TITLE: Water Resources Management Plan in the Diep River Catchment: A Situation Assessment

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This document gives a description of situation assessment on water resource quality of the Diep River Catchment. The study originated from a request by the Regional Office, Western Cape of Department of Water Affairs and Forestry (DWAF), to the Institute of Water Quality Studies (IWQS) in 1997.

The main objective of this report is to provide a situational assessment of the water quality, quantity and the aquatic ecosystem health of the surface, ground and coastal waters of the Diep River Catchment. This study is aimed not only at the Western Cape regional office, but it can be used for a wide readership by the catchment management agencies in the area, interested parties (e.g. salinasation issues in the Western Cape) and decision makers, as an input into catchment management plan for example.

The Diep River rises from the Riebeek-Kasteel Mountains, north-east of the catchment. It then flows in a south-westerly direction through Malmesbury before discharging into Table Bay, north of Cape Town. The Diep River has a total length of about 65 km. The catchment has a total area of about 1 495 $km^2$. The Diep River catchment is low lying and flat with isolated mountains on its eastern boundary, namely the Perdeberg, Kasteelberg, and Paarlberg.

The Diep River has one major tributary, the Mosselbank River, which rises in the Skurweberg Mountains and drains the south-eastern portion of the catchment namely, the Durbanville and Kraaifontein areas. The Mosselbank River has a tributary called the Klapmuts River. Other tributaries of the Diep River include the Riebeek River, Klein River, Swart River, Platklip River, Groen River, and the Sout River.
The estuary is approximately 900 hectares in area and consists of Rietvlei and Milnerton lagoon. The lower estuary, generally called Milnerton Lagoon, follows a narrow winding channel from the southern tip of Rietvlei to the river mouth.

The catchment falls into the western lowland area of the Western Cape. This area may be divided into the Swartland in the east and the Sandveld in the west. Virtually the entire catchment is under cultivation of mostly wheat. In the southern extremes of the catchment, urban and industrial development is dominant.

A general overview of the water chemistry of the surface, ground, and coastal water within the catchment is briefly given. The Western Cape Regional Office (DWAF), the City of Cape Town, and the Local Authorities are currently in charge of the monitoring activities within the catchment. The surface and groundwater quality was not monitored regularly during the study period and hence the trends and water quality changes are not indicated. An assessment available data on the suitability of the water

quality was however done for the various water users. The most prominent problem at most sites with all the water users was elevated salt concentrations (Total Dissolved Salts, Electrical Conductivity), which could be attributed to the geology in the catchment.

Assessment of the available data in terms of the requirements for domestic use indicates that the surface water monitoring points on the upper, middle, and lower catchment are classified mainly in the marginal to poor water quality classes. There are two monitoring points, which are classified under the unacceptable water quality class. In the upper catchment the groundwater has the classification of ideal class (one source), good class (one source), and marginal water quality class. The middle and lower part of the catchment indicates poor and unacceptable water quality classes for the groundwater resources as a result of elevated salt concentrations.

An assessment of the microbial water quality data for recreational use indicated that the coastal water monitored points will only pose health risk if the water is swallowed during contact recreational use (e.g. swimming).

The assessment of the data for agriculture - irrigation use - indicates that irrigation of the surface water requires management intervention at monitoring points on the upper catchment due to elevated electrical conductivity, sodium and chloride concentrations. The middle and lower catchment irrigation of water also requires management intervention (with, exception of water obtained from the Kraaifontein Wastewater Treatment Works which can be utilised to irrigate less sensitive crops). In the upper catchment the groundwater data indicates that the water also requires management intervention at monitoring points and also as a result of elevated electrical conductivity, sodium and chloride concentrations. Groundwater in the middle and lower part of the catchment is not suitable for irrigation.

The assessment of water quality data for agriculture – in the form of livestock watering indicates that the use of surface water for livestock watering at monitoring points on the upper, middle and lower catchment may create problems for particularly more sensitive animal species. The effect of elevated salts will depend on the type of livestock as the actual intake volumes and subsequent ingestion of salts varies enormously between species and production systems. Water on the upstream sites of Mosselbank River is however suitable for livestock watering. The groundwater quality data indicates that the use of water for livestock watering could create problems in the upper, middle, and lower catchment, particularly for more sensitive animal species.

Biomonitoring is an assessment tool that was also utilised to assess the integrity of the aquatic ecosystems in the Diep River catchment. The results from the various investigations indicate that only one monitored point located upstream of the Diep River is moderately impaired. The rest of the monitoring points are classified as deteriorated. For the proposed

second phase studies, results of biomonitoring need to be compared and contrasted with the chemical monitoring as the monitoring programmes would give information on the water quality that could supplement each other.

It is recommended that further negotiation within the catchment by stakeholders and other water users be initiated/continued for the setting and attainment of water resource quality objectives. The resource quality objectives should also be assessed in terms of the requirements of the "Reserve" and in terms of the needs of the other users, as part of the second phase of the project.

Issues have been raised in this report that need to be addressed for the improvement of water resource management in the Diep River catchment. For each water resource issue alternative recommendations has been made and constraints identified such as:

- Non-access to potable water by some communities requires an investigation of alternative sources of water.
- Rapid development in the lower parts of the catchment need to be controlled as specified in the environment policies e.g. Environmental Impact Assessment as stipulated in the National Environment Management Act.
- Areas with alien (exotic) vegetation infestation in the catchment should be identified. The removal of alien vegetation should then be prioritised.
- Better farming practises and environmentally friendly urban development should be exercised to avoid vegetation removal, bank erosion and channel modification.
- Mining (sand) and quarries issues in the catchment need co-ordination between planning legislation and procedures administered by Municipalities.
- Altered flow in the river system issue has to be managed by controlling access of domestic livestock to surface water.
- Impacts of dams in the catchment could be addressed by water use registration and monitoring.

The issues mentioned and the recommended actions should not be considered as the final solution, and further input from the stakeholders should be considered. A second Phase of the project is recommended, to cover sections of the National Water Act dealing with Resource Direct Measures, i.e. the determination of the catchment class, reserve requirements, and resource quality objectives.