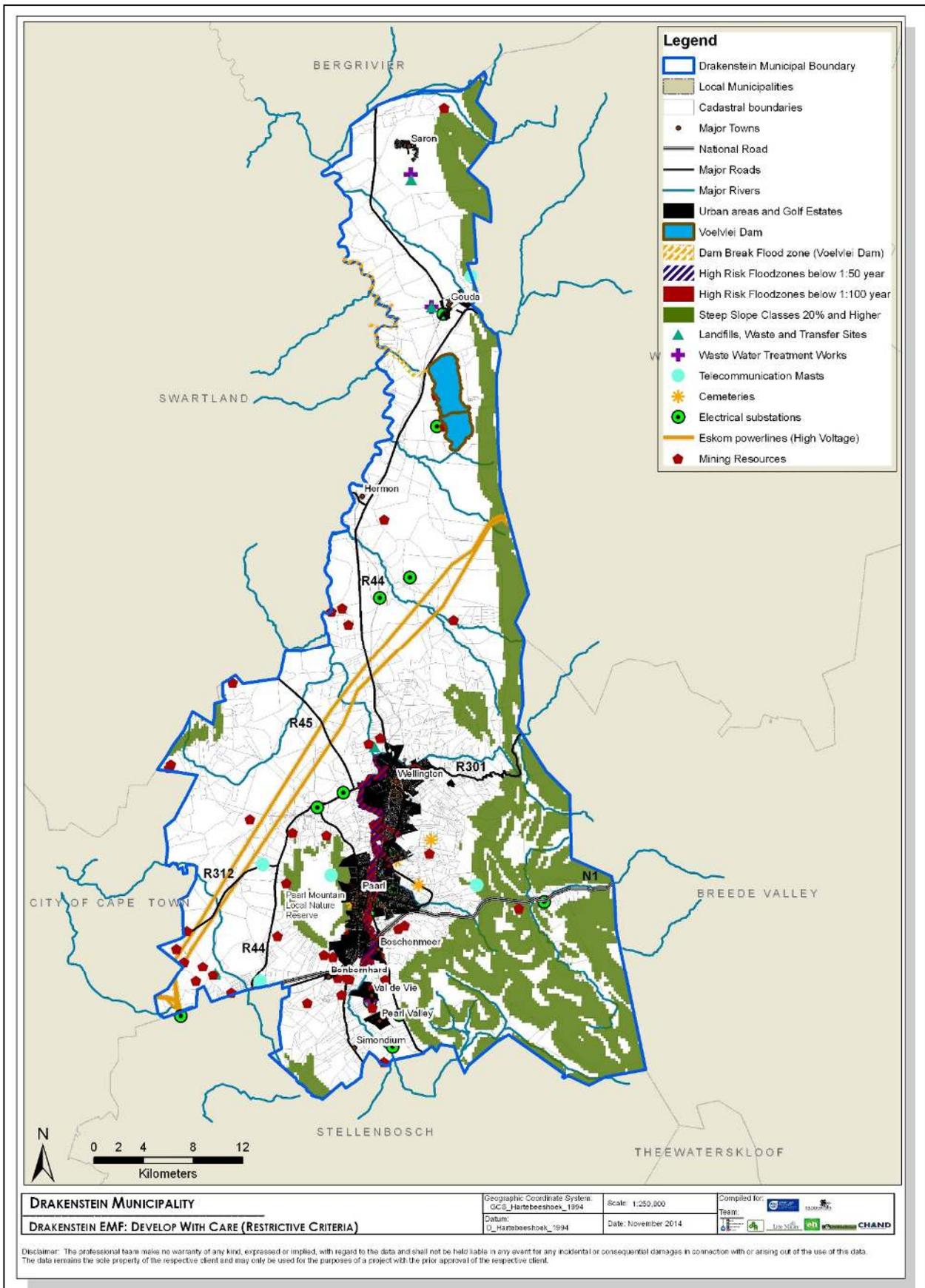
<i>Important public and tourism resources</i>					
ATTRIBUTE	MANAGEMENT OBJECTIVE	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	POTENTIAL MITIGATION
Public Open Space	<ul style="list-style-type: none"> To retain open spaces of value for public recreation and wellbeing. 	<ul style="list-style-type: none"> No transformation of Public Open Space into other urban uses. 	Existing extent of Public Open Space	<i>Promote green technology (e.g. green energy) and community-based projects (e.g. craft markets, community markets) which are non-permanent.</i>	<i>Avoid transformation.</i>
Tourist attractions and scenic routes	<ul style="list-style-type: none"> To retain the character of tourist attractions and scenic routes 	<ul style="list-style-type: none"> No degradation of the quality, especially visually, of tourist attractions and scenic routes. 	Quality of tourist attractions acceptable to tourism authorities and interest groups.	<i>Promote green technology (e.g. green energy) and green building. Make space for community-based projects (e.g. craft markets, community markets).</i>	<i>Provide for attractive design / use design measures to prevent visually intrusive structures. Use architecture that fits in with existing structures.</i>

8.5 EMZ 3: Develop with Care – Restrictive Conditions or Constraints

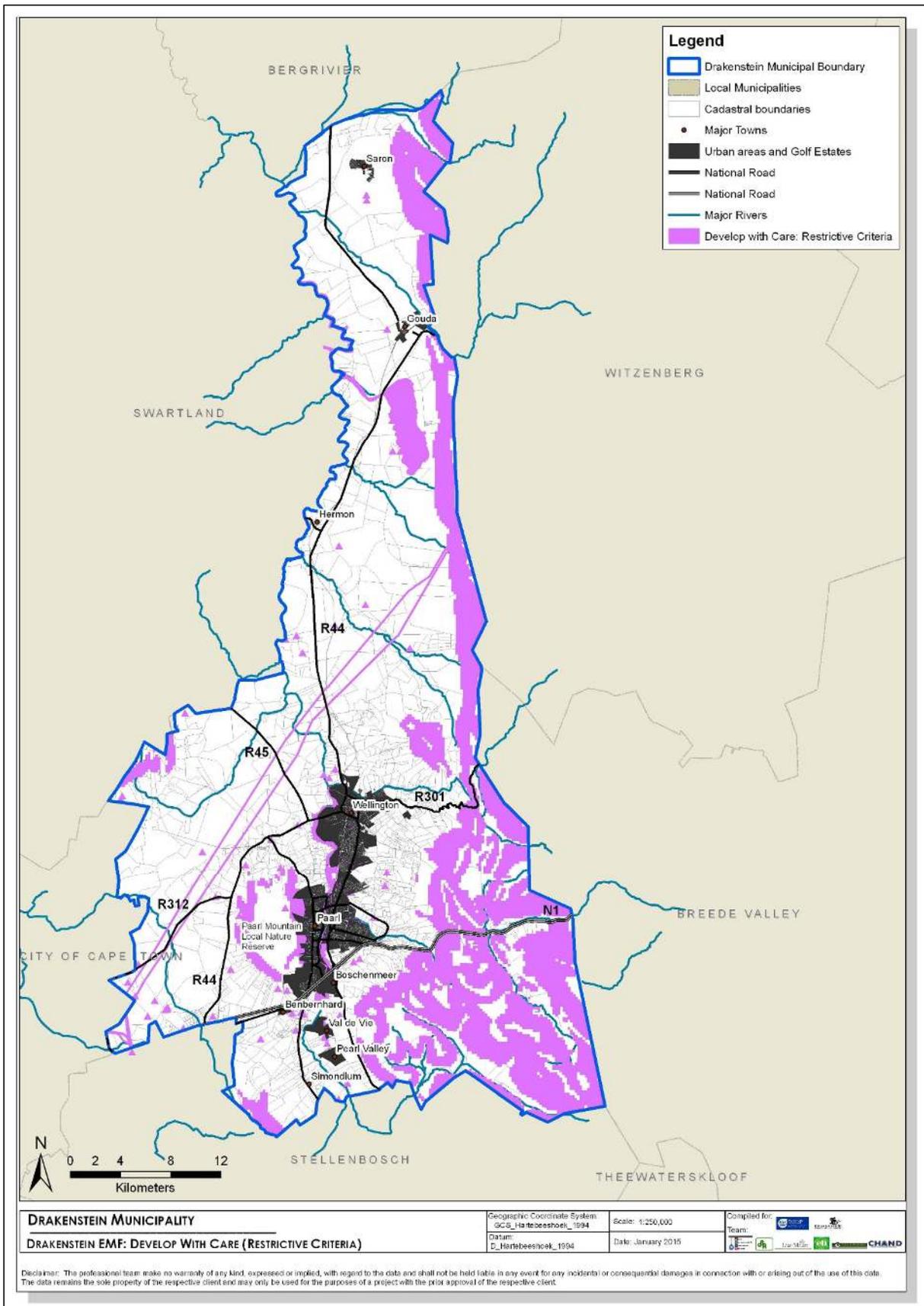
The criteria that inform EMZ 3 are concerned with possible restrictions on land use and development either due to environmental quality issues or due to potential natural environmental risks such as flooding potential. In terms of natural risks, data are limited (i.e. floodlines available for some areas only) and thus few factors in this respect are included in this EMZ at this stage. EMZ 3 attributes are shown on Map 21 and the total spatial extent of this zone is provided in Map 22.

TABLE 16: Attributes that inform EMZ 3 – Develop with Care: Restrictive Conditions or Constraints

EMZ 3 – DEVELOP WITH CARE: RESTRICTIVE CONDITIONS OR CONSTRAINTS			
ATTRIBUTE		PURPOSE	COMMENTS / NOTES
RESTRICTIVE CRITERIA			
ENVIRONMENTAL RISK ISSUES	Flood lines, both natural and due to dam failure	<ul style="list-style-type: none"> To identify areas where a flood risk exists and establish appropriate setback lines for development. 	Voelvlei dam, Berg River and various tributaries
	Steep slopes	<ul style="list-style-type: none"> To identify areas where development on steep slopes is likely to cause instability and / or erosion, and / or visual impacts 	
ENVIRONMENTAL QUALITY ISSUES	Water pollution “hot spots”	<ul style="list-style-type: none"> To identify areas where water quality is problematic and could be harmful to human or ecosystem health 	Berg River
	Land uses or facilities that generate pollution or other hazards	<ul style="list-style-type: none"> To identify land uses that have the potential to generate noise, pollution, dust and odours, and/ or potentially dangerous conditions. 	Landfills, waste sites, mines and quarries, electrical infrastructure
MINERAL RESOURCES	Known deposits of potentially exploitable minerals	<ul style="list-style-type: none"> To alert developers of potential exploration and / or mining or the presence of existing or abandoned mines / quarries. Mining resources (rights) may place limitations on the use of land where they occur. 	



MAP 21: EMZ 3 – Develop with Care – Restrictive Conditions or Constraints (Attributes)



MAP 21: EMZ 3 – Develop with Care: Restrictive Conditions or Constraints (Total Spatial Extent)

8.5.1 Development and EMZ 3 – Develop with Care: Restrictive Conditions or Constraints

A matrix describing the development types that would be considered appropriate or inappropriate in EMZ 3 – Develop with Care: Restrictive Conditions or Constraints is provided in Table 17:

- ◆ *Activities that would generally be deemed to be unacceptable in that zone:* These activities would typically exacerbate existing restrictive conditions due to poor environmental quality or risks, and would thus be contrary to sustainable development and the management objectives.
- ◆ *Activities that could have significant negative impacts* by virtue of the condition of the receiving environment. Where residual negative impacts of a proposed activity would be significant **despite proposed mitigation**, the project would be contrary to sustainable development objectives and trade-off rules. This implies that a more suitable location should be sought or that the project should be subject to substantial planning and design revision to better respond to the environment in which it is to be situated.
- ◆ *Activities that are considered unlikely to have a significant negative impact:* These activities would typically be compatible with the objectives of the EMZ and would not pose a risk of exceeding the LoAC.

Guidance in respect of environmental applications and waste licence applications:

Environmental attributes that make up EMZ 3 – Develop with Care: Restrictive Conditions or Constraints are related to environmental quality and risk factors. Hence, EMZ 3 addresses the impact of existing environmental quality conditions and risk factors on proposed development. Where a proposed such development could potentially exacerbate such risks, this would indicate a potential ‘show stopper’ and thus a high likelihood of environmental authorisation being refused. EMZ 3 could also be used to indicate inappropriate locations for sensitive development. For example, placing low cost housing or residential development in an area subject to noise, odour or pollution impacts would not be appropriate.

Since all attributes and areas in EMZ 3 represent constraints or risk factors, the focus in the impact assessment would be on determining whether the proposed development / activity would serve to exacerbate the situation (e.g. lead to further deterioration in environmental quality or increased environmental risk). The impact assessment should also consider the social implications of any deterioration of environmental quality, namely which communities would be worst affected. Conversely, there are projects that could result in an improvement in environmental quality and the benefits thereof should be assessed.

The matrix provided in Table 17 ought to be applied as a **screening mechanism** and should not be interpreted as being definitive. It provides an indication of the types of development / activities within EMZ 3 – Develop with Care: Restrictive Conditions or Constraints where there is potential for negative effects on development or where development would be precluded due to inherent risks (e.g.

flooding potential). Clearly, each project must be evaluated on its merits and on the extent to which it is responsive to environmental factors. Specialist studies would always be required for “groundtruthing” purposes in respect of each EMZ 3 attribute that is indicated as being present on the site. Such groundtruthing would also be valuable in determining the extent of the impact assessment required.

One of the objectives of the EMF is to provide guidance for the NEMA EIA Regulations. The 2014 NEMA EIA Regulations (GNR 982 of 4 December 2014) allow for the competent authority to provide advice or instruction on the “nature and extent of any of the processes that may or must be followed or decision support tools that must be used in order to comply with the Act and these Regulations.”⁶³ In terms of NEMA section 24O(b)(v) and Regulation 5(2) of the EMF Regulations (GNR 547 of 18 June 2010) the competent authority must take an EMF that has been adopted⁶⁴ into account in the consideration of environmental applications. It therefore follows that in providing advice or instruction to an applicant / proponent in the context of regulation 8 of the 2014 NEMA EIA Regulations, it would be advisable for the competent authority to take guidance from the EMF. The following guidance is applicable to EMZ 3:

- ◆ *Regulation 8(a)*: With regard to regulation 8(a) applicants / proponents ought to be advised or instructed to fulfil at least the following:
 - Cognisance must be taken of the EMF in any environmental application within the Drakenstein Municipal area (Refer to Map 1 for EMF boundary). This includes spatial information on environmental attributes as well as management objectives, desired outcomes and limits of acceptable change applicable to each attribute. Applicants/proponents should demonstrate the extent to which the proposed activity meets the applicable management objectives and desired outcomes. Guidance on mitigation measures and opportunities for benefit should also be considered (refer to Section 8.4.2).
 - Each environmental attribute must be addressed through a specialist study. In addition, consideration must be given to inter-relationships between attributes, especially where an impact on one attribute could have ‘knock-on’ effects on other attributes. Specialists therefore need to work in consultation with one another. Where environmental quality issues are of concern, specialists must assess whether the proposed development would improve or worsen the situation.
 - Authorities with responsibility for an environmental attribute must be consulted – and not just those authorities that have jurisdiction (i.e. decision-making power) in respect of any aspect of the application.
 - Where specialist input indicates that an attribute shown in the EMF is actually not present on the site or its immediate surroundings, verification of this information must be provided. This must include consultation with

⁶³ Regulation 8(a).

⁶⁴ An EMF may be adopted by the MEC in concurrence with the Minister. Where an EMF has been adopted it must be considered. The Regulations also allow for EMFs to be taken into account even if not adopted by the MEC in concurrence with the Minister (Regulation 5(3)). The terminology used in regulation 5(3) is “may be taken into account in the consideration of environmental applications” whereas that used in regulation 5(2), which deals with adoption of EMFs is “must be taken into account in the consideration of environmental applications” (emphasis added).

the relevant authority or agency. An independent peer review could also be requested. Where there is any uncertainty about the matter, such as conflicting information, an independent review should always be required.

- Applications for exemption under the Exemption Regulations (GNR of 8 December 2014) related to provisions in the EIA Regulations could be considered where Listed Activities indicated as being potentially suitable in EMZ 3 are involved (column 3 in Table 17).

- ◆ *Regulation 8(b)*: With respect to EMZ 3, the EMF provides guidance on activities that would be regarded as appropriate / inappropriate where highly sensitive and valuable environmental attributes occur. This information would be an important consideration in determining the likely success of an application and should be used by the competent authority in the context of regulation 8(b). It should be borne in mind that the factors that make up EMZ 3 are likely to result in negative effects on development if it is located inappropriately. This has relevance to Listing Notices or Listed Activities (e.g. Listing Notice 3 of the 2014 NEMA EIA Regulations, GNR 985 of 4 December 2014) where reference is made to an impact assessment not being required for certain types of development / activities (e.g. urban areas). Certain types of development would be sensitive to environmental quality issues irrespective of their location in an urban area. Accordingly, EMZ 3 could be used to inform Applicants / Proponents in this regard.

Regulation 15 specifies that the EAP (Environmental Assessment Practitioner) must identify whether an application ought to be subject to a Basic Assessment or Scoping and Environmental Impact Report (S&EIR). In making this determination the EAP must take account of any guidelines as well as any advice provided by the competent authority in terms of regulation 8. Furthermore, in order to meet the requirements of the 2014 NEMA EIA Regulations, whether Basic Assessment or S&EIR, the EAP must take account of the EMF, based on the following provisions:

3. *Basic Assessment*: In accordance with regulation 19, a Basic Assessment must contain the information listed in Appendix 1 of the Regulations. The applicable legal and policy context, guidelines, spatial tools, municipal planning frameworks and instruments must be described (Appendix A – 3(1)(e)(i)). In addition, the EAP needs to describe how the application complies with and responds to the EMF (Appendix A – 3(1)(e)(ii)).
4. *Scoping & EIR*: The policy and legal context, guidelines, spatial tools, municipal planning frameworks and instruments that are to be considered in the assessment must be described (Appendix 2(e)) in the Scoping Report. Although the EIR content only makes reference to the need to include the legal and policy context (Appendix 3 – 3(e)), it would be necessary to address guidelines, spatial tools, municipal planning frameworks and instruments identified in the Plan of Study and in the Scoping Report. Any deviation from the Scoping Report, including the Plan of Study, must be indicated and motivated (Appendix 3 – 3(u)). It is improbable that a deviation involving the absence of consideration of the EMF would be accepted by the competent authority.

TABLE 17: Development / activities matrix for EMZ 2: Develop with Care: Restrictive Conditions or Constraints

Activities that should be avoided (i.e. that should not be considered) in this zone	Activities that could have a significant negative impact in this zone due to scale and/or cumulative impacts	Activities that could be considered for this zone
<ul style="list-style-type: none"> • Residential projects • Commercial or retail facilities • Intensive agriculture • Facilities for the concentration of livestock or for intensive / commercial livestock production • Aquaculture / mariculture facilities • Forestry / afforestation • Dams (instream & offstream) and water transfer schemes • Recreational facilities • Tourism facilities • Jetties, slipways, marinas (on inland waters) 	<ul style="list-style-type: none"> • Mining • Extraction or processing of oil or gas • Power generation projects (fossil fuels or nuclear) • Electricity distribution infrastructure • Industrial / manufacturing projects • Bulk storage / stockpiling of minerals, ore or coal • Storage / handling facilities for dangerous goods / substances • Facilities / infrastructure for bulk transport of dangerous goods • Liquid waste storage facilities / waste lagoons • Waste treatment facilities • Sewage, wastewater or effluent treatment works • Cemetery • Abattoirs • Masts and communication towers • Airports and/or landing strips • Agri-industrial facilities • Solid waste disposal sites 	<ul style="list-style-type: none"> • Waste recycling facilities • Waste transfer stations • Transport infrastructure (e.g. roads, railways) • Essential engineering services such as sewerage and water pipelines, outfall sewers and storm water systems • Road, rail, pipeline and cable crossing and bridges • Power generation projects (renewable) • Bulk water, sewage or stormwater infrastructure • Linear infrastructure, including roads and railways. • Bulk stormwater outlets, canals or channels. • Outdoor advertising (billboards) • Infilling, excavation or deposition of material

8.5.2 Management Framework for EMZ 3: Develop with Care - Restrictive Conditions or Constraints

Given the factors that make up EMZ 3, the following strategic objective has been formulated:

Strategic (management) objective applicable to Zone 3

Ensure development undertaken so that it does not pose a threat to valued environmental components. Seek to develop on the basis of best practice environmental standards and seek to restore degraded ecosystems where possible.

Although this EMZ represents a situation where there would typically be few constraints to development, the following approach is nonetheless applicable to

- ◆ Irreversible negative impacts on adjacent land owners, occupiers or users of land (e.g. noise, air emissions) must be avoided;
- ◆ Increased exposure of communities to hazards with regard to health and / or safety must be avoided.
- ◆ Best available environmental technology should be applied and “green technology” (e.g. energy conservation, waste re-use, effluent re-use) should be implemented wherever practical.
- ◆ Environmental quality standards (e.g. effluent quality, air quality) must be met.

This EMZ contains the following attributes:

- ◆ Environmental risk issues (Table 18(a)).
- ◆ Environmental risk issues (Table 18(b)).

The management framework comprises the following for each attribute:

- ◆ The management objective.
- ◆ Desired outcome (basis against which objective can be measured to establish progress, even success, in respect of the objective).
- ◆ Limit of Acceptable Change (limit beyond which irreversible change to an attribute is likely to occur and thus compromise the functioning of this attribute and thus the ability to sustain the services / benefits that are important to human wellbeing).
- ◆ Opportunity for benefit (factors for consideration that could result in benefits to society and to the environment; includes opportunities that could contribute to social priorities such as poverty alleviation and job creation).
- ◆ Mitigation / management approach.

TABLE 18(a): Management Framework for EMZ 3 – Develop with Care - Restrictive Conditions or Constraints

<i>Environmental risk issues</i>					
ATTRIBUTE	MANAGEMENT OBJECTIVE	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	POTENTIAL MITIGATION
Areas below the 1: 50 year flood line and 1 in 100 year flood line. Areas within the flood zone should the Voelvlei Dam fail.	<ul style="list-style-type: none"> To avoid placing people and infrastructure at risk from floods To alert developers to risk of dam failure 	<ul style="list-style-type: none"> No settlement or infrastructure development below the 1 in 50 year flood line. Only appropriate settlement or infrastructure development within the 1:100 year flood line 	No increase in the exposure of people to flood risks and/ or increase in damage to infrastructure as a result of flood events	<i>Clearing of alien invasive plants from watercourse to avoid flood aggravation.</i>	<i>Avoid hard development and structures below the 1 in 50 year flood line and allow only development that could withstand / accommodate floods below the 1 in 100 year flood line (e.g. sport fields, parkland / open space).</i>
Steep slopes (greater than 1 in 5)	<ul style="list-style-type: none"> To ensure development-induced erosion, slippage or slope instability is prevented. 	<ul style="list-style-type: none"> No activity that would result in erosion or destabilize slopes, including cultivation of land erection of structures or building 	Current extent of development on steep slopes.	<i>Positive contribution to restore and re-vegetate steep slopes</i>	<i>Avoid development on steep slopes and/ or ensure design addresses risks</i>

TABLE 18(b): Management Framework for EMZ 3 – Develop with Care - Restrictive Conditions or Constraints

ATTRIBUTE	MANAGEMENT OBJECTIVE	DESIRED OUTCOMES	LIMIT OF ACCEPTABLE CHANGE	OPPORTUNITY FOR BENEFIT	POTENTIAL MITIGATION
<i>Environmental quality issues</i>					
Water pollution “hot spots” specifically the Berg River (Paarl-Wellington area)	<ul style="list-style-type: none"> To prevent further discharges of pollution into degraded water resources To maintain, or preferably to improve, the quality of water in the Berg River 	<ul style="list-style-type: none"> No exceedances of applicable water quality standards. No water quality related human health impacts occur in the area. No further deterioration in water quality in the Berg River 	Water quality standards	<i>Improvement of quality of the affected freshwater environment</i>	<i>Avoid or at least minimize discharge of effluent into rivers. Design to prevent effluent discharges and to store and recycle stormwater. Treatment and re-use of effluent should be considered.</i>
Land uses that generate pollution, nuisance or present hazards	<ul style="list-style-type: none"> To prevent the location of residential and other sensitive land uses adjacent to land uses that generate noise, pollution, dust and odours, or potentially dangerous conditions, and/ or that could cause health or nuisance impacts. 	<ul style="list-style-type: none"> No exceedances of ambient noise level standards. No exceedances of ambient air quality standards. Risk levels associated with hazardous industries at least meet internationally accepted risk levels for the public. 	SANS standards for environmental noise levels. Ambient air quality standard	<i>Improvement of quality of the affected environment and increasing options for adjacent or future land use</i>	<i>Avoid or at least minimise noise, dust, odour and other potential nuisance impacts or hazards.</i>

9 General Guidance for EIA Process

This section provides guidance on the use of the EMF in respect of the EIA Regulations as well as for the use of the EMF when undertaking an application for environmental authorisation. It is not intended to provide detailed guidelines for the undertaking of EIAs. Rather this section deals with the manner in which the EMF should be used in the EIA process.

9.1 Use of the EMF

The EMF should be used as follows:

1. As a screening tool to evaluate whether the proposed location for a project is appropriate or not. This should be done through consulting both the EMF document and the associated GIS database. “Groundtruthing” would be of assistance in this regard. Where more than one location is under consideration, the EMF could be used to establish which option would be the most suitable. Furthermore, the EMF could be consulted prior to acquiring land (e.g. prior to purchase), as part of the process of assessing its suitability for a particular use, purpose or project.
2. As a scoping tool to identify the issues that require investigation as part of the EIA process. Each attribute that is indicated as being present at a particular location and its surroundings would need to be considered and relevant specialist input obtained. Note that a site should not be viewed in isolation since impacts can extend beyond cadastral or property boundaries. Thus, attributes within close proximity to the proposed development location must also be considered. This would be particularly relevant where a proposed development will rely on resources outside of its boundaries or where it would result in the discharge of emissions, effluent or wastes. The use of the EMF to assist scoping should involve reference to both the EMF document and the associated GIS database. “Groundtruthing” would be of assistance in this regard.
3. As an impact assessment tool, particularly in respect of determination of the acceptability or otherwise of impacts. The tables that provide the management framework for each environmental attribute are applicable in this regard. Acceptability of impacts should be tested against the objectives, desired outcomes and limits of acceptable change described in these tables.

The earlier the EMF is consulted in the project planning and design process, the greater the potential for formulating a development proposal that is appropriate and that meets important sustainability criteria. Identifying issues that may be ‘show stoppers’ at an early stage is invaluable. These would be those issues that have significant potential for the rejection of the proposed development by Interested and Affected Parties and/or that have a high risk of having environmental authorisation refused. The EMF would also serve to identify issues that represent ‘red flags’. These would be those issues that need to be addressed to ensure the proposed

development is appropriate. Such issues require investigation and the development would need to be responsive to the findings of the resultant studies. The more the development proposal responds to the sensitivity of environmental attributes (e.g. through avoiding adverse impacts), the greater the potential for it to be accepted and to make a positive environmental and social contribution.

9.2 Relevant legislation and guidelines

There is various legislation that needs to be considered when undertaking an environmental application. In addition, environmental and land use authorities or agencies may have published guidelines that need to be taken into account. Authorities and environmental organisations should always be consulted to determine the availability of guidelines: There may also be useful guidelines available through professional organisations.

9.2.1 Legislation

Legislation that may be relevant to an environmental application is shown in the table below. This table summarises key information in respect of national legislation. There may be applicable provincial and local legislation that also requires consideration. In particular, municipalities may have legislation that relates to effluent discharge, water conservation and fire and safety requirements. It is the responsibility of the applicant / proponent and the EAP to ascertain which legislation needs to be taken into account in the planning and design of the project and in the assessment of impacts.

TABLE 12: Key relevant legislation

LEGISLATION	RELEVANCE
National Environmental Management Act (Act 107 of 1998) read with the 2014 NEMA EIA Regulations (GNR 982, 983, 984 and 985 of 4 December 2014)	<ul style="list-style-type: none"> • Principles (section 2) – these are relevant to developing assessment criteria. • Integrated Environmental Management objectives (NEMA - section 23) • Environmental Impact Assessment requirements (NEMA - section 24)
National Environmental Management Air Quality Act (act 39 of 2004) read with: <ul style="list-style-type: none"> • Listed Activities (GNR 893 of • Regulations regarding air dispersion modelling (GNR 533 of 11 July 2014) 	<ul style="list-style-type: none"> • Projects that result in atmospheric emissions: <ul style="list-style-type: none"> – Establish need for an Atmospheric Emission Licence (AEL) – Emission standards to inform project design – Requirements for dispersion modelling within air pollution / quality specialist study
National Environmental Management Biodiversity Act (Act 10 of 2004) and: <ul style="list-style-type: none"> • Alien and invasive species regulations (GNR 598 of 1 August 2014) • National list of ecosystems that are threatened and in need of protection (GNR 1002 of 11 December 2011) • Critically Endangered, Endangered Vulnerable and Protected Species List (GNR 1187 of 14 December 2007). 	<ul style="list-style-type: none"> • Projects located on vacant / undisturbed / undeveloped land • Alien clearing and rehabilitation requirements for land where alien species are present • Establish need for permit – restricted activities. • Establish presence of listed species and / or listed ecosystems • Establish need for permit – restricted activities

LEGISLATION	RELEVANCE
National Environmental Management Waste Act (Act 59 of 2008) read with: <ul style="list-style-type: none"> • Listed Waste Activities (GNR 921 of 29 November 2013) • Norms and Standards for disposal of waste to landfill (GNR 636 of 23 August 2013) • National Norms and Standards for storage of waste (GNR 922 of 29 November 2013) 	<ul style="list-style-type: none"> • Projects that involve waste facilities: <ul style="list-style-type: none"> – Establish need for a waste licence – Design of waste disposal facilities – Design of waste storage facilities
National Water Act (Act 36 of 1998) General Authorisation (GNR 665 of 6 September 2013)	<ul style="list-style-type: none"> • Projects that involve abstraction of water or discharge of effluent or stormwater into water resources. <ul style="list-style-type: none"> – Establish need for water use licence. – Establish water quality requirements.
National Heritage Resources Act (Act 15 of 1999)	<ul style="list-style-type: none"> • Any project that could affect heritage resources. Of particular relevance is: <ul style="list-style-type: none"> – Establish need for a permit (e.g. section 27) – Establish need for permission to alter buildings older than 60 years. – Establish need for Heritage Impact Assessment (section 38)
Major Hazard Installation Regulations (GNR 692 of 2001) read with the General Machinery Regulations (GNR R1521 of 5 August 1988)	<ul style="list-style-type: none"> • Project that involve the handling, storage and/or use of substances that could pose a major hazard <ul style="list-style-type: none"> – Establish need for Major Hazard Installation risk assessment and procedures for undertaking such assessment. – Notification of Major Hazard Installation.
Hazardous Chemical Substances Regulations (GNR 1179 of 25 August 1995)	<ul style="list-style-type: none"> • Establish design requirements for facilities involving handling storage and use of hazardous substances.
General Safety Regulations (GNR 1031 of 30 May 1986)	<ul style="list-style-type: none"> • Establish design requirements for facilities involving handling storage and use of hazardous substances.

There are numerous guidelines that available to assist Applicants and EAPs in addressing environmental issues and thresholds in project planning and design. A list of guidelines is given below – this list is not exhaustive.

- ◆ DWAF Water Quality Guidelines of 1996. These guidelines comprise several volumes relating to different water uses, with the objective of ensuring water resources remain fit for use.
- ◆ Western Cape Provincial Spatial Development Framework: Rural Land Use Planning and Management Guidelines, May 2009
- ◆ NFEPA: Management Guidelines for wetland and river FEPAs (Implementation Manual for FEPAs (Driver *et al* 2011).
- ◆ DWAF Minimum Requirements relating to waste management (4 volumes) of 1998.
- ◆ DEA&DP Guidelines for involving specialists in the EIA process. A series of documents make up these guidelines including heritage, economic and biodiversity specialists.
- ◆ DEA&DP EIA Guideline and Information Document Series March 2013.
- ◆ DEA&DP Guideline on Environmental Management Plans.
- ◆ DEA&DP Guideline for the Management of Development on Mountains, Hills and Ridges in the Western Cape.

- ◆ DEA&DP Guideline on the Application of the EIA Regulations to Structures Associated with Communications.
- ◆ DEA&DP Guidelines for Golf Courses, Golf Estates, Polo Fields and Polo Estates in the Western Cape.
- ◆ DEA&DP: Rural Land Use Planning & Management Guidelines (2009)
- ◆ DEA&DP Generic Environmental Best Management Practice Guideline for Aquaculture Development.
- ◆ DEA&DP – Provincial Spatial Development Framework (2009 and 2014).
- ◆ DEA&DP – A Guide to Reporting and Estimating Emissions.
- ◆ Department of Environmental Affairs Integrated Environmental Management Information Series (IEM). This comprises a series of documents that deal with various aspects of the EIA process.
- ◆ Department of Environmental Affairs: South African Manual for Outdoor Advertising Control.
- ◆ CapeNature stewardship guidelines.
- ◆ Drakenstein River Management Plan Ninham Shand and Freshwater Consulting Group).
- ◆ Cape Winelands Biosphere Reserve SDP.
- ◆ SANS 241 – South African Drinking Water Standard.
- ◆ SANS 1929 – Ambient Air Quality – limits for common pollutants.
- ◆ SANBI: National Biodiversity Assessment, 2011.

9.3 Listing and delisting of activities

The EMF is seen as a tool to direct attention to those issues and impacts that are most likely to be significant, as well as to give support to associated decision-making on proposed development. The Drakenstein is characterised by a number of natural and heritage resources that are regarded as either ‘irreplaceable’ or ‘important’; there are very few areas remaining that would be able to support major or substantial new development without potentially significant environmental impact. Clearly, the extent to which cognisance is taken of sensitive environmental attributes in the planning and design planned and designed to take account of environmental attributes and their sensitivity could substantially reduce the significance of adverse impacts or even serve to avoid them altogether.

Given scale considerations (both of studies used to inform this EMF and of the EMF itself), it would not be appropriate for blanket ‘delisting’ of any Listed Activities. This is due to the extent of irreplaceable and/or important resources as reflected in EMZ 1 and EMZ 2. It is possible that already disturbed or transformed sites with negligible restoration potential occur within broader ‘irreplaceable’ environments that could be developed with no residual negative impacts. This is where the role of ‘groundtruthing’ is important. Assuming that scientifically rigorous investigation shows that a particular attribute from EMZ 1 or EMZ 2, the effect would be to influence the scope of the impact assessment in terms of specialist input required. The need to obtain environmental authorisation, as well as any other environmental licencing and permitting requirements, remains.

9.3.1 Exclusion of activities

Section 24(2)(c) of NEMA allows for the exclusion of specified activities from having to obtain environmental authorisation in the case of a listed area. A “listed area”, means a geographical area identified in terms of section 24(2)(b) and (c). Accordingly where an EMF constitutes a “listed area” specified activities may be excluded from having to obtain environmental authorisation. This is sometimes also called “delisting”. The only potential opportunities for a “blanket” exclusion of activities from having to obtain environmental authorisation are regarded as the following:

1. The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good/s if located within an existing industrial area.
2. The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage if located in a noxious industrial zone or industrial zone with an equivalent categorization.
3. The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good/s on vacant land if located within an existing urban area already zoned for industrial use, provided that the land concerned falls outside of any of the EMZs identified in the EMF (i.e. zoning does not conflict with the EMF).
4. The establishment of facilities that require an Atmospheric Emission Licence (AEL) within an existing industrial area, provided that the area is not already an air pollution “hot spot” (where ambient air quality standards have already been exceeded) or priority area identified under the National Environmental Management Air Quality Act (Act 39 of 2004) and/or that ambient air quality is not approaching the accepted standards. This approach acknowledges that the AEL process is subject to advertising and that air pollution dispersion modelling would be requested by the competent authority (typically the District Municipality) if deemed necessary. The reason for considering delisting of this activity is due to the potential for duplication between the AEL and environmental application processes.

9.3.2 Inclusion of specified activities

Section 24(2)(b) of NEMA allows for the listing of specified activities in a listed geographical area in terms of section 24(2)(b) and (c). In circumstances where the EMF area constitutes a listed geographical area, additional activities could be specified (over and above those published in the NEMA EIA Regulations) for which environmental authorisation is required. The specified activities that could be considered for the Drakenstein EMF area are:

1. Development on any land that is used for agricultural purposes and that has Water Use Rights for agricultural purposes attached to it.

2. Development of any vacant or derelict land not currently used for agricultural purposes but which is indicated as having such potential in a spatial plan or tool of the Provincial Department of Agriculture, excluding land that has already been identified as being of biodiversity importance in a Fine Scale Plan, a bioregional Plan or an EMF.
3. Development of any vacant, undeveloped and/or derelict land that falls outside of sensitive biodiversity areas as shown in the EMF but where endemic and/or Red Data species are present.
4. A number of Listed Activities would be excluded from requiring environmental authorisation based on factors such as location in an urban area. Where such activities are proposed within an urban area within an area identified as being sensitive in the EMF, they ought to be regarded or designated as a specified activity. Examples of activities that do not require environmental authorisation based on the Listing Notice descriptions in the 2014 NEMA EIA Regulations include aircraft landing strips, development of new roads, widening or lengthening of roads, bulk Stormwater or water infrastructure, funiculars or cableways, and ziplines and foefie slides. These activities should be

In listing activities such as those given above, appropriate thresholds for triggering the need for environmental authorisation may need to be considered. For the purposes of this EMF, any activity in Listing Notice 3 of the NEMA 2014 EIA Regulations, EMZ 1 – Keep Assets Intact or EMZ 2 – Develop with Care: Valued Resources would constitute an activity that is being proposed in a ‘sensitive area.’

9.3.3 Exemptions

The Exemption Regulations are aimed at regulating the process for applying for exemption from provisions in NEMA or Regulations and Notices published under the Act. It is therefore possible that applicants / proponents would seek exemption from provisions in the NEMA EIA Regulations. Such applications may be sought as a means of reducing the extent or range of tasks required for the BA or S&EIR processes. There may be circumstances where exemption from fulfilling certain tasks set out in the EIA Regulations would be appropriate or warranted, with certain provisos, which could be catered for in the Exemption Application form / documentation:

1. The transformation of undeveloped, vacant or derelict land outside an urban area to residential, retail, commercial, recreational, tourist or institutional use, provided that this land does not fall within any of the EMZs identified in the EMF and that the following provisos are met:
 - ‘Groundtruthing’ has confirmed that no sensitive features exist on the site.
 - The heritage authorities and a heritage expert have been consulted about the potential for pre-historic and/or historical remains and that the requirements of the National Heritage Resources Act (Act 25 of 1999) are fulfilled.

- Conservation authorities have confirmed that the land is not suitable for restoration and/or is not a target site for restoration to meet conservation targets.
2. The expansion of linear infrastructure or facilities for bulk water supply, stormwater and sewerage (i.e. underground infrastructure) outside existing urban areas, provided that the land where such infrastructure will be located does not fall within any of the EMZs identified in the EMF and that the following provisos are met:
 - ‘Groundtruthing’ has confirmed that no sensitive features exist on the site.
 - The heritage authorities and a heritage expert have been consulted about the potential for pre-historic and/or historical remains and that the requirements of the National Heritage Resources Act (Act 25 of 1999) are fulfilled.
 - Conservation authorities have confirmed that the land is not suitable for restoration and/or is not a target site for restoration to meet conservation targets.
 3. Any proposed project that is located within an urban area and that is aligned to both the SDF and the EMF and that the following provisos are met:
 - ‘Groundtruthing’ has confirmed that no sensitive features exist on the site.
 - The heritage authorities and a heritage expert have been consulted about the potential for pre-historic and/or historical remains and that the requirements of the National Heritage Resources Act (Act 25 of 1999) are fulfilled.
 - Conservation authorities have confirmed that the land is not suitable for restoration and/or is not a target site for restoration to meet conservation targets.

The implication of the proposals for activities where a ‘scaled down’ environmental impact assessment process is that the environmental authorities would need to implement an Application Form that would serve as a screening mechanism. This would need to be structured so as to provide a means of verifying that the proposed project meets the relevant criteria / provisos set out above. The use of the EMF together with an Application Form that also serves as a screening mechanism provides the means for determining whether the Exemption Application should be considered or whether an impact assessment process should be followed.

10 Roles and responsibilities

The roles and responsibilities in respect of the EMF are concerned with its implementation. There are various parties that have a role to play in giving effect to the EMF. These are:

1. The environmental decision-making authorities (competent authority in respect of environmental authorisations under section 24 of NEMA).
2. Commenting authorities.
3. Authorities responsible for natural resources management.
4. Authorities responsible for spatial planning, development planning and land use.
5. Environmental Assessment Practitioners.
6. Applicants.

The respective roles and responsibilities of the above-mentioned parties are shown in Table 13 below.

TABLE 13: Roles and responsibilities in respect of the EMF

ROLE	RESPONSIBILITY
DEA&DP and DEA – competent authority for issuing environmental authorisation ⁶⁵	<ul style="list-style-type: none"> • Take the EMF into account: Cognisance must be taken of the EMF when considering environmental applications in the area covered by the EMF. This is a requirement of regulation 2(1)(c) of the 2010 EMF Regulations and of section 24(3) of NEMA. • Measure performance: The competent authorities should include performance indicators in their Annual Performance Plans to track the extent to which environmental decisions are aligned / not aligned with the EMF. • Maintain the EMF: Ensure that the EMF is kept up-to-date in accordance with an appropriate review period schedule. In doing so, cognisance must be taken of policy and legal developments as well as information pertinent to environmental trends including (but not limited to) the provincial and municipal State of Environment Report / Environmental Outlook Report, water resource management plans, biodiversity plans, waste management plans and air quality management plans.
DEA&DP (Directorate: Climate Change and Biodiversity) / CapeNature / SANBI	<ul style="list-style-type: none"> • Keep track of transformation of biodiversity: This applies in general and in particular to CBAs/ ESAs/ FEPAs and listed threatened ecosystems. Monitoring of levels of illegal conversion of natural areas also needs to be monitored. • Monitor remaining areas of natural, indigenous vegetation: It is essential that remaining areas of natural vegetation are monitored in relation to conservation targets and that a reliable record of areas formally protected for conservation is maintained. • Revise biodiversity plans: It is important that any erosion of CBAs/ ESAs/ FEPAs triggers a revision of associated biodiversity plans and re-assessment of areas needed to meet conservation targets.
DEA&DP (Directorate: Spatial Planning)	<ul style="list-style-type: none"> • Take the EMF into account: Although there is no specific regulatory obligation placed on this Directorate to consider the EMF in decision-making, it must be borne in mind that an obligation is placed on all organs of state to consider the NEMA principles in respect of any activity for which they are responsible, where the activity could have significant environmental consequences. Decisions that involve land use and spatial planning would fall into this category. The EMF has taken cognisance of the NEMA principles and thus provides a mechanism for the Directorate to meet this legal obligation. Similarly, the EMF offers support to the Directorate in giving effect to the Environmental Right in the Constitution. It also supports the realisation of the Provincial Government of the Western Cape's strategic objective relating to the mainstreaming of sustainability into its activities.

⁶⁵ “environmental authorisation”, when used in Chapter 5 of NEMA, means the authorisation by a competent authority of a listed activity or specified activity in terms of this Act, and includes a similar authorisation contemplated in any Specific Environmental Management Acts (NEM Protected Areas Act, NEM Biodiversity Act, NEM Air Quality Act, NEM Integrated Coastal Management Act, NEM Waste Act and National Water Act). That is, ‘environmental authorisations’ include emissions and waste licenses/ permits, in addition to EIA authorizations.

ROLE	RESPONSIBILITY
Municipalities	<ul style="list-style-type: none"> • Take the EMF into account: Although there is no specific regulatory obligation placed on the municipality to consider the EMF in decision-making, it must be borne in mind that an obligation is placed on the municipality to consider the NEMA principles in any activity that could have significant environmental consequences. TYPO Decisions that involve land use and spatial planning would fall into this category. The EMF has taken cognisance of the NEMA principles and thus provides a mechanism for the municipality to meet this legal obligation. Similarly, the EMF offers support to the municipality in giving effect to the Environmental Right in the Constitution. Furthermore, the EMF would be of assistance to the municipality in drawing up comments on environmental applications in its role as a commenting authority. • Encompass the EMF into the SDF: It is preferable that the EMF serves as the “environmental layer” in the municipality’s SDF. The SDF needs to be informed by environmental factors and the EMF can fulfill this role. This would mean that the environmental and land use authorities would be working off the same information base. This in turn would advance co-operative governance. This is one of the objectives of EMFs (regulation 2(3)(c)). • Participation in the review and updating of the EMF: The EMF would require revision on a regular basis (Refer to Section 14). The municipality should participate in this process and make relevant information available such as the SoER / Environmental Outlook Report, IWMP and the AQMP to ensure that there is consistency and synergies between these different environmental management tools.
Other authorities	<ul style="list-style-type: none"> • Take the EMF into account: Consider the EMF in decision-making as it is a requirement to consider the NEMA principles in any activity that could have significant environmental consequences. The EMF has taken cognisance of these principles and thus provides a mechanism for the authority concerned to meet this legal obligation. • Use the EMF for commenting purposes: Clearly, the comments from authorities would be made in the context of their role and mandate. The EMF should be considered in drawing up comments on environmental applications. In particular, the EMF could be of assistance to authorities in providing a context and framework for their comments.
Environmental Assessment Practitioners and specialists	<ul style="list-style-type: none"> • Take the EMF into account: Consider the EMF when conducting Basic Assessment or Scoping and EIA processes. The EMF serves as a guide for the location of development proposals. It also provides assistance in the identifying potentially significant impacts and risks upfront. In this regard, impacts should be evaluated within the context of the management objectives and the limits of acceptable change detailed in the EMF. The objective of this approach would be to determine whether impacts are within acceptable levels or not. Finally, the EMF provides an early indication of specialist studies that may be required. EAPs should bear in mind that the competent authority is obliged to consider the EMF in its decision-making process. Thus, if the EMF is not considered in a Basic Assessment or Scoping and EIA process, there is a high probability that these reports will be rejected.

11 Decision-making framework

It is generally acknowledged at an international level that there has been lack of progress in mainstreaming environmental considerations into development and investment decisions. This is despite the commitment made by governments, including South Africa, to promote the principle that environmental protection should be integrated into development decision-making, as set out in the Rio Declaration. In an analysis by the UNDP, UNEP, World Bank and the World Resources Institute⁶⁶ it is concluded that development decisions are being made without local information, consultation, or support. Accordingly the contribution of ecosystem goods and services to human welfare has not been well recognised, which leads to erosion of civil and economic rights, as well as natural heritage. This situation is starting to change with the development of tools such as biodiversity plans and guidelines on biodiversity assessment and on valuing ecosystem services

One of the reasons that this situation exists is that there is a “disconnect” between different levels of decision-making. There are basically two types or levels of decision-making: namely strategic decisions and implementation decisions, which are interdependent. In the context of determining how land should be used (i.e. development planning) *strategic decisions*, are primarily concerned with defining the direction over the long-term. Thus, a strategy would reflect the “desired future state” of an area or region, for example. Strategic decisions range from the adoption of international agreements, the formulation of national policies and plans (which become gazetted as White Papers) and the preparation of Spatial Planning Frameworks, as the Provincial Spatial Development Framework and Municipal Spatial Development Frameworks (SDFs). Similarly, an EMF can be regarded as a strategic-level document and its endorsement or adoption by the Minister or MEC responsible for environmental matters amounts to a strategic-level decision.

Implementation decisions relate specifically to the management or control of development on a particular site or area. Decisions at this level (site specific) ought to be aligned with the strategy for the area. If they are not, they have the potential to undermine the strategy and its vision and goals. This in turn means that it would be highly unlikely that the “desired future state” put forward in the strategy would be achieved. Thus, given that a sustainable future is generally acknowledged to be desirable, decisions about development and economic growth must be taken with sustainability principles in mind.

11.1 Decision-making (sustainability) criteria

Together, the Constitution and NEMA provide a robust foundation for sustainability that has guided the preparation of this EMF. Section 24 of the Constitution of South Africa, the ‘environmental right’, states that everyone has the right to an environment that is not harmful to health or wellbeing, and to have the

⁶⁶ United Nations Development Programme, United Nations Environment Programme, World Bank, World Resources Institute, (2003): World Resources 2002 – 2004: Decisions for the Earth, Balance, Voice and Power

environment protected for the benefit of present and future generations, through reasonable measures that:

- ◆ prevent pollution and ecological degradation
- ◆ promote conservation and
- ◆ secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

This section lays a foundation for long-term conservation or protection of important natural and social resources as envisaged by the environmental management principles in the NEMA. The NEMA principles underline the fact that the environment is 'held in public trust', to be safeguarded as 'the people's heritage'. These principles therefore acknowledge the dependence of human wellbeing on natural systems and resources. It is widely acknowledged that environmental concerns must be considered if basic human needs are to be met, both now and in the future. The NEMA principles emphasize conservation of biodiversity and ecological integrity (paying particular attention to sensitive, vulnerable, highly dynamic or stressed ecosystems subject to development or use pressure), conservation of heritage landscapes and sites, and avoiding or minimizing and remedying pollution and environmental degradation.

In addition, a 'risk averse and cautious' approach is advocated, that takes into account limits of current knowledge about decisions and actions. Importantly, the principles include an expanded 'polluter pays' requirement, that requires Applicants to take account of the potential of their proposed project / development to cause adverse environmental impacts (e.g. pollution, environmental degradation, adverse human health effects) upfront. In effect, this means that the Applicant's project would carry the costs of avoiding negative environmental and social impacts, and where these cannot be fully avoided to minimise such impacts. This is in accordance with the mitigation hierarchy, which is encompassed in the NEMA principles. In circumstances where adverse impacts involve threatened resources (natural or social), impact mitigation might include compensation for or offsetting of the residual negative impact. In essence, this approach deals with equity and environmental justice concerns; preventing private enrichment at the cost of loss or deterioration in public resources.

Table 14 presents a number of broad sustainability criteria which should be used to guide decision-making on development within the Drakenstein Municipality. These criteria have been developed internationally and can be seen to resonate well with the requirements of both the Constitution and NEMA. In addition, they reflect the contents of the draft Municipal Decision-making Guideline prepared for DEA&DP.

TABLE 14: Linking the Sustainability Criteria proposed for use in the EMF to the Constitution of South Africa and the National Environmental Management Act (NEMA: Act 107 of 1998)

SUSTAINABILITY CRITERIA		S24 OF THE CONSTITUTION	RELATED NEMA PRINCIPLES
1	<p><i>Integrity and resilience of social-ecological systems</i></p> <p>Maintain the long-term integrity of ecosystems and associated social systems.</p> <p>Protect the irreplaceable life-support functions and diversity of life (biodiversity) that provides future insurance against change, and on which human as well as ecological well-being depends, and maintain or improve the ability of the ecosystems and dependent social systems to recover after disturbance or shocks.</p>	<p>Everyone has the right to an environment that is not harmful to health or wellbeing, and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development while promoting justifiable economic and social development.</p>	<p>s4(a) Sustainable development requires consideration of all relevant factors, including:</p> <p>(i) Avoid or, where not possible to altogether avoid, minimise & remedy, disturbance of ecosystems & loss of biological diversity;</p> <p>(ii) Avoid or, where not possible to altogether avoid, minimise & remedy pollution & degradation of the environment;</p> <p>(iii) Avoid or, where not possible to altogether avoid, minimise & remedy, disturbance of landscapes and sites that constitute the nation's cultural heritage.</p> <p>(r) Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.</p>
2	<p><i>Social and livelihood sustainability</i></p> <p>Support and improve sufficient services, resources and opportunities to contribute to sustainable livelihoods (e.g. access to basic resources and essential services, employment opportunities, reduced vulnerability to disease and economic insecurity, and opportunities to seek improvements in social, human and productive capital in ways that do not compromise future generations).</p>		<p>s2(2) Environmental management must place people and their needs at the forefront of its concern, and serve their long term physical, psychological, developmental, cultural and social interests equitably.</p> <p>s4(a)(v) Responsible and equitable use and exploitation of non-renewable natural resources, taking into account consequences of resource depletion.</p> <p>(vi) Development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised.</p> <p>(q) Recognise the vital role of women and youth in environmental management and development, and promote their full participation</p>
3	<p><i>Equity and environmental justice within current generations</i></p> <p>Ensure fairness in allocation of, and access to, natural resources and opportunities in the Drakenstein Municipal area, so that gaps in wellbeing between rich and poor in the current generation are narrowed.</p>		<p>s4(c) Pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.</p> <p>(d) Pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure well-being. Special measures may be taken to ensure access by categories of persons disadvantaged by unfair discrimination.</p> <p>(p) The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.</p>
4	<p><i>Equity and environmental justice between generations</i></p> <p>Ensure fairness in allocation of, and access to, natural resources and opportunities in the Drakenstein Municipal area, so that options for future generations are kept open.</p>		<p>s4(o) The environment is held in public trust for the people, the beneficial use of resources must serve the public interest and the environment must be protected as the people's common heritage.</p>

SUSTAINABILITY CRITERIA		S24 OF THE CONSTITUTION	RELATED NEMA PRINCIPLES
5	<p><i>Efficiency in use of natural resources and available capacity</i></p> <p>Ensure that no one would be left worse off, benefits are maximised and costs are minimized, resources (e.g. water, energy) are used efficiently, and best use is made of available capacity.</p>	<p>Everyone has the right to an environment that is not harmful to health or wellbeing, and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development while promoting justifiable economic and social development.</p>	<p>s4(a)(v) Responsible and equitable use and exploitation of non-renewable natural resources, taking into account consequences of resource depletion.</p> <p>(vi) Development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised.</p>
6	<p><i>Democracy and good governance</i></p> <p>Promote good governance, appropriate and capacitated institutions, greater attention to fostering reciprocal awareness and collective responsibility.</p>		<p>s4(f) Promote participation of all interested and affected parties (I&APs) in environmental governance, and all people must have the opportunity to develop understanding, skills and capacity necessary for achieving equitable and effective participation. Ensure participation by vulnerable and disadvantaged persons.</p> <p>(g) Decisions must take into account the interests, needs and values of all I&APs, recognising all forms of knowledge including traditional and local knowledge.</p> <p>....(h) Promote community well-being and empowerment through environmental education, raising environmental awareness, sharing of knowledge and experience and other appropriate means</p> <p>(k) Decisions must be taken in an open and transparent manner and access to information must be provided in accordance with the law.</p> <p>.... (l) There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.</p>
7	<p><i>Precaution and adaptation</i></p> <p>Respect uncertainty, avoid even poorly understood risks of serious, irreversible damage to the foundations of sustainability, or irreplaceable loss of resources, plan to learn, design for surprise and manage for adaptation.</p>		<p>s4(a)(vii) A risk-averse and cautious approach is applied, taking into account the limits of current knowledge about the consequences of decisions and actions (vii).</p>
8	<p><i>Integration</i></p> <p>Seek mutually supportive benefits, synergies and overall gains or positive outcomes for all the above sustainability criteria and in integrating different land uses in the terrestrial and aquatic environment of the Drakenstein Municipal area.</p>		<p>s4(a)(viii) Anticipate and prevent negative impacts on the environment and on people's environmental rights; where they cannot be altogether prevented they should be minimized and remedied.</p> <p>(b) Environmental management must be integrated and take into account effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.</p>

11.2 Using the EMF to inform environmental decision-making

The significance of impacts caused by development depends on:

- ◆ The nature of the proposed development (e.g. heavy industry is generally associated with high pollution potential and health hazard) and the extent to which potential impacts can be effectively mitigated; and
- ◆ The attributes of the receiving environment (e.g. scarce water resources, sensitive, vulnerable or threatened ecosystems, fertile soil / productive agricultural area, sensitive cultural resources).

Where the characteristics and value of the receiving environment are unique or considered to be irreplaceable, almost any type of development would cause significant impacts. This situation is represented by the 'Keep Assets Intact' EMZ. Where the receiving environment is less sensitive in that there are important attributes, but these are not irreplaceable, the nature of the development would determine the significance of impacts. The 'Develop with Care' EMZ is of relevance to this situation.

The Drakenstein area has been extensively transformed in the past for a range of agricultural uses and settlement. Most of the areas that could support productive land uses have already been converted, and the ecosystem services underpinning those uses are reaching, have reached or have exceeded their capacity to support further growth. Pressures on natural resources are illustrated by, for example, the deterioration in the quality of water in, and the condition of the Berg River.

Since this area has a high concentration of unique, threatened and / or highly valued natural and heritage resources, further transformation and use of resources outside existing urban areas must be approached with caution. In effect, the receiving environment dictates the type of development that could be supported. For this reason, all of the areas beyond existing urban areas ('limited constraints zone') fall into either a 'Keep Assets Intact' or a 'Develop with Care' EMZ. The EMF provides clear management objectives and specifies limits of acceptable change for each EMZ. These considerations should be used by decision-makers to evaluate development proposals, and by developers to guide their proposals in such a way as to minimize risk.

In essence, further development of the Drakenstein should be '*smart growth*' rather than simply growth for its own sake, in response to the Municipality's values of 'sustainable' and 'quality' living environments. That is, the focus should be on advancing human wellbeing and quality of life through improving the efficiency and quality of - and increasing the spread of benefits from - existing agricultural and commercial activities, and on realising the opportunities for development associated with the unique natural and heritage assets of this Municipality.

Development proposals that would lead to environmental impacts inconsistent with the recommendations of the control zones and associated limits of acceptable change should not be authorized, unless there are unique and /or exceptional circumstances. These 'exceptional circumstances' would be associated with over-

riding public good issues such as meeting basic needs and the equitable distribution of resources. Projects involving public infrastructure developments where it can be demonstrated conclusively that there are no alternative locations for these projects, and no options exist for delivering the intended benefits to the public would fall into this category. Where at all possible, development should strive to exploit opportunities to make a net positive contribution to the health of the environment and wellbeing of people in the Drakenstein Municipal area as well as avoiding negative impacts.

The issues in the Drakenstein that are central to its sustainability are:

- ◆ Biodiversity conservation;
- ◆ Conservation and/ or improvement of ecosystem services;
- ◆ Safeguarding productive agricultural land;
- ◆ Protecting cultural heritage and important social resources,
- ◆ Controlling urban spread; and
- ◆ Providing infrastructure and services in support of poor and vulnerable communities.

The tables relating to the EMZs provide criteria in the form of management objectives and Limits of Acceptable Change which should be applied in the environmental decision-making process. There is no uniform definition or description of a good environmental decision. Gibson *et al* (2005) note that decisions should be aimed at achieving net gains from a sustainable development perspective. In this regard, decision-making criteria need to be clarified and the trade-offs between criteria that are applied by decision-makers must be open. Generally, attributes of a good decision are considered to include the following:

- ◆ That it provides for protection of natural resources.
- ◆ That the social costs are not borne solely or primarily by vulnerable groups or communities.
- ◆ That it is in the interests of the “public good” particularly in respect of access to resources.
- ◆ That it does not result in Limits of Acceptable Change being exceeded.
- ◆ That it takes cognisance of the NEMA principles.
- ◆ That it is technically sound.
- ◆ That it is based on a defensible rationale.
- ◆ That it reduces risk at a reasonable cost.
- ◆ That it is consistent with other similar decisions.
- ◆ That it meets legal obligations or requirements.
- ◆ That it takes account of limitations in knowledge, adopting a precautionary approach where warranted.
- ◆ That it is based on input from all parties.
- ◆ That it addresses a clearly-defined problem.
- ◆ That it provides a solution and does not transfer the problem from one place or time to another place or time.
- ◆ That it is widely accepted.

11.3 Protocol for dealing with offsets and trade-offs in decision-making

Trade-offs imply accepting loss in one area for important gains in another, usually *between* environmental components, that is, they involve weighing up residual negative impacts on one component of the environment with net benefits in another (e.g. gains in job creation versus losses in water quality). In effect, they represent compromises.

Offsets deal with losses and gains *within* an environmental component; they are measures to compensate fully for negative impacts remaining after measures to avoid, minimize and restore have been fully explored. If full mitigation of negative impacts could be achieved there would be no need for tradeoffs.

Consideration of alternatives is an important part of evaluating tradeoffs and enabling choice of the optimum (or best practicable environmental) option. Trade-off rules proposed internationally (e.g. Gibson *et al* 2005), together with their implications for the Drakenstein, are shown in Table 15. Where limits of acceptable change, environmental quality targets or ‘bottom lines’ for a specific environmental component are approached, beyond which consequences for ecological integrity and human wellbeing would be undesirable or unacceptable, the onus should be on the proponent to demonstrate reliably how additional negative impacts would be fully compensated or offset. For example, where water quality standards or supply could be exceeded, the proponent would have to show what measures would be implemented to ensure that the net effect of the proposed development – either through the project itself or interventions beyond the ambit of the project – would be neutral or positive. ***In essence, the Municipality should apply the equivalent of a ‘cap and trade’ approach to maintaining environmental quality.***

In some cases, negative impacts on a particular environmental component may represent **irreplaceable loss** of a number of valued elements to the local community or to society as a whole and could thus not be fully compensated. Sustainable development requires consideration of current and future generations. Permitting loss of irreplaceable natural resources transfers the burden of reduced options - and any costs to ecological integrity and human wellbeing - on to future generations. In these situations, development would not be ‘ecologically sustainable’ and it would be arguable if it were ‘economically and socially justifiable’ (as required in SA’s Constitution) unless there were ‘exceptional circumstances’. These circumstances would comprise development of public infrastructure for which no spatial alternatives were available, and where the proposed activity was of overriding public importance. Each of these elements must be taken into account in evaluating the consequences of trade-offs. For example, transformation of indigenous natural habitat may imply the following lost values to society:

- ◆ Loss of biodiversity;
- ◆ Loss of ecosystem services provided by that intact ecosystem (e.g. regulation of water supply and quality, flood buffer, soil protection);
- ◆ Loss of cultural value (e.g. natural heritage landscape); and
- ◆ Loss of socioeconomic value (e.g. loss of tourism asset).

TABLE 15: Trade-off rules

	TRADE-OFF RULES	IMPLICATIONS FOR THE DRAKENSTEIN
1	Avoid trade-offs where at all possible	Trade-offs are undesirable unless clearly proved otherwise. No development should thus be authorized involving trade-offs (i.e. where a decision is contrary to the management objectives and would result in limits of acceptable change being crossed) unless it can be clearly shown that that <ol style="list-style-type: none"> a) development would have significant long term benefits to society as a whole, b) that all feasible alternatives have been duly considered, c) that all measures to avoid, minimize, restore/ repair and compensate / offset negative impacts have been addressed and provided for, and d) that the trade-offs would be consistent with the rules given below.
2	Maximize net gains	Choose the development option that maximizes benefits to all components of the environment (e.g. increases efficiency of water or energy use, restores wetlands or riparian areas, improves use of productive lands, builds resilience of ecosystems and related livelihoods, etc.)
3	Do not allow any significant negative, irreversible effects and/ or loss of irreplaceable resources	Do not permit further decline in an area of concern where additional mitigation (i.e. offsets or compensation) is feasible. Principal areas of concern in the Drakenstein are the following: water quantity and quality, wetlands, loss of biodiversity, loss of agricultural land, loss of heritage and landscape character). Where there is uncertainty about the potential significance of impacts, gaps in information or an unprecedented development is being proposed, a risk-averse and cautious approach to designing mitigation and to decision making must be applied. The developer carries the burden of proof that negative impacts would be acceptable to society.
4	No significant adverse effects should be displaced to the future	Do not permit impacts that remove options for the future through loss of irreplaceable resources, or cause irreparable harm to ecological integrity, the environment, people’s health or wellbeing. Where there is uncertainty about the potential significance of impacts, gaps in information or an unprecedented development is being proposed, a risk-averse and cautious approach to designing mitigation and to decision making must be applied.
5	Provide explicit justification for any tradeoffs in decision making	Give clear and defensible reasons for approving any trade-offs made, with explicit reference to this EMF and its contents and to the NEMA principles.

12 Monitoring and evaluation framework

The EMF highlights particular environmental attributes and their limits of acceptable change in relation to specific management objectives. The EMF strives to instill a proactive approach to environmental management by directing development to areas that could support such development, thereby striving to avoid or prevent significant negative effects and optimize potential benefits. In addition, the EMF sets explicit objectives and limits of acceptable change for environmental attributes; the onus being on the proponent of development to demonstrate reliably that these limits would not be exceeded.

However, for the EMF to be effective, it is essential that these attributes be monitored and evaluated in light of the objectives, and that negative trends are brought to the attention of the Municipality, other responsible authorities and the public. Only in this way can decision makers take due notice of potential problem areas and build in relevant safeguards to halt negative trends.

The monitoring and evaluation of these attributes should be a focus of the SoER, of the Municipality's IWMP and AQMP, of relevant catchment management agency or water user associations and of monitoring in terms of biodiversity plans.

12.1 Indicators – delivering sustainability through the EMF

The purpose of the indicators is to provide a basis for measuring performance. In the case of the EMF, the indicators are focused on primarily on the NEMA EIA Regulations, with a view to assessing the performance of this system against policy goals and priorities and in relation to objectives and desired outcomes described in this EMF. Indicators are provided for:

- ◆ Environmental authorisation compliance
- ◆ Green economy
- ◆ Biodiversity and ecological integrity
- ◆ Agricultural resources
- ◆ Water resources and water quality
- ◆ Heritage resources
- ◆ Environmental quality and risk

It is envisaged that these indicators would be incorporated into the performance management system of the DEA&DP in respect of its environmental impact management role. Other decision-making authorities could also utilize these indicators (e.g. land use and planning decision-makers). It is not the intention that all of the indicators be applied as this would result in a potentially cumbersome performance monitoring system. Rather, a wide range and number of indicators are provided from which the most meaningful, useful and appropriate would be selected.

Environmental authorisation compliance

- ◆ Number of incidents of non-compliance with conditions of environmental authorization.
- ◆ Number of incidents of non-compliance with conditions of authorisation that have resulted in environmental pollution or degradation.
- ◆ Number of incidents of non-compliance with conditions of authorisation that have resulted in the reduction of or loss in extent of environmental resources.

Green economy

- ◆ The number and type of projects authorised which have resulted in job creation through community-based natural resource management and the number of jobs created.
- ◆ The number and type of projects authorised where green technology has been applied to reduce water use and the extent of water savings achieved.
- ◆ The number and type of projects authorised where green technology has been applied to reduce energy use and the extent of energy savings achieved.
- ◆ The number and type of projects authorised where green technology has been applied to reduce waste production and the extent of waste reduction achieved.
- ◆ The number and type of projects authorised where green technology has been applied to reduce pollution to air, water or land.

Biodiversity and ecological integrity

- ◆ The number and type of projects that have been authorised which have resulted in loss or reduction in the area (ha) of CBAs, CESAs, FEPAs and important ecological corridors.
- ◆ The number and type of projects that have been authorised which have resulted in a reduction in the area of unique or special habitats.
- ◆ The number and type of projects that have been authorised which have resulted in a decline in the number of threatened or local endemic plant or animal populations.
- ◆ The number and type of projects authorised that have resulted in the loss or infilling of wetlands and the number of wetlands affected.
- ◆ The number and type of projects authorised that have resulted in land conversion (ha) within the prescribed setback lines of river corridors and wetlands.
- ◆ The number and type of projects authorised where an area of land has been committed to formal conservation in terms of NEMPAA and/ or set aside as a biodiversity offset.
- ◆ The number and type of projects authorised which have resulted in a reduction of the area (ha) of invasive alien plant cover (e.g. through clearing) and where this area is undergoing an ecological restoration process.
- ◆ The number and type of projects approved in which wetlands have been restored or created and the extent thereof (ha).
- ◆ The number and type of projects authorised which include riverine corridor restoration and the extent thereof (ha).

Agricultural resources

- ◆ The number and type of projects authorised which have resulted in the loss of irrigated agricultural land (ha).
- ◆ The number and type of projects authorised which have resulted in the loss of dryland agricultural land (ha).

Water resources and water quality

- ◆ Number and type of projects authorised that require water abstraction from rivers or water bodies.
- ◆ Number and type of projects approved that require water abstraction to the extent that could threaten the maintenance of the ecological reserve or in-stream flow requirements in rivers.
- ◆ Number and type of projects authorised that will result in the release of effluent into rivers or water bodies.
- ◆ The number and type of projects authorised that result in changes to the floodlines, such that flooding risk has changed and whether this risk has increased or decreased.

Heritage resources

- ◆ Number and type of projects authorised which have resulted in the damaging or destruction of heritage resources.
- ◆ Number and type of projects authorised which have resulted in restoration and / or given formal protection.

Environmental quality and risk

- ◆ Number and type of projects authorised which have a known nuisance or pose a hazard and are located next to sensitive land uses.
- ◆ Number and type of projects authorised that are located in risk areas such as flood prone areas.

12.2 Indicators – adherence to the EMF

- ◆ Number of applications authorized that meet the EMF management objectives relevant to the application.
- ◆ Type / nature of EMF objectives where difficulty is being experienced in meeting these.
- ◆ The number of applications where trade-offs have been applied in decision-making where the outcomes / objectives of the EMF are being met.
- ◆ The number of applications where trade-offs have been applied in decision-making where the outcomes / objectives of the EMF are being undermined.
- ◆ The nature of trade-offs that are being applied in decision-making – what is being traded off and why?

13 Maintaining the EMF

This section deals with both the updating of the EMF and its integration with spatial plans.

13.1 Updating the EMF

The EMF must be updated every 5 years. It is preferable that the revision cycle be synchronized and integrated with the IDP/ SDF revision. A protocol for revision is as follows:

1. The revision cycle would be initiated by the DEA&DP in consultation with the relevant municipality/ies.
2. The DEA&DP should inform the national Department of Environmental Affairs of the EMF revision process.
3. The DEA&DP should inform other relevant national, provincial and local authorities that the EMF is entering a revision cycle. These authorities can be requested to advise as to whether they have useful information to contribute.
4. Assess the performance of the EMF against the relevant indicators and determine where performance has been weak and where it has been satisfactory. In particular, consider whether the EMF has contributed to the reversal of negative trends and if so, how this was achieved. If the EMF is deemed to have resulted in a worsening of negative trends, then the reasons need to be established so that these weaknesses can be addressed in the revision process. The results of this performance assessment process should be used to inform the Scope of Work for the EMF revision/updating. It is preferable to involve other relevant authorities in the evaluation of performance of the EMF.
5. The revision process should involve the following:
 - Establish whether new or revised data with respect to environmental attributes are available. The GIS database and Situation Assessment must be updated accordingly.
 - Determine whether new or revised policies and/or guidelines relating to sustainability, heritage resources, biodiversity, water and other natural resources management and/or environmental management have been published that are of relevance to the EMF area. Review the criteria relating to management objectives, desired outcomes and limits of acceptable change in light of any new or revised policies / guidelines.
 - Evaluate whether the attribute criteria for the EMZs are still relevant and revise as necessary. Update the EMZ maps and the associated tables as relevant.
7. Determine whether trends and pressures identified in the EMF are still relevant, whether negative trends have worsened, stabilised or reversed, and if there are

any new trends emerging that pose challenges for environmental management, drawing in particular on SoER and/ or Environmental Outlook reports. Review the categories of EMZ, and the criteria relating to management objectives, desired outcomes and limits of acceptable change, as appropriate, to address these trends. Integration with spatial plans

The information base used to determine EMZs in this EMF comprises the best available, up to date data on a wide range of attributes. These EMZs should therefore inform the pattern and direction of future development and thus the decision-making process. Furthermore, they should be used by the municipality to assist in defining an urban edge and giving environmental input into the SDF and zoning schemes.

Every municipality must adopt an IDP within a prescribed period after the start of its elected term.⁶⁷ An IDP adopted by the council of a municipality is “the principal strategic planning instrument which guides and informs all planning and development.”⁶⁸ The IDP must be “compatible with national and provincial development plans and planning requirements binding on the municipality in terms of legislation.”⁶⁹ In practice, there is likely to be an IDP already in place while the EMF is being drafted. Municipalities are required to review their IDPs annually.⁷⁰ It is at this stage that a relevant EMF adopted during the previous year, could be considered and the spatial development framework (SDF) aligned with the EMF.

EMFs could have legal effect through linking them to other development plans. These may include zoning schemes adopted under the Land Use Planning Ordinance (“LUPO”);⁷¹ IDPs (which municipalities must compile in terms of the Local Government: Municipal Systems Act (“LG: MSA”))⁷² and the SDFs contained in IDPs. The EMF highlights both opportunities and focal areas for directing future development, and constraints to development. These opportunities and constraints can only be translated into effect by informing and linking with the SDF; i.e. it is important for the SDF and EMF to ‘speak the same language’. The EMF ultimately needs to be embedded in the zoning scheme.

⁶⁷ Section 25(1) of the MSA.

⁶⁸ Section 35(1)(a) of the LG: MSA.

⁶⁹ Section 25(1)(e) of the LG: MSA.

⁷⁰ Section 34 of the LG: MSA.

⁷¹ Ordinance 15 of 1985.

⁷² Act 32 of 2000.

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