

4 SURFACE WATER RESOURCES OVERVIEW

4.1 INTRODUCTION

This chapter documents the details of the water resources, water requirements and water quality of the catchment as obtained through this ISP process. These are broadly the same as those of the NWRS, but where deviations from the NWRS are recommended, these are carefully motivated in each chapter describing the specific ISP key area. This updated information will be incorporated into future updates of the NWRS. A reconciliation of the available water with the water requirements for the current level of development and future expected developments was conducted. From this, the key issues were identified and broad strategies developed to address these issues. Detailed strategies are attached in **Part 2** of this report.

4.2 MANAGEMENT OBJECTIVES

There are a number of generic objectives relating to the management of the water resources of the Mzimvubu to Mbashe catchments. These are:

- ☐ Effective and sustainable use and management of the water resources in the catchment, which recognises the Reserve and the value of water as an asset for economic and socio-economic benefit.
- ☐ Equitable allocation of the surplus allocable water resources to encourage the development of the rural economy in order to contribute to poverty eradication.
- ☐ To make more efficient use of the existing available water resources by all water user sectors. This will enable the DWAF in the interim and the CMA in future, to free up additional water, which can be put to beneficial use.
- ☐ Achieving water quality that is fit for its intended purpose, with the negative externalities being borne by the responsible institutions (polluter-pays principle) and maintaining aquatic ecosystem health on a sustainable basis.
- ☐ To ensure availability of reliable data and information on all aspects of integrated water resource management and potential development in the catchment.

In many cases there are more detailed objectives relating to specific issues or problems. These are provided in the strategies in **Part 2**.

4.3 METHODOLOGY

The methodologies used to present the water availability, water use and yield balance in this ISP are essentially the same as in the NWRS. While these are well documented in the WMA report (Report No. P WMA 12/000/00/0203), some of the more important points are highlighted here for convenience.

Afforestation and invasive alien plants both reduce the natural runoff from a catchment through increased rainfall interception and transpiration. This inevitably impacts on the yield available in the catchment. However, from a legal and economic point of view, afforestation and invasive alien plants need to be treated differently from a water resources perspective.

The impact of invasive alien plants (IAPs) is incorporated into the water resource and reflected as a reduction

in yield rather than a water use. DWAF is, however, actively trying to reduce this impact through the Working for Water programme and hence reducing the impact of IAPs listed in this report represents a possible opportunity to make more utilisable water available for productive use.

Afforestation is a declared streamflow reduction activity (SFRA) and subject to control by DWAF. The estimated impact of afforestation on available yield is listed as a water use.

Water for the ecological Reserve is water that must remain in the river and may not be abstracted. This is expressed as an estimated reduction in available yield and shown as part of the resource. The total resource available under natural conditions has been estimated and the utilisable resource reduced by the impact that the ecological Reserve has on this resource.

The categories used to define water use are the same as those used in the NWRS. Urban use in this context includes domestic and industrial use within the urban area. Large industries, which have their own source of water, are listed under *mining and bulk*. Rural use includes domestic use in small settlements and on farms as well as stock watering.

4.4 SURFACE WATER RESOURCES

Table 4.1 provides the mean annual runoff (MAR) per key area of the Mzimvubu to Mbashe ISP area.

Table 4.1: Natural Mean Annual Runoff and Ecological Reserve (million m³/a)

COMPONENT /KEY AREA	NATURAL MAR	ECOLOGICAL RESERVE ^{1,2}
Mzimvubu	2 897	338
Pondoland	796	148
Mtata	836	163
Mbashe	1 126	203
Total	5 655	852

1) Quantities given are incremental, and refer to the key area under consideration only.

2) Total volume given, based on preliminary estimates. Impact on yield being a portion of this.

(Source: DWAF, 2003) ⁽²¹⁾

There are no major dams in the Mzimvubu key area. The Vaal Augmentation Planning Study (VAPS) identified at a reconnaissance level that there is potential for water resource development on this river sometime in the future to meet part of the future water requirements of the Vaal River Supply Area.

The Mtata River key area is highly regulated but has an estimated natural MAR of 836 million m³/a. The major dam in this catchment is the Mtata Dam which is situated upstream of the town of Mtata.

The Pondoland key area is the area with the smallest runoff with a MAR of 796 million m³/a. This is still very significant when compared with other catchments in the country.

4.5 COMPARISON OF THE NWRS WITH THE UPDATED ISP WATER BALANCE

The ISP area was divided into key areas as described in section 2.1. These key areas are consistent with the key areas in the NWRS and the key areas for the groundwater resources. The following points are important when analysing the water resources of each key area to ensure consistent use of the same figures or to justify changes to the figures in the NWRS. This has been done in the ISP with respect to balancing water resources availability and water requirements for each area. The following approach was used in the ISP:

- ❑ The water requirements for the year 2000 level of development have been updated based on the latest available information from various sources. These are presented in a table that also indicates the current sources of water for the various water user sectors in the various key areas. These sources have been grouped into four main categories, namely, groundwater resources, surface water resources, transfers and return flows.
- ❑ The balancing of the water resources available with the water requirements is presented in a similar tabular format to that of the NWRS.
- ❑ The water balance figures for the ISP key areas were aggregated to reflect the key areas given in the NWRS. A comparison has been made between the NWRS and the ISP water balance. The comparison is discussed in each chapter of the key area. Where inconsistencies have been identified and there are justification for using ISP figures, motivations are given in the following chapters as to which figures have been used in the balancing of water resource availability with water requirements for the key area. The figures so determined are referred to as the strategy figures.
- ❑ The water requirements and the sources of supply to meet requirements were determined at quaternary catchment level. This was done in order to analyse where local deficits and local surpluses occur in each of the key areas. The purpose of providing water balance figures at quaternary catchment level is to provide the Regional Office with first-level assessments on where the water resource allocations (or licences) can be considered. Where the difference between available water resources and water requirements are small, then a detailed system analysis is recommended before a decision is made on water use allocation and licensing of the water resources. This is due to the high uncertainty (risks) in the level of confidence that can be placed on the strategy figures. Where the surplus is large water use allocation can be considered with little or no risk of failure in the system.